



COSMO'S TR4/4A E-mail Manual

by Jeff (Cosmo) Kramer

Forward

I'd like to thank **EVERYONE** that has been on the [TRIUMPH List](#) for asking questions & willingly giving out information in order to keep our **TRIUMPHS** running on the road. I've accumulated these threads over the years, & **ANYONE** can obtain this information by going through the TRIUMPH List's Archives. I've just collected the threads that pertain to the TR4 & TR4A cars.

I changed everything into **Microsoft Office Word 2007** when doing this into PFD. I found viewing at 120% magnification is the largest size to read the document without moving the lateral scroll.

How to read these threads:

If there is more than one person's thread (of that topic), then the first thread is normal in reading. Every thread after that first thread (Pertaining to that topic) will have the heading indented. A new thread (in that folder) will be on the next new page. If you come to a blank page with a heading, then nothing was submitted to go into that section. You might see something repeated in two different sections because they were cross referenced.

I have included a **Table of Contents** for ease of finding an article that may help you.

-Cosmo Kramer

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Body/Cock-pit

Subject: TR4 Inside Mirror
Date: Thu, 15 Feb 2007
From: Steven Newell <steven@newellboys.com>

Geo & Kathleen Hahn wrote:

- > On the TR4 (on mine anyway) the inside rearview mirror is convex, at least convex in the horizontal plane.
- > Cars behind me look normal height but skinny... in other words, 'objects in mirror are wider than they appear'.
- > ... I ask because mine is a bit tatty but I like the wider field of view it provides and would want any
- > replacement to have the same.

Geo, years ago I installed what I recall was a TR6 rear view mirror on my TR4. I was commuting back and forth from downtown Denver. It provides a way better field of view, and has a breakaway feature that my boys have tested while playing in the car.

FWIW the mirror in my car when I bought it is, if not original, old enough to be. It is labeled "WINGARD" and "MADE IN ENGLAND" on the bottom of the mounting bit, and reads "Pat. No. 662246" on the bottom of the housing around the mirror. It has a little tab at the bottom which can tilt the mirror face. It's not big, 5" x 2 3/8".
-Steve Newell

Body/Cock-pit/Carpeting/Carpet

Subject: Carpet Install question
Date: Fri, 25 Aug 2006
From: Michael Godley <mgodley@tiac.net>

Folks.

I am installing new carpets in the 4A, and am not familiar with some of the hardware. Specifically the female snaps are two pieces. One is a black retaining ring with 3 triangular teeth that fit into the business end of the snap. What is the correct way to install these?

-Mike Godley

Subject: Carpet Install question
Date: Fri, 25 Aug 2006
From: Darrell Walker <darrellw@ipns.com>

Hi Michael,

The black rings go on the top side, with the little points going through the carpet. The snap goes on the back side. I then used a little hand dolly on the top of the carpet to support the black ring, and a small hammer to bend the teeth over. After you fuzz the top of the carpet back up, the ring is pretty much invisible.

-Darrell Walker

Subject: Carpet Install question
Date: Fri, 25 Aug 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Michael Godley wrote:

> I am installing new carpets in the 4A, and am not familiar with some of the hardware. Specifically the female
> snaps are two pieces.

One other tip... if you place the carpet in the exact position you want and press hard on the carpet where is it directly over the male snap you will make a mark in the underside of the carpet so you will know where to mount the snap. Works on grey carpet at least... if you have black carpet and the mark is hard to see you can put a bit of chalk on the male snap before you lay the carpet over it to leave a better mark.

-Geo H

Body/Cock-pit/Carpeting/Carpet

Subject: Installing carpet snaps - is there a trick to this?
Date: Wed, 19 Mar 2008
From: "Marty Clark" <marty.tr6@gmail.com>

Brian,

The quickest and easiest way I found was to mount a male ring upside down in a female ring and place both on top of the snap on the floor board with the male prongs facing up. Put the carpet in place and push down a little by the snap and rings. The prongs will pop through the carpet (but from the wrong side). I pull the carpet up holding the rings onto the back of the carpet and then using the prongs sticking through from the back as a guide place a male ring where the other one is by lining up the prongs. Remove the male piece from the back after pushing the male ring into place from the front. Slip on the female ring on from the back and bend over the prongs (I used needle nose pliers with a tight rolling over action using the female ring to brace the pliers to get a tight fit) and it should line up right where the snap is.

-Marty Clark

Body/Cock-pit/Carpeting/Carpet

Subject: TR4 Carpet install
Date: Wed, 6 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

From: <richhalpern@verizon.net> wrote:

> ... I am wondering if I can tap any experience installing a TR4 carpet set. Do I have to use the traditional
> snaps (the new floors have none), or is there another, more modern way to keep the carpet and pad in place.

As I recall, the carpet on the forward floorboards lays there just fine... held by a pair of metal clips at the forward/upper edge (don't get your finger caught in one of those!). The carpet under the seat is clamped down by virtue of the seat tracks. The piece that goes over the hump on the rear deck is glued, as is the part of the rear carpet that covers that vertical surface behind the seats.

The tunnel pieces (gearbox & propeller shaft) use those snaps that fasten to the carpet with spiky rings. I good way I think as you're likely be pulling them off from time to time.

The inside rocker pieces get clamped by the door trim... I think I just let them hang and get tucked under the floor carpet (no glue).

The kick panels have screws along the front edge, maybe some adhesive too (don't remember) though the forward area of the driver's side kick panel is pretty well clamped in place by the dipper switch bracket.

What am I missing?

In general I like to glue as little as possible so everything can come out to dry on the line when I get a soaking.
-Geo

PS - Are you getting the grey carpet? That has been my biggest disappointment as mine changed color to a shade of orange-grey. They (TRF) may have improved the UV resistance since I got mine 5 years ago.

Subject: TR4 Carpet install
Date: Wed, 6 Jun 2007
From: Bob Labuz <yellowtr@adelphia.net>

Rich,

I installed the 2 snaps on the front floor carpets my recent carpet install.

Snaps were also used on the transmission tunnel pieces.

I glued the small pieces over the inner sills as well as the vertical part behind the seats. Now the same part on the horizontal is not glued. It attaches with lift-o-dot females over 4 males which secure the rear hoodstick cover.

The side panels are screwed in the rear (3) screws, and on the left the forward part of the panel is held in with the high beam switch. On the right, I installed 2 screws forward and 3 in the rear as in the left side.

The carpets under the seat are held in with the seat hardware as George said.

The snaps on the front pieces are optional. I did it due to originality only. They sit pretty flat without the snaps.

I wanted to go with grey, but TRF recommended I not use Grey due to the fading. I went with black and it looks real nice. TRF does a good job on carpets these days.

Remember to take your time, it is not a hard job.

Also remember to install your wheel well covers, rear 1/4 panels, the gas tank panel and all 3 hood stick covers before carpet is installed. Those wheel well covers do take glue and some patience! Have fun!

-Bob

Body/Cock-pit/Carpeting/Carpet

Subject: Two piece (TR4A) versus one-piece (TR6) Door Seals
Date: Tue, 29 Oct 2002
From: "Jack W. Drews" <vintr4@geneseo.net>

Ben and Pam Zwissler wrote:

> I'm about to repaint my TR4A body tub and have removed the channels for mounting the outer door seals.
> The TRF catalog and others recommend the one-piece TR6 "fuzzy door seal" for the TR4A at least in part
> because then you don't need the channel to mount the "outer" seal.
>
> My question is, how does the one-piece seal work around the triangular plate at the bottom of the "B" pillar?
> The channel went around the bottom of the pillar (two short sides of the triangle), while the flange that the
> one-piece seal attaches to goes across the "hypotenuse/long side" of the triangle.
>
> If I'm going to reattach the channel, I need to do it before I paint. I'm looking for people's experience fitting
> the one-piece seal to the TR4A and whether they were happy with it.
>-Ben Zwissler

We just went through this on a ground-up restoration of a TR4. We had the same experience that another leading restoration shop had -- that with new TR4 door seals, it is nearly impossible to get the doors to close nicely. The problem is the lack of compressibility of the seals in three places:

- The lower rear,
- The lower front, and
- The pinch point between the top front corner of the door and the body immediately below the windshield frame.

Using the new seals, you have to have a gorilla as a passenger, just to shut the doors. (No dear, I'm not talking about you)

We did not try the TRF seals. Maybe they fix this problem. What we did do was use the TR6 seal, which is a fuzzy channel plus a rubber tube section, much more compressible. When we did this, it did not seal against the metal surface at the lower rear corner, so we used an additional seal around that corner against the metal instead of the upholstery.

If you take this approach, you do not need to replace the rinky-dink little metal channel.

-uncle jack

Body/Cock-pit/Carpeting/Insulation

Subject: Sound Deadening - What works? What Doesn't?
Date: Mon, 11 Nov 2002
From: "Scott A. Roberts" <herald1200@comcast.net>

With my Herald, I liberally salted with Dynamat Sound Proofing Pads, which I purchased at the local auto paint supply house for \$20./pack of 6. These are placed as follows:

Doors- 2 each side, 1 forward of skin strengthener, 1 behind, mounted (self adhered) to the outer door skin.

Rear Wings-(All mounted to outer skin) 1 behind rear seat side panel, 1 at rear section behind fuel tank, 1 (halved) above wheel well. This was on both sides of car

Boot- (Not Dynamat) The interior kit came with boot floor insulation kit, same type material as Dynamat, but large sheet (2 sections) cut to fit around spare tyre well, on flat floor of boot.

Floor under rear seat- 3 pieces Dynamat, center one over-lapping outer ones, as was originally insulated.

Floor- Rear Foot wells- 1 piece each side, fitted one on drive shaft tunnel. 1 piece each side under the seats, and again, 1 fitted on drive shaft tunnel, around brake handle mounting.

Front Foot wells- 1 each side.

This arrangement has made for a pretty quiet car, with the hood down. I am planning to add the other type insulation to the underside of the transmission tunnel, but haven't bothered yet. The firewall is covered with a closed cell foam set of pieces which also came with the interior kit. They were precut to fit, and only required a little persuasion.

I saw no reason to insulate the bonnet. I did make sure I had good bonnet strike cones in place (Neat trick- a little adjustment to them, and the bonnet lined right up! All this after fiddling around with the other adjustment points for literally hours to no avail!) These rubber cones take out a great deal of rattle, if installed properly.

Frame mounts were also replaced, in the interest of silence.

-Scott

Body/Cock-pit/Heater/Core

Subject: Heater Fan Question and Suggestions (long)
Date: Mon, 3 Jan 2000
From: <Bud_Rolofson@nps.gov> (Bud Rolofson)

Brad Kahler ask me this question and I thought the list might be interested in the answer too.

Brad wrote:

> In your opinion is the fan upgrade worth it? I assume all it does is replace the motor itself or
> does it also replace the fan? That works out to around \$75 plus shipping. Rather expensive for
> a little more air movement.

Answer:

It upgrades the motor (advertised as 60% more power...which I think does happen but 60% of not a lot is still not a lot) and replaces the blade fan with a squirrel cage fan, which is more efficient.

If for some reason you have to get into the heater box like I did to pull a leaking heater core then it is very worth it, since pulling the heater box is a lot of work and it's one of those...well as long as I've gone this far I might as well go ahead and upgrade.... And it does blow more air. You can actually hear air flow.

I don't think it's worth it JUST to increase air flow or heat since there's some other things that you can do to improve that such as:

- 1) Backflushing the heater core,
- 2) Vacuuming twenty some years of leaves off the heater core by accessing through the scuttle vent (my heater core was about 20% covered/clogged with leaves that had no place to go) with a small hose duct taped to your shop vac, or by **GENTLY** blowing air (back flushing) through the heater core via the bottom flap on the heater box while the scuttle vent is open,
- 3) Closing the dash and floor vents (swivel ones) when using the heater and defrost, &
- 4) Opening the scuttle vent when using the heater or defrost.

Lot's of people don't realize the scuttle vent should be open (and I didn't until I read it here on the list) or there's no air source for the fan and air flow is **GREATLY** reduced. I told a guy in the RMTC about this yesterday at the club breakfast...he had a 4A that he was complaining about poor heating but he didn't have an owner's manual (which is apparently one of the few places that tells how to operate the heat/demist/vent system) and didn't know to open the scuttle vent.

Nothing like experience to be a good teacher so I thought I'd share what I've learned the hard way.

Air Vent Control (the bottom flap on the heater box) Positions/Functions on MY TR6.

- 1) Knob all the way in. Open scuttle vent and open the dash and floor vents to get ambient air temperature air flow. Air flow is only through the air vent hoses and none through the heater core.
- 2) Knob pulled out to first click. Open scuttle vent and close the dash and floor vents. Air flow is through the heater core and then through the demister/defrost hoses only. Pull heater control valve knob/cable to get heated air.
- 3) Knob pulled all the way out. Open scuttle vent and close the dash and floor vents. Air flow is through the heater core and then mostly out the bottom of the heater box onto your feet with maybe

a little through the demister/defrost hoses. Pull heater control valve knob/cable to get heated air. This is how I get maximum heating in the cockpit.

Look at a heater box in a manual or catalog, and you'll see where the various air vent and demister/defrost hoses connect and the position of the heater core and it'll make more sense.

TR4-6 heater upgrade kit # **812301X** 56.40 (pounds)

Moss Manchester
113-117 Stockport Road
Cheadle Heath, Stockport
Cheshire, SK3 OJE
Tel 0161 480 6402
Fax 0161 429 0349

They are also available through:
M & G International, Manchester, 0161 7739678, and
M & G International, Merseyside, 0151 6661666.
-Bud

Body/Cock-pit/Heater/Core

Subject: TR4 Heaters
Date: Sat, 16 Dec 2006
From: "Tim I. Purdy" <timipurdy@citlink.net>

The heater in my 64 TR4 no longer works at all. The fan, went out a year ago, making an ugly sounds, but I could still using the two other controls, have heat. I am not really familiar with this part of the TR4, especially since a lot is hidden. I did spray some WD-40 on the cables, thinking something might be stuck, but still not getting any warmth, and at 32F today it was a bit chilly on the usual Saturday drive.

Any assistance, certainly be appreciated, and remember I am novice on some of this stuff, so keep suggestions elementary for my brain.

-Tim

Subject: TR4 Heaters
Date: Sat, 16 Dec 2006
From: John Mitchell <jmitch@snet.net>

Revington TR is producing a new up rated replacement heater but the price is a bit steep at 360 pounds sterling.
-John Mitchell

Subject: TR4 Heaters
Date: Sat, 16 Dec 2006
From: <Dave1massey@cs.com>

The heat is controlled by a valve on the right rear of the engine. Is the cable opening and closing the valve? (This can be verified visually) Are the hoses getting warm?

Also, since you have no fan the only air that will pass through the heater will be ram air from the scuttle vent at the base of the windshield. Is that vent open?

-Dave

Subject: TR4 Heaters
Date: Sat, 16 Dec 2006
From: "Terry Smith" <terryrs@adelphia.net>

I'm sure this isn't the problem, but because of the severity of implications, I always check the water level first. If coolant is low, it won't heat anything, until of course it melts the engine....

-Terry Smith

Subject: TR4 Heaters
Date: Sat, 16 Dec 2006
From: "Lou Metelko" <lmtr4a@ctlnet.com>

I agree with Dave M. on this. To get your TR4 producing heat close the vents with the thumb wheel on the dash, manually open the heater valve on the right rear of the engine and lastly open the air vent in front of the windscreen.

At just 32 degrees even with no fan motor, there will be more than enough heat.

-Lou Metelko

Subject: TR4 Heaters
Date: Sun, 17 Dec 2006
From: Brian Jones banc8004@comcast.net

Tim wrote:

> The heater in my 64 TR4 no longer works at all. ... Any assistance, certainly be appreciated.

> -Tim

Tim:

There is not much to go wrong. Kneel at the driver footwell, looking above the gearbox hump. Pull on the air-direction control, and you should see the air dam drop to direct air to the foot wells.

Start your engine, and wait for the thermostat to open (the pipe to the radiator will then be getting warm). Pull the heater control. This cable leads to a valve mounted near the oil filler cap (on my '63 anyway) that should now allow hot water to the heater. Follow the rubber pipe from the valve to the firewall. It's the upper of the two, and should quickly feel warm to the touch. This will tell you that:

a) your valve has opened,

b) that you have flow).

You should soon be able to feel warmth in the return pipe - the lower of the two, connected side by side at the firewall.

Open your scuttle vent at the base of the windscreen and close the dash vents using the thumb-wheels, and take her out for a drive (I'm assuming it's a 'she').

At say, 30 miles an hour, there should be a noticeable flow of warm air.

If you have warmth in the supply pipe, and still no heat in the car, I'd imagine the heater element is blocked. In this case, I'd use a good brand radiator flush product and use the supply/return hoses to thoroughly back flush and flush the heater element. That will give you a good chance of clearing things.

If you get no warmth in the supply hose, suspect a faulty valve. Moss 635 270, \$25.

<<http://www.mossmotors.com/Shop/ViewProducts.aspx?PlateIndexID=29174>>

On your fan, I can only imagine it is a dash-out job. My fan didn't work when I got my car three months ago. My PO had adopted the 'twist and tape' method for joining wires. Soon fixed, but I don't think I have used the fan since I got it to work. Good luck,

-Brian

Subject: TR4 Heaters
Date: Sun, 17 Dec 2006
From: Bob Labuz <yellowtr@adelphia.net>

TR4, 4A, 250 and I think TR6 heaters are on E-bay all the time and I believe they are interchangeable. If you decide to get a newer one, go for the 2 speed. I am guessing it will be a real pain to remove the old one and install a new one. I installed mine, but without the dash installed etc. in place. I used new rubber washers available from TRF. Not too bad to get the 3 bolts in. Make sure the bolt sleeves are clean due to the close tolerance of the metal guides in the rubber washers.

-Bob

Subject: TR4 Heaters
Date: Sun, 17 Dec 2006
From: <jar@aldermanroad.net>

As is the case with all heaters, the biggest pita is the access/removal. The 4's heater element is much better designed in that it is self-flushing, but the hoses are these little, short, stubby curved things that are a difficult to access remove. Thus, if the hoses are intact, then you can put an attachment on the firewall connections inside the engine compartment and flush is. Access to the fan is another story.

Subject: TR4 heaters
Date: Mon, 18 Dec 2006

From: <CarlSereda@aol.com>

One thing I found that reduced my TR4 heat flow tremendously was a mouse nest on top of the heater core! Didn't you say the fan stopped with some ugly noises a year ago? You might try one of those pincher tools through the scuttle vent flap to see if you can pick up any items in there blocking flow. Good luck,
-Carl

Body/Cock-pit/Heater/Core

Subject: TR4-6 Heater Seal
Date: Mon, 17 Nov 2003
From: "dixie" <dixie4@wales.freemove.co.uk>

In my case the original rubber type seal had compacted and hardened to such a degree that it was no longer providing a seal. I rectified this with 1/2" deep x 1/2" wide foam that comes on a roll and has a self adhesive surface on one side. This is the kind of stuff you use to seal heating ducts and such like.

After removing the heater unit I applied the foam neatly around the hole in the bulkhead/firewall and replaced the heater unit still using the original seal. My problem was solved in a very cost effective way and the repair is invisible and effective.

Now if you have removed the remains of the original seal I am sure a visit to a heating and ventilating workshop will yield something similar to the original seal.

-Adrian

Subject: TR4-6 Heater Seal
Date: Mon, 17 Nov 2003
From: "Rob Christopher \(\rob\)" <rob@cisco.com>

Jeff,
Don't laugh, but I just did this on my car. My heater box had a badly dried out foam ring on top of it to seal to the underside of the plenum. The diameter of the opening at the top of the heater is 4". The standard size toilet flange is 4". I bought one of the foam type toilet seals (the other type is the wax ring) and used that.

About \$0.99 at Home Depot.

-Rob

P.S. I could be mistaken on the diameter, it could be they are both 4.5". In any case, the foam sealing ring is a perfect fit.

Body/Cock-pit/Heater/Hose & Duct

Body/Cock-pit/Heater/Switch & Electrical

Subject: Cable Routing for TR4A
Date: Thu, 29 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

"C E White" <BN_Knight@Ameritech.Net> wrote:

> What is the proper cable routing through the firewall for the choke cable, heater control cable and wiring harness for a TR4A? Pictures would be great! Thanks!
> -Chuck White

Hi Chuck!

I didn't see any reply, & I DID finish reading the digest before typing this E-mail to you.

I just went out in the garage to look at my Garage Queen. The wire harness for the Starter Solenoid runs through the hole that is just above the Heater Water Hose. The Coke & Heater cable BOTH run through the SAME hole at the **same level** as the wiring harness for the Starter Solenoid BUT this hole is CLOSER to the battery [Positive side].

If you can NOT follow this then I'll try sending you a pic. It's my 1st time, new camera. So let me know if it did or did NOT go through.

-Cosmo Kramer

Subject: Cable Routing for TR4A
Date: Thu, 29 Mar 2007
From: "C E White" <BN_Knight@Ameritech.Net>

Cosmo,

Hey, buddy! How ya doin'? It's good to hear from you. Thanks for the information and the picture. They both came through loud and clear.

I've been working with Mark Macy on a few of these great British irons and this was a stumper. We tried using my '4A as an example but found a problem right out of the box. My heater cable runs out of a grommet in the firewall bump-out just behind the right hand fender well. It's the grommet that is used for the choke cable on a TR4. My wiring comes out of the grommet next to the battery (positive side) and the choke cable comes out of the grommet just above the heater hose adaptor. According to the TRA Judging Guide for the TR4A, all 3 arrangements are wrong on my car. According to the guide, the heater control cable is supposed to go through the grommet just above the heater hose adaptor, the choke cable is supposed to go through the grommet just to the right of the battery, and they don't mention where the wiring cable is supposed to go. Piggott's book on originality, Williams book on restoring TR's, my workshop manual, my Haynes manual, and my InterEurope manual don't show any pictures of the firewall where the cables/wiring come through it. Are you sure yours are in the correct, original locations?

-Chuck

Subject: Cable Routing for TR4A
Date: Fri, 30 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

C E White <BN_Knight@Ameritech.Net> wrote:

> Cosmo,

> Thanks for the information and the picture. They both came through loud and clear.

> I've been working with Mark Macy ... Are you sure yours are in the correct, original locations?

NO, But I did copy it off my 1st TR4A car [Org. to me owning a car.]. BUT! That doesn't mean that it wasn't

changed by someone else before I obtained the car. Probably not, but there's still a chance that it could have been.

-Cosmo Kramer

Subject: Cable Routing for TR4A
Date: Mon, 2 Apr 2007
From: "C E White" <BN_Knight@Ameritech.Net>

Cosmo,

What we ended up doing was using the grommet next to the positive side of the battery box for the heat control cable. We ran the choke cable and the wiring harness for the solenoid through the grommet above the heater's water adaptor hoses thingy. With the exception of the wiring harness, that's what the TRA Judging Guidelines specify. It doesn't say anything about where the solenoid's wiring should go. This car is just a driver for a customer here in the shop and originality isn't an issue.

-Chuck

Body/Cock-pit/Heater/Switch & Electrical

Subject: Heat blower Question
Date: Fri, 6 Oct 2000
From: <JRossi727@aol.com>

Hello All. A little shade tree tech-tip. Overhauling and cleaning the heater unit for my TR-250 project. Found the motor did not work. Took it apart and look it over. Well, looks like a MGB blower motor. Just different mounting. Yes, it will work. Just use the Triumph mounting brackets and fan. Wire it up to two speeds. And it now in the restoring 250. There are a lot more MGB parts out there than TR parts. And a lot cheaper. I also posted a note on TR-6 starter motor. Being the same as MGB. Except for the nose cone.

-John

Subject: Heat blower Question
Date: Sat, 06 Jan 2001
From: Randall Young <randallyoung@earthlink.net>

Hook each one in turn to a source of 12 volts DC (a 10amp battery charger will work fine), preferably with a fan blade attached, and see how it runs. Fast and smooth is best, you can judge relative speed by the noise (higher pitch = faster).

Note that the motor will jump when you first apply power. If spinning fan blades don't bother you, you can hold it in your hand, otherwise you'll need to arrange some sort of mount, preferably along the lines of the original mount. Just clamping the motor housing in a vice may distort the housing.

-Randall

Subject: Heat blower Question
Date: Sat, 6 Jan 2001
From: David Massey <105671.471@compuserve.com>

Message text written by "Patrick Bitton"

> I have 3 heater blowers and don't know which one is the better one. Is there anyway to test the blower if it is
> completely out of the car?

There are two things you can check on a blower when it is out of the car. You can spin the scroll by hand and check for stiff bearings and you can hook it up to a 12 volt battery and spin it to check for balance and lack of vibration and noise. (Follow Randall's recommendation on securing the motor as it will want to rotate on you)

-Dave

Body/Cock-pit/Heater/Switch & Electrical

Subject: Heater cable TR4
Date: Mon, 19 Feb 2007
From: "Chris Simonsen" <ccsimonsen@gmail.com>

I bought a heater cable from one of the big 3.....

It mounts up just fine - Used a dremel to shorten. Only to find it has about half the throw of the OE cable I had that separated.

Can anyone mail me off list and tell me where I can get one that fits properly? I don't want to order yet another cable destined to be my secondary hood release.....

Off list as I do not want to start any Triumph supplier email wars.... Thanks
-Chris

Subject: Heater cable TR4
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

--- Chris Simonsen <ccsimonsen@gmail.com> wrote:
> It was about 8 feet long..... only 3 feet longer than the original....
>
> had to be really careful with the dremel.
>
> I'll get it fixed about the time it gets warm here!!!
> -Chris

Hi Chris!

So I gather that the problem is that you cut it too short vs the cable NOT working properly? Can you pull the actual cable completely out from the cable housing? OR Did you have to cut the cable housing with the cable inside the housing? [Being careful NOT to nick the cable while cutting the housing?]

-Cosmo Kramer

Subject: Heater cable TR4
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

--- Chris Simonsen <ccsimonsen@gmail.com> wrote:
> nope - not at all - still plenty of length.

Good! I gather that you are referring to the actual cable. From what I recall for the last time that I had this cable end disconnected from the 'Heater Flap' was, there was about 3 to 3 1/2" of cable sticking out from the cable housing.

> The cable knob does not pull out as far as the original one!!

Now I gather that you mean that the cable is being blocked by something to restrict the length of movement of the end of the cable to the end from the cable housing, right?

> big problem....

Yes, this is. I can go up into my loft to check out my extra cable & housing unit later on, but this unit that you have doesn't sound like a copy of the original, more like an 'after market' unit. Does your unit have about 5 notches at the knob for being able to pull the actual cable out to various openings for the Heater Flap? If not,

then this sounds like a choke cable that has a Heater symbol on the knob. As I recall, the org. unit came out of a TR4, right?

-Cosmo Kramer

Subject: Heater cable TR4
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

--- Chris Simonsen <ccsimonsen@gmail.com> wrote:

> Hi Cosmo -

> I made sure I ordered the correct cable from Moss - diff part number between the flap and the valve cable -

> Now - I could have gotten a mislabeled cable but the pic from Moss looks like the cable I got.

Yes, that's what I was thinking that the supplier [Moss/USA], pulled the wrong part. But being that you have already cut it, then you can't return it. BUT! Your mention of using it as a 2nd [back-up] Bonnet release cable is a VERY Good idea. I did this by: Notching out the Catch Plate Assy. [Moss/USA Fig# 76, Part# 802-230] with a file enough for a 2nd Cable Retainer Clip (CRC) [Moss/USA Fig# 85, Part# 803-405 to fit to the inside [closer to the Bulkhead]. Then I placed the extra Cable Housing at the 2nd CRC T threaded the cable through the hole that is holding the org. Bonnet Release Cable & secured it. I then added a 2nd Cable Securing Bolt [Moss/USA Fig# 86, Part# 466-385] holding **BOTH** cable ends, again. I just let the knob & cable housing fall between the starter & the inner wheel well.

> Cut new cable exact same length as old cable (that worked until a few months ago).

Then what happened, to cause it NOT to work anymore?

> No kinks no sharp bends. The old knob pulls out about 3 1/2 inches the new one less than 3.

>

> Also the new one has an inner cable that has lots of room with the outer cable - this means to me that the inner
> cable has room to bunch up a little

Ok, Then the newer cable is a braided cable instead of a solid stiff wire, Right?

> - and I see it happening at the valve - I can pull the cable and then push on the valve arm and get additional
> travel - by the way - new valve - easy moving.....

Suggestion: Phone up Moss/USA & ask to speak with the person in charge of quality control. I think this is Peter A., but in any case; tell him your situation & ask him if it was possible that you received the wrong part? There's NO USE in ordering the same part again, because you'll most likely end up in the same situation again. REMEMBER: There are 'Other' dealers out there. ;>)

> I think I will send my old cable to Peter here on the list and see what he can do for me.

Read above, because I answered this E-mail by 1st reading the reply before reading the actual E-mail.

> I will want it back in case I have to try to epoxy the outer sheath back to the knob assy.

If you phone 1st, then it may save you this step?

> If you have a pic of your cable - I can compare to mine - or I can send you a pic of mine later today.

I do NOT have a picture of mine & I JUST ordered a digital camera that hasn't arrived, YET! I think it would be better if you E-mailed me a pic. of yours. In the mean time I'll look for my spare unit up in the loft.

> Thanks for the help!!! (glad to see your internet working - or you are early at the library!!)

> -Chris

My computer is working {I'm NOT at the library}, because the building isn't open until 10:00 & I started E-mailing you around 5:30 this morning. :>0

-Cosmo Kramer

Body/Cock-pit/Heater/Switch & Electrical

Subject: Heater Stuck Open (long reply)
Date: Sat, 29 Jun 2002
From: "levilevi" <levilevi@attbi.com>

"Phil Smith" <philip.smith25@verizon.net> wrote:

> I've noticed that my TR6 seems warmer. I believe my Heater may be stuck on, even though my pull knob is
> not pulled out. (69 TR6) When I pull out the fan knob, I get hot air. When I open the scuttle vent, I get hot
> air? Is the problem merely that I don't understand the usage of the fan, scuttle or what. Any comments would
> be appreciated. Thanks in advance
> - Phil Smith

Phil,

Your heater valve may be stuck open. Check at the engine to see if the cable is hooked up properly and if you can open and close the valve by hand.

As far as operation of the system I'm enclosing a rather long explanation (actually an article I wrote for our newsletter) of how the heater/vents/scuttle work so you can play around with some other settings. Basically cool air only comes through the "eye-ball vents" that are in the dash (of a TR6) and under the dash, but in the summer when outside temperatures are high even that air is hot and since it's passing through a duct with the firewall being one side of the duct it gets heated up even more. The knob that controls the flap on the bottom of the heater box should stay closed if you're going for coolness.

When it's 90+ on a road trip I drive with the top up (with some foil-covered bubble insulation woven between the top frame), the rear zippered window down, and the scuttle closed.

-Bud Rolofson

Some Hot Air (Tips) By Bud Rolofson

Not getting the heat you want in your TR4, TR4A, TR250, or TR6? Are you getting cold air through those dash air vents (the eyeball vents)? These Triumphs have a heater core that's about the same size of some American station wagons so the potential for heat is there. The trick is getting maximum airflow through that heater core and where you need it.

Here's a few tips to help keep you a little warmer when you're out driving the Triumph during one of our cool winter days or cool summer days for that matter.

Don't expect to get hot air through the air vents (eyeball vents) in the dash or the air vents that are under the dash because they are connected to the heater box "above" the heater core and it's not possible to heat the air before it comes flowing into your face or on your shins. This is especially true for you TR4 and TR4A people since your square dash vents don't even hook up to the heater box. These air vents were designed only for **fresh air** and not heated air. If you're trying to heat the interior or get heat to the defroster/demister vents twist all four of those air vent center knobs closed. Make sure all four are in working order otherwise you're going to always get nice fresh (freezing) outside air into the interior and less air through the heater core.

Heated air can (or should) only come out two places, the defroster/demister vents or out the bottom of the heater box. This is true for all of the models mentioned above (and maybe some others I don't know about). Your air distribution knob on your dash lets you choose which one gets the heated air and if you have a delicate touch you can get a little going to both.

If you look at a picture of the heater box in a catalog or in a manual you'll get a better idea of what happens when you pull the air distribution knob and what that does to the flap controlling air flow through the heater box. The heater core in the heater box is mounted at an angle between where the black air hoses connect on

both sides of the heater box (highest hoses are for the dash air vents and lowest hoses for the defroster/demister vents). With the air distribution knob pushed all the way in the flap stops airflow through the heater core (by sealing the heater box right below the heater core) and that's what you want in summer when you want unheated air coming through those dash air vents. With it pulled to the 1st "detent" position the flap moves to a position just below the lower black air hoses so air flows to the defroster/demister vents after it's been heated up through the heater core. If the air distribution knob is pulled out to the 2nd position the flap opens up the bottom of the heater box and heated air flows out over the transmission tunnel and heats up your right leg until it can't take it anymore.

Mini Tips:

Those with pre-72 cars should open the scuttle vent cover in the winter. It increases airflow and thus heat into your interior. Those with post-72 cars don't have a cover on the scuttle vent only a black plastic grille so it's open all the time....but I could be wrong about that too.

Try to get leaves and other debris off the heater core either by somehow vacuuming them up with a small flexible hose duct taped (Red Green would be proud*) to your shop vac and gently pushed down through the scuttle vent. Or by blowing some compressed air up through the bottom of the heater box (back flush it) with the flap open and the scuttle vent open (or grille off). Two or three leaves on there can be blocking 25-30% of your heat flow, ask me how I know this.

*The Red Green Show can be found on PBS. He's the Champion of auto repairs using duct tape.

Body/Cock-pit/Heater/Switch & Electrical

Subject: Stuck Heater Valve TR6
Date: Tue, 13 Aug 2002
From: <HDRIDER570@aol.com>

I had a similar problem with a newer valve. It turned out to be deposits that had accumulated on the sealing surface of the valve. You can open the valve by drilling out the pop rivet on the perimeter and turning the top section slightly. There is a rubber diaphragm and a knob on the inside. The rubber seals the unit off and the knob controls the water flow in the open positions. I cleaned out the deposits and it worked fine. I had let the car sit for a couple of months without starting and as it does not have an overflow bottle the valve sits above the "high tide" mark so to speak.

-Edward Hamer

Subject: TR4-4A Heater Valve (plugs, ball valve)
Date: Fri, 16 Aug 2002
From: Steven Newell <steven@newellboys.com>

"Evans, Mark" wrote:

- > I started my engine for the first time in 11 months last night. Everything ran great but the heater valve leaks in
- > all positions. The heater valve (original) must be replaced. My heater core is currently by-passed so I don't
- > really need it now.
- >
- > What size bolt do I need to plug where the valve goes into the head?
- > What's the best way to plug the pipe from the water pump housing?

Both the adaptor (valve to head) and the hole in the head are 3/8" NPT on my TR4 (1962 TR4 CT5018LO). When my heater valve failed this May I bought a ball valve to replace it. I didn't remove the adaptor -- that slightly bent pipe coming out of the head -- since it looked like I'd have to pull the valve cover for clearance, but it would be easy to plug the adaptor.

I found a 1/2" bolt plug in the hose didn't work perfectly (on my drive to Home Depot for the ball valve). So instead of plugging it and worrying about another leak, you *could* replace the valve with a ball valve even though the heater is bypassed. Then when you reinstall the heater you can get a "correct" valve and keep the ball valve as a spare. Since there have been issues with new replacement valves, I think keeping a ball valve as your spare is a Good Thing.

Here's what you'd need:

- 90 degree angle joint, male/male, 3/8" each side
- 3/8" ball valve, female/female
- 3/8" male to 1/2" hose fitting

... or equivalent fittings. The 90 degree bend goes into the adaptor. My Home Depot had a bunch of ball valves (mine was made by Mueller) but a limited selection of other fittings, so I got the other fittings at my local Ace hardware.

The downside is that you can't turn the heater valve on/off from inside the car, but my heater cable is mangled so I can't anyway. The only other downside I see is that you won't have an "extra" radiator in the form of the heater.

- Steven Newell

Body/Cock-pit/Heater/Switch & Electrical

Subject: TR4-6 Heater Switch Shorts/Blown Fuse
Date: Tue, 8 Feb 2000
From: "Taffel, Sherman" <STaffel@bcps.k12.md.us>

The problem with the heater fan switch blowing the fuse is just not the heater fan. As a follow up point of information, if the fuse that is linked in the heater blower motor blows (like when the heater blower motor switch shorted), is not only the temp and fuel instruments going off line (as the heater is wired to the B (Battery Post) of the voltage stabilizer, but the flashers (turn signals) and wiper motor will not be on-line either- this is usually much more important than the heater fan!

When I figured out the short problem, in the early '70's, I tapped the 'hot' side of the fuse box, wired a new lead with an in-line fuse direct to the heater motor, that way if the switch shorted (even after elec. tape wrap) and the fuse blew, you still had the important stuff - turn signals, instruments and wiper motor! (remember the heater motor was an 'optional equipment' item. Check out the wiring diagram! Also on this circuit were the 'reversing' lights and overdrive switches-if fitted!

-Sherman D. Taffel

Body/Cock-pit/Heater/Switch & Electrical

Subject: TR4A heater
Date: Fri, 24 Aug 2007
From: Bob Labuz <yellowtr@adelphia.net>

David Brister wrote:

> Putting my car back together after suffering a (happily mild) attack of shipwright's disease I have found one
> green wire with a spade connection which belongs to the heater switch under the radio bracket. It is live and
> switched by the ignition switch. I have spent a lot of time trying to locate the other wire, which should lead to
> the heater motor. With no luck.
>
> Does anyone know where I should look for said wire? It must be there somewhere as it all worked before!
> -David Brister.

David,

If the heater is a single speed like the TR4 there should be 2 wires from the heater motor.

The wire you mention that is hot should go to 1 side of the switch and any wire from the motor to the other side of the switch.

The remaining motor wire will go to any ground. I don't believe it matters which motor wire goes to hot.
-Bob

Body/Cock-pit/Panels/Backside

Subject: Fitting Rear Wheel Well Covers
Date: Sun, 13 Apr 2003
From: Darrell Walker <darrellw@inetarena.com>

Well, I got my wheel well covers installed. I read the description on Brian Sanborn's page, and got a tip from Geo Hahn who suggested:

> This may be too late for you... but last time around on my TR3 I glued the foam to the covers, not the wheel
> wells. I made paper patterns of the inside of the covers so the foam fit perfectly. I used a very soft foam -- it
> was about a 1/2" thick but would compress easily to almost nothing. Fitting the foam this way let me position
> it exactly on each side of the seam of the cover so the seam did not create a lump. I then glued the covers to
> the body of the car along the edges only allowing the cover to be drawn very tight.

Which it was too late, as I had already glued the foam to the wheel wells. But it gave me an idea. I went back and trimmed the top strip of foam (I glued the side first, then the top) to match where I wanted the seam to be. Then I turned the cover inside out, and glued just the edge of the seam to the side foam. This allowed me to get the seam straight and tight. I left the bottom third or so unglued at this point. Then I flipped the top section over and glued it to the side. I was able to pull it very tight without distorting the seam. Then I glued the flat side section, then finished the lower "leg".

All in all, I think it came out very well.

-Darrell Walker

Body/Cock-pit/Panels/Door

Subject: Spring Guide for Door Check Strap (TR6 Bad Info)
Date: Fri, 25 Jul 2003
From: "Brooks Bullock" <airsmyth@adelphia.net>.

Alan and List:

I have to apologize for the Bad info. regarding the 4-40 threads it should have read **6-32T** with a washer. Terrible memory on my part, as I thought about it, I kept thinking man that sure is small...are you sure? So I had to pull down the side panel to get my peace of mind back, once again I apologize.

-Brooks

Body/Cock-pit/Panels/Door

Subject: TR4 door locks
Date: Thu, 17 May 2007
From: Bob Labuz <yellowtr@adelphia.net>

Hello, Just finished putting in the panel etc on the door. Then tested closing, opening etc and I noticed that the door locks automatically upon shutting the door. The gear like thing on the door latch always locks the door. Now I don't have keys for these door handles so locking is not a good thing when the window is up. I checked the other door that is still open, (no panel or handles) and it does the same thing. I tried taping the locking mechanism open but the closing action always pulls the locking gizmo down when the door is closed. Is there a way to disable the locking mechanism when the door is shut? Or do I have to always leave the window down! Or get a new set of handles with keys. Thanks,

-Bob

Subject: TR4 door lock followup
Date: Thu, 17 May 2007
From: Bob Labuz <yellowtr@adelphia.net>

In order to disable the auto lock feature do I just have to disconnect that spring loaded gizmo that connects latch to the handle mechanism? Thanks,

-Bob

Subject: TR4 door locks
Date: Sat, 19 May 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi Bob!

BEFORE you start taking everything apart, check to see if you have the inside door handle in the lock position. If you push the inside door handle forward, then it will be locked. Therefore; if you PULL the inside door handle backwards, it will keep the door unlocked. Get back to me on what you have found out after trying this.

BTW- If you have the door locked with the windows up & top, then unsnap the 3 side snaps to reach in to unlock & open the door.

-Cosmo Kramer

Subject: TR4 door locks
Date: Sat, 19 May 2007
From: Bob Labuz <yellowtr@adelphia.net>

Cosmo,

I didn't get much time to mess with the doors yesterday, but I did try your suggestion.

And after locking, unlocking with the inside handle, the locking mechanism still sets the lock in the handle as before.

Others have said there is an adjustment in the handle internals. I will have to check that out when I have time.

-Bob

Subject: TR door Locks
Date: Sun, 20 May 2007
From: "Cosmo Kramer" <TR4A2712@yahoo.com>

To be honest, I don't know anything about that adjustment, BUT when you do, then PLEASE let me know about it. When I went out to the Garage Queen (GQ) & tried locking the door from the inside & then shutting it closed; I then checked to see if the door was locked & it was NOT. So I may have something wrong with my door, too. OR That's the way that it's to work? I never intend to lock my door, anyways, but it's nice to know that I can if I want to. I'm interested if my door is working correctly, too. I'll have to look into it on my manuals.

-Cosmo Kramer

Body/Cock-pit/Panels/Door

Subject: TR4A New Door Seal Problem
Date: Fri, 17 Aug 2007
From: "Glenn Owen" <mgowen55@hotmail.com>

I just replaced the door seal rubber (not the Furflex) on both door openings of my TR4-A and now have trouble closing the doors. I had to move the striker plates out in order to get the doors to latch, but there is now a huge gap between the doors and body panels. The doors closed and lined up fine before (but there was no rubber in the channel at all - rotted away over the years). The rubber seal came from TRF and installed fine - looked to be a good match to what original would have been.

If I keep the doors closed against the new seal, will the fit improve? Or is there a trick to getting a good fit with the new seals? Thanks

-Glenn

Subject: TR4A New Door Seal Problem
Date: Fri, 17 Aug 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

Quite possibly. I used the seals from TRF on my TR4 (the separate fuzzy seal & rubber seal, both identical to original). I don't think mine were as bad as yours as I did not have to realign anything to get the door to close but I did have to slam it pretty good.

After a year or so all was back to original with closing requiring no more effort than closing a refrigerator door. Over time the rubber seal has become noticeably depressed.

Okay -- after rereading that I can see some wisecracks telling me to get that seal into counseling.

-Geo

Body/Cock-pit/Panels/Door

Subject: Two piece (TR4A) versus one-piece (TR6)
Date: Tue, 29 Oct 2002
From: "Jack W. Drews" <vintr4@geneseo.net>

Ben and Pam Zwissler wrote:

>I'm about to repaint my TR4A body tub and have removed the channels for mounting the outer door seals. The
> TRF catalog and others recommend the one-piece TR6 "fuzzy door seal" for the TR4A at least in part because
> then you don't need the channel to mount the "outer" seal.

>

>My question is, how does the one-piece seal work around the triangular plate at the bottom of the "B" pillar?
> The channel went around the bottom of the pillar (two short sides of the triangle), while the flange that the
> one-piece seal attaches to goes across the "hypotenuse/long side" of the triangle.

>

>If I'm going to reattach the channel, I need to do it before I paint. I'm looking for people's experience fitting
> the one-piece seal to the TR4A and whether they were happy with it.

>-Ben Zwissler

We just went through this on a ground-up restoration of a TR4. We had the same experience that another leading restoration shop had -- that with new TR4 door seals, it is nearly impossible to get the doors to close nicely. The problem is the lack of compressibility of the seals in three places:

- The lower rear,
- The lower front, and
- The pinch point between the top front corner of the door and the body immediately below the windshield frame.

Using the new seals, you have to have a gorilla as a passenger, just to shut the doors (no, dear, I'm not talking about you).

We did not try the TRF seals. Maybe they fix this problem. What we did do was use the TR6 seal, which is a fuzzy channel plus a rubber tube section, much more compressible. When we did this, it did not seal against the metal surface at the lower rear corner, so we used an additional seal around that corner against the metal instead of the upholstery.

If you take this approach, you do not need to replace the rinky-dink little metal channel.

-uncle jack

Body/Cock-pit/Radio

Subject: Adjusting antenna for AM
Date: Mon, 23 Aug 2004
From: "Ron L'Herault" <lherault@bu.edu>

I think it is called trimming the antenna. If I remember correctly, you tune the radio to the weakest station you can find at the 550 end of the dial and then turn the adjusting screw, which is usually close to where the antenna wire enters the radio, until the weak station gets as strong as it can get.

-Ron L

Body/Cock-pit/Radio

Subject: Car radio speakers TR4A
Date: Tue, 05 Sep 2006
From: <acekraut11@aol.com>

<chris.buckley@tz.knightfrank.com> wrote:

> Hi List,
> I am loath to start carving up my new trim panels but need to install speakers for the radio. I am wondering
> where they were traditionally installed when the cars were new. Can anyone help? Otherwise any bright ideas
> would be greatly appreciated. Cheers,
> -Chris Buckley

Hi Chris,

I made my own kidney pads and that is where I have put my speakers. By trim panels, do you mean the panels next to the door, or kidney panels that fit next to the center gearbox hump? I have a picture of the finished product at the site listed below my name to show how 6X9 speakers CAN fit. Having said that, I have recently redone them, I'm now mounting the speakers behind the pads and redoing them. They turned out great and look much better than the picture on the site below. <<http://www.triumphowners.com/108>> Guess it's time to update those pics. Sound is great, even at highway speeds. Let me know if you want any details of the process I went through.

-Aaron Cropley

Subject: Car radio speakers TR4A
Date: Tue, 5 Sep 2006
From: "David Brister" <david.brister@wanadoo.fr>

I have mounted my 7 inch speakers on pieces of plywood and screwed them to the lip of the underneath of the dash one at each end. Not perfect from the hi fi point of view, but what with the wind noise and the racket from the 3000 rpm at my cruising speed, the driving seat of a TR4A is not ideal for quality listening and at least they are out of the way but easily accessible.

-David Brister

Subject: Car radio speakers TR4A
Date: Tue, 05 Sep 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

The usual installation on these cars was a single speaker in a metal housing in the upper passenger side wheel well. Satisfactory for listening to NPR but doesn't do justice to the White Album.

Pics below show the housing used and the location where the bolts that hold its bracket appear in the engine compartment.

Images will be stripped off for listees but you should see them on your p-mail copy.

-Geo H

Subject: Car radio speakers TR4A
Date: Tue, 5 Sep 2006
From: "Chris Simonsen" <ccsimonsen@gmail.com>

I made aluminum mounts and have them mounted under the dash pointing down on my TR4.

Not optimal, but out of site. I do get a bit of stereo separation when the engine is off and the car is not moving.

-Chris

Subject: Car radio speakers TR4A
Date: Wed, 6 Sep 2006
From: "Chris Buckley" <chris.buckley@tz.knightfrank.com>

Thanks to all for their input. There doesn't seem to be a perfect solution. I will probably go along with Aaron's method of making kidney pads which fit behind the H frame and alongside / above the gearbox cover attached with Velcro. Regards,
-Chris Buckley

Subject: Car radio speakers TR4A
Date: Tue, 12 Sep 2006
From: <acekraut11@aol.com>

Hi Chris,
I have modified my design a bit after living with my original design for awhile. I have just been so busy getting ready for the British Invasion that I haven't had the time to sit down and update the information on the <triumphowners.com> website. If you are starting right away then let me know and I will fire off an email to you with the "new and improved" information. If not then in about a week or so I should be able to update the site with newer pics and information. Don't hesitate to contact me if you are ready to proceed and you would like some info. Cheers,
-Aaron Cropley

Subject: Car radio speakers TR4A
Date: Thu, 14 Sep 2006
From: <acekraut11@aol.com>

Hi Chris,
Busy time here getting ready for the car show in Vermont (about a 5 hour trip) and having a visitor to the house so I haven't had time to sit down and reply. What you want for information depends partially on what size and type of speaker you will want to put in the kidney panels. I chose 6X9 for best sound but if I had to do it over again I might choose 6X8 or 5X7 to get a little bit snugger fit without sacrificing too much sound quality. My friend has the standard factory kidney pads. If you wanted a pattern I could certainly send you a folded up paper pattern of either of these or take a picture and you could cut a rough shape in cardboard and do what I did, test fit and cut, repeat as necessary. Once you have the desirable shape for the kidney pads its easy. Just position the speaker where you want it, and cut the hole in the cardboard, test fit again. I had to add back pieces of cardboard several times until I got it right. Then I took my pattern and transferred it onto luan or any 1/4 inch wood would do. I added a slight amount of padding but after I checked out my friends stock kidney pads I noticed he had quite a bit more padding then I did. I guess that really comes down to your preference and skill with padding. What I did recently was to change the mounting from the front side of the kidney pad to the backside, which makes the speaker stick out a little less and looks like a cleaner installation to me. To do this I drilled the holes for the speaker bolts and stuck the bolts through the outside of the kidney pad. Then I put a nut on the bolts to hold them in place. The next part isn't too bad. I bought some vinyl and using a staple gun with staples that were long enough to go through the vinyl and padding but not out the other side of the wood I stretched, cut, stapled and trimmed the excess until I had secured the vinyl all around the outside of the pattern. Then I cut the speaker hole and repeated the process. At this point you have a covered pad with bolts sticking out to slide the speaker on.

The grill that came with the speaker was made of metal and designed for top mounting, not bottom mounting. So I carefully cut the excess around the outside, leaving enough so that the speaker grill overlapped slightly then sandwiched the grill between the speaker and panel. I bolted down the speaker and then onto the last step, mounting. I used sticky backed Velcro at first and it worked well....for awhile. Then it started to give way. So I ended up doing a couple things. I stapled the outside of the Velcro to the pad. Problem solved there. Way under the dash I mounted the mating Velcro and drilled a hole in the middle and took a small sheet metal screw with a washer and used that to make sure it stayed. While I could easily do the same thing to my center dash support I

haven't yet. I am still using Velcro and replacing it ever so often. It is easy enough to do and only takes 5 minutes from prep to clean up. I am going to attach brackets to the front of the pads so that they can slide onto the front of the center console but I haven't tackled that quite yet.

I have a busy day planned today and then it's off to the show but when I return if you would like I can take some pics and send them to you. Sound like a project you want to tackle?

-Aaron Cropley

Subject: Car radio speakers TR4A
Date: Fri, 15 Sep 2006
From: "Chris Buckley" <chris.buckley@tz.knightfrank.com>

Hi Aaron,

I have already got the pads cut to a shape that fits nicely. I have gone for 5 inch Sony speakers for compactness. I hope to continue the installation this weekend and will let you know how I go. Happy driving to Vermont!

-Chris Buckley

Body/Cock-pit/Radio

Subject: Fuse rating for Radio
Date: Sun, 3 Feb 2008
From: <ZoboHerald@aol.com>

yellowtr@adelphia.net wrote:

Does anyone know the fuse rating for a 12v Triumph AM radio that came with the TR4 model?
I have installed an inline fuse but only had the std 25 and 50 amp Lucas fuses to use. I am guessing maybe 5 Amp?

==AM==

Too cold to run out and check, but 5 amp is what I remember...and a very short (length) fuse at that to fit the original inline holder.

-Andy Mace

Body/Cock-pit/Radio

Subject: One approach to installing loudspeakers in a TR
Date: Wed, 1 Aug 2007
From: Brian Jones brianjone5@mac.com

On occasion, I want to be able to listen to some decent music while I'm tootling around in my TR4. I've tried various combinations of speakers in plastic speaker cases, designed for surface-mounting in cars but I placed behind the seats, to small wooden (chipboard) speaker boxes on the 'diff' shelf, and speakers mounted under the dash. Nothing proved satisfactory and all were totally inadequate above even modest speeds. I noticed at the VTR convention that many TR drivers are struggling with similarly unsatisfactory approaches.

I wanted something better. I wanted something that met these criteria:

- to maintain the integrity of the vehicle
- to conceal the speaker installation
- to produce acceptable fidelity
- to permit easy removal from the vehicle

I have uploaded a file describing my solution (as a .doc, and as an HTML page), if anyone who would like to roll along to a bit of Coltraine or Ella. It should give you some ideas in finding your own solution.

[<http://idisk.mac.com/brianjone5-Public?view=web>](http://idisk.mac.com/brianjone5-Public?view=web)

Select the .doc or the HTML file and then click the download arrow on the right side of the window. Cheers,
-Brian

Subject: One approach to discretely installing loudspeakers in a TR
Date: Sat, 4 Aug 2007
From: Brian Jones <banc8004@comcast.net>

A few folks let me know that they had trouble downloading the rather large Word doc that I posted on this installation. Apologies to them. I have now uploaded the file as a .pdf at the same link. It is 1/10th of the size now, at just under 3MB.

[<http://idisk.mac.com/brianjone5-Public?view=web>](http://idisk.mac.com/brianjone5-Public?view=web)

It was good to hear that a few listers are going to give it a go for their TRs.

Let me know if I can help with any advice. The carpentry is simple, but the 'upholstery' was new territory for me.

-Brian

Subject: One approach to discretely installing loudspeakers in a TR
Date: Sun, 12 Aug 2007
From: "Brian Jones" <banc8004@comcast.net>

Cosmo Kramer wrote:

> Brian, What's a cross-over?

Cosmo,

A cross-over separates an audio signal into high and low notes, sending high notes to the tweeter, and low notes to the woofer, reducing distortion.

-Brian

Body/Cock-pit/Radio

Subject: Radio Static Elimination
Date: Mon, 5 Jul 2004
From: "Randall" <tr3driver@comcast.net>

> Personally, I consider radio static to be 'original' too.

FWIW, I have found the original resistors (one in the dizzy cap, and one at each spark plug) to be reasonably adequate at suppressing radio noise. Most of the remaining noise comes from the generator. Adding a 0.1 mfd mica cap across the generator output (right at the generator) will kill that too, but of course is not 'correct'.

And some radios (like my old Johnson CB) were sensitive to noise on the power wires. A 0.1 mfd from the key side of the coil to the engine block will help cut that down (and some 70's Triumphs came with such a cap), but the sure cure is an in-line filter in the power lead to the radio. If you've installed an alternator, this is the only way to keep the "alternator whine" out of the radio.

-Randall

Body/Cock-pit/Radio

Subject: Radio Static: Resistor Wires or Resister Plugs
Date: Mon, 28 May 2007
From: <terryrs@comcast.net>

First, I've done the alternator conversion, so the static I'm getting from the new radio I installed this weekend is most likely coming from the copper core spark plug wires. Reading the archives, I see Randall responding to Brian Sanborn (in 1999) on Ignition Interference. Randall suggests one of two options: 1) "premium" plug wires that have solid wire but a resistor built into the molded plug boot. ...Or 2) resistor plugs as an acceptable substitute. No need to do both. That was in 1999. Is current thinking the same? And is there a recommended resistor plug?

-Terry Smith

Subject: Radio Static: Resistor Wires or Resister Plugs
Date: Mon, 28 May 2007
From: "Randall" <tr3driver@ca.rr.com>

> And is there a recommended resistor plug?

I used Bosch WR7BP (which is a platinum resistor plug) in addition to the solid wires with resistors in the cap. Not sure, but I think what I suggested before is what I would suggest now: Try one, and if that's not enough, add the other one. Note that it is possible for alternators to put out electrical noise as well. If you can't kill the noise at the plugs, you might try temporarily running with the alternator disconnected electrically (usually just pulling the small plug out so it doesn't charge, no need to disconnect the main wire), and see if the noise disappears.

-Randall

Subject: Radio Static: Resistor Wires or Resister Plugs
Date: Mon, 28 May 2007
From: <terryrs@comcast.net>

>> And is there a recommended resistor plug?

> I used Bosch WR7BP (which is a platinum resistor plug) in addition to the solid wires with resistors in the cap.

Thanks, Randall. Where have you been getting yours? I just had a quick and thoroughly enjoyable drive through bright sunshine to the couple of usual culprits who were open today and none carried them (AutoZone and VIP). Could try NAPA tomorrow. Tried JC Whitney online, but no luck either.

I'm having similar trouble ferreting out a set of spark plug wires with solid core and resistors in the boot. Anybody have a source for these, while I continue to search online? Thanks, everyone.

-Terry Smith

Subject: Radio Static: Resistor Wires or Resister Plugs
Date: Tue, 5 Jun 2007

From: "Randall" <tr3driver@ca.rr.com>

> Randall, do either of the two listed here with JC Whitney look okay as RFI suppressing, metal core spark plug
> wires?
<<http://www.jcwhitney.com/autoparts/Search?catalogId=10101&storeId=10101&sku=spark+plug+wire+rfi+suppression.>>

Sorry, I've never tried "magnetic suppression" wires. Don't see why they wouldn't work, though. I don't buy the hooey about better performance than resistive suppression wires, but it seems like they at least might work OK with the funky way the TR2-4 dizzy cap attaches to the wires.

Sorry for the delayed reaction, was out of town last week.
-Randall

Subject: Radio Static: Resistor Wires or Resister Plugs
Date: Tue, 5 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

>> I used Bosch WR7BP (which is a platinum resistor plug) in addition to the solid wires with resistors in the
>> cap.
>
> Thanks, Randall. Where have you been getting yours?

My local independent auto parts store carries them. Not under that number, unfortunately, there is a different 4-digit number that applies to a set of 4 of them which they have to look up every time (since I don't remember it).

Fred Thomas also has a source for them.
-Randall

Subject: Radio Static: Resistor Wires or Resister Plugs
Date: Wed, 06 Jun 2007
From: <btmfdchn@aol.com>

Greetings, I'm using Magnecor suppression wires but didn't think the funky cap with the piercing screws was the hot setup. I am using an MGB cap (no, it fit ok without the car rejecting it). Magnecor makes a TR set with the proper cap terminals for a push in cap. This setup has worked real well.
-TJ

Subject: Radio Static: Resistor Wires or Resister Plugs
Date: Wed, 6 Jun 2007
From: "THOMAS FANSHER" <tfansher@comcast.net>

I just looked at the box that Fred sent me a while back. The Bosch number on the box is 4216 hope this helps.
-Tom

Body/Cock-pit/Radio

Subject: Radio suppression and ballast resistors
Date: Fri, 2 Jul 1999
From: "jonmac" <jonmac@ndirect.co.uk>

As I said yesterday on the radio suppression aspect, a negative earth (ground) has the suppressor lead going to negative on the coil. I wasn't using a TR4 as the example but my PI saloon which has been negative since new - they all were. On the ballast resistor side of things, it appears some people aren't too sure of their purpose, so at the risk of a little bandwidth I'll explain the reasons for them being fitted. Firstly, they're the little ceramic cubes often shipped along with coils. STI fitted them because of starting problems associated with the early carbon cotton HT leads. There had been major starting problems in cold climates (cranking related) and it was found the HT leads were the culprit. Rather than either upgrade the leads to something far more expensive or go back to copper cored, they lowered the coil voltage from 12 to 6 volts. All the ballast resistor did was to temporarily allow 12 volts to go through a 6 volt coil to provide extra 'wallop' into the coil and presumably down the HT leads too. Soon as the engine fired, the resistor took the voltage back to 6 volts. I expect electricians far more learned than me might be able to shoot holes in this background story but I remember it well on a product training session when these BR's first came in on production. I can't say anyone was too enthusiastic about them and there were many fears they would fail and quickly destroy the coils they controlled. To everyones amazement, they didn't - and they worked rather well. Certainly cleared up cold start problems in Scandinavia and Canada. Oh, yes - you still got a nice shock if you grabbed the HT leads by accident but that was assumed to be one of the joys of Triumph motoring - sometimes known as 'value added.'

-John Mac

Body/Cock-pit/Radio

Subject: Spark plug / radio static question
Date: Sun, 10 Jun 2007
From: aribert <aribert@c3net.net>

First question: Do resistor plugs ever lose their resistance?

This spring (as soon as I took the car out of storage) have radio static that increases with RPM. I understand that sometimes static is a function of bad grounds. This winter I replaced a burned thru head gasket and removed and reinstalled 2 grounds. I have ohm'ed across to check for continuity and the grounds appear to be fine. I removed and reinstalled the same plugs during the head gasket replacement. All 6 plugs function correctly as spark plugs (the plugs only have about 8,000 miles on them, NKG BPR6ES). So, can a plug suddenly lose its ability to shift the resistance?

I did nothing in the passenger compartment this past winter. I have hung a condenser (capacitor) off of the + coil terminal as I remember seeing years ago - this reduced the static by about 2/3. I have seen ignition noise suppressers for sale at auto parts stores. My radio has 2 power in leads (memory and radio operation). If I were to get one of these suppressers, would I be correct in splicing it in the radio power lead (or would I still be getting static thru the memory lead)?

Subject: Spark plug / radio static question
Date: Sun, 10 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> First question: Do resistor plugs ever lose their resistance?

Never heard of it; but why not try some new plugs and see? If they don't help, you can put the old ones back in and save the new ones for your next tune-up.

> If I were to get one of these suppressers, would I be correct in splicing it in the radio power lead (or would I still be getting static thru the memory lead)?

I suspect it depends on the radio. On my CD-MP3 player, the "memory" lead is also the main power supply lead, the switched power lead from the ignition switch controls a solid-state switch inside the unit.

Some things to try:

- Disconnect the alternator temporarily. If it's an original Lucas, you can just pull the plug out (with the engine off) and then start the engine.
- Loosen (or remove entirely) the clamp at the base of the antenna, then reinstall it. An ohmmeter won't show a bad connection here, because it's still grounded through the cable & radio, but a good ground at the antenna will definitely help reduce noise (and it's a common place for corrosion to grow over the winter).
- Use the ohmmeter to check the resistance of each plug wire. They should all be roughly the same; one very high or one very low probably indicates a wire starting to fail (which may be the cause of your noise).

-Randall

Body/Cock-pit/Radio

Subject: TR4 Idling Speed & polarity RADIO Condenser
Date: Thu, 21 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

> The original radio plays fine till I start the engine, then it's just pure static. Help me remember about the
> condenser? Where did we get them and where did they go in the circuit. I am converted to alternator also.

If it's just noise without a strong engine rpm component, then try adding a capacitor from the coil's hot terminal to ground, right at the coil. If it's more of a wime, then you can try adding a capacitor across the alternator output, but most likely you'll need an inductive noise filter in the power lead to the radio. RS sells them.

Also check out your radio antenna carefully, as a bad ground or broken lead can sometimes appear this way, as can a bad radio. Basically the engine always puts out some noise so if the radio is just barely picking up the station, it will disappear into the noise when you start the engine.

Running a ground strap from the hood (bonnet) to a good chassis ground may help too.
-Randall

Subject: TR4 Idling Speed & polarity RADIO condenser
Date: Fri, 22 Mar 2002
From: Dave Massey <105671.471@compuserve.com>

Bill, there are two possible sources for interference, conducted and radiated. The conducted noise will be noise on the power wires and most likely from the alternator. The radiated noise is typically from the spark plug wires.

A quick check to determine which one you have is to disconnect the belt and start the engine. You'll only have to run the engine long enough to verify if the noise is still there or not (15 seconds?). If it goes away then the source of the noise is the alternator and a power line filter is called for. Filters are available at most outlets that sell automotive electronics.

If the noise is still there then you need to address the spark plug wires and plugs. Resistor plugs may solve the problem or you may also need resistor wires. Also, sometimes a ground strap to the hood (bonnet) will also help.

Remember that interference suppression is more an art than a science and trial and error is the usual procedure that is followed.
-Dave

Body/Cock-pit/Radio

Subject: TR4 radio
Date: Mon, 20 Aug 2007
From: Bob Labuz <yellowtr@adelphia.net>

Ok here is a question for all you electrical physics types.
It is an original AM + ground model with single speaker. The radio was recently repaired and works just fine.

I hooked up the - wire to the same wire (green) that goes to the heater. I made a "Y" since both connections were very close and only hot when the ignition is on.
After hooking everything up, I noticed that the volume was not what I expected. Thinking my garage was killing the signal, I started up the car, backed up and noticed when I revved the engine the volume went very loud... so loud I had to turn the volume down.

Now when the car is at idle, the volume is very low but when I rev the engine (over 1000RPM) so the ammeter shows no discharge, the volume is just wonderful.

Yesterday while cruising around, I was able to listen on 1/2 volume with the top down at 55 MPH. But come to a light and with engine at idle, much less volume. Now I do have an electric fuel pump but that is about it as far as extra load on the system.

Is the drop in overall voltage causing this problem? Is there a fix other than adjusting the idle to over 1000 RPM?

The battery is a new Exide Orbital that turns the engine over just great with an original Lucas starter. The generator keeps the battery charged. I never see the ignition warning light come on unless the engine is stopped.

It looks to me that the charging circuit is working just fine as I see no differences in the ammeter action as compared to my 3.

One other thing, the engine on the 4 seems to idle very well at about 650 RPM. I cannot get the 3 to idle this low, must be the newer components in the 4.

-Bob

Subject: TR4 radio
Date: Mon, 20 Aug 2007
From: <ZoboHerald@aol.com>

Interesting. Actually, that's just what you WANT the radio to do, right? Boost the volume when other noises increase?

There are some fancy car stereos that do that, presumably with some fancy electronics involved, and here you've managed to figure out/stumble across an extremely simple way to do it. ;-)

-Andy Mace

Subject: TR4 radio
Date: Mon, 20 Aug 2007
From: <tr3driver@ca.rr.com>

> Is the drop in overall voltage causing this problem?

Seems fairly clear the (normal) drop in voltage is causing the loss of sound. But it shouldn't do that.

> Is there a fix other than adjusting the idle to over 1000 RPM?

I would be looking for any reason the radio is not getting full battery voltage, like maybe it's not well grounded or has a bad connection somewhere. If possible, measure voltage both at the battery and right at the radio, with

the engine not running. The radio should work fine down to at least 10 volts (usually even lower than that) with only a very minor drop in volume. If it's losing a lot of volume at 12 volts (which is about the minimum you should see), then the radio itself has a problem.

-Randall

Body/Cock-pit/Radio

Subject: TR6 [4/A] Radios
Date: Mon, 23 Dec 2002
From: "Williams, Bill (Atlanta)" <Bill.Williams@hp.com>

Hi All,

I would like to update the radio in my 74 TR6. My cutout between the two shaft holes is $3\ 3/4"$ X $1\ 5/8"$ which I think was "standard" for the TR4/A-6.

Trying to find a "modern" version of the two "shaft" radio has been an interesting experience. Jensen, Audiovox and Kenwood still make them, but they don't list enough data in their specs to know if they will fit my cutout.

Has anyone recently purchased a unit, and if so, what was the make and model number? Thanks,
-Bill

Body/Cock-pit/Radio

Subject: Triumph Bendix Radio
Date: Tue, 26 Oct 2010
From: "Randall" <TR3driver@ca.rr.com>

> It has "ear com neg" written vertically on the side of the can. Not sure how that might relate to the terminals
> on the bottom.

That means that the mounting tabs are also the negative terminal.

> There are three spade connectors equidistantly spaced just inside the outer edge of the capacitor base

Those are the mounting tabs, so negative.

> and one longer wire connector more inboard.

Which it will be the positive.

> With no power to the radio but the power switch "on" and the polarity switch set "up" all three spade
> connectors show a direct connection to the power lead and the wire connector shows a direct connection to
> the chassis.

So that is the positive ground configuration.

> With the polarity switch flipped "down" the three spades now show a direct connection to the chassis and the
> wire connector shows a direct connection to the power lead.

For negative ground.

-Randall

Body/Cock-pit/Seat belts

Subject: TR4A to TR6 Seat Belt Anchor hook structural integrity for lap belts??
Date: Sat, 28 Jul 2007
From: Ted <triumph66@gmail.com>

Speaking of TR3 seat belt anchors, are the seat bolt hooks that were installed at the factory for TR4A to TR6 considered structurally sound to take the g-forces of a good lap belt installation????

-Ted

<wbeech@flash.net> wrote:

> Steve,

> Nice site, I wish I had seen this before I ordered, and installed last night, the ones from Moss as I really wanted

> red webbing on the simpler style of belt. I will surely save this site for the future. Thanks,

> -Bill

> -----Original Message-----

> Subject: TR3 Seat Belt Anchor Positions

> Sent: Saturday, July 28, 2007

> From: british-cars-bounces+wbeech=flash.net@autox.team.net

>

> Bill,

> Check out the Wesco site. In addition to selling belts and installation hardware, they have excellent

> retrofitting instructions:

> <<http://www.wescoperformance.com/lap-belts-install.html>>

>

> There are pages for two and three point belts, and they cover a number of different situations. Very useful.

> -Steve

>

bill beecher wrote:

>> I am considering adding seat belts to my TR3, and I'm wondering where the best and strongest anchor points are.

>> Is the floor or side of the tunnel better?

>> Do I need to weld something off the frame member? Not belts for competition but simply for use as a

>> daily driver.

>> -T.L.L.

Subject: TR3 Seat Belt Anchor Positions

Date: Mon, 16 Jul 2007

From: "Kentech HomeTech" <kentech0822@verizon.net>

I made up a couple of 4"x4"x1/8" steel backing plates to go beneath the floor for the seatbelt mounting. Here's a 1962 Standard Triumph memo/template on mounting points for the TR3:

<http://mysite.verizon.net/kentech0822/triumph/tr3_seatbelt.pdf>

Body/Cock-pit/Seats

Subject: Carpeting and seat tracks
Date: Thu, 25 Sep 2008
From: <Dean.Mericas@CH2M.com>

One additional comment before this thread dies.

An MGA owner once told me that it is standard practice among his kind to place a tapered wooden shim under each seat track to give the seat a little more rake.

The seats in my TR4 were causing me some back pain, and I had a long tour coming up, so I decided to try it. I cut tapered strips of oak the width and length of the seat tracks, 1/2" tall at the thick end tapering to nothing at the thin end. I spray painted them black to match the carpet, and mounted them thick end forward to tilt the seats back a little.

This has worked wonderfully for me, and is essentially undetectable without looking for the shims.
-Dean Mericas

Body/Cock-pit/Seats

Subject: Heated Seats & Power Windows
Date: Wed, 15 Mar 2006
From: "Kentech Home Technology" <kentech@midmaine.com>

Aaron,

I am just undertaking such an improvement, fitting both bottom seat foams to replace the bouncy springs and seat heaters. So far, I have the folding seat bottom blasted and recovered, ready for foam. I ordered the heaters from <autowarm.com>. They can be cut to size, are paper thin but require a 10amp continuous power source so I will also do the alternator conversion before I can use them. As to the removable seat bottoms, it requires that I splice a connector into the 14ga. wires connecting the bottom and seat back seat heaters (yes the kit has both bottom and back heat!). We have heaters in our Audi and VW and absolutely love them. bet we'll love them even more in a car without roll up windows!!! I'll keep you posted as I progress.

-Peter

Subject: Seat Heater Update
Date: Tue, 21 Mar 2006
From: <acekraut11@aol.com>

Hi List,

I thought I would let everyone know what I had decided to do in regards to seat heaters. While bidding on a set of seat covers on e-bay I received an email from <autowarm.com> letting me know about their products. I checked out the website, and checked out the link they gave to a single seat warmer for \$80. Their website lists the same product for \$120 on sale for \$100. The specific product is a Heizgerat Setzt Seat Heater, model H2. I sent them an email and asked if there was a discount for purchasing two and they responded with a price of \$155 for two, including shipping. I ordered the heaters late in the evening and actually received an email right away. I paid via paypal and the products were shipped the next business day and arrived a couple days later, well packed, with everything as advertised included.

The heaters look to be of good quality, with a good instruction manual. It will be awhile before I am ready to install them but I am very pleased with my overall experience to this point. NFI, etc., etc.

Thanks again to everyone for their responses to my original post.

-Aaron

Body/Cock-pit/Seats

Subject: Replacing Seat Diaphragms
Date: Fri, 1 Feb 2002
From: "Hugh Fader" <hfader@usa.net>

-----Original Message-----

> Subject: Fitting on 72 TR6 passenger seat
> From: Williams, Bill (Atlanta) <Bill.Williams@COMPAG.com>
> To: Hugh Fader

> Hugh,
> I pulled my driver's seat out this afternoon to replace my split diaphragm.
>
> Working from the bottom of the seat and without removing the covering of foam, I got the old diaphragm
> removed. I also got the new diaphragm connected on two sides. That was easy....
>
> How in the world did you get the other two sides hooked in? Did you remove the cover and the bottom foam
> in order to gain access to the top of the frame? Any hints, or tools that you can recommend? I feel like I'm
> trying to stretch a 2X4 wooden stud....
> - Bill

Hi Bill.

The first seat took me a couple of hours using several different sometimes painful methods. The second seat took about 20 minutes. Here's how I installed the Seat Diaphragms on the second seat:

1. Put the seat upside down on my workbench.
 2. Put the front hooks in place.
 3. Pulled on the thick rubber next to the hooks with vise grips to pull the rear hooks into place.
 4. Put the seat on its side on the floor.
 5. Used a very large flat bladed screwdriver to push down on the hooks nearest the floor and slip them into place. It takes a bit of fiddling.
 6. Turned the seat on its other side and repeated step 5.
- Hugh

Body/Cock-pit/Seats

Subject: TR4 Rear seat back cushion
Date: Tue, 02 May 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Mark Endicott wrote:

>A friend asked for info on attaching the bottom of the rear (mini) seat back cushion. I don't have one and can't
> help or find anything that shows how it is retained in place. Anybody help?

There should be 4 Lift-the-Dot pegs in the floor pan along the bottom edge of the seat back. The seat back has 4 grommets that go over these pegs. The floor carpet in that area has 4 Lift-the-Dot fasteners that then go on the peg, trapping the seat back in place.

Let me know if you need photos.

-Geo Hahn

Subject: TR4 Rear seat back cushion
Date: Tue, 02 May 2006
From: "pethier@isd.net" <pethier@isd.net>

The back part is attached at the top to the cockpit rail. The cockpit rail covers the vinyl. The bottom of this part has four snaps on the back portion of the "shelf". The two outboard snaps on my car are not usable since I have mounted seat belts for the grand kids.

The bottom cushion has a sort of fiberboard base. It has a couple of holes in it which mate to some sort of pegs on the shelf. There does not seem to be any positive attachment. This is just as well, since one must shift the base cushion forward and unsnap the back part to gain access to the top hood) frame.

I can look at mine this evening if you need me to, and can take pix to put on Flickr if necessary.

-Phil Ethier

Subject: TR4 Rear seat back cushion
Date: Wed, 3 May 2006
From: "Lee&John Howard" <leejohn7@gmail.com>

Which raises a question that I've always had, which TR4's had a rear seat cushion? Or was it an option on all years? Mine came incomplete and in boxes.

-John Howard

Body/Cosmetics/Cosmetics

Subject: Installing metal beading
Date: Sun, 8 Apr 2007
From: Bob Labuz yellowtr@adelphia.net

Doug wrote:

> I have never installed the metal beading that runs along all the fenders on a TR3A. From what I understand it
> is a three person job requiring lots of patience. I understand the beading is fitted by inserting the tabs between
> the fender and tub and the fender is tightened to secure the beading.
> However, I noticed a fender for sale on e-bay that had the beading riveted to the fender. This looks like a great
> idea. Has anyone else installed their fender beading this way? Any tips or advice?
> Here is the fender. I do not know the seller and am just using his pictures to illustrate the concept.
> <[http://cgi.ebay.ca/ws/eBayISAPI.dll?ViewItem&item=250102800412&ssPageName=A DM E:B:SS:CA:1](http://cgi.ebay.ca/ws/eBayISAPI.dll?ViewItem&item=250102800412&ssPageName=A%20DM%20E%3A%3A%3A1)>
> Thanks for your advice,
> Doug

Doug, The installation of the bead is at most a 2 person job, but if you are careful 1 person can do it with no trouble. In order to prevent scratches, I tape the tabs with masking tape. Install the fender and tighten finger tight with some space between body and fender. Now install the bead and tighten as you go so as to prevent the beading from popping out. I always have a bead as close to the applicable bolt as possible so when the bolt is tightened, it holds the bead in place. I have heard of others bending the bead under the fender but this should not be necessary until the installation is complete. I would not advise using the rivet method as shown in the e-bay add. This might lead to scratching of the body during installation if the bead is mounted too close. I just don't think that step is necessary.

-Bob

Subject: Installing metal beading
Date: Sun, 8 Apr 2007
From: Bill & AnnaBelle anabil007@comcast.net

My Son, came up with a solution for this ... we drill very small holes through the beading tabs and the fenders, installed small sheet metal screws, and the beading fits perfectly, can even be removed and re-installed by one, fairly limber person ... It does work ...

>I have never installed the metal beading that runs along all the fenders on a TR3A. From what I understand it
is
> a three person job requiring lots of patience. I understand the beading is fitted by inserting the tabs between
>the fender and tub and the fender is tightened to secure the beading.
> -Bill Pugh

Subject: Installing metal beading
Date: Sun, 8 Apr 2007
From: <MMoore8425@aol.com>

<twakeman@razzolink.com> writes:

> I did it by myself. It may be a 3 man job but I found it to be a one woman job.

Terry, I agree it's a one person job, **HOWEVER** those tabs are very sharp, and I have scratched paint in a flash by letting them hit the paint. I would either have a second person do nothing but hold those tabs away as you press them in, or tape towels over the painted surfaces to protect them.

-Mike Moore

Subject: Installing metal beading
Date: Sun, 8 Apr 2007
From: Mark Macy <pmmacy@sbcglobal.net>

Doug: Triumph used #4 x 3/8 slotted pan head screws for this. p/n YA.0183 from the miscellaneous body fittings section at the back of the Spare Parts Catalog.

-Mark Macy

Subject: Installing metal beading
Date: Mon, 9 Apr 2007
From: "Randall" <tr3driver@ca.rr.com>

From what I understand it is a three person job requiring lots of patience.

Gee, I'm glad no one told me that before I did mine by myself. Wasn't particularly hard or tedious ... don't think it took me more than an hour to do the whole car. The tabs are supposed to be folded over ... if you spread them a bit (and the beads are roughly the right shape to begin with, as mine were supplied) then they will hold the bead in place while you tighten the fender bolts.

-Randall

Body/Cosmetics/Paints & dyes

Subject: Evaporust application?
Date: Sat, 29 Apr 2006
From: "Mark" <lists01@canleyworks.com>

Mark Mason wrote:

> You can get the same acid that's not sold as a rust remover for a small fraction of the price. I got a 5lb bag of
> citric acid powder for around \$15, enough to remove a lot of rust, and it works as well as any of the
> expensive stuff.

I'd like to give it a try. Where does one buy large quantities of citric acid powder?

FWIW, Evaporust is not an acid. It works through "selective chelation," whatever that is. More here:

<<http://tinyurl.com/qkqkm>>

Still, I'd happily use citric acid if I could get the same results.

-Mark

Body/Cosmetics/Paints & dyes

Color Name	Model	Primary		Alt.	Alt. PPG	ICI	Dockers	Rinshed	Dupont
		Code	Code	Ditzler	Mix	Mix	Mason	Mix	Acme
								S/W	
Lt. Blue Lustreen	Metal 20S Estate					4581			
Dark Blue Lustreen	Meta 20S Estate					4932			
Dark Blue	20S Estate					5009			
Light Blue	20S Estate					5069			
Salvador Blue	20S Estate					5173			
Elfin Green	20S Estate					5171			
Birch Grey	20S Estate					5174			
Primrose (pale) Yellow	TR2/TR3			82043	3220				
Olive Yellow	TR2/TR3					4862			
Geranium	TR2/TR3					4863			
Ice Blue	TR2/TR3					4575			
Black	TR2/TR3					5516			
B. R. Green	TR2/TR3					5761			
Signal Red	TR2/TR3					5468			
Salvador Blue	TR2/TR3					5323			
Birch Grey	TR2/TR3					5467			
Elfin Green	TR2/TR3					5325			
Winchester Blue	56-57				5944				
Beige	20S Phase 3 Saloon				2918				
Lavender Grey	20S Phase 3 Saloon				2917				
Coffee	Herald				3246		2998		
Alpine Mauve	Herald				3278				
Monaco Blue	Herald				3281				
Velasquez Cream	TR3-TR4				3368		9243		
Pearl White	50s on			8204	2857	5460			
Apple Grn (Special Order)				42486	2920	2920			
Primrose (pale) Yellow	66 on				81168				
Silverstone Grey	58-61				51943	3277			
Spa White	63-65				8335	3436			
Powder Blue	58-63				12163	8013			
Pearl Gray	57-58				32220	2931			
Beige	55-57				21730				
Flat Black	71-73				9381				
Fern Green	71 GT6 Stripe				50816				
Black	All 51-77	11	90 PAC	9000	2224		99		
Matador Red (trim)		12							
Jonquil Yellow	up to 67	14		81454	14	7340			
Cactus Green	63-69	15		43312	3735	3910			
Midnight Blue (trim)		16							
Damson Red	69-72	17		50816		8511			
Damson Red	79	211		51055					
Gunmetal Grey	63-69	18		12924	1	1624			
Pure White	All 63-77	19	206 NAB	8380	19	9925	97066		
Cherry Red	64-69	22		71452	7907	5758			
Sienna Brown	All 70-73	23	AAN	23406		8729			
Wimpey Yellow (trim)		24							
Conifer (T.R.) Green	63-69	25		43232	25				
Wedgwood Blue	63-71	26		12873	26				
Shadow Blue (trim)		27							

Color Name	Model	Primary		Alt. Alt. PPG		ICI	Dockers	Rinshed	Dupont Acme
		Code	Code	Ditzler	Mix				
Dark Gray (trim)		28							
Sebring White		29		8247	3276				
Signal Red	58-71	32		70966	2829		2989		
Jasmine Yellow	68-72	34		81686			8453		
Olive Green	63-69	35		43311	35	3911			
Delft (Dark) Blue	75 on	36	136 JAB	14871			43913		
Phantom Gray (trim)		38							
Honeysuckle	73	39		82143					
Burgundy (trim)		42							
Saddle Tan (trim)		43							
Beige (trim)		44							
Lichfield Green	65-67	45		42464		3520	83738		
Renoir Bue (trim)		46							
Dolphin Grey	66-69	48		32582					
Scarlet (trim)		52							
Dark Brown (trim)		53							
Saffron Yellow	71-72	54		81913		35250			
Laurel Green	70-72	55		44264					
Royal Blue	65-72	56	156	13126	56		8455		
Shadow Blue (trim)		58							
Inca Red (trim)		62							
Chestnut (trim)		63							
Mimosa Yellow	73-75	64	FAA	82126			43018		
Emerald Green	72-74	65	HAC	44665			35253		
Valencia Blue	67-72	66		13547					
Slate Grey	69-70	68		32819					
Pimento Red	72-76	72	204 CAB	71996			35252		
Sepia (Maple) Brown	74-75	73	83 AAC	24075	9578		43403		
B. R. Green	57-67	75		42487	2855				
Dark (B.R.) Green	75-76	75	43 HAA	45102	CC43		35912		
Print Blue (trim)		76							
Gray (trim)		78							
Carmine Red	All 73-80	82	209 CAA	72065			43019		
Topaz (Orange)	75	84	41 EAA	60812			43915		
Java Green	75-77	85	205 HAB	45060			43914		
Navy Blue (trim)		86							
Magenta	73-76	92		50921			43020		
Russet Brown	76-80	93	205 AAE	24378					
Inca Yellow	76-80	94	207 FAB	82309			44880		
Sapphire(Imperial) Blue	72-74	96		14416			35251		
Mallard Blue	All 72-76	106	HMD	44666			43080		
Ice(Porcelain) Blue	73-76	116		14608					
French Blue	73-76	126	JAA	14658			43021		
Vermilion	All 78-79	CML	118 CAE	60932					
Flamenco Red	SP 75-79	CAD	133	72144					
Astral Blue Metallic	76-78	JAF	140 JMR	14995					
Tahiti Blue	76-78	JAE	146 JMP	14866					
Pageant Blue	All 78-80	JMA	224	15231					
Tara Green Metallic	77-78	HAD	148	45349					
Brooklands Green	76-80	HAE	169 HMM	45190					

Color Name	Model	Primary	Alt. PPG	Alt. ICI	Dockers	Rinshed	Dupont
Acme		Code	Code	Ditzler Mix	Mix	Mason	Mix S/W
Dark Red(Richelieu) 79		CCE	211	51055			
Cotswold (Turmeric)Yell 79 on		FCB	212	82444			
Tudor (Pendelican) Whit 79-80		NCF	215	90134			
Silver Frost Metallic)P 79-80		MCA	216	33380 5216M			
Midas Gold (Metalic)All 79-80		GCC	218	24753			
Triton Gold (Metalic)81on		HAG	230	HCH 45620			
Persion Aqua (Metalic)79-80		JCG	241	JMW 45508 6294M			
Leyland(Porcelain) Whit78-80		NMC	243	NAF 90106			
Poseiden Dark Grn Meta All 78-79		HAF	281	45507			
Sebring(Carnelian)Red All 79-81		CDE	282	72376			
Mineral Blue	81		311	15546			
Pharoh Gold	81	GCF	375	25025			
Rhodium Gray (Argent Si 81		MCB	396	33504			
Aran Beige	81	NCC	417	25024			
Bordeaux Red (Metalic) 81		CCK	432	72472			
Cavalry Blue	81	JCJ	433	15512			

Body/Cosmetics/Paints & dyes

Subject: Paint repairs very long
Date: Wed, 19 Mar 2003
From: "Fred Thomas" <vafred@erols.com>

Well after I inflicted 4 very deep scratches in my cowl, today I have successfully repaired them with the help of Tom Householder and Eastwood, here is the procedure, Eastwood sells a paint touch up stick that has a small felt tip (very tiny) on the end, with a 1/2 pint of computer matched paint, I use the felt tip and the lid of the paint can to dip the tip, I then applied only "ONE" coat of color to each scratch, waited 1/2 hour and repeated this until "all" of the touched up scratches had a surface above the original paint is usually about 5 applications, let dry overnight, this a/m I cut a 1" X 1/4" block of rubber out of a fiber-glass applicator pad, then cut a 1" Wide X 4" long strip of 1600 grit sand paper and wrapped this around the rubber block, I use soapy water and wet sand "only" the 4 scratch marks using a rubber squeegee to keep track of the height of the touch-up paint, being very careful not to go down below the applied level of touch-up, after I have smoothed this area down to the original paint level I use my drill and 5" buffing pads with white (enamel) compound to remove the sand paper scratches, then I use polish cleaner and another clean buffing pad, and then finish it off with a good paste wax and then glaze, unless you knew exactly where the scratches were it is difficult to locate them, the secret is the felt tip and applying one coat at a time, go slowly, it works and Tom's grandfather taught him this and you know how old Tom is so now you know how long this has been around [:)], many, many years.

-"FT"

Body/Cosmetics/Paints & dyes

Subject: Royal Blue PPG or Sherwin Williams paint code
Date: Fri, 5 May 2006
From: "Dave Connitt" <dconnitt@fuse.net>

Hi List,

Can someone tell me the color code for Royal Blue in either PPG or Sherwin Williams?

Thanks,

-Dave Connitt

Hi Dave!

The colour code for my '67 TR4/A is #56, which is Royal Blue. The PPG's Paint # is: Concept DCC 3146H.

The formula to make a pint of paint is:

354.9 Parts of DMC 924

122.4 parts of DMC 904

53.9 parts of DMC 902

13.5 parts of DMC 900

I hope this answers your question.

-Cosmo Kramer

Body/Cosmetics/Paints & dyes

Subject: RUST Removal
Date: Tue, 05 Mar 2002
From: Michael Ferguson <fergie@ntplx.net>

I have no idea whether or not this works, but I was introduced today to the theory of electrolysis for rust removal (it involves a basic solution and an electrical charge, so I wouldn't recommend it for THAT kind of electrolysis).

A gallon or two of water in a non-conductive container (e.g. Rubbermaid), some Arm & Hammer Washing Soda, a chunk of stainless (or not) steel and a battery charger are basically all that's needed. I found this through another interest of mine, woodworking and old tools so this link relates to that, but hey, rust is rust, huh? And we ALL know about rust!

Anyway, if you're interested, check it out at... <<http://www.rusty21.com/>>

I intend to try this soon (bought the soda on the way home tonight) and will report results. When I heard about this, I thought, "The guys on the TR list are going to LOVE this!"

Think I'll try it on an old car part instead of my "new" 100 year-old tenon saw though. Where can I find a Rubbermaid container large enough for a TR3? :^)

-Michael Ferguson

Body/Cosmetics/Paints & dyes

Subject: Sandblasting Media info.
Date: Thu, 5 Feb 2004
From: "Gene" <genegleenn@qwest.net>

List,

We just finished glass bead blasting 5 TR3 steel wheels with #10 glass beads which I have used on aluminum aircraft parts for 20 years. They were too fine for heavy rust removal. Glass beads do a fantastic job and don't rough up the surface, but one must go coarser than # 10. If you don't have a severe rust problem #10 produces a beautiful satin finish. For heavy rust one will have to go down very close to a #4 or be willing to spend a lifetime in front of a blasting cabinet. The lower the number, the coarser the bead, and I think the range is from #13 (fine) to #4 (coarse).

-Gene Glenn

Body/Glass/Curtains

Subject: Factory fixed TR4 window winders
Date: Mon, 5 Feb 2007
From: <CarlSereda@aol.com>

Hi Bob,

Since you're so close .. I would highly recommend updating your TR4 window winders to final factory improvement as noted in 1964 bulletin below; (a simple procedure)

BULLETIN T-64-41
ALL TRIUMPH DEALERS - WESTERN ZONE
SERVICE DEPARTMENT
TRIUMPH TR4 WINDOW
DECEMBER 10, 1964
WINDER REGULATOR

When reports of stiffness in the operation of the door glass are received, the following procedure should be adopted which will prevent straining and damage to the regulator. The same instructions should also be followed when renewing a regulator.

- 1. Remove trim panel.
- 2. Raise window and check the clearance of the glass fore and aft in the top of the rear channel. The recommended clearance is .030" which should be maintained for the whole length of the channel. Excess clearance will allow tilting and the jamming of the glass and insufficient clearance will produce stiff operation. Clearance can be obtained by the use of packing washers between the inner door panel and top channel bracket (see illustration A A).
- 3. Adjust bottom brackets and crimp the tie rod to ensure that the channels are parallel (illustration C).
- 4. Remove regulator pivot pin nut and delete spring washer under head of nut. Add washer WP0119 1/2"x 7/8" x .050" behind head of pivot bolt and additional washer WP0160 5/16" x 1 5/8" x 16 S.W.G. behind head of nut (illustration B B).
- 5. Tighten nut sufficiently to allow ease of operation and peen or center pop end of thread.
- 6. Refit trim.

PS; the second page of Bulletin shows 2 helpful drawings - it's easier than it sounds! (let me know if you need the diagrams) Good luck,

-Carl

Body/Glass/Curtains

Subject: TR4 doors- installation of tie rod?
Date: Mon, 5 Feb 2007
From: Cosmo Kramer <tr4a2712@yahoo.com>

Hi List!

Jim Hassall asked the list about a door's Tie Rod installation, [Fig.#61 in the Moss/USA catalog] for a TR4.

I found this piece in one of my extra doors. Being that the part is listed in the catalog as 'NA'. One will have to make it, IF they lost that part.

Here is how you can make it from the measurements that I took. Starting with a 9/16ths" rod x 33 1/4", measure out 1/2" & put a 90^ bend in it. Go another 3/4" with another 90^ bend [on the SAME PLANE- otSP], then 30 3/4" put another 90^ bend [otSP], 3/4" with another 90^ bend [otSP]. You should have a rod with two-'J's' connected together about 30 5/8th's" a part on the ID of this rod.

Each end [the 'J'] is to go around the outside of each Window Channel, with the 30 3/4" length resting on top of the Bracket/Window Stop [Fig. #62 in the Moss/USA catalog] that's located at the bottom inside of the door.

-Cosmo Kramer

Body/Glass/Curtains

Subject: Window tracks
Date: Tue, 21 Mar 2006
From: Cosmo Kramer <tr4a2712@yahoo.com>

"James King" <kingjf@stny.rr.com> wrote:

> Does anyone have a source for the felt strip that lines the tracks for the door windows? Seems like you
> should be able to buy the stuff and install it. In fact, has anybody tried this and what are the tips??
>-Jim King

Hi List & Jim!

Sorry about giving my reply so late, because I'm catching up on my back log of TRIUMPH Digest readings. I'm sure you all have submitted your input [which I haven't had a chance to read, yet]. But here's my 2 cents on this topic:

A cheap way that works, is to go to the local drug store or any place that sells 'Dr. Scholls' foot products. Purchase 'Moleskin, the stuff that you can cut up & place over a 'starting' blister that one might receive from breaking in a new pr. of shoes.

- This stuff is a 'felt' like material with an adhesive back on it.
- Cut this into long strips. The width should be from one edge of the U channel, down, along the U channel, & back up.
- Remove part of the adhesive back to place on the one Top edge of the inside of the channel.
- Then as you remove the rest of the backing, press the felt part inside along the bottom & back up the side of the U channel.
- You may have to place these strips in three locations along the channel. The top, mid section, & the bottom.
- Repeat this to the other U channels as necessary.

BTW- I picked up this info. from this list some years ago. [Maybe 5->10 yr. ago?] So if one could check the archives, you might find a better set of directions than the ones that I just gave.

The other option is to purchase new channels, if they have them.

-Cosmo Kramer

Subject: Window tracks
Date: Sun, 19 Mar 2006
From: "Tim Hutchisen" <hakhutch@adelphia.net>

I went through this a few years ago with my TR6. I ended up sourcing window channel from JC Whitney. The channel comes with the felt already adhered, cut to the length you need with a hacksaw, and rivet it to the support brackets. It was not all that expensive as I recall and has worked great even after some 6000 miles now. You will need to take the channels out of the door to measure the dimensions of the U shape as JC Whitney offers numerous sizes of window channel. I have no financial interest in JC Whitney but they do have some odd stuff NLA from the big three suppliers in our hobby. Good luck,

-Tim Hutchisen

Subject: Window tracks
Date: Wed, 22 Mar 2006
From: <DaveImassey@cs.com>

J C Whitney carries a nice selection of steel core window guides. One of those is a perfect match for out cars. If you don't want to replace the steel part you can peel the felt part out and install it in your old tracks.

-Dave

Subject: Window tracks
Date: Wed, 22 Mar 2006
From: "David Brister" <david.brister@wanadoo.fr>

Have a look at: <<http://www.sctoa.org/win-chan.htm>>

-David Brister

Body/Glass/Curtains

Subject: Window Problems on my TR4
Date: Tue, 26 Jul 2011
From: DaveImassey@cs.com

john.dunham@amphenol-tcs.com writes:

> Just wondering if I am missing something or if there are any tricks to keeping a door window in its track. It
> seems as though the problem is only limited to the passenger's side. The window is tough to crank and
> virtually every time I crank it fully open it falls out of the track closest to the front of the car. I am hoping to
> get my door panels & door hardware re-installed but this window is proving to be a thorn in my passenger's
> side. Any help or comments would be greatly appreciated.

The mechanism is a scissors arrangement with one end attached to the crank and the other three on rollers in tracks. One is on a fixed track and the other two rollers work in a track attached to the window. If the window is falling out of the side channels, then one of the wheels may have fallen out of the track.

The other cause may be due to the track is loose or bent and is not confining the glass as it should.

Let us know what you find when you get it apart.

-Dave

Subject: Window Problems on my TR4
From: Chris Simo <ccsimonsen@gmail.com>

I had similar issues 3 or 4 years back. When I took my windows apart I had a few issues. The clip that holds the scissors arrangement that Dave spoke about had broken on one of the mechanisms - and both sides the window tracks were really worn.

I bought new track from JC Whitney, and it came in a long cardboard tube - damaged but I think it was handled roughly. Even though they were tweaked, it was easy to bend them straight.

I drilled out the rivets from the old tracks and cut new ones to length and riveted back in place - afternoon job and works well. I ended up going the hardware store and buying a few of those axle caps to hold the mechanism together.

BTW - those clips are hard to figure out when installed - they slide to one side and pull off - there is a spring finger in the center of the clip that holds tension once in place - the center spring was broken on my clip.

If your tracks and mechanism looks good - it could just be a spacing issue with the track - you can make some adjustments with shims or washers to move the tracks around once you are in there.

I also made sure the holes in the bottom of my door were open while I was in there - and treated the inside surface rust with rust restorer before painting it. I glued plastic sheet inside the interior panel before re-installing the door panel as I saw some water stains on the door panel as well.

Sorry - I had a brain lapse and did not finish my thought on the clips. I tried the axle cap and it worked but was sloppy. Then I switched it out for an appropriately size Jesus clip (from the same hardware store) and that has worked well.

-Chris

Body/Glass/Windscreen

Subject: Beading (was - Anyone know a good auto glass)
Date: Thu, 27 Apr 2006
From: Dennis N Culligan <dncullig@us.ibm.com>

Geo wrote:

>But be aware that the beading may shrink. ... You may want to have them leave the beading as long as possible
> so you've still got some material under the clip as the stuff shrinks.

No matter how long it's left, it will eventually shrink to the point where one clip won't do the job. What I did (the second time I replaced the beading) was keep a small piece that had been cut off. When the beading shrunk so much that the clip no longer bridged the gap, I stuck the piece in the gap and secured it with 2 clips (one on each end of the short (1"-1 1/2") piece). Nearly unnoticeable and LOTS cheaper and easier than replacing the whole thing.

-Dennis Culligan

Subject: Beading (Anyone know a good auto glass)
Date: Thu, 27 Apr 2006
From: <ZinkZ10C@aol.com>

dncullig@us.ibm.com writes:

>> No matter how long it's left, it will eventually shrink to the point where one clip won't do the job.

Are these seal strips pre cut or are they extra long and trimmed to fit?

I'm not familiar with this exact application but if it is anything like the seals used on flat glass aluminum vans there is a trick. If they are trim to fit, they are probably being stretched during install and relax to original length later. The trick here is to measure what is needed, add a 1/2 inch or so then make sure all of the rubber is used.

-Harold

Subject: Beading (Anyone know a good auto glass)
Date: Thu, 27 Apr 2006
From: "THOMAS FANSHER" <tfansher@comcast.net>

When I replaced mine a few years ago, I knew (through the list) that they had a tendency to shrink. So, I left mine an inch or so too long - just left it sticking out for a month or so and then when it shrank, I had a better fit. Can't remember if I retimed it or not. Of course this doesn't apply if you're going to a show next week, but if you're not planning something special or if you're not too appearance conscious for the short term --- it worked for me.

-Tom

Body/Glass/Windscreen

Subject: TR4 Windscreen Glass
Date: Wed, 30 Jan 2002
From: "john matthews" <john__matthews@hotmail.com>

Hi Geo,

My best advice on this job is don't do it by yourself. I've done windshield many times and it always helps to have someone else there. If you can't find anyone from your local club to help just have an installer do the deed.

That said it is pretty tricky to get that big rubber band around the glass without having it slip off the other side. I would clean off all the soap first since it probably isn't helping. Then you can try getting the seal warm first, maybe hot water will work. Try to orient the seal properly on the windshield (corners in the right places) then slowly work it into place. It will help if you have a workbench at a comfortable working height and have some sort of soft cover over it. Once you have the seal on you should probably go ahead and install it into the frame. It's easier if it's off the car. First get some 1/4" nylon rope and wrap it twice around the seal. Offer the windshield up to the frame and press it into place while pushing the glass firmly towards the frame. This is where you discover that glass really does bend. It will all seem pretty impossible, but you will find that with some windshield sticks and some Guinness Stout it will finally fit. It's really one of those jobs that is hard to describe but fairly easy to do once you have done it a few times. Experience really is the key here so get someone who has done it before if you can. If not there is really no shame in farming this job out to an experienced installer. Try to get someone over 40 who has at least done windshields on VW Bugs before.
-John Matthews

Body/Glass/Windscreen

Subject: Windshield Capping Seal for TR4A
Date: Fri, 22 Oct 2010
From: Bob <yellowtr@adelphia.net>

Guy D. Huggins wrote:

> Listers,
> I am wondering if a part exists.
>
> When I removed the capping piece from atop the windshield of the TR4A (by drilling out the rivets), it has
> what appears to be the remains of a rubber seal. This seal was BETWEEN the capping piece and the
> windshield frame itself. (I suppose to prevent water from getting into the hollow parts of the windscreen
> frame.)
>
> I have looked but cannot find a parts reference for this seal. The closest I've found is the seal that attaches to
> the hood frame bar, along with three metal strips, to form a seal between the hood frame and the windscreen
> when the hood is raised.
>
> Does anyone have any information on this?
> -Guy D. Huggins

Guy,

When I attached the capping to my 63 TR4, I was in the same spot where you are today. What I did was go down to Lowes and look at their weather stripping selection.

I found a type of weather stripping about 1" wide and in a very long coil. It had a layer of thick sticky back tape on one side and the other was soft vinyl. The total thickness was about 1/8" which is what I chiseled out of the existing capping.

So I stuck the piece to the entire capping and riveted the capping with the seal installed to the top of the windshield.

I have been through many of heavy rain storms and there are no leaks what so ever.

I used the same technique on the TR6 I just restored which is more like your 4A than my 4 but still requires the seal.

The key for me was to apply the seal so when I installed the pop rivets the rivet went through the seal. That way I knew the seal was in the correct position.

The action of the pop rivets drawing towards the windshield frame compresses the seal for waterproof installation.

The problem is I don't remember the product name but if you need the name, I can go to Lowes and check it out.

The seal came in various colors, white, off white and tan. I picked off white I believe but once installed you cannot see the seal.

-Bob

Subject: Windshield Capping Seal for TR4A
Date: Sat, 23 Oct 2010
From: ADRIAN DIX-DYER <dixie4.wales@virgin.net>

When I removed my capping there was no rubber seal on my TR4A. What was there appeared to be a semi hardening sealer Sealstik or something similar. If there was a rubber seal at sometime it had been replaced with the Sealstik method. What I am thinking is that when I refit the capping I will probably opt for silicon sealer.

-Adrian

Body/Glass/Windscreen

Subject: Windshield top seal
Date: Mon, 3 Jul 2006
From: "Kirby Vaughan" <mrkirbyv@yahoo.com>

Terry,

I just did this with my TR6. Can't imagine it's too much different with the TR3. I was successful doing it alone after a couple of tries. I tried soaping up the gasket as recommended but it just seemed to make a mess on the dash and dried out before I got to the hard parts. I ended up using Sil-Glyde on the corners and the ends, the straight parts go in fairly easily. Sil-Glyde is supposedly for lubing rubber parts so it shouldn't hurt the rubber.

I used a 1/8" nylon rope around the gasket. Run the rope around the windshield with both ends coming out at the bottom center. Set the glass in the frame with as much of the gasket over the bottom of the pinch weld as you can get. On the TR6 I ended up having to run a second rope around the outside flange because it was curling in and keeping the gasket from sliding down as far as it should. The rope allowed me to pull it up and away from the windshield so I could push the glass down into place.

Start at the bottom and pull about a foot in each direction and make sure it is pulling the gasket over the frame. As I went I was constantly stopping and pushing the glass down onto the frame. Until you get around the corners it won't go very far. The first corner is tough but once you get around the corner it almost pulls itself onto the frame as you go. Just keep working a little at a time, alternating sides and pushing it down onto the frame. If you get it pushed down tightly on the bottom of the frame, the top corner will pop on just fine. If it is hanging badly at the top corner, it probably is not down on the bottom pinchweld far enough, so keep working it. If it's just not working, don't be afraid to pop it back out and start again. That's better than tearing the gasket. I had more problems getting the gasket onto the glass than getting it into the frame. Boy what a bear that was! Hope that helps!

-Kirby...

Subject: Windshield top seal
Date: Tue, 04 Jul 2006
From: <mrV8q@netscape.net>

"Terry Smith" <terryrs@adelphia.net> wrote:

>Hello, everyone. ...

Hello, Terry, I can only help with the bottom seal; I was staring at my new TRF top seal just yesterday. I've used a product called Clear Guideb ", that I know is available at Home Depot, but that I borrowed from work. It's used to lubricate long runs of video cable in tight quarters, and it works perfectly in this application, as it won't dry out like soap and water, and cleans up nicely. I remember it took over an hour to work that bottom seal through the windshield, just take your time! Don't forget to leave enough seal to bend around the scuttle and tuck down beside the side frame; if you have a seal there now, it'll help of course.... just take your time, it'll turn out great! Best,

-Kevin Browne

Body/Hood/Hard

Body/Hood/Soft

Subject: Best outside temperature for installing a new soft top
Date: Wed, 9 May 2007
From: Greg Perry <rgperry@earthlink.net>

Jim, I once installed a top in July in the heat of the day. I eliminated the gap at the top bar in order to prevent the top flapping going down the highway. When winter came I had a hard time attaching the top to the windshield frame. The top material shrank in the cold temperature. I suggest that you install the top at the average temperature for the region that you live in. I've learned since then!

-Greg Perry

Body/Hood/Soft

Subject: Convertible Top Installation
Date: Sun, 6 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> I have the convertible top (Sun Fast) and all the hardware for installation today. Then I realized, I don't know
> how to cut the fabric to receive the lift the dot hardware.

I've always done mine by hand. Find where you want the stud to go, then use the bottom plate on top of the vinyl as a pattern to cut 4 slits with a sharp X-acto knife. Be sure to orient the plate the right way round. A piece of cardboard is handy as backing material, as otherwise it's easy to stab your finger. Work the 4 prongs of the top plate through the holes you just made. Then slide the bottom plate onto the tabs, and cut around the center hole. Crimp the tabs tightly, and you're done with that one. I use an old pair of "water pump" slip-joint pliers to crimp the tabs, as they have enough 'reach' and the notches help roll the tabs over.

FWIW, If you Google for "lift-the-dot tool" (without the quotes), you'll probably some less expensive tools. I see one at: <<http://www.rochfordsupply.com>> for under \$40.

-Randall

Subject: Convertible Top Installation
Date: Sun, 06 Aug 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Terry Smith wrote:

>...I don't know how to cut the fabric to receive the lift the dot hardware.

My method differs from Randall's, proving only there are many ways to get to the same place.

On a vinyl top (don't know if this would work with Sunfast) I first punch a 3/16" hole where I want the peg to come thru. Then I align the top piece of the female fastener with that hole -- the whole works perched over a hunk of soft wood such as the end grain of a very short 2x4. I then put a length of wood dowel against the fastener and smack it with a hammer... the prongs are sharp enough they poke right thru the vinyl w/o any cutting. This gives it the holes just where they need to be and no bigger than necessary.

I fit the bottom half of the fastener, press firmly in its center (to assure it is tight against the other half) and fold over the tabs one at a time with the piece of wood dowel.

-Geo

Subject: Convertible Top Installation
Date: Sun, 6 Aug 2006
From: "Kinderlehrer" <Kinderlehrer@comcast.net>

I did my hood stick cover a little differently. After marking the spot the receiver was to go, I used a hole punch to put a hole in it. I then used a spare lift the dot stud through the hole to center the top part of the receiver while locating the spots for the tiny slits to push the tabs through. It worked well for me, of course, the material is probably a lot thinner than Everlast.

-Bob

Body/Hood/Soft

Subject: Convertible Top Replacement
Date: Sat, 26 Jul 2003
From: "Brian Sanborn" <brian.sanborn@charter.net>

Hugh Fader wrote:

Hi folks. My next project is to replace the convertible top on my TR6. I want canvas and I'm leaning toward the stafast top from AABEST. As I understand there are a bunch of other parts such as seals I should probably replace at the same time. Can anybody advise me on this or point me at a list of "belt and braces" things to do when replacing the top?

-Hugh Fader

Hugh,

Check out my website pages on putting a new Robbins top on a TR4. It's slightly a different job but same techniques and tools.

<http://webpages.charter.net/sanborn/New_Top.htm>

-Brian Sanborn

Body/Hood/Soft

Subject: Hood & Tonneau Installation
Date: Thu, 20 Feb 2003
From: Geo Hahn <ahwahnee@cybertrails.com>

<Egbman1@aol.com> wrote:

> I'm about to embark upon the installation of a new top and tonneau cover on my '62 TR4.

Apologies for the length -- long for an email but brief as instructions go. I send this to the list so others might add, correct, etc....

It's really pretty easy -- wish I had taken some photos for my website the last time I did this. Some thoughts...

Tools:

I use a hole punch (start small 9/16", & increase size if necessary) that came with a set of Xacto knives. There are many sources for these, get one that is pretty sharp. You use this for both snaps and lift-the-dot (LTD). It is the only special tool I needed for the LTDs.

You will need a little anvil piece to hold the button side of the snap -- some are plastic, some are a metal casting. These usually come in an installation set that includes little tool (about an inch long) to flare the rivet portion of the fastener. The kit (probably available from a fabric store or auto upholstery supplier) may also include a little hole punch -- but this may be too dull & small to be of much use.

Only other things I use are a small hammer, small screwdriver and two blocks of soft wood (the end grain of a short piece of 2x4 is good).

For LTD:

I punch a hole where I want the fastener, then position the top of the LTD fastener over the hole with a block of wood underneath. I then tap the fastener using the hammer and the other block of wood. I have always been able to punch right thru the vinyl with those sharp tabs (some folks prefer to pre-cut the slits with an Xacto knife).

Flip the piece over & slip the bottom plate over the tabs (there is a right direction -- tabs are closer together at one end of the fastener) and crimp the tabs over. I crimp them by pressing with the blade of a flat-bladed screwdriver.

For Snaps:

Punch the hole using the wood block as above. With the 2 parts of the snap in place rest the button side in the little anvil and use the flaring tool & hammer to spread the rivet. Actually, my kit came with 2 flaring tools -- one with a sort of round tip and the other sort of square. I make the initial hit with the square one to get a nice spread... then use the round one to really secure the pieces.

Where did you get your top & tonneau? My tonneau was from Moss and my top from Vicki Brit (Robbins I think) -- both were *very* tight -- that is, the fasteners had to be installed right up against the seams to make it fit. I would have been happier with a little slack to work with but the results are very nice and that tonneau is as tight as a trampoline:

<http://www.geocities.com/tucson_british_car_register/tr4-five.html>

For the tonneau I started at the front and put the snaps as far forward as I could. I worked from the center out, first the front, then across the back lastly along the doors.

For the top I hooked the front edge in place and again did the LTDs from the center out.

For the LTDs on both I would do 2, then trial fit and mark for 2 more. I had the old top so I would measure the

actual peg spacing on the car (at the base of the peg) & the fastener spacing on the old top and finally mark the spot on the top/tonneau where the next peg wanted to be. The last is the surest method but measuring the pegs and old top makes it triple-darn-sure that it is right.

As I said, mine came out nice and tight but I have seen some that are baggy so not all brands fit the same. If yours look like they will be tight you may want a warmish day to make things easier to work with and to assure a year-round tight fit. If you could even just get a sunny day this would be enough to make things easier (especially if the pieces are black).

-Geo Hahn

Body/Hood/Soft

Subject: Hood sticks
Date: Sat, 11 Nov 2006
From: "Eureka Saws Co, Inc." <ambritts@ptdprolog.net>

Hello all,

I have a question on the resting location for the hood sticks. Reviewing numerous pictures, I see two positions. One position has the sticks folded on the edge of the coping and outside the cockpit. Second position the sticks are folded and resting on the top of the back panel inside the cockpit.

Does anyone know the correct placement and is there a reason why some sticks are outside the cockpit.

-Alex

Subject: Hood sticks
Date: Sun, 12 Nov 2006
From: "Eureka Saws Co, Inc." <ambritts@ptdprolog.net>

Hi Gang,

Well got numerous responses to this one. It would have been nice if I let everyone know what kind of car. (TR3A) Anyway, many thanks to all.

David

Did shot off a picture which solved the problem. This was one of the parts that came in a box with the disassembled car. I was testing back panel, hood sticks etc., and used regular bolts to fasten the sticks. The stick frame would not clear the bolt head. Put in proper recessed screws and bingo. You would think someone that took a car apart and put it back together would have caught that. I'll attribute it to a senior moment at 56.

-Alex

Subject: Hood sticks, again
Date: Sat, 18 Nov 2006
From: "Tom Wirt @ Claycoyote" <twirt@claycoyote.com>

On my 1961 TR3, DPO re-did the interior and didn't mark the spot where the hood sticks are supposed to go. I haven't removed the new interior to see if there are holes tapped into the body panel. Are there? Or if not, how to locate where they should be? I would assume that location is critical to having the hood tight.

-Tom Wirt

Subject: Hood sticks, again
Date: Sat, 18 Nov 2006
From: "Randall" <tr3driver@ca.rr.com>

> On my 1961 TR3, DPO re-did the interior and didn't mark the spot ...

Not all that critical. The length of the straps can be changed to adjust the tightness.

If you live where it gets cold, you might want to use an old trick:

Leave the rear most bow free from the strap. When you are installing the top in cold weather, leave the rear bow folded forward against the next bow while you install the top & straighten the dog legs. Then sitting inside the car, you can force the bow backwards to tighten the top. Since the vinyl top tends to shrink in cold weather, this lets you make a nice, snug installation in warmer weather, and still install it when it's cold. The bow may not even go all the way into position until the top warms up some; but it will stay wherever you put it, from friction against the top.

-Randall

Subject: Hood "sticks"
Date: Sat, 18 Nov 2006
From: <jar@aldermanroad.net>

On my 1961 TR3, DPO re-did the interior and didn't mark the spot where ...

Actually, behind the panels are a set of three holes, and behind the holes there is one "caged" nut and a separate piece of "caged" metal with two holes, all tapped to 1/4" X 28tpi (NF, or national fine) threading.

Triumph used special counter sink (flat, slotted face with a conical back,) machine screws with a conical end. The conical end was important for feeding the screw into the "caged" nut and avoiding the problem of cross-threading.

You can use your finger to press on the material to locate where the screws should go, but I would suggest that you remove the quarter panels to examine the nuts. Use a good tap to clean the threading in these nuts. Use a little kerosene or penetrating oil on the tap as you run it into the nut, and then wipe the nut with a q-tip or such. Then make sure the screws start and go in smoothly.

I bought a box of 100 SS 1/4" NF machine screws, 3/4" long. If you cannot find the original style (try TRF or other TR supply house) in SS, I suggest this approach. The thing is, without the conical end, getting the screws started is a bit more difficult.

Positioning of the frame prior to fitting the hood (top) webbing I would recommend. Initially fit the webbing from the leading top bow to the second, then third bow. Make sure that these bows are fully in the open position prior to putting the screws in place. Once you have fitted the webbing to the third bow, the tricky part is positioning the soft top, and attaching the webbing ends to the rear capping edge.

I would snap the soft top along the rear capping, and with the top frame raised and in place and the ends of the webbing laying across the rear capping, lay the top over it. Then connect the leading edge of the top to the windshield. Using two people, one on each side of the car, have them place their hands on the point on the frame where the frame finally locks. They should push backwards until the top is taut. The ends of the webbing where they attach to the rear capping should now be marked for attachment.

A bit tricky, but I have done this with a new top which did not have any of the snaps installed, and it fit beautifully.

Cheers

Subject: Hood sticks, again
Date: Sun, 19 Nov 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Tom Wirt @ Claycoyote wrote:

> ... I haven't removed the new interior to see if there are holes tapped into the body panel. Are there?

There should be a metal plate with 2 threaded holes that floats (like a rectangular captive nut with 2 holes) behind the holes in the body work. I believe the correct bolts will have pointed ends that make it much easier to get them started. These may be the same as the bolts used for the door hinges.

I have attached a copy of the diagram that came with my top (Amco?) back when and shows the recommended spacing for the sticks when attaching the webbing. Use this as a guide rather than Gospel. Temporary spacing can be achieved by using small diameter nylon rope tied to the centerline of each stick to see what spacing is best for your top.

-Geo

Subject: Hood sticks, again
Date: Sun, 19 Nov 2006
From: <kinderlehrer@comcast.net>

I did this and it was a lot easier to get the hood up, but when it got hot the hood kept collapsing on top of our heads as we were driving, I had to reattach the straps to get it to stay up. Now of course, it's a bear to get up the hood that is. Just my experience, YMMV---

-Bob

Subject: Hood sticks, again
Date: Wed, 22 Nov 2006
From: <jar@aldermanroad.net>

The basic use of the rear bow is for the shape of the top. It does not keep the top from falling. As long as the webbing is attached to the front bow, the second bow, and the rear capping, the top cannot fall. Keep in mind that what keeps the top up is the folding link that is attached to the body. After you have attached the top to the Windshield and the rear capping, you push that link at the fold point rearward until it snaps. If the top is too loose when these links are fully rearward, then the top frame can collapse.

The fit of the top to the frame when raised is the critical element, and I've only ever seen a custom-made top, or a very good one that has the snaps custom fitted to the car, work correctly. That's why the aftermarket tops always flop around, the side curtains never match, etc. Even when these cars were in general use, I only ever knew one upholstery shop that knew how to make/fit a new top. No dealer ever had the skill to do it, even with a new, factory soft top.

-Cheers

Body/Hood/Soft

Subject: Surrey Top (TR250)
Date: Mon, 10 Jul 2006
From: <AMfoto1@aol.com>

Hi David,

Congratulations on acquiring at least most of an original top for your car! First, some terminology, just in case you're not aware of it. This can be important when trying to find parts, because the terminology is sometime used differently, one vendor to the next. But, if you are aware of it, you can watch out for problems and get clarification. The factory "hard top" was offered as a two-piece accessory consisting of the "back light" and a rigid roof panel. The back light consists of the cast aluminum window frame, rear window and interior trim. The rigid roof panel was finished, inside and out. Since there's no place to stow the rigid roof panel when motoring around without it, the "surrey" accessory was offered separately and just consists of the vinyl roof and folding framework you have. About five years after Triumph introduced the two-piece hard top and surrey for the TR4,

Porsche copied the general idea and design for their 911 and called it a "Targa" top. Of course, now both Surrey and Targa have become somewhat generic terms and are used in all sorts of ways. Over the years I've done a lot of research about the original top as it pertains to my '62 TR4, and spent some time searching for one before finally acquiring it. I know some of the related details changed a little during TR4A production and there might have been further changes for TR250, of which I am unaware. For example, the trim finisher strip atop the windshield and the soft top attachment were both changed on the later cars, which I'm sure must effect the method of fitting either the hard top's rigid roof or the surrey accessory. And, I don't have or use the vinyl surrey accessory on my car, so am not totally familiar with it. As to color, the hard top and aluminum back light frame were offered in white, black or painted to match the body color. The surrey's vinyl was available in black or white. Interior trim of the rigid roof panel (head liner) and back light frame were an off-white vinyl with a coarse texture that matched the material on the sun visor. Exact color and texture of the interior might have changed over the years and repros today aren't exact, but from what I've seen of them, TRF's vinyl is very close. The rigid roof panel that would have been part of an original "hard top" kit from the factory or as a dealer accessory kit. FYI, only the very earliest of these roof panels were aluminum (first 500, probably all sold and fitted in the first couple years of TR4 production). After that they were sheet steel (i.e., appropriate for cars after roughly 1963-64 if originality is a concern). The rigid roof panels do show up occasionally at swap meets and in online auctions, so keep a watch for one. You might get lucky and find one separately, or find a damaged/broken back light/window with a good, rigid roof, to get just the pieces you need. You can also buy brand new aluminum roofs from Revington TR in England (www.revingtontr.com), including a special version Neil has come up with that's split down the center so the two halves will fit into the car's trunk (boot :-). While I'm sure they are well-made, the cost of these repros/replacements is relatively high and there's shipping and import duties to consider, but it's an option. You will also find you need hardware and seals to fit both the back light and, eventually, the hard top panel. There are studs around the base of the backlight frame, which just require nuts (nylocks recommended) and flat washers. There are two studs to be fitted atop the B-post and serve as the most forward attachments on each side because there is no room for a bolt, which are a bit tricky to find (I'm still looking, none of the usual vendors have them, but might just make some up, if I can't find the right size). There is a special, u-shaped rubber seal that fits around the bottom of the back light frame, sealing it to the car's cockpit rim. TRF offers a "hard top" hardware kit, but it really only applies to the rigid roof panel (consists of four special bolts, washers and two special sleeves that fit into and reinforce the windshield frame - the sleeves are the most important part of their kit, IMO). There are also special door seals and "fuzzies" used with the hard top conversion. The door seals on TR4 are much longer, now coming all the way to the top of the rear window. The "fuzzy" or draught excluder on TR4 (which was separate from the rubber door seal on TR4, but not later cars) is one, single, very long piece all the way from top of the windshield frame on one side, down around the door frame, up and across the leading edge of the back light frame, down around the other door frame and up to the top of the windshield frame on the other side. I don't know the exact arrangement on later cars, where the rubber door seals and fuzzy were combined, but one of the vendors or the factory TR4A or TR250 parts manuals probably show it.

There were a number of rubber seals specific to the hard top, too. The most obvious seal is the large rear window seal, which is basically a larger version of the seal used for the windshield. Like the windshield seal, it

has a polished/chromed insert strip that locks the window in place. Originally, the chrome finisher strips are bright anodized aluminum with clips at the center. The very earliest inserts were one-piece with a single clip covering a joint at the center/bottom of the rear window. Later ones were two pieces with clips at both top and bottom center. Modern repros of the finisher strips are chromed plastic (and prone to shrinking, so cut them extra long when fitting them). Modern clips are now also plastic. There are also rubber seals on all four sides of the rigid roof panel. One seals the top of the windshield frame, another to the top of the back light frame. Cantrail seals are used on either side to seal the top of the door windows. Since these are attached to the rigid roof panel, they don't apply to the "surrey" top accessory you have. Finally, the rigid roof panel has its own "fuzzy" that finishes the edge of the head liner, on three sides. Another thing, the three rear interior cockpit trim panels were special for the hard top, too. The two on the sides (over the rear/inner wheel wells) don't have holes for hood stick mounting brackets, and the rear one (covering the fuel tank) is special at least on the earlier cars that had a separate hood stick cover, but might be unchanged on the later cars that didn't have the hood sticks cover. In your search for a hard top rigid roof panel, you might find some fiberglass repros. I'm not aware of anyone making these for use with the original, factory back light, but perhaps someone does. Be aware that there were also aftermarket copies of the original design, in fiberglass, the roofs of which might or might not fit up to the original back light frame. I suspect most would not fit, since most of the fiberglass back light frames appear to be a thicker design than the original. There was also a "Sebring" two-piece aftermarket top that used a fiberglass back light and a black, injection molded plastic rigid roof panel. I doubt that roof panel would fit up with the original, aluminum back light frame, but don't know for certain. Finally, you will find some vendors offering "race" hard top kits. These are special light weight versions that might not be usable on the street, or in some case are one-piece tops that give the appearance of the original two-piece, but don't have a removable roof.

When you get the top, you might find the rear window seal needs replacement. These get a lot of direct sun and often harden and crack over the years. If you find you need to replace that seal, handle the glass with a lot of care! Replacement rear windows *are* still available, but are quite expensive. It's also not uncommon for the original Tri-plex glass to have already been replaced with Lexan/Perspex or similar, either by racers for a weight savings or just as a less expensive replacement for street use. There are a couple photos of initial fitting of the hard top on my TR4 at the link below. There's still some work needed on it (and the rest of the car!), but I was fortunate to get an early top that still had its original paint (white), seals, window, interior trim/head liner and at least remnants of all the original rubber seals, so I could compare these items with currently available replacements. Feel free to email directly if you wish.

-Alan Myers

Body/Hood/Soft

Subject: TR4 soft top install
Date: Sat, 6 Jul 2002
From: <CarlSereda@aol.com>

Geo,

My original TR4 soft top does NOT have the slits you speak of - 6" from ends for inserting center metal stiffener strip. But I have seen this area as a natural tear point if you're rough with it. And originally I believe the stiffener metal strips (really for keeping leading roof lip inside the windshield groove) were riveted through the vinyl to hold them in position - on later roofs the rivets seem to be left out but the holes usually still seen in the metal strips (these metal strips are now impossible to find in the proper 'spring steel' and correct shape ie; you can get correct shape in bubble gum soft too-thick metal or the wrong shape in proper thin 'spring steel!'). Please - please -somebody prove me wrong. The confused paper-clip like hook device you mention is just that. It's a hook - it attaches onto the welded hooks near top of your windshield (missing obviously). These hooks are shown in the Moss UK catalogue (item #2 on page 103) and easily made if you feel like welding new ones through your nice paint job. Unfortunately Moss UK doesn't have them in stock. Basically it looks like a fat T cut out of fender gauge sheet metal with the foot of the T bent backwards soft like into a hook .. and this gadget is welded to upper windshield frame in a sideways orientation so the foot of T bracket hooks your wire loop. This catch keeps the roofing very taught against the tops of windows - and as you may have noticed on proper soft tops there is also a stretchy strap opposing this catch which snaps onto roof stick inside upper area (vicinity of rear corner of glass when up). Whew as far as tips - get the roof stick strapping correct first (so it's not sloppy loose when top is in place). And remember that usually roofs 'go on' in cold and wet weather, so if you stretch it out too tight this Summer you may be sorry this Winter.

-Carl

Body/Hood/Soft

Subject: TR6 Top and Tonneau Cleaning
Date: Wed, 24 Sep 2003
From: "Christopher A. Kantarjiev" <cak@dimebank.com>

I recently had the zipper replaced on my tonneau. The owner of the upholstery shop that did the work told me how to keep the thing looking new - it was pretty filthy:

Get a soft brush - soft enough to rub on your face. I ended up buying a horsehair brush for polishing shoes.

Wash thoroughly with the same stuff you'd wash the car with - dishwashing soap, car soap, whatever - lots of suds, warm water. This combined with the soft brush gets the gunk out from the "pores".

Let dry.

He sold me a cleaner, "Malco Leather and Vinyl Cleaner". Use this to do a final clean. I suspect that the similar product from Lexol is also good. Follow the instructions and allow to dry.

He sold me a small bottle of "TKO dressing" - I've found this for sale by the gallon. This goes on with a sponge - ideally one of those sponges with netting around it. Not too heavy, but don't skimp.

I gotta say, my tonneau looks better than it has in years.

Check out <<http://www.carcareonline.com>> for some other product recommendations, from another pro. I suspect that the exact product isn't as important as the time it takes to do it well. Cleaning with the soft brush seems to be a big key.

-Chris

Body/Hood/Soft

Subject: Webbing tension on TR4 hood sticks - cause of roof noise?
Date: Fri, 10 Nov 2006
From: <banc8004@comcast.net>

My PO replaced the webbing on the hood sticks of the TR4 when he replaced the hood some years ago. I find that I get significant noise from the hood above 30 mph, and I suspect my webbing strips are too loose.

With the levers raised to the 'taut' position for the roof, the front webbing strap - the one that attaches to the top-centre of the windscreen, and the two straps at the rear, seem slack to me.

The front strap could have at least an inch taken out, the two rear strips could lose half - to three-quarters of an inch too.

The symptoms I am getting above 30 mph are a drumming noise, and, if I put an index finger over the rear hood stick while the drumming is going on, the noise stops. One suggestion I have been offered was to add a piece of adhesive weather strip to the top side of the hood sticks where the top lays on it - but that treats the symptom, not the cause.

I am going to experiment with small c-clamps and small blocks of wood to temporarily shorten the webbing by 'pinching' it to see if I can resolve this before I start cutting and hacking...but just wondered: how taut are your webbing straps?

-Brian

Body/Trouble Shooting

Subject: Valve Cover fitting in relation to the underside of the Bonnet
Date: Wed, 28 Jan 2004
From: John Innis <innisjohn@mcleodusa.net>

Along those lines, someone posted this tip to another Spitfire list not long ago. I can't find the original email, so I am unable to credit the author. Hopefully he won't mind me passing on this tidbit.

He suggested placing a dozen or so Styrofoam disposable coffee cups on various points of the motor and then closing the bonnet. When you reopen the bonnet, the amount of crush will tell you how much clearance you have. You might have to use a little grease to get the cups to stay put. But then you will know exactly where you have problems.

-John

Body/Tub/Accessories

Subject: Guess My Weight
Date: Mon, 04 Feb 2002
From: "Michael Gajic" <michaelgajic@hotmail.com>

Geo Hahn wrote:

- > The replacement plate (from Moss) has a space where apparently I am expected to stamp in the weight in lbs.
- > My old plate has no such stamped number. If some original TR4 plates were so stamped, what weight was
- > used? (Yes, I can find weight figures for the car, several in fact... looking for what was actually used for the
- > commission plate)
- >
- > Also, from what was left of the paint on plate it appears that the weight on the original plate was painted on
- > and was in kilos. Apparently there were changes or variations in commission plate other than the 'early TR4'
- > and 'late TR4 & TR4A' presented in the moss catalog? Thanks for any insight.

Geo,

There were two styles of plate on the TR4, the early ones had no space for paint and trim codes while the later ones had paint and trim codes stamped on. The change occurred at CT 28807 (3 January 1964).

Early TR4 plates had the weight printed on together with the text and the weight (gross laden) used was 1205KG. If your car seemed to have the weight painted on it probably used the earlier plate. I don't think there were other changes to the plates other than the early/late change with paint and trim codes.

FWIW Piggot's book shows the later style plate on a TR4A with no weight stamped in the gap, however his book also shows a near identical plate from a TR5 with the weight stamped (in pounds).

-Michael

Body/Tub/Accessories

Subject: Rear Wind deflector DIY \$20
Date: Sat, 20 Apr 2002
From: <corey.sherman@RCN.COM>

I started to write this DIY for LBCarCo, but never submitted it (still in draft form, but this will give you a good idea of what can be done). I built the windbaffle with great success! I'm been just a bit too busy to finish these instructions.

*** DRAFT *** not complete.

Ever get tired of wearing that baseball cap every time you take to the open road over 50 mph... tired of your wife complaining that her hair gets too tangled when you drive... you don't feel like spending \$200 on a wind baffle for your LBC. Well here's the solution.

For less than \$20, an hour of time, you can fashion your own wind baffle, that is incredibly impact strength, very flexible, and has high UV resistance.

Project Description:

Using a small Lexan sheet secured by three sets elastic bands is an effective & low cost windscreen. Several elastic bands secure the windscreen to the seat backs, much like a worker's "hard hat". The "back draft" pressure created by the wind adds additional stability to the windscreen from vibration, and an additional strap to the floor of the car keeps it from lifting up unexpectedly.

Supply list:

Cost	Item	Qty	Description
\$12.00	A	[1]	clear "Lexan" polycarbonate plastic approx 12"x36" 0.125" thick
\$3.00	B	[3]	1"x 36" woven elastic bands
\$3.00	C	[6]	rivets and snaps
\$1.00	D	[1]	screw in rivet and snaps

Tools:

Drill

1/2" drill bit

rivet gun

scissors

tape measure

*optional saw if additional cutting of lexan is required

Instructions: [draft - still under development]

Step 1 - measure windscreen size

First, measure the outside distance between your two seats headrests (LHD, left driver's headrest to right passenger's headrest). This is the maximum Length of the lexan you need. Then measure the distance between [a] the top of the seat's headrest and [b] the convertible top when folded down (you may include Top Stowage Cover). This is the height required, which varies based on your vehicle and preference, but 12" should be adequate.

Step 2 - Drill holes

Once the right size Lexan sheet has been acquired, we need to drill holes required to secure the Lexan to the back of the seats. For my 1971 TR6, which has high back seats, I positioned the holes in a triangular pattern, surrounding the headrest.

Step 3 - lace the elastic bands in a "Y" pattern through the holes and secure with rivets
- Corey Sherman

Body/Tub/Accessories

Subject: Replica Commission Plates and Stamping (long - and probably tedious!)
Date: Wed, 27 Feb 2002
From: "William Davies" bill@rarebits4classics.co.uk

----- Original Message -----

Geo Hahn <geohahn@theriver.com> wrote:

> Since this has come up a couple of times recently... I just stamped a new commission plate for the TR4.

> Highlights at:

> <http://www.geocities.com/tucson_british_car_register/tr4-commission.html>

>

> I see that the plate that Bill D. plans to have available soon will have the weight designated in kilos which is

> (I think) correct for a 4. The plate I received from Moss had 'lbs', presumably suitable for some later TR.

Hi Geo,

I'm still researching the exact plates fitted to the different models through the years - let's just say the situation is complicated! The early TR4 had a unique plate which showed the particular vehicle type, as did most other Triumphs during the early 1960s. Early in 1964, a new universal plate was introduced which was applied to pretty much the whole Triumph range, however stocks of the remaining type specific plates were used up - some models did not receive the new pattern plates until 1965 - I don't know how this applies to the TR4 and I'd be interested in any feedback from late TR4 owners regarding the types of plate fitted to their cars. This new plate is the one with the weight shown in Kilos. The plate was further changed to reflect the seatbelt mountings being approved to British Standards, which came into effect during 1965, hence the "BS AU48:1965" stamped onto the bottom margin of later plates. I don't know at which point this marking was introduced, but 196! 5 or shortly after is a safe assumption. There were several other changes over the next few years, including the change to weights recorded in lbs and the offset of the plate to give a large margin at the bottom and none at the top. There were also several model specific plates introduced around this time with different types being used for different markets. I don't pretend to know all the answers yet, but I am doing my best to provide all of the different patterns.

On the web page you note that the stamping is "if anything a bit straighter and more evenly punched than many originals". The original commission numbers were stamped as a block, excepting the last numeral, which was individually stamped. What this usually means is that the prefix and digits all sit nice and square and stamped with the same weight, then the last numeral is struck offset slightly and usually has a deeper impression. Stamping this way allowed the plates to be block stamped in 10s, rather than the dies be swapped after every impression. It appears that the suffix was stamped independent of the other characters. This is the method I am using in finishing my replicas. Cheers,
-Bill.

Body/Tub/Accessories

Subject: Thoughts on making a teardrop camping trailer for the TR4
Date: Thu, 8 Feb 2007
From: "Chris Simonsen" <ccsimonsen@gmail.com>

I went to a few Triumph and British car gatherings last year after several years of inactivity.

I did not realize how much I missed the adventure getting there, and the fun and the people who love these cars, once I got there.

Even though Fred directed me to a very glamorous hotel during last year's summer party, I have the camping bug. At almost every event I went to, I ended up in the evening at some camp site at least for a little while.

I've seen a Mini towing a Mini Bar (back half of a mini with a pony keg, etc) at the Gathering, A GT6 towing a mini GT6 at the summer party last year, and a lot of tents. I'm thinking about building a fun low profile light weight teardrop trailer that was common in the 40's and 50's. I'm wondering what the list thinks the practical in terms of overall weight, tongue weight (Dave will probably have a comment about this), hitch mounting points. I do not want to build a trailer the TR can't pull with some reliability (an added oil cooler is probably a good thing to consider).

Similar to this: <<http://www.angib.pwp.blueyonder.co.uk/teardrop/tear22.htm>>

I would love to hear any comments, suggestions or concerns. I saw a vertical hitch for the Miata I may try to replicate for the TR - from the pictures it looks completely out of site when the draw-bar is removed.

-Chris

Subject: Thoughts on making a teardrop camping trailer for the TR4
Date: Thu, 8 Feb 2007
From: <Dave1massey@cs.com>

<ccsimonsen@gmail.com> writes:

> I'm thinking about building a fun low profile light weight teardrop trailer that was common in the 40's and
> 50's.

Interesting. Are you intending this as a sleeper or just something to carry tents and the like? A sleeper would have to be at least 6 ft long unless you do some sort of telescopic or fold-out feature to make it more compact during travel. If it were just for carrying stuff it could be, would be shorter and lighter.

-Dave

Subject: Thoughts on making a teardrop camping trailer for the TR4
Date: Thu, 8 Feb 2007
From: <TR6UO@aol.com>

Chris,

My only comment would be on the passenger tire replacement for the HF trailer. A regular radial ply tire would have too much side (radial) flexibility for a stiffer trailer suspension and could cause sway issues. Check out the following article on trailer tire requirements:

<http://www.championtrailers.com/tire_art.html >

Otherwise, great idea!! Regards,

-Steve

Subject: Thoughts on making a teardrop camping trailer for the TR4
Date: Thu, 08 Feb 2007

From: "Stephen Sandberg" <Ssandberg@MEDIATECH-INC.COM>

An excellent idea! Northern tool (formerly northern hydraulics) has everything you would need for the trailer chassis

<http://www.northerntool.com/webapp/wcs/stores/servlet/category2_6970_166839>

Again, depending on what size you want they have prebuilt chassis at \$199.00 for a 4X8 which you could use as your starting point.....

-Steve

Body/Tub/Accessories

Subject: TR3A Wind Wings- making the brackets
Date: Mon, 23 Jul 2007
From: <terryrs@comcast.net>

Hello, everyone.

A while back I ordered some TR wind wings from Moss, installed them, and within a week had a broken bracket dangling from the wing. Apparently these brackets, as others responded on the List, are made of a cheap pot metal. I have to testify this is true.

Disclaimer: Absolutely no reflection on Moss. The supplier for this part seems to be universal for our parts houses, again as List members report.

Anyway, when I called Moss, they gave their usual terrific customer experience (my experience, anyway, both with them and TRF), by sending me not the replacement brackets I'd asked for, but a whole new set of Wind Wings complete with ½.

But that still left me with the original problem, poor quality brackets. ...So, for those of you who are interested, I went to the local hardware store and purchased four ½" x ½" x 1 ½" steel machine keys. These I used as blanks. With original brackets for a pattern, I cut the key down to 1 ¼" length using Vise Grips as a clamp to hold the key steady on my table saw set up with a metal cutting blade. Then I cut the slots down the center, taking several slow careful passes. Last, I drilled the holes for the set screw in the same location, and tapped same for the inset screws I purchased at the same time I got the machine keys. Drill all the way through both "legs."

After light sanding for a smooth finish, I painted with Rustoleum primer and Rustoleum Metallic Finish. Results are impeccable. They look great and are sturdy enough to crank as hard as you want on the set screw without ever breaking again.

-Terry Smith

Body/Tub/Accessories

Subject: TR4A Luggage Boot Rack mounting
Date: 2-04-04
From: <ebk@buffnet.net>

> Hi List!

> I obtained an original Boot Luggage Rack for my TR4/A. I would like to mount it so no harm is done to the
> body's paint. This rack mounts with mounting plates that go under the Boot's Hinges & behind the license
> plate's holes. I was thinking of using a bicycle inner tube to go under the mounting plates because of the thin
> rubber protection, but I'm stumped about the force being placed on the license plate holes & what would be
> best to protect the holes from becoming oval & not do any harm to the paint. I've already downloaded Justin
> Wagner's plans for the bracket supports & have them made, but haven't done any mounting.

>

> Therefore, I'm asking the list of people who have mounted this rack to their TR4's or TR4/A's:

> What precautions did they do to protect the paint? TIA,

> -Cosmo Kramer

Cosmo, how are you doing? I have one of the same luggage racks that you have. An alternate to the rubber tube material would be some thick gasket material, but you really don't need anything. Your choice obviously. My rack didn't mount to license plate holes but rather to the license plate bracket, a thin piece of steel stamped to allow the plate to stand away from the boot lid.

Mine ended up bending the bracket down somewhat so I normally didn't put anything very heavy on the rack. My plans have been to make a stronger bracket but so far I haven't done so. I don't have it mounted currently. I've had the rack since 1969 and it's been on and off the car several times.

-JVV

<tedtsimx@bright.net> wrote:

Go to an industrial plastics supply house and buy some sheet urethane.

-Ted

<geneglenn@qwest.net> wrote:

Cosmo/List,

The bicycle tube might be a bit spongy. Get the TR4\4A radiator shim pads from Moss; they should work well, and they are cheap. They are used under the lower radiator mounting brackets to equalize the elevation of the top hose connection with that of the thermostat housing; they are compensable, yet not spongy. Trim them to look neat. I think the inside diameter is 5/16ths. Or, go to a big NAPA and get not porous gasket material that is not spongy or bouncy.

-Gene Glenn

Body/Tub/Accessories/Tools

Subject: A question regarding 12 point and 6 point sockets
Date: Mon, 13 Aug 2007
From: <pethier@comcast.net>

"sujit roy" <triumphstag@gmail.com> wrote:

> All my sockets at home are of the 12 point type. I've seen 8 point and more commonly 6 point. Are there
> advantages using 6 and 8 point? One advantage I see with a 6 point socket is that there is more surface area
> being applied on the nut and can help prevent it from the corners from rounding.
>
> So I suppose if you have a stubborn nut or bolt, a 6 point socket would be a better choice. Would this make
> sense?

Never use a 12-point when you can use a 6-point. This applies to box wrenches as well as sockets.

-Phil Ethier

Subject: A question regarding 12 point and 6 point sockets
Date: Mon, 13 Aug 2007
From: "Michael Marr" <mmarr@notwires.com>

Generally speaking, six point sockets are used on hex nuts where a heavy tightening or untightening torque is to be applied, as in using an impact wrench. 12 point sockets are generally used when tightening or untightening can be accomplished by hand, rather than by a machine.

8 point sockets would only be used on square nuts.

As a sided, you should always use the correct sized wrench or socket for the job. I have never bought into the "pound a metric socket onto the nut" school of thought, for loosening nuts that have worn corners, for example. There are better and safer ways of removing recalcitrant nuts, that don't involve smashing your knuckles because the wrong sized socket slipped off the nut.

For the same reason, any adjustable wrenches should be banished to the far corners of the shop so that you are not tempted to use them instead of the correct wrench. I would venture to guess that many of the rounded off corners on nuts and bolts on our cars were caused by POs that used adjustable wrenches.

-Mike Marr

Subject: A question regarding 12 point and 6 point sockets
Date: Mon, 13 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

"sujit roy" <triumphstag@gmail.com> wrote:

> So I suppose if you have a stubborn nut or bolt? A 6 point socket would be a better choice. Would this make
> sense?

Yes, absolutely! 12-point sockets (and wrenches) are a convenience, easier to get on (especially in tight places). 12 point nuts do exist, but none of the original Stag fasteners were 12 point.

8 point is only for use on square heads, like the transmission fill plug.

-Randall

Subject: A question regarding 12 point and 6 point sockets
Date: Mon, 13 Aug 2007
From: <MMoore8425@aol.com>

<mmarr@notwires.com> wrote:

- > For the same reason, any adjustable wrenches should be banished to the far corners of the shop so that you
- > are not tempted to use them instead of the correct wrench.

Alongside the Vise grips!

-Mike Moore

Subject: A question regarding 12 point and 6 point sockets
Date: Mon, 13 Aug 2007
From: <Dave1massey@cs.com>

<triumphstag@gmail.com> wrote:

- > All my sockets at home are of the 12 point type. I've seen 8 point and more commonly 6 point. Are there ...

Most nuts are six sided. Hence they are called "hex" nuts. Some nuts are four sided. These are called "square" nuts. Square nuts are almost unknown in automobiles for the past 50 - 60 years but early on they were quite common.

A twelve point wrench will fit both a hex nut and a square equally poorly. The six point wrench is better for the hex nut but won't fit a square nut. An eight point wrench works better on square nuts than a twelve point style but won't fit a hex nut.

Another advantage to the twelve point wrench is that if you are in confined spaces you can reposition the wrench "half" a flat. This is a moot point with a ratchet style wrench.

Like Phil says, if given a choice, use a six point wrench.

-Dave

Body/Tub/Accessories/Tools

Subject: ATV Jacks Revisited to Lift
Date: Thu, 11 Dec 2003
From: M D Nugent <carcentric@yahoo.com>

Here's an idea I've never tried, but might some day:

- Step 1. Buy a set of four crank-style (or electric if you have more money) camper jacks - they're usually bolted to the corners of a camper so you can jack it up and drive the pickup out from under the camper.
- Step 2. Build or have built a rectangular frame that the four jacks would be bolted to (instead of to a camper) and gusset the corners so it doesn't parallelogram on you.
- Step 3. Hang chains from the frame to ground level.
- Step 4. Connect the bottom ends of the chains to two strong cross-beams.
- Step 5. Slide the beams under the car (one right behind the front wheels and one right in front of the rear wheels).
- Step 6. Crank each corner a little in turn to lift the whole car, but use jack stands to support it once it's at the height you want.

I bought a \$1400 "low lift" hydraulic unit (lifts the car about 27") back when I was routinely dropping engines in/out of 914s, and it's a great piece but heavy at 900 pounds. Another way to go is the 12'-16' long inclined ramps you drive up on and then jack up the back end (lifts the car about 12" but it's still on its wheels). I've seen the camper jacks on e-bay for \$100-300. The cheapest alternative I know of is this:

<<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=42820>>

You could reach the differential from the rear of the car with its length.

-M D "Doc" Nugent

Body/Tub/Accessories/Tools

Subject: DIY Leak down tester
Date: Thu, 13 Feb 2003
From: "Rob Christopher \(\robc\) " <robc@cisco.com>

In a fit of boredom (OK in reality I'm busy as heck at work and there's no time for any big fixes on the TR6) I bought all the bits required to build my own leak down tester.

The parts list came from these sites recently posted
<<http://www.briggs-racing.com/tech/leakd.htm>> or
<<http://members.tripod.com/~Wrenchbender/leakdown.html>>

My question is related to the differences in the two testers on these two pages. One shows a regulator and pressure gauge separated by a tightly reduced (1mm hole in epoxy filled pipe) segment and in line with the air flow. It is noted the restricted piece is vital.

The other has an air gauge mounted to the regulator directly, but there is no mention of a restricted piece between the two except in the parts list there is a 'close nipple' noted.

What is a close nipple? Is it a restricted piece of pipe between the gauge and regulator? I of course have the bits to build this second type but am not sure if I need this restricted bit of pipe.....

-Rob

Subject: DIY Leak down tester
Date: Thu, 13 Feb 2003
From: Randall Young <ryoung@navcomtech.com>

> The parts list came from these sites recently posted
> <<http://www.briggs-racing.com/tech/leakd.htm>> or
> <<http://members.tripod.com/~Wrenchbender/leakdown.html>>

Hey, Cool! Thanks, Rob. I've been wanting to build one for some time, but didn't know how big to make the orifice. I've got all the other parts lying around my garage, including a spark plug hose and adapter from my compression gage.

> What is a close nipple? Is it a restricted piece of pipe between the gauge and regulator? I of course have the
> bits to build this second type but am not sure if I need this restricted bit of pipe.....

Some sort of restriction is essential, it should be logically between the regulator and the gage. But the term "close nipple" just means the shortest possible pipe nipple (typically 1/2" for 1/8" pipe), I don't know what he's using for a restriction. Perhaps the regulator itself is restrictive enough for what he's doing?

BTW, he's not kidding about locking the engine. On my TR3, if I don't hit TDC just right the engine will turn, even against 4th gear and the handbrake applied as tight as I can get it.

-Randall

Subject: DIY Leak down tester
Date: Thu, 13 Feb 2003
From: <mporter@zianet.com>

I think part of the need for an orifice is dependent upon the type of regulator used. In the commercial ones I've used in the past, what accomplished the purpose of a graded orifice was either a regulator with a ten-turn valve, or a ten-turn metering valve after the regulator. Despite the additional cost, being able to adjust the airflow is more precise (as opposed to using a fixed orifice). That is how one is able to determine the rate of leakage as a

percentage of the air source. If the leakage rate is unspeakably bad, a graded orifice will not give as accurate an indication of that as will an adjustable metering valve.

That said, I suspect the feature is helpful for people running commercial shops (i.e., one can write on the work order, "65% leakage rate through exhaust valves," and have repeatable results). For home use, a graded orifice may be just fine, since the degree of the problem is not as much an issue as is diagnosis of the problem.

-Mike Porter

Subject: DIY Leak down tester
Date: Thu, 13 Feb 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I think ...a graded orifice will not give as accurate an indication of that as will an adjustable metering valve.

Michael, I've never even seen a commercial unit ... can you please explain how the metering valve is used? Does one set it for a certain pressure drop, and then read how far the valve is turned?

-Randall

Subject: DIY Leak down tester
Date: Fri, 14 Feb 2003
From: "Lumia, John" <jlumia@ball.com>

Rob wrote:

> My question is related to the differences in the two testers ... I of course have the bits to build this second > type but am not sure if I need this restricted bit of pipe.....

Rob,

Here is another link that discusses the orifice. I tried a leak down test using my Sears compressor that has two gauges (tank and line pressure, obviously no orifice) and I got stable readings varying from 85 to 92%. Of course, my engine had compression readings that ranged from 75 to 110 PSI, and I could definitely hear the air coming out of various places for the cylinders with low compression/ leak down rates. So I'm not sure if an orifice is absolutely necessary if you get a stable PSI reading. Perhaps others on the list who are more knowledgeable in this area could "pipe" in.

<<http://www.530i.org/530i-Test-leak-compression.htm>>

-John Lumia

Subject: DIY Leak down tester
Date: Fri, 14 Feb 2003
From: Randall Young <ryoung@navcomtech.com>

John Lumia wrote:

> Here is another link that discusses the orifice. ... knowledgeable in this area could "pipe" in.

The problem I have is statements like "a new engine may lose 5% to 8% on a leak down test" (from the web page that John cited). Let's say, for the sake of argument, I have a perfect engine cylinder, except it has a .010" hole through the piston. It seems clear to me that, assuming I get a constant 100 psi out of the regulator, I'll get a very different pressure reading with a .010" orifice than with a .100" orifice. So, in order for "5% to 8%" to mean anything at all, there has to be a standard for the orifice size.

And with no orifice at all, I'll get no pressure drop at all (again assuming the regulator is perfect which of course they aren't).

I haven't tried it, mind you, but I'll bet I can build a system that will show only a 5% pressure drop, with the spark plug adapter laying on the floor ... of course first I'll need a really big air tank or a 1000 cfm compressor ... <g>

-Randall

Body/Tub/Accessories/Tools

Subject: Engine Tool
Date: Wed, 27 Aug 2003
From: "Randall Young" <Ryoung@navcomtech.com>

FWIW, I made mine, by using the fitting from a compression gauge (the kind that screws in rather than just being held over the hole). There's a Schrader valve inside the fitting that has to be removed, then I removed the hose from the gauge and adapted an air line fitting to it (using a 1/8 NPT by 1/4 NPT bushing). The whole process is reversible, so I can turn it back into a compression gauge when I want.

Not certain, but I think this is similar to the gauge I bought
<http://www.actron.com/cgi-bin/web_store.cgi?page=cp7826.htm>

I see they have a more expensive model that includes the airline fitting
<http://www.actron.com/cgi-bin/web_store.cgi?page=cp7827.htm>

-Randall

> -----Original Message-----

> You can get this adaptor at Napa auto parts.

>

> If I recall it was between 10\$ and 20\$.

>

> I used it to change a broken exhaust valve spring on my 6 on my 6 instead of pulling the head.

> -Roger

Body/Tub/Accessories/Tools

Subject: Engine swap / motor skip - Tool!
Date: Tue, 29 Jan 2008
From: Tom White <tswhitez123@hotmail.com>

To get valve adjustment correct you should use a dial indicator. When I was in auto tech at the dawn of time a company named Perfect Circle actually made a tool for this. I haven't seen one since. So I made my own:

Take a piece of 1/8" thick steel the length of the engine head. Make adjustment cut to it so one edge of it fits on top of the valve cover mounting surface on one side of the head. Now find a way to secure it to the head. Then mount your dial indicator stand to the plate of steel. Install your dial indicator so that you can set the index point vertically at the midpoint of the rocker arm where it contacts the valve stem.

Now rotate the engine until the particular valve is closed. Set your dial indicator to zero with the rocker arm depressed to the valve stem. Then insert a feeler gauge and read the dial indicator. Twist the feeler gauge a little to see if the rocker arm is fully raised. Adjust the rocker arm until you get an accurate reading. Then move on to the next rocker arm.

When I did this to my engine it made a world of difference in the way it ran and the amount of noise it made.
-Tom

Body/Tub/Accessories/Tools

Subject: How do you remove the flywheel bolts?
Date: Mon, 26 Mar 2007
From: <emanteno@comcast.net>

----- Original message -----

From: Greg <one_second_zero@yahoo.com>

> I've got the transmission out of the TR6 to replace the clutch and I'm trying to un-do the four flywheel bolts to
> remove it to have it resurfaced. Problem is that the engine is turning and I can't break the bolts loose. Engine
> is still in the car. What's the trick to holding the engine from turning? There's not enough room to get a socket
> onto the front fan hub without removing the radiator (which I would like to avoid if possible). Any thoughts
> are appreciated.
>-Greg

I usually use a pry bar in the ring gear.

-Irv Korey

Subject: How do you remove the flywheel bolts?
Date: Sun, 25 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

> I usually use a pry bar in the ring gear.

Another trick is to use a fairly long breaker bar, oriented so it crosses the center of the crankshaft, and smack it with your hand (or even a BFH). Kind of a human-power impact wrench. (Of course, an air or electric impact wrench works well, too.) If that doesn't work, stuff one of the cylinders full of rope through the spark plug hole. Be sure it's moving towards compression TDC as you turn the flywheel, so the valves are closed and can't possibly get bent. Be sure to leave the end of the rope hanging out though <g>

-Randall

Subject: How do you remove the flywheel bolts?
Date: Mon, 26 Mar 2007
From: Bob Labuz <yellowtr@adelphia.net>

Greg, Another method is to use an air wrench. Start out with a little torque and adjust etc. Use short blasts. Now putting them back in and setting the correct torque you will need one of the other methods to hold the flywheel in place! I used a breaker bar on the front pulley bolt and had a friend hold it as best he could. But the engine was out of the car at the time.

-Bob

Subject: How do you remove the flywheel bolts?
Date: Mon, 26 Mar 2007
From: Greg <one_second_zero@yahoo.com>

Yeah, I tried that, but it seems to be a two person job with one person holding the pry bar. My wife wasn't very successful at holding the prybar. I may have to con a friend into coming over to help me. ;-)

- Greg H

Subject: How do you remove the flywheel bolts?
Date: Mon, 26 Mar 2007
From: <pethier@comcast.net>

A C-clamp on the flywheel has worked for me in the past. Be sure it comes up against something solid and does not dent up the oil pan.

Try an RX7 sometime. The flywheel is held on by one huge nut. There is a tool with a little gear designed to walk around the ring gear. You power the gear with half-inch drive, and it powers the large wrench.

- Phil Ethier

Subject: How do you remove the flywheel bolts?
Date: Mon, 26 Mar 2007
From: Mitchel Seff <ms6453@optonline.net>

Greg, I simply made a metal stop that bolts through one of the back plate holes & locks into the flywheel ring gear. If you need a pic let me know.

-Mitch Seff

Subject: How do you remove the flywheel bolts?
Date: Mon, 26 Mar 2007
From: Mitchel Seff <ms6453@optonline.net>

Mitch Seff <ms6453@optonline.net> wrote:

Cosmo,

Look on page 134 in the Bentley. It shows a picture of the flywheel and back plate. If I remember correctly I used one of the holes at the bottom of the engine plate to bolt the stop to & hold the flywheel. The stop should be made of at least 1/4" thick material. You may have to use flat washers to raise it up to the height of the flywheel teeth.

-Mitch

Subject: How do you remove the flywheel bolts?
Thu, 29 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Mitch Seff <ms6453@optonline.net> wrote:

> I guess there were different editions. Does this help?

I did receive the pictures of the part you made each time, but my problem is where the part attaches to the Engine Block. I can easily make the part Right Now, by using an extra Flywheel with the Ring Gear on it. In fact, I was thinking of making it Longer [thus having a curve to match the Ring Gear] with two or more hole for better strength in holding power. Therefore; Not putting as much stress onto the bolt hole 'Bottom?'. There really isn't a 'bottom' to the Engine Block. So I'm thinking you're really meaning the 'bottom- side' [where the tranny bolts attach to]. Yes?

I would think the better place to place this 'home made tool' would be at the top of the engine block where the studs are. This way you just place the spacers 'washers' on to get the tool to come out to match the teeth of the Ring Gear & place nuts on the studs to secure the tool. Right?

In any case, I think I've got the concept of the tool & how it's to work to hold the Flywheel from rotating.

Now what I do to hold the Flywheel steady is just place a spanner wrench on my Damper to hold the engine, but I've also modified the damper so adjusting valves is 100% 'Dead On'. But I have a wet sleeve engine & I think you have a 6 cyl., right?

-Cosmo Kramer

Subject: How do you remove the flywheel bolts?
Date: Thu, 29 Mar 2007
From: "Mitch Seff" <ms6453@optonline.net>

Glad I could help. I didn't realize it wasn't on a six cylinder engine but the theory & tool should be the same. I like your idea of using the top studs. I made mine from aluminum. I like to use softer materials than what I'm working on so I don't damage the part I need. Locking the flywheel will make installing & torquing the bolts a breeze.

-Mitch Seff

Body/Tub/Accessories/Tools

Subject: Ignition switch tool
Date: Wed, 27 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

> Maybe a tool like this?

> <<http://www.harborfreight.com/cpi/ctaf/displayitem.taf?Itemnumber=36554>>

Certainly not that one. Its pins are round, and much too large.

In fact, I would say that any 'adjustable' tool is going to work poorly. It takes thin, rectangular blades to engage the ring, and they need to be at both the correct distance and angle to fit securely. If it slips, it will mar the relatively soft (brass) ring.

I made my own tool out of a short length of small galvanized water pipe. Drilled the opening larger so it would fit over the threaded portion of the switch, then I used a Dremel Moto tool to mostly cut the two rectangular teeth into the edge, to engage the ring. Final cutting was done with a machinist's file, to ensure the sides of the teeth were in line, and the tips square.

If I do it again, I'll use harder metal for the tool (like a cheap socket), and add an outer sleeve to slide over the outside of the ring, to help locate the tool in the slots.

However, you might be able to "make do" with the tips of a pair of needle nose pliers, suitably ground/filed. That's what I used for many, many years.

-Randall

Body/Tub/Accessories/Tools

Subject: Is there a rule of thumb on when to use a flat washer with a lock nut/nyloc?
Date: Mon, 13 Aug 2007
From: Hugh Barber <tr6nut@verizon.net>

sujit roy wrote:

- > On my Stag, I see some nuts being used with a flat washer and some without.
- > Is there a rule of thumb when to use a flat washer with a lock nut/nyloc?

Don't know if there's a "Triumph" rule, but Carroll Smith (wrote all those "Tune to Win" books) wrote that you should always use a flat washer under a nut.

-Hugh Barber

Subject: Is there a rule of thumb on when to use a flat washer with a lock nut/nyloc?
Date: Mon, 13 Aug 2007
From: Hugh Barber <tr6nut@verizon.net>

Don Spence wrote:

- > Why? Must be a good reason.

Don't have any of his books in front of me at the moment, but I recall that it had to do with spreading the fastener load and reliable torque readings.

-Hugh

Subject: Is there a rule of thumb on when to use a flat washer with a lock nut/nyloc?
Date: Mon, 13 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

I've not read Carroll Smith's book yet, but IMO one good reason for using a flat washer is to spread the load whenever the underlying material is softer/weaker than the nut. Sheet metal or aluminum always gets a flat washer. 'Split' lock washers also tend to tear up castings, so use a flat washer there, too.

-Randall

Subject: Is there a rule of thumb on when to use a flat washer with a lock nut/nyloc?
Date: Mon, 13 Aug 2007
From: "sujit roy" <triumphstag@gmail.com>

Would it be a good idea to place a flat washer on the bolt head too?

-Sujit

Subject: Is there a rule of thumb on when to use a flat washer with a lock nut/nyloc?
Date: Mon, 13 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

"sujit roy" <triumphstag@gmail.com> wrote:

- > Would it be a good idea to place a flat washer on the bolt head too?

IMO if it's a bolt and nut, then generally no need for a flat washer under the head, since it doesn't turn or take a lock washer. But if the bolt threads into a casting, then generally a flat washer is appropriate.

Generally, though, I go with the original arrangement as shown in the parts catalogue :^)

-Randall

Body/Tub/Accessories/Tools

Subject: Making a Toe-in Tool
Date: Mon, 26 Aug 2002
From: "Lumia, John" <jlumia@ball.com>

Hugh Fader wrote:

- > Just went back out and adjusted the toe-in to 1/16" and took a ride. I found that each turn of a tie rod changes toe-in by 1/16". Don't know if others have observed this, but it seems a good thing to remember.
- >
- > The change is dramatic. Part of what felt like loose steering was poor alignment. It now feels much tighter, just because the wheel wants to return to center. I was about ready to take the car off the road and rebuild the suspension. Still needs it, but it can wait till winter now.
- > Has anybody bought the toe-in gage that Harbor Freight has for about \$12. Did it work for you?

Hugh

I don't know if the Harbor Freight tool will work, although it is priced right. In general I have found that it is difficult to use these devices because something on the car gets in the way. You need clear access from one side of the car to the other at a level that is ideally around the center of the tire.

I made my own alignment device out of an old laser, the kind that is a tube about 14 inches long and 2 inches in diameter. But you can use this idea with the inexpensive laser pointers that are available. The idea is to fabricate something that will pick up the rim at two points, say a two by four of appropriate length. Secure your laser pointer to the 1 1/2" edge of the 2x4, and make sure it doesn't move throughout the alignment process. Also, rig the laser to be on all the time if possible, so you introduce any errors associated with turning it on and off. With your alignment tool resting against the rim, point the 2x4 with laser horizontally at the front wall of your garage and have an assistant mark off the location of the point. Turn the tool around and point it to the back wall or garage door and again make a mark. Now repeat for the other front tire, at which point you have 4 marks. Measure the distance between the front marks (A) and also, measure the distance between the rear marks (B). Also measure between the distance between the front and back walls (C). Finally, measure the diameter of the wheel (D). Now using a little trigonometry and a calculator, the total toe-out (X) can be calculated as follows:

$$X = (B - A) * D / C$$

For instance, if A = 60", B = 61", C = 240", D = 15", then the toe-in is +0.0625", or 5/8". A negative number means toe-out. Note that this is total toe, which really is all you should need. You can also use this method to do rear wheel toe-in, but with an additional step that mimics a 4 wheel alignment. Since the measured rear wheel toe-in is a relative measurement, you need to get an absolute reference relative to the frame. I have done this by making a measurement from the frame edge at the front wheel opening to the laser beam as the laser is aimed from the rear wheel in the forward direction. Thus if the toe-in is correct, and the distance from the frame to the laser beam is equal on both sides, then you're done. If not, you will have to make some shim adjustments to the rear brackets on one side or the other.

If you don't have a garage, you can do something similar outside with a set of cardboard boxes or something else suitable. I have used this method on all my cars and have never experienced any adverse tire wear, although I must admit it is tedious, time consuming, and maybe not worth the trouble considering you can usually get a two wheel alignment for \$19.95 and a 4 wheel alignment for \$39.95. Once I did this alignment after a front end rebuild, and brought it into a shop to have the alignment checked anyway. He said it was lucky I got it back together in spec after doing all that rebuild work, LOL!

-John

Body/Tub/Accessories/Tools

Subject: More torqueeness, security, etc
Date: Wed, 27 Aug 2008
From: "Karl Vacek" <kvacek@ameritech.net>

- > > Does wiring a nut on mean 'tightening it, then drilling a hole thru nut and bolt, then sticking wire thru it?
- >
- > No. The hole is already drilled through the nut. The hole does not go through the threads. There is no hole in
- > the bolt. After the nut is installed, the safety wire is put through the hole and looped tightly to an adjacent
- > object, perhaps another nut.
- >
- > I used to wire the wheel nuts on my MG Midget because the light torque specified for those little 3/8" studs
- > was not enough for the flat washers of the wheels I was using. After having stock steel wheels (torqued to
- > specs!) loosen up, I was not going to take a chance with the flat-washer setup on those alloy wheels.
- >
- > Of course the same can be done with bolts. The hole is through the bolt head.

There are lots of ways to safety-wire fasteners. Bolts can have safety-wire through the head or the shank (near the end of the threads). If you wire through the threads of the bolt, you should use a castellated nut, torqued properly and then turned as appropriate (ie don't torque so hard you break the fastener) to align a set of slots in the castellated nut with the hole.

Safetying is similar to cotter pinning, but you can safety things that can't be held by a cotter pin. A cotter pin can hold a nut from turning. Safety wire can do that, or keep a screw, plug, etc. etc. that is threaded into something, from turning.

Safety wire is threaded through the hole, then bent together so there are two lengths of wire running parallel, The wire is then twisted (in the appropriate direction) to keep the loop on the head or shank of the screw, and fastened to the next screw or to a hard point. Easier to understand if you've seen it.

When you safety something, remember to install and tension the wire in a direction that will tighten the fastener - not loosen it. Easy to mess that one up.

Safetying is normally done with stainless steel wire, .032 being a common size for smaller fasteners, say 8-32 up to maybe 5/16". Above that you might want to go .041, maybe larger, depending on the size of what you're safetying. My perspective is airplanes, and we use lots of .032.

Aircraft mechanics safety things all day long. If you look for a copy of FAA Advisory Circular AC 43.13 you will see lots of examples of various ways to properly safety wire bolts, screws, plugs, etc.

-Karl

Subject: More torqueeness, security, etc.
Date: Wed, 27 Aug 2008
From: Jeff Scarbrough <fishplate@charter.net>

Karl Vacek wrote:

- > There are lots of ways to safety-wire fasteners. ...
- > Aircraft mechanics safety things all day long. If you look for a copy of FAA Advisory Circular AC 43.13 you
- > will see lots of examples of various ways to properly safety wire bolts, screws, plugs, etc.

Here you go:

<<http://tinyurl.com/safety-wire>>

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/99c827db9baac81b86256b4500596c4e/\\$FILE/Chapter%2007.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/99c827db9baac81b86256b4500596c4e/$FILE/Chapter%2007.pdf)

aka <http://tinyurl.com/safety-wire>

I've got some surplus safety-wire pliers at work, never knew exactly how to use them. Now I can have some fun!

-Jeff Scarbrough

Subject: More torqueeness, security, etc.
Date: Wed, 27 Aug 2008
From: "Karl Vacek" <kvacek@ameritech.net>

As long as they're surplus pliers they should work just fine. Don't bother buying the \$10-\$15 Chinese ones that Horrible Freight, etc. sell. They're made wrong and just don't work properly at all. The handles aren't springy at all and the latch is hard to use and so weak that it quickly bends and won't hold closed. After you safety a few fasteners, the latch will break and you can use the "lifetime warrantee".

Good safety wire pliers have springy handles to hold the wire without smashing it, and also have a clutch to allow them to twist either way, as needed, since properly in safetying a series of fasteners you should really alternate twisting directions to ensure that the "loops" around the heads of the fasteners stay in place.

And the best ones have wave-form jaws rather than serrated - they're called "Tiger-Wave" jaws. They don't nick the wire at all, so there's much less chance of a wire breaking in service, and if you need to add a couple more twists, the "waves" bent into the wire turn right into neat twists matching the rest.

-Karl

Body/Tub/Accessories/Tools

Subject: Mouse Trap success
Date: Mon, 25 Mar 2002
From: KTnKT <ktnkt@cape.com>

Well, by following the advice of one of the list members I have succeeded in preventing mouse related problems from occurring in my TR6. This approach involves the 5 gallon sheet rock pail with a smooth rod inserted through the top from side to side. In the center of the rod I put a soup can with both lids intact and the rod going through the top and bottom lids, allowing it to spin freely in the center, at the top of the bucket. A thin strip of peanut butter was applied around the circumference of the can, then a thin wooden strip was attached with duct tape (everything needs at least one piece of duct tape) from the floor to the top of the pail where one end of the rod goes through the pail, to act as a walkway. A couple inches of water, or antifreeze, is then put in the bottom of the pail.

I put this set-up in the shed when the TR was put to sleep last fall, and yesterday I saw the first two "testers" of the system. It worked flawlessly!

And, I'll be using Zerex anti-freeze in my cars, as both mice showed no signs of freezing, boil-over, or corrosion.

- Kevin Thompson

Subject: Mouseketeer Terror!
Date: Sun, 1 Apr 2007
From: "Randall" <tr3driver@ca.rr.com>

> So, what keeps the critters out? Mothballs? Bait traps? Shotguns and plastic explosives?

Absolute best method is cats. But of course they introduce problems of their own.

Or, here's a recipe for a better mousetrap. Not tried it myself but it sounds good:

Start with one of those 5 gallon plastic buckets. You can usually beg for one at any restaurant that uses sliced dill pickles (ask for a pickle bucket) or Home Depot sells them for a couple of bucks. Pool chemical also comes in them, if you've got a buddy with a swimming pool. You'll also need some heavy "coat hanger" wire, so pick some up while you're there if you don't have a bunch of wire coat hangers lying around.

Buy a can of soup or similar, and open it such that there is a strip of metal left intact across the top. Pour out the soup, and wash the can. Remove any paper on the outside, too. Now punch a hole in the center of the top, and in the center of the bottom, big enough to put the wire through. Also punch holes in opposite sides of the pickle bucket, near the top. Thread the wire through one side of the bucket, through the center of the can, and through the other side of the bucket, so the can is suspended near the center and can spin freely.

Butter a ring around the center of the can with peanut butter, then pour a few inches of water into the bottom of the bucket. Set the bucket in the area to be protected, and lean a small board or something against the side, near the wire, for the mice to climb.

The theory goes that the mouse will climb out on the wire and onto the can, which will then spin and spill him off into the water. Supposedly the water is important, because it keeps the mouse from jumping out.

Another version just has a small piece of wood floating on the water, with peanut butter on top.

Yet another version leaves the lid on the bucket, and a length of vacuum cleaner hose to serve as a ramp. The end of the hose protrudes through a hole cut in the lid. Mice climb into/through the hose to get to the Peanut butter, then fall into the bucket and can't get back up to the hose.

-Randall

Body/Tub/Accessories/Tools

Subject: Oberg Tilt Sling
Date: Thu, 3 Jan 2008
From: "Nolan" <foxtrapper@aceweb.com>

"Bob Danielson" <75TR6@tr6.danielsonfamily.org> Wrote:

- > I'm going to pull the engine and tranny this week and picked up an Oberg Tilt Sling to make life easier...or so
- > I'm told. The only problem is that their directions are lacking, at best. To paraphrase the directions:
- > 1. Attach both ends of the cable before turning drum and
- > 2. One half turn of the drum with a 1/2" ratchet will tilt an engine up to 45 degrees. End of directions.
- > So I'm left to assuming, which always gets me in trouble. I assume that releasing the Oberg locking bar will
- > let me pull out sufficient cable to attach to the engine and I assume that as you pull the engine up and forward
- > you can release the locking bar and the engine will hold its position while you ratchet it to the angle you want.
- > I also assume that ratcheting in one direction raises the front and in the other direction lowers the front.

I don't use an Oberg myself, just a leveler bar, but it all works on the same premise.

Releasing the lock lets you make adjustments. The adjustment simply moves the pulley system one way or the other on the cable, fore or aft. Pull the pulley system forward on cable and you'll get more engine weight to the rear, and the rear of the engine will tilt down.

I can't tell from the picture if the unit uses a ratchet lock beyond the external lock. If it does not, be *REAL* careful when tilting, as it could get away from you easily and drop the engine end down completely. In fact, if it can free wheel with that external lock off, I would not use it. I'd use something like this instead:

<<http://store.summitracing.com/partdetail.asp?autofilter=1&part=SUM%2DG1022&N=700+4294860074+115&autoview=sku>>

To set it up, bolt the two cable ends down to the ends of the engine. Then roughly center the pulley over the center of the engine. Hook it all up and pull just a little tension.

Spin the ratchet each way a few times to see how far and how fast it moves along the cable, and to familiarize yourself with how it works.

Then go ahead and unbolt and remove the engine.

If you're removing the engine and transmission as a unit, start with the pulley roughly over the back half of the engine. Lift slightly, wiggle things loose, and adjust as necessary.

If you're removing just the engine, start with the pulley roughly centered over the engine. Lift slightly, wiggle things loose, and adjust as necessary.

-Nolan

Subject: Oberg Follow Up
Date: Fri, 4 Jan 2008
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Thanks to everyone for all the suggestions on using the Oberg Tilt Sling. The Oberg made the job so easy. Al has pulled quite a few engines going back to his drag racing days and he said he'll never pull another engine without the Oberg. That's how easy it was. The two best tips I got from the List was: Use a breaker bar for making the Oberg adjustments and use wood blocks to protect the valve cover and/or valve train. The breaker bar gives you the extra leverage you need to counteract the weight of the engine.....not a big deal. The wood blocks at the lifting eyes eliminated any damage to the valve cover by the cables. And yes.....the front lifting eye did bend in slightly. I'll straighten it out after re-installing everything. No web site update yet.....maybe

over the weekend I'll find time.

-Bob Danielson

Body/Tub/Accessories/Tools

Subject: Oiling Tool for the Trunnions
Date: Tue, 26 Mar 2002
From: Justin <jmwagner@greenheart.com>

There was a thread about oiling the front trunnions with gear oil instead of grease. I came up with a little tool for just that... I found a pressure fed oil gun at Harbor Freight tools, on sale. I bought a grease gun flex hose. I then removed the oil gun's tip and adapted the grease gun hose to it. In short, I ended up with a pressure fed oil can that can quickly be adapted to a grease fitting and back again. It worked well, though the handle was a little wimpy and I had to be careful to squeeze at the strong point of the handle. (At \$3.99 I didn't mind the wimpy handle, but you could hold out for a better quality pressure fed oil gun.) It wasn't an expensive proposition and the oil can may come in handy for other purposes. I'd be happy to send a pic to anyone that requests it. (I know one could just load a grease gun with the oil, but something just seemed wrong about it. Like using a pliers instead of the correct sized wrench on a nut. :)

Here's the part:

Pressure Fed Oil Gun, Item Number 36629, \$3.99

<<http://www.harborfreight.com/cpi/photos/36600-36699/36629.gif>>

9" Flex Hose (for Grease Gun), Item Number 38320, \$3.99

To adapt the grease gun hose to the oil gun, I bought a compression fitting at the hardware store... that happened to have all the right threads... 1/8 CMP x 1/8 FPT COMP-FPT Adapter. (You discard the compression sleeve and nut, and just use the main part of the fitting.)

I also bought an o-ring to seal the fitting... 7/16x1/4x3/32

-Justin

Body/Tub/Accessories/Tools

Subject: O-ring Lubricant
Date: Fri, 8 Nov 2002
From: "Michael Hutchinson" <mahutchinson@aceks.com>

Patrick wrote:

> What is a good lubricant I can use for the o-ring of my carbs? I would image something that is not petroleum
> based. Thanks,
> -Patrick

Patrick,

The best o-ring lube I've ever found is automatic transmissions assembly lube. I've seen it under the trade name of Transgel. I've used it on every type of o-ring imaginable with no adverse effects.

-Michael

Body/Tub/Accessories/Tools

Subject: Parts Washing
Date: Mon, 11 Nov 2002
From: <ZinkZ10C@aol.com>

<AVALON2455@aol.com> writes:

>> It's what the shops use.....when it gets real dirty, take it to a hazardous waste center.....

To make the cleaner (Mineral spirits) last longer install a engine oil filter after the pump. This will make the cleaner last and last. My parts washer saw 10 years of day to day auto repair shop use and I had never made a wholesale change of the fluid. The fluid that got carried off with parts and the odd quart pumped out to clean something really dirty was all I ever did. Filter changes were made when the flow got low.

A couple of tricks

Try to use an oil filter that does not have a anti drain back valve. This is a rubber flap that can be seen through the circle of holes on the base. (This is the inlet side) These valves tend to restrict flow since the solvent pump is a low pressure unit. The rubber valve can be punctured and removed with a screwdriver.

Use a Chrysler/Ford remote oil filter base. There are many filters of all sizes that use this thread.

Flea markets are a good source for filters, otherwise purchase a cheapo store brand filter.

-Harold

Body/Tub/Accessories/Tools

Subject: Perfect Tool for installing & removing Fuel Pump TR 3, 4
Date: Wed, 15 Oct 2003
From: J M Wagner <jmwagner@greenheart.com>

I recently had to replace my fuel pump and I was back to fumbling around with finding just the right set up of tools to get at the nuts. I had a basic set up and plan of attack that I had developed since I was a teen with my first TR 4A... but I ran across this socket at Sears on the day of the installation and I suspected it might do the trick. I have to say, I don't think it gets any better. It accesses both the nuts on the fuel pump without any obstruction around the socket and the throw of the wrench, at that length, is clear enough to make it all a speedy process. I had to share this one. See the set-up here:

<<http://www.jmwagnersales.com/fpit.html>>

-Justin Wagner

Body/Tub/Accessories/Tools

Subject: Spot Welding drills
Date: Tue, 25 Mar 2003
From: "Dave Connitt" <dconnitt@fuse.net>

List,
Sorry to bomb the list but I have tried to respond to Curt several times today with no success. Curt e-mailed me from my web page regarding sources and opinions on spot welding drills. Something must be wrong with the email address he sent me. Anyway, here goes.

Message follows:

Hi Curt,

Thanks for the encouragement on the web site. I actually tried two different types of drills. The first I bought from The Eastwood Company <<http://www.eastwoodco.com>> do a search on spot welds I think. Anyway, they sell one. This one worked OK but it was hard to keep centered in the hole as it was really just a very blunt drill bit. I bought the other one at a local autobody supply company (KOI autoparts and paint). It had a small pilot pin in the middle which centered a small circular cutter. This one worked pretty good. You need to pick up a pair of plug welding pliers too. It looks like vise grip with a copper plate on one jaw and a fork on the other. You center up the fork over the hole you are welding in so the copper plate closes the hole. When you MIG weld, the copper absorbs much of the welding heat so you don't end up burning holes into the metal. You end up with a nice filled hole. I will put them on my web page soon.

-Dave Connitt

Body/Tub/Accessories/Tools

Subject: Suggestions for a Travel Kit
Date: Sun, 28 Apr 2002
From: <corey.sherman@RCN.COM>

So, as the weather turns from dreary to dreamy, I would like to compile a road worthy (not concours) tools and spare parts kit. I came across an old **Stanpart Continental Touring Kit**, but it seems too light for serious driver/mileage.

Stanpart Continental Touring Kit, consists of:

- 1 contact breaker
- 1 condenser
- 1 high tension lead
- 2 spark plug
- 1 value cover gasket
- 1 fan belt
- 1 flasher unit
- 1 front flasher bulb
- 1 front sidelight bulb
- 1 stop/tail light bulb
- 1 rear flasher bulb

Please forward your suggestions
-Corey Sherman

Subject: Suggestions for a Travel Kit
Date: Sun, 28 Apr 2002
From: "Fred Thomas" <vafred@erols.com>
"Randall Young" <ryoung@navcomtech.com>
"Jay Welch" <jay_welch@juno.com>

Cooling System -

- 3 feet of: 5/8" heater hose & clamps
- Top, Bottom, & Bypass radiator hoses
- Pipe radiator hose
- Thermostat
- Gaskets for Water Pump/thermostat Housing & Water Pump
- Heater control bypass made from 3/8" NPT to = tubing adapter, 90 degree street elbow & 1 plug

Electrical-

- 6' of electrical wire in various gauges
- 1 bulb ea. of: R turn signal & brake, F flasher/turn signal & sidelight bulb, Head Lamp
- Test lamp [with an insulation piercing probe], multi-purpose volt meter
- Coil
- Generator
- Starter & Solenoid
- Voltage reg.
- 2 fuses (ea)- 35A & -50A [Lucas]
- Jumper cables
- Timing Light

Fuel System -

- Rubber fuel line [1/4" & 5/16"]
- Fuel Pump, Gaskets & Spare screen

Fuel filter,
1/4" Fuel line clamps
Short lengths of 1/4" & 5/16" steel fuel line

Fluids -

1 qt. of Anti-freeze or water
Brake fluid
3 qt. of oil
1 gal. of gas
small tin of grease
oil filter
spray bottle of ether instant-start

Safety -

Flares, HELP sign, Flash Light
ABC fire extinguisher
Cell phone, & List of members #'s along travel route (for long trips)
AAA member card
First Aid Kit [with aspirins]
Moss catalog, Repair manual

Ignition Parts -

Entire Distributor set-up with cap and wires [You know are working]
4 Spark plugs
High tension wire, one long ignition wire with clips on each end

Tools -

Vice grips
13/16 Spark plug socket
Pocket knife, Box cutter, Razor, Small scissors
Multi-tip screwdriver having tips:

- #2 Philips
- straight blade
- Posi-drive

Adjustable wrench & Channel locks
Ignition wrench set
Brake & Strap wrenches
Socket set & Wrenches in: (7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 22m)
3/8" & 1/4" ratchet
6" extension in 3/8"
1/4->3/8" & 3/8->1/4" adaptors
Jack & handle
Carburetor mixture tool
Feeler gauge

Miscellaneous -

Sun Glasses & Sun Screen
Wide brim hat
Mechanic's wire, wire ties
Electrical, Duct tape & JB Weld
Gasket Material: Paper, Cork, Permatex gasket maker
Emergency fan belt (with link if the pulley is very close to the crosstube)
Tyre inflation/sealer, & Tyre pressure gauge
Emery board, fine sandpaper

Rags & Waterless cleaner

Muffler clamps

Rain-X

Quarters- [Film container=\$7] for a pay phone, Two 20-dollar bills, rolled up inside spare distributor cap

Ignition key

1 set front wheel bearings

2 u-joint units

Moss parts catalog & Service manual

Tow rope

Maps or G.P.S.

Tarp or plastic bag

Driver's license, registration and proof of insurance card, Passport [if going into another country]

Church key (bottle & can opener)

set mechanics gloves and/or Latex gloves, 1 set coveralls

Funnel

Siphon (clear plastic tube)

Set of Disc brake pads, & Rear brake shoes

Body/Tub/Accessories/Tools

Subject: Taps & Dies
Date: Fri, 27 Jul 2007
From: <Dave1massey@cs.com>

<acekraut11@aol.com> writes:

- > Hi Everyone,
- > A local hardware store is going out of business and they have a bunch of taps and dies that are 75% off.? I
- > thought it might be wise to pick up some of the more common taps and dies that are typically used during an
- > extensive restoration.? Can anyone recommend some sizes?
- > Thanks in advance for your help and expertise.
- > -Aaron

If it were me I would buy taps in the following sequence:

5/16-24
3/8-24
1/4-28
3/8-18
5/16-18
1/4-20
10-32
8-32

I don't know how many you plan to buy but start at the top of the list and work down. If you are feeling rich you may want to buy one of everything they have. The list is based on my perception of the frequency that you will find these sizes but there are a couple of threaded fasteners that are 7/16 UNF and there may be an electrical connection or two using a 6-32 screws. And get some tapping oil.

-Dave

Subject: Taps & Dies
Date: Fri, 27 Jul 2007
From: <pethier@comcast.net>

<acekraut11@aol.com> writes:

- >> A local hardware store is going out of business and they have a bunch of taps and dies that are 75% off.? I
- >> thought it might be wise to pick up some of the more common taps and dies

I wouldn't bother buying them unless they were High Speed Steel. I have used a lot of hardware-store taps over the years and most of them are rubbish suitable only for cleaning up existing threads in soft metal.

I also am a fan of "gun" taps, which are cut at a negative angle on the point and push the waste ahead of the tap, preventing the jamming and breakage for which taps are known. If you are tapping a blind hole, I suggest you start it with a gun tap and finish it off with a bottoming tap.

<Dave1massey@cs.com> wrote:

- > And get some tapping oil.

Just don't use it in cast iron. :-)

-Phil Ethier

Subject: Taps & Dies
Date: Fri, 27 Jul 2007
From: "Brian Induni" <308gtsi@adelphia.net>

Seems like everything on my TR4A is fine thread pitch, so I'd buy everything from #6 up to 3/4 in fine pitch!
-Brian

Subject: Taps & Dies
Date: Fri, 27 Jul 2007
From: "Glenn A. Merrell" <StagByTriumph@tscusa.org>

<acekraut11@aol.com> wrote:

> Hi Everyone,
> A local hardware store is going out of business and they have a bunch of taps and dies that are 75% off.? I ...
>> -Aaron

Don't forget there are different taps for the same size and thread pitch- starter, running, bottoming. So you want the set to do it correctly.

Also, get some ratcheting handles, and don't forget the dies too!! Small diameters tend to break easily, so those should be purchased in a higher quantity than just one.

Also as had been said, look for quality - don't buy any garbage from the pacific rim. Also look for those technology improvements.

-Glenn A. Merrell

Subject: Taps & Dies
Date: Fri, 27 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> I have used a lot of hardware-store taps over the years and most of them are rubbish suitable only for cleaning
> up existing threads in soft metal.

Which presumably is exactly what we're talking about here. The very few hardened fasteners on a TR should be replaced if the threads are damaged, IMO. And while the need to fabricate parts during a TR6 restoration does sometimes arise, hopefully it's not often (since the hand-fabricated part will not be a match for the "correct" part).

As I understand it, high speed steel is appropriate for situations where the cutting edge potentially gets hot enough to soften carbon steel; which generally means a power tool is involved. Otherwise, ordinary carbon steel actually holds an edge better. Hand-tapping would seem to usually fall in the second category ... although I must admit, I finally wore out a 30 year old carbon steel die a few days ago, cutting threads on drill rod with it. But if it didn't have a couple of broken teeth, I'd sharpen it and go on.

> Just don't use it in cast iron. :-)

I'll bite, what's wrong with using cutting oil in cast iron?

I very rarely cut new threads in cast iron anyway; and generally don't bother with it when I'm just chasing old threads; but the few times I've cut new threads in cast iron, the cutting oil seemed to help.

-Randall

Subject: Taps & Dies
Date: Sat, 28 Jul 2007
From: <Dave1massey@cs.com>

<pethier@comcast.net> writes:

> I wouldn't bother buying them unless they were High Speed Steel. I have used a lot of hardware-store taps ...

Which is the main purpose for us restorers. The main use for those of us not fabricating parts from scratch is to clean the rust and paint out of the factory tapped holes. I chuck one up in my battery drill, set the torque limiter to an appropriate level and zip, I've got clean threads.

-Dave

Subject: Taps & Dies
Date: Sat, 28 Jul 2007
From: <Dave1massey@cs.com>

<308gtsi@adelphia.net> writes:

> Seems like everything on my TR4a is fine thread pitch, so I'd buy everything from #6 up to 3/4 in fine pitch!

That's what I thought until I ran into coarse threads on my exhaust manifold. 3/8-18

-Dave

Subject: Taps & Dies
Date: Sat, 28 Jul 2007
From: "THOMAS FANSHER" <tfansher@comcast.net>

My theory is I'm not sure which taps, dies, or even drill bits I'll use the most on any given project. So I just buy the inexpensive set and use them. When one breaks I replace it with a high quality one since it seems to have been one I would use more. I also have the sizes used less frequently that the cheaper ones serve the purpose. Dave, great meeting you and welcoming you to the Single Malt Society.

-Tom

Subject: Taps & Dies
Date: Sat, 28 Jul 2007
From: <Dave1massey@cs.com>

<tfansher@comcast.net> writes:

> My theory is I'm not sure which taps, dies, or even drill bits I'll use the most on any given project. So I just ...

I want to thank you for initiating me into the SMS. I guess being the initiate I am obligated to bring the bottle next year. Maybe I should adopt your philosophy and buy a cheap set and if we break one I'll replace it with a quality version. ;-)

-Dave

PS: I want to thank you for not hitting the very tempting target I provided on show day. I know there are many on the list that would have availed themselves of the opportunity.

Body/Tub/Accessories/Tools

Subject: Tool for machining a part
Date: Mon, 1 Mar 2004
From: <ZinkZ10C@aol.com>

<ryoung@navcomtech.com> writes:

> Problem with using an end mill is that you have to hold it centered on the hole. Extra set up, and it's tough to
> do on a drill press, virtually impossible by hand.

If we have a 5/16 thread bolt with a regular Allen/Phillips or slotted head that needs to be below the surface and the part we are drilling does not need threaded, do the following:

- Drill a 21/64 hole (1 size above 5/16) all the way through the part.
- Drill a hole a size or two larger than the head of the bolt, drill until the head of the bolt is almost below the surface.
- Use an end mill equal to or slightly smaller than the drill above. Continue with the end mill to clean the bottom of the hole up. The hole from step 2 holds the end mill from walking. Drill until the head is just below the surface.

The only additional setup is changing the bits in the drill. In small numbers this isn't a factor. If we were making many parts a core drill would be the answer. (This is a stepped drill that makes a pilot hole and a counter bore in one shot)

Another alternative is to drill a 21/64 hole and use a countersunk bolt.

Step 2 would be used but we would drill until the countersunk screw is below the surface.

-Harold

Body/Tub/Accessories/Tools

Subject: Jacks for TR2/3/3A/4
Date: Sat, 30 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> My question is: Has anybody tried the repros from TRF? Are they as sturdy as the originals? Which version
> is better? I assume either type would work in a TR4, though I realize the pressed-steel hook would be correct
> for the car...

I've never handled an original, so can't compare. But the pressed steel hook version from TRF seems to work well enough jacking up my TR3A. At home I use a hydraulic floor jack, but I've used it on the road more than once.

Be sure to get the wrench for the top as well. It's a Whitworth size, ordinary wrenches don't fit right.
-Randall

Subject: Jacks for TR2/3/3A/4
Date: Sun, 1 Jul 2007
From: Bob Labuz <yellowtr@adelphia.net>

Nick,

I see the jacks on E-bay every so often. I got one about a year ago for the TR4.

The seller bead blasted it, which was a mistake. There's plenty of material in the screw. Well I finally got it apart, cleaned and it works great.

I can't say the same for the ratchet. It was shot. The ratchet TRF sells is of top quality and fits the OEM jack perfect. I am guessing the jacks are of similar quality.
-Bob

Body/Tub/Accessories/Tools

Subject: Turning the Oil Pump
Date: Wed, 8 May 2002
From: <PeterSchop@aol.com>

In trying to turn the oil pump, I have now removed the dizzy pedestal and made a duplicate of the distributor shaft. I bought a piece of 1/2" round aluminum stock. It was .003" wider than the shaft I had to copy. I used my belt sander to bring it down to size. I then cleaned it up with emery cloth, cut a flat tip on the end to go in the slot in the oil pump then cut down the other end to fit in my electric drill. I used a cordless drill with a weak battery. It was probably turning at about 400 RPM. Since the oil pump is turned by the camshaft which turns at half the speed of the crankshaft, I must have had the pump turning at an equivalent of 800 RPM or an idle speed. The oil pressure gauge read 40 PSI. Not bad. After building up the oil pressure, I hit the starter solenoid. The engine turns over good. Now I have to put the spark plugs back in along with the distributor, water pump, radiator and a few other parts.

-Peter

Body/Tub/Accessories/Tools

Subject: Headlamp removal
Date: Mon, 11 Apr 2011
From: "Randall" <tr3driver@ca.rr.com>

> So, what is the best way to get this darned chrome trim ring off without damaging anything? Should I
> fabricate a special tool to do the job? If so, what are its dimensions?

IMO, just do the tool.

Got an old PC lying around? I hear that I/O slot covers make a usable tool.

Mine is made from an old hacksaw blade (so perhaps 1/2" wide). I heated it with a propane torch to bend a right angle in it. I then cut the end off about 1/4" away from the bend. Ground the teeth off and wrapped some plastic (electrical) tape around it to protect the cars finish.

-- Randall

PS- This might be able to be used for installing the side curtain (inside & outside) Brush Seal & Rubber Seal on the doors, also.

Body\Tub\Accessories\Tools

Subject: Needle bearing extractor
Date: Wed, 13 Jul 2011
From: Catpusher@aol.com

tr4a2712@yahoo.com writes:

----- Original Message -----

I took a rod long enough to fit through the laygear, turned it to fit in the small space inside the TRF long, press in, brgs (highly recommended). I drilled and tapped the working end, then cut a slot (or X) part way along it. A socket head cap screw head fastener, with the underside of the head beveled to match a bevel in the tool. For the first brg, insert from opposite end till brg. For the first brg, and apply copper hammer to other end of tool.

-Hardy

Hi Hardy!

I would like to make this tool for myself, but I have a couple of questions to ask you, because I'm having a hard time following your description.

1- What does: "brg." stand for?

2- What was the diameter of the rod? That of the same size of the laygear or .005" smaller?

3- "turned it to fit in the small space inside the TRF long"

What was the dimension that it was Before 'turning it'?

How much did you 'turn it'? OR

Are these questions redundant of #'s 1 & 2?

What does "TRF" stand for?

4- What was "pressed in"? &

What was "it" pressed into or on to?

5- "I drilled and tapped the working end"

How did you "drill the working end", Laterally?

Longitudinally?

What size drill?

How deep or how far down?

What was the 'tapper" & how far down the shaft?

6- " then cut a slot (or X)part way along it."

Was this done on the end? OR

Was it done along the length of the rod? (Like a 'grove' that is made for a 'tongue & grove' joint? (Using wood working terms.)

How long or far down the rod, if done length wise?

7- "A socket head cap screw head fastener"

I'm completely lost here. Like an acorn nut?

8- "with the underside of the head beveled to match a bevel in the tool."

Again, I'm lost, please explain clearer.

9- "For the first brg"

I thought that you only made one 'brg.' OR Did you make one 'brg.' at each end?

As you can tell, I'm REALLY LOST in your description. Is it possible to DRAW me a diagram & snail-mail it to me? I'm willing to give you my home address & pay for the stamp. OR

Could you DRAW the diagram, scan it, & then E-mail it to me as an attachment?

Could you please answer each question, BELOW each specific question? So I'll be able to follow each of your answers. TIA,

-Cosmo Kramer

After a long search, I relocated the tool. brg. is a standard abbr for bearing, & TRF is The Roadster Factory. Please do an internet search for # 7. More later

Hardy

Subject: Needle bearing extractor
Date: Wed, 13 Jul 2011
From: Catpusher@aol.com

Cosmo,

I assume that you realize the amount of time that your requests take.

The tool is 12" long, the long shaft is 0.611" dia,(the end is reduced for clearance after hitting with the Copper hammer) the head dia is 0.820" by 0.960" long. and the cap screw is 1/4" X 20, 1.25" long; 5/16" dia would be OK. You should be able to figure out the other details.

2 pictures attached.

-Hardy

Subject: Subject: needle bearing extractor: images or zip file attached
Sent: Thursday, August 4, 2011 7:45 PM
From: "Catpusher@aol.com" <Catpusher@aol.com>

TR4A2712@yahoo.com writes:

Hi Hardy!

Looking at the first picture closer, I see a taper on the inside of the screw's head. So as you tighten the screw into the rod, then that causes the end of the rod to expand against the inside section of the bearing, right?

-Cosmo Kramer

Cosmo,

The tool is expanded to partially drive the inside of the laygear end of the brg so it can be drifted out of the gear. This is done with the gear removed from the gearbox. If you clamp the tool end in a vise, then slide the laygear over the tool, the tool will be held to rotate the cap screw to expand the (other) working end so that it will work on the end of the brg.

Hardy

Attachments: Photo #1 & #2





Body/Tub/Chrome Trim & Decals

Body/Tub/Frame

Subject: Apparatus to apply Waxoyl inside frame?
Date: Wed, 19 Apr 2006
From: "Chris Buckley" <chris.buckley@tz.knightfrank.com>

> I plan to nuke the inside of my TR4's frame with (probably homebrew) Waxoyl. Anyone have BTDT tips to
> apply inside the frame?

I diluted the "Waxoyl" with paraffin (kerosene) put masking tape over all the holes and also closed the front ends of the frame. I then made a cradle' supporting the middle of the frame about 1.5m above the ground, poured the waxoyl in the open ends of the frame which were then sealed. Next I lifted the newly closed end so all fluid ran to the front, then turned it 1 side and let it run back and so on eventually doing the same thing with the frame upside down until all inside surfaces must be coated. Finally remove sealing at end and let the excess drain out for a few hours. Be prepared to be covered from head to toe yourself as well as the floor (put lots of newspaper down underneath).

-Chris Buckley

Body/Tub/Frame

Subject: Lower Air Foil
Date: Fri, 09 Apr 2004
From: Geo Hahn <ahwahnee@cybertrails.com>

Gene wrote:

>Could someone explain the "air dam" to throw cool air to the lower 1/3rd of the radiator. I've never heard of
> that installation.

Here's a couple of photos:

<http://www.geocities.com/tucson_british_car_register/MVC-002F.JPG>

<http://www.geocities.com/tucson_british_car_register/MVC-003F.JPG>

I had the loose spare as I made a couple at the same time anticipating parking lot damage. Certainly can't prove that it helps but would seem that it directs more air at the lower third of the radiator.

Used 1/2" plywood just because that was lying around. On the TR4 the dimensions are **24 11/16" x 4 11/16"** and it's secured to existing holes with 1" Stanley 'L' brackets.

Have a similar one on the TR3A but different dimensions and the brackets are fashioned out of bar stock and attach to the bottom end of the crank support braces.

-Geo Hahn

Body/Tub/Frame

Subject: Rear Cross Member Repair
Date: Sat, 19 Jul 2003
From: Dave Massey <105671.471@compuserve.com>

Don Malling wrote:

>What is the "Belts-and-suspenders" fix?

>

> My frame is off. There were no cracks, but we welded a plate along the top of the cross member. The plate is
> large, almost the length and width of the cross member. We welded the differential mounting studs to the
> plate. We also boxed in the differential mount brackets.

>

> Hmmmm.... the body doesn't rest anywhere on the cross member does it? I hope not, because the extra
> thickness of the plate we added may not be good if it does.

You've already done the belts-and-suspenders bit. You can sleep soundly now. If the body does touch you can always shim the whole thing up a bit to clear it. How thick was the plate? If it was 1/16 I doubt there will be a problem since the studs protrude that much.

-Dave

Body/Tub/Frame

Subject: Rear Shock Conversion Frame Problems Part 1
Date: Fri, 22 Sep 2006
From: <acekraut11@aol.com>

After trying to send this twice and not showing up I have gone to the Part 1 and Part 2 solution, sorry....

Hi List,

I wanted to give the list an update on a frame problem that had developed on my car. If you would like to see pictures of what is described in this email, go to <triumphowners.com/108> and click on the photo entries for Rear Shock Conversion Problems.

A year plus or so I installed a rear tube shock conversion kit from John Horton. I had used the kit with no problems for quite awhile but in late July I noticed a noise coming from the rear suspension and decided to see what the problem was. Looking through the wheels I could see the frame was cracked around the differential mounting bracket. I took it over to Rick's house and we put the car on the lift for an inspection. We discovered that where the frame and the differential bracket met there were quite a few cracks. Basically, every place that the frame met had either started to crack or most of them were all the way through. I believe the noise I heard was the differential mounting bracket moving on the frame. The driver's side was slightly worse than the passenger side but both were pretty bad. With Rick at the welder everything was cleaned up to provide clean metal for welding and then the cracks were welded. As an extra measure of strength the bottom 8 inches of the differential bracket was boxed in.

Before the repair we pulled down on the body to see what was happening and it was clear that as the suspension deflected downward the shock bracket traveled towards the back of the car, putting a great deal of stress on the differential bracket. Now I won't pretend that my frame was newly replaced or that it is perfect or has never had any rust on it. But I think it is typical of what you might find for a 35 year old frame and there were no apparent problems at the time of the install.

-Aaron Cropley

Subject: Rear Shock Conversion Frame Problems Part 2
Date: Fri, 22 Sep 2006
From: <acekraut11@aol.com>

Continued from Part 1....(pictures at <triumphowners.com/108>)

After discussing and brainstorming, Rick suggested a length of 3/4 square inch metal tubing could be welded high up on the shock mount and angled down and bolted to the frame, effectively stopping any backward movement of the shock mount. Since I am planning on rebuilding a spare frame I have and transferring the body over hopefully next year we plan to leave the repair as is for right now, keep an eye on it, and make the modifications to the new frame.

Now I hate to say something bad about someone who has worked to make improvements for these cars but I think it is important to let others know so they can be well informed and to make sure they have no problems. I have tried twice to get in touch with Mr. Horton regarding this problem. I emailed him at the email provided at his web site: <<http://www.geocities.com/johnehorton/>>, I did not receive any response. Not too long ago he posted an email to the list saying that he had a spare TR6 hardtop to sell. I responded to that email, to the same email address and received no response. On this list in the past I have recommended this product and feel that is only right to give the other side if I know about it. My post to him was not negative, nor did I ask for a refund or any money back. I made him aware of the problem and suggested a modification that I thought would work.

My suggestion would be that if you have this conversion, check to see if you have any damage, and have someone push down on the bumper while you watch for movement of the shock mount. If you are considering

buying this conversion, or have bought it but not installed it, carefully inspect the condition of the frame on your car and consider boxing in the bottom of the differential bracket and/or adding a brace to the bracket for additional support.

-Aaron Cropley

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

Hello Aaron and list,

I may start a lively discussion with my opinion about the frame members cracking after installing tube shock conversion brackets, so here is my opinion. I believe that the problem of cracked frame members is due to the relocation of the fulcrum point from between the two mounting lever arm bolt holes to a point extended at the end of the shock mounting bracket. This distance change between the old and new fulcrum points acts as lever multiplying the forces applied to the original lever arm shock point. Thus increasing the force applied to the differential cross member beyond what it was engineered for. A basic analogy would be when one is applying a cheater bar on to the end of a breaker bar to provide more force to break a bolt or nut loose.

Disclaimer Notice:

I am only expressing my opinion on the reason why sometimes the frame cracks after installation of the tube shock conversion brackets, not about the benefits or deficiencies of installing the tube shock conversion kits on a vehicle.

-Greg Perry

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Disclaimer Notice: ...

Whew! Must have been some interesting flame wars over there on the 6-pack list!

Not that anyone cares, but I think Greg is right. The increased lever arm, plus the fact people do this upgrade in order to get much stiffer shocks, greatly increases the forces and so increases the chances for cracks.

-Randall

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: <N197TR4@cs.com>

List(s)

I kind of wondered about this, but the first I have heard of a problem. Interesting!

I was considering doing this, a new project build I am doing, using a TR4A frame with solid axle. Will reconsider.

I also converted my early TR4 to tube shocks for Vintage Racing. Pretty beefy, but still is showing signs of stress and will have to be re-engineered.

Now for the final comment. I just came across a guy who has developed a lever shock that has external adjustability with a knurled knob. He showed them to me at Road America and they seemed to make sense. This guy is a rebuilder of shocks and I believe is capable of doing this. I am hoping to test them out soon.

I am fascinated by this...anyone else?

-Joe (A)

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: <Dave1massey@cs.com>

<rgperry@earthlink.net> writes:

> ... I believe that the problem of cracked frame members, is due to the ...

And my opinion is quite different. Since the eventual point of force application remains the same (the end of the trailing arm) the net forces applied to the shock mount doesn't change. If you add up all the force vectors the major vertical vector contributed by the shock bracket is negated by the vertical vector of the telescopic strut.

On the other hand, since the telescopic shocks are much more effective at dampening movement than the lever shocks the net forces applied will be higher. But this has nothing to do with geometry.

-Dave

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> And my opinion is quite different. Since the eventual point of force ...

Mental exercise:

- 1) Compute the torque applied by a 1 pound force applied to the end of a 1ft wrench.
- 2) Compute the torque applied by a 1 pound force applied to the end of a 10ft wrench.

Hint: They are not the same, even though the applied force (eg the force from resisting the motion of the trailing arm) is the same.

-Randall

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: <McGaheyRx@aol.com>

<Dave1massey@cs.com> writes:

And my opinion is quite different. Since the eventual point of force ...

It seems to me that the force that counts here is the force applied to the frame thru the shock mount - with lever shocks, this force pivots around a point relatively near the mounting holes - with every bolt-on tube shock conversion I've ever seen, you are bolting a rigid bracket to those 2 holes and applying an upward force at the end of the bracket which will try to twist the cross member upward and off the frame - I cannot imagine applying the same force to the cross member thru the pivoting lever-shock arm.

-Jack Mc

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: David Brady <dmb993@earthlink.net>

Randall,

OK, if I take a torque wrench and place the socket directly over a nut and apply 10 ft-lb of torque, then the nut is torqued to 10 ft-lb. Moreover, if I put a 2 inch 90 deg. right angle extension on the torque wrench and I connect the socket to the end of the right angle extension, I am still applying 10 ft-lb of torque to the bolt.

Because the right angle extension is parallel to the applied force, it doesn't alter the final torque on the bolt. The important quantity is the length of the moment arm from the nut to the perpendicular (normal) force (not the diagonal); i.e, the length of the torque wrench.

In the case of tube shock conversions, the newly installed bracket is equivalent to the 2 inch right angle extension mentioned above.

-David Brady

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> OK, if I take a torque wrench and place the socket ...

Are you sure about that? Try it sometime with a 12" extension, and I think you'll see that there is more force being applied with the extension than without ... if you don't support the head of the torque wrench, it will literally tear the socket off the bolt. Or the shock mount out of the frame.

Ok, I understand your point about the on-axis force not translating to torque. To that extent, it's a poor example. But any lever arm, no matter which way it points, does increase the total force. And although a bolt only 'cares' about torque applied around its axis, the frame welds don't.

-Randall

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: David Brady <dmb993@earthlink.net>

Randall,

I should have preceded everything I said with "in theory" (lol), and I know that you already know what I'm talking about, I'm certainly not teaching you anything new here.

In practice, my 12 inch 90 degree arm (was 2 inches) will flex and will deliver its own component of torque to the nut (and it might not be a small component, but I think it will be a fraction of the intended torque say an additional 10 to 20%).

-David B

Subject: Rear Shock Conversion Frame Problems
Date: Fri, 22 Sep 2006
From: "Rick" <patton@suscom-maine.net>

Hello All,

I welded up Aaron's frame and it is quite solid. John stated that:

Displacing the fulcrum point upwards will NOT cause the frame member or cross members to break. These frame members can break after 30 years of vibration and impacts. The frame members are normally 1020 steel and 3/16th thick. This change causes the original mount bracket I.E. 3/32" thick to deflect in a horizontal direction towards the center of the car. However this deflection is limited due to the mount plate being butted up against the body. It **CANNOT** move more than 5/16" inwards. This is not enough to cause stress fractures. Also I have **NEVER** had information of a mount plate attached to the frame breaking.

I agree, however Aaron's tube shock mount does not move in and out toward the body but fore and aft as the shock works. You can see where it has "worked" in his photo:

<http://www.triumphowners.com/uploaded/34/4978-4978-111032_35dscn2714.jpg>

The top is rigid perpendicular with the frame. When the shock compresses it pushes the top of the mount

backwards, conversely on rebound. The original shock mount is not designed to handle fore and aft twisting movement.

I believe an option is to stabilize the top of the mount with a brace running back to an already existing hole in the frame. Boxing the backside of the cross brace may also reduce twisting. After all, like John says these frames are 30 years old!

Aaron's car handles better than mine with the tube shocks so I will someday make the change.

-Rick Patton

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: Mitchel Seff <ms6453@optonline.net>

Hi all,

Again, no expert or engineer on suspension geometry, only a good mechanical understanding of how things work. Some observations I think were overlooked at the condemnation of the shock conversion. I installed the VB kit with KYB gas shocks over four years ago without ever experiencing any failure or sign of failure. Here are some variables that may lead to such a problem:

- 1) The type & setting (if adjustable) of the telescoping shock Adjustable Spax or Konii's set to stiff may accelerate an already existing problem.
- 2) The condition of the welds & chassis. Even though these cars were mass produced the craftsmanship & integrity seems to be questionable & inconsistent. Its basic good sense to inspect & reinforce areas that were weak initially by design. I'm sure British Leyland never thought the differential mounts would fail the way they do.
- 3) Worn or missing compression bump stop. It is unlikely that the stop used for full extended suspension travel comes in to play unless you are off-roading your car or doing daredevil stunts.
- 4) Suspension height & stiffness. I installed the TRF competition springs that lower the car & lessen suspension travel under normal driving conditions. Some owners don't like the "sports car" ride & prefer taller, softer springs that increase travel and make the shock work harder, also increasing the arc created by this suspension travel.

I have used both lever & tube shocks & in my opinion there is no comparison in ride & rebound control. I found the difference obvious. Keep in mind that JK Jackson lever shocks are on a race car with very limited suspension travel & are specifically valved for a narrow purpose. We are asking our shocks to give us smooth ride, dampen bumps & make the car handle like it should.

-Mitch Seff

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: "T. S. White" <tswrace@pacbell.net>

I was once told that if you add an extension to a torque wrench you must increase the torque by 1lb. per inch of extension. This is because the extension "twists" under load.

David Brady wrote:

> Randall,

> OK, if I take a torque wrench and place the socket ...

Best regards,

-Tom

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: <Dave1massey@cs.com>

<McGaheyRx@aol.com> writes:

> It seems to me that the force that counts here is the force applied to the ...

Have you done a force vector analysis to negate the canceling forces. You have to consider that the force applied to the end of the shock mount is in the vertical vector in line with the shock. If one were to apply a sideways force (or a front/rear force) to the shock mount you would be right but the shock doesn't do that. What you get is a vertical force (plus and minus*) and a torque (plus and minus). You get the same thing with the lever shock.

*Plus and minus means both up and down.

-Dave

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: <Dave1massey@cs.com>

<tr3driver@comcast.net> writes:

> Mental exercise:

> 1) Compute the torque applied by a 1 pound force applied to the end of a 1 ...

Mental exercise:

Put 10 lb. of force on the end of a 1 ft rod mounted vertically.

Put 10 lb. of force on the end of a 10 ft rod mounted vertically.

See the difference? I didn't think so.

The point is the force is applied parallel to the length of mount added. If it were applied normally (at right angles) there would be a difference but it isn't.

-Dave

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: <Dave1massey@cs.com>

<tr3driver@comcast.net> writes:

> Ok, I understand your point about the on-axis force not translating to ...

Here's another way to look at it. Take a 15 inch torque wrench and apply a force to it but apply the force parallel to the shaft of the torque wrench. How much torque is being applied to the nut?

When calculating the torque applied to a moment arm it is important to extract only the normal component of the force applied. The rest becomes shear stress. And the shear stress doesn't change no matter how long the wrench shaft is.

-Dave

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: <Dave1massey@cs.com>

<tswrace@pacbell.net> writes:

> I was once told that if you add an extension to a torque wrench you must ...

Experience has taught me that when using a torque wrench with an extension you always support the other end of the wrench shaft to avoid side loading the nut/bolt and invalidate any reading.

-Dave

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> When calculating the torque applied to a moment arm it is important to ...

I still disagree. The "out of plane" torque is still torque, it's just trying to force the socket off the bolt rather than turning the bolt. And like any torque, it obeys the "force times lever arm" law.

The shock mount would easily support a 50 pound weight applied directly above it, but if you attach a long enough lever, 50 pounds of force (at a right angle to the lever) will break the mount. The length of the lever arm (vector sum if it's not straight) affects the force applied, no matter what axis it is in.

-Randall

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Put 10 lb. of force on the end of a 1 ft rod mounted vertically. ...

Are we talking force applied down the axis of the rod? Or at an angle to it? If the force is at an angle, even a small angle, there's a big difference!

> The point is the force is applied parallel to the length of mount added. If ...

That would be true IF we were talking about force applied along the axis of the length added. But I don't see any indication that is the case.

-Randall

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

Hello,

>Have you done a force vector analysis to negate the canceling forces. You ...
From what Rick (Aaron's welder) previously posted below:

I agree, however Aaron's tube shock mount does not move in and out toward the body but fore and aft as the shock works. You can see where it has "worked" in his photo:

<http://www.triumphowners.com/uploaded/34/4978-4978-111032_35dscn2714.jpg>

The top is rigid perpendicular with the frame. When the shock compresses it pushes the top of the mount backwards, conversely on rebound. The original shock mount is not designed to handle fore and aft twisting movement.

There is a fore and aft component vector due to the swing arm radius. This in turn moves the fulcrum pivot point at the top of the tube shock mount creating a lever acting on the differential cross member.

-Greg Perry

PS- I have tried replying twice this morning with no results.

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Experience has taught me that when using a torque wrench with an extension ...

EXACTLY !!!

You have to counter-balance the extra force that otherwise would be applied as a bending moment on the bolt ... and the longer the extension, the more force you have to counter-act! The force on the end of the wrench stays the same, but the force on the fastener goes up.

-Randall

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: David Brady <dmb993@earthlink.net>

Greg Perry wrote:

> >From what Rick (Aaron's welder) previously posted below:

> I agree, however Aaron's tube shock mount does not move in and out toward the...

Gregg,

It looks to me like something else is going on there. It looks like the suspension assembly is bottoming on the shock instead of on the body bump stops. If the shock is absorbing the considerable g forces of suspension bottoming, then all bets are off. There's no way the shock bolt attachments on the frame can take these loads. I don't know what else would cause the tube shock conversion to deflect to the degree indicated in the photo. The shock ends are rubber mounted to the trailing arm and to the tube shock conversion; these mounts have tons of compliance. The arc of the trailing arm is easily handled by the compliance of the bushings w/o applying bending moments to the shock conversion bracket. Check to see what's bottoming - shock or body/frame bump stops. I don't get anything close to this kind of deflection with my tube shock conversion.

-David B

Subject: Rear Shock Conversion Frame Problems
Date: Sat, 23 Sep 2006
From: David Brady <dmb993@earthlink.net>

Yes, these are the additional force imposed by the bracket deflecting, and the taller the bracket the more deflection. But my shock conversion bracket is about 12 inches tall, and the deflections are very small, and consequently these additional forces are small. I think the real culprit here is bottoming of the suspension thru the tube shock, or an already cracked or compromised frame shock mount, or insufficiently tightened bolts holding the conversion bracket, or a very poorly designed and very flexible conversion bracket (not gusseted sufficiently).

There that about covers it! lol

-David B.

Subject: Rear Shock Conversion Frame Problems
Date: Sun, 24 Sep 2006
From: "Robert M. Lang" <lang@isis.mit.edu>

Hi,

A couple of comments:

- 1. If the frame member is cracking or tearing loose, one of two things is happening. The list has already started the discussion of the "extra force" on the frame due to the lever effect. I don't think this should be the case, unless item "two" comes into play. I mention this because the load should be transmitted to the spring, not the shock, all things being equal. However, the dampening action of the shock might show up weakened components.
- 2. If the shock is bottoming before the suspension can hit the upper (or lower) bump stops, then you are on to something. This could be the culprit because if the suspension bottoms via the shock, then the shock becomes the bump stop and you would be changing the load from practically nothing to hundreds of pounds

instantaneously and this is "a bad thing". It would make the car very hard to drive as the effect would be to increase the spring rate to _infinite_. From experience, this usually translates to instant "loose" handling. Very exciting. The key here is that you need to pull the spring out and run the suspension through the entire range from full droop to full compression. If there is no visible bump rubber on the shock that "catches" the shock before full droop, you're PULLING on the upper rear x-member and this will highlight weaknesses in the welds, etc in the rear. If the shock "bottoms" before full compression, then you should be able to adjust the upper bump rubber on the trailing arm to get the situation "right".

This appears to be one of those cases where running the suspension through the entire range will show you what's going on. Everything else is just speculation and we don't want that... noooooooooo.

But I'll bet dollars to doughnuts that the suspension droop is the problem and I'm only guessing that based on the fact that the elimination of the lever arm gets rid of the droop bump stop. And you need that.

Also, be aware that the rear trailing arms travel in an arc from full compression to full droop. If the shock is secured "tight" in the trailing arm, there is fore/aft force that needs to be dealt with. There is also a slight amount of side-to-side motion.

If I were putting tube shocks in my TR6, I'd put the shock in the middle of the spring and I would def. make sure that there is some method of full-droop / full compression "compensation". And, of course, I still run lever shocks for that very reason. **THEY WORK.**

Regarding the adjustable lever shocks, sounds like a great idea. I would however like to back that up with some shock dyno numbers so you can "see" what the adjustments do and you can then measure the shocks to see if they are still working. **THAT** is the biggest problem with the lever shock - knowing what shape they are in and if they are "working" properly. If you could measure that - it would be awesome. regards,

PS- rear coil-overs were in the plan for this year 'till the budget ran out. :-(
- Bob Lang

Body/Tub/Frame

Subject: Stiffening '74 TR6 Frame Reinforcement
Date: Sun, 9 Nov 2003
From: John & Patricia Donnelly <pdonnell@san.rr.com>

-----Original Message-----

Subject: Stiffening '74 TR6 Frame
Sent: Saturday, November 08, 2003
From: Len Tichy <SMTP:lentichy@yahoo.com>

I've got a frame off project started.... frame is in good condition. Some minor surface rust. 43,000 miles on the car. Stored indoors for the past 20 yrs.

I have seen a few comments here and there about gusseting the frame while I have the chance. I would like to stiffen suitable for race preparation.

Does anyone know where I can find a reliable set of plans, guidelines, instructions, photos, etc. for welding additional bracing on the TR6 frame without causing fit / clearance problems later?

-Len

In front, I suggest you reinforce the gusset plates where the lower A-frame bolts mount to the frame. I believe that the '74 already has the stock plates that Moss sells as an add on for earlier models, but extra reinforcement is needed for racing.

Also, the rear area where the trailing arms bolts go through the frame. Fabricate a plate to give the retaining nuts additional support.

-John

Subject: Stiffening '74 TR6 Frame
Date: Sun, 9 Nov 2003
From: Nicholas Froome <listreader@pvision.co.uk>

I'd have a word with the ever-helpful Colin Matthews at CTM in Southampton (UK). He knows all about Triumph chassis and he repairs and race-preps them as well as manufacturing them from scratch

CTM

<<http://www.ctmengineering.co.uk>>

-Nick Froome

Jeff Tedder <jtedder68@cox.net> wrote:

Hi Len,

In addition to the other suggestions I've seen posted, I'd reinforce the rear diff mounts. I've just had this kit installed on my TR4A IRS, and it was really straight-forward. I'd also suggest installing the gusset kit for the front A-arm brackets, and the tie-in plate between the forward A-arm bracket and the steering rack mount.

The 'How To Improve TR6' book by Roger Williams (as well as his earlier book, 'How to Restore TR6' has good suggestions, as does Kas Kastner's comp. prep guide. Although, it appears to me that if you did everything that Williams suggests to your car, it would cost you \$10,000!

-Jeff

Len Tichy wrote:

Yes, your suggestions are of help. I have the Williams book on order. Sounds like I, at least, am starting in the right direction.

Thank you for responding,
-Len Tichy

Body/Tub/Frame

Subject: TR Frames from RATCO
Date: Thu, 4 May 2006
From: "Wages, Jeffrey \((CDC/NCID/DHQP)\)" <bzw8@CDC.GOV>

Just passing along the web site to RATCO for new TR frames. I was unable to find it until I spoke with them and they gave me the URL. Sorry if this info is old news.

They're kind of pricey but none the less intriguing. I am considering this for my restored TR6 that has a botched frame repair. I'll let you all know what I decide to do. In the mean time maybe we can start passing the collection plate and I'll provide a comprehensive study for everyone of the RATCO product. ;-) \$10 a piece from about 250 listers should just about cover it. LOL <<http://rat-co.com/index.html>>
-Jeff

Body/Tub/Frame

Subject: Triumph Frames
Date: Tue, 7 Oct 2008
From: Raymond Hatfield <iron_horse819@yahoo.com>

Marty Sukey <trmarty@hotmail.com> wrote:

> From a drive train and suspension standpoint..... Other than motor mounts is there much of a difference
> between TR6 and TR4A frames?
> -Marty Sukey

Hi Marty,

The major difference is that instead of an upper "t-shirt" section, the TR4A IRS frame has an arch in its place. The trailing arms are different, in that the rebound bumper is mounted to the body instead of the T.A. as in the TR6.

-Raymond L. Hatfield

Body/Tub/Sheet metal

Subject: Boot Lid Seal - which way around?
Date: Wed, 25 Sep 2002
From: "William Davies" <bill@rarebits4classics.co.uk>

----- Original Message -----

Northway, Barry <Bnorthway@textron.com>

> Hello all,
> I'm about to install a new rubber seal around the boot for my TR250. It's the original type with a slot in the
> bottom, which is glued to the body all around the boot opening, and an upper portion sealing against the
> bottom of the lid when it's closed. The upper portion has sort of a double raised row one of which is higher
> than the other. The consensus at The Roadster Factory is that the higher raised portion goes toward the boot
> opening (that is, on the inside). That's how I had installed the old one 12 years ago but it was always hard to
> close the lid and didn't seem to seal all that well. Now, when I think about it I'm not sure that way is correct.
>
> Has anyone done this? Or can someone check their car to see which way it goes? I'm not sure but a TR4
> might use the same seal.
> -Barry

Hi Barry,

I sell essentially the same section as it's applicable to most Triumph Heralds and I'm sure many other Triumphs too. You have fitted the seal correctly in the past with the higher lip on the inside. The original pattern seal can be less than effective, which is why I also carry an aftermarket seal which I sell for cars where practicality is more important than originality,
-Bill.

Subject: Boot lid seal - which way around
Date: Tue, 24 Sep 2002
From: "Thomas Beaver" <beaver@spillmanco.com>

Barry

Our seal has the rounded side out and the flat side toward the inside, and according to my wife that's the way Piggot's book displays it in his book, not that means much.

-Tom Beaver

Body/Tub/Sheet metal

Subject: Butyl rubber caulk is better than silicone
Date: Fri, 2 Feb 2007
From: <FGFO1@aol.com>

Paul

As previously stated only a few silicone caulks remain that are acid curing. And those that do will cause you no harm. Silicone caulks however will not accept paint over top of them. Yes, you can spray it over but it will come off. Butyl caulks generally never set up. They remain pliable forever, or at least till you rub up against them and smear them. Once you paint over them they are still soft under and may interact with the paint. My recommendation is to use a latex or polyurethane type caulk. These do set up to a pliable state and will accept paint over top after they have cured. They lost popularity in the construction trades when silicone came along and show greater resistance to UV exposure. Of course most caulks where not being painted over. good luck
-Frank Fisher

Subject: Butyl rubber caulk is better than silicone
Date: Fri, 2 Feb 2007
From: <acs25m@swbell.net>

Paul,

Yes any good body man will tell you not to use silicone caulk just because of that fact. The best thing to use is body seam sealer. 3M makes it in a regular tube for a calking gun. It doesn't set up hard so that it will expand and contract with the metal and is paintable after curing. This is the same stuff that the auto makers use. You can get it at any auto paint and body supply store. Hope this helps.
-John Maneke

Subject: Butyl rubber caulk is better than silicone
Date: Fri, 2 Feb 2007
From: Bob Labuz <yellowtr@adelphia.net>

<acs25m@swbell.net> wrote:

> Paul,

> Yes any good body man will tell you not to use silicone caulk just because of that fact. The best thing to use is
> body seam sealer. 3M makes it in a regular tube for a calking gun. It doesn't set up hard so that it will expand
> and contract with the metal and is paintable after curing. This is the same stuff that the auto makers use. You
> can get it at any auto paint and body supply store. Hope this helps.
> -John Maneke

All,

I used a GE paintable silicone caulk. I primed and then applied the caulk. Waited until try, primed over the caulked areas and then tested. Stuck just fine. Applied final coat and all is ok.
-Bob

Body/Tub/Sheet metal

Subject: Door adjustment
Date: Sun, 22 Jul 2007
From: "Brian Induni" <308gtsi@adelphia.net>

Hello all,

I'm finally re-assembling my TR4A after being apart for 30 years, and was looking for some tips on hanging the doors. I understand which bolts to loosen to adjust vertical and in-out, but it's nearly impossible to open the door, loosen, move, tighten, and close the door to check if you've made the correct adjustment! Any help, tips, suggestions would be greatly appreciated.

-Brian

Subject: Door adjustment
Date: Sun, 22 Jul 2007
From: John Mitchell <jmitch@snet.net>

Brian Induni wrote:

> I'm finally re-assembling my TR4a after being apart for 30 years, and was looking for some tips on hanging ...

Hi Brian,

I used a floor jack with a 2X4 on the saddle to support the back end of the door while I fiddled with adjustment. It really is trial and error and it's not a fast and easy job. It took me at least 4 hours per door, mostly because I'm a perfectionist.(not a good thing to be with a Triumph:).

-John Mitchell

Subject: Door adjustment
Date: Thu, 26 Jul 2007
From: "Brian Induni" <308gtsi@adelphia.net>

Thanks for all the feedback on the door adjustment. As I expected, no "easy way" to get the job done, but none the less very helpful ideas. After fiddling with each door for a multitude of hours, I'm seeing it fit fairly well in the opening, and the latch lines up fine, but the rubber weather strip is making the door bind real bad. I'm using the original style (slides in to the channels welded on the body), but I'm wondering if I put it in backwards. If you look at a cross section of the strip, it looks like a "V" with one end of the V sliding in to the channel and the other free. I assumed the free side would face the door and move as needed for a good seal. Is this correct? The front edge of the door is binding too tight against the rubber, and if I move it back it doesn't line up with the latch properly. This is the case for both doors.

Background: no major body was done that would affect the door opening, meaning the floors, sills, etc were all in excellent shape and not replaced.

Any ideas?

-Brian

Subject: Door adjustment
Date: Thu, 26 Jul 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I've forgotten what kind of car this is... but on my TR4 the new door seals made the door a bit hard to close at first. They eventually settled in to where it now closes with about as much effort as a refrigerator door.

-Geo

Body/Tub/Sheet metal

Subject: Door Popping -(was Window seal installation questions)
Date: Wed, 1 Jan 2003
From: <stantr6@bellsouth.net>

"Tom Di Iulio" <diulio@ix.netcom.com> wrote:

> I am also replacing the check straps for the doors. Mine make an awful bang when I open and close the doors.
> The first one I installed is much quieter, but still makes a distinct 'pop' when the door is opened. Any tips on
> making these things quieter? Sounds like something breaks every time the door is opened.
>
> I did the same thing you did, found the new straps to be a little more muted, but still had the "pop" you
> describe. This is inherent to the design. Let's see if someone has come up with a solution. It sounds as if the
> door has been sprung when you open it!

Tom,

Just went through this myself - In my case, the driver door had, in a prior ownership, been dented by the edge of the front fender, indicating the strap had failed. When I got the car ('74 TR6), the fitting in the A-post that the strap rides through was broken.

As part of frame-off, all was disassembled. I bolted (small bolts) in a new fitting in the A-post, crease in door was repaired, etc. Assembled the empty door (window guts, interior panel, etc, still out.) a few weeks ago and noticed a very pronounced BANG when door was starting to be closed.

I investigated and found that in the two tabs on the jamb of the door, the holes had been elongated (likely from whatever event broke the A-post fitting and resulted in the crease in the door skin).

What I concluded was happening was:

As the strap is being pushed back into the A-post, the "W" shaped portions of the check strap are pried over the top and bottom of the A-post fitting. In my case, as they neared the inside of the fitting, the beveled edge of the two "W" shaped pieces rapidly pulled the strap towards the A-post. It was obvious as I could see the strap jump forward at the BANG. This was due to the play in the elongated holes in the tabs on the door jamb.

I have since cut out the tabs, fabricated new ones out of 3/4" flat stock, fabricated a bracket from 1" angle that fits inside the door, and re-assembled the lot with a new strap from TRF. Loud BANG is gone; there is only a minor snap sound. That is still due to some play in the connection between the new tabs and the new strap. New tabs have 1/4" holes, new strap has a very slightly larger hole (metric?).

I figure the only way to eliminate all noise is to ensure the holes in the tabs, the hole in the strap, and the pin passing through them (was a rivet, is now a grade 8 1/4" bolt shank) are all sized so there is NO play.

Hope this is useful....

Stan

Body/Tub/Sheet metal

Subject: Drilling out spot welds, steel guage
Date: Sat, 4 Oct 2008
From: Gary Nafziger <nafziger@yahoo.com>

I'm curious about what people are using to drill out spot welds. I've been using regular drill bits (bought more expensive one at Sears which didn't help a whole lot) and I find they don't last long. I'm just wondering what others have found to work well. Do the special spot weld drill bits work well? Or are there more expensive regular bits that work just as well?

Also does anyone know what guage steel TR-3 bodies are made of? I'll be needing to buy some replacement steel soon.

-Gary N.

Subject: Drilling out spot welds, steel guage
Date: Sat, 4 Oct 2008
From: Bob <

Gary Nafziger wrote:

> I'm curious about what people are using to drill out spot welds. I've been using regular > drill bits (bough ...

Gary,

I used one of these along with liberal cutting oil. Worked nice.

<<http://www.eastwoodco.com/jump.jsp?itemID=14684&itemType=PRODUCT>>

-Bob

Subject: Drilling out spot welds, steel guage
Date: Sun, 05 Oct 2008
From: Dixie <dixie4.wales@virgin.net>

I have tried the special spot weld drills but find that once blunt are impossible to sharpen. 1/4 " standard drill is best. When the edge goes it can be touched up on the bench grinder.

-Adrian

Subject: Drilling out spot welds, steel guage
Date: Sat, 4 Oct 2008
From: "Joe Curry" <spitlist@cox.net>

There is a special tool that is sorta like a very small hole saw that actually drills a hole in the panel around the spot weld and leaves the actual weld sticking up a bit without leaving any holes. All you have to do is grind it smooth and install the new panel.

I got mine from an auto body repair store.

-Joe C.

Subject: Drilling out spot welds, steel guage
Date: Sat, 4 Oct 2008
From: <DLyilis@aol.com>

Gary,

As to the gauge of steel, I took a piece of my front wing to my local industrial supplier and was assured that it was 18 gauge. I had an unfortunate surprise that a rather large area of both front wings needed to be replaced. I knew there was some but in the end it was larger than the "patch pieces" the big 3 sell would handle. I used 18.

Having said all that, if you are repairing much smaller areas, 20 is much easier to work and for smaller areas that's what I did.

-David Lylis

Subject: Drilling out spot welds, steel guage
Date: Sun, 5 Oct 2008
From: "Dave Connitt" <dconnitt@fuse.net>

Gary,

There are a couple of different types of spot weld drill that I have seen and the both have been mentioned. I have used both. The first one looks kind of like an end mill bit. It has a flat end with two cutting surfaces and a very small pointed tip that is intended to hold the bit in the intended location while you cut thru the spot weld. Nice idea in that it only removes the weld and if you stop when it gets thru the first piece of metal you end up with a nice smooth surface on the second flange behind the weld. These work great until the point goes away which is usually after about 20 welds as I remember. Once the point is gone you will have a heck of a time keeping the bit in one spot. They are basically a throw-away at that point. The second one is the mini hole saw type. This has a small dia. drill bit in the center which makes a pilot hole for the little hole saw. These last much longer but you end up with a small hole in the center. You also end up with a "disc" of metal which has to be ground down before you can install your new piece.

After using both types when I was restoring my TR4A tub, I actually prefer a regular drill bit. You end up with a hole in the piece you are going to save but that is no problem if you pick up a piece of copper sheet you can use to back the hole when you plug weld it. Just hold the copper piece against the back of the hole and fill the hole with weld. Grind it off and you have an invisible weld. I bought a set of 3 different shapes and the plug welding pliers described below from Eastwood and they worked great. If you can find one, pick up a pair of plug welding pliers. It's a vise-grip type of tool that has a copper plate that swivels on one jaw and a forked hole on the other. You just clamp the two pieces together with the forked jaw facing you and weld the hole shut.

I have some pictures of me using them to weld up my sills on my website if you want to see them. Go to the bodywork section and take a look. <<http://home.fuse.net/davestr4a>>

-Dave Connitt

Body/Tub/Sheet metal

Subject: Early TR4 door stops
Date: Sat, 17 Mar 2007
From: Bob Labuz <yellowtr@adelphia.net>

J.C. Hassall wrote:

> Since there was thundering silence from my first post, I'll ask again. Early TR4s used item 38 on Moss' page
> <<http://www.mossmotors.com/Shop/ViewProducts.aspx?PlateIndexID=29167>>. Is there any cushioning in
> the door stops used on early TR4s? Mine, which seem to be in fairly good shape, have none. If the door slams
> open (wind gust, etc), it'll slam to a sudden stop when metal hits metal. That bends metal. Did the standard
> design in fact have no shock absorption at all? Has any retrofitted the later TR door stops (which do have
> shock cushioning)? TIA
> -Jim Hassall

Jim, I just took a look at the parts manual and as I suspected it is metal on metal. The stop is provided by the screw through the stop. What I did is line the stop with a plastic gasket on both sides and made a stop out of about 1/8 " rubber. I made a washer to give the rubber something solid to bang against. I plan to take it easy on the doors. The plastic cuts down on metal on metal rubbing and the rubber does act as a damper. Sort of a cob job. I haven't put it to the "wind" test yet but the rubber does help a bit. I don't know how long this will last but it is all I could come up with short of going to the TR4A style.
-Bob

Body/Tub/Sheet metal

Subject: How to seal TR4 wings
Date: Sat, 11 Nov 2006
From: <Dave1massey@cs.com>

<jhassall@blacksburg.net> writes:

- > Listers,
- > The shop manual sez to seal the wings from the underside with a seam sealer after installation. I think that's
- > counterproductive, as it creates a trap for water above the seal. I'm inclined to either seal at the very top of
- > top the wing to tub interface (immediately under the trim bead) with clear silicone sealant or leave it unsealed.
- > The latter is probably not smart, as the screws would leak into the tub. Am I missing something?
- > Could it be that the shop manual is correct after all?

I agree with you. I think the best defense against rust inside the wings is to apply a good coat of paint inside the fender and on the inner fender and sill. I used a rattle can in a color that closely matched the car color. No need for a professional job here since no one will see it.

Sealing at the top of the front wings is futile since the baffles will inevitably leak road spray from the front tires and the scuttle vent drains into that space as well. In fact, I think the scuttle vent drain is a good thing as it will rinse away the nasty stuff that comes in with the road spray.

But let it drain out by all means.

-Dave

Body/Tub/Sheet metal

Subject: Inner sills
Date: Wed, 29 Oct 2008
From: Gary Nafziger <nafziger@yahoo.com>

I received a new sill today from TRF and it looks nice. Its painted however I'm wondering what people do with new sills. I'd like to POR-15 it or otherwise rust proof it better. Is that what others do? Just cover it with a few final coats of paint or strip and POR-15? Thanks

-Gary N

Subject: Inner sills
Date: Wed, 29 Oct 2008
From: Michael Lang <mlang99@comcast.net>

Mine were coated with a thin layer of black glossy paint when I got them from TRF. I sanded the paint off and sprayed the area between the inner and outer sills with a few good coats of cold galvanizing compound. I don't know if this was the best thing to do, but at the time it seemed far better than doing nothing. I first used weld-through primer in the areas that I was going to be welding then sprayed the rest with the cold galvanizing compound.

I chose not to use POR-15 as I have heard that it does not adhere well to fresh clean steel. I have used it on rough pitted areas and have been very impressed so far.

-Mike

Body/Tub/Sheet metal

Subject: Odd TR4 restoring prob
Date: Sun, 29 Jul 2007
From: <CarlSereda@aol.com>

Hi all,

Are there any other TR4 owners/restorers out there finding a problem with the upper front valance 'parking light BRACKETS' located in the wrong position behind the grill's lamp holes? I have 2 upper valances and 4 grills. It looks to be that the parking lamp support brackets were welded in the wrong location from factory on both valances.. I'd like to have these brackets function (stabilizing the 2 park lamps and grill corners). This would require drilling out spot welds, repositioning brackets and re-welding.

WERE ALL PARK LAMP BRACKETS POSITIONED WRONG FROM FACTORY!?! - anyone have lamp holes that line up with the brackets? Any tips? Regards,
Carl

Subject: Odd TR4 restoring prob
Date: Sun, 29 Jul 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I recall no alignment problem there when I R&Red the grille & lights for cleaning. Is your issue with the 'parking lights' (the little ones up in the corner) or the turn signal flashers (the bigger one lower down)?

Is it possible that the bracket location changed when they went with the larger (plastic) turn signal lights in mid-64?

-Geo

Subject: Odd TR4 restoring prob
Date: Sun, 29 Jul 2007
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

Carl, I have just begun a long awaited restoration of my TR4A today. I have a newly finished tub ready to install on my frame and so have begun to disassemble the original tub. I've owned this car since 1969 (it's a 1966) and it's never had front end damage. Your point is interesting so I went and looked at my 2 tubs. The original tub has those brackets welded at the 12 o'clock position but the rebuilt tub with a repro front valance has those brackets welded at the 9 o'clock position. So I guess I've found exactly what you have found. I don't know what effect this will have when I go to re-install the grill and the lights. I don't know if this addresses your concerns or just verifies your findings. It's a 4A as well so there is a slight difference between the grills but the light placement is the same.

-JVV

Subject: Odd TR4 restoring prob
Date: Sun, 29 Jul 2007
From: <CarlSereda@aol.com>

>> Carl, I have just begun a long awaited restoration of my TR4A today...The original tub has those brackets
>> welded at the 12 o'clock position but the rebuilt tub with a repro front valance has those brackets welded at
>> the 9 o'clock position.
>> -JVV

Thanks JVV,

The TR4 & 4A valances have slight mods from each other. Based on some pics in books, the 4A eliminated the PARKING lamp 'brackets' because they sent those lamps out to the wings. I see in Moss/Uk and other documenting books that the position of the DIRECTIONAL lamp brackets was 7pm-R & 5pm-L position (from

driver's seat view) on the TR4, and changed to 12 noon for both directionals on the TR4A. It's just weird that my parking lamp brackets are quite tidily positioned near the edge on BOTH valances, I'd have to get medeivel with heavy pliers to get the bracket-slots to line up with the grill lamp hole - I might break them before landing them in the right position. The DIRECTIONAL lamp brackets in comparison were decently easy to adjust by twisting/turning/pliering but the PARKING lamp brackets are koo-koo.

-Carl

PS- Congrats on your 4A resto progress!

Subject: Odd TR4 restoring prob
Date: Sun, 29 Jul 2007
From: <CarlSereda@aol.com>

> I recall no alignment problem there when I R & Red the grille & lights for cleaning. Is your issue with the
> 'parking lights' (the little ones up in the corner) or the turn signal flashers (the bigger one lower down)? Is it
> possible that the bracket location changed when they went with the larger (plastic) turn signal lights in mid-
64?

> -Geo

Geo,

I'll send you a photo of what I mean.. maybe you'll recognize my problem since you R&R'd your TR4 grill recently. This is my second valance replacement on this car .. I tossed my original mangled one back in '78 - that's where the answer might have been. Out to my garage for a photo or two.

-Carl

Subject: Odd TR4 restoring prob
Date: Sun, 29 Jul 2007
From: Bob Labuz <yellowtr@adelphia.net>

<CarlSereda@aol.com> wrote:

> Hi all,

> Are there any other TR4 owners/restorers out there finding a problem with the upper front valance 'parking ...

Carl,

I just completed my 63 restoration and the grill lined up perfectly with all 4 valance brackets.

Both the parking lights and directional's are secured by all brackets. That grill and lights are very solid with all those speed nuts! The Triumph engineers really didn't want the grill falling off!

As far as I can tell, it was the original valance. I did replace the lower valance but that did not affect the alignment of the brackets in the upper part.

It sounds like you have a 4A valance with the 4 grill.

-Bob

Subject: Odd TR4 restoring prob
Date: Sun, 29 Jul 2007
From: <CarlSereda@aol.com>

Thanks Bob,

Maybe I do have a TR4A valance for my TR4... the first one I installed was about 1978. The second one is identical and installing now... I will also send photos to you maybe you'd recognize difference.. on a TR4A, maybe they retained park lamp brackets (in slightly different position) for the new grill even though the lamps went to wings??? I've got the bottom light (directional brackets lined up perfectly) but the parking lamps another story...

I agree about the stamped grill being very sturdy whence bolted on - I'm impressed! regards,
-Carl

Subject: Odd TR4 restoring prob
Date: Mon, 30 Jul 2007
From: Allen Hess <allenhess@mgcarclub.com>

<CarlSereda@aol.com> wrote:

> Hi all,
> Are there any other TR4 owners/restorers out there finding a problem with the upper front valance 'parking ...

That sort of rings a bell . . . I did mine about 10 years ago with a NOS part that probably was later than a 4. The brackets may have changed with the 4A/250 grille and lights and may be wrong for a 4.

-Allen

Subject: Odd TR4 restoring prob
Date: Mon, 30 Jul 2007
From: <CarlSereda@aol.com>

Thanks Allen,

Sounds just like mine. Can you tell me if your brackets on your original TR4 valance are EXACTLY like mine in this attached photo? Please note how close the bracket is to the edge of valance - and too closely positioned over the wiring hole in valance. . . same as yours? (I put a green dot where bracket-screw/slot needs to go to line up with my grill). Otherwise grill fits perfectly and is in fact all bolted in for this photo! Regards,

-Carl

Subject: Odd TR4 restoring prob
Date: Tue, 31 Jul 2007
From: <CarlSereda@aol.com>

> Carl, Here are some photos, I hope they clear things up. You might want to hang the fenders just to be sure
> that the grill is being correctly positioned. It looks like your piece is not in the car yet? So, I would try and put
> more together first temporarily and check fit. However, if the bracket seems wrong, I wouldn't hesitate to
> reposition it.

> -Allen

Allen,

Thanks a ton. Your photos clearly show that my park-lamp brackets are indeed 1/2" too low for a TR4 grill. Perhaps my two valances, the one I installed in '78 and the one I'm installing now, are in fact from TR4A's. I will drill/reweld my brackets 1/2 inch UP based on your excellent documentary photos and my park-lamps will then tie in perfectly. Thanks again - I was stumped!

-Carl

Subject: Odd TR4 restoring prob
Date: Tue, 31 Jul 2007
From: AMfoto1@aol.com

"Jerry Van Vlack" <jerryvv@adelphia.net> wrote:

> ... Your point is interesting so I went and looked at my 2 tubs. The original tub has those brackets welded at
> the 12 o'clock position but the rebuilt tub with a repro front valance has those brackets welded at the 9 o'clock
> position. So I guess I've found exactly what you have found. I don't know what effect this will have when I go
> to re-install the grill and the lights. I don't know if this addresses your concerns or just verifies your findings.

Hi Carl,

Hey, I think the two of us are vying for the longest TR4 restoration project in recorded history! I also have two upper valances: The one that was on my '62 when purchased in 1977 and a spare I bought a few years ago (both are pretty beat up). Those support brackets or "tabs" were removed (by me) from the "original" upper valance years ago because the car was fitted with a later TR4A grill that didn't use them (Note: I'm not sure the upper valance truly is original because the car had front end damage that had been repaired when I bought it, and I did additional work on it back in the 1970s when I first restored the car.)

With the TR4A grill, those bracket/tabs just protruded through the grill and served no purpose. However, it's obvious from the weld residue that the two bracket/tabs were located at the 12 o'clock position to align with the upper mounting hole for the parking lights. I hadn't noticed before, but now looking at the spare upper valance I see it has them in a different position... the one you have noted!

Supposedly this came off a TR4, too, if so then somewhere during the production run something must have been changed. Another clue. The original style TR4 grill I've got (intending to restore my car to original) has all the spire clips still on it. On both the parking and directional lights, the one hole (maybe slot would be a better description) that aligns with the support bracket/tab does not have a spire clip, because it is instead fitted on the bracket/tab itself. The top slot or hole on both the parking light cutouts lack the spire, while the bottom ones have theirs.

So, based on these clues, I'd have to say the 12 o'clock position is the correct location for the bracket/tab on our cars. This puts the bracket/tab sort of "horizontal" and leaves its outer (most forward, right behind the grill) 90 degree bent tang pointing straight downward, while the 90 degree bent tang that's used to tack weld the bracket to the upper valance points upward.

Now, if I only had a set of those parking light assemblies to fit TR4. (I finally managed to get a good set of correct glass "beehive" directional lamps!) Oh well, I'm pretty sure decent repros are available. Cheers!

-Alan Myers

Subject: Odd TR4 restoring prob
Date: Tue, 31 Jul 2007
From: <CarlSereda@aol.com>

Hi Alan,

Good to hear from you.. I've had to start telling folks "it's not the destination... it's the journey" (but really.. wishing I could drive my TR4 there!).

In my latest quest I've found 3 versions of the upper TR4/4A valances. Attached is detailed photo of my TR(?) valance from a wrecking yard next to Allen H's known original TR4 valance. Allen's brackets are 1/2" higher above wiring hole and that's where I'm moving my brackets.

Thanks for the tip on the spire locations - that's exactly what I'll do there.

PS- The little front parking light fixtures not that easy to find 'good used' - I could use a better pair as well - maybe people will see this and get those TR4 FRONT PARKING LIGHTS up for sale! eh? Cheers,

-Carl

Body/Tub/Sheet metal

Subject: TR6 Outer Waist Seal - Done...Here's how...
Date: Sun, 17 Nov 2002
From: "Williams, Bill (Atlanta)" <Bill.Williams@hp.com>

Guys,

Here's the technique that I used to install the outer waist seal on the door:

First, note that the seal has seven indentations where the clips attach. Hold the seal in position, using a magic marker, mark the position of the clips inside the door.

Next, attach the clips to the door with the exception of the last clip just above the door handle. You'll note the window channel will prevent you from using the last indentation on the seal.

I made a tool using a metal cover that goes over a computer's PCI slot. The tool simply lifts the clip and attaches it to the door.

Next, I had to cut the seal to fit. Cut the end that points to the front of the car. I had to take about 1/2" off.

Position the seal into the door and push the seal's edge into the clips. Use the tool to hold the clips in place.

Because of the rear window channel makes it almost impossible to attach the last clip, I drilled a small pilot hole through the seal and inner door. I then used a very small, black sheet metal screw to screw the seal firmly onto the door. The seal looks great and the fit is firm.

-Bill

Body/Tub/Sheet metal

Subject: Questions about sill replacement on a TR3
Date: Mon, 27 Nov 2006
From: "Dave Connitt" <dconnitt@fuse.net>

Paul,

Question 1:

The idea is to maintain a couple of points of reference to keep things straight. I found it to be very difficult to remove the floor pans without addressing the sills too. After all, you need to be able to weld to something solid along the outside edge of the floor pan and I would think you weren't considering welding the floor to your bad sills.

Question 2:

I have no idea how a TR3 goes together in that area but on the TR4 and TR4A, the sills are way too flimsy by themselves to install just one at a time. When they are welded together, they become a very rigid piece which is very important. I ended up grinding off the paint along the mating surfaces and spraying them with weld thru primer. Then clamped them together with vise grips and plug welded them along the top and bottom. Go slow and jump around a bit to spread the heat around so you don't warp anything.

Question 3:

As to the powder coating, you will still have to grind off some of the powder coating where ever you end up welding things together. Kind of surprised that you are seeing rust at this date. Are they stored outside? Even so, I thought the whole idea of powder coating was to stop rust. Maybe they weren't prepared correctly prior to coating? Although some of my fine Home Depot metal deck furniture seems to be "going Triumph" on my lately and it is powder coated.

Question 4:

I purchased end caps for my TR4A but they didn't fit worth a crap as you could see from my website. I ended up trimming them to fit. After brazing them in they fit OK. I can't remember where I found them. After receiving them, I would have rather started with a cardboard template and my trusty tin snips. Do you have your old sills to determine the shape of the end caps? I would definitely install them.

-Dave Connitt

Subject: Questions about sill replacement on a TR3
Date: Tue, 28 Nov 2006
From: Mark Macy <pmmacy@sbcglobal.net>

Hi Paul:

You're comparing apples to oranges. TR2/3 sills are quite different from TR4/4A (Dave Connitt's). Since the TR2/3 inner sills are quite rigid on their own, I'd install them first and solve all of the door opening - A and B post location issues. Then install the floor pan, and the outer sill (rocker) last. The floor pan welds to one side of the inner sill, and the rocker to the other. No need to pre-weld any pieces together as Dave did on his TR4A. Also, no end caps are used on the TR2/3.

-Mark Macy

Body/Tub/Sheet metal

Subject: Rusty Panel treatment
Date: Mon, 25 Aug 2008
From: William Brewer <wsb1960tr3a@att.net>

I have a friend and we made a derusting tank off of info we found on the net. It took a plastic tank full of baking soda solution. The tank was lined with steel mesh (an old bird cage ISTR). The part in question hangs in the tank by a steel wire, not touching the steel mesh. Then we hooked up a battery charger with one lead to the steel wire supporting the part and the other on the steel mesh. The part would bubble slowly and after a few hours the part comes out shiny clean and bright. It doesn't eat the metal away at all, unless you hook the leads up backwards. We experimented on old rusty horse shoes first. You can probably still find the info with a Google search.

Here is a link: <http://www.stovebolt.com/techtips/rust/electrolytic_derusting.htm>

or

<<http://www.rowand.net/Shop/Tools/Electrolysis.htm>>

-Bill Brewer

Subject: Rusty Panel treatment
Date: Tue, 26 Aug 2008
From: tom white <tswwhitez123@hotmail.com>

I would send the rusty fender out to be stripped before painting it. Either chemical stripping or media blasting would do fine. Remember it must be painted within 24 hours of stripping to prevent the rust from returning.

-Tom

Body/Tub/Sheet metal

Subject: Scuttle vent rod
Date: Fri, 22 Feb 2008
From: "Brian Induni" <308gtsi@roadrunner.com>

All,
I can't thank you enough for the info on the connector for the scuttle vent rod to handle for my 4a! Now, as I promised, here's the process on getting the rascal connected:

First, go get yourself a good rechargeable LED drop light - stays cool and gives off a ton of light!

Remove the dash support bracket that runs underneath the glove box - 3 screws.
Remove the glove box - 6 screws. A bit of a tight fit past the heater hoses, but it fits without destroying anything.

With the glove box door open and the glove box removed, you can see the hole in the fire wall the rod will pass thru. It's to the left of the wiper box access cover.

Make sure the rubber grommet is on the rod first, pass the "L" bent end thru the hole and push the grommet in to place. Slide the "L" bent end in to the hole in the vent cover hinge right near the spring. From here, I had to bend the rod to fit it in to the connector in the handle and then bend it straight after install. Tighten the connector, try it out, and enjoy not having to reach over the windscreen to open the vent! Kinda tricky going down the highway...

In all, took me about 30 minutes.
-Brian

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In all, took me about 30 minutes.
-Brian

Body/Tub/Sheet metal

Subject: Spring guide for door check strap - TR6 (Bad Info)
Date: Fri, 25 Jul 2003
From: "Brooks Bullock" <airsmyth@adelphia.net>.

Alan and List:

I have to apologize for the Bad info. regarding the 4-40 threads it should have read 6-32 with a washer. Terrible memory on my part, as I thought about it, I kept thinking man that sure is small...are you sure? So I had to pull down the side panel to get my peace of mind back, once again I apologize

-Brooks

Body/Tub/Sheet metal

Subject: TR3A bodywork? Mr. Wallace
Date: Mon, 23 Feb 2004
From: "Randy Homanchuk" <rhomer@porchlight.ca>

Jim Wallace's front end body alignment problems mailed to the list this Sunday past. A few suggestions, hopefully they may help. First check the inner sills, they connect the front clip to the rear clip, they are the back bone of the car body, they keep the door gaps even, meaning no sagging, if they are weak the body could twist, droop, while not supported by the frame? Where the front inner fenders bolt to frame on the diagonal, there are 1/4 thick aluminum spacer(s) (factory) that could be added to or subtracted from ,to raise one side reverse the other , maybe leave none on one side and two on the other? That may help the outer fender height? As for the captive nut misalignment I do not have enough experience, but the outer fenders are spot welded together in three pieces, and can be separated with a hand drill. Lots of work, I did it for rust repair? The enthusiast's restoration guide written by Roger Williams title How to restore TR 2,TR3&3A has many do's and don'ts of TR3 bodywork?

-Randy Homanchuk

Body/Tub/Sheet metal

Subject: TR4 Body Fit
Date: Mon, 07 Apr 2008
From: <richhalpern@verizon.net>

<GhaynesTR4@aol.com> wrote:

- > One possible buyer for my early 1962 TR4 body shell would like to use it on his 1966 TR4A frame. It appears
- > the body will fit with no problem but we are not sure. What is the collective wisdom here?
- > -George Haynes

George,

Depending on whether your floors were ever replaced, the holes from the body to the TR4A frame might not line up in the rear. I know when I replaced my floors on my early TR4, the new floor pans had rear holes drilled for the 4A and I had to drill the holes for the 4, and had to plug the rear holes for the 4A. Older floor pans have no such place for the 4A rear holes to exist.

-Rich

Body/Tub/Sheet metal

Subject: TR4 Boot gasket
Date: Sun, 28 May 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

J.C. Hassall wrote:

> ... Pix I've seen seem to show tall lip on the inside, but in that orientation the boot lid doesn't want to close,
> but rather push the gasket out and down (clearly it isn't glued in yet).

That is how mine was originally and how I did the replacement. It wouldn't stay in place until I did some serious gluing. Ordinary contact cement/weather strip cement wouldn't hold it. In the end what worked was a polyurethane glue. I used the Elmer's version -- Gorilla Glue may be similar stuff. The surfaces have to be wet and the stuff kind of foams and definitely oozes out as it sets. I found the excess is easier to remove before it hardens.

-Geo H

Body/Tub/Sheet metal

Subject: TR4A license plate position
Date: Fri, 25 Jan 2008
From: Steven Newell <steven@newellboys.com>

<CarlSereda@aol.com> wrote:

> For some reason on my TR4 I have 7 drilled holes in the rear trunk lid in the license plate area. I installed this
> used trunk lid around 1980 after a hit & run left me with severe damage. Getting ready to weld at least 5 of
> these holes closed, and want to ensure I have the 2 remaining drilled holes in the right spot for my license and
> amco rack. Can you please tell me the height of your 2 bolts from bottom edge of trunk lid (center of the bolt
> head to bottom edge of lid?

My TR4, still warm from the first top-down drive of the new year on a balmy 45F day, measures 8 1/4" from the lower edge of the boot lid to the center of the bolt head.

-Steven

Body/Tub/Sheet metal

Subject: Weather Strip
Date: Thu, 13 Feb 2003
From: "Fred Thomas" <vafred@erols.com>

Doing a little winter cleanup that has been on the back burner for some time now. So this morning I removed the weather strip from the bottom of the windshield on my "3", got the trusty "fiberglass stick" that glass installers use on gasket and the entire job of removing the old and installing the new took less than 5 minutes, using "Armor All" generously I placed the gasket at a angle in the Windshield slot and using the rounded tip of the stick, just sled it along the edge of the frame and with a slight bit of downward force/pressured it compressing the gasket right in place. Not a hard job anymore using these sticks, most glass shops will give them to you free of charge.

-FT

Body/Tub/Sheet metal

Subject: Welding in New Floor Pans
Date: Thu, 11 Jan 2007
To: "Cosmo Kramer" <tr4a2712@yahoo.com>

Bill Brewer wrote:

Replacing Triumph TR3 Floors- Notes about the lessons:

I had been driving for 8 years with plywood thrown down for floors and was tired of the cold winter drafts and dust blowing in. I regret waiting so long now. When I got the floors out, I discovered that the only thing really holding the body on the car was the four bolts at the corners. The floor mounting bolts weren't even connected to sheet metal anymore and the four bolts on the 45's in the sides of the engine compartment were loose and missing the aluminum spacers. Think about that next time you slide around a corner. There was even less sheet metal in floor than I originally thought. Scary.

The floors really should be replaced with the body off the car, but that is another story. I did mine on the car as part of an on going rolling restoration.

Do one side at a time so you can use the other as the pattern if you forget how something goes. I had to check several things on the original side.

I found the floor job much more enjoyable than I originally anticipated and recommend that others don't put it off. It is a good winter project. Don't do it during the driving season or you'll miss out too much.

It is easier to do the job right than half-ass. Forget about pop riveting it in, using JB Weld, sheet metal screws, gas welding or leaving any of the old floor in. Do it right. I've seen some strange ways to put floors in that pretty much ruin the car.

I am amazed at the difference that it made in the car.

This was on a TR3 but is probably very similar to a TR4 or 6.

The passenger floor panel fit perfect. The driver's side was a little short and the inboard holes didn't quite match up.

This is just how I did it. In hindsight, there is another and possibly better way that I am putting into my PS at the end.

Times:

Plan on about 50 man/hours per side on the floors. Maybe 40 per side if you use my lessons learned. Maybe more. This is just to get the floors in and doesn't reflect painting or putting the interior back in.

Keep band-aids around while working around the jagged sheet metal. I tore myself up pretty bad on the first side. Not a scratch on the second.

Some tools needed:

- Air driven nibbling tool (Harbor Freight)
- Air driven cut off tool (HF)
- Power wire brushes
- Dremel tool (Sears) with cut off wheel, various grinding bits and little wire wheels
- Air impact chisel (\$10 HF)
- 4 inch disk grinder (optional with above tools)
- MIG welder (don't try gas welding)

Big can of PB Blaster
Strong putty knife.
Electric drill and bits.
Nut breaker
Body work dollies and hammers
A friend with a floor lift is a Godsend (Thanks you Jon Paschke)

Removing old floors:

Take the seats, carpets and trans tunnel out. Take the car door off on the side that you are going to be working on. Get the car up on jack stands.

Unbolt the 6 bolts holding the floors in. Make sure to keep the inner aft bolt with its metal grommet, they are not available from the big three. The others just keep as patterns for replacing with stainless. The two sets of bolts that are mounted to the outriggers will be rusted beyond belief. Mine didn't even have a flat for a wrench. I ended up using the Dremel cut off wheel to cut the threaded part off underneath, using the air driven cut off wheel to cut a square head on the top of the bolt, soaking it all with PB Blaster and working it back and forth until I got them out.

Use the nibbling tool to cut the floor out around the perimeter. You have to work the nibbling tool over the frame by lifting up on the old floor panel for clearance. Don't cut the flanges that the new floor will get welded to.

Save all of the hardware holding the seat rails in. If it is all frozen (and it will be), cut the floor from around the rail bolt caged nuts for clearance, break the nuts with a nut breaker, soak it all in PB Blaster and unscrew the bolts holding the rails on. The last I checked, the bolts were unavailable. A moot point if you are going to replace them with stainless bolts like I ended up doing.

Use the impact air chisel to get the sides off. It took only a few minutes working carefully. Don't try the impact chisel on the drive shaft hump, the back or the front flanges or you'll be sorry.

To break the spot welds front & back and on the drive shaft hump, try to drill out the spot welds. If you are good, you can drill about halfway through. Try not to go all of the way through. A Dremel tool is handy in the tight spots. You can find the spot welds from the top or underneath. In the front, you can find the inboard ones from looking down the top of the engine compartment. About 3 welds will be "blind" from anywhere else. If you absolutely can't see the spot weld, try gently pounding a thin strong putty knife between the seam until it stops. By poking around it on three sides you can find exactly where it is to drill it out.

I have seen spot weld removal drill bits from Eastwood. They might be good, but I had no problems just using a drill bit.

I used pliers to twist and pull the old metal off. Sometimes I pounded the putty knife gently to separate the panels after drilling out one half of the metal.

You'll probably find some weird welds in some of the corners that you just have to gently grind out until it is clear.

When the floors come out, look to see where the factory put the rubber strips.

Hardware:

The big three were out of body mounting hardware kits, so I ordered the rubber individually.

I replaced all the bolts with stainless from the local True Value hardware. For the long bolt in the front I used a cadmium plated grade 8.

Removing rust:

I used power wire brushes and the little wire brush on the Dremel. I tried muriatic acid (pool acid) for some of it, but don't recommend it. You'll probably end up making patch panels for severely rusted areas.

Patch panels:

If the drive shaft hump is seriously rusted, consider just making a new hump from scratch and welding it in. I wish that I had. I ended up making a big patch. You could also get another hump from a parts car, but it is probably already welded in and rusted through too.

Also, if the front or rear panels are severely rusted, pitted or deformed, consider making a complete new patch panel to weld in about 1 inch up from the floor. If you make a flange, use a flanging tool (Eastwood), lap weld and then grind it down carefully, it will look like original and you'll have good metal to weld to. It is easier than making multiple patch panels.

I lap welded my patch panels instead of butt welding them. When we tried butt welding, the mig welder would just melt and blow away the old floor metal. Lap welding was easier. I also pop riveted the patch panel to hold it in place. I used stainless pop rivets. If you are really into it, use aluminum rivets, drill them out when done welding and weld in the holes.

Fitting new floor:

Straighten out all of the bent up old metal flanges. I made a neat little dolly out of a piece of 1/4 steel plate about 3 by 6 inches and it came in handy.

The real trick is where the floor has to fit in over the "Y" in the frame where it meets the forward bulkhead. There is a slot where the fore and aft member behind the bulkhead fits against it and rests on the frame. You can't slide the new floor panel into it and still get it past the lip at the back panel. You can cut off this lip from underneath without hurting the car's structural integrity, but there is another way.

Take the forward outboard corner of the floor and gently pound it over flat against the floor for about the first 3 inches. This will allow you to slide the side rail under the forward bulkhead while fitting the floor. I probably slid the floor in and out of the car 10 times for each side minimum.

Measure and mark where the floor slides into the slot. Cut a rectangle out of the new floor approximately 4 across by 3 deep. This will allow you to slide the floor past this slot and then slip the floor under the rear lip. When the floor is in, it is a simple matter of sliding in the piece that you cut out and mig welding it in from the top. Afterward, you can easily grind the mig weld flat and paint it.

The side where I cut off the lip looks better, in hindsight.

Before bolting and welding the new floor in, paint the bottom of the floors with the same color as the car. It is a pain to try to do it later. I also painted the frame of the car under the floor at this time.

Welding in new floors:

Replace the rubber strips between the floor and the frame. I used 3M weather strip adhesive to hold them in.

I measured the placement of the original spot welds. They were approximately every inch in the front and back, every inch and half against the drive shaft tunnel and every two and a half inches on the side rails. I drilled the

new floor panel with a 1/4 drill at the proper places and then Mig welded in these holes. Afterwards, the excess weld can be ground off and it looks like the factory spot welds.

Under the forward bulkhead, close to the transmission, I couldn't weld in the holes like I liked. I ended up Mig welding the leading edges of the metal.

Before painting the around where the floor will go in, I marked through the drilled holes with a "Sharpie" marker. I covered these marks with little round paper stickers that I bought at a stationary store. After painting around the floor with rust resistant paint, I peeled these little stickers off so it would be exposed for Mig welding. It worked well for me.

PS. In hindsight, my front and rear flanges are about as good as they could have been, but still don't look all that great. I think that it would be faster, easier, better looking but scarier to do to make a new flange front and rear that goes up about 1 inch up the bulkheads. You could take the flange and floor to a sheet metal shop and have them spot welded together. Use an Eastwood flanging tool, flange the original bulkheads to accept the new flange, pop rivet it together to hold it tight and take it to a professional welder for Tig or Mig welding. Grind off the excess metal so it looks like the original steel. Someone else tried this and did a write up on the list. I've already welded in my floors. Good luck.

-Bill Brewer

Brakes

Subject: Convert a TR4A to TR6 braking system- Parts needed?
Date: Wed, 6 Dec 2006
From: <Dave1massey@cs.com>

<dkspence@telus.net> writes:

> I'm collecting the bits to convert my 4A to TR6 braking system. I want the additional safety of a dual circuit
> system. What parts do I need to gather from the TR6?
>
> Any major problems in doing this?

The biggest ordeal in my mind is cutting the large hole in the firewall for the booster mounting. But it's easily done with a few hand power tools.

I would replace the pedal box, master cylinder (duh!), the wheel cylinders (they are probably the same but I would verify it first) and all the tubing. That includes adding the PDWA. If you wanted to do your own custom lines you could skip that but it may be easier to piggyback on the factory's handiwork. If the TR6 calipers will mount to the TR4 vertical links I would go with them, too.

I guess you could tap into the PCV valve connection for the vacuum or you can drill and tap a new hole in the intake and install a barb fitting.

In its day the TR6 was known for having pretty good brakes. I've been impressed by their abilities on occasion.
-Dave

Subject: Convert a TR4A to TR6 braking system- Parts needed?
Date: Wed, 6 Dec 2006
From: "Kentech Home" <kentech0822@verizon.net>

I am also doing this to my 4A. Here's how I did it:

- 1- My driver side bulkhead was rusty at the bottom so I purchased a repair panel for a TR250 from TRF that already has the holes for the brake servo and clutch/pedal assembly. You will either need this bulkhead panel or accurately cut yours.
- 2- The TR250-TR6 pedals mount on the front of this panel unlike the TR4 that mounts on the top. You will also need a TR6 pedal assembly and MC bracket. The pedal/mc assembly on the 4 must be removed and is not reused.
- 3- Next is a TR6 servo/MC. Best price for the MC new was from Kai at Wishbone Classics. I sourced my servo on e-bay but was lucky to get a decent one. You also need the aluminum spacer between the bulkhead and servo.

You should be able to reuse your TR4 clutch cylinder.

I chose to use a PDWA for plumbing convenience and plugged the switch tap since I didn't have a switch. I plumbed from the front output circuit of the PDWA to a 3-way connector for the two TR4A front lines. I then made up a line to go from the PDWA rear circuit to a Wilwood manual proportioning valve, from the proportioning valve to the existing 4-way connector location which I replaced with a 3-way connector (where the original MC used to connect to the front and rear.) The 3-way has:

- 1) Input from the proportioning valve output,
- 2) Line to the rear brakes, and
- 3) A bleed nipple for bleeding the front of the circuit easier (and plugs the hole nicely!)

At the rear the TR4 uses just one bleed screw on the pass wheel cylinder for bleeding. I added a 3-way mounted on the axle tube. This allows me to spilt the rear to left and right cylinders and be able to bleed each Rear

Cylinder independently. If you do this, make sure that you use flexible line from the hard line from the front to the 3-way. Just make sure the hard line isn't part of the suspension, it needs a flexible connection.

Also, my 4A has Toyota 4-pot brakes so I changed the rear wheel cylinders to .75" instead of .70" and will use the proportion valve to dial in rear. You will also need to fabricate a plate to cover the existing MC bracket holes.

Hope this helps.

-PeterK

Subject: Convert a TR4A to TR6 braking system- Parts needed?
Date: Wed, 06 Dec 2006
From: "Jeremy Kinney" <kinneyjr@msn.com>

Revington TR sells a dual circuit brake conversion that is a straight bolt-on and even has the option of adding two (yes, I said TWO!!) servos. It's not cheap, but it is the same they use on their rally cars. You can google their website address. I'm tempted. Cheers,

-Jeremy

Brakes/Front

Subject: Brake upgrades on 55 TR2
Date: Thu, 15 Feb 2007
From: A Daniel Cronin <adcronin@ameritech.net>

First, thanks to Randall and John for their responses on "Knock-back" as relates to Toyota caliper conversion. Revington TR had advised me to avoid the Toyota calipers due to excessive knock-back.....

I am going to list the brake upgrades I am considering and would be interested in the experiences, feedback of list members, especially those who have had experience in various upgrades.

RATCO is building a new frame for me and will be installing TR4A-6 lower suspension mounts and 4A spring tower for the late 6 suspension components I plan to install. Was thinking of swapping out the late 6 calipers and disks for: Toyota 4-pot or spending \$\$\$ on alloy 4-pots. Then there is the "?" of std. 12mm slotted or 22-24mm ventilated disks. I will be going to alloy front hubs and am wondering if going to the alloy 4-pots, 12mm disks and the resulting reduced unsprung weight will be sufficient benefit to offset the \$\$\$ of the alloys???

Plan to install Revington's split brake kit and dual line servo. I would install a brake line pressure switch to modulate the front to rear pressures.

At the rear I am strongly considering going with Revington's disk brake conversion for Girling solid axles as well. He may be using modified Spitfire components in this upgrade. There are lots of other things I plan to do on TS6927L, but will save those for another chapter. Any thoughts, suggestions, rebuttal or general discussion will be appreciated.

-Dan Cronin

Subject: Brake upgrades on 55 TR2
Date: Thu, 15 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> I will be going to alloy front hubs and am wondering if going to the alloy 4-pots, 12mm disks and there
> resulting reduced unsprung weight will be sufficient benefit to offset the \$\$\$ of the alloys???

Depends an awful lot on what you plan to do with the car. On the street, I don't think you'll see enough benefit to even notice, let alone offset the price of alloy calipers. On the track, I don't know where you would be both competitive and legal. And cheating is probably not something you should be asking advice about. OTOH, should be fun, which is tough to put a price on.

-Randall

Brakes/Front/Calipers

Subject: TR3 Brake caliper dust cover installation
Date: Thu, 13 Jul 2006
From: "Randall"

> I'm putting a new rebuild kit and pistons in my TR3A brake calipers. I put in the seal and pushed the piston in
> to place. Then I pushed the new dust cover over the piston and tried working it into the groove in the caliper. I
> could get it in most, but not all the way around. Gave up after 45 minutes.

It's been a long time (I love DOT 5!), but aren't the TR3A calipers the ones where the dust seal has to be fitted into the caliper bore before you insert the piston? Then you stretch the smaller end of the seal over the rounded end of the piston, and push the (lubricated) piston into the caliper. The small end of the seal will fall into the groove in the piston when the piston is pushed home in the caliper.

Swaps are common, so be sure you have the seals for your calipers. At some point, the seals and calipers changed so the seal fits over a lip on the caliper, rather than under.

-Randall

Subject: TR3 Brake caliper dust cover installation
Date: Thu, 13 Jul 2006
From: <Geo & Kathleen Hahn>

Randall wrote:

> It's been a long time (I love DOT 5!), but aren't the TR3A calipers the ones where the dust seal has to be fitted
> into the caliper bore before you insert the piston? Then you stretch the smaller end of the seal over the
> rounded end of the piston, and push the (lubricated) piston into the caliper...

And that is where a modest bit of air pressure may help. If you get this far (seal in groove, piston perched on top of seal) and can't seem to get the seal stretched around the piston then a little air pressure into the caliper will inflate the seal and make it want to go around the piston. Of course the other side of the caliper needs to have a piston in it for the caliper to hold air... a piston w/o a seal is enough to plug the opposite side, use a c-clamp (g-clamp to some) to hold it back.

Very little air pressure is enough, a tool made out of a piece of 12 ga solid copper wire with the tip rounded and bent into a hook may also prove useful.

-Geo H

Brakes/Front/Calipers

Subject: Brake calipers - Removing Pistons/ with a bike pump
Date: Wed, 15 Mar 2000
From: "Kinderlehrer" <kinderlehrer@mindspring.com>

Here's what I did- I took the old flexible brake line that I was replacing anyway and cut in half. I then took a tire valve stem and whittled the rubber off the end leaving the brass tube bare which I inserted in the cutend of the hose, the half with the fitting that came out of the caliper. I actually ran the brass tube through a die, putting threads on it and screwed it into the hose- it fit pretty tight so I didn't need the hose clamp I had planned on using to keep it in. I then screwed the fitting back into the caliper and, since I don't have an air compressor I used a bicycle pump on the tire valve to push out the caliper. When 1 side popped loose, I put it back in and held it place with a C-clamp and pumped the other one out.

Many people are suggesting a grease gun in place of the air pressure. I suspect that you could use the hose trick to rig an adapter for a grease gun as well and not worry about trying to find the right size grease fitting or stripping the threads in the caliper.

-Bob

Brakes/Front/Calipers

Subject: Caliper piston UN-stuck! "grease-pressure" method
Date: Sun, 9 Jan 2000
From: "Jeff McNeal" <jmcneal@ohms.com>

After wrestling around a bit more with the piston, I called my local garage and made an appointment to go in tomorrow and have them extricate the piston from the caliper chamber.

Then, armed with all your great advice, I mustered up the courage to try the "grease-pressure" method.

Placing the free piston back in place on the opposite side of the caliper, I used a quick grip to hold the piston in place and attached the grease gun to the brake line opening. Believe it or not, I've never actually used a grease gun before so I wasn't sure if I loaded it properly. The instructions were rather ambiguous. My concerns were addressed soon enough when I saw the free piston pushing against the clamp. I attached a second clamp because the pressure was really building and a few easy strokes later, one of the clamps exploded into pieces from the stress. Oops. I bought those for my wood working projects. So much for that quick grip clamp! I grabbed the only thing I had that was large enough and strong enough to hold the free moving piston in place. My father's old monkey wrench. Worked like a charm. The stuck piston began easing out, and once it was out far enough, it simply fell out.

So, three days before my 40th birthday, I officially became a "grease monkey" ha ha. I blew compressed air through the line to clear most of the grease out, and used a rag to wipe out the cylinders, but am open for suggestions on how to finish the job. I have a feeling that denatured alcohol and brake fluid are going to come into play, here. I have the feeling that this piston has been inoperable for some time, which explains the imbalance of wear on the pads that were on that caliper. The piston is fairly severely pitted so I'm going to junk it and replace with new.

-Jeff

Subject: Stuck piston in caliper -- what now?
Date: Wed, 19 Jan 2000
From: Alan Myers <reagntsj@ricochet.net>

Hi Jeff,

I made a tool to help remove caliper pistons on my TR4, might help you too. It's nothing more than one of those rubber replacement engine "freeze plugs" that are available at most auto parts store. I welded a flat steel handle on the large washer that makes up one side of the "sandwich". When you tighten the nut on the freeze plug, the rubber is squeezed between two washers & expands. Before tightening, it fits loosely into the back of the caliper piston. When I tighten it, the rubber expands and gets a good grip inside the piston. I can usually then rotate it enough to break it loose and work it free from the caliper body. 9 times out of ten, it's old dried up brake fluid that "glues" the seal and piston into the caliper body. Sometimes just drizzling a little fresh brake fluid around the edge of the piston helps, too.

I've also heard of using a bicycle pump to put some air pressure in the caliper to pop the pistons loose. Another lister while ago said he used a grease gun, pumped the caliper full until it pushed the piston free.

Ideally, you could use the hydraulic system itself to pop a piston loose, by clamping all the others and pumping on the brakes a bit. Of course, it's usually the last piston that won't come out!

-Alan Myers

Brakes/Front/Calipers

Subject: Caliper Rebuild/Boots
Date: Wed, 15 Dec 1999
From: "Taffel, Sherman" <STaffel@bcps.k12.md.us>

Reference TR-4 front calipers. I always replace the pistons, and hone the piston cyl wall very gently, the only problem is with the 'Boots'.

Over the years various suppliers of 'boots' have provided a different style lip on the boots, some are V shaped, and these are a problem, and the original sytle needs to be used, which was a like a squared side U. In desperation of the non-sealing boots and desire to keep debree (even brakedust) out of the piston area, I alcohol cleaned the lip of the caliper adjacent to the piston, and over a couple of days, doing 1/4 of the lip each 6-8 hours, used 3M weatherstrip adhesive to 'glue' the v lip of the boot to the caliper lip.

-Sherman D. Taffel

Brakes/Front/Calipers

Subject: Chromed or Stainless Brakes Better?
Date: Tue, 07 Sep 1999
From: Cliff Hansen chansen@access1.net

Carl,

I replaced my OEM pistons with stainless last year. No problems with fit or function. I got the pistons from TRF, they were about \$20 each, I could have got chromed steel for about \$12. Thirty two bucks was small enough price not to worry about corroding brake parts.

BTW, you don't have to separate the calipers to replace the pistons. Whether you should separate them at all, well, I don't want to start that again. But if you do separate them, the torque numbers I got from TRF are **75 ft-lbs for the large bolts, 45 ft-lbs for the small ones.**

Brakes/Front/Calipers

Four piston brake caliper conversion for TR3/3A/4/4A/250 and 6

by R. John Lye and Lee Janssen

First, in our current litigious society I feel that I must point out that the neither of the authors are brake experts, nor are we automotive engineers; as such, follow these instructions at your own risk. The braking system on your car must function correctly to avoid serious injury; if you do not feel competent to do these modifications correctly, please either stick with the stock brake system or have a professional do the work for you.

In the quest for better braking on our cars (autocross prepared TR-4, and high performance, street driven TR-6), we began looking into four pot caliper conversions. While there are several sources of commercial conversions, especially in England, and there are race calipers like Wilwood and AP that we could have used, we were looking for a simple, cost effective solution. We discovered that the calipers from a 1979-83 Toyota four wheel drive pickup (non-diesel) are almost a bolt-on conversion.

These calipers are readily available, and are relatively inexpensive; at this time, they should cost about \$39.95 at your local auto parts store (plus about a \$20 core charge). You will also have to buy a "hardware kit" for a few more bucks to get the pins that hold the pads (one kit per car).

There are four things that need to be done to fit these calipers to the Triumph uprights (late TR-4 through TR-6):

1. The Toyota mounting bolts are 12 mm, rather than 7/16", so our first solution was to make up some reducing bushings to fit into the ears of the caliper to bring it down to the 7/16 ID. These bushings have a 12 mm OD and a 7/16" ID and were made from mild steel. However, there is a better solution; there were three types of calipers fitted to the TR-6 range. The first was the Girling 16P (which was fitted until 1969) followed by the Girling 16PB (which was fitted until 1973). Both of these calipers had "Imperial" threads. After 1973, TR-6's got the Girling M16P caliper, which had metric fittings. So far, so good. The interesting thing is that there are different mounting bolts specified for the different calipers: 113142 is specified for both the 16P and the 16PB (ie, the "Imperial" thread types), while 158668 is specified for the M16P (these are the factory part numbers). Here are measurements of the relevant diameters:

0.478", 0.479" Toyota caliper mounting bolt hole inner diameter (measured 2) 0.433"

71 TR6 caliper retaining bolt (113142) shank outer diameter (measured 1) 0.472", 0.469"

74 TR6 caliper retaining bolt (158668) shank outer diameter (measured 2)

The latter bolt has a metric (12 mm) shank but has 7/16" threads and it fits the Toyota calipers perfectly. These bolts should work to mount the Toyota calipers to the TR-2/3/4/4A/250 uprights as well as to the TR-6 uprights. I just wish I'd known this before I made up those bushings! One drawback is that the hybrid metric/inch bolts are more than twice as expensive as the standard bolts.

2. The bleeder bolt uses a 10 mm wrench instead of the standard 7/16" wrench, so you'll need to buy one of those if you don't already have one.

3. If you are fitting these calipers to a TR-3/3A/4, you'll need to make up a flex line that is SAE (or AN-3) at one end, and metric at the other end. The caliper uses a 10 X 1.0 inverted flare fitting, which is a bit hard to find as a fitting for braided lines. If you want to use a straight end right on the line, Earl's part number 640803 will work (this should be available from many of the race supply shops such as Summit Racing). I wanted to have a 90 degree end, so I used a metric to -3 male to male adaptor that I got from Porterfield (1-800-537-6842); their part number for this fitting is 420103. To be sure that it sealed, I backed it up with a dowty washer. If you are fitting these calipers to a TR-4A/250 or TR-6, your job will be a bit easier. These cars use a short piece of hard line that goes between the caliper and the flex line. For these cars, you can simply buy a length of

metric brake line from your local auto parts store. Cut the female SAE end off your current hard line and cut one of the ends off the new metric line (cut it to the proper length at this time). Put the female SAE end on the piece of metric hard line and form a new flare (be sure to make the proper double flare with a good quality flaring tool; this is essential to get a good seal). If you are not sure how to make up brake lines, be sure to get a professional to do this for you; it is essential that the brake lines function properly.

4. Finally, the brake dust shield needs to be trimmed to clear the larger, Toyota calipers. See figure 2 for a trimming diagram; the black areas should be removed. Alternatively, the dust shield may be left off if you prefer.

5. In addition to the above instructions, to fit the Toyota calipers to a TR-3/3A or early TR-4, you will need to use the later brake caliper mounting plates (Stanpart part numbers 133499 and 133500). These were used on the late TR-4 through TR-6 cars, but they will bolt right up to the earlier vertical links.

That's it. It is quite an easy conversion, and the pads are readily available from all the usual sources (both standard-type and racing pads are available) as this is apparently a common conversion for the Datsun Z-cars.

We have performed some braking tests on this conversion. Braking test summary is as follows:

The distances are based a 74 TR6 running at 3000 rpm in 4th gear with a 3.45 differential and 205-70 R15 tires. The tire weight distribution was as follows:

L front 660

L rear 780

R front 620

R rear 720

Front wheel camber was set to 3/8 degree positive. All tests were performed with a newly rebuilt master cylinder, using DOT 5 brake fluid.

EARLY (prior to metric calipers) Stock configuration with semi metallic pads, composite shoes and 0.70" rear wheel cylinders: 262 feet with a standard deviation of 19; 6 data points, tossed out both the minimum and maximum measurements.

Toyota front calipers with semi metallic pads, composite shoes: 243 feet with a standard deviation of 9; 8 data points, tossed out minimum and maximum.

Toyota front calipers with semi metallic pads, composite shoes with a 7/8 inch brake cylinder: 215 feet with a standard deviation of 9; 9 data points, tossed out minimum and maximum.

Observations:

Testing was much harder to do than I expected. Left front tire was about 1.5 pounds under inflated for all tests and would lock prior to any other wheel for all tests; since this was constant for all the tests, this should not affect the relative results. With the new rear cylinders, another wheel was locking up shortly after the front left but I was uncertain which one it was (I suspect that it was the right rear).

My test method was to start braking when a bar painted on the road disappeared under the hood. Brakes were applied to start squealing the front left tire but not to allow it to lock up.

Pedal travel increased as the size of the calipers/cylinders increased. This was initially a little alarming but it was fine once you got used to it.

Since the first car that this conversion was performed on had rear discs, we weren't sure what we'd need to do as far as brake bias goes with the drum brakes on the rear. So, a proportional valve was installed on the rear brake lines of the TR-6 used for the brake tests above, but it was set to have no effect (completely backed out). We had predicted that the 7/8 cylinder would overpower the rear brakes; however, this turned out not to be the case. At this time, none of the cars that we are aware of that have had this conversion performed on are using proportioning valves and none of these are having any problems with rear wheel lock-up.

Sources for parts mentioned in the text:

Summit Racing:

Moss Motors:

TSI:

-John Lye

Porterfield: 1-800-537-6842:

The Roadster Factory:

Carbotech Engineering:

Brakes/Front/Calipers

Subject: Front Caliper Rebuild Tip
Date: Tue, 4 Feb 2003
From: Dave Massey <105671.471@compuserve.com>

Message text written by "rksuggitt":

> Does anyone have any suggestions on how to fit the rubber dust boots around the front caliper pistons? No
> problem fitting the seal and the piston fits nicely without the boot but I can't get the boot lip to fit in its
> groove in the caliper body. The calipers are the type that doesn't use the wire retaining ring.

Old mechanic's trick:

Fit the dust boot to the caliper. You'll notice that the opening in the boot is too small to let the piston fit down without a bit of stretching. Now, apply compressed air to the hydraulic fitting and offer up the piston to the boot to block off the air escape route. The boot will balloon out around the piston and voila! c'est fini!

Um... works best if you take out one piston at a time. If you have both pistons out install one temporarily without the dust boot. After the other side is finished, remove the piston and reinstall with the dust boot.

-Dave

Brakes/Front/Calipers

Subject: High Performance Brake Kits
Date: Wed, 2 Apr 2003
From: Chris Kantarjiev <cak@dimebank.com>

> I'd like to make the brakes on my TR3A as good as (reasonably) possible. In scanning the Moss USA
> catalogue, I noticed that they offer a High Performance Brake kit with slotted, cross-drilled rotors that they
> claim is compatible with TR3A through TR6.

All they'll really do is lighten your wallet. If they don't increase the swept area, they're not appreciably changing your braking performance.

The way to go is the Toyota truck caliper swap that was pioneered by John Lye and Lee Janssen. See:

<<http://www.vtr.org/maintain/brake-conversion.html>>

Combine with stainless/Teflon lines for the best possible pedal feel - you're going to have to do some plumbing adaptation anyway. You can see:

<<http://bosphorus.dimebank.com/tech/BrakePlumbing.html>>

For some words of wisdom in that regard; Pegasus racing has the parts you need and their catalog has the instructions for putting the hoses together.

-Chris

PS- I forgot to mention - I'm very fond of Porterfield's R4S brake pad compound. This is a carbon-compound pad that is rotor friendly, low dust, low squeak ... and vastly superior to stock. I like it better than Metal Masters, too. Very good for the street.

Brakes/Front/Calipers

>> Subject: High Tensile Caliper Bolts
>> Date: Tue, 04 Jun 2002
>> From: "dave worne" <daveworne@hotmail.com>

>> Hi folks,
>> I'm a member of the TR Register in the UK, I drive a 4A and I have a 6 currently undergoing a
>> ground up restoration. My problem is that I took this on as an abandoned project and the two halves of the
>> Girling Calipers had been unbolted. I am having a difficulty finding the proper bolts in the UK. I can find
>> the correct sizes etc. but not the correct tensile strength.
>> Details as follows: (for a vehicle set)
>>
>> 4 - 7/16"UNF x 2 1/4" long.
>> 4 - 3/8 UNF 2 1/8" long. (2 1/4" acceptable)
>> The bolts require to be Type 'U' - 60 tons tensile, which is where my difficulty lies. I can obtain the sizes,
>> but not the tensile strength.
>>
>> I wonder if I may ask your good selves to e-mail me the details of a few bolt stock lists/suppliers in the
>> USA who I may contact in pursuance of the above.
>> -Dave Worne

Subject: High Tensile Bolts
Date: Wed, 5 Jun 2002
From: <ZinkZ10C@aol.com>

<ZoboHerald@aol.com> writes:

> If any of you might be able to advise Dave, please make sure to include him in your reply at the address
> below. Thanks!
> -Andy Mace

Try race shops that prep Formula Fords as this caliper was pretty common on many race cars.
-Harold

Brakes/Front/Calipers

Subject: Toyota Caliper upgrade
Date: Fri, 26 Sep 2003
From: "Hugh Barber" <tr6nut@sbcglobal.net>

Phil,
Irrespective of whether the late TR6 caliper has metric hydraulic threads, the caliper-end fitting on the hard pipe is not compatible with the Toyota caliper. One must either use a longer flex hose with appropriate ends or fabricate a new hard line with the TR fitting on one end (the end that goes to the flex hose) and an ISO metric bubble flare on the other end (the end that goes to the Toyota caliper).

-Hugh

-----Original Message-----

Subject: Toyota caliper upgrade
Date: Friday, September 26, 2003

David Templeton wrote:

>Phil,

> When I did this modification, I changed the flex hoses to match and it was the worst thing I could have done.
> Very expensive change when it was not required. In retrospect, I should have done what the article suggested
> for the TR6 and make a small steel line that had the male metric and the female imperial and simply fabricate
> a bracket as seen in figure 3 of the article. This would allow the normal TR3A to work and could be bent and
> mounted to suit the application. Oh well, hind sight is 20/20 :)
> -David Templeton

I guess I should have been a bit more specific in my question. There is a short pipe which connects the flex hose to the caliper on a TR6. On early cars, like mine, the caliper end of this pipe is fitted with "imperial" or SAE threads. Later cars had metric calipers, and metric fittings on this pipe. My question is: Will the metric thread from a late TR6 pipe mate with the Toyota caliper? If it does, no fabrication is required. If it does not, then the pipe will have to be custom-made, as described in the article.

-Phil

Subject: Toyota caliper upgrade
Date: Fri, 26 Sep 2003
From: "Gerald Van Vlack" <jerryvv@alltel.net>

Phil wrote back to me to say I was wrong so I looked in the TRF parts book, sure enough it say that after a certain Commission Number the caliper end is a metric thread. I stand corrected, and learned something today.
-JVV

Subject: Late TR6 Calipers vs. Toyota Calipers - Flares
Date: Fri, 26 Sep 2003
From: "Hugh Barber" <tr6nut@sbcglobal.net>

As Randall Young has reminded me, there is another reason why you cannot use the existing hard line for the Toyota conversion: The TR6 caliper uses a bubble flare at the caliper while the Toyota uses a double flare at the caliper. Looking at the diagrams in the below referenced article will make it clearer.

-Hugh

-----Original Message-----

Subject: Late TR6 Calipers vs. Toyota Calipers - the final word?
Sent: Friday, September 26, 2003
From: Hugh Barber <tr6nut@sbcglobal.net>

Listers,

After all the traffic this afternoon about TR6 calipers vs. Toyota calipers re: metric/english, I decided to see for myself. I've made the Toyota mod, but its been a while and occasionally my memory fails me (sound of wife

laughing hysterically in background). I went out to the garage, pulled a set of late TR6 calipers out of the parts box, pulled the front wheel off my TR6 and compared the original "6" calipers to the Toyota 4-pot calipers on the car.

Girling 16PB:

bleed screw - 10mm x 1.0

hard line thread - 10mm x 1.0

Toyota 4-pot:

bleed screw - 10mm x 1.0

hard line thread - 10mm x 1.0

So the threads are the same. However, you can not re-use the original hard line when making the Toyota upgrade. Due to the different configuration/size of the calipers, the line is too short and bent wrong to use with the Toyota caliper. A new hard line must be made using the "old" fitting that screws to the flex line. A nice write-up of this is found at:

<http://www.cs.du.edu/~ljanssen/tr6_brake_install.html>

-Hugh Barber

Brakes/Front/Calipers

Subject: TR 6 Brakes
Date: Tue, 18 Jan 2000
From: "Kyle K. Rice" <kkrice@earthlink.net>

Wiard,

Completed the change over to Toyota calipers and it was a very easy swap. Yes I needed new pipes from the braided line to the caliper but that was not hard. The easy thing to do is when you make up your new pipes, take the old fitting going to the flexible line and use that for the new pipe and then get a new fitting to fit the Toyota caliper, that is what I did and it worked great. No other problems at all. It was a chore keeping the m/c full with brake fluid with such a small opening for the rear system. I would recommend the Toyota calipers and the price was great (\$125.00 Fully loaded with pads ect...) Just bolt on, bleed the brakes and go. (Small cuts need to be made on the dust shields).

-Kyle

1/2/00, you wrote:

>Hi Kyle,

> I have been thinking of changing over to the Toyota calipers on my TR4/A but not yet sure what problems
> I will encounter. Take it I will need new pipes which are between hose and caliper. Not sure yet, what
> thread the calipers have. If you know let advise.

>

>Also encountered some time back problems with bleeding the brakes on my TR6. The manual is not very
> clear on this. I use a fairly simple syringe to keep the front chamber of the m/c full with brake fluid.
> Also, having the rear end of the car higher helps.

Subject: TR 6 Brakes
Date: Tue, 18 Jan 2000
From: "Kyle K. Rice" <kkrice@earthlink.net>

Andy,

I used Loaded Calipers from CAR QUEST part #17-821. Any store should have similar. They came from a 1983 Toyota 4x4 truck. I have a 74 TR6 so the bolts fit but I understand that if you have an earlier TR you will need to get the bolts from a '74, '75 or '76 as they use the correct SAE thread but have a shank diameter that is metric to fit the calipers. Other than that, new brake lines and cutting a small amount off the dust shields is all it took. I could not believe how easy this was. For the price, it almost makes sense to swap out the calipers each time you do a brake job since you know you are getting rebuilt calipers and they are fully loaded with pads. Now I do not want to take credit for this so here is John Lye's response to me when I asked about them a while back, Thanks to everyone for all the help on my TR.

-Kyle

Brakes/Front/Calipers

Subject: TR4 Brakes - 2 Questions
Date: Tue, 30 Apr 2002
From: Irv Korey <emanteno@attglobal.net>

Randall Young wrote:

>> When the TR4 sits overnight the first push of the brake pedal is very soft. Not all the way to the floor but
>> definitely a long stroke. The second push and all thereafter are short and firm.

>I'm having a really tough time thinking of an explanation for that one, best I can do is a partially stuck caliper
> piston that slowly returns farther than it should. An even remoter possibility is a MC push Rod that is a little
> bit long (or a sticking pedal that is holding the push Rod into the MC), but I think you would notice other
> problems (like the brakes dragging after you'd driven a bit).

How about if he has to make a sharp turn into the driveway and he is experiencing the dreaded pad knock back?
Of course, once he brakes to a stop in the driveway, that should reset the pads, but if he only needs light
pressure to stop in the drive (uphill for example), then the first push in the AM would be a long one.

IF it is the dreaded pad knock back, you will need to check your wheel bearings for wear and adjustment, the
thickness of your rotors, and the condition of your pads.

-Irv Korey

Subject: TR4 Brakes - 2 Questions
Date: Tue, 30 Apr 2002
From: john donnelly <pdonnell@san.rr.com>

Hey Geo,

Sometimes we look too hard and miss the obvious. I had the same experience after my restoration. The brake
pedal seemed mushy the first try. Afterwards it felt fine, at least for another few miles.

Someone told me it was air in the line. Another suggested it was the DOT 5 fluid, so I painstakingly bled the
lines making sure I didn't agitate the fluid.

It turned out that the rear brake drums weren't adjusted correctly. I reset those and now it's rock solid. Back to
the basics.

-John

Subject: TR4 Brakes - 2 Questions
Date: Wed, 01 May 2002
From: <pmmacy@att.net>

George:

If you want to eliminate the dust, I highly recommend the Kevlar pads (and rear shoes) from Ted Schumacher at
TSI. I've been using them for 4 years now, and only cleaned my wires once. No adverse effects on braking
efficiency either. NFI.

-Mark Macy

Brakes/Front/Calipers

Subject: TR6 Brake questions
Date: Tue, 17 Feb 2004
From: "Graham Stretch" <technical@iwnet.screaming.net>

----- Original Message -----

Subject: TR6 Brake questions
From: "Dave Massey"

> I did this in 1996 and I have had zero issues with the brakes since (other than the dreaded piston kickback),
> but I am inclined to think that is normal with these cars)
> -Dave Massey

Hi Dave

I would say not to fit new pistons from most of the new sources unless the originals are not serviceable. The reason for this is piston "pull back". A friend fitted new pistons on a Vitesse which had real nice brakes, just he decided to renew it all on it's thirty years old thing. After the new pistons he could not get a decent feel back to the system, even sat still on the drive. I went to the car and watched and the pistons were visibly retracting, so take 4 x 1/64 to 1/32 inch travel on each piston and you have a lot of lost travel before the brakes start to work. We tied it down to the "new" pistons, they were slightly smaller than the originals (a metric approximation perhaps, being sold by a reputable dealer as correct for the caliper) which allowed the seals to distend into the clearance slightly more than is normal so pulling the pistons back further when the pedal was released. He decided to bin the new bits and clean the original pistons and refit them, hey presto perfect brakes!
-Graham

Brakes/Front/Rotors

Subject: 240Z brake drums & rotor thickness
Date: Sat, 08 Jan 2000
From: Alan Myers <reagentsj@ricochet.net>

In case it is helpful to anyone on the list, just checked a new TR4 rotor in the garage & it is marked **min. thickness 11.3 mm**, which I believe converts to .44 inch. Since it's new, I measured the starting thickness & found it is .505, which means you have .065 of wear allowed over the life of the rotor. I am guessing that TR3 through TR6 are probably about the same. It may be diff. for some of the other Triumphs out there.

The min. thickness on this rotor (Brembo) is stamped into the outside rim. I've also seen it cast into the hub area of the rotor.

-Alan Myers

Brakes/Front/Rotors

Subject: Another Front Brake Question
Date: Mon, 14 Aug 2000
From: Randall Young <randallyoung@earthlink.net>

Michael :

Please let us know if you find anything cast in. Many others have looked and not found anything.

However, one of the 1958 service bulletins that Michael Porter, Dan Buettner and others have conspired to make readily available has the answer, which is :

> It is unlikely that the brake disc will ever require attention, but should it ever suffer damage or be excessively
> scored, Messrs. Girling Limited and ourselves recommend that it be replaced with a new disc. If, however,
> replacement of the disc is not possible and regrinding is contemplated, great care should be exercised, as
> incorrect grinding can seriously mar the efficiency of the brake. It is a skilled operation and should only be
> undertaken by competent engineers.

>

> **The machining limits shown below should not be exceeded under any circumstances. The maximum that can
> be removed from either side of the disc is .025" (.63 mm) and, as illustrated overleaf, measurement "A"
> should not be LESS than 1.475" (37.46 mm) and measurement "B" should not be more than 1.025" (26 mm).**

This gives 0.450" as the minimum thickness (assuming both the grinding and the wear are perfectly symmetrical). I measured a disc in the parts bin that I thought was nearly new, it only miked at 0.463".

See <<ftp://ftp.thelittlemacshop.com/1958bul.pdf>> for the full text and a diagram showing not only the relevant measurements, but a caution to radius the grinding into the 'top hat' portion of the disc.

I've watched the local auto parts house turn rotors. They sure don't impress me as "competent engineers"
-Randall

<OHFASTONE@aol.com> wrote:

> I've never looked on a Triumph rotor but I'm going to look.

Brakes/Front/Rotors

Subject: Brake rotor run out
Date: Tue, 12 Jun 2007
From: "Tom Note" <tom628@verizon.net>

I checked the run out of the front rotors of our '76 TR6 with a dial indicator, and got TIR readings of 0.008" and 0.012". There was a little slop in the bearings, so I snugged them up, but it didn't make any difference in the run out.

My Haynes manual lists a run out spec. of 0.002" and recommends replacement if much over this but, of course, gives no limit. The rotor surfaces look very good.

My questions are:

1. Do the above readings require replacement of the rotors?
2. Could the run out be caused by some irregularity where the rotors are mounted to the hub?

TIA,
-Tom

Subject: Brake rotor run out
Date: Tue, 12 Jun 2007
From: <DLylis@aol.com>

The first questions are; does the car stop poorly, and is there a pulse or vibration when you step on the brake? If the answers are no, then leave well enough alone.

If you have a yes answer to either then you can get them turned for a lot less than new ones. There is a limit as to how many times a rotor can be turned but I doubt that if you haven't done it, that limit has been reached.

-David Lylis

Subject: Brake rotor run out
Date: Tue, 12 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> My questions are:

- > 1. Do the above readings require replacement of the rotors?
- > IMO, .012" is too much, even if you don't feel it in the pedal. Of course, it might be the hubs rather than the rotors ...
- > 2. Could the run out be caused by some irregularity where the rotors are mounted to the hub?

Absolutely; especially if you don't see a corresponding variation in thickness. After you check the mounting points, you can try turning the rotor 180 relative to the hub and see if that improves things.

-Randall

Subject: Brake rotor run out
Date: Wed, 13 Jun 2007
From: "Rick" <patton@suscom-maine.net>

Tom,

We turn brake rotors at our store and, in general, the typical run out limit before turning is required is 0.006". And even at that you may not feel any pulsation in the pedal.

- > 2. Could the run out be caused by some irregularity where the rotors are mounted to the hub?

Absolutely. If you buy a new set of rotors and bolt them to the hubs without cleaning off the rust and dirt they will wobble to some degree. Almost always a customer returning new rotors, because "they pulse as bad as the

old ones" has not cleaned the hub. Not to say that new rotors are always perfect but they are cut on very expensive lathes and inspected carefully. Unless mishandled in shipping there isn't much to go wrong. 3M has just announced a hub cleaning kit that they expect to be a huge seller.

You can try rotating the rotors on the hub to minimize run out. If your brake pedal isn't pulsating they are probably OK anyway. And if you have them turned, you'll need about 0.030" in thickness over the discard figure

for safety. I've cut several thousand rotors and you may not realize it but brake lathes are only accurate to about 0.002" and that is with a skilled operator. You can cut a rotor, put it back on the same lathe, and because of the way rotors mount, have two or three thousandths run out. For super accurate rotors on high end race cars, we grind them on a flywheel grinder after cleaning the mounting surface carefully. A little tiny wobble is actually good as it knocks the caliper pistons back a tad minimizing pad wear.

-Rick Patton

Subject: Brake rotor run out
Date: Thu, 14 Jun 2007
From: Doug Hamilton <douglasehamilton@shaw.ca>

Check around at various shops in your area, the shop I take my cars to locally has machine that turns the rotors on the hub of the car. When I saw this machine in action on my wife's car I asked the owner about it he said he was really happy with it. He has never had a customer come back with pulsing brakes with this new machine.

-Doug Hamilton

Brakes/Front/Rotors

Subject: Directional brake rotors
Date: Wed, 12 Nov 2008
From: Joe Merone <jmerone@rocketmail.com>

All:
I've just received my new drilled and slotted TRW brake rotors. They look cool enough, and will be even better once installed with the other brake toys I just bought. But - they're directional.

Which way do the slots (//) point? My guess is that for the passenger side it's: // > front of vehicle.

Correct?
-Joe Merone

Subject: Directional brake rotors
Date: Wed, 12 Nov 2008
From: <ZinkZ10C@aol.com>

From what recall (and using logic) the outer edge of the slots should face the rear. (Passenger side, visible part of the rotor looking at the top of the rotor \\ \)

The slots are there to let gas/dust escape from the pad/rotor interface. When the rotor is spinning you want the stuff to escape the rotor rather than being drawn into the center.
-Harold

Brakes/Front/Rotors

Subject: Rotor Thickness
Date: Tue, 28 May 2002
From: <WBabbitt@aol.com>

<Bwfox@aol.com> writes:

- > Listerati:
- > What is the minimum safe thickness for TR4A brake rotors?
- > -Barry Fox

My new TR4A rotors (I believe they came from TRF) have a minimum thickness of 11.4 mm stamped on them. According to the Bentley Manual, minimum thickness is **11.18 mm**. You pick it,
-Bill Babbitt

Brakes/Front/Rotors

Subject: TR3A & TR6 rotors
Date: Thu, 13 Jan 2000
From: Angelo Graham <a3graham@admmail.uwaterloo.ca>

Hello List:

Does anyone have an idea on the differences between a TR3A rotor using the 2nd generation Girling caliper without the bridge pipe and the rotors fitted to the 4A's & 6's. These rotors, if I understand, fit the later Girling (3rd.generation?) caliper. What about interchangeability? Has anyone fitted these rotors to a 3A? Thickness is the same; diameter a problem? These are much less expensive than the 3A rotors listed by the usual sources and are often available from North American made sources.

Thanks in advance for any help in this.

-Angelo Graham

Subject: Rotors
Date: Thu, 13 Jan 2000
From: <N197TR4@cs.com>

Angelo,

I converted my TR3A over to TR6 Calipers and rotors.

I had a choice of rebuilding my TR3A calipers or taking my TR6 components off of the shelf, as they were already freshly restored.

You need the TR4-6 rotors which are smaller in diameter, the calipers as they match the diameter of the rotors, and the mounting brackets...and dust shield if you choose to use them.

I removed a very good set of TR3A rotors, freshly turned, and measure .500 in thickness. Includes is stripped , primed and painted dust shields. I also have the hubs with recent bearings. They are available for sale.

-Joe Alexander

Brakes/Front/Rotors

Subject: TR-3A Brake rotors
Date: Thu, 13 Nov 2008
From: William McLeod <wbmcleod@gmail.com>

Could someone tell me the correct thickness limits of the TR-3 brake rotors? Thanks,
-Bill

Subject: Tr-3A Brake rotors
Date: Thu, 13 Nov 2008
From: "Randall" <tr3driver@ca.rr.com>

> Could someone tell me the correct thickness limits of the TR-3 brake rotors?

As I recall, there was no clearly defined wear limit given (this was before the days when such things were required by law). However, the discs are about .500" new, and the workshop manual says not to remove more than .060", so presumably **.440" is minimum thickness** for a rotor to be installed.

However, I've seen people run them much thinner, with no apparent problems.
-Randall

Brakes/Front/Rotors

Subject: TR4 Brake Rotor Thickness?
Date: Fri, 8 Sep 2000
From: <CarlSereda@aol.com>

Hi List,

Anyone know brand new thickness on front brake rotors for TR4, 4-A, 250 and 6?

I know you can turn them down to .440" but I can't find anywhere what thickness they were as new (.550" ??)
-Carl Sereda

Subject: TR4 Brake Rotor Thickness?
Date: Thu, 07 Sep 2000
From: Brian Kemp <bk13@earthlink.net>

I just happen to a brand new pair of rotors for my TR6 on my living room floor. One is 0.504 inches thick and the other is 0.506". Right about 1/2" if you measure with regular tools. I guess that is close enough for the new Italian made rotors from TRF. I can even read the minimum thickness on the side - 11.4 mm. -Brian Kemp

Subject: TR4 Brake Rotor Thickness?
Date: Thu, 07 Sep 2000
From: "Michael D. Porter" <mporter@zianet.com>

Important to note, that there are still more than a few metrically-challenged mechanics running brake lathes out there. So it should be said that the 11.4 mm printed on these rotors indicates a minimum thickness of 0.448".
-Michael D. Porter

Brakes/Front/Rotors

Subject: TR4 Brakes - 2 Questions
Date: Tue, 30 Apr 2002
From: Irv Korey <emanteno@attglobal.net>

Randall Young wrote:

>> When the TR4 sits overnight the first push of the brake pedal is very soft. Not all the way to the floor but
>> definitely a long stroke. The second push and all thereafter are short and firm.

>I'm having a really tough time thinking of an explanation for that one, best I can do is a partially stuck caliper
> piston that slowly returns farther than it should. An even remoter possibility is a MC push Rod that is a little
> bit long (or a sticking pedal that is holding the push Rod into the MC), but I think you would notice other
> problems (like the brakes dragging after you'd driven a bit).

How about if he has to make a sharp turn into the driveway and he is experiencing the dreaded pad knock back?
Of course, once he brakes to a stop in the driveway, that should reset the pads, but if he only needs light
pressure to stop in the drive (uphill for example), then the first push in the AM would be a long one.

IF it is the dreaded pad knock back, you will need to check your wheel bearings for wear and adjustment, the
thickness of your rotors, and the condition of your pads.

-Irv Korey

Subject: TR4 Brakes - 2 Questions
Date: Tue, 30 Apr 2002
From: john donnelly <pdonnell@san.rr.com>

Hey Geo,

Sometimes we look too hard and miss the obvious. I had the same experience after my restoration. The brake
pedal seemed mushy the first try. Afterwards it felt fine, at least for another few miles.

Someone told me it was air in the line. Another suggested it was the DOT 5 fluid, so I painstakingly bled the
lines making sure I didn't agitate the fluid.

It turned out that the rear brake drums weren't adjusted correctly. I reset those and now it's rock solid. Back to
the basics.

-John

Subject: TR4 Brakes - 2 Questions
Date: Wed, 01 May 2002
From: <pmmacy@att.net>

George:

If you want to eliminate the dust, I highly recommend the Kevlar pads (and rear shoes) from Ted Schumacher at
TSI. I've been using them for 4 years now, and only cleaned my wires once. No adverse effects on braking
efficiency either. NFI.

-Mark Macy

Brakes/Front/Rotors

Subject: Ventilated Front Discs
Date: Mon, 12 Apr 2004
From: "Hugh Barber" <tr6nut@sbcglobal.net>

TJ Wrote:

>Someone mentioned using ventilated discs with the Toyota front caliper conversion, but I don't recall seeing
> any details. I may soon be looking at a 59 TR3 project and would like to see what is involved.

TJ,

The vented rotor conversion uses rotors from a Toyota Cressida. The inner hole of the Toyota rotors needs to be machined to 3.125". The bolt holes in the Cressida rotors are the same as the TR rotor and do not need modifying. The Toyota calipers are 4-piston units from a 4 cylinder Toyota 4-runner. They look the same as the non-vented Toyota calipers used in the conversion listed on the VTR website (which happens to be down as of this writing); they're just wider to fit the vented rotors. Part numbers are as follows:

Rotors- Aimco 3247: 1986-1988 Toyota Cressida Front Rotor (Sedan Only)
Alternate Part Numbers; Raybestos 96042, Bendix 141410

Calipers- Fenco C8554, C8555: 1988-mid 1989 Toyota 4-Runner, 4WD, 4Cyl
Alternate Part Numbers: Cardone 19-827, 19-826

You may also need to purchase a fitting kit (pins, shims, etc) for the calipers and brake pads. The installation is the same as for the non-vented conversion at:

<http://www.cs.du.edu/~ljanssen/tr6_brake_install.html>

Sometimes you will need some thin AN washers to shim the caliper (center it on the disk). Some installs need the shims, some don't.

If you have access to the 6-pack website, there are some photos of the conversion on my TR6.
-Hugh Barber

Brakes/Lines & Peddle & Linkage/Lines

Subject: Brake lines
Date: Sat, 16 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

Cliff:

I believe most of the fittings are "standard", I've been able to buy them at local parts stores (usually as 'British' brake fittings). Compare the new ones to old ones carefully, in particular watch that the threads on the inverted flare nuts do not extend to the end of the nut. That blank area is important, without it the fitting may not seal, or worse break the cylinder.

This is obviously a critical area, I urge you to be cautious. Only use parts designated for brake systems and no 'sealers'. Anti-seize is OK, especially on steel nuts that mate with aluminum fittings, but be sure none of it gets inside where it can touch the brake fluid.

Randall Young

-
- > I am considering making my own brake lines for my 73 TR6. I can pick up the 3/16 tubing at the local Auto
 - > parts store and I have the flaring tool for 3/16. Are the fittings standard or do I need to get them from a
 - > specialty shop? Any BTDT advice would be helpful.
 - > Thanks,
 - > - Cliff

Brakes/Lines & Peddle & Linkage/Lines

Subject: Brakes locking up
Date: Sun, 17 Feb 2002
From: "Roger Colson" <sassamon@mediaone.net>

Hi Jack,

I had a similar problem with my TR3. All new brake parts except for the caliper bodies and the restrictor valve.

The best of several correct responses from the list was from Shayne Peterson which I have copied here with my original post.

The problem was that the master cylinder push rod was adjusted with negative play. This would keep the pressure in the brake line and lock up the brakes.

My recommendation would be to check the push rod. By the way the most important part of the car is correctly operating brakes.

Subject: Brake binding problem
Date: Sun, 11 Jun 2000
From: PETERSON SHAYNE <triumph-tr4@home.com>

-----Original Message-----

Roger Colson wrote:

- > Hello fellow listers,
- > I am now able to drive my TR3 under its own power. Spent most of the morning adjusting the mixture.
- > Some first timer mistakes slowed me down.
- >
- > A major problem is that I believe the brakes appear to be locking up after a short trip. After about 200 feet
- > they start to bind and then shortly thereafter the engine bogs down trying to move the car. After waiting the
- > car will roll again but then go through the same routine.
- >
- > Last time I noticed that the brake pedal was hard, so I looked and the brake lights were on. So I opened one
- > of the caliper bleeders and a small amount of brake fluid spouted out. I was then able to get the car back in the
- > garage.
- >
- > The brakes have been done over this winter. New master cylinder, rebuilt calipers with SS pistons, New
- > pads, SS hard lines, SS braided hoses, New rear cylinders, New rear shoes. The rotors were fine, with lots
- > of metal left, and the drums were like new.
- >
- > What I would like help with is in trying to diagnose and repair this problem.
- >
- > What would cause the brake pressure to build up? Several times I did not even touch the brake pedal.
- >
- > What I plan on checking is:
- > What appears to be rubbing. Could the pads be too thick? The rotors were hardly worn. The pads were a
- > little snug when installing.
- >
- > Could the caliper be off center? Forcing one pad to always be in contact?
- >
- > I will re-check the rear brake adjustment.
- >
- > Is there freedom of movement in the hand brake pawls with the hand brake off?
- >
- > If I need to, I will pull the rotor and have it checked for trueness
- >

- > I won't be able to get to the car until Tuesday evening. So I can read responses sent directly to the list in the
- > list digest.
- > -Roger Colson

I have never had this problem, nor have I ever even diagnosed it, therefore, I may be way off base.

I believe this problem crossed the list a little while ago and it was caused by the master cylinder not returning to the 'home' position fully. This would make sense, as the reservoir would not be open to the loop and the pressure would not bleed out of the system properly. The pressure would also increase as friction induced heat increased from the pads rubbing on the rotors.

If others on the list could throw in their \$.02, to verify my diagnosis, it would be a much appreciated sign that I am beginning to get the hang of this stuff (all things lbc).

-Shayne Peterson

Brakes/Lines & Peddle & Linkage/Lines

Subject: Flare instructions for Hydraulic Lines
Date: Sat, 22 Dec 2007
From: "Chris Simonsen" <ccsimonsen@gmail.c>

Tom white tswHITEz123@hotmail.com wrote:

When I look at an inverted flare (American) I can clearly see that the metal is doubled over on itself. I have never been able to figure out this with a flaring toll and new line. I always end up with a flare that is single layer metal and they rarely hold pressure. Can someone explain to me the procedure for making a doubled over inverted flare with a flaring tool?

-Tom

<<http://www.carcraft.com/howto/50919/index.html>>

I hope this helps!!!

Subject: Flare instructions
Date: Sat, 22 Dec 2007
From: "Randall" <tr3driver@ca.rr.com>

> When I look at an inverted flare American) I can clearly see that the metal is doubled over on itself. I have
> never been able to figure out how to do this with a flaring tool and new line.

It requires a special tool; an ordinary plumbing flaring tool will not do. The directions should come with the tool. Generally, you have to square, deburr and then file a chamfer on the end of the line. Then for the kit I used, you mount the line in the tool and use a special die to crush the end into a bubble shape. Then remove the die and use what amounts to an ordinary flaring tool to crush the bubble into a double flare.

I found this nearly impossible on pre-cut lines from the local auto parts store ... I'm told it's much easier if you start with 'virgin' brake line which apparently is softer. But since pre-flared lines are available for the TR2-6, I would suggest going that way if at all possible.

-Randall

Brakes/Lines & Peddle & Linkage/Lines

Subject: TR3A Hydraulic lines to brake reservoir?
Date: Mon, 13 Aug 2007
From: "Steve Ball" <banjonut@verizon.net>

OK everybody....on a TR3A, what's the trick to bending the short brake lines that run from the master cylinders to the fluid reservoir? I got new lines from Moss (1/4" stuff), but they're so stiff I can't bend them without getting a horrible looking line full of kinks and dents. I have tried 3 different bending tools and a lot of patience, wore my fingers out, and I still had no luck....there are some tight bends in those lines. Is there better material...something that's a little softer and easier to bend? Or maybe somebody has a "secret method" to bend these things without collapsing them?

Fill 'em with sand first?
-Steve Ball

Subject: TR3A Hydraulic lines to brake reservoir?
Date: Tue, 14 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

"Steve Ball" <banjonut@verizon.net> wrote:

> OK everybody....on a TR3A, what's the trick to bending the short brake lines that run from the master
> cylinders to the fluid reservoir?

- 1) Buy them pre-bent from TRF.
- 2) Buy Cunifer (copper-nickel alloy) lines, they are much softer and easier to bend with your fingers. (But don't try to use ordinary copper or anything not designed for brake system service.)
- 3) I have a very small diameter tubing bender, with a notch cut to receive the tubing nut, but I have no idea where to find another one like it (and you can't have mine).

I've never had any luck with the sand approach, but maybe that's just me. Bought some of those springs that slip over the outside, but so far I've only tried them on much larger steel tubing (1/2"). They helped some, but were a pain to use.

-Randall

Subject: TR3A Hydraulic lines to brake reservoir?
Date: Tue, 14 Aug 2007
From: <banjonut@verizon.net>

Thanks again to this list for helping me solve the mystery of the hydraulic lines on my TR3A. I heard from several of you with good information, and I ended up ordering them pre-bent from TRF. I'll let you know how they fit in a few days....I hope this is the final solution.

I appreciate all the good information. Once again, this list comes through for us when we need it!
-Steve

Brakes/Lines & Peddle & Linkage/Lines/ Peddle & Linkage

Brakes/Master Cylinder/Master Cylinder

Subject: Brake cylinders
Date: Wed, 27 Jan 2010
From: <wbeech@flash.net>

-----Original Message-----

Subject: Brake cylinders
Date: Wednesday, January 27, 2010
From: <triumphs-bounces@autox.team.net>

Do brake cylinders go bad slowly? Without leaking? or Are they more like a switch - either they work or don't?
-Oliver

Typically they would go slowly as the parts wear. This, of course, would be in the absence of any traumatic outside forces.

Symptoms might be:

1. Noticing the pedal slowly going down as you are holding the brake firmly, as if you were at a stoplight on a hill. (You probably need to rebuild a cylinder or look for visible sign of a leak)
2. Or, the pedal goes down a little further than it used to before you have good braking action. (It could be fluid or adjustment is needed)
3. Or, you find you need a second pump of the brakes to get a good stop (this is when it is time to quit driving and get it fixed now!) This was my case but fortunately I found that it was just adjustment of the stroke of the rod in the master cylinder that corrected it.

Brakes are nothing to fool with if you are not 100% competent in this area, take it to a professional and get them look at.

The opinions express here are my own.
-Bill

Brakes/Master Cylinder/Master Cylinder

Subject: No brakes
Date: Sun, 13 Apr 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I came up to a light and luckily no one was in front of me...it was brake fade personified. The pedal went half
> way to the floor and finally all the way to the floor, I did get it home pumping the brakes. Help me diagnose
> this...I have a full reservoir of fluid. Is it the brake master cylinder?

There is a spring inside the MC that can break and cause this symptom. Last time I looked, no one listed this spring for the TR3A, however [Moss P/N 582-065](#) will work. Given the relative costs, and how easy and simple the TR3A MC is, I would certainly suggest rebuilding it yourself. Get the rebuild kit and replace all the parts that come in it as well, while you have it apart.

> If it is should I buy a replacement, what should I know about replacing it and I assume I have to bleed the
> master cylinder, I know how to do the brake cylinders but not the master.

If you fill the MC with fluid on the bench before installing it, you shouldn't need to bleed it very much after installation. It's been my experience that I can usually get the air out by pumping up the brakes and holding the pedal down for 10-15 seconds, then releasing it. I repeat this 3 or 4 times until I get good pedal on the first stroke.

However if you do find you need to bleed the MC, start by using the nut on the outlet as a bleed valve, ie loosen the nut, have someone depress and hold the pedal, then tighten the nut. Repeat until no more bubbles show up. Then you may have to bleed through to the slave cylinders.

-Randall

Subject: TR3a master cyl springs
Date: Tue, 16 May 2006
From: "Randall" <tr3driver@comcast.net>

> A few years back I had my clutch and brake master cylinders rebuilt by White Post. When they came back
> they were missing the springs. No luck at the time getting them back...anyone know of a source for these?

Jim, are you talking about [Moss 582-065](#)? They're still listed on the web site, although the price has gone up somewhat since I bought mine.

The little wavy spring should be in the rebuild kit, I've never seen it sold separately.

Sorry, Bill, none of my Girling references lists just the spring.

-Randall

Brakes/Master Cylinder/Master Cylinder

Subject: Retrofitting a dual circuit brake master cylinder to a TR4A
Date: Sun, 25 Jun 2006
From: <emanteno@comcast.net>

From: "Dave Connitt" <dconnitt@fuse.net> wrote:

> List,
> I ran across this racing TR4A on E-bay yesterday which seems to have been fitted with a TR6 brake master
> cylinder. It appears to not have a brake booster installed. I contacted the seller to find out how he did it but
> have not received a response yet.

This is a mod that has been done to several race prepped TR4's. It is a "relatively" easy and "relatively cheap" way to get a dual circuit brake master cylinder in the car, which is required by most vintage race organizations. The conversion requires a complete TR250/TR6 pedal assembly and the TR250/TR6 clutch master cylinder in addition to the brake master and booster. I have seen this done with and without the power booster. After racing several seasons with the booster, I chose to replace that set up with twin master cylinders and a balance bar on my TR4, it was too difficult to modulate the brakes under racing conditions with the booster (too easy to lock up a wheel and flat spot an expensive racing tire). On the street however, this would make a nice conversion. You will also have to cut a large diameter hole in the firewall for the brake master, as well as a smaller one for the clutch master. Those who have done this conversion without the power booster report that the pedal pressure required to stop the car is extreme. This wouldn't be bad during a 20-30 minute race, but would probably be less than optimum for a street driven car.

-Irv Korey

Subject: Retrofitting a dual circuit brake master cylinder to a TR4A
Date: Mon, 26 Jun 2006
From: "Todd Bermudez" <red_tr250@hotmail.com>

Dave,

Yep, a brake booster will bolt right up AFTER you drill the 4 holes & the big one in the center for the big rubber boot & push rod to come through the firewall...oh and don't forget about the aluminum spacer between the booster & firewall...it's about 3/4" thick.

I have lots of rebuild able boosters so come by & see me. You can always make a rubbing off one of my 250s or TR6s...all the same.

-Todd Bermudez

Brakes/Master Cylinder/Switch

Brakes/Rear/Drums

Subject: 4 Wheel disc brake conversion
Date: Mon, 03 May 1999
From: "Terry & Cindy O'Beirne" <esp@hypermax.net.au>

I have done a rear disc conversion on our race T2500 sedan which uses an identical rear end to the TR6.

We used Australian Nissan (datsun) parts because it meant the stud pattern through the disc was the same as triumph. maybe some export Datsuns/Nissans use the same bit but I would have to check. As an engineer it did not take much trouble to get our conversion also approved for road use by the local authorities. The trickiest parts are the design of the hub to caliper mount (to stop it flexing) and neat attachment of the handbrake cable. No problems with it in several seasons racing.

We run these in conjunction with porsche front discs & 4 pot calipers.

If there was enough interest I would make up some kits. Anyone wanting a kit could email me , but this would have to be a private commercial activity and thus kept off the list.

-Terry O'Beirne

Brakes/Rear/Drums

Subject: TR3A Brake Drum Screw Size
Date: Sat, 9 Feb 2002
From: "Randall Young" <ryoung@navcomtech.com>

> I want to use stainless with Robertson heads, if I can find them, but my car came without any at all, so I don't
> know the size. Can someone advise?

I believe they are 1/4-28. Even with stainless, I'd still use anti-seize ...
-Randall

Brakes/Rear/Drums

Subject: Brake Rotor & Drum Wear on TR6
Date: Sat, 16 Nov 2002
From: "Randall Young" <ryoung@navcomtech.com>

> What are the specs for brake rotor and drum wear on a TR6 - how thin can they get before they have to be
> replaced? The car I have just started on has surprisingly smooth-looking drums and rotors. At first glance they
> look usable. I thought the Bentley book would tell me, but I can't find it. Maybe I'm looking in the wrong
> places. Is there another book that has this kind of information in it?

Dave, I never did see a reply to this, so I looked it up. My Chilton's gives .460" as the minimum thickness for the rotors. However, the Haynes says .060" wear is permissible (and we decided the original thickness was .500" in a long ago thread). I guess you can take your pick. I've seen people drive with rotors much thinner than that, with no apparent problem (not that I'm recommending such a thing, just observing).

I've got an original Standpart TR6 drum that says max diameter 9.040"
-Randall

Brakes/Rear/Drums

Subject: Modifying Old Datsun Brake Drums
Date: Mon, 30 Jun 2003
From: <Rikrock@aol.com>

<sdtilton@yahoo.com> writes:

> Hey guys,
> I've had some old Datsun 240Z finned aluminum brake drums in my possession for a number of years.
>
> I never got around to modifying them to fit on one of the TRs (4 or 6). I actually thought I'd just break down
> and go buy new ones that were machined to fit the TR.
>
> Being a non-mandatory repair (the cast iron TR drums work fine after all), that plan also got sidetracked.
>
> So anyway, I finally had an opportunity to put these suckers up on a lathe and modify them. I opened up the
> center hole to fit the Triumph hub. I kept it very close so the hub should center the drum and I won't bother
> with the little screws.
>
> I also enlarged the groove around the rim to allow it to wrap around the triumph back plate.
>
> I thought I was all set until I went to fit them up . . .
>
> Turns out the outer edge of the brake shoes are actually bottoming out on the inside face of the aluminum
> drum before it is seated all the way against the hub. BUMMER!
>
> I can see that the Datsun drums actually have a circular recessed section machined about .070" into the inside
> face of the aluminum drum.
>
> I can only guess that if this recession weren't there. . . they'd fit okay. Maybe the new drums that can be
> bought pre-machined for the Triumph application don't have this recession.
>
> So I guess I could look into getting a thin spacer made to go between the drum and the hub and fill this
> recessed area.
>
> I was wondering if anyone who had fit Datsun drums to their car had to go through the same thing?
>-Scott

Scott,

I have never had this problem with Datsun drums. Are you certain that the brake shoes are causing the problem? Aside from the mods you mention, I have always found it necessary to enlarge the holes for the wheel studs.

-Rich Rock

Brakes/Rear/Drums

Subject: TR4 -> 4/A Rear Brake Drum Differences
Date: Thu, 14 Aug 2003
From: <CarlSereda@aol.com>

Randall,

Do you know what the difference between a TR4 and a TR4-A rear brake drum is? I'm wondering if a simple modification at home or expensive machine shop work is required to fit them to my TR4.

Carl

>> (Note that TR4A IRS - TR6 drums will not fit without modification.)

Subject: TR4 -> 4/A Rear Brake Drum differences
Date: Thu, 14 Aug 2003
From: "Randall" <ryoung@navcomtech.com>

> Randall,

> Do you know what the difference between a TR4 and a TR4-A rear brake drum is?

I know the wheel stud holes are larger on the TR3/4 drum, because the studs for the solid axle cars screw in from the wheel side and have a flange at the base of the stud that the drum must fit over. I'm not certain whether the offset is different or not, but it might be.

-Randall

Brakes/Rear/Emergency Handbrake

Subject: Fly-off Handbrake
Date: Mon, 6 Dec 2004
From: Chris Kantarjiev <cak@dimebank.com>

A well-timed grab of the brake to lock up the rears is a time-tested technique, still used today at the highest levels of rally competition. Those fancy WRC cars with all wheel drive have their brake handles rigged in fly-off (or no lock at all), and typically have a mechanism built in to disable the center differential when the lever is lifted.

The short lever of the 4A provides less mechanical advantage than you might like. This is exacerbated by the need to adjust the brakes such that the lever engages them after only a few clicks. I often end up using both hands to pull up when I need it to really stick.

Adjustment and lubrication is the key. The cables need to slide freely in their housings, and the slack in the cables should be removed at each wheel cylinder (once you take the wheel off, it will be obvious which nut to fiddle). Then adjust the rear brakes. I've tried several methods, and have come to like this one best:

Set the handbrake up three clicks. Set the rear brake adjusters so the drum won't move under full hand pressure. Release the handle, the drums should spin freely. You're done.

I find this much more satisfying than the "tighten until resistance is felt and then back off", especially since it doesn't allow you to get the handbrake adjusted correctly.

-Chris

Brakes/Rear/Emergency Handbrake

Subject: TR4 Handbrake
Date: Wed, 26 Jul 2006
From: Bob Labuz

isharkey wrote:

- > I am cleaning/inspecting/repairing/replacing anything that might prevent the "barn find" from stopping once I
- > get it going. I am now into the handbrake and all is coming apart nicely. However, the cable compensator has
- > got me puzzled.
- >
- > Firstly, should it swivel horizontally AND rotationally? The forward zerk fitting and grease seal suggests that
- > it should, but it only moves horizontally. Also, it looks like you should be able to remove it, but I have to
- > admit to being stumped as to how? Any light on this would be appreciated.
- > -Ian

Ian,
Yes it rotates on both axis. It is removed by unscrewing the assembly from the base welded to the rear axle.

On my project, the assembly would not turn... So after some heat and pp blaster it finally turned and I was able to remove, clean and reassemble with plenty of grease. Now it moves in both directions with ease.

Good luck and use plenty of pp blaster. You don't want to break it off.

I am guessing the reason it won't turn is it was never greased even though there are fittings in both screws.
-Bob

Subject: TR4 Handbrake
Date: Wed, 26 Jul 2006
From: "Randall"

- > Firstly, should it swivel horizontally AND rotationally?

YES! The 3-fingered lever turns around its axis to apply the brakes, while the right angle bar that it's attached to turns in the housing on the axle to compensate for brake wear.

- > Also, it looks like you should be able to remove it, but I have to admit to being stumped as to how? Any light
- > on this would be appreciated.

ISTR it unscrews, but I forget just how.
-Randall

Brakes/Rear/Wheel Cylinders

Subject: 3/4" vs. 0.70" rear cylinders on TR3
Date: Mon, 13 Dec 1999
From: Randall <randallyoung@earthlink.net>

Jim :

According to the latest Moss catalog :

- 1) Both .75" cylinders and rebuild kits are available
- 2) .75" was used on TR4 to roughly CT5700, **.70" after that**. So the .70" was used for the majority of TR4, and all of 4A, 5, 250, and 6 production. Probably other cars as well.

Note that other factors also affect brake balance : front caliper style, rotor diameter, drum diameter, pad/shoe material, etc.

-Randall

Brakes: Rear -Wheel Cylinders

Subject: TR3b brakes - broken bleed nipple
Date: Sun, 21 May 2000
From: Randall <randallyoung@earthlink.net>

Richard White wrote:

> Lister,
> Two weeks ago I found enough nerve to try starting my B after about seven year "rest". I have the engine
> running, no real problems just a stuck float and a couple of carb gaskets. Today I tried to bleed the
> brakes and now I need some advice.
>
> Both rear bleeder nipples were stuck. The DCO, me, proceeded to break one of them. It's broken even
> with the wheel cylinder.
>
> How do I fix the broken one? Do I need to just replace the wheel cylinder?
> How do I get the other one out with out breaking it.
> -Rich White

Rich,

Since the bleed screw (as well as the pipe nut) is steel, but the cylinder is aluminum, heat works very well. Remove the piston, seal and dust cover, as well as the rubber dust cover around the e-brake lever, then heat the threaded part of the cylinder with a propane torch.

For the nipple that's already broken, get an "Eazy-out" the right size to fit the hole, and turn gently! While heating the cylinder. It may take a few minutes, but when the cylinder gets hot enough, the nipple will be loose.

Don't worry, a propane torch won't get things hot enough to hurt anything here, although you might want to have a fire extinguisher handy, in case you get a grease fire started.

-Randall

Brakes\Rear\Wheel Cylinders

Subject: Rear brake cylinder installation kit question
Date: Sat, 27 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

<dconnitt@fuse.net> wrote:

> I am getting ready to install new rear brake cylinders in my TR4A and looking at the contents of the
> installation kit, there is a small pouch of grease. I assume this grease is to lube the fulcrum point of the safety
> brake arm but can I also use this to lube the adjuster? If I am totally wrong, where is it used?

Can't lay my hands on them at the moment, but ISTR the Girling instructions say to put the contents of that pouch inside the boot on the piston. Where the cylinder rides on the back plate, the handbrake pivot, the adjuster and where the shoes touch the backplate are to be lubricated with 'white' lithium grease, not included.

The pouch is a special 'red' grease, that isn't very good grease (IMO) but is compatible with brake fluid and won't attack and soften the seals as regular grease can.

Since I use silicone brake fluid, I use silicone grease instead. It doesn't dry up and turn to sand like the red grease does over time.

-Randall

Subject: Rear brake cylinder installation kit question
Date: Sat, 27 Sep 2008
From: "Brian Induni" <308gtsi@roadrunner.com>

Dave,

The grease is for the inside of the outer rubber cup/dust seal. It helps seal out moisture and dust from the area between the piston and the outer seal. **DO NOT PUT ANY INSIDE THE HYDRAULIC CYLINDER!** But you knew that... right? :-)

-Brian

Subject: Rear brake cylinder installation kit question
Date: Sat, 27 Sep 2008
From: "Ed Woods" <fogbro1@comcast.net>

The GREEN Girling grease, "Mechanical", if included, is intended for: "where the cylinder rides on the back plate, the handbrake pivot, the adjuster and where the shoes touch the backplate..."

Brakes\Rear\Wheel Cylinders

Subject: TR6 Rear Wheel Cylinders
Date: Wed, 3 Apr 2002
From: Dave Massey <105671.471@compuserve.com>

"Cliff Davies" Wrote:

>Could anyone please give me instructions on how to install the dust cover and three clips that hold the wheel
> cylinder to the back plate. I just bought a new kit and the old was not installed correctly. I have followed the
> Haynes manual but there must be a trick so that the cover lives through the process.
>-Cliff

Cliff, having just installed these on my TR3 this past weekend (it's been 6 years since I did this on the TR6) it is fairly straight forward but there are a few tricks:

1) First of all, you can install two of the clips and still pull the cylinder away from the backing plate far enough to install the parking brake lever - and it is much easier to install the two clips that install from that side with the lever out of the way.

2) Smear the clips with a thin layer of grease so that they will slide into place more easily - and they will not rust quite so quickly.

3) Test position the cylinder and parking brake lever to become familiar with how they fit.

Procedure:

1) Position the wheel cylinder in place and slide the large clip with the two folded up tips into place from the parking brake lever end with the tips pointing out. Slide the smallest clip in from the same end with its tips out as well.

2) Pull the cylinder away from the backing plate far enough to slide the parking brake lever pivot pins into the recess provided for it. Make sure it is facing the right way. Slide the boot over the lever and fit the rectangular loop around the lower clip.

3) Slide the remaining clip from the opposite direction until the two tips on the lower clip engage the relieved areas in this last clip and everything will be locked into place. C'est fini!

-Dave Massey

Subject: TR3 Rear Wheel Cylinder retaining plate
Date: Sun, 31 Aug 2003
From: <pmmacy@att.net>

Terry:

Put the rubber boot on LAST, after all 3 metal pieces are in place. The "distance piece" (middle of the 3) is larger than the bottom retaining plate and stands off from the backing plate enough for the "rim" of the rubber boot to slip underneath.

Randall was correct on the order of assembly. I normally slip the retaining plate (bottom piece) on first, positioned with the opening forward and the prongs pointing up away from the backing plate. This is nearly impossible to do with the handbrake lever in place, so pop the handbrake arm into place AFTER the retaining plate is loosely in position. Next comes the spring plate, also with the prongs pointed "up" and facing forward like the retaining plate. Drive the distance piece in between the first 2 from front to rear (opening toward the handbrake lever and opposite direction from the other 2). Then pop the rubber boot over the whole works.

-Mark Macy

Brakes\Rear\Wheel Cylinders

Subject: Replacing rear brake cyls.

Date: Sat, 22 Nov 2008

From: <DLylis@aol.com>

Tom wrote:

> I'm installing new rear brake cylinders in our 76 TR6, and having a difficult time getting the springy locking
> plates inserted between the backing plate and the cylinder with the E-brake lever blocking access. Anyone
> have any tips from personal experience in refitting these things?

I found that putting the smallest one with the locking hooks on first is the answer. Then the flat one that goes against the backing plate and then tap in the one with the small hooks. Put a little grease on these as they want to be able to move to center the cylinder as the shoes bed in.

-David Lylis

Subject: Replacing rear brake cyls.

Date: Sat, 22 Nov 2008

From: "Ed Woods" <fogbro1@comcast.net>

With all due respect, the Danielson method is doing it the hard way. The three pieces are orientated properly in the photos, but the order of assembly should be:

1. Insert the long piece, with the locking tabs up, from the brake lever side.
2. Insert the shortest piece, also from the brake lever side
3. Insert the brake lever
4. Insert the remaining long piece between the first two pieces from the side opposite the brake lever until the tabs from the bottom piece lock in place. You'll have to tap it home with a light hammer and a punch or screw driver.
5. Install the dust cover. It does NOT go between the 1st plate and the backing plate, but fits the periphery of the 3 plate assembly. If it was placed under the first plate, it would prevent the assembly from sliding along the backing plate easily.

And, yes, rubber grease, Girling green or equivalent, should be used throughout, especially between the brake cylinder and the backing plate.

-Ed Woods

Subject: Replacing rear brake cyls

Date: Sat, 22 Nov 2008

From: "Randall" <tr3driver@ca.rr.com>

Tom wrote:

> I'm installing new rear brake cylinders in our 76 TR6, and having a difficult time getting the springy locking
> plates inserted between the backing plate and the cylinder with the E-brake lever blocking access. Anyone
> have any tips from personal experience in refitting these things?

Many of the books have an incorrect illustration of how the plates go; plus I believe Bob has the sequence wrong.

What I do is leave the brake lever off while installing first the smallest plate (with the open side away from the lever and the bent tips away from the backing plate) and then the larger plate with the bent tips in the same orientation (between the smaller one and the backing plate). That leaves enough slack that you can now install the handbrake lever with a moderate amount of force. Then drive the third plate (the large flat one) into place between the first two plates, from the side away from the handbrake lever. Keep tapping on it until both of the

tabs from the other large plate drop into the slots.

-Randall

Subject: Replacing rear brake cyls
Date: Sat, 22 Nov 2008
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

-----Original Message-----

Subject: Replacing rear brake cyls.
Sent: Saturday, November 22, 2008
From: <triumphs-bounces@autox.team.net>

Bob Danielson wrote:

> > Or am I missing something?

Randall replied:

> I don't think you are missing anything ... this is one of the rare cases where I disagree with Nelson as well.
> Here's the text from the TR3 factory manual, that I believe is correct:
>
> (b) Refitting the Rear Wheel Cylinder
>
> Mount the wheel cylinder on to the backplate with the neck through the large slot. Replace the distance
> piece between cylinder neck and backplate, with the open end away from handbrake lever location. The two
> cranked lips must also be away from the backplate.
>
> Insert the spring plate between the distance piece and backplate, also with open end away from handbrake
> lever location and the two cranked lips away from the backplate.
>
> Replace handbrake lever. Locate the retaining plate between the distance piece and spring plate (open end
> towards the handbrake lever), tap into position until the two cranked tips of the spring plate locate in the
> retaining plate.
>
> Fit the rubber dust cover. Attach the pressure pipe union to the cylinder and connection to the handbrake
> lever. Replace the shoes, brake drum, and bleed the system. Finally re-fit wheels,
> -Randall

I just checked the Haynes manual which is useless.....basically says to remove the plates and installation is in the reverse order. So I checked the "TR6 Repair Operations Manual" that I have in PDF format and that says to do it in the same order as in the Buckeye article. Did something change from the TR3 to the TR6? All I care about is that my rear brakes are properly installed.

-Bob Danielson

Brakes\Rear\Wheel Cylinders

Subject: TR6 Rear Brake Upgrade (same as TR4A)
Date: Tue, 3 Jul 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Bob Lang just tipped me off to an easy brake upgrade for a TR6. Just drop in Sunbeam Alpine (.750 bore) or Morgan (.875 bore) rear wheel cylinders and you can get a pretty significant increase in rear wheel braking. Then I found this article <http://www.turbo-tr6.info/tr6_brake_install.html> which addressed both Bob's suggestion and the Toyota 4 pot front calipers.

My question is the price difference for the rear wheel cylinders for OEM (Morgan \$150 each Rebuilt S/S) and after market (\$30 each Alpine). That is a HUGE price spread. I don't mind spending more for quality but that seems a little much....so to speak.

Anyone have any experience with these and why the huge price difference? Thanks,
-Bob Danielson

Subject: TR6 Rear Brake Upgrade
Date: Tue, 03 Jul 2007
From: "Jack W. Drews" <vintr4@geneseo.net>

I would be very careful about increasing the stopping power of the rear brakes while not making a change to the front brakes. Too much braking on the rear can cause the car to want to swap ends under panic braking conditions. Ask any vintage TR racer.

I installed the Toyota 4-pot front brakes on my TR4 race car and ran it that way for three years. For 2007, the sanctioning body I run with made some rules changes and I had to remove those and go back to TR brakes to make it "era correct". My experience is that there is not much braking difference between the two setups. Although the originator of this conversion did some braking tests, the differences in stopping distances were really not very big.

Comparing the two calipers, the TR calipers are lighter (as if that really mattered much). The piston area of the Toyota calipers is larger, but the pad area is actually smaller than the TR brakes. So you takes your choice in regards to what is the most important.

Nevertheless, I liked the Toyota parts better, solely on the basis of higher quality replacement parts and longer intervals between having to rebuild the calipers. I felt that their "feel" under maximum braking was a little, but not much, better. Rebuild frequency isn't an issue on the street and stock parts have worked just fine for years on my street TR6, but on the race TR4 (virtually identical brakes as the TR6), the heat from the front brakes cooks the rubber parts in the front calipers. They become "well done" after three or four races and require replacement, always a lot of fun.

-uncle jack

Brakes/Trouble Shooting

Subject: Brakes Locking Up
Date: Sun, 17 Feb 2002
From: "Roger Colson" <sassamon@mediaone.net>

Hi Jack,

I had a similar problem with my TR3. All new brake parts except for the caliper bodies and the retractor valve.

The best of several correct responses from the list was from Shayne Peterson which I have copied here with my original post.

The problem was that the master cylinder push rod was adjusted with negative play. This would keep the pressure in the brake line and lock up the brakes.

My recommendation would be to check the push rod. By the way the most important part of the car is correctly operating brakes.

Subject: Brake binding problem
Date: Sun, 11 Jun 2000
From: PETERSON SHAYNE <triumph-tr4@home.com>

Roger Colson wrote:

- > Hello fellow listers,
- > I am now able to drive my TR3 under its own power. Spent most of the morning adjusting the mixture.
- > Some first timer mistakes slowed me down.
- >
- > A major problem is that I believe the brakes appear to be locking up after a short trip. After about 200 feet
- > they start to bind and then, shortly thereafter, the engine bogs down trying to move the car. After waiting the
- > car will roll again but then go through the same routine.

- > Last time I noticed that the brake pedal was hard, so I looked and the brake lights were on. So I opened one
- > of the caliper bleeders and a small amount of brake fluid spouted out. I was then able to get the car back in the
- > garage.
- >
- > The brakes have been done over this winter. New master cylinder, rebuilt calipers with SS pistons, New
- > pads, SS hard lines, SS braided hoses, New rear cylinders, New rear shoes. The rotors were fine, with lots
- > of metal left, and the drums were like new.
- >
- > What I would like help with is in trying to diagnose and repair this problem.
- >
- > What would cause the brake pressure to build up? Several times I did not even touch the brake pedal.
- >
- > What I plan on checking is:
- > What appears to be rubbing. Could the pads be too thick? The rotors were hardly worn. The pads were a
- > little snug when installing.
- >
- > Could the caliper be off center? Forcing one pad to always be in contact?
- >
- > I will re-check the rear brake adjustment.
- >
- > Is there freedom of movement in the hand brake pawls with the hand brake off?
- >
- > If I need to, I will pull the rotor and have it checked for trueness
- >

- > I won't be able to get to the car until Tuesday evening. So I can read responses sent directly to the list in the
- > list digest.
- > -Roger Colson

I have never had this problem, nor have I ever even diagnosed it, therefore, I may be way off base.

I believe this problem crossed the list a little while ago and it was caused by the master cylinder not returning to the 'home' position fully. This would make sense, as the reservoir would not be open to the loop and the pressure would not bleed out of the system properly. The pressure would also increase as friction induced heat increased from the pads rubbing on the rotors.

If others on the list could throw in their \$.02, to verify my diagnosis, it would be a much appreciated sign that I am beginning to get the hang of this stuff (all things lbc).

-Shayne Peterson

Clutch/Master/Slave Cylinder

Subject: TR3 Clutch Hydraulics working - finally
Date: Mon, 28 Feb 2000
From: <Jeff.A.Williamson@jci.com>

Last week, I sent a post asking for help with my clutch hydraulics problem. The freshly rebuilt clutch master cylinder did not appear to be drawing fluid from the reservoir. I received many suggestions from many of you. This weekend I finally found the problem, but not until I had to completely remove the master cylinder. After several hours of trouble-shooting, I finally figured out that the valve was not opening. The reason for this was that the valve/spring/cup assembly was not pushed all the way onto the plunger. Although it looked as though the locking tang on the cup was locked under the lip on the back of the plunger, it wasn't. It couldn't have been off more than 1mm. But it was just enough to allow the valve to remain closed at all times. Once I found and corrected this, problem solved.

I also finally broke down and got me one of those "EasyBleed" systems, so I was able to bleed the clutch myself after re-assembly, and finished bleeding the brakes. I now have a clutch that seems to be working! I'm nearing the end of a total restoration on this car, and since it hasn't been driven in 15 years, I couldn't wait to check things out. I've had the engine running already, but have not had the car moving under it's own power, nor had any clutch or brakes to this point. So, with the car still up on jacks, I cranked her up, pressed the clutch, shifted into first, released the clutch, and WOW. Everything seemed to work fine. The tranny is quiet, the clutch works smoothly, the brakes seemed to be working (although the rear brakes are dragging a bit), and I went from 0 to 60 in just a few seconds. Now I can't wait to see how well it'll do when it's not on jack stands !!!

-Jeff Williamson

Clutch/Master/Slave Cylinder

Subject: Clutch bleeding woes
Date: Sun, 26 May 2002
From: Bob Fabie <rmf3860@erols.com>

Lou:
You may have air in your clutch master cylinder. It's usually best to bench bleed it because the stroke of the clutch pedal does not move the master cylinder piston as far as you can when you do it by hand on the vise. This ensures that you get all the air out.

Bench bleeding is simple. Attach the M/C to your vise using one of the mounting flanges. Fill the reservoir. Push the plunger in all the way and hold it momentarily until you cover the exit hole with your finger. While holding your finger on the hole, release the plunger. Release your finger. Repeat three times. Don't let the reservoir get empty. Reinstall the M/C, and attach the hose to the slave cylinder. Open the bleeder on the slave cylinder and just let the fluid gravity flow until there is a solid stream of fluid and not air. I hope this solves your problem.
-Bob Fabie

Subject: Clutch bleeding woes
Date: Sun, 26 May 2002
From: "Randall Young" <ryoung@navcomtech.com>

Lou wrote:
> Toward the end of last year's driving season I found that I was topping up the clutch reservoir on the 4A about
> once a week. Found a leak in the slave cylinder but since it was the end of the season I kept filling it. As part
> of the 4A's welcome home present, I ordered a clutch slave cylinder kit from TRF. Disassemble and
> reassemble went well but I have spent the better part of today trying to bleed the system. I have pumped about
> a pint of Dot 4 through the system but still have a soft pedal. I am doing the assistant with the open bleeder on
> the down stroke into the "jam" jar with plastic hose all to no avail. Bleeder screw is on top, cup lip is toward
> the front and there is no leakage. I am stumped and frustrated because the weather here in North Indiana is
> beautiful. Any suggestions would be appreciated

Lou, try this. Might not work, but if not, you haven't lost anything but a couple of minutes time. With the bleed valves closed and the reservoir fairly full, 'Pump' the pedal several times and then hold it depressed for about 10-15 seconds. Let off and let it sit for another 10-15 seconds. Repeat the process 2 or 3 times or until you get good pedal. Works for me, every time.

This works the air backwards through the MC, so it's possible for the MC to become 'air locked'. If so (no pedal resistance at all), you can bleed right at the MC with it still on the car. Loosen the fitting, depress the pedal (since there's no pressure involved, you may be able to do this by pressing on the top of the lever under the hood), tighten the fitting. Repeat as necessary.
-Randall

Subject: Clutch bleeding woes
Date: Sun, 26 May 2002
From: "Peter Arakelian" <PeterAra@msn.com>

Might try holding the slave cylinder push Rod in the cylinder as far as you can push it before pressing on the pedal and opening the valve. This reduces the amount of available space inside the cylinder and will make getting any air out easier. Are you pushing the pedal too hard, too fast, too rapidly in succession? This might foam the fluid. Try letting it sit for a while - a few hours should do; then try again holding the Push Rod in while you bleed it.
-Peter Arakelian

Cosmo:

To bench bleed the master cylinder, the line has to be removed so that all you have is the master cylinder fastened to your vise. Then fill it with fluid. Push the plunger as far as possible (fluid will leak out of course). While holding the plunger in, cover the outlet hole with your finger and hold it. Release the plunger. Release your finger from the outlet hole. Add more fluid. Repeat the process three times. Don't let the reservoir get low. This will ensure that there is no air trapped in the master cylinder.

After you've done this, reinstall the M/C and reattach the hose, pipe and slave cylinder and let them dangle straight down. Now, open the bleeder valve on the slave cylinder and fluid will naturally (gravity) flow from the master cylinder to the slave cylinder. Ensure you keep topping off the reservoir with fluid. If you have the red color plastic hose, you can literally see air versus fluid. Just let it drain until there are no bubbles visible in the hose and an airless stream of fluid is coming out of the slave cylinder. This sounds more complicated than it is, but I hope it helps you.

-Bob Fabie

Subject: Clutch problem - TR4A, 1967
Date: Sun, 9 Nov 2003
From: "dixie" <dixie4@wales.freemove.co.uk>

Try this, it once worked for me.

Fully depress the clutch pedal and then select a piece of timber of the correct length to fit between the pedal and the seat thereby keeping the clutch pedal depressed. Leave it overnight or more if possible in this position.

The theory is that any trapped air will find its way up to the reservoir and out of the system. Worth a try, although bleeding the system is quite straight forward enough.

-Adrian

Clutch/Master/Slave Cylinder

Subject: Clutch Slave Cylinder - removing the piston
Date: Fri, 22 Oct 1999
From: "Randall Young" <randallyoung@earthlink.net>

John :

I just did something similar a few months ago, except I was disassembling slaves removed from parts cars some 25 years ago <g>

NOTE : All of these procedures are somewhat dangerous. Wear eye protection, make sure no one is within 10 feet of you, and preferably rig something to catch the piston when it does come loose. Try not to have your face in-line with the end of the cylinder at any time.

1. Try soaking in penetrating oil (Kroil or PB Blaster seem to work about equally well for me). Apply the oil both inside (through the ports) and out, let sit for a few days. Then apply air pressure again. I've had good luck with this before, but it didn't work this time.

2. Hold the slave in a vise, and rap on the piston with a punch and hammer (air pressure applied). If it will move at all, keep working it until it comes loose. I didn't have any luck with this.

3. Heat the slave with a propane torch, with air pressure applied. This worked for me, 1 out of 3.

4. Fill the inside of the slave with penetrating oil, through the ports. Install bleed valves into both ports, so the cylinder is sealed. Hold the slave in a vise (by one ear), with the opening aimed where the high energy projectile won't do any harm. Now heat the bottom of the slave (where the piston is stuck) with a torch. This worked great for me, the first piston just kind of hopped out onto the bench. The second piston however, left a dent in the ceiling ! <g>

DISCLAIMER : Step 4 above has the potential to turn into a grenade. It seems unlikely to me, but use it strictly at your own risk.

IMO the crystalline stuff is hardened Girling brake grease.

BTW, don't forget to remove the retaining clip at the end of the bore. One of mine was rusted so bad that the end of the clip had fallen off, but the clip itself was still in place.

-Randall

> -----Original Message-----

John Runge wrote:

> The big question is: How do I get the piston out? I have tried with compressed air.

Subject: Fix Stuck Cylinder Pistons
Date: Sat, 23 Oct 1999
From: <CarlSereda@aol.com>

Hi List

I don't have compressed air so when I couldn't get the piston out of my master cylinder I boiled it! Throw a bucket of water on the stove and cook up your master cylinder real good - then while it's still hot give it a good wrapping on the floor so the weight of the piston carries it out the bore.

-Carl

Clutch/Master/Slave Cylinder

Subject: Making a Push Rod for the Slave Cylinder

Randall Young wrote:

> Ok, How long should the 'longer push rod for the clutch slave' be? If one wanted to go this route?

Without meaning to be a smart-*ss, the best answer I have is "long enough". I just pushed the slave cylinder piston all the way home, then pushed the clutch lever the opposite direction as far as I could, and made up a rod the right length to go between them. I used ordinary mild steel rod from the hardware store (5/16" I think, same as the original push rod), and rounded one end to approximate the original push rod end. Then I stuffed it into the slave, and marked the other end so it would protrude slightly from the threads in the clevis. Cut it off, ran a die down it, and put it in.

At the time, I thought the problem was mis-matched parts. I had installed a transmission from a earlier TR3 with Lockheed hydraulics, and I thought somehow the mounting was different, which was why my push rod was too short. Didn't realize until several years later (when the Throw Out Bearing failed) that the taper pin was broken.

-Randall

Clutch/Master/Slave Cylinder

Subject: TR4 Girling to Wilwood Master Cylinder replacement
Date: Wed, 14 Jan 2004
From: "Jeffrey J. Barteet" <barteet@barteet.com>

Greetings Everyone,

A week or so ago I asked about replacing the stock Girling Master Cylinder (MC) with a Tilton unit. I got no replies, (or maybe ya'll were just ignoring me) so I set out on my own to see if it was possible.

I found some dimensional specs for both the Girling's and the Tilton's, and the Tilton MC was a tad longer AND the line attached at the end of the cylinder rather than on top of the MC body. Given the already tight location of the brake and clutch MCs in the TR4 installation, I figured the Tilton unit was out unless you wanted to replace the entire pedal assembly. (In fact, many racers do just that.)

While poking around on the <www.summitracing.com> web site, however, I did find something very interesting. It was a Wilwood unit that was clearly a knock off of the Girling unit.

You can search for it by part number on the <www.summitracing.com> web site by part number **WIL-260-1304**. It lists for \$45.95 and cost an additional \$8.50 for S&H.

I checked the dimensions from the Wilwood website and they were a spot on match for the Girling MC.

I received it today and it is IDENTICAL to the Girling unit for all practical purposes. In fact, the only outward difference was 'Wilwood' set into the casting instead of 'Girling'. That and the Wilwood casting were a bit smoother. It is 42 years newer.

Wilwood, by the way, is a big aftermarket brake and hydraulic manufacturer somewhat like Brembo. I swapped out the actuating rod from the Girling unit to the Wilwood as the Wilwood came with a threaded rod and then bolted the MC in. The mechanism works perfectly.

The MC is available in several bore sizes. The part number I mentioned and ordered is .75". The stock .70" size is available as well.

As far as originality is concerned....one could argue the part is not original because it's not Girling. BUT, there are LOTS of parts you can't get from the original vendors (Lockheed, Lucas, AE, AC, etc.) so if a judge would look over a non-original manufacturer fuel pump, I don't see why they would mind the Wilwood MC. The original Girling reservoir cap even fits.

Finally, it costs about 50% of the Girling unit. Perhaps the Girling unit is expensive because of the actuating rod unique to the TR, though I'm not sure it comes with it.

In any event, I find it both fun and comforting that with a tiny bit of web legwork, you do have options outside the usual British car parts vendors.

-Jeffrey

Clutch/Master/Slave Cylinder

Subject: TR 3/4 Clutch Slave questions
Date: Mon, 28 Aug 2000
From: <erl@unix.mail.virginia.edu>

<BPAULTR3@aol.com> wrote:

> Having spend some time in fairly intense conversation with the underside of the 59 TR3, particularly in
> the area of the clutch slave, I had a couple of questions.

Don't know about this, but there may have been a variation in the interior diameter of the slave.

> 1. There are only 2 slaves used throughout the TR2 through TR 4A production, the early, short Lockheed
> unit and the later and more plentiful Girling #313440. Correct?

>
> 2. Whatever I can find showing illustration of installation shows the early slave mounted through the
> support bracket on the back side (back of car) of the bracket and the Girling unit bolting on the front
> of the bracket. The bracket appears to be the same and attaches to the tranny the same. Correct?

Yes, for the Girling.

> 3. Is the stay rod for the purpose of supporting the bracket and preventing it breaking out at the aluminum
> bell housing only or might it serve as an adjustment possibility on the alignment of the Girling unit?

To remove the Girling slave, you must remove the mounting bracket, and the stay rod. You can leave the stay attached to the engine/oilpan, but if you remove it, make sure that you keep the spacer that goes between the stayrod and the engine/oilpan. The stayrod is only for reinforcement, not adjustment. However, this stayrod provides a third point of mounting for the bracket, and when reinstalling the slave, use the stayrod/bracket mounting to make sure the operating rod runs basically colinear with the axis of the cylinder bore.

> 4. There are 3 holes on the clutch operating shaft actuating lever into which the
> fork end of the slave push rod might attach. Is it the opinion of anyone that these
> holes are for possible adjustment of alignment of the slave?

This is a simple lever arm. Hole uppermost gives a short/heavy clutch, furthest out, a longer, softer clutch.

> The failed slave I removed had worn extensively on one side of the bore due to a severe misalignment of
> the centerline of the push rod and the piston. On reinstallation I attempted to correct this. The
> supporting bracket is not bent and the attachment points at the bell housing are ok. The tranny is
> rebuilt with a new clutch operating shaft. I ended up shimming out one of the mounting bolts on the
> barrel of the cylinder to correct the misalignment. I tried fooling with the stayrod but it had little effect
> due to the rigidity of the bracket, besides it moved the slave in only one direction, the wrong one. The
> only hole which the pushrod even approached alignment was the bottom hole of the three holes on the
> actuating rod.

>
> Anyone have any info or relevant experience on the alignment of the slave to the clutch operating fork?
> Seems like there ought to be a better way than shimming, clutch operating Fork?

-Bob Paul

Clutch/Master/Slave Cylinder

Subject: TR4 Clutch Advice
Date: Wed, 30 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> If the master clutch cylinder was worn out, wouldn't the slave cylinder, be a problem shortly? Should I go
> ahead and replace it as preventative maintenance or use the philosophy of sorts - if it ain't broke don't fix it.

In this case, I wouldn't fix it ... except perhaps to switch to DOT 5 <g>

-Randall

Subject: TR4 Clutch Advice
Date: Thu, 31 Aug 2006
From: <Davelmassey@cs.com>

Depends on the history. If the whole system is untouched all these years then I would definitely change or at least rebuild both cylinders and replace the hose. They have all lasted longer than one should expect.

Also look at the brakes.

-Dave

Clutch/Master/Slave Cylinder

Subject: TR4 Clutch hydraulic problem
Date: Tue, 15 Oct 2002
From: Randall Young <ryoung@navcomtech.com>

- > I have a clutch problem. The reservoir is full but oftentimes I have to pump the pedal several times in order to
- > get enough pressure for the clutch to work. Then it works just fine for while. I do not have a leak in the
- > system. I have bled the system and that eliminated the problem for a while but now it is back.
- > My question is:
- > I think I have either a bad master or a bad slave cylinder (right?)How can I tell which is the problem cylinder?
- > Or could something else be wrong?

Roxy,

I can't remember offhand when the change was, so this may not apply. The earlier TRs used a return spring on the clutch slave, to be sure the slave piston always returned to the stop. Many people try to substitute a different spring here, with the result that they do not always pull the piston back (or the original may simply be broken). Also, on the systems that have the return spring, the push rod on the clutch slave has to be adjusted from time to time, as the clutch wears. So, check it out, if your car has the return spring, try replacing it with the correct spring (available from the Big 3, **TRF P/N is 106347**) and adjusting the slave cylinder.

If that doesn't help (or your car doesn't have the return spring), then the most likely culprit is the spring inside the MC. This seems to be an increasingly common problem, I guess they've just reached the end of their natural lifetimes <g> I don't know if anyone has the original spring, but **Moss 582-065** will work here. You might as well install new seals while you're at it.

-Randall

Clutch/Master/Slave Cylinder

Subject: TR4 clutch master revisited
Date: Thu, 21 Jun 2007
From: <pethier@comcast.net>

My TR4 clutch master cylinder is leaking.

Where is the best place to buy rebuild kits?

Is there any difference in kits required through the run of the TR4? This car is an early one, CT2846L.
-Phil

Subject: TR4 clutch master revisited
Date: Thu, 21 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> Is there any difference in kits required through the run of the TR4? This car is an early one, CT2846L.

All TR4 are supposedly the same, but there are other MC's that will fit. Might be wise to disassemble it, and check that the bore is .75". You should probably pull it to inspect the bore before ordering the kit anyway, since it's possible the bore is corroded badly enough to warrant replacing the entire cylinder. The entire cylinder is only \$100 from TRF (and on sale this weekend for \$78).
-Randall

Clutch/Pad & Fly Wheel

Subject: 1974 TR6 flywheel ring gear
Date: Thu, 8 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I know that I've read that the ring gear is often put on backwards because of habit and the change of starter
> from the TR250/early TR6. What is the proper orientation....mitered edge of tooth toward or away from
> starter? Logic tells me towards but I found mine facing away.

The evidence seems clear that the factory installed them that way (beveled edge of ring gear teeth facing away from starter pinion) on at least some cars. The bevel was only required for early 'Bendix' starters, where the gears had to engage while the starter was already spinning. [Like the TR4/A.] The later cars used a "pre-engaged" design that does not require a bevel, since the starter does not spin before the gears engage.

-Randall

Clutch/Pad & Fly Wheel

Subject: Flywheel/Starter Gear
Date: 4/28/2002
From: <ZinkZ10C@aol.com>

<ebk@buffnet.net> writes:

> Therefore, the starter gear should also have a matching end of the bevels to each tooth, right?

Yep, most drives have a chamfer as well. I do suspect some drives don't have any chamfer so your mileage may vary.

> Some of my start gear's bevel look pretty bad. At what point would it be considered being bad? [More than 1/3
> in length being 'chewed-up'?] on either Ring Gear or starter gear?

I should also point out the 1/3 loss of tooth length applies to gears that are being flipped. Losing tooth surface on the opposite side of drive engagement isn't much of a problem. Losing tooth surface on the drive engagement side can cause more of a problem since the starter could start to spin at full speed before engagement. (This assumes a solenoid type positive engagement starter, older inertia Bendix drive starters spin at full speed and really rely on the chamfer to assist engagement so tooth loss is less of an issue.)

1/4 or less tooth loss on the engagement side of a ring gear is what I like to see. The greater number of teeth damaged, the less likely I'll reuse the gear.

I like to see minimal starter gear damage since that gear has only ~ 10 teeth vs. the ~ 145 on the ring gear. With less teeth the gear wear is more rapid even though the starter gear is hardened. A bad starter gear will quickly damage a ring gear so I tend to replace starter drives early.

A lot of this stuff is a real judgment call. I've seen some pretty chewed stuff not make any noise and some lightly worn stuff grind.

-Harold

Clutch/Pad & Fly Wheel

Subject: TR4 clutch choices
Date: Mon, 18 Sep 2000
From: a Wallace <wallaces@superaje.com>

Another possibility to consider would be the clutch from a Daimler SP250. This was recommended in Triumph TR Maintenance Modification and Tuning by J. L. S. MacKay and described as being able to cope with 140 hp. He says it bolts straight on; I don't know whether he means that literally, or if he's just referring to using the friction disc. Don't know where you might find one but did correspond with an Oz lister some time back who had done this with success, and found (at least) the disc as an off-the-shelf part. John Pike, you still around?

Regards, -Jim

Clutch/Pad & Fly Wheel

Subject: TR4 Slipping Clutch
Date: Mon, 18 Jun 2007
From: "Daehler, William F" <william.f.daehler@delphi.com>

I had slipping clutch problem on my TR4. The level of slip was annoying, but not insurmountable to get around, but it wasn't healing itself either.

I thought I knew what to do, but I have now found some forks in the road. I don't know which way to proceed. I'd rather spend whatever money I need to get the reliability, but somehow I don't think that new parts (if they are junky) are the way to go.

I pulled the tranny and the clutch pressure plate. There is not really any strong evidence of failure, like I was hoping to find what, oil soaked asbestos or something clearly wrong. The clutch disk looks a tad frazzled, but not a smoking gun. The pressure plate assembly is like a rock, it's a Beck Arnely unit. The surface of the pressure plate is ringed and a bit wavy. The surface of the flywheel is also ringed, and a bit wavy. The throw out bearing is shot, and I'll have to replace that for sure, but that doesn't explain the clutch slipping.

My research looking at Moss, British Parts North West and The Roadster Factory web sites seem to hint at transition of replacement clutch parts. Like Borg and Beck are no more. Moss doesn't even have a throw out bearing available, what's up with that?

My questions to the List:

Should I order a replacement disk, and get the flywheel resurfaced, get the pressure plate resurfaced? Is there such a thing as resurfacing a pressure plate? What quality is the AP Driveline parts? What do you guys recommend I do? I want to get back on the road.

-Will Daehler

Subject: TR4 Slipping Clutch
Date: Mon, 18 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> I had slipping clutch problem on my TR4. The level of slip was annoying, but not insurmountable to get around, but it wasn't healing itself either.

Will, what steps did you take to ensure that the problem was not outside the bell housing? Was there sufficient free play in both the slave and MC push rods? Pedal returning all the way under just spring pressure?

> Like Borg and Beck are no more.

AFAIK, they were bought out by Automotive Products (AP) a long time ago; and AP is still in business. I believe they have just switched factories and dropped the "B&B" name. Which may or may not make current supply as good as the old ones, I don't know.

> Moss doesn't even have a throw out bearing available, what's up with that?

Beats me, TRF has them on sale.

> Should I order a replacement disk,

My local independent auto parts store can have them relined for substantially less money.

> Is there such a thing as resurfacing a pressure plate?

Yes, but since it has to be disassembled to do it, it's generally called "rebuilding". There are adjustments required when it's reassembled. And they should check that the springs are up to snuff, which might possibly be the cause of a slipping clutch (although I've never heard of such a thing on a TR).

> What quality is the AP Drive line parts? What do you guys recommend I do? I want to get back on the road.

My experience has been that the old B&B plate was simply bullet-proof. AFAIK, my 59 TR3A still had its original pressure plate when I converted to a 4A-style clutch (and alloy flywheel) a few years ago. The one in a previous 3A stood up to incredible abuse (used to launch my warmed-over motor at 3500 rpm, full throttle and right on top of the torque curve) and never gave me a problem. (Although I have heard they tend to blow up if you spend a lot of time over 6000 rpm <G>)

So if you can't find someone to resurface yours for you, I would probably pick up a used one on flea-bay or whatever.

And keep looking for why your clutch slipped. Could the TOB carrier sleeve have been binding on the snout of the gearbox? I had one seize up there once, after the failed TOB got extremely hot and apparently crushed (or melted) the carrier.

-Randall

Subject: TR4 Slipping Clutch: Problem Solved, back on the road.
Date: Mon, 16 Jul 2007
From: "Will Daehler" <wdaehler@wi.rr.com>

Thanks to the Listers that helped me through my slipping clutch problem on my TR4. The clutch was getting worse and worse, to the point where the car was getting too slow and sluggish to drive.

I ordered parts a new clutch kit from TRF, which included the throw out bearing, the clutch pressure plate and the clutch disk. AP Drive line components, by the way, excellent quality.

By jacking up the car a foot I was able to get at some of the nuts and stuff from below. I had plenty of reference material, like the Haynes and the Bentley, and a general idea of what to do.

I did have the flywheel resurfaced for \$34 at a place called Car Quest, might be a national chain. I knew I was in the right place when I got inside, and there were four men behind the counter, each manning his own cash register, and the shortest line was two deep. Busy place, and the guy didn't blink an eye. I picked it up the next morning.

Getting the flywheel back on was not easy, I used a combination of both feet, both hands and two by fours sitting on a jack to take the weight. Eventually got the bolts started. Tightening them pulled the flywheel the rest of the way on.

Mounting the new clutch pressure plate and disk took just ten minutes with the help of the clutch alignment tool.

My buddy Mike helped me wrestle the tranny back in. I made a tool to help. I should sell it on E-Bay now that I'm done with it. I bored a hole in a six inch long 2 X 4. I put this short block of wood on the hydraulic jack. With the drain plug of the tranny sitting in the hole of the wood block, this was a pretty close to the center of gravity, and was able to raise and lower it to line up with the engine.

The last inch and half took a while, but all of a sudden, whoosh it slid into place. Thirty nuts and bolts later, I was ready for a test drive.

The first shift was in the garage, into first. I squealed the tires! I left a little patch of black tire mark on the concrete. So the slipping clutch problem was solved.

-Will

Clutch/Pad & Fly Wheel

Subject: TR4A clutch not clutching
Date: Sat, 19 Aug 2006
From: "Francis Precht" <FPrecht@frostburg.edu>

Question for those more knowledgeable than I on things Triumph. '65 TR4A - ran great before I went on vacation. When I returned after a month, and wanted to go for a 're-acquaintance' drive, the clutch refused to allow me to shift into any gear.

Symptoms:

clutch not depressed - starts fine
in gear - bucks and stalls (like any standard shift car)
in gear with clutch depressed - acts like car is in gear with no clutch applied (bucks & stalls)

Sounded like the clutch needed bleeding. So I did ---- 4 times !!! I get bubbles in the fluid in the jar, pump till the bubbles stop, and re-tighten the bleeder screw with the pedal depressed.

Result ---- same symptoms as before.

Re-bleed -----more bubbles. Repeat. Repeat. Arrrrrrgggggghhhhh!

Lots of dark crud in the fluid in the jar, also indicates to me it was about time the fluid was symptom.

I have ordered the rebuilt kits for the slave and master cylinder as well as a new hose (pipe to slave cylinder) and the copper washers that go on the pipe/hose adapter, but figured I'd ask for brilliant insight or advice while I wait for shipping of such. What would the symptom be if the clutch disk was 'stuck' to the flywheel, and how would I go about doing the unstuck (short of doing a whole clutch replace ???)

I can see NO fluid leakage anywhere, which I would have expected if there was a leak somewhere. Not even inside the dust caps.

I also get about 1.5" travel on the master cylinder push rod (manual says 1.38") but only about 1/2" travel on the slave cylinder push rod - how far should the slave cylinder travel ????

I guess I should have taken the TR with me, but it wouldn't fit in the carry-on !! (A though it would have been a lot more fun to drive than the Chevy Malibu rental)

Many thanks for any help or insight you all may provide.

-Bud P.

Subject: TR4A clutch not clutching
Date: Sat, 19 Aug 2006
From: "Mark Hooper" <mhooper@digiscreen.ca>

Hi Bud:

Sounds like the clutch disc is rusted to the flywheel. Dead standard/normal here in Canada where the cars sit idle for 5 months of the year.

Roll car to place where there is 300 feet of road available in front of you.

Start car in neutral and warm engine.

Stop engine

Put car in 1st gear.

Press clutch pedal to floor

Start car (will buck but will start rolling)

Keep clutch pedal depressed and floor gas

drop gas while keeping clutch depressed

Floor gas, etc.

After a couple of bucks she should free up nicely. Done it many times with nary a problem.

-Mark

Subject: TR4A clutch not clutching
Date: Sat, 19 Aug 2006
From: <MMoore8425@aol.com>

It sounds to me like the friction disc is stuck to the flywheel or pressure plate. This is pretty common on my TR3 if it sits for a long time. Here's how I fix mine:

1. I jack up both rear wheels.
2. I start the engine in gear (wheels spin now).
3. Try running the engine up a little in speed and simultaneously hit the brake and the clutch and pull hard on the emergency brake.
4. repeat as necessary.

Another way which some favor is to get the car on the road and hit the brakes and the clutch. I don't like that as I think it's dangerous.

-Mike Moore

Subject: TR4A clutch not clutching
Date: Sat, 19 Aug 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

One more recipe... When my clutch disc got overly attached to the flywheel and pressure plate, I jacked up the rear end, got it running in a forward gear, depressed the clutch, revved it and had my wife release the jack. Popped free before the car had moved 5 feet -- but still you'd want some empty road in front of you. Had a wood block between the jack saddle and the cross member to assure a smooth release.

-Geo H

Clutch/Pad & Fly Wheel

Subject: TR6 Laycock pressure plate - which friction disk
Date: Mon, 5 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

> I also understand that the mounting bolts from my old B&B pressure plate might be too long for the Laycock
> unit. Is this in fact the case?

Dunno, but it's always best to check such things on your own car. There no telling what some DPM (darn previous mechanic) has done, and even factory defects (like a hole not tapped deep enough) are not out of the question. Thread the bolts in finger-tight without the pressure plate in place, and compare the gap to the thickness of the pressure plate. No need for fancy measuring tools here, you can just hold the plate up to the bolt. If it won't slide into the gap, or will just barely slide in, then the new lock washer should give sufficient clearance to ensure the bolt grabs the plate rather than bottoming in the hole. Easier of course to measure, all you need is a dial caliper (Enco's \$15 model works fine for me) and some feeler gauges, but the above method will work in a pinch.

-Randall

Clutch/Pad & Fly Wheel

Subject: TR6 Stuck clutch
Date: Mon, 22 Nov 1999
From: Geo Hahn <geohahn@azstarnet.com>

"Bromiel, James E (James)" wrote:
> I recently purchased a '74 TR6 with overdrive, My problem is the clutch seems to be stuck. <snip> Is
> there a way to free it without dropping the trans?

Mine stuck when the car sat for a year in storage. You might try bumping the starter with the car in gear & clutch pedal down to see if that frees it. That didn't work on mine and I finally called the tech number at Moss for advice, here's what they told me to do...

Raise the rear of the car with a jack, put the car in 1st gear, start the engine, depress the the clutch pedal, rev up, have someone push you off the jack. Oh yeah, have a lot of clear road ahead of you when you try this.

I jacked on the rear cross tube and used a block of wood between the jack and the car to make it easy for my wife to push it off the jack. Make darn sure that the car will clear the jack once it's pushed off it. Make double-darn sure you've selected a forward gear!

Anyway, it worked for me first try. Pretty exciting, took a few months for the rain to wash the "patch" off the driveway.

I assume no responsibility for this stunt other than to say that it worked for me. Good luck. -Geo Hahn

Subject: TR6 Stuck clutch
Date: Mon, 22 Nov 1999
From: Steven Newell <steven@cravetechnology.com>

James:

In regards to your stuck clutch, here is advise from the BMW 2002 mailing list that follows Geo's advice, though without the thrill of asking your wife to push your Triumph off a woodpile. :-)

With luck, these gentler techniques might:

- 1) reduce your wife's eye rolling while talking about you and your car at parties.
- 2) reduce our collective angst, by reminding us how much Triumph owners have in common with other classic makes.

-Steven

Subject: Kent's stuck clutch
Date: Tue, 28 Sep 1999
From: "Ron Ewing" <ron.ewing@worldnet.att.net>

Kent - I believe your disc is rusted to your flywheel - a common occurrence with cars that are stored in humid conditions. Warm it up in neutral, turn it off, put it in gear, put the clutch in, start it up and goose the throttle - this will usually break it loose right away, tho sometimes it's necessary to drive it around the block with the clutch depressed until it decides to give up and release it's captive! Have fun, and be careful,

-Ron

Subject: Frozen Clutch Story
Date: Tue, 28 Sep 1999
From: "Jack Roberts" <JackRoberts@CentroVision.prsvr.net>

The first time that it happened to me, it took me some time to figure out exactly what happened. If you will indulge me in a little story, I will tell you what I did to fix it.

The story is that many years ago I was on a business trip in Seattle, and there was a '02 stuck in a parking spot on the street. A very attractive young lady was trying to start it, and her boyfriend, a hysterical type, was shouting at her, trying to give her advice. I walked over, and asked through the sunroof if I could be of any assistance. She described the problem to me, and the boyfriend started to tell me what he thought the problem was (it could start in neutral but they couldn't get it in gear, so the transmission was broken(?!)) and now they needed to call for a tow. I turned back to her and told her to put the car in 4th gear, press the brake hard, pull up the parking brake, and depress the clutch, and then crank the car. (The starter motor is usually powerful enough to unfreeze the clutch.) After a few tries, the clutch unfroze and she was off. The boyfriend was clearly impressed, and I didn't even get my hands dirty. Of course, you need some battery power to do this, so if you've been driving the car with the starter motor (I did the same thing) you will need to charge it up first.

This has happened to me three times in 25 years of owning my car, and each time I fixed it the same way. Let me know if it works for you.

-Jack Roberts

Subject: TR6 Stuck clutch
Date: Mon, 22 Nov 1999
From: "Power British Performance Parts, Inc." <britcars@powerbritish.com>

The less spectacular approach is to safely support the rear of the car on jackstands - sit in the car, select 4th gear, start engine (rear wheels will start to spin), have assistant manually depress throttle to raise speed to about 3000 RPM, allow engine to stabilize for a few seconds, then simultaneously jam the brake and clutch to the floor and yank on the handbrake with all your might. This way, the impulse reaction is applying full brake pressure instead of waiting for the car to fall off the jack under throttle and you will not run the risk of running someone or something over.

If this does not free the engine on the first try repeat the procedure and have your assistant increase throttle opening as you initiate the brake/clutch application.

-Brian Schlorff

Clutch/Pad & Fly Wheel

Subject: TR-250 Clutch and Starter Help
Date: Mon, 20 Dec 1999
From: "Jack Brooks" <brooks@belcotech.com>

John Flintstone wrote:

>Hello All. I have my 250 engine completely apart. Things look good. Crank will need turning and I will bore
> it out a least +20. To clean it up. Was still standard pistons and crank. Cam looks new "Standard" brand.
> Must have been replaced at one time.
> Questions: I would like to upgrade and install a TR-6 clutch and starter. I have an A-type overdrive unit
> "#CD-36955". (What year is it?) I purchase some 6 years ago for this project for \$500. This is the tranny I
> am going to use. Do I need to use a TR-6 backing plate for a late model starter? Also I will need a TR-6 late
> model flywheel? Now I figure all this should work? Because they used A-type OD up to '72 TR-6. Which
> had a late model starters and clutches right? And yes I will have to make some wiring changes for the starter
> system.
> Thanks
> -John Flintstone

John,

I don't know what clutch/Flywheel combination was used with your A-type OD, but make sure you have the shorter Front cover (the nose, inside the bellhousing) if you use the later Diaphragm clutch. The earlier trannies has the longer nose, which may foul and destroy the diaphragm clutch fingers. The Moss catalog has the dimensions, The later one is shorter.

-Jack Brooks

Clutch/Peddle & Linkage

Subject: Clevis forks
Date: Tue, 16 Nov 2004
From: Chris Kantarjiev <cak@dimebank.com>

> The clevis forks on the brake and clutch master cylinders are different from the clevis fork on the slave
> cylinder. On the slave the fork is a separate component from the push rod and is adjustable. On the two
> masters it is lone piece and is "headed over" and cannot be separated from the closing face ring.

Yes, I know. That was my point - you can get separate, adjustable parts that fit the masters. From Triumph Tune aka Moss Europe, if not elsewhere. It's entirely possible that the parts from the slave cylinder will fit - I don't know. The parts that I have on the master appear slightly different than what's on the slave, but it might just work.

I'll try to remember to look up the part numbers that I installed.

I expect that someone like Dave Bean Engineering could sell you a "generic" adjustable push rod and clevis for Girling cylinders.

My concern about using a hard bushing is that it will be difficult to press in and out true and without distorting the fork of the clevis. That's why I prefer the idea of the tophat style Thomson Nyliner, one per side - admittedly, I haven't done this.

Subject: Clevis forks
Date: Wed, 17 Nov 2004
From: Chris Kantarjiev <cak@dimebank.com>

It took some digging, but I found it. In 1995 I ordered 4ea 057194K from Moss Europe/TriumphTune. 057194 is the adjustable fork used on the clutch slave of TR2 through 4A - the "K" designates that this is a kit including push rod, threaded clevis, spring, clevis fork and jam nut.

I have these on the master cylinders of my 4A and my GT6+.

What I often found was not only that the fork holes wore - but the hole in the pedal wears oval, too. Rewelding and drilling this is quite the nuisance. Using an adjustable arrangement lets me put that work off a lot longer.
-Chris

Subject: Clevis forks
Date: Wed, 17 Nov 2004
From: "Randall" <tr3driver@comcast.net>

> It took some digging, but I found it. In 1995 I ordered 4ea 057194K from Moss Europe/TriumphTune.
> **057194** is the adjustable fork used on the clutch slave of TR2 through 4A

And TRF has it listed in their price list. They've got the pin listed too, **57195**.
-Randall

Clutch\Peddle + Linkage

Subject: Clutch Adjustment
Date: Tue, 19 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> When I rebuilt the T3A, I put a new clutch and pressure plate in it. When I took it for a test drive, the clutch
> would barely engage. Car wouldn't go uphill. Tested the freeplay at the slave cylinder, and had the proper
> inch of movement before engaging the fork.

What? The correct free play at the slave varies a little bit by source, but should be more like 1/32".

This is measured as how far the push rod can move out of the slave cylinder, with it still connected to the operating lever.

> There is the fulcrum adjustment in the bell housing that the fork rides on. Should I have adjusted that?

Ok, you've lost me totally here. Are we talking about a stock TR3A transmission? There should be no adjustments inside the bell housing unless someone has substituted something.

-Randall

Subject: Clutch Adjustment
Date: Tue, 19 Jun 2007
From: <movement@aol.com>

Terry,

I do not understand what you mean by the inch of free play. It sounds to me like your throw out bearing is preloaded on the fingers. Did you replace the throw out bearing? I would take out the clevis pin in the slave shaft and see if the clutch lever wants to settle further forward than the slave shaft wants to let it. In other words, if the fingers push the throw out further back on the tranny shaft when the slave shaft is not connected.

-David Lylis

Subject: Clutch adjustment
Date: Tue, 19 Jun 2007
From: Allen Hess <allenhess@mgcarclub.com>

> Tested the free play at the slave cylinder, and had the proper inch of movement before engaging the fork.

The proper amount is One Tenth of an inch - 0.10" when measured at the adjusting rod and clevis.

-Allen

Subject: Clutch Adjustment
Date: Wed, 20 Jun 2007
From: <terryrs@comcast.net>

Thank you, everyone, for your responses. We seemed to have gotten rather sidetracked on the technology of the amount of proper free-play for the clutch slave cylinder. The real issue was that the clutch dis-engages too soon in the pedal travel, and re-engages at the end of the travel, later than perhaps it should. The issue of early disengagement, late engagement, doesn't seem that it should be affected by the amount of free play, just as long as there IS free play. (Actually, having too much free play would seem to mean the clutch should be disengaging midway or lower down the pedal's travel, right?)

Fed Thomas wondered if there might not be a pre-load on the throw out bearing. (Yes, Fred, this was new too.) I think he's right. This is what it seems to act like. I have free play on the slave even with the clevis pin

removed and the slave fork removed from the transmission lever. ...But if there is no fulcrum pin (maybe I'm remembering my Datsun Roadster, and not the TR transmission), then what can account for a preloaded throw out bearing when there's any (regardless of measurement) free play in the slave shaft?

Thanks again, everyone, for your responses.

-Terry Smith

Subject: Clutch Adjustment
Date: Tue, 19 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> (Actually, having too much free play would seem to mean the clutch should be disengaging midway or lower
> down the pedal's travel, right?)

Terry, my point is that there is less than one inch of total travel at the clutch slave. If you think you have that much free play, you are measuring it wrong or you have the wrong parts.

And having no free play at all can cause exactly the symptom you describe.

>I have free play on the slave even with the clevis pin removed and the slave fork removed from the
> transmission lever.

This statement makes no sense. Which seems to make it even clearer that you are not measuring the right thing.

Since having it wrong can cause exactly the symptom you are complaining about, my suggestion is to either learn how to do it right; or find someone who does to do it for you.

-Randall

Subject: Clutch Adjustment
Date: Wed, 20 Jun 2007
From: <terryrs@comcast.net>

>> (Actually, having too much free play would seem to mean the clutch should be disengaging midway or
>> lower down the pedal's travel, right?)

> Terry, my point is that there is less than one inch of total travel at the clutch slave. If you think you have that
> much free play, you are measuring it wrong or you have the wrong parts.

The adjustment of the clutch is made at the slave cylinder rod that feeds the clutch lever. That is where the free play is. My point is that there is no free play in the clutch lever itself, leading to the suggestion from list members that there is pre-loading on the throw out bearing. My question about what makes that occur.

> And having no free play at all can cause exactly the symptom you describe.

Exactly.

> I have free play on the slave even with the clevis pin removed and the slave fork removed from the
> transmission lever. This statement makes no sense. Which seems to make it even clearer that you are not
> measuring the right thing.

It makes clear sense to me, but that's scary because I'm not an engineer. If I'm misreading something, I'm writing eager for an education.

> Since having it wrong can cause exactly the symptom you are complaining about, my suggestion is to either

> learn how to do it right; or find someone who does to do it for you.

Thank you for your many years of help while I restored my car, Randall. I continue to value your advice. I must add, though, that obviously if I'm asking a question it's because I am seeking to "learn to do it right." You can choose to answer or not. Being disrespectful doesn't have to be part of the equation.

I still owe you a beer for all those other times (well...okay...a keg)!

-Terry

Subject: Clutch Adjustment
Date: Wed, 20 Jun 2007
From: <Dave1massey@cs.com>

<terryrs@comcast.net> wrote:

> The adjustment of the clutch is made at the slave cylinder rod that feeds the clutch lever. That is where the
> free play is. My point is that there is no free play in the clutch lever itself, leading to the suggestion from list
> members that there is pre-loading on the throw out bearing. My question about what makes that occur.

I see two possible causes for not having play at the slave cylinder. One is the push rod is too long. The TR3 should have an adjustable push rod. If it does not you have the wrong push rod. Perhaps you have a TR6 push rod. With a push rod that is too long the piston will bottom out in the slave cylinder before the clutch is fully engaged causing the problem. Of course, if this is the problem it makes me wonder how you got the push rod installed since the clutch pressure plate is partially depressed at rest.

The other possibility is that the master cylinder has a problem. On the end of the piston assembly in the master cylinder is a cup that seals off the passage to the reservoir. There is a small rod that will retract that cup and open up the passage when the pedal is fully released. If that rod comes loose from the piston the cup will remain in place and not allow the fluid to expand into the reservoir as it warms up causing residual pressure in the system even with the pedal fully released. An easy way to test this is to try bleeding the clutch hydraulics to relieve the residual pressure.

-Dave

Subject: Clutch Adjustment
Date: Wed, 20 Jun 2007
From: "Ed Woods" <fogbro1@comcast.net>

...and of course the slave cylinder return spring is in place, the one that is attached to the linkage and causes the slave cylinder piston to bottom when the clutch pedal is released.....

-Ed Woods

Clutch\Peddle + Linkage

Subject: Clutch fork
Date: Fri, 17 May 2002
From: Mitchel Seff <ms6453@optonline.net>

Just received the new pin for the fork and decided instead of machining a modified pin as described in the Buckeye Triumph tech pages, I would try a bushing in the top part of the fork to make sure the pin was snug in both ends of the fork. I machined a simple steel sleeve to accept the new pin tip (about 1/4" enters the bushing) and pressed it into the upper hole already in the fork. It seems to be a rock solid tight fit & should prevent the shearing condition caused by the original design. Because I never want to do the same repair twice I'm also going to install a second pin with a grade 8, 1/4" bolt through the center of the fork. This will be the last time I pull the tranny (I pray to God) for a \$5.00 bolt. Thanks to all for their help & suggestions.

-Mitch Seff

Clutch\Peddle + Linkage

Subject: Gear Shifting Difficulty with TR6
Date: Wed, 27 Feb 2002
From: "Nelson Riedel" <nriedel@nextek.net>

Hi Peter,

Many of us have had the same symptoms due the clutch not fully releasing when the clutch pedal is pressed. If there are no leaks in the clutch hydraulic system, the problem is usually due to slack around the clevis pin - master cylinder push rod joint. The easiest test is to measure the travel of the pin in the slave cylinder - clutch operating arm connection.

When the pedal is moved from all the way out to as far in as it will go, that pin on the slave cylinder push rod should move at least 1/2 inch and preferably 5/8 inch. If the motion is less than 1/2 inch, look around the pedal connection. You might also check for slop in the pedal indicating that the pedal bushes need replacement.

-Nelson Riedel

Clutch\Peddle + Linkage

Subject: Making a Push Rod for the Slave Cylinder

Randall Young wrote:

> Ok, How long should the 'longer push rod for the clutch slave' be? If one wanted to go this route?

Without meaning to be a smart-aleck, the best answer I have is "long enough". I just pushed the slave cylinder piston all the way home, then pushed the clutch lever the opposite direction as far as I could, and made up a rod the right length to go between them. I used ordinary mild steel rod from the hardware store (5/16" I think, same as the original push rod), and rounded one end to approximate the original push rod end. Then I stuffed it into the slave, and marked the other end so it would protrude slightly from the threads in the clevis. Cut it off, ran a die down it, and put it in.

At the time, I thought the problem was mis-matched parts. I had installed a transmission from an earlier TR3 with Lockheed hydraulics, and I thought somehow the mounting was different, which was why my push rod was too short. I didn't realize until several years later (when the TOB failed) that the taper pin was broken.

-Randall

Clutch\Peddle + Linkage

Subject: Slippage?
Sent: Feb. 21, 2003
From: <ebk@buffnet.net>

Hi Randall!

Well, I did it. [:-\] I don't know what the problem is, but maybe you can help me?

I took the Rebuilt TR4/A engine out for its first ride this year [last yr., 12/1/02 ONLY, = 2miles [:-D]]. I drove it a total of 30 miles in 35+^F weather. I took it slow & slowly did the acceleration for short bursts [around 35,000RPM's & letting off the accelerator initial to 20,000 RPM's. Ideal = 11,000RPM's]. I noticed that when I reached 25->30,000RPM's the engine would rev high & the tach would show like 35,000 with loss of POWER! I first thought that the clutch is slipping [installed new clutch Sach's Pressure Plate, Gunst TOB, with 2nd pin perpendicular to the taper pin. I'm afraid that my rings aren't 'seating-in'. What do you think? Feel free to ask any questions.

-Cosmo Kramer

Subject: Slippage
Sent: Feb. 22, 2003
From: <Ryoung@navcomtech.com>

Cosmo, I agree most likely your clutch is slipping. 2500-3000 RPM's is just about peak torque, so that's where it would slip, too.

I would start by checking carefully that there is some free play in both the clutch MC linkage, and in the slave linkage. Doesn't have to be much, but there does have to be some. If I remember right, the 4A does not have the return spring or adjustable linkage at the slave, so just check that you can pull the arm towards the slave and get a little slack. Also, with the car on jack stands, press and release the clutch pedal and then immediately crack the bleed valve on the slave cylinder. If the fluid spurts out under pressure, then either there is a problem at the MC, or the line to the slave is internally blocked or collapsed. I had this happen on a rear soft brake line once, took me forever to find the problem.

If none of that shows up a problem, you may need to remove the tranny again. I'm not familiar with the Sach's/Gunst combo, but it sounds as though something is not right. But since that's a lot of work, I would probably first try disconnecting the linkage to the slave completely, check that the arm has some free play in it, and perhaps even try driving the car that way to see if it still slips. Driving with no clutch is one of those skills that every LBC owner should have ...

-Randall

Subject: Slippage/Break-in
Date: Feb. 23, 2003
From: <105671.471@compuserve.com>

A quick test you should try is when it starts doing that, bleed the clutch slave cylinder and see if it has any effect. If the symptoms go away, then I suspect the little seal on the end of the rod in the master cylinder is not being retracted and the hydraulic system is not "equalizing" and your clutch throw-out is no longer returning far enough.

The description points that way, at any rate.. And it is an easy test and a fairly easy fix if it is the case.

Good luck

-Dave

Subject: Slippage/Break-in
Sent: Feb. 24, 2003
From: <105671.471@compuserve.com>

<ebk@buffnet.net> wrote:

> OK, You've got me. [:-)] I'm to drive around & as soon as this happens, then I'm to pullover to the
> side of the road & start bleeding the slave Cyl.? I really need two people to do this.

Let me qualify that. You don't need to do a full bleed, just crack open the bleeder valve and relieve any pressure that may have built up. **If the fluid is not allowed to return to the reservoir there will be residual pressure even with the pedal all the way out. This pressure will hold the clutch partially disengaged.** When slippage occurs, grab a 7/16 wrench and open the bleeder and see if fluid squirts out. If it does, then close again the bleeder and test drive. If you have no more slippage then that is your problem. The little cup that blocks off the port to the reservoir is not being pulled back

Either the clutch master cylinder is not returning all the way, or the rod that pulls the cup has come loose.
-Dave

Subject: Slippage/Break-in follow through
Sent: Feb. 24, 2003
From: <Ryoung@navcomtech.com>

> I was thinking of putting the car up on 4 stands & testing out the car in the air in my garage. Will this
> work to check out the clutch 'slippage' or do I need the 'road resistance' to be able to get the 'slippage'?

Cosmo, from your description your clutch is slipping only when the engine reaches maximum torque. This means it won't slip if the engine has no load to work against (and thus cannot develop max torque).

Clutch engagement right at the top is a give-away for linkage/hydraulic problems. Check the things I gave you before, especially free play at the MC. It doesn't have to be much, but there has to be some, otherwise the little valve won't open and let any pressure buildup back into the reservoir. A stiff pedal pivot or broken pedal return spring can cause the same problem.

-Randall

Subject: Break-in follow through
Sent: Feb. 24, 2003
From: <Ryoung@navcomtech.com>

> OK, then even if I do adj. the slave cyl. to .010" as I think the manual states [I'll check the specks
> before I actually do anything], then I really wouldn't know if that was the fix until I can take it out
> again, right?

Yes, exactly.

This explanation goes along with Dave's reply:

> You don't need to do a full bleed, just crack open the bleeder valve and relieve any pressure that may
> have built up. If the fluid is not allowed to return to the reservoir there will be residual pressure even
> with the pedal all the way out. This pressure will hold the clutch partially disengaged. When slippage
> occurs, grab a 7/16 wrench and open the bleeder and see if fluid squirts out. If it does squirt out then, close
> the bleeder and test drive. If you have no more slippage then that is your problem. The little cup that
> blocks off the port to the reservoir is not being pulled back.
> Either the clutch master cylinder is not returning all the way, or the rod that pulls the cup has come loose.
> -Dave

Am I sort of right?

Well, I'll disagree with Dave to some extent. If you do find pressure in the system when you crack the bleed valve, it definitely indicates either a partially blocked line or (more likely) a master cylinder problem. However, just bleeding off the pressure may not help, as the system may build pressure back up on the very next operation of the clutch pedal.

There is actually some confusion over what the free play at the clutch slave should be, there are several conflicting figures given. And, it's difficult to measure exactly .010". However, it's not all that critical, anything between .005" and 1/8" will work fine. The important thing is that there is some free play, at both the slave and master cylinders.

If your slave has a return spring on it (I don't think TR4As should have the return spring, but I'm not certain), then pull the lever away from the slave (extending the return spring as much as you can) and check that the push rod becomes loose (ie rattles a bit when you shake it). If your slave does not have a return spring, then push the lever towards the slave cylinder (forcing the piston into the cylinder as far as it will go); release the lever and again check that the push rod is loose.

At the master cylinder, just shake the push rod to be sure it rattles a bit.

If you find no free play at either end, rectify the problem and test drive the car again.

-Randall

Subject: Break-in follow through
Sent: Feb. 25, 2003
From: <105671.471@compuserve.com>

"Randall Young" wrote:

>Well, I'll disagree with Dave to some extent. If you do find pressure in the system when you crack the
> bleed valve, it definitely indicates either a partially blocked line or (more likely) a master cylinder
> problem. However, just bleeding off the pressure may not help, as the system may build pressure back
> up on the very next operation of the clutch pedal.

Point taken. I intended this as a test only. Finding pressure here with the pedal fully released is an indication of (usually) the master cylinder. Just relieving the pressure doesn't cure any problem, it merely points to the problem. And the problem is Probably the master cylinder.

To verify that you can drive the car again until the symptom returns and then crack the line at the master cylinder. If the blockage is in the line or slave cylinder you will not get the same squirt of fluid. But if you do get the same squirt the problem is the master and you'll need to pull it apart again. Or check to make sure it is returning all the way.

-Dave

Subject: Break-in follow through
Sent: feb. 28, 2003
From: <ebk@buffnet.net>

Hi Randall!

I got up this AM & adjusted the Clutch Slave Cyl. Rod [it **WAS** too tight], & took it out for another test ride [27 miles this time]. NO SLIPPAGE!!!! Thanks for the correct diagnose.

I now have over 50 miles on the engine with it staying in the 20 -> 35 RMP range of increase -> coast down to 20 & cruise at 20 ->25 for a while then 'increase/decrease reps' in 3rd gear cruise 'I/D' shift into 4th & cruise 20 -25, well maybe 30 RPM's then cruise in 3rd gear. This cam is 'VERY Nice' in 3rd gear. In fact, I find it VERY hard to have the engine run @ 30 MPH in 3rd. gear. It's got quite a range 20RPM=30MPH, 25RPM's=35, 30RPM's=40, 35RPM's=45. I haven't pushed it beyond that, at this time ;>). Now would longer cruises on country roads be the best? [NO HILLS!]

Now all I have to do is get the setting right on the OD [Mechanical/electrical adjustment @ the solenoid], :>(adjusted & check out the heater! Yes, I've been running around in 32^ F weather without the heater on, & no coat. Just a couple of sweatshirts. I guess the adrellian is 'REALLY' Flowing!

-Cosmo Kramer

Clutch\Peddle + Linkage

Subject: TR3 Clutch Clutch: Trouble Shooting-
Date: Wed, 11 Jun 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I've had this car for many years and have taken the slave cylinder out so many times that I've lost track of how
> it's supposed to go together. With the cylinder (Girling) bolted to the rear of the bracket and the end float
> adjusted to .075", the clutch lever moves about 3/4" when the pedal is fully depressed. When I try to bolt the
> cylinder to the front of the bracket, the rod isn't long enough to adjust the end float. Does this indicate a
> problem with the clutch fork?

I believe so, yes. Note that the factory manual (and many other) drawings show the early clutch slave, which did have the mounting ears to the rear of the bracket. However, the longer slave on the later TR3 and all TR3A/B should be mounted with the ears to the front of the bracket.

> Why would the clutch fail to disengage fully only after warming up?

I'm wondering if perhaps you have multiple problems. If you can get the free play in the slave linkage down to spec (which I believe should be only .010" - .030"), it should release the clutch even with a broken pin. I actually drove my TR3A for several years with a broken taper pin, by making up a longer push rod. One thing to watch for: be sure the slave piston is pushed fully home when checking the adjustment. If the slave is sticky, or the spring is weak with age (or improper replacement), the piston may not return home when cold. Then when it warms up and works more freely, it may return home and cause excessive end float.

Another indicator:

Where is the pedal when the clutch starts to engage? If it's still near the floor, then a broken pin or inadequate movement is likely. If it's halfway up or more, then there may be a different problem.

If you do pull the gearbox, check that the locating pins are present. Absence of the two pins can sometimes let the gearbox move against the engine enough to make the pilot bearing drag (which causes the same symptoms as a dragging clutch). Probably worth replacing the bearing anyway, while it's apart.

One more, check the free play at the master cylinder. Lack of free play at the master typically causes a clutch that slips when hot, but I suppose it could cause the opposite problem, especially if either the master or slave leaked a bit.

-Randall

Clutch\Peddle + Linkage

Subject: TR3 Clutch question
Date: Tue, 26 Jun 2007
From: <KingsCreekTrees@aol.com>

Hi all;

I have a very early TR3A, built Oct.'57. I was lapping Mosport race track at very low speed/low revs, when the clutch pedal suddenly went very firm.

Testing shows it is slipping too, but is still driveable (just). A good friend suggests this is likely to be the pin that locates the throw out bearing fork on the cross shaft. I don't disbelieve this at all, but I seem to remember having the same problem many years ago, probably with a Mk.1 Spit, and it turned out to be something like internal master or slave seals, whereby the fluid leaked past them (but remained in the cylinder---the fluid is full on my car) and made the pedal very firm. Pressing the pedal therefore felt horribly firm and had a bit of an effect in that the clutch would do its clutching thing, but not to acceptable standards. I must admit it "feels" like it's a hydraulic problem on the pedal, but I could be wrong. Any ideas??? PS, slave cylinder is not very old, nor is the clutch assembly. Thanks!

-Tim Dyer

Subject: TR3 Clutch question
Date: Wed, 27 Jun 2007
From: <TRDOCTOR@aol.com>

I had the same problem a few years ago with our TR3A. It ended up being the rod coming out of the clutch master not being adjusted correctly. From what I recall there is something in the blue manual that describes the correct adjustment. If not adjusted correctly, something in the master cylinder (a "bleed hole") will not be exposed. Our pedal would "pump up" and get extremely hard. One day when this was happening I loosened the lock nut and effectively made the rod shorter. I could actually hear the springs in the pressure plate relax as the pressure was bled off. That fixed that problem but, I then had a bad throw out bearing. Car has been apart ever since. Sigh.

-Sam and Carol Clark

Subject: TR3 Clutch question
Date: Wed, 27 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I would doubt that it is a broken clutch fork pin.

What it could be: (I have not experienced this but...) some have reported that the flexible line can fail internally and act like a check valve, failing to release pressure when pedal is released.

-Geo

Subject: TR3A clutch fixed!
Date: Wed, 27 Jun 2007
From: <KingsCreekTrees@aol.com>

Hi Everyone;

You may have seen my question of yesterday regarding my TR3A that suddenly developed a firm clutch pedal and a slipping clutch.

I was very worried I'd have to take the gearbox out; I don't have time for that right now. I also did not think it could be as a result of adjustment, as the symptom happened so suddenly.

Anyway, the TR Doctor (thanks Sam!) suggested adjustment of the clutch master cylinder rod. This is the rod that connects to the top of the pedal. It was a very easy adjustment; the whole operation took less than five minutes and it cured the problem.

So, if you experience a very firm pedal and a slipping clutch, go for adjusting that rod first!

-Tim Dyer

Subject: TR3A clutch fixed?
Date: Fri, 29 Jun 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

<KingsCreekTrees@aol.com> wrote:

Hi Everyone;

..., the TR Doctor (thanks Sam!) suggested adjustment of the clutch master cylinder rod. This is the rod that connects to the top of the pedal. It was a very easy adjustment; the whole operation took less than five minutes and it cured the problem.

So, if you experience a very firm pedal and a slipping clutch, go for adjusting that rod first!

-Tim

Hi Tim!

Being that I do NOT own a TR3, but do own a TR4A, I looked up in Moss catalog to look at the TR3 Clutch MC to NOT see any way of how to adjust the MC linkage. I can see an adjusting rod on the Slave Cyl., so my question is:

Exactly **HOW** did you do this adjustment on the Clutch MC?

-Cosmo Kramer

Subject: TR3A clutch fixed?
Date: Fri, 29 Jun 2007
From: <KingsCreekTrees@aol.com>

Hi Cosmo;

Basically you undo the locknut at the end of the master cylinder rod. This locknut is the one that secures the bolt that goes through the end of the housing around both cylinders. The bolt goes through the housing and butts up to the end of the rod that comes out of the master cylinder. Anyway, once the locknut is loosened, then thread the bolt on the end either in or out, dependent upon which way it needs to be adjusted. Once in the position you want it (I determined what position I wanted it in by testing the clutch pedal feel every now and again), tighten up the locknut and the adjuster bolt stays secure.

The advice I received, that fixed the problem, was from a TR4A owner who had experienced the same thing a few years ago and fixed it the same way, so it must be common to both.

Let me know if you need more detail, or if perhaps I haven't described it very well. If you'd like me to re-describe it using the TR workshop manual or TR parts manual as a reference, I'd be happy to.

-Tim

Subject: TR3A clutch fixed?
Date: Sat, 30 Jun 2007
<tr4a2712@yahoo.com> wrote:

<KingsCreekTrees@aol.com> wrote:

> Hi Cosmo;

> Basically you undo the locknut at the end of the master cylinder rod. ...

> The advice I received, that fixed the problem, was from a TR4A owner who had experienced the same thing a
> few years ago and fixed it the same way, so it must be common to both.

Tim- I don't question that the same problem can't show up on the TR4/A's as it did for you on the TR3. I looked at my [TR4A] MC of BOTH Brake & Clutch [which has the same linkage, just different size reservoirs], & didn't see ANY way to do adjustments. Looking at the Moss [USA not Eng.] catalog, I can see [possibly?] a nut at the end of the shaft, but before the fork that attaches to the top end of the peddle, for adjustment, on the TR3. BUT looking at the TR4's linkage & there is no nut for adjustment at the MC.

Now looking at the TR4's SLAVE Cyl. there is an adjustment nut on the rod {that's where the adj. is preformed on the TR4/A's} & it looks like there 'MIGHT' be a VERY slight adjustment in the TR3's SLAVE CYL.

This is why I think the other TR4A person that gave the advice to you, that said there is adj. in the TR4's MC, meant to say Slave Cyl.

> Let me know if you need more detail, or if perhaps I haven't described it very well. If you'd like me to
> re-describe it using the TR workshop manual or TR parts manual as a reference, I'd be happy to.
> -Tim

Thanks Tim for offering me more opportunity to obtain the info. that you have described to me. I also wonder if I've explained something well enough for the reader to comprehend. I do get the gist of it [being that I don't have the actuarial part in front of me, in my hand]. I'm interested in this thread because I was thinking 'Adj. the slave cyl.', but I think that it was mentioned that no adj. came be done there. So I saved this thread in my 'TR4/A E-mail repair manual'. Now that I see that this specific sol. can't be done on a TR4/A, then I'm adding in that this sol. operation would be done on the Slave Cyl., OK?

-Cosmo Kramer

Subject: TR3A clutch fixed?
Date: Sat, 30 Jun 2007
From: <KingsCreekTrees@aol.com>

Hi Cosmo;

I am really, really sorry. I went back through the e-mails that I've received from my initial query. Two were from TR4A owners and one was from a TR3A owner. It was the TR3A owner that gave me the advice that cured the problem, and not a TR4A owner. I got completely mixed up and I apologize profusely.

This is what Sam said:

> "I had the same problem a few years ago with our TR3A. It ended up being the rod coming out of the clutch
> master not being adjusted correctly. From what I recall there is something in the blue manual that describes
> the correct adjustment. If not adjusted correctly, something in the master cylinder (a "bleed hole) will not be
> exposed. Our pedal would "pump up" and get extremely hard. One day when this was happening I loosened
> the lock nut and effectively made the rod shorter. I could actually hear the springs in the pressure plate relax
> as the pressure was bled off. That fixed that problem but I then had a bad throw out bearing. Car has been
> apart ever since. Sigh. . . "

> -Sam

-Tim Dyer

Clutch\Peddle + Linkage

Subject: TR4 Clutch stay rod thread size
Date: Wed, 6 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> I was wondering if anyone knew the thread size for the clutch stay rod for a TR4. This would be the rod that
> is used to bolt the clutch slave cylinder to its mounting bracket.

ISTR it's 5/16-24 NF.

-Randall

Clutch\Peddle + Linkage

Subject: TR6 Clutch Frustrations
Date: Wed, 23 Aug 2006
From: "Skip Gurnee" <skip47@powernet.net>

"Francis Precht" <Fprecht@frostburg.edu> wrote:

- > Skip,
- > I posted to the triumphs list regarding the clutch on my '65TR4A, but happened to see your reply on another
- > clutch question for a TR6.
- >
- > In your reply you stated "...The factory Manuel for the TR4A belleville spring specifies maximum travel is
- > 0.27/0.29 inch..."
- >
- > Does this mean that the slave cylinder push rod on a TR4A only travels that much ?? Is this sufficient to fully
- > engage the clutch or is this merely the amount that the internal spring in the slave cylinder expands/contracts
- > with further travel of the slave push rod taken up by the other springs in the system ??

- > Thanks for any insight you might provide. I decided that I would rebuild both clutch master and slave
- > cylinder, and replace the hose and give a nice complete internal cleanup to the whole system before I try the
- > 'unstick' the friction disk from the flywheel trick others have suggested.
- > -Bud P.

Hi Bud!

There are no springs within the hydraulic system that affect the travel of the clutch release bearing. The springs you find in the system acts only to ensure pressure is maintained, or to help the system retract -away from clutch engagement. Full disengagement of the clutch needs only that small 0.27 inch. There's a ratio in the difference in length between the cross shaft-to-clutch centerline distance vs the cross shaft-to-push rod distance. The manual doesn't list these numbers, but the pictures show the fork shorter than the lever. So the answer is the push rod moves more than a quarter of an inch. You can check the potential movement of the push rod by measuring from the bottom of the bore of the slave cylinder to the circle clip, minus the length of the piston. The internal spring isn't a part of the measurement. A very rough estimate would be over an inch is possible. If your push rod can be moved closer to the cross shaft via multiple holes drilled in the actuating lever, then you get more distance pushed on the belleville spring, because the mechanical ratio changes. You'll also get a heavier pedal.

I had an experience with a stuck clutch. The pedal felt stuck solid also, even after checking the hydraulic system. If your clutch is stuck engaged, you should have an instinctive feel in the pedal that nothing is moving. The pressure you can apply with the hydraulics is not usually sufficient to unstick a clutch disc. Then the suggestions already provided by others are applicable.

Hope this helps; let me know.

-Skip

Clutch/Throw Out Bearing

Subject: Clutch Shaft Taper Pin
Date: Mon, 25 Mar 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> I'm sure this has probably been discussed a million times, but being new to the list I'm not in the know!
> Broken pin ...What now? Any quick and easy fixes out there? Thanks.

I wish it was quick and easy!

Remove seats, carpet, trans tunnel. Remove 4 bolts to the drive shaft, 2 to rear motor mount, and speedo cable. Support rear of engine enough to remove pressure from rear motor mount. Undo the clutch slave (which can remain connected to its flex line), starter, and all the other bolts/nuts holding the gearbox to the engine. Get a friend to help you lift out the gearbox.

With the gearbox out and supported somehow standing on its tail flange (or laying on the bench), use a center punch to make a mark in the surface of the clutch fork, in-line with the broken taper pin. Drill through the fork with a 3/16" (or so) drill bit, starting at right angles to the surface and gradually turning to be in-line with the broken pin. Unscrew the broken head of the taper pin, turn the fork to its approximate original position on the shaft (look down the hole to find this) and use a 1/8" punch to drive out the remains of the pin. See: <<http://www.buckeyetriumphs.org/technical/Clutch/ClutchForkPin/RemovingBrokenClutchForkPins.htm>> for some good photos and info. (If that link doesn't work, go to <<http://www.buckeyetriumphs.org>> and click on 'Technical' and then 'Removing Broken Clutch Fork pins'.

Consider how far you're going to go with "Shipwright's disease". The TOB and clutch friction plate are probably a given at this point, anything beyond that is up to you and your wallet. Herman van den Akker is selling a Toyota 5-speed transmission conversion kit, that never suffers from a broken taper pin ...

Assuming you elect to reinstall the original gearbox, use a new taper pin and do a trial assembly with the shaft still out of the gearbox. Make sure the pin locates the fork securely with it only moderately tight. If you can feel any movement whatsoever, replace the shaft too. Personally, I like the "crossbolt" mod to ensure it never happens again, but Nelson Riedel has kindly posted several alternatives at:

<<http://www.buckeyetriumphs.org/technical/Clutch/ClutchShaft/ClutchShaft.htm>>

Note: Without realizing I had a broken taper pin, I drove several years by making a longer push rod for the clutch slave. I don't necessarily recommend this, but it's a thought if you want to put off the clutch job just a little longer ...

-Randall

Clutch/Throw Out Bearing

Subject: Gunst bearing grease
Date: Sat, 3 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> I'm changing transmissions and intend to reuse my Gunst bearing as it only has about 400 miles on it. I don't
> have anymore of the grease that came with it and the directions say to use a grease without any solids.

You're talking about where the bearing sleeve rides on the transmission front cover, correct? I feel this stuff
<http://www.toolfetch.com/Category/Lubrication/Dry_Lubes/125-03084.htm>
is better than any grease for this location, because it dries to a slippery dry film that cannot collect clutch dust
and so on to become sticky.

Also good for where the clutch plate rides on the input shaft.

Doesn't need to be CRC brand, lots of makers offer the same thing. That's just the first web page I found.
Another example is Dow Corning Molykote 321.
-Randall

Clutch/Throw Out Bearing

Subject: Installing Clutch Fork Taper Pin
Date: Fri, 17 May 2002
From: Mitchel Seff <ms6453@optonline.net>

Just received the new pin for the fork and decided instead of machining a modified pin as described in the Buckeye Triumph tech pages, I would try a bushing in the top part of the fork to make sure the pin was snug in both ends of the fork. I machined a simple steel sleeve to accept the new pin tip (about 1/4" enters the bushing) and pressed it into the upper hole already in the fork. It seems to be a rock solid tight fit & should prevent the shearing condition caused by the original design. Because I never want to do the same repair twice I'm also going to install a second pin with a grade 8, 1/4" bolt through the center of the fork. This will be the last time I pull the tranny (I pray to God) for a \$5.00 bolt. Thanks to all for their help & suggestions.

-Mitch Seff

Clutch/Throw Out Bearing

Subject: Koyo clutch release bearing
Date: Mon, 19 Jun 2006
From: "Chris Bohn" <cbohn@sidepipe.com>

A couple of years ago, I ordered a release bearing from TRF. I had ordered the OEM brand, but already put on the sleeve by TRF (I ordered from the TR4/4A Glove box Companion). I did not receive the OEM unit, but rather the up rated Koyo bearing on a sleeve (I don't think TRF carries the OEM release bearing anymore). Well, I am finally getting around to pulling the tranny, and putting in the new release bearing will be part of the drill. Here is my "issue": I've read some notes online written by some respected members of the TR community that the Koyo bearing will eat through the fingers of the clutch pressure plate, the reason being that it requires more torque to spin up to speed when engaged and thus there is slippage against the clutch fingers prior to synching up...and that means wear. So, I am asking members of the list to relate any Koyo bearing issues that have been encountered. This slippage is apparently heralded by a slight shriek when the clutch is depressed; I've seen some photos of clutch fingers that are pretty worn away by the Koyo. Note that my 4A has the slave cylinder arrangement of the 4 and earlier models, meaning that there is a spring that pulls the release bearing back out of contact with the clutch pressure plate and the operating fork lever is threaded and can be adjusted. The later slaves/forks on TR250-6 don't have that (and neither do the replacements from TRF, even for 4A). That may make a difference. Anyway...if anyone has installed that Koyo bearing on their TR, do let me know if it has worked out well for you or not. Theoretical conjecture will also be warmly received! Many thanks

-Chris

Subject: Koyo clutch release bearing
Date: Mon, 19 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Note that my 4A has the slave cylinder arrangement of the 4 and earlier models, meaning that there is a spring
> that pulls the release bearing back out of contact with the clutch pressure plate and the operating fork lever is
> threaded and can be adjusted.

In that case, Chris, there should be no concern over the stiff bearing causing problems. In fact, converting to that arrangement is one of the acknowledged fixes for the problem (on later cars). Just keep it properly adjusted (so there is some free play at the slave) as the clutch wears.

> The later slaves/forks on TR250-6 don't have that (and neither do the replacements from TRF, even for 4A).

Interesting. At one time, the adjustable forks were NLA, but Moss has them listed now. Perhaps the Glove box Companion listed a substitute and was not updated when they became available again? What was the P/N? (It should be 57194, I think.)

-Randall

Subject: Koyo clutch release bearing
Date: Mon, 19 Jun 2006
From: "Chris Bohn" <cbohn@sidepipe.com>

Randall,

Thanks for feedback. The TR250-6 did not come with the threaded fork lever nor spring -- it is not adjustable. One of the TR experts (might have been N. Riedel) wrote that he thought that the bearing on the TR250-6 was meant to stay in contact with the driven plate, thus continuing to spin, but he wasn't sure. He conjectured that the threaded fork lever with spring would definitely pull the bearing back so it was out of contact and would be at rest during driving. Since the Koyo is stiffer, he thought that there was not enough pressure to ensure that the Koyo also spun, yet because it was in contact, wear would ensue. If he is right, it might also explain why the

bearing on the 6-cylinder cars seem to go bad sooner than on the earlier cars. If the bearing is in contact with the driven plate, and hence always spinning, then it had better be perfectly coaxial with the driven plate, otherwise you can imagine that the rotation of the bearing could become slightly eccentric and that can't be good. This may be why it seems to be a really big deal on the 6-cylinder cars to line up the gearbox perfectly with those dowel pins -- to ensure that the bearing and the driven plate are coaxial.

I ordered the clutch shaft "kit" from TRF, RFK1249, which comes with the cross shaft, shaft bushes, pin, and lever. It is listed as the part for T4-6, so is for 4A-6. I looked up the part number you gave, it lists it as applying T2-3. Part SUAUC2256 is also listed as the fork for T2-4, and 138247 is the part for T4-6. So, those with a TR4A should probably keep their old adjustable fork if they order the TRF kit. I think that often TRF tends to lump the 4A clutch parts in with the 250 & 6; they don't realize that there is a difference. The best example is the clutch itself. All of the parts suppliers list the same clutch for 4A-6, but the 4A actually had a different B&B clutch that had less spring pressure. Only Moss UK sells the correct 4A clutch these days, and it does make a difference in pedal pressure and probably longevity of the T/O bearing.

Well, I'll give the Koyo a go and hope it all works well. Would hate to have to pull that gearbox again... Thanks
-Chris

Subject: Koyo clutch release bearing
Date: Mon, 19 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> The TR250-6 did not come with the threaded fork lever nor spring -- it is not adjustable.

That's right, it was "self-adjusting", so there's no need for the adjustment.

> One of the TR experts (might have been N. Riedel) wrote that he thought that the bearing on the TR250-6 was
> meant to stay in contact with the driven plate, thus continuing to spin, but he wasn't sure.

Nelson may have said that at one point, but his "Reliable clutch" article states unequivocally (and correctly) that "The TR250/TR6 is designed to have the release bearing held against the pressure plate at all times." FWIW, my 1980 Chevy used a similar design (with a cable and ratchet rather than hydraulics), as I believe all GM cars (with manual clutches) do.

Also, Nelson wrote that he found the KOYO bearing Not Satisfactory, because it doesn't hit the B&B pressure plate in the right place.

> If the bearing is in contact with the driven plate, and hence always spinning, then it had better be perfectly
> coaxial with the driven plate, otherwise you can imagine that the rotation of the bearing could become slightly
> eccentric and that can't be good.

Personally, I do not believe this is a concern. Any eccentricity would be amplified with the clutch released (meaning a large load on the bearing) ... not enough to hurt anything with the bearing not loaded.

> This may be why it seems to be a really big deal on the 6-cylinder cars to line up the gearbox perfectly with
> those dowel pins -- to ensure that the bearing and the driven plate are coaxial.

The dowels are present on all cars (although not always as dowel bolts) because it is important for both clutch and gearbox operation that the gearbox input shaft be perfectly in-line with the crankshaft.

> I ordered the clutch shaft "kit" from TRF, RFK1249, which comes with the cross shaft, shaft bushes, pin, and
> lever. It is listed as the part for T46, so is for 4A-6. I looked up the part number you gave, it lists it as
> applying T23.

As we've discussed before, those numbers are intended only as a rough guide. They are not always accurate and this is a perfect example. 57193 is the number given in the factory Spare Parts Catalogue, which is more definitive than the TRF price list.

> All of the parts suppliers list the same clutch for 4A-6, but the 4A actually had a different B&B clutch that
> had less spring pressure.

I think you can blame that on B&B, not the suppliers. The 4A clutch was superseded by the TR6 clutch ... possibly even by the factory (but I don't have my factory supersession list handy to check). And the clutch being supplied today isn't even "right" for the TR6, it's a later "rationalization" apparently done by B&B.

> Well, I'll give the Koyo a go and hope it all works well. Would hate to have to pull that gearbox again...
Good luck.

-Randall

Clutch/Throw Out Bearing

Subject: TR3 Clutch Fork Mod.
Date: Dec. 07, 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

William C. Quincy wrote:

> Some time ago I read about a clutch fork mod that seem a good idea if you had the fork exposed for some
> other reason. It was suggested to drill a hole through the fork and shaft, install a 5 mm bolt and nylock nut to
> insure reliability. Is this a good idea? If so, could someone please elaborate on the details.

I used a 1/4" grade 8 fine thread, 2" long, shortened to about 1 5/16". You want the 2" bolt so the shank is 1" long... thus the threads of the bolt don't chafe the hole in the fork or shaft. I used a self-locking nut (also grade 8).

The attached pics show the result. The parts are disassembled as I have the shaft out for transfer to a new gearbox... when I originally did the cross-bolt thing I just drilled it with a hand drill with the shaft, fork & fork pin in situ.

Lest you think this is just a 'suspenders & belt' approach... the 3rd pic shows the fork pin that I removed alongside the new one. It came out unbroken but there is a definitive curve in its shape.

-Geo H

Clutch/Throw Out Bearing

Subject: TR4A Throw out bearing question
Date: Tue, 2 Feb 1999
From: "Martin Gonzales" <mxgo@ix.netcom.com>

> **One pointer:** Heat the bearing for 20 minutes directly on a 75 watt light bulb. It will be quite hot, so use a glove to handle it. Then drop it onto the sleeve and presto, a perfect fit.

You might try putting the sleeve in the freezer over night, then try the light bulb trick. According to my brother, ship's engineer, they put the bearing in a sealed plastic bag in boiling water, the sleeve in the freezer overnight, then the bearing pops in with no trouble. Please use gloves.

-Martin

Subject: Throw-out bearing
Date: Tue, 07 Sep 1999
From: <levilevi@home.com>

Fred,

My guess is it's the TO bearing, since you don't have a shifting problem, but you get noise when it's in the spin position. And AFAIK our clutches aren't adjustable. If the TO bearing was installed onto the sleeve with too much brute force (e.g. hammered onto the sleeve) then that could have caused it's premature death. The TO bearing should be placed on a light bulb for 20-30 minutes and the sleeve in the freezer overnight and then gently pushed together (a little anti-seize on the sleeve helps too). If you have to tap on the sleeve (use a flat piece of something between the sleeve and hammer) to get them to mate then you need to tap then spin the TO bearing, tap and spin, tap and spin, etc. so that you aren't hammering the same spot on the ball bearings every time (at least that's my take on it). Ask the local parts guy for a 1984-86 Landcruiser TO bearing. It fits on the new sleeve you will want to buy (from the usual TR suspects) and they are impressive in how much sturdier they look. Did one on my 6 when I put the OD in for my trip to VTR and so far it's been super. Oh and I didn't grease the bearing either and according to Phil Barnes that was the right thing to do. So far so good.

You could probably go for quite awhile (as long as you can stand the noise) with your present TO bearing and not create any other problems but YMMV. My old TO bearing was wobbly and sounded like a baby rattle when I replaced it but I'd had zero problems of any kind, no noise, no shifting problems, nothing. It's condition though was appalling and I'm glad I had a reason to change it before the trip. Good Luck, -Bud

Subject: TR6 Clutch advice - TOB
Date: Mon, 03 Jan 2000
From: Roger Bolick <rgb@exact.com>

Use an early Toyota Throw Out Bearing for the Land Cruiser, Worldparts Beck/Arnley Part # 062-0898.

These are about twice the weight of the ones "sold" as OEM today and are really robust looking/feeling. I've used these in 4 cars already with no noise, no problems. These should last the life of the car.

After trying presses, the rotating screw on tool to prevent BB damage and most every other method... my secret is:

1. Place bare sleeve into the freezer overnight coated with WD-40
2. Place the TOB on a cold 25W light bulb downside down, plug it in and wait 30 min.
3. Wear gloves

4. Place the sleeve on counter, lay TOB down on it (correct direction) and leave this to cool/heat. (do this quickly)

This method requires no tools, seems to work everytime and cannot damage the TOB.

OPINION ONLY - The TOB and PP sold as OEM on the TR6 just plain aren't. The PP is 2 to 3 times as stiff and the TOB is just plain junk. I have several cars with original PP's and I just replace the TOB and clutch disk, not wanting the new "feel" of a muscle car PP in a 100HP car. The Sach's brand PP, SC436 is better than the others, though still not as light as the original's.

Note the PP bolts come in different lengths, make certain to test fit and watch the torque, these things are spec'ed really low.

The best alternative to the fork pin was drilling/tapping the shaft and other side of the fork for a grade 8 bolt the same size as the threads in the fork.

This bolt was threaded through the fork, through the cross-shaft into the other side of the fork, i.e. stock location, but threaded all the way.

I usually use the new hardened fork pin with a new cross shaft and only snug the pin as excess tightening will crack it. Those pins on the fork can be rotated with vice-grips to put a fresh area into the TOB.

Clutch/Throw Out Bearing

Subject: TR6: sheared off clutch fork pin
Date: Mon, 4 Jun 2007
From: Greg <one_second_zero@yahoo.com>

I have my transmission out for a clutch replacement on my 76 TR6. I was trying to remove the clutch fork retaining bolt and it sheared off in the shaft with the fork still on. On closer inspection, the fork itself was cracked all the way through on the side of the hole where the retaining bolt passes through it. Not sure if that was already there or if it cracked when I was trying to unscrew the retaining bolt. So now I have ordered a new cross shaft, fork, and fork pins from TRF (I'm praying none of them are backordered) to add to the cross shaft bushings and new retaining bolt that I'd already ordered. I remember that there was a reliability upgrade that involved drilling a hole through the fork and cross shaft and putting a second bolt through for additional strength. Can someone point me to a source of information on how to do that? Also, how are the brass cross shaft bushings installed into the transmission case? Are they pressed in? Thanks,

-Greg H

Subject: TR6: sheared off clutch fork pin
Date: Mon, 4 Jun 2007
From: "Kinderlehrer" <Kinderlehrer@comcast.net>

try this link:

<<http://web.archive.org/web/20021218153422/www.buckeyetriumphs.org/technical/Clutch/ClutchShaft/ClutchShaft.htm>>

-Bob

Subject: TR6: sheared off clutch fork pin
Date: Mon, 4 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I used a 1/4" grade 8 bolt. Got one with a long enough shank that there were no threads inside the shaft, had to shorten it a bit for best fit. Used a Grade 8 self locking nut. Some use a larger bolt, some a roll pin... I think all these methods are significantly better than just relying on that pesky pin.

<<http://www.cybertrails.com/~ahwahnee/cross%20bolt.JPG>>

Hole for the bolt is drilled perpendicular to the stock pin. It's pretty easy drilling with a hand drill.

-Geo

Subject: TR6: sheared off clutch fork pin
Date: Tue, 5 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

----- Original Message -----

From: "Glenn A. Merrell" <StagByTriumph@tscusa.org>

>>

>> <<http://www.cybertrails.com/~ahwahnee/cross%20bolt.JPG>>

>>

> Is that a bronze bearing carrier I see in the photo??

Yes, is that not usual? AFAIK this is the original carrier and bearing in the '64.

-Geo

Subject: TR6: sheared off clutch fork pin
Date: Tue, 5 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> Yes, is that not usual? AFAIK this is the original carrier and bearing in the '64.

Bronze (or brass, not sure which it is) was standard on the earlier cars. It was changed to steel at some point, early TR6 I think, probably to reduce manufacturing cost.

The reduced lubricity of the steel, along with the shorter front cover introduced with the TR4A, is likely part of the reason TR6 clutches are so troublesome, while the earlier ones are relatively trouble-free.

BTW, when adding the bolt to reinforce the taper pin, be sure to check that the end of the bolt cannot drag on the gearbox front cover. As already mentioned, it will have to be trimmed to achieve this.

-Randall

Subject: TR6: sheared off clutch fork pin
Date: Tue, 05 Jun 2007
From: "Glenn A. Merrell" <StagByTriumph@tscusa.org>

Geo & Kathleen Hahn wrote:

> ----- Original Message ----- From: "Glenn A. Merrell" <StagByTriumph@tscusa.org>

>>>

>>> <<http://www.cybertrails.com/~ahwahnee/cross%20bolt.JPG>>

>>>

>> Is that a bronze bearing carrier I see in the photo??

> Yes, is that not usual? AFAIK this is the original carrier and bearing in the '64.

> -Geo

Ah, I must have missed the TR4 in an earlier post. Yes, IIRC early Triumph manual transmissions had bronze carriers. I completely forgot that, the last TR4 I had apart was in 1972! This changed I think with the 67 IRS when it went to steel.

-Glenn A. Merrell

Subject: TR6: sheared off clutch fork pin
Date: Wed, 06 Jun 2007
From: <spamiam@comcast.net>

> Triumph manual transmissions had bronze carriers. I completely forgot that, the last TR4 I had apart was in
> 1972! This changed I think with the 67 IRS when it went to steel.

> -Glenn,

I had my original TR4A transmission off a few years ago. It had (and still has) a bronze bearing carrier. I was going to use a steel replacement, but I did not like the fit.

The bronze carrier has the lip indented to prevent spinning of the carrier. I think this was done because, unlike earlier cars, the clutch is "self adjusting" and remains in contact with the fingers on the clutch pressure plate, similar to the TR6.

-Tony

Clutch/Throw Out Bearing

Subject: Yet Another TR6 Clutch Post

Date: Mon, 27 Aug 2007

From: <acekraut11@aol.com>

Hi List:

While there have been many discussions regarding the TR6 clutch I don't recall this particular question being asked. According to TRF web site:

"Joachim does not recommend using his throw-out bearing with Borg & Beck pressure plates or with any pressure plates having bent or "crooked" end on? spring fingers..."

Of course, I purchased a clutch set-up before being aware of this fact and, you guessed it, it is a Borg & Beck, and it has bent fingers. What has been the experience of the list regarding this set-up? Has anyone installed a Gunst bearing with a Borg & Beck pressure plate or another brand with bent fingers. What was the result? TRF suggest that LUK clutches are best with the Gunst Bearing. For those running with the Gunst bearing what do you have installed for other components besides B&B and how is your set-up performing?

-Aaron

Clutch/Trouble Shooting
Bench Bleeding

Subject: Clutch bleeding woes
Date: Sun, 26 May 2002
From: Bob Fabie <rmf3860@erols.com>

Lou:
You may have air in your clutch master cylinder. It's usually best to bench bleed it because the stroke of the clutch pedal does not move the master cylinder piston as far as you can when you do it by hand on the vise. This ensures that you get all the air out.

Bench bleeding is simple. Attach the M/C to your vise using one of the mounting flanges. Fill the reservoir. Push the plunger in all the way and hold it momentarily until you cover the exit hole with your finger. While holding your finger on the hole, release the plunger. Release your finger. Repeat three times. Don't let the reservoir get empty. Reinstall the M/C, and attach the hose to the slave cylinder. Open the bleeder on the slave cylinder and just let the fluid gravity flow until there is a solid stream of fluid and not air. I hope this solves your problem.

-Bob Fabie

Subject: Clutch bleeding woes
Date: Sun, 26 May 2002
From: "Randall Young" <ryoung@navcomtech.com>

Lou wrote:

> Toward the end of last year's driving season I found that I was topping up the clutch reservoir on the 4A about
> once a week. Found a leak in the slave cylinder but since it was the end of the season I kept filling it. As part
> of the 4A's welcome home present, I ordered a clutch slave cylinder kit from TRF. Disassemble and
> reassemble went well but I have spent the better part of today trying to bleed the system. I have pumped
> about a pint of Dot 4 through the system, but I still have a soft pedal. I am doing the assistant with the open
> bleeder on the down stroke into the "jam" jar with plastic hose all to no avail. Bleeder screw is on top, cup lip
> is toward the front and there is no leakage. I am stumped and frustrated because the weather here in North
> Indiana is beautiful. Any suggestions would be appreciated.

Lou, try this. Might not work, but if not, you haven't lost anything but a couple of minutes time. With the bleed valves closed and the reservoir fairly full, 'Pump' the pedal several times and then hold it depressed for about 10-15 seconds. Let off and let it sit for another 10-15 seconds. Repeat the process 2 or 3 times or until you get a good pedal. It works for me, every time.

This works the air backwards through the MC, so it's possible for the MC to become 'air locked'. If so (no pedal resistance at all), you can bleed right at the MC with it still on the car. Loosen the fitting, depress the pedal (since there's no pressure involved, you may be able to do this by pressing on the top of the lever under the hood), tighten the fitting. Repeat as necessary.

-Randall

Subject: Clutch bleeding woes
Date: Sun, 26 May 2002
From: "Peter Arakelian" <PeterAra@msn.com>

You might try holding the slave cylinder push Rod in the cylinder as far as you can push it before pressing on the pedal and opening the valve. This reduces the amount of available space inside the cylinder and will make getting any air out easier. Are you pushing the pedal too hard, too fast, too rapidly in succession? This might foam the fluid. Try letting it sit for a while - a few hours should do; then try again holding the Push Rod in while you bleed it.

-Peter Arakelian

Cosmo:

To bench bleed the master cylinder, the line has to be removed so that all you have is the master cylinder fastened to your vise. Then fill it with fluid. Push the plunger as far as possible (fluid will leak out of course). While holding the plunger in, cover the outlet hole with your finger and hold it. Release the plunger. Release your finger from the outlet hole. Add more fluid. Repeat the process three times. Don't let the reservoir get low. This will ensure that there is no air trapped in the master cylinder.

After you've done this, reinstall the M/C and reattach the hose, pipe and slave cylinder and let them dangle straight down. Now, open the bleeder valve on the slave cylinder and fluid will naturally (gravity) flow from the master cylinder to the slave cylinder. Ensure you keep topping off the reservoir with fluid. If you have the red color plastic hose, you can literally see air versus fluid. Just let it drain until there are no bubbles visible in the hose and an airless stream of fluid is coming out of the slave cylinder. This sounds more complicated than it is, but I hope it helps you.

-Bob Fabie

Clutch/Trouble Shooting

Subject: Clutch Problem - '67 TR4A
Date: Sun, 9 Nov 2003
From: "dixie" <dixie4@wales.freemove.co.uk>

Try this, it once worked for me.

Fully depress the clutch pedal and then select a piece of timber of the correct length to fit between the pedal and the seat thereby keeping the clutch pedal depressed. Leave it overnight or more if possible in this position.

The theory is that any trapped air will find its way up to the reservoir and out of the system. Worth a try, although bleeding the system is quite straight forward enough.

-Adrian

Clutch/Trouble Shooting

Subject: Slippage
Sent: Feb. 21, 2003
From: <ebk@buffnet.net>

Hi Randall!

Well, I did it. [:-)] I don't know what the problem is, but maybe you can help me? I took the Rebuilt TR4/A engine out for its first ride this year [last yr., 12/1/02 ONLY, = 2miles [:-D]]. I drove it a total of 30 miles in 35+^F weather. I took it slow & slowly did the acceleration for short bursts [around 35,000RPM's & letting off the accelerator initial to 20,000 RPM's. Ideal = 11,000RPM's]. I noticed that when I reached 25->30,000RPM's the engine would rev high & the tach would show like 35,000 with loss of POWER! I first thought that the clutch is slipping [installed new clutch Sach's Pressure Plate, Gunst TOB, with 2nd pin perpendicular to the taper pin. I'm afraid that my rings aren't 'seating-in'. What do you think? Feel free to ask any questions.

-Cosmo Kramer

Subject: Slippage
Sent: 2/22/03
From: <Ryoung@navcomtech.com>

Cosmo, I agree most likely your clutch is slipping. 2500-3000 is just about peak torque, so that's where it would slip, too.

I would start by checking carefully that there is some free play in both the clutch MC linkage, and in the slave linkage. Doesn't have to be much, but there does have to be some. If I remember right, the 4A does not have the return spring or adjustable linkage at the slave, so just check that you can pull the arm towards the slave and get a little slack. Also, with the car on jack stands, press and release the clutch pedal and then immediately crack the bleed valve on the slave cylinder. If the fluid spurts out under pressure, then either there is a problem at the MC, or the line to the slave is internally blocked or collapsed. I had this happen on a rear soft brake line once, took me forever to find the problem.

If none of that shows up a problem, you may need to remove the tranny again. I'm not familiar with the Sach's/Gunst combo, but it sounds as though something is not right. But since that's a lot of work, I would probably first try disconnecting the linkage to the slave completely, check that the arm has some free play in it, and perhaps even try driving the car that way to see if it still slips. Driving with no clutch is one of those skills that every LBC owner should have...

-Randall

Subject: Slippage/Break-in
Date: 2/23/03
From: <105671.471@compuserve.com>

A quick test you should try is when it starts doing that, bleed the clutch slave cylinder and see if it has any effect. If the symptoms go away, then I suspect the little seal on the end of the rod in the master cylinder is not being retracted and the hydraulic system is not "equalizing" and your clutch throw-out is no longer returning far enough.

The description points that way, at any rate.. And it is an easy test and a fairly easy fix if it is the case.

Good luck

-Dave

Subject: Slippage/Break-in
Sent: 2/24/03
From: <105671.471@compuserve.com>

Written by <ebk@buffnet.net>:

> OK, You've got me. [:-)] I'm to drive around & as soon as this happens, then I'm to pullover to the
> side of the road & start bleeding the slave Cylinder? I really need two people to do this.

Let me qualify that. You don't need to do a full bleed, just crack open the bleeder valve and relieve any pressure that may have built up. **If the fluid is not allowed to return to the reservoir there will be residual pressure even with the pedal all the way out. This pressure will hold the clutch partially disengaged.** When slippage occurs, grab a 7/16 wrench and open the bleeder and see if fluid squirts out. If it does, then close again the bleeder and test drive. If you have no more slippage then that is your problem. The little cup that blocks off the port to the reservoir is not being pulled back

Either the clutch master cylinder is not returning all the way, or the rod that pulls the cup has come loose.

-Dave

Subject: Slippage/Break-in follow through
Sent: 2/24/03
From: <Ryoung@navcomtech.com>

> I was thinking of putting the car up on 4 stands & testing out the car in the air in my garage. Will this
> work to check out the clutch 'slippage' or do I need the 'road resistance' to be able to get the 'slippage'?

Cosmo, from your description your clutch is slipping only when the engine reaches maximum torque. This means it won't slip if the engine has no load to work against (and thus cannot develop max torque).

Clutch engagement right at the top is a give-away for linkage/hydraulic problems. Check the things I gave you before, especially free play at the MC. It doesn't have to be much, but there has to be some, otherwise the little valve won't open and let any pressure buildup back into the reservoir. A stiff pedal pivot or broken pedal return spring can cause the same problem.

-Randall

Subject: Break-in follow through
Sent: 2/24/03
From: <Ryoung@navcomtech.com>

> OK, then even if I do adj. the slave cylinder to .010" as I think the manual states [I'll check the specks
> before I actually do anything], then I really wouldn't know if that was the fix until I can take it out again,
> right?

Yes, exactly.

This explanation goes along with Dave's reply:

> You don't need to do a full bleed, just crack open the bleeder valve and relieve any pressure that may
> have built up. If the fluid is not allowed to return to the reservoir there will be residual pressure even with the
> pedal all the way out. This pressure will hold the clutch partially disengaged. When slippage occurs, grab a
> 7/16 wrench and open the bleeder and see if fluid squirts out. If it does, then reclose the bleeder and test
> drive. If you have no more slippage then that is your problem. The little cup that blocks off the port to the
> reservoir is not being pulled back

> Either the clutch master cylinder is not returning all the way, or the rod that pulls the cup has come loose.

-Dave

Am I sort of right?

Well, I'll disagree with Dave to some extent. If you do find pressure in the system when you crack the bleed valve, it definitely indicates either a partially blocked line or (more likely) a master cylinder problem. However, just bleeding off the pressure may not help, as the system may build pressure back up on the very next operation of the clutch pedal.

There is actually some confusion over what the free play at the clutch slave should be, there are several conflicting figures given. And, it's difficult to measure exactly .010". However, it's not all that critical, anything between .005" and 1/8" will work fine. The important thing is that there is some free play, at both the slave and master cylinders.

If your slave has a return spring on it (I don't think TR4As should have the return spring, but I'm not certain), then pull the lever away from the slave (extending the return spring as much as you can) and check that the push rod becomes loose (ie rattles a bit when you shake it). If your slave does not have a return spring, then push the lever towards the slave cylinder (forcing the piston into the cylinder as far as it will go); release the lever and again check that the push rod is loose.

At the master cylinder, just shake the push rod to be sure it rattles a bit.

If you find no free play at either end, rectify the problem and test drive the car again.

-Randall

Subject: Break-in follow through
Sent: 2/25/03
From: <105671.471@compuserve.com>

"Randall Young" wrote:

>Well, I'll disagree with Dave to some extent. If you do find pressure in the system when you crack the
> bleed valve, it definitely indicates either a partially blocked line or (more likely) a master cylinder problem.
> However, just bleeding off the pressure may not help, as the system may build pressure back up on the very
> next operation of the clutch pedal.

Point taken. I intended this as a test only. Finding pressure here with the pedal fully released is an indication of (usually) the master cylinder. Just relieving the pressure doesn't cure any problem, it merely points to the problem. And the problem is probably the master cylinder.

To verify that, you can drive the car again until the symptom returns and then crack the line at the master cylinder. If the blockage is in the line or slave cylinder you will not get the same squirt of fluid. But if you do get the same squirt the problem is the master and you'll need to pull it apart again. Or check to make sure it is returning all the way.

-Dave

Subject: Break-in follow through
Sent: 2/28/03
From: ebk@buffnet.net

Hi Randall!

I got up this AM & adjusted the Clutch Slave Cyl. Rod [it WAS too tight], & took it out for another test ride [27 miles this time]. NO SLIPPAGE!!!! Thanks for the correct diagnose.

I now have over 50 miles on the engine with it staying in the 20 -> 35 RMP range of increase -> coast down to 20 & cruise at 20 ->25 for a while then 'increase/decrease reps' in 3rd gear cruise 'I/D' shift into 4th & cruise 20 -25, well maybe 30 RPM's then cruise in 3rd gear. This cam is 'VERY Nice' in 3rd gear. In fact, I find it VERY hard to have the engine run @ 30 MPH in 3rd. gear. It's got quite a range 20RPM=30MPH, 25RPM's=35, 30RPM's=40, 35RPM's=45. I haven't pushed it beyond that, at this time ;>). Now would longer cruises on country roads be the best? [NO HILLS!]

Now all I have to do is get the setting right on the OD [Mechanical/electrical adjustment @ the solenoid :>(adjusted & check out the heater! Yes, I've been running around in 32^ F weather without the heater on, & no coat. Just a couple of sweatshirts. I guess the adrellian is 'REALLY' Flowing!

-Cosmo Kramer

Clutch/Trouble Shooting

Subject: TR3 Clutch
Date: Wed, 11 Jun 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I've had this car for many years and have taken the slave cylinder out so many times that I've lost track of how
> it's supposed to go together. With the cylinder (Girling) bolted to the rear of the bracket and the end float
> adjusted to .075", the clutch lever moves about 3/4" when the pedal is fully depressed. When I try to bolt the
> cylinder to the front of the bracket, the rod isn't long enough to adjust the end float. Does this indicate a
> problem with the clutch fork?

I believe so, yes. Note that the factory manual (and many other) drawings show the early clutch slave, which did have the mounting ears to the rear of the bracket. However, the longer slave on the later TR3 and all TR3A/B should be mounted with the ears to the front of the bracket.

> Why would the clutch fail to disengage fully only after warming up?

I'm wondering if perhaps you have multiple problems. If you can get the free play in the slave linkage down to spec (which I believe should be only .010" - .030"), it should release the clutch even with a broken pin. I actually drove my TR3A for several years with a broken taper pin, by making up a longer pushrod. One thing to watch for: be sure the slave piston is pushed fully home when checking the adjustment. If the slave is sticky, or the spring is weak with age (or improper replacement), the piston may not return home when cold. Then when it warms up and works more freely, it may return home and cause excessive end float.

Another indicator: where is the pedal when the clutch starts to engage? If it's still near the floor, then a broken pin or inadequate movement is likely. If it's halfway up or more, then there may be a different problem.

If you do pull the gearbox, check that the locating pins are present. Absence of the two pins can sometimes let the gearbox move against the engine enough to make the pilot bearing drag (which causes the same symptoms as a dragging clutch). Probably worth replacing the bearing anyway, while it's apart.

One more thing, check the free play at the master cylinder. Lack of free play at the master typically causes a clutch that slips when hot, but I suppose it could cause the opposite problem, especially if either the master or slave leaked a bit.

-Randall

Cooling System/Belt, Fan, Hose/Belt

Subject: Things I would have learned from the list... (Fan Belt Part #'s)
Date: Sat, 30 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

Anyway, it's NAPA **25-24379**. Thanks to FT for looking up the cross-reference from the Cummins belt I used to use. The NAPA belt is 1/2 the price (under \$15) and a lot easier to find than the Cummins (**178539WRZ**).
-Randall

> Randall:
> Any chance you can get the part # for the NAPA fan belt and post it to the list?
> -Paul Burr

>> Randall Young wrote:
>> Also, NAPA sells a belt that is considerably thinner and more flexible than the last one I got from Moss. It's
>> cogged, so it doesn't look exactly original, but it works quite well and even seems to last longer.

Subject: More on the NAPA belt
Date: Sat, 30 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

BTW, the NAPA belt is actually made by Gates (says so on the box), so it might possibly be available direct from them. I don't have any numbers from them, except it's 3/4" x 38-1/2" (19mm x 980mm).
-Randall

Subject: TR2-4A fan belt
Date: Sun, 31 Mar 2002
From: "James R. Holekamp" <jholekamp@attglobal.net>

Recently I did a little research on avail TR4 cylinder fan belts with these results:

Gates TR28386 (7/8 " x 39 1/4" - 22 x 995), per Gates email - cogged

NAPA part no 2528386 , belt is made by Gates per NAPA parts man -cogged

Goodyear - part no 24377, per Autozone website & Goodyear email - cogged

Moss US cat nos:
834-000 OE type (no longer available)
834-025 cogged type

-Jay

Subject: NAPA fan belts
Date: Mon, 01 Apr 2002
From: Eric Miller <ebuzz@teleport.com>

I looked it up on their web site several months ago and went into a local store with this part number - NBH2528386. The belt was a tight fit but seems to be the right part.
-Eric Miller

Cooling System/Belt, Fan, Hose/Belt

Subject: Fan belt tension - Have reviewed previous postings
Date: Wed, 29 Oct 2008
From: <thenicholls@verizon.net>

To the list,

I am preparing to swap my alternator out with a new rebuilt Lucas 15 ACR unit on my 1972 Triumph TR6.

I had to replace the water pump recently, which required me to adjust the fan belt tension on reinstall. I do notice that the pulleys do not seem to line up as well as they did before, and I see that this has been discussed on the list. Both the water pump and rebuilt alternator were purchased from TRF.

The book states 3/4-1", which is where I am now. My red light is definitely less happy than it was before the water pump, had it tested and it is putting out 14 volts and 30 amps. I am replacing this unit because it does appear it has some issues, and I will have it rebuilt. I also installed an Optima battery during this time.

My question, Star Auto Electric in California says to adjust the fan belt as follows:

You should tighten the fan belt just enough so the belt does not slip on the generator pulley. To test for possible pulley slippage with the vehicle's motor stopped, take your hand and with one of your fingers apply rotating pressure on one of the generator's fan blades and try to see if you are able to move the fan and pulley. If this action is possible and you can turn the fan and pulley without the belt moving you need to retighten the belt a little more. I know this sounds tedious and time consuming, however if you want to save the rear bushing from premature failure I cannot stress enough the importance of correct fan belt tension for these types of generators.

Currently with 3/4-1" play, I can indeed move the fan with one finger. I am toying with the idea of tightening the belt before I swap to see what impact it has on the red light. It used to just be dim at idle (normal), but now sometimes it is glowing red.

Anyone have an opinion on the proper tension without be so tight that damage to the water pump and my new alternator occur? Thanks,

-Craig H. Nicholls

Subject: Fan belt tension - Have reviewed previous postings
Date: Wed, 29 Oct 2008
From: "Randall" <tr3driver@ca.rr.com>

> I do notice that the pulleys do not seem to line up as well as they did before, and I see that this has been
> discussed on the list.

Guess I missed that one. The pulleys need to line up, or you will have problems with rapid belt wear.

> The book states 3/4-1", which is where I am now.

But what the book leaves out is how much force you apply when checking the tension. What I use is more like 1/2" - 3/4" deflection, when applying as much force as I reasonably can with a single thumb.

> had it tested and it is putting out 14 volts and 30 amps.

So in other words, it was working fine?

> Currently with 3/4-1" play, I can indeed move the fan with one finger.

While 1" of play (with moderate finger pressure) does seem awfully loose, I don't believe you should be able to turn the alternator fan that easily. I would get a new belt (the old one may be glazed or hard), and carefully clean the pulley to ensure it has not had a lubricant spilled on it. If the surfaces where the belt rides look shiny

(like a mirror), they could even be roughened up a bit with fine emery cloth.

Also inspect carefully to ensure that the belt is not touching the bottom of any of the pulley grooves. There were two different widths of belt used on various years of the TR6, and it's easy to get components mixed up.

-Randall

Subject: Fan belt tension - Have reviewed previous postings
Date: Wed, 29 Oct 2008
From: <thenicholls@verizon.net>

Randall,

As you always do, good points.

Have a new adjustment bracket for the alternator that is twice as thick as the current one. Will be installing it.

I am not applying that much force, so I am too loose. Will correct that.

The alternator is producing the correct output, but several British car shops have stated that it must have a dead spot or some internal issue because it does on occasion, not read correctly.

The fan belt was replaced last year, and it is the correct one. No problem there, however, I will take a look at how it sits in the pulley and check for a glazed belt. Thanks for your input,

-Craig

Cooling System/Belt, Fan, Hose/Belt

Subject: TR3-4 Generator Drive Belts
Date: Thu, 20 Apr 2000
From: "Randall" <ryoung@navcomtech.com>

Paul Cordts wrote :

> 1. Are there longer drive belts available for the TR3-4?

Yes, but they are difficult to find, and usually way too long. The Cummins 178539WRZ is effectively slightly longer, mostly because it rides lower in the pulleys. I had to special order it through a Cummins truck dealer.

> 2. What is the size of the stock belt??

The belt that used to be supplied (NLA) was marked 20x900. I don't know how that was measured though, the standards have apparently changed. Jim Wallace made a post about a year ago about current Gates belts that would be close in size, you can find it in the archives.

> 3. Does the crank pulley for the MGB fit the TR3-4?

Not without significant modifications. The hub is too short (needs a spacer behind it), and the surface for the front seal is smaller (needs a special seal). The ID of the hub opening appears to be OK, but I haven't actually tried it yet. Someone mentioned a harmonic balancer from a 5.0 Mustang, I plan to look at that next.

> 4. Is there a 3/8" hub that will work for the water pump if one were to use a 3/8" belt??

Yes, BFE, Revington, probably others carry them. Might be able to use an original TR6 pulley, with some mods. BFE carries the entire kit to convert to a narrow belt, but it's not cheap.

-Randall

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR3A Balance piece for Fan
Date: Mon, 14 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> Shouldn't I refit my balance piece with my new TR6 yellow plastic fan? I guess I'll center it where the 1/16th
> hole is in the crankshaft. The manual seems to say that this can be adjusted from left to right, but, how does
> one know to do this? It seems odd to me that Triumph designed an out-of-balance crankshaft, anyway!

It's not for the crankshaft, Paul, it's for the fan. The old steel/aluminum fans weren't very well balanced. The plastic ones are much better, which is why everyone keeps telling you not to fit the balance piece.
-Randall

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: Dampener or no Dampener on Tractor Engines
Date: Sun, 2 Sep 2007
From: <N197TR4@cs.com>

Randall wrote:

>> Pardon my ignorance, but I have a question. Do the eliminated parts contribute in any way to balancing or
>> dampening vibrations on the crankshaft?
>
> On the TR2-4; I've been told by those who should know that the stock fan itself, and the rubber bushings it
> mounts on, acts as a harmonic dampener. This has nothing to do with engine balance (although the fan
> assembly is balanced by itself), but with reducing vibrations in the crankshaft that add to its stress.
> However, based both on personal experience and what I've been told, this doesn't appear to be too important
> for nearly stock, street-driven engines. It's the people who consistently run over 5000 rpm that seem to need
> the dampening. To that end, most of the racing TR parts suppliers offer a harmonic dampener to fit the
> TRactor motor. It's also usually alloy, and usually part of a narrow belt conversion, and quite pricey.
> TriumphTune used to sell the parts to allow using the dampener from a BMC motor, but AFAIK that kit has
> been NLA for a long time.
>
> I've run over 100,000 miles on the street with no mechanical fan or extension, even exceeding 5000 rpm on
> occasion (once had a passenger ask me if the tach was supposed to hit the stop like that <g>), and never
> broken a crank. I have seen the cranks others broke, but AFAIK every one of them was on the race track, not
> on the street. YMMV of course.
> -Randall

My own opinion is that a very heavy 31# flywheel has more to do with cranks cracking than the absense of a dampener. These flywheels should have never been 31#.

I use an MGB harmonic balancer on #197, but seriously doubt it does very much, outside of provide me with a pulley for a narrow belt.

I have used flywheels from 10-20# in 16 years of racing, sometimes exceeding 6,000 RPM and have never broken a crankshaft. And I use a stock crankshaft with no preparation beyond balancing.

It is my understanding that harmonic balancers have to be carefully engineered to the specific engine characteristics. I doubt that Triumph studied this in very great depth for this particular engine. Mostly my opinion, but I have some history, both empirically and by association.

-Joe A

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: Electric Fan Control
Date: Sat, 5 Apr 2003
From: <ZinkZ10C@aol.com>

<MotoPsyche@aol.com> writes:

> Do you use a thermostatic switch to control the fan, or did you hook up a manual on/off switch?

A thermo switch is much better since it is automatic. Get a hot light switch from a GM or Ford car (most any year from 60's to recent) Chryslers have always (at least back to 55) had temp gauges so that sensor won't work.

The GM switch you want has a 1/4 tab for a wire and a small (3/32) hole covered with paint. Scrape the paint from the hole and you will find a slotted screw. Turning the screw clockwise will cause the switch to come on at a lower temperature.

The Ford switch has a threaded wire terminal with either a slot on top or flats. Turning the screw clockwise will lower the turn on temp.

Use this switch to ground the coil of a relay. The Bosch cube relays are just great for this since they have 1/4 push on terminals. Be sure to get a good one though, many places sell junk copies.

The other end of the coil needs switched 12V+ if you want the fan to run only when the key is on. Use constant battery power if you want the fan to run with a hot motor that is shut off. This trick can reduce fuel boil over after a hard run. If your battery is any good this won't be a problem.

One contact of the relay goes to the + side of the fan. (use contacts that are normally open) The other contact goes to a fuse then to constant battery power. Place the fuse (or a fusible link) as close to the battery as possible.

The temp sensor can be threaded into most any water jacket though a block drain is probably the least desirable location.

Turn the temp screw a couple of turns clockwise then experiment a bit.

A second switch like this can be a great early warning light. I added one to my 77 Chevy truck. The factory gauges are still intact but don't catch your eye like a light. (the light is even integrated in to the existing warning cluster, also added a oil light as well.)

The switch does not turn on in normal driving. During a long uphill pull (3 miles) towing a box trailer the light will turn on at the top. Also after a highway run the light will be on for a min on a hot restart. With this setup a small loss of cooling capacity will be noticed long before any damage is done.

All this stuff can be made from junkyard parts for \$ 5 - 10.

-Harold

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: Electric Fan-TR3
Date: Wed, 22 Mar 2000
From: "Erkan Hassan" <ehassan@rx.umaryland.edu>

Listers,

I received the 11 inch electric fan from JC Withney (no comments please) in the mail the other day for installation in my 62 TR3B. The installation looks pretty straight forward that I think even I can do it.

First, I am concerned that the weight of the fan being held in place against the radiator by the 4 plastic Ty rods will result in stressing and bending the fins. Is this a valid concern? Should I rest the fan on the lip in front of the radiator or on a piece of wood or something?

Second, although I have a doctorate degree it is not in car mechanics nor electrical components. The wiring harness has 4 wires. One is the inline fuse to power the fan and hooks to the fan. The second is to vehicle ground.

The third and fourth wires are stripped on the end and raise questions. The instructions say to attach the black wire "To ignition switch power flow only when key is on". The red wire is "To power flow even when key is off".

1. Does this make sense? It seems to me that if you are going to have power flow even when the key is off, this is all one would need, since the fan would work with the key on or off. Do I need power to the fan (and therefore the fan working) when the key is off? Since no further heat is being generated, won't things cool down by themselves? And even if they don't cool down by the time I am back in the car, driving again, the fan should kick back on with the key on. So do I connect both these wires to one site that works either with the key on or off?
2. Assuming I need both to different sources, where exactly do I splice these wires to? What have others done in the past?
3. How do I know BEFORE cutting into all these wires in the car which ones work with the car on and/or off?

FWI, there is also a separate wire that is the ground for the fan motor.

-Erkan Hassan

Subject: Electric Fan-TR3
Date: Wed, 22 Mar 2000
From: "Randall" <ryoung@navcomtech.com>

Erkan Hassan wrote :

- > First, I am concerned that the weight of the fan being held in place against the radiator by the 4 plastic Tie
- > Rods will result in stressing and bending the fins. Is this a valid concern? Should I rest the fan on the
- > lip in front of the radiator or on a piece of wood or something?

I asked the same question of my local radiator shop, they said the only concern was to be sure that the plastic rods are not touching the tubes, but are centered between the tubes. Otherwise they can rub holes. They also cautioned to be sure there was some compression of the rubber pads, so the fan cannot move against the core.

- > Second, although I have a doctorate degree it is not in car mechanics nor electrical components. The
- > wiring harness has 4 wires. One is the inline fuse to power the fan and hooks to the fan. The second is to
- > vehicle ground.

>

> The third and fourth wires are stripped on the end and raise questions. The instructions say to attach the black wire "To ignition switch power flow only when key is on". The red wire is "To power flow even when key is off":

> 1. Does this make sense? It seems to me that if you are going to have power flow even when the key is off, this is all one would need, since the fan would work with the key on or off. Do I need power to the fan (and therefore the fan working) when the key is off? Since no further heat is being generated, won't things cool down by themselves? And even if they don't cool down by the time I am back in the car, driving again, the fan should kick back on with the key on. So do I connect both these wires to one site that works either with the key on or off?

I would assume this means there is a relay somewhere in your wiring harness. The idea is to not have the fan motor current drawn through the ignition switch (and possibly overload it). Based on my experience, this is an excellent idea ! So, the wire to switched power would power only the relay coil (maybe .2 amps), while the wire to unswitched power carries the current to the fan motor (8-15 amps). (Note that the fan motor draws much more current when starting than when running. The wiring, etc. needs to be able to handle the startup current, at least momentarily.) The relay also prevents another problem, where the spinning fan can feed enough power back into the ignition circuit to keep the engine running for several seconds after the key is turned off.

> 2. Assuming I need both to different sources, where exactly do I splice these wires to? What have others done in the past?

Not sure where a good point is on a 3B. For pre-TS60000, the fuse block makes a good point, as it will accept the extra wires and has both switched and unswitched power available. I created a new terminal in the output lead of the alternator, where all my high current accessories tie in, including the unswitched power lead to the fan relay. The switched power lead goes to the hot side of the starter pushbutton.

> 3. How do I know BEFORE cutting into all these wires in the car which ones work with the car on and/or off?

I don't have the info handy, but there are standard wire colors for the different circuits. Should be marked in your manual, or on the VTR web site somewhere. I would also recommend buying one of the cheap DVMS (Digital Volt Meter, although in reality they are Digital Multi-Meters) at Harbor Freight. Although they certainly have their limitations, they are cheap enough that anyone with a LBC should have one, and rugged enough to keep in the boot or spare tire well. Frequently on sale for \$10 or less.

-Randall

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: Electric TR3 Cooling Fan
Date: Tue, 29 Jun 1999
From: "Jack Brooks" <brooks@belcotech.com>

Morning Mike,
Here's what I did:

I eliminated the mechanical fan entirely, by cutting the fan extension off at the base near the pulley, adding a plate across the fan hub flange to support the pulley bolt.

I added four 1/4 - 20 studs on the outside of the radiator to bolt up to. I installed the fan as a puller(behind the radiator), as this is considered the most efficient way to mount it. I've considered adding a piece of rubber fuel line hose around the perimeter of the fan to isolate it from the radiator, but it's been bolted up to the studs with nyloc nuts, so there does not appear to be a vibration problem. The fan hides pretty well in the engine bay, if having an electric fan in the bay bothers you.

The fan I used is from Scott's Manufacturing (see the monster list) 13 inch diameter fan. The mounting holes line up almost perfectly with the edge of the radiator. The lugs on the fan are designed to be enlarged and they required a slight enlargement to fit the radiator. The fan draws 6.9 amps (I measured) which my stock generator has no problem providing with the head lights OFF at idle or head lights ON at speed). BTW - You can't hear this fan running from inside the car, when the engine is running and a stock exhaust. It can be heard from outside the car.

You must be careful to avoid interference between the fan and the cross member on the front of the engine. My fan is mounted as high as possible on the radiator and clears the top of the cross member by less than an inch. <Whew!> Take measurements before you take everything apart Also, since the water temp is higher at the top, the cooling air is more effective here, albeit a minor amount.

I also added a thermostwitch in the top header of the radiator to control the fan and only run the fan when the ignition is on, hence switched power source. My fan relay is mounted just below the directional flasher, in the same hole in the firewall. This location meant I didn't have to drill a new hole and it was close to the fuse box, where I got the power from. Also, as long as the radiator was off the car, I had it boiled out, tested and painted.

Right now I am sorting out the new engine (50-60 miles). The 160F thermostat combined with the 180F thermostwitch seems to be a great combination. A 160F T-stat starts to open at 160F and goes full open somewhere before 180F(I believe). The fan goes on at 180F and off at 170F. Perfect overlap for minimizing the fan running, without letting things get too hot. I'm debating the merit of adding a switch inside the cockpit to manually turn the fan on, but short of thermostwitch failure, I can't see the need for it.

This is the first modification I made which is easily non-reversible, but I am really happy with it. Fan hub extensions are plentiful and cheap. Also, if I wanted to restore the radiator to original, the studs could be ground off. The thermostwitch bung (the threaded adapter) would be more difficult to repair, but I put it on the front of the radiator, so the only way it can be seen is up through the grill.

Mike, if you have any questions, please feel free to ask. I apologize, but I did not take any pictures of what I did. This is especially unfortunate, as the new zinc plated nyloc nuts on the gloss black powder coated crankshaft pulley (thanks FT) look awesome.

-Jack Brooks

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: Fan Blades
Date: 4/28/2K3
From: <bbrewer@qnet.com>

Bill Brewer wrote:

I already gave it a home with a guy in my car club. Sorry. FWIW, I made a 7 blade flex fan from a generic fan that I bought at our local "Car Quest" parts store. I only had to drill two new mounting holes and enlarge the center hole. It bolted right on and served me well for about 6 or 7 years. It moved a lot of air.

-Bill Brewer

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: Fan extension, fan belt, steering rack
Date: Sat, 01 Sep 2007
From: "Jack W. Drews" <vintr4@geneseo.net>

I've run the MGB conversion on my race car for eleven years. I honestly don't know if it does any good or not, but it makes me feel like I've done everything possible short of buying a high priced aftermarket dampener. The theory of these dampener is that it helps dampen the torsional vibration imparted to the crank by our four banger engines. I agree with Randall that it doesn't make much difference on an engine seldom over the 6000 rpm line. You can do almost anything with these engines if you keep it below 6000.

What's required for the conversion is to shorten the extension of the MGB pulley that would normally go through the front seal, and cut enough off of that portion of the TR pulley that it can serve as an extension plus give the right diameter for the seal. The only part that leaves me uneasy is the key in the crank does not engage much of the key way in the pulley, but that hasn't caused a problem in my car and others with the same conversion. If anyone wants dimensions to cut these two pieces, contact me off list and I'll send them to you.

Randall wrote:

>Randall wrote:

>> <Btmfdchn@aol.com replied>:

>> The dampener from a 3-main MGB will fit with slight modification to the key-way to make it a bit deeper.

>

>It takes a bit more than that, at least for the dampener I sourced from a MGB (maybe it was a 5 main?). The hub area is both shorter and smaller diameter; meaning you need a spacer between it and the crank gear to clear the timing cover (and line the belts up), plus a special seal to fit both the cavity in the cover and the smaller hub. My understanding is that the TT kit was the spacer and special seal. Of course, someone that was handy with a lathe could probably create a spacer that would perform both functions; or the seal might even be available off the shelf somewhere.>

>> He didn't recall the details for the waterpump pulley, maybe TR6.

>

>Only the TR5/250 and possibly very early TR6 had removable pulleys. At one time, VB had some NOS pulleys, but most likely they are gone now.

>

>> His further recommendations were tufftriding the crank and a very precise balance job.

>

> Good advice.

> -Randall

-uncle jack

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: Fan hub removal TR3 & 4

Date: Mon, 17 Jan 2000

From: <WLSSEv@aol.com>

<davelee1@home.com> writes:

> I have a quick question about removing the pulley hub behind the fan spacer.

David

Leave the hub connected to the pulley. Use a 6" piece of 1/2" pipe or 6" 3/8 socket extension. Insert that where the bolt goes, connect a gear puller to front of hub. Two or three turns and it's off. BTDT.

-Walt

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR Fan Pitch
Date: Thu, 02 Aug 2007
From: Steven Newell <steven@newellboys.com>

<[wbeech](#)> wrote:

> Has anyone tried to bend the fins on their fan to increase the pitch and therefore move more air across the radiator? Just eyeballing it I would say the TR3 fan is pitched at about 10-15 degrees, but looking at pictures > of those yellow fans at TRF they look to be about 30 degrees and they have six(6) blades.

I don't know exactly what the TR3 fan looks like, but I have an early TR4 CT5018LO with the four flat aluminum blades. Not much pitch at all.

A couple years ago my fan threw a blade -- probably just 40 years and 100K of metal fatigue -- which luckily went down instead of up. That gave me the reason to install the yellow fan I had hanging on the wall.

They have 8 blades, and plenty of air-moving pitch. I made one or two changes at the same time, but I think the fan is the main reason my car now runs so cool.

I wouldn't recommend bending a 50 year old fan from your TR3, since it'll increase the chance the metal might fail. If you really need better air movement, look at a yellow fan or an electric pusher fan. Best luck.

-Steven Newell

Subject: TR Fan Pitch
Date: Fri, 3 Aug 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

<[wbeech](#)> wrote:

> Has anyone tried to bend the fins on their fan to increase the pitch and therefore move more air across the ...

Some fans with lots of pitch flex and flatten out at high speed... don't know if this is the case with the TR plastic fans but, as noted, tweaking the old metal fan seems dicey.

I somehow ended up with a TR4 fan (square tip) on my TR3A (would have had the rounded tip) which may perhaps provide some small improvement.

-Geo

Subject: TR Fan Pitch
Date: Fri, 3 Aug 2007
From: "John Macartney" <standardtriumph@btinternet.com>

I recall seeing in one of my old sales training manuals that fan blade pitch on all Triumphs (presumably other Brit makes too?) was at optimum *scoop* at around 1000-1200 rpm. At higher engine speeds the fan became a power drain and was effectively useless. IMHO fitting an electric fan will:

- a) reduce the fan noise that is considerable until you hear its absence
- b) allow a faster warm-up and
- c) provide improved fuel economy.

The latter is important for us who can only enjoy our cars while paying gas prices @ approx US\$7.40 per US gallon. My Triumph is currently costing me about 32 cents a mile, so trips in it are becoming fewer and fewer. A pity Standard-Triumph never made a 6 cyl turbo-diesel . Give me a diesel any day for economy, reliability, slogability and long life.

-Jonmac

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR3/TR4 metal fan balance
Date: Fri, 1 Feb 2002
From: "Taffel, Sherman" <STaffel@bcps.k12.md.us>

Hi Tom!

Very interesting notes. What I did with my original metal fan, after cleaning it up during the restoration, and before painting the fan, was this:

I removed the 'burs' on the outer tips/edges of the blades (certainly not enough mass removed to make a difference, this I know from working with aircraft propellers- where balance is even more critical).

I placed the blade, one side at a time, on the flat clean workbench. I noted blade tips that were 'higher than others'. I flipped the fan, did the same thing. I 'tweaked' the blades till they were all in 'the same plane'. I did this by gently pushing to have all the tips rest evenly on the bench. Did this both ways. I installed the fan on the hub with the balance piece - From whence it came off. After start up I watched the 'plane' of the diagonal blades in reference to the radiator. As one accelerates the engine, one can see a fine change of plane. I measured with a micrometer the fine differences. Each tweek made the high rpm balance 'better', but it is still far from acceptable to me.

I know from my early years with the car (1970-71) driving across Oklahoma, Texas and New Mexico at 5000-5500 rpm (valves adjusted per Kasters 'blue tuning manual) - I had no vibrations then that were 'annoying or clearly 'unacceptable'.

As you say- with the age of the fan - it just seems the logical next step for practical driving and occasional bursts thru the mid 4,000 rpm range - is a plastic fan or an electric fan conversion, which seems most practical to me. After all, this is what TRiumph did for the TR-6 - better technology.

I'm not about to pull the engine & tranny for this problem. I have no 'abnormal vibrations' at 3800 RPM or below- where most cruising is done, despite my Panasperts with 165 x15 tires which have the effect of 'low profile tires (1/2" wider rim than stock discs). The GPS confirms the car runs about 5mph slower at 3500 RPM (65mph real speed vs 70mph indicated). This is a NON-overdrive car. Another someday project!

Interesting about the tranny balance piece, I'll look for that next time I'm under there. For me, originality is not an issue vs practicality. Another thing, I recently learned there is some minor play in the crank with the 'thrust washer test'. Don't know if this has anything to do with this crank/fan imbalance or not.

All these are Interesting technical questions in our search for 'Triumph Perfection'! I'll report back in the spring, when I get the conversion completed.

Hope to see you in Ohio for the TRA National next year!
-Sherman

-----Original Message-----

Subject: TR3 fan balance
From: T.R. Householder <trhouse@greenapple.com>

FYI. Tom

There is a system of balance weights mounted on the fan assembly. These however do not balance the engine in my opinion. Somewhere I saw a photo in a manual of how the fan and hub assembly were balanced on a bench jig. Once the assembly was balanced, holes were drilled to mark the correct location of the weight. If you have the original fan assembly it should go back together without much difficulty. Hard to say how accurate it is after all these years. The jig was nothing more than a couple of rails that ran parallel to each other probably about ten inches apart. a machined shaft was inserted through the assembly and the ends of the shaft were placed on the

rails. It appeared as though the assembly would be rolled along the rails and then when it settled out the heavy side was marked. The weights were probably then adjusted and the procedure repeated until the assembly rolled without stopping in any certain spot. Technology is far more advanced I'm sure that your shop will be able to sort this out. The only other balancing mechanism added was a weight to the end of the four speed syncro box. This was attached to the tail shaft of the trans. there was an archive tread on this a couple of years ago. It sort of surprised me & I always thought the large cast Ball worked more as a heat sink to keep the exhaust heat off of the rear seal. Your Clutch disc and pressure plate should surely accompany the engine to the shop.

Subject: Balancing a Fan
Date: Tue, 17 Jul 2007
From: "Guy D. Huggins" <guy@genfiniti.com>

Listers,

I just added the fan assembly to the engine of my TR4A. I purchased a new fan mounting kit which included all the asundry hardware, including the balancing plate.

In the workshop manual it talks about a 1/16" hole that you use to line everything up. Only problem is none of my fan pieces, have a guide hole!!

How do you perform this balance without a hole? Cheers,
-Guy D. Huggins

Subject: Balancing a Fan
Date: Fri, 20 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

"Guy D. Huggins" <guy@genfiniti.com> Wrote:
> In the workshop manual it talks about a 1/16" hole that you use to line everything up. Only problem is none ...

The hole is drilled as a witness mark, once everything is balanced.

To balance new components, you'll need a device to support the fan & hub assembly exactly on-center and allow it to turn freely, so you can find which side is heavier. Unfortunately I have no idea where to find such a device, short of live centers in a lathe, or making something yourself.

I solved the problem by hanging the mechanical fan on the garage wall and leaving it there <G>
-Randall

Subject: Balancing a Fan
Date: Sat, 21 Jul 2007
From: "Joe Wilson" <jawilson40@bellsouth.net>

You could try using a lawn mower blade balancer, which can be obtained at hardware stores. It is a hollow, stepped, conical shaped piece, which has a stand consisting of a base and a spike sticking up which rests in the center of the cone.

-Joe

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR4 Engine Question on Fan Extension Hub
Date: Sat, 12 Jan 2002
From: Eric Miller <ebuzz@teleport.com>

<HDRIDER570@aol.com> wrote:

>As I was rummaging through the old parts bin today I found an unusual item. It is a fan extension hub (Moss
> part 837-530). The unusual part is that it is cast aluminum. It has all the external dimensions of the regular
> steel part but the front flange has not been drilled for the fan mounting holes. It does have one 1/2" dia cast
> hole in the fan flange. The pulley flange has only three (rather than six) mounting holes drilled. The center
> bore is drilled for a standard bolt instead of the special TR bolt that has the starter handle dogs.
>
>It has two numbers cast into the extension section 142121 CFL and V2993. Has anyone seen one of these
> before?-EJH

My 4A had the aluminum fan extension and yellow plastic fan installed when I bought it 5 years ago. The yellow plastic fan has a little cylindrical shaped peg like thing molded into it that fits in the 1/2" hole and locks the fan to the hub so it spins at engine speed. I bought a new plastic fan from TRF and it did not have this peg, but had four 1/2" holes drilled around the center hole. I had to make up a little piece that would fit in both holes to lock the fan to the hub.

I have now run into a new problem. The fan is really close to my recently re-cored radiator. Anyone know how close is too close? There is currently about a 1/2" gap.

-Eric

Subject: TR4 Engine Question
Date: Sun, 13 Jan 2002
From: Eric Miller <ebuzz@teleport.com>

Well, I bought myself some extra room between my new plastic fan and radiator, and solved the problem of why the crank pulley didn't line up with the water pump pulley. Turns out that when I installed the hub on the end of the crank, I bolted the crank pulley between the hub and the fan extension instead of putting the pulley on the inside of the hub. I fixed it tonight and that, along with some slight grinding of the radiator mounts, I now have about an inch between the fan and radiator.

-Eric

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR4 fan replacement
Date: Sat, 20 Jan 2001
From: "Brad Eells" <bradlnss@lightspeed.net>

Bill wrote:

> Fellow Listers;
> It is almost time for my 62 TR4 to finally be roadworthy. This would not be possible without the help and
> assistance of this list and its members. I found the answers to many of my technical problems either
> through a current thread or from a search of the archives. But I have not found an answer to my
> current problem in the archives.
>
> I recently purchased a used yellow 8 blade fan to replace the tired old stock unit. It was advertised at
> auction as an early TR6 fan that would fit a TR4. For radiator clearance I planed to mount the fan
> inverted, and I understand that this is possible. I removed the radiator, took off the old fan, and much
> to my surprise the diameter of the hub extension is greater than the recess in the inverted fan.
>
> Do I have the wrong fan? Can I reduce the diameter of the hub extension? Do I need a different hub
> extension?
>
> The fan does fit and bolt holes match when mounted normally, but there is not enough clearance for
> the radiator. Advice and suggestions appreciated.
> -Bill Grubb

Bill,
Interesting question. I own an early TR4A that has the yellow fan. I have always felt this was an original
installation. A plastic fan is listed in the TR4A parts book. A specific fan hub extension is shown for the plastic
fan assembly #142121 that is different than the extension for metal fans (#128318).

It appears you will need to track down the hub extension for the plastic fan. No plastic fan option is shown in
my copy of the TR4 parts book.

-Brad

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR4 Fan Replacement #1
Date: Tue, 4 Nov 2008
From: "Geo Hahn" <ahwahnee18@gmail.com>

Been on the road and off the list for a month... what'd I miss?

I need to replace the fan on the TR4 and for reasons of originality will be using a stock fan. It seems straightforward but I have questions about balancing.

If there is/are balance piece(s) in place do I just reuse them in the same spot as before? The manual is a bit vague on how any balancing should occur and I'm not even clear whether the pieces are mainly balancing the fan or the hub extension.

Using a couple of crude balancing arrangements the replacement fan itself appears to be fairly balanced and I likely could improve that slightly by removing some material.

The main question -- how critical is balance here and if critical, how do I get it?

This is a non-race stock engine. Driving style is spirited but not aggressive though the car does see all-day drives at 3000-3200 RPM. Thanks for any help.

-Geo

Subject: TR4 Fan Replacement
Date: Tue, 4 Nov 2008
From: "Geo Hahn" <ahwahnee18@gmail.com>

I couldn't find it with either an archive search or by looking at threads for the past 5 weeks -- but then subject lines are often cryptic and threads can get hijacked w/o a change in subject line. I did learn that the balance pieces are to balance the fan (not the extension).

If there is an explanation there (how to balance a replacement stock fan) perhaps someone can point me to it. Thanks!

-Geo

Subject: TR4 Fan Replacement
Date: Tue, 4 Nov 2008
From: "wbeech" <wbeech@flash.net>

Geo,
> From the TR2-3 manual it says; "Using a jig, ascertain the lighter side of the assembly and fit the balancer to
> that side." I know you wanted more than that, hope there is more help to come!

If someone has a picture of the jig, I would like to see it too as I will be crossing this bridge soon, I hope. I will be installing a TR4 Tropical Fan on my newly re-built TR3 engine. Thx,
-Bill B

Subject: TR4 Fan Replacement
Date: Tue, 4 Nov 2008 From: "Randall" <tr3driver@ca.rr.com>

> If there is an explanation there (how to balance a replacement stock fan) perhaps someone can point me to it. Thanks!

Seems to me the consensus was to find a motorcycle shop with a static balancer.

<http://tinyurl.com/68b4pd>

-Randall

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR4 fan upgrade (longish, MacGuyverish)
Date: Tue, 15 Sep 1998
From: Alan Myers <reagntsj@ricochet.net>

Hi fellow listers,

Following up on the earlier posting about upgrading the LBC's cooling fan (and not being worried about keeping my car original) I just adapted an off-the-shelf, 15" diameter 6 blade stainless steel flex fan to the ole TR4. I imagine you could do something similar to adapt or create an adapter for another style fan.

The first modification needed was to cut 5/8" off the back side of the fan to get clearance at the frame/suspension cross tube. The blades are pretty deep, so this wasn't a big loss. The handy dandy Dremel tool with those little cutoff wheels zipped through the stainless steel blades.

Biggest problem was enlarging the center bore (where the crank bolt goes). Modern standard is about 3/4". The TR is about 1-3/16". I carefully positioned a scrap of aluminum and bolted it to the fan, then drilled a 1/4" pilot hole precisely in the middle. This served as a pilot hole for a carbide cutter to enlarge the hole to about 1-1/8". I then cleaned up the hole with the Dremel and those cute little grinding tips. Next, a 1" drum sander gradually enlarged and trued up the hole to just fit over the crank bolt. Finally, the fan extension itself provided a guide to mark and drill 4 new bolt holes, offset from the elongated "universal" holes already in the fan.

As an alternative to all the above, I imagine you could make an aluminum spacer that would move the fan closer to the radiator and compensate for the center bore and bolt hole differences.

I'll have the whole unit balanced when I have the rest of the crankshaft assembly balanced, unless I can figure out a good way to do it myself.

Looks great and with about double the total blade area and much deeper offset, I guess-timate I'll get about double the air pulled through the radiator at idle speeds. Plus, the blades will "feather" at higher RPMs, somewhat reducing drag on the engine.

-Alan Myers

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR4 help, cooling fan
Date: Wed, 06 Aug 2008
From: Steven Newell <steven@newellboys.net>

Peter C wrote:

>Hello luminous listerati, I had a gentleman at our counter yesterday ask me I'm unsure of. Does the cooling fan
> push or pull through the radiator? The obvious (to me) answer is pull, but his pushes. Is that right? He's trying
> to solve hot fuel issues in his ZS carbs, but if the fan is wrong, I think we'd start there.

Ah. The stock, nearly flat, 4-blade fan NEITHER pushes nor pulls through the radiator. Some might say it sucks, but rather it gently wafts air around the engine compartment, and as an added benefit blows oil leaking from the front main seal back across the engine block to provide even rust proofing.

-Steven Newell

Subject: TR4 help, cooling fan
Date: Wed, 6 Aug 2008
From: <CarlSereda@aol.com>

Let's see a photo of this fan.. is it the earlier blade like spatulas or the later one with ribbed rectangles? As far as reversibility, not that it makes a big difference, but it at seems I've seen at car shows about 10% of 1960's Triumph TRs and 1960's MGBs have their fans on backwards!..For some reason people don't quite understand the airflow dynamic... blade still works, but works better facing forward..

-Carl

PS- I would think the earlier fans make more turbulence than draw, especially at idle .. could be why your paper sticks to back of radiator.. rev it up and see where it goes from there!

If he drops a piece of paper into the engine bay between radiator and cylinder head, the piece of paper sticks to the engine side of the radiator.

Curiouser and curiouser. I've rounded up a used fan, for comparison or installation. I dunno... maybe the engine's running backwards?

That would really... you know...

Subject: TR4 help, cooling fan
Date: Thu, 07 Aug 2008
From: Peter C <peter@nosimport.com>

Ah customers... he lied... he never DID try to install the fan the other way around, as I had explicitly asked.

Makes me look stupid. Anyway, turning the blade over has gotten the airflow in the right direction. I should really do this stuff myself, rather than trust that someone else has.

So, we'll have a used fan blade here in a day or two. He may still have hot fuel issues, but I'm less inclined to help at the moment. Maybe later.

If anyone has any sure fire remedies for hot fuel cavitation issues, let me know. Details, rerouted fuel lines, ZS carbs, electric fuel pump, though he's tried others.

-Peter C.

Subject: TR4 help, cooling fan

Date: Thu, 7 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

> Makes me look stupid. Anyway, turning the blade over has gotten the airflow in the right direction.

Don't mean to add insult to injury, Peter, but turning the blade over would make no difference at all to airflow direction; just like a nut turns the same way no matter which side goes on the bolt first.

-Randall

Subject: TR4 help, cooling fan
Date: Thu, 7 Aug 2008
From: "Joe Curry" <spitlist@cox.net>

Bob Danielson wrote:

> Randall,

> Just curious but if flipping the blade over has no impact, why does Hayden have you flip the blade and swap
> the wires around to turn a pusher into a puller? I know that swapping the wires changes the rotation of the fan
> motor but there must also be something in the fan blade construction that makes it more effective? I learned
> the "hard" way when I went to change the fan from puller to pusher and just flipped the blades over as the
> direction said to do. The part about changing the wiring around was in a completely different section of the
> instructions. As you said, just flipping the blades had no impact of pusher vs. puller.

> -Bob Danielson

I think I can answer that one.

Reversing the wires reverses the direction of the motor and blade. Flipping the fan makes it work the way it was designed since the blades are not designed like a Triumph fan and are not efficient if run in the wrong direction.

-Joe

Subject: TR4 help, cooling fan
Date: Thu, 7 Aug 2008
From: "Geo Hahn"

Brilliant example! I've tried to explain this (turning the fan around does not reverse flow) to people who just couldn't wrap their head around it. Next time (and I know there will be a next time) I'll explain it your way.

As for the Hayden fan, et al -- as Joe notes these are a more modern design, if you look at the blades you will see they are curved like an airfoil/airplane wing. Airplanes of course can fly upside down but not particularly well.

-Geo

Subject: TR4 help, cooling fan
Date: Thu, 7 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

> Just curious but if flipping the blade over has no impact, why does Hayden have you flip the blade wires
> around to turn a pusher into a puller?

I only said it wouldn't change the direction, I didn't say it would have no impact.

As Joe says, the Hayden blades are designed to be more efficient in one direction. That's why you are supposed to flip them over to change from a pusher to a puller. If you don't flip them as directed, the air flow will still be in the right direction, just not as much.

And the wires need to be changed because you are turning the motor front to back. If you didn't swap them, the motor rotation as viewed from the driver's seat would change, due to the change in orientation.

-Randall

Cooling System\Belt, Fan, Hose\Fan, extension

Subject: TR6 Differential Mounts - TR3/4 fan belts
Date: Wed, 27 Oct 1999
From: "Arakelian, Peter" <arakelianp@mossmotors.com>

As the Moss rep. who was at VTR in Portland, I am the one who was told of the problem with bad mounts. Having jumped my tech dept, they tell me that there was a time when we did supply non-sleeved mounts, but they now are made with metal sleeves.

For those of you seeking originality in TR3-4 fan belts, I have managed to acquire some 20x900 non-cogged fan belts. These are Moss number **834-000**. The cogged version is **834-025**.

-Peter Arakelian

Cooling System/Belt, Fan, Hose/Hose

Cooling System/Radiator

Subject: Radiator cap (long but relevant)
Date: Mon, 24 May 2004
From: "Randall Young" <ryoung@navcomtech.com>

Geo Hahn wrote:

> > Mine doesn't overheat but I've done about every trick in the book to try to help it stay cool in AZ summers.
> > Let me know if you want a quick run-down of those items.

Joe Maher replied:

> Could I get a rundown of those items?

Here are a few things I've learned. First the ones that worked for me:

1) Have the radiator recored with a modern core and no crank hole. Or, at the very least, have it professionally rodded out and tested for efficiency. This was the "magic bullet" for me ... my stock radiator flowed OK but had really lousy efficiency. Apparently there was corrosion (or just lack of air space) between the tubes and the fins, blocking heat transfer.

2) Make sure the vacuum and centrifugal advance are both working. (We're talking TRactor motors here, those of you with no vacuum advance will just have to suffer. Or convert.)

3) Replace the carb jets and needles if they haven't been done recently or you've ever found the needles to not be properly centered.

4) Make sure the water jacket inside the engine is clean, and is kept that way. If water doesn't positively gush out when you open the rear drain valve, chances are there is crud piled up behind #4 cylinder. It can be very difficult to remove by simply flushing ... best to take it to a radiator shop and have them chemically flush it. (For some reason, the good chemicals are no longer sold over the counter ... maybe because modern cars won't stand up to them.) If flushing won't get it, you'll have to remove the liners and use a wire brush (which I did with the engine still in the car).

5) Whatever thermostat you use, make sure it opens fully by 195F or so. This can be tested on the kitchen stove, with a pan of water and a candy thermometer (but be sure your wife isn't around if you use her candy thermometer).

6) Make sure your temperature gauge is accurate. Originals can be rebuilt, or physical replacements can be had fairly cheaply (mine's a "SunPro", cost about \$25 at Pep Boys).

7) If your problem is idling or stop-and-go traffic, fit an electric radiator fan. I removed my original fan entirely, and installed a 16" Hayden behind the radiator, I never have any trouble in traffic now.

8) Use only distilled water and antifreeze. The antifreeze is only for corrosion protection where I live, but you have to run something, and the "anti-rust treatment" they sell at Pep Boys will interfere with cooling. I ordered some "No-Rosion" on FT's advice, but never received it and the vendor will not answer the phone or my e-mails. Change the coolant every 2 years even if it looks fine. Glycol never wears out, but the anti-corrosion additives do, and you need to flush out the acids anyway.

9) As recently mentioned, I run 7 psi instead of 4. Don't know that it made a big difference (but having a cap that didn't leak definitely helped). I also don't have the optional heater ... don't know if the heater core would withstand the added pressure or not.

10) Be sure the shroud around the radiator is in good shape. Early TR3A (like mine) did not originally have a shroud, but it's a very worthwhile (and factory approved) retrofit.

And the things that didn't work for me:

A) Water wetter. Theory sounds good, others say it works for them, but I couldn't tell that it made a difference for me. The maker also says it will inhibit corrosion ... my system curded up just as fast as with distilled water.

B) Sleeved thermostat. Again others swear by them, I couldn't tell the difference.

C) Blocked thermostat bypass (as an alternative to a sleeved thermostat) made no difference that I could tell.

D) Do not run more than 30% antifreeze (unless needed for cold weather obviously). More antifreeze will raise the boiling point of the coolant, but it also reduces its effectiveness as coolant. Pure antifreeze won't boil over, but the extreme heat will damage other things (Dad's TR3A eventually swallowed a valve).

Other's have had different experiences ... let's hear them!

-Randall

<ebk@buffnet.net> wrote:

> I would like to look over this list of yours Geo, when you get a chance to E-mail it to me, OK?

> -Cosmo Kramer

Here you go...

In the summer I live at 7,000' about 10 miles north of Tucson, so my drives often end up in 100+ heat followed by a 5,000' climb up a mountain road. Pretty good work-out for a cooling system. Here are things I have done...

Air Dam- added to scoop air against the lower third of the radiator. Ever notice that a big hunk of the radiator isn't in the air flow? I think this helps a lot at speed.

Electric Fan- installed as a 'pusher' in addition to the stock fan. I control it with a manual switch, mainly used at long stop lights and slow traffic. It is the cheapo from the FLAPS and installed using a set of clamping bolts so it can be easily removed. Wired into the horn circuit w/o a relay & never been a problem.

Water Wetter- added to the coolant. An added bonus (?) is that it will find any little leaks you have.

25% Coolant- as I am not concerned about freezing I can reduce the % of coolant to what is supposedly a more efficient mix for cooling.

Blocked Bypass Hose- controversy here as some think this can cause problems with the head. I have used this for 20 years w/o such problems.

Duct work in place- the stock cardboard air deflector is in place in the front apron.

Overflow bottle- on the TR4 it was easy to add. Haven't done this on the TR3A yet though some say the radiator cap can be modified (adding a sealing gasket under the lip to maintain vacuum) to draw coolant back in as the engine cools.

Fan Blade- I'm using a TR4 (square ended) fan blade on the TR3A (stock is rounded ends).

There are 2 things I haven't done:

- 1) Change the TR3A radiator to one w/o a crank hole. I still use the crank and prefer to keep the original set-up.
- 2) Other thing is an up-graded water pump I have heard about but not pursued.

All this assumes that the radiator and block are clean and engine tuning, esp timing, are correct. I've got some pictures of the air dam and electric fan mounting if you need them. I can also explain the blocking of the bypass hose if you are not familiar with that. -Geo

Cooling System/Radiator

Subject: Radiator Cap Pressure Rating
Date: Mon, 13 Aug 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

While poking through the 6-Pack forums, I saw a post on the impact of radiator caps and thermostats on cooling the car. I understand the thermostat impact but what does the radiator cap do cooling wise? It somehow raises or lowers the boiling point? I checked and my car has a 4 lb cap while Moss & TRF state that a 13 lb cap is needed for my model year. Does the 4 lb cap make the car run hotter or cooler? Thanks

-Bob

Subject: Radiator Cap Pressure Rating
Date: Mon, 13 Aug 2007
From: Aldwyn <aldwyn@sylvancircle.org>

Bob,
The more pressure in the cooling system, the higher the boiling point for the coolant is.... so the 13 pound cap is your better bet for the 6 since your coolant would not boil as easily under that pressure.

Maybe the PO had some issues with the radiator or hoses leaking with the higher pound cap, so he/she went to the 4 pound? Keep an eye on your system once you switch over!

- Aldwyn

Subject: Radiator Cap Pressure Rating
Date: Mon, 13 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

"Bob Danielson" <75TR6@tr6.danielsonfamily.org> wrote:
> I understand the thermostat impact but what does the radiator cap do cooling wise?

The primary effect is to raise the boiling point (by **about 3 degrees for each psi**); which gives you more margin before it boils over.

Won't do much for running temperature either way, unless it's about to boil over. But that 13 psi cap might help keep it from 'puking' when you stop suddenly after a run (like pulling into a freeway rest stop).

-Randall

Subject: Radiator Cap Pressure Rating
Date: Mon, 13 Aug 2007
From: "Tim I. Purdy" <timipurdy@citlink.net>

The other day I checked the radiator, and just awhile ago, I am now missing the radiator cap, good thing I have not been going anywhere, though I am supposed to take it for a drive on Wednesday. My question is, can I buy a replacement at either Napa or Kragen, the only two parts supply stores here, and if so, what would a reference to them that I need? Like a certain brand or radiator cap style, instead of mentioning it's for a Triumph, as they give me funny looks in the past.

-Tim

Subject: Radiator Cap Pressure Rating
Date: Mon, 13 Aug 2007
From: "wbeech" <wbeech@flash.net>

The cap doesn't make it run hotter or cooler, it just raises the boiling point of your coolant and thus keeps the car from boiling over when too hot. The thermostat regulates the temperature of the coolant along with the radiator and fan.

Be careful increasing the capacity of the cap, if it doesn't allow you overheated engine to boil over, you could burst a hose or worse.

-Bill B

Subject: Radiator Cap Pressure Rating
Date: Tue, 14 Aug 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

I like the puking analogy.....and that would explain why the electric fan might turn on after you've shut the engine off.

-Bob Danielson

Subject: Radiator Cap Pressure Rating
Date: Tue, 14 Aug 2007
From: <Dave1massey@cs.com>

<75TR6@tr6.danielsonfamily.org> wrote:

- > While poking through the 6-Pack forums, I saw a post on the impact of radiator caps and thermostats on
- > cooling the car. I understand the thermostat impact but what does the radiator cap do cooling wise? It
- > somehow raises or lowers the boiling point? I checked and my car has a 4 lb cap while Moss &TRF state that
- > a 13 lb cap is needed for my model year.
- >
- > Does the 4 lb cap make the car run hotter or cooler?

The cap will not make the car run cooler but it will allow it to run hotter without boiling the coolant. If your car is boiling over with a 4 lb cap, try a 13 lb cap. If it ain't boiling over, don't worry about it. But the 13 lb cap will put more stress on the cooling system. That's the trade-off.

Personal experience: When I put my TR8 back on the road I used my original cap (in an ill-advised attempt for originality) which unbeknownst to me was not holding pressure at all. Result: no problems during the month of driving around St. Louis but as soon as I hit 5,000 ft in altitude I had serious boil-over problem when I shut down. One of the many things I tried to resolve the issue was replace the cap and voir l', problem solved. Even at the almost 13,000 ft mountain passes in Colorado.

The short answer is if it ain't broke, don't fix it.

-Dave

Subject: Radiator Cap Pressure Rating
Date: Tue, 14 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

- > I like the puking analogy.....and that would explain why the electric fan might turn on after you've shut the
- > engine off.

They happen for the same reason: when you shut the engine off, the insides of the cylinders are still hot. That heat moves into the coolant in the engine block and cylinder head; but the coolant is no longer moving to carry the heat away to the radiator. If the coolant inside the engine gets hot enough, it boils a little and forces coolant out the overflow. The boiling absorbs heat though, so it cools the engine and stops the boiling.

A higher pressure cap means the coolant can absorb more heat before it boils.

-Randall

Cooling System/Radiator

Subject: Radiator Overflow Bottle - TR4A
Date: Sat, 7 Feb 2004
From: <CarlSereda@aol.com>

Geo wrote:

Can someone with a TR4A tell me where the bracket for the overflow bottle is bolted on? (I'm adding a bottle to a TR4)

-Geo

I used same bolt that holds base of TR4 radiator to frame on passenger side - works perfect with a TR4A bottle & bracket. C

Subject: Radiator Overflow Bottle -- TR4A
Date: Sat, 7 Feb 2004
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

Paul and others. I wrote to George and neglected to "Reply to All". The overflow bottle bracket on a TR4A mounts at the right side radiator mount. The bracket slides between the frame and the radiator and is located by a small tab that is bent down to fix it from rotating. I mentioned that the TR4A radiator is wider than a 4 and that the frame is also different, so I didn't know if it would work on a TR4. I see that Carl Sereda has written that he was successful in mounting the bottle at the same spot on his TR4. So it looks like mounting it at the right side radiator mount will work on a TR4 as it does on a TR4A.

-JVV

Subject: Radiator Overflow Bottle -- TR4A
Date: Sat, 07 Feb 2004
From: Geo Hahn <ahwahnee@cybertrails.com>

In the end I did not mount it the same place as the TR4A. I use an air dam that interferes with the area where the bottle would hang if mounted using the right hand radiator mount on the TR4. Instead I flattened the bracket and mounted to the wheel well using the same bolt as the over rider support.

Using the radiator mount would seem to put the whole works much lower than I would have expected but that may be due to differences between the radiator mount on a TR4 and a TR4A (which I am not familiar with). This is what it looks like...

<http://www.geocities.com/tucson_british_car_register/overflowbottle1.jpg>

<http://www.geocities.com/tucson_british_car_register/overflowbottle2.jpg>

Originality disclaimer... blue & black wires and bracket on radiator are for electric fan, air dam also partially visible).

Goodness knows why the 4s (with no-neck radiators) didn't have an overflow originally as the radiator cap is such that it draws coolant back in just fine as the engine cools down.

-Geo Hahn

Cooling System/Radiator

Subject: TR3 Radiator Cap
Date: Thu, 27 Apr 2006
From: "Terry Smith" <terryrs@adelphia.net>

Randall,

In archives, I see you posted a problem with auto parts stores having an incorrect listing for radiator caps. You commented,

>I believe the correct Standpart number is **11208**, which is listed for "TR4 with special head", but I won't know
> for sure until the one I ordered shows up.

I need to purchase a radiator cap. Just out of curiosity, did you ever resolve this one?

Terry Smith

Subject: TR3 Radiator Cap
Date: Thu, 27 Apr 2006
From: "Randall" <tr3driver@comcast.net>

> Randall,

> In archives, I see you posted a problem with auto parts stores having an incorrect listing for radiator caps.

> You commented,

>> I believe the correct Stantpart number is 11208, which is listed for "TR4 with special head", but I won't
>> know for sure until the one I ordered shows up.

>

> I need to purchase a radiator cap. Just out of curiosity, did you ever resolve this one?

As I recall, the resolution was that the Standard catalog was simply wrong. They do not make a cap with the correct 1 inch "reach" for early TR's. Some number of late TR4's with the "no neck" radiator apparently did take a 3/4 inch cap, as did all (?) TR4A, and those caps are available (or at least were) from Standard.

If you look at your radiator fill neck, you should be able to easily see the surface inside the neck where the plunger seats to seal the coolant. Stick a ruler in and measure to the top of the neck. If the measurement is 1", then you need an early cap (readily available from Moss, TRF et al). If it's 3/4" then you need a later cap.

Note that some people have had the early radiators converted to take the later cap (my radiator guy suggested this when I had my radiator worked on). Installing a 1" reach cap on a 3/4" neck leads to some interesting problems, like the upper hose blowing up like a balloon and then bursting. Took one of our local club members a long time to figure that one out!

-Randall

Cooling System/Radiator

Subject: TR4 stuck coolant Drain Tap
Date: Sun, 25 Jul 2004
From: "Randall" <tr3driver@comcast.net>

> Just wondering if anyone has recommendations for freeing a stuck drain tap at the bottom of a TR4 radiator. I
> don't really want to apply too much force to it and wrench it off or break it. Any chemicals or other advice?

My suggestion would be to remove the tap from the radiator first, and then work on freeing it up.

If it's a 1/4 turn tap like the ones on a TR3, then it is held together by a cotter pin that you can remove, along with the washer and spring under it (don't worry, these components are fairly easily replaceable). Then with the body of the tap supported firmly on vice jaws or whatever, gently tap the tapered spigot out of the body. Clean it up and smear a little silicone grease on, before reassembling. While you're at the store searching for a new spring and washer, pick up some Teflon pipe dope to use on the threads into the radiator.

-Randall

Cooling System/Thermostat Housing & By Pass

Subject: Misc Q's & TR4 Cooling
Date: Wed, 8 May 2002
From: <CarlSereda@aol.com>

Clark wrote:

- > I've had no trouble with just using standard, off the shelf thermostats, that fit the hole.....I use 180
- > Degree.....same for my '64 Ford 170 cc. and my TR4A-IRS.....Maybe I don't get it.....but are we beating a
- > dead horse here????
- > I'm following the thread with interest!!!
- > -Clark

Clark,

I too have used off-the-shelf thermostats (non-sleeved) in the TR4 since 1974 but there have been a couple times on hot days that my overheating car seemed to have a mind of its own - and I couldn't get it to run cool enough. I didn't fully understand the bypass port function until recently and discovered my thermostat housing bypass port window (rectangular hole) had nearly doubled in size from original! (you have to check it from inside the housing) It looked like molten lava went coursing through the once, little squared port aperture and eroded so much of the aluminum that it was nearly round and fully doubled in size and flow allowance. Surely, too much coolant was by-passing the radiator and not just during warm-up when the thermostat was closed. That's why it was hard to get my overheating motor to calm down - not enough coolant through the radiator - even with a low-temp stat. If your bypass flow has doubled in volume more hot coolant keeps re-circulating and less coolant travels through the radiator. Putting a small washer with a 1/4 inch hole in the by-pass hose helps insure most of your coolant goes through the radiator and is a popular fix - only downside is it might take longer to thoroughly warm up the motor in freezing winter. Not a big problem here in California. My thermostat housing had 200,000 hard miles on it. I replaced it with a good used housing with the sharp square port hole as new, and got SMITH'S and Moss's sleeved thermostats to restore factory circulation function. For improved cooling I will use a TR4A 'tropical' 6-bladed radiator fan. In a pinch I would opt for 'Water-Wetter' brand coolant additive for the additional 10 degrees heat reduction. With all that - should be ready for traffic jams and global warming!

-Carl

Cooling System/Thermostat Housing & By Pass

Subject: Skirted Thermostat work around
Date: Thu, 18 Jul 2002
From: <CarlSereda@aol.com>

Ken,
Money permitting you can buy the aftermarket Jag-type skirted stat for \$36 from XK's Ltd. or Moss Motors TR catalogues. (It's a very well constructed equivalent) that work perfectly in our TR housings. They start with a Robert Shaw all brass pellet type stat and silver solder a heavy die-cut brass sleeve to it. I have tested these new stats alongside a NOS SMITHS sleeved stat inside my TR4 housing in a pot of water on the stove with virtually identical end results. Before these aftermarket Jag stats came to market a few years ago folks would put a steel washer with a 1/4" hole right before slipping on the hose to the bypass port-tube on the outside of thermostat housing. The idea being you would still get a little circulation to stir up the coolant in the block and warm up your motor evenly (no hot spots from stagnant coolant). Also it lets coolant pass the stat's 'button' to give more active stat response. The other thing at play is once the stat opens with its much larger passage capacity, it greatly reduces the 'high pressure' at the little 1/4" hole thereby majority of coolant takes easier 'low pressure' route to radiator. Later on designers fine-tuned this fluid dynamic and eliminated the 'sleeved' stats. Our Triumphs are not designed optimally for this fluid dynamic and reducing the hole to 1/4" is only an approximate work-around. But it's better than leaving hole as is. In a pinch I recommend using the washer trick - if it's your birthday spring for the sleeved stat!

-Carl

PS- If you run the car for years without rectifying the bypass port like I did in my youth - the unprotected port erodes from inside the housing to twice the size! - 'detouring' even more coolant AWAY from the radiator. On a new housing, the port hole outside the housing (where hose slips on) is twice the size of the hole inside the housing, where the sleeve works.. ie; outside hole is approx 18 mm round, whereas the inside hole is approx a 6x12 mm rectangular hole.

Cooling System/Thermostat Housing & By Pass

Subject: THERMOSTATS
Date: Wed, 21 Jan 2004
From: <CarlSereda@aol.com>

John H. Wrote:

> "I checked the By-pass outlet on some of my extra (water pump) housings. They are 21/64 (about 5/16").
> You can see where they modified the pattern to make a smaller opening.
> -John H.
>>... There is evidence that even the factory came around to this view eventually ... late TR4s were delivered
>> with non-sleeved thermostats and the bypass open.
>> -Randall

Regarding thermostat bypass topic: a TR4 aficionado named John H. has looked at quite a few TR water pump 'bodies' (the manifold part, not the section with the impeller) and discovered that some of the bypass 'input openings' (where the bypass hose hooks into manifold) had been REDUCED AT THE FACTORY (the 'mold' was altered BEFORE casting). The typical TR2-3-4 opening is 9/16" and he found a few manifolds that had been reduced by almost half to 5/16" - in the cast.

Perhaps this modified water pump body (or manifold) is the reason late TR4's and TR4A's were shipped without sleeved thermostats from the factory.. 'be interesting if someone could find an alternative part # in the TR4-A Parts Catalogue. My TR4 Parts Catalogue only shows one item under WATER PUMP ASSEMBLY - BODY, water pump: # 57014. Any alternate numbers out there? If the factory reduced the hole from 9/16" to 5/16" eliminating the need for the sleeved thermostat, then inserting a washer with a 5/16" hole in the bypass hose seems the way to go.

-Carl

Cooling System/Thermostat Housing & By Pass

Subject: TR Bypass Port restrictor washer size
Date: Mon, 6 May 2002
From: <CarlSereda@aol.com>

-Mike Kitchener wrote:

- > Having just replaced my 31 year old thermostat with a new not sleeved one, what should be the internal
- > diameter of the "inserted washer" in the by-pass hose ?
- > -Mike Kitchener

Mike,

I recall people using washers with 1/4" hole in it. I would match OD to protruding neck piece (bypass port) on thermostat housing so that when you push on the hose it holds washer against the aluminum neck/hole.

-Carl

Cooling System/Thermostat Housing & By Pass

Subject: TR2,3,4 thermostats
Date: Thu, 11 Jan 2007
From: "Arakelian, Peter" <arakelianp@mossmotors.com>

One thing to keep in mind with a bellows thermostat is that they were designed for the low pressure caps, 7 lbs I believe. If you decide to change to the higher pressure cap, the bellows will collapse under the pressure.
-Peter Arakelian

Cooling System/Thermostat Housing & By Pass

Subject: TR3 cooling
Date: Wed, 4 Jul 2007
From: "Ken Gano, home" <triumphs@consolidated.net>

I am trying to diagnosis an on going problem with my TR3 cooling system. It would be very helpful to have some baseline numbers on the heat gain from a stock system.

What I am interested in is how quickly a stock system gains heat at a standing still idle. Could anyone (or everyone :-)) note the ambient temperature and how many minutes it takes your car to reach say 170, 180 and 190? If you were otherwise doing tuning work, it should just be a matter of writing down the information and forwarding it.

I will be at Summer Party and VTR with a digital thermometer and asking anyone willing to let me take some measurements and will be happy to post the results thereafter. My thought is that the bigger the sample, the better. Thanks in advance.

-Ken Gano

Subject: TR3 cooling
Date: Wed, 4 Jul 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

One thing I have checked with a infrared thermometer is how much temp change I get from the top of the rad to the bottom. I see a drop of about 40 degrees on a running engine coming off of a brisk run. I think this is one way of seeing if the radiator is operating properly.

-Geo

Cooling System/Thermostat Housing & By Pass

Subject: TRactor By Pass
Date: Thu, 18 Nov 2004
From: "John A. Wise" <Wise@erau.edu>

Terry Smith wrote:

> My apologies, folks, for asking a chestnut question.

>

> I've put a dowel plug in the thermostat bypass of my TR3A engine rebuild. But it niggles at me that I was
> supposed to drill a quarter-size hole in the plug to allow some water to relief bypass. Which of me is right?

I used a 3/4" copper pipe end cap, which fits very snugly into the bypass hose. It was very easy to drill a 1/8' hole (same as the one in the thermostat itself) in the end.

-John A. Wise

Cooling System/Thermostat Housing & By Pass

Subject: Vacuum, oil pressure, ELECTRIC FAN thermo. SOUGHT
Date: Wed, 26 Apr 2006
From: Chris Kantarjiev <cak@dimebank.com>

You can find all sorts of fancy, adjustable, solid state or otherwise electric fan thermostats on the market. I've tried them all, and they all have ... interesting failure modes. I finally settled on the dead-simple fixed temp. version that Scotts Manufacturing sells. You can find their contact information in the Monster List <www.dimebank.com> - it's a small round button sold with two "nails" that go through the core. I mount it about 1/3 of the way from the bottom of the radiator and wired it into the ground lead of the fan. If you also want manual control, you can wire a toggle switch in parallel, but I never bother.

You can make adjustments in when it comes on by moving it up and down the core - higher to come on earlier (lower temp), lower to come on later (higher temp). My theory is that you want to run the fan only when the exit temp of the water is increased, not when the entry temp is...

-Chris

Subject: Electric fan thermostat
Date: Thu, 27 Apr 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

I've been thinking about this for some time now, and something about Chris's message struck a chord, so I called up Scott's Manufacturing and ordered one of the thermostats described below (I already have an electric fan on hand). I think it was the "simple is beautiful" theme..... They are not on the web. To save you some time hunting, here is their number: 800-544-5596. I spoke with Gary who was most helpful; he is going to throw in a wiring diagram with the order. BTW, they have re-located to Rhode Island so are on eastern time.

-Jim

Cooling System/Trouble Shooting

Subject: Cooling Systems
Date: Thu, 15 Aug 2002
From: "Fred Thomas" <vafred@erols.com>

Listeners, I have been using a radiator rust preventive called ="No-Rosion"= with 100% satisfaction for the past 10 years, it works as described, never seen any rust or scale in any radiator on any car I own, and remember I do not change anti-freeze every year I do this about every 5 years or so, very good product for rust protection in any type car. NFI "FT"

Cooling System/Trouble Shooting

Subject: Winter time - Electrically testing coolant
Date: Fri, 21 Dec 2007
From: "FRED E THOMAS" <frede.thomas2@verizon.net>

Easy way to check for radiator corrosion protection, just as important as checking the antifreeze, if the coolant is allowed to become "acidic" the engine and radiator will also become corroded with rust. Using a volt-ohm meter (VOM) set it to a DC voltage range that measure in "tenths" of a volt, remove the cap and place the negative VOM lead into coolant, being very careful not to touch any other part of the radiator. Place the Positive lead of the VOM against a bare metal part of the radiator (or a good ground of the engine), a reading of 0.2 volts or less, coolant is in good shape, a reading of 0.5 volts it is borderline, 0.7 volts replace your coolant immediately.

This comes from my "Model A" workshop manual and also says it works in modern cars as well, which is really more important because of aluminum heads or dissimilar metals in modern cars.

Cooling System/Trouble Shooting

Subject: Major Overheating Puzzle
Date: Wed, 15 Oct 2003
From: Dan Buettner <danb@thelittlemacshop.com>

- > I have been going around in circles on this problem and I'm becoming convinced that I am missing something
- > obvious. It is with a tractor but I'm going to claim LBC content as it is a Vanguard derivative...and the
- > folks on the tractor lists are less scientific than you guys...
- > 1. Needed timing chain. Took great care to line up very faint marks on crank and cam gears, ensuring chain
- > was tight on the side that is under tension when doing so.
- > 2. Set valve stem gaps.
- > 3. Found TDC and installed distributor with rotor pointing at cylinder #1.
- > 4. After flushing some old gas through, started up and ran well, but overheated severely, quickly.
- > 5. Thoroughly flushed cooling system; it needed it.
- > 6. Checked thermostat; it's fine.
- > 7. Started again, still overheats - like in three or four minutes.
- > 8. Played with ignition timing, retarding and advancing so now I don't know where it is. There is no timing
- > mark.
- > 9. Got to be evening and tried again; noticed exhaust manifold and muffler glowing red; shut it off.
- > 10. Thought it might be an air leak in the intake, so took off manifold, looked fairly OK but cleaned mating
- > surfaces thoroughly and replaced gaskets.
- > 12. Still no luck.
- >
- > Now, I have always thought too hot would be from timing too far advanced, but then I was reading where
- > overheating can be caused by timing too far retarded as fuel burns late i.e. in the exhaust manifold. But if I
- > advance it to try to fix that, it seems to run far too fast Any thoughts?
- > -Confused in Ontario

What if your radiator is plugged up? You mentioned you flushed the system and it needed it - perhaps silt/rust has plugged up the passages in the radiator. You might take it to a shop and have it boiled out.

Silly questions, but it pays to cover the bases - is there a cooling fan, and does it turn? Is there some sort of cowl missing that may be preventing the fan from drawing air through the radiator? Is the water pump belt tight? Is the thermostat in the right way around?

What if you run without the thermostat?

Does it still overheat if you put a box fan running full tilt right in front of the radiator?

Is it possible your valves aren't closing quite all the way? Gummed up valves or gummed up seats or damaged somehow?

How are you measuring overheating? You mentioned that the manifolds were red, so that's a pretty good indicator, but ... I chased 'overheating' problems in my Spitfire for two years before discovering it was the gauge that was faulty, not the cooling system.

Anyone else have any other thoughts?

-Dan

Cooling System/Trouble Shooting

Subject: Temp gauge
Date: Thu, 31 May 2007
From: <Dave1massey@cs.com>

<KingR44916@aol.com> writes:

> I just replaced my sending unit and after a few min. the gauge goes all the way to hot and the car isn't
> overheating. Is there a way to see if the gauge is working properly? I put in a new thermostat also. Can I
> check the voltage regulator? All help appreciated.

When you say all the way to hot are you saying all the way to the right side of the gauge? The typical symptom of a bad voltage stabilizer is a high reading, not a full scale reading. If this is your problem I suspect you got the wrong sending unit. Try and locate another sender and try that.

If it is just going into the low side of HOT then you may indeed have a bad voltage stabilizer. If you have a test light touch the light green wire and you should see the light flash on and off. If you have a volt meter you should see the voltage reading switching between battery voltage and zero. The flashing should be about one-second for an ON/OFF cycle. The typical failure mode for the stabilizer is always on.

BTW- a bad ground will cause the stabilizer not to regulate so be sure it is well grounded if you do find a non-operating stabilizer.

-Dave

Cooling System/Trouble Shooting

Subject: TR3 overheating
Date: Sun, 15 Dec 2002
From: "Randall Young" <ryoung@navcomtech.com>

> I have an overheating problem with my TR3 in the summer. It is worse when under hard load such as going
> up a long, steep grade. I have a new radiator, the thermostat has been checked and is of the original bellows
> type.
> It has 87 mm pistons with a stock cam. I'm about to pull the engine and check that the valve timing is OK.
> Any ideas?

Dave, you can check the valve timing without pulling the motor:

First, double check that the mark on the pulley is accurate. To do this you'll need a piston stop, which you can either buy <<http://www.cranecams.com/master/toolcmpr.htm> is one source> or make by knocking the ceramic out of an old spark plug, threading the shell for a bolt, and grinding off the head of the bolt. Insert the stop in the #1 plug hole, and turn the engine (gently) until it stops. Make a temporary mark on the pulley under the pointer, then turn the engine the opposite way until it stops again. Make a second mark, and verify that the TDC hole is exactly half-way between the two marks you've just made.

Now remove the rocker cover, and turn the engine until both valves on #4 are open slightly. Set the clearance on both #1 valves to about .030", the exact number doesn't matter, as long as both are the same, and you can stack feeler gauges if your set doesn't go that large. Now turn the engine forward for one complete revolution, stopping exactly where the TDC hole lines up with the pointer. It's important that you turn forward to this point, so if you pass it, you'll have to back up and try again. Now measure the clearances for the #1 valve. If both are equal, the camshaft is at 0 degrees. If the exhaust valve gap is larger, the cam is retarded. If the intake gap is larger, then the cam is advanced. You can expect some error, anything in ± 2 degrees is acceptable. If you turn the engine until the two gaps are equal, you can estimate how much the error is by measuring between the TDC hole and the pointer. Each $3/32$ " is roughly 1 degree of cam rotation (2 crank degrees).

Some other things to check:

Make sure the timing is correct, not just the initial setting but that both the mechanical and vacuum advance work.

If the carb jets and needles haven't been replaced recently, or you know the jet centering was wrong at one time, replace them.

If you have the 'wide mouth' grill (3A or 3B), be sure the cardboard shroud in front of the radiator is in good shape. Some early 3A's didn't have the shroud originally, IMO it's worth adding.

Check that the front lower generator mount is in good shape, both the bolt and nut are tight.

Make sure your radiator cap is holding pressure. I don't know if radiator shops can normally test these systems due to the unusual cap dimensions, but they probably can. I tested mine by screwing a plumbing tee with a pressure gauge and a valve stem into the heater outlet on the head. Added some pressure with a tire pump, fixed leaks and worked on the cap until it would hold pressure overnight. 4 psi is standard, I ran mine up to 7 psi using a modified cap. (Not sure if this is a good idea with a heater, but since I don't have one ... <g>) BTW, most vacuum test gauges will also read small amounts of pressure, mine goes to 10 psi.

If all else fails, pull the water pump and check the vanes. BFE has available a high efficiency 6-vane water pump that several people have said helps.

-Randall

Cooling System/Trouble Shooting

Subject: TRactor Engine Overheating
Date: Tue, 5 Oct 2004
From: John & Patricia Donnelly <pdonnell1@san.rr.com>

On the way to/from Triumphest my TR4A ran hot. By hot, I mean somewhere between 2/3 and full. This was especially true as the revs went up during highway speeds of 65 to 75. As I slowed going through small towns the temp went down. The outside temp didn't have big effect although the temp was lower when it was 40 outside. Also, opening/closing the heater didn't seem to have much affect.

Over time water escaped out through the radiator cap into the overflow reservoir. But, even with a full radiator the car still ran hot. Of strange note is that water was never "sucked" back into the radiator, so the reservoir always remained full and overflowed. A couple of the guys at TrFest suggested that my 7 LB cap was the problem. I'm hesitant in using a "shotgun" approach to fix the problem, but even after changing it to a 4 LB cap I still have the problem.

Today I pulled the thermostat (it's a 160 deg), and tested it on the stove. It fully opens and closes, but it appears to "shudder" or step as it opens. It also looks like the bi-metallic piston is off center so I'm off to the parts store to get a \$5.00 cheapy - this time a 185 deg. If the thermostat change doesn't cure the overheating the cause is either the radiator or a blockage in the block/head.

So, a couple of questions:

1. I'm considering using water wetter and Prestone coolant. Does water wetter really work?
2. Is there a "flush" for the block, or is this the same as the radiator stuff? Any suggestions as to which brand?
3. Can I test for block/head blockage? How?
4. The fact that the radiator doesn't suck back water from reservoir means that air is getting back into the system (from somewhere). When should the "sucking" occur, during cool down or lower revs (meaning less pressure)?
5. Is there something else I need to look for?

Thanks!
John

Subject: TRactor Engine Overheating
Date: Tue, 05 Oct 2004
From: Geo Hahn <ahwahnee@cybertrails.com>

<John & Patricia Donnelly> wrote:

> On the way to/from Triumphest my TR4A ran hot...

>

> Over time water escaped out through the radiator cap into the overflow reservoir. But, even with a full
> radiator the car still ran hot. Of strange note is that water was never "sucked" back into the radiator, so the
> reservoir always remained full and overflowed....

One possibility this suggests is a small head gasket leak that is putting exhaust gases into the coolant jacket. This would cause the coolant to be forced out into the reservoir to the point of overflowing... a pocket of 'air' in the coolant would also cause ineffective cooling.

If this is the case you may be able to see bubbles in the coolant as you carefully observe the open radiator neck and rev the engine.

I doubt that changing the lbs of the radiator cap, going to a different degree stat. or adding water wetter are going to get at the problem.

-Geo Hahn

Subject: TRactor Engine Overheating
Date: Tue, 05 Oct 2004
From: Jim Wallace <jim.wallace@netscape.ca>

John wrote:

> Today I pulled the thermostat (it's a 160 deg), and tested it on the stove. It fully opens and closes, but it
> appears to "shudder" or step as it opens. It also looks like the bi-metallic piston is off center so I'm off to the
> parts store to get a \$5.00 cheapy - this time a 185 deg. If the thermostat change doesn't cure the overheating
> the cause is either the radiator or a blockage in the block/head.

John,

Try to find a replacement thermostat that has a large opening when it opens. Somewhere someone once noted that the modern "happens to fit in the hole" replacement has a much smaller opening and that when a unit was found with a larger opening his cooling problems were greatly reduced. As I recall it involved reducing the outer diameter (via a grinding wheel) of a thermostat from an Australian Nissan until it suited but there is no doubt some similar North American solution. Also don't underestimate the benefit of flushing the rad with a garden hose. Sometimes a surprising amount of stuff comes out and even if it doesn't help your cooling problem, you feel better, and it was free.

-Jim

Subject: TRactor Engine Overheating
Date: Tue, 5 Oct 2004
From: <CarlSereda@aol.com>

John,

1. Maybe your tubing from radiator neck to overflow bottle is leaking air through a crack or split in the rubber. The radiator only sucks coolant back in when car cools down - a lot.
2. Using a lower pressure radiator cap doesn't make sense to me.
3. Installing a hotter thermostat doesn't make sense to me.
4. Not sure about your current aftermarket thermostat - if the hole is too small perhaps high revs is overwhelming it. I know the \$36 sleeved stat from Moss opens up pretty darn big.
5. The only downside I've heard about Water Wetter is it can find leaks better than regular water or coolant.
6. Might be time to have your radiator restored (rodded out, etc)?

-Carl

Subject: TRactor Engine Overheating
Date: Wed, 6 Oct 2004
From: <Btmfdchn@aol.com>

Greetings... If you have the original radiator neck, than that is probably where your problem lies. The neck is 1 inch deep as opposed to the 3/4 inch depth for anything "modern." In order for a recovery system to work, the cap must seal around the top of the neck as well as the bottom or air will get past the cap and into the system when it cools. Look at a "modern" cap and you will see some sort of gasket next to the body of the cap. I've not found a cap for the 1 inch neck that has this seal. Next time you have your radiator in for servicing, have them change the neck to a 3/4 inch and you can use a proper cap. Another route is to use a pressurized recovery system where the pressure cap in on the recovery tank and a plain cap is on the radiator. This is the system used on (dare I say it) BMC cars.

-TJ

Subject: TRactor Engine Overheating
Date: Tue, 5 Oct 2004
From: "John A. Wise" <Wise@erau.edu>

John wrote:

> Today I pulled the thermostat (it's a 160 deg), and tested it on the stove. It fully opens and closes, but it
> appears to "shudder" or step as it opens. It also looks like the bi-metallic piston is off center so I'm off to the
> parts store to get a \$5.00 cheapy - this time a 185 deg. If the thermostat change doesn't cure the overheating
> the cause is either the radiator or a blockage in the block/head.

I did a very informal study in my 1960 TR3A in Phoenix 110F weather. I removed the thermostat & drove my car. I put in an outer ring of a thermostat without the inner-ring & drove the car. I then put in a regular 165 F thermostat & drove the car. I found absolutely no difference in operating temps.

-John

Subject: TRactor Engine Overheating
Date: Tue, 5 Oct 2004
From: "Randall" <tr3driver@comcast.net>

> I did a very informal study in my 1960 TR3A in Phoenix 110F weather. I removed the thermostat & drove my
> car. I put in an outer ring of a thermostat without the inner-ring & drove the car. I then put in a regular 165 F
> thermostat & drove the car. I found absolutely no difference in operating temps.

Which is exactly the result I would expect. That business about moving water too fast is hooley.

-Randall

Subject: TRactor Engine Overheating
Date: Wed, 6 Oct 2004
From: John & Patricia Donnelly <pdonnell@san.rr.com>

Thanks to everyone for their ideas and suggestions. Since the overheating problem is relatively new (getting worse over the last month or so) I'm sure it's not a bypass issue, or a thermostat issue, or a fan issue, or a water wetter issue. The symptom of the overflow reservoir constantly overflowing, plus air in the radiator leads me to believe that if we fix that, we fix the overheating.

Tonight we talked over my overheating problem at the SDT Club, and tomorrow I'm having the coolant tested for exhaust gases (also known as a block test). We believe that the head gasket may have burnt through, especially since I have 87 mm pistons and there have been similar type problems with these gaskets in the past with the bigger liners. A compression test, nor a cooling system pressure test would find this type of problem.

I'll give everyone an update by Friday.

-John

Cooling System/Water Pump

Subject: Alloy Water Pump
Date: Sun, 22 Jul 2007
From: <AMfoto1@aol.com>

> Just curious..... I ran into a few people at VTR who were running alloy water pumps. I did a quick Google but
> can't find any. So, who sells them and what are the advantages? One guy installed an alloy pump and the
> output was so great that it blew out his stock radiator! Good thing he had a Wizard Cooling Aluminum
> radiator on hand!

Hi Bob,

In the U.S., check with Ken at <<http://www.britishframeandengine.com>>. He sold me an alloy pump for my car (TR4) and imports a number of Triumph performance products from Darryl Uprichard at Racetorations and from other sources. I think he also offers an alloy pump for TR6. Last I heard Ken is still pretty active in Triumph vintage racing, although he's not driving anymore. For that reason, best time to reach him during race season is usually Monday through Thursday. BTW, I see that clicking on his email link on his homepage *still* generates an incorrect address. His email is correctly stated there as (mail to: <bfeken@copper.net>, but clicking on the link will pop up an incorrect <bfeken@copper.com> (mailto: <bfeken@copper.com>. I think it works correctly everywhere else on his site. Ken loves to talk Triumphs, so if you call instead, be sure you have plenty of minutes available on your phone plan! ;-)

The alloy pump I got from him (and Racetorations) has a high performance impellor with six curved blades and is better made than many of the less expensive rebuilds/repros I've seen in recent years. For one thing, it was very neatly machined so that the pulley couldn't possibly rub against the housing, which is an all too common problem on other TR2/3/4 repro pumps. I've had no experience with TR6 pumps, so can only assume they are as nicely set up. In the TR2/3/4 version, besides some weight reduction, the pumps will move more coolant and are much less prone to cavitation at high rpms. For TR2/3/4, there is also a pump housing available in aluminum, for weight further reduction and perhaps a little more heat transfer, along with AL pulley's offered as part of either thin-belt/alternator conversions or in standard widths. Of course, things are set up quite a bit differently on your car, so what's available or necessary will vary from the 4 cylinder cars.

I'd say the person whose radiator went South was due for a new one anyway! The radiator in my TR4 was rebuilt a few years ago... but I'd still like to go to an AL eventually. I'd suggest anyone pressure test their rad along with all the rest of the coolant circuit before installing a high performance water pump.

One alternative I've noticed - at least for TR2/3/4 - is an electric water pump being offered by Neil at Revington TR in the UK <<http://www.revingtontr.com>>. I haven't had any experience with it, but at least in theory it should free up a few horsepower and might be set up with a thermostat to cycle on and off as needed.

-Alan Myers

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> Just curious.... I ran into a few people at VTR who were running alloy water pumps. I did a quick Google ...

I think I've already seen BFE mentioned as a source. So I only want to add that it's the 6-blade impeller that increases water flow, not the alloy pump. Don't know if he still does, but Ken (at BFE) used to sell the 6-blade installed on a cast iron pump considerably cheaper than the alloy pump. Only advantage of alloy, AFAIK, is that it saves a pound or two. At least partially in your wallet!

BTW- Since the pressure cap is at the point water enters the radiator, the pressure in the radiator is not increased by additional water flow. If anything, the pressure at the bottom outlet is decreased (because of increased drop across the radiator).

-Randall

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: <MMoore8425@aol.com>

<tr3driver@ca.rr.com> writes:

> BTW- Since the pressure cap is at the point water enters the radiator, the pressure in the radiator is not ...

I would sure be curious if there is any analytical data w/r improved pumping ability. I say this because I once was fortunate enough to spend a bit of time discussing automotive water pumps (specifically the two different Stag pumps) with an automotive water pump specialist from Chrysler who belonged to our club. My conclusion from that conversation was that adding vanes does not necessarily improve water pump performance. Does anyone know if there is credible evidence that it improves cooling in this case? Thanks,

-Mike Moore

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: "v6spitfireguy@cox.net" <v6spitfireguy@cox.net>

<Mmoore8425@aol.com> wrote:

> I would sure be curious if there is any analytical data w/r improved pumping ability. I say this because ...
> -Mike Moore

Just adding vanes, if it doesn't improve coolant flow, will not improve cooling (that is to say that there is a problem with cooling in the first place). However, if adding vanes DOES improve the coolant flow, then yes cooling would be improved - (this is of course assuming that there is an adequately sized radiator, correct pressure, no leaks, etc.).

Check out Stewart water pumps for details on pump flow vs cooling effectiveness -

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: <Harrymague@aol.com>

I was wondering if the curved parts of blades would make a difference. It certainly makes a difference in airplanes.

Harry Mague

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: "FRED E THOMAS" <frede.thomas2@verizon.net>

<Harrymague@aol.com> wrote:

> I was wondering if the curved parts of blades would make a make a difference. It certainly makes a ...
> -Harry Mague

Many years ago I purchased from Ken Gilanders @ British Frame & Engine the 6 bladed water pump for my always overheating T/R 3 and since that day the car has never overheated again and operates so cool it is almost scary, great part for all 4 cylinder Triumph's

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: <MMoore8425@aol.com>

<Harrymague@aol.com> writes:

> I was wondering if the curved parts of blades would make a difference. ...

> -Harry Mague

As I recall, the originals on the Stag were curved, and the "improved" ones were straight (but more blades). My friend the water pump engineer for Chrysler said the big difference in the two would be the manufacturing cost (I showed him both impellers). The starlight ones were likely less expensive he said.

-Mike Moore

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

-----Original Message-----

Subject: Water Pump
Sent: Tuesday, July 24, 2007
From: <triumphs-bounces+75tr6=tr6.danielsonfamily.org@autox.team.net>

> Just curious.... I ran into a few people at VTR who were running alloy water pumps. I did a quick Google ...

I think I've already seen BFE mentioned as a source. So I only want to add that it's the 6-blade

-Randall

And one nice Lister just offered me a brand new 6 blade impeller at a very reasonable cost. :-)

-Bob Danielson

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: <MMoore8425@aol.com>

<75TR6@tr6.danielsonfamily.org> writes:

> And one nice Lister just offered me a brand new 6 blade impeller at a very reasonable cost. :-)

> -Bob Danielson

Bob,

They may be great-I just haven't seen any evidence, although we just had an email for a TR3 which now runs cooler. I tend to be pretty skeptical of most of the aftermarket stuff.

-Mike Moore

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> My conclusion from that conversation was that adding vanes does not necessarily improve water pump

> performance. Does anyone know if there is credible evidence that it improves cooling in this case?

Improving cooling is a different matter than improving water flow. The evidence of increased water flow seems clear to me, several racers have reported increased pressure readings inside the engine. Henry Frye reported pegging a 35 psi gauge coming off the straight (but declined to mention his tach reading at the moment).

Whether and how much that improves cooling is a different matter. However, on the TRactor motor, there does appear to be a problem with insufficient water movement around the #4 cylinder, which increased flow is bound

to help, IMO. I've heard from several people who are also experimenting with restrictors fitted to the front water passages, for the same reason. (For example, Mordy Dunst sells head gaskets with smaller holes for the front water passages.) All this is under racing conditions though, so may or may not be applicable to the street. Higher pressure inside the head will also, at least in theory, reduce nucleate boiling near the limit, which can be important for engines modified to produce twice (or more) as much power as original.

It's not even clear to me that the real difference is 6 vanes vs. 4 vanes. The 6 vane pumps have more surface area on the vanes, and are finished all over, while at least some 4 vane impellers have rough sand-cast surfaces. The vanes are also curved on the 6-vane, straight on the 4-vane. Might be that a 4 vane pump built to the same vane shape and size as the 6 would work just as well. But until someone builds a pump like that, it's kind of a moot point.

-Randall

Subject: Alloy Water Pump
Date: Tue, 24 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> And one nice Lister just offered me a brand new 6 blade impeller at a very reasonable cost. :-)

Cool! How about temporarily connecting a pressure gauge instead of the heater valve, and giving us "before and after" pressure readings?

-Randall

Subject: Alloy Water Pump
Date: Sun, 22 Jul 2007 09:42:36 EDT
From: <CP25616@aol.com>

<75TR6@tr6.danielsonfamily.org> writes:

> Just curious.... I ran into a few people at VTR who were running alloy water pumps. I did a quick Google ...

Hi Bob

Racetorations in the UK do alloy water pumps and you will find all details through Google. Hope this helps.

-Alan

Cooling System/Water Pump

Subject: Moss 6 vane water pump
Date: Thu, 12 Jul 2007
From: William Babbitt <wbabbitt@sbcglobal.net>

Has anyone had experience with these 6 vane water pumps from Moss? I picked one up for my TR3A (TR4A engine). I've noticed two things:
The shaft material is soft, and the shaft is shorter than stock.

The shaft length concerns me the most since it does not fully fill the cavity in the pulley. As a result the nut is not fully driven home. It is an elastic stop nut. I also used Loctite as a backup.
-Bill

Subject: Moss 6 vane water pump
Date: Fri, 13 Jul 2007
From: "Kentech HomeTech" <kentech0822@verizon.net>

Bill,
I'd check for interference with the pump housing, Specifically check the pass side pump casting at 10 o'clock position hitting the inside of the pulley where it tapers. Mine required a little burr work to clear. Also needed a couple of dead blow hammer taps to drive the pulley home.

Also, has the key slide backwards, out of the keyway?
-Peter K.

Cooling System/Water Pump

Subject: TR Water Pump experts
Date: Wed, 25 Jun 2003
From: "Fred Thomas" <vafred@erols.com>

Carl, these seals are available from your local Massey/Ferguson tractor dealer and are being made by "Rover", also available from V/B (not Rover made) there are 2 "C" clips that hold the bearings in place inside the housing and keep them from any movement, 1 is on the outside of the top bearing and the other is on the bottom of the bearing, the impeller should have a clearance of .085 from the housing, if you try to press the impeller further onto the shaft to get the right clearance you must make sure the 2 "C" clips did not move, the outside "C" you can see, the inside you must look through the water drain outlet slot where you will see the rubber water thrower and the small "C" clip, if it is not in place or has been bent you must completely start over with a new "C" clip and this time press the impeller onto the shaft a little further place the rear impeller seal in place and then insert the shaft into the housing, install the small "C", bearing abutment washer, bearing (face-up), spacer, bearing (face down), and now press the bearings down until the "C" can be placed into it's slot, not too much pressure downward just enough to clear the groove, on the bottom of the housing where the impeller seals, this surface "must not" have any grooves or badly worn areas, if it does the seal will leak, I have parts available if you are in need, I also have the complete breakdown/cross over part numbers for the "Massey/Ferguson" part numbers if anyone cares for a sheet. Don't forget to "powder-Coat" the housing and pulley while you have off :)

- "FT"

Subject: TR 4 Water Pump Bearing
Date: Thu, 14 Aug 2003
From: "Bob Nogueira" <nogera@worldnet.att.net>

I'm rebuilding my spare TR4 water pump. I thought finding the seal would be the problem but that was easy. The problem came when I went to three of my local bearing suppliers here in Dallas TX to pick up a pair of bearings. Well as one told me "the good news is we have determined a source for the bearings the bad news is it is in Italy and is going to cost you dearly IF THEY HAVE THEM!" This is the first time in twenty years that I have not been able to find a bearing locally. Anyone out there know a source for these bearings? It's the aftermarket pump with the nut that holds the pulley on to the shaft.

Thanks

-Bob Nogueira

Subject: TR 4 Water Pump Bearing
Date: Sat, 16 Aug 2003
From: "Fred Thomas" <vafred@erols.com>

> I had a bit of an inquiring conversation with the owner and he admitted that all of the parts of the pump were a
> direct fit from a Massey Ferguson tractor pump. He said anyone could do it.
> The pump has been in my car for 10 years and performs flawlessly. Check out your closest tractor dealer. He
> doesn't know about the parts fitting your pump so you will have to do some explaining.
> It is always good to know this stuff for when you break down "in the middle of nowhere".
> -Fred

I have the crossover water pump listings from Triumph to Massey/Ferguson tractor parts complete with breakdown picture, and yes your M/F dealer will know the pump immediately, the bearings and shafts have not been available for some years now, the rear seal is being made by "Rover" and still available, anyone wishing this crossover sheet send me your mailing address and I'll forward you a copy

- "FT"

Cooling System/Water Pump

Subject: TR2-4A Water Pump Rebuilding
Date: Wed, 13 Nov 2002
From: "Fred Thomas" <vafred@erols.com>

On the front of the water pump is a "C" clip holding the bearings in place, remove this clip, turn your water pump over with the impeller facing up and place in a vise, using a good size punch, so as not to distort the shaft, drive the shaft out the front of the housing. It's very easy, taking about 30 seconds, if you have a press use a large bolt to rest on the shaft and then press it out.

Reinstalling / Assembling:

Place water thrower rubber bush on shaft, place the lower interior "c" clip on the shaft then the abutment washer, 1 bearing facing up, spacer, 2nd bearing facing inward, load the inside space of the 2 bearings (facing each other) with grease and press into housing, reinstall the outer "C" clip, & insert new rear bushing/seal in impeller turn the water pump over and press the impeller onto shaft, you want .085 clearance between impeller and housing.

-"FT"

Subject: TR2-4A Water Pump Rebuilding--#2
Date: Wed, 13 Nov 2002
From: <AVALON2455@aol.com>

Looks like <vafred@erols.com> has a much better mousetrap!!!.....uses the housing as the bearing splitterDuh.....!.....Well I'll know next time, eh?

In reassembly, I would but the front Circle clip #12 back on and reinstall the pulley, so that you are then pressing the impeller back on against the pulley rather that against the bearing and circle clip.

Thank Goodness for our Net!!! Thanks FT!!!.....

-Clark

Subject: TR2-4A Water Pump Rebuilding--#2
Date: Thu, 14 Nov 2002
From: "Fred Thomas" <vafred@erols.com>

Clark Wrote:

> In reassembly, I would but the front Circle Clip #12 back on and reinstall the pulley, so that you are then
> pressing the impeller back on against the pulley rather that against the bearing and circle clip.

Then you are still pushing against the "C" clip as it will always be about 3/4" below the pulley level, The "C" clip is the only way to get the shaft in its proper location so as to receive the impeller, the pulley only holds the fan belt in place and nothing else. "FT"

Cooling System/Water Pump

Subject: Water Pump
Date: Wed, 05 Nov 2003
From: a Wallace <wallaces@superaje.com>

Terry Smith wrote:

> "...I guess I'm back to the original question. It just seems such a waste to buy an \$80 water pump from a
> catalog when all that really needs to be done is just a bushing or bearing, a seal, something like that....Did
> Massey Ferguson (M-F) originally make these engines, and would they still carry the part?"

Terry,

It was the other way around; Standard Motor Co built the Ferguson engines.

You can still get the seal and spring arrangement through M-F (or FT I think), but the bearings are not available anyplace, as far as I know. I have hunted a bit too. They were made by Hoffman, part #N3179 V2; if you can find an equivalent please let me know and I will take half a dozen. I think this is why it is so common for people to replace the whole pump, as they are not hard to rebuild but quite often do need a bearing.

-Jim Wallace

Cooling System/Water Pump

Subject: Water Pump Bearing Info
Date: Thu, 6 Feb 2003
From: <AVALON2455@aol.com>

Hey Harold!

But (sincerely) I hope you can find a source for usI, myself, will be glad to buy 10 new ones at \$50 each.!!!

Here are the #'s on the bearing.....Outer Rim: HOFFMANN 117 FS V2 ENGLAND RQPO
(A DELTA SIGN)N Inner Rim: QPO
N3179 V2

It is my understanding that these were made only by Hoffmann (they have evidently been out of business for years)they have a seal on one side (retaining ring, flat thin metal washer ring, fiber filler ring) and nothing on the other sideanything less than this, the grease pressure will blow out the seals!!!

(FYI.....if you find an old one.....clean it up.....they were probably a bit loose when new.....My Guru said, "That's a bad bearing, try to replace it!".....I broke it up, took it back to him.....and he said, "Hmmmmm.....I can't see anything wrong with it!.....it's an older bearing.....maybe it started loose!")
When a good one is clean.....it rattles a bit when you spin it.....but really doesn't have any appreciable movement vertically or horizontally.

-Clark

Cooling System/Water Pump

Subject: Water Pump Rebuilding
Date: Mon, 11 Jun 2007
From: "Jim Bauder" <jimbpps@cox.net>

Listers,

Over the years I seem to remember that there have been several discussions on the list about rebuilding the TR3, etc. water pumps. It seems that the pumps available from the usual suppliers are fine and they work, but they are not original enough for some of us anal compulsive types!

Has there been any progress in this area that anyone is aware of? I have a couple of friends with good rebuild able cores, but no seals or other internal parts are available from the usual suppliers. I have seen Massey-Ferguson mentioned as a possible supplier, can anyone confirm or deny?

Am I alone in this search? Are there others of you that would like to have a choice to rebuild or buy new? Please let me know any thoughts or ideas you may have. TIA,

-Jim

Subject: Water Pump Rebuilding
Date: Mon, 11 Jun 2007
From: William Babbitt <wbabbitt@sbcglobal.net>

Jim,

You can get replacement seals from Victoria British.....

-Bill

Subject: Water Pump Rebuilding
Date: Tue, 12 Jun 2007
From: TeriAnn Wakeman <twakeman@razzolink.com>

Gosh Jim! You know how to make a girl feel bad.

Very recently I've been getting rid of all those possessions that encumber my life to take care of that I never use. Just last week I went through a big file cabinet full of stuff I've saved for reference but never seem to refer to. That included back issues of Triumph club newsletters, VTR and TRA newsletters going back into the mid 1980's.

I know in there was an article on rebuilding TR3 water pumps that included Massey Ferguson part numbers for the bearings and seals. The parts were (are??) available to keep the old tractors running.

Why is it that you never use something for 20 years then you have a use for it right after you get rid of it???

My goal is to eliminate possessions that I no longer use or that I've kept just because it might come in handy one of these days.

For people local to Monterey bay that means I'm putting a good condition TR3A cylinder head and a set of 4 knock off Minilite look alike wheels up for sale.

It's kind of like weight watchers for possessions

-TeriAnn

Subject: Water Pump Rebuilding
Date: Wed, 13 Jun 2007
From: "McEwen, Art (MOH)" <Art.McEwen@moh.gov.on.ca>

> You can get replacement seals from Victoria British.....

I saw them there as well, I just pulled my original type (possibly original) water pump and replaced it with a Moss 6 blade one (BFE were out of stock) and I'm glad I took that route, under 2 hours the evening it arrived, the engine is now a LOT quieter and I presume the pump capacity is higher.

However I wouldn't mind rebuilding the old one (next winter) to have as a spare or flog on e-bay to all those who demand a grease nipple in their lives. Any idea the tolerances/thicknesses that need to be remaining in the shaft?

-Art McEwen

Subject: Water Pump Rebuilding
Date: Wed, 13 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I got a water pump from that guy in Idaho who regularly lists Triumph parts on eBay. About \$90 I think. It was aftermarket but with the zerk & stock-style (removable) pulley.

There is also a guy selling rebuilt originals on eBay -- not cheap but looks nice. He had there recently, didn't sell but as it was a 'buy it now' so he may have an inventory. No experience on the quality of the product...

<http://cgi.ebay.com/ebaymotors/TRIUMPH-TR2-TR3-TR4-4A-WATER-PUMP-MORGAN-2YR-WARRANTY_W0QQcmdZViewItemQQcategoryZ34202QQihZ013QQitemZ230134512221QQrdZ1QQsspageZWDVW>

-Geo

Cooling System/Water Pump

Subject: Woodruff Key TR3 Water Pump
Date: Thu, 8 Aug 2002
From: "Mark Gendron" <mgendron@speakeasy.org>

-----Original Message-----

> Subject: Woodruff Key TR3 Water Pump
> From: <RayAntoky@aol.com>
> What's the chance that my friendly machine shop person can make me one? Or do I have any other
> alternatives?

You might look for something locally. According to the parts manual, this is a **KW0420**. The hardware catalog lists this as 1/8" thick x 1/4" high x 5/8" diameter (being the diameter of the imaginary circle that the key is cut from).

-Mark

Cooling System\Water Pump

Subject: TR3A Overheating
Date: Thu, 14 Jul 2011
From: Michael Porter <mdporter@dfn.com>

wbeech@flash.net wrote:

> <moral of the story - before it finally dies, a water pump may only be working somewhat . . .>

>

> Question: How does a water pump partially wear out? Do the vanes wear down? I should think that if it is not
> leaking and the belt is not slipping that it is working as intended. Give you radiator a good check/cleaning if
> you have not already.

Corrosion can cause the pump vanes to wear down over time, once the pump begins to cavitate, that can accelerate the wear. That said, the pump doesn't have to leak to create symptoms of overheating. I had one that didn't leak (at least not enough to notice), but the seal had worn just enough to suck air in due to rotation of the shaft, which would over pressurize the system and cause the cap to vent as if it were boiling over.

But, a goodly number of the Cummins diesels we'd purchased for customers' buses at one time were going through water pumps at a ferocious rate (with the primary symptom being overheating), and the problem was traced back to a corrosion inhibitor that was incompatible with the water pump vane alloy, and was accelerating the erosion of that part. Once the anti-corrosion chemistry was sorted out, everything was back to normal. So, it can happen.

=Michael Porter

Electrical

Subject: Lucas Part Numbers
Date: Sun, 19 Sep 2010
From: Brad Kahler <brad.kahler@141.com>

Here is the Lucas 400e catalog broken into sections, scanned and ocr'd so you can do part number and text searches.

<http://campkahler.com/files/Lucas-400e-index-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-A50-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-A116-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-B18-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-E10-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-F68-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-G85-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-J30-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-K71-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-M8-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-N40-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-P32-ocr.pdf> NO?

<http://campkahler.com/files/Lucas-400e-to-P32-ocr.pdf> Yes!

<http://campkahler.com/files/Lucas-400e-to-R47-ocr.pdf>

<http://campkahler.com/files/Lucas-400e-to-U38-ocr.pdf>

-Brad

Subject: Lucas Part Numbers
Date: Sun, 19 Sep 2010
From: Brad Kahler <brad.kahler@141.com>

Dean,

Try that link again. I had a typo in the file name up on the server. Should be resolved now.

-Brad

<Dean.Mericas@ch2m.com> wrote:

> Brad

>

> First, thanks for posting the Lucas 400e parts catalog files. One of the files

< <http://campkahler.com/files/Lucas-400e-to-P32-ocr.pdf> >

> came up as not found. Can you provide an alternate link?

> -Dean Mericas

Electrical/Battery

Subject: Batteries
Date: Sun, 4 Jan 2004
From: "Fred Thomas" <vafred@erols.com>

- > How much VX 6 do you use per battery per season? Is it a onetime treatment or do you add more
- > periodically?
- >
- > I have 2 of the HF \$7.00 battery maintainer's, but I've heard nasty comments about them on these lists.
- > They fail and can ruin batteries. Maybe they should only be used on a fully charged battery? Any
- > comments anyone?
- > -Don Malling

I've had no problems with the JCW maintainer over the years, the VX 6 takes 1/2 oz. per cell per year. I add it every winter when she goes to sleep.

-“FT”

Electrical/Battery

Subject: Battery Charger hookup on Positive Ground Car
Date: Tue, 23 May 2006
From: "Jim Bauder" <jimbpps@cox.net>

Yes, Paul. The Red always goes to the +Battery terminal and the Black goes to the Negative, regardless of which side of the battery is connected to the cars chassis!

-Jim Bauder

-----Original Message-----

Subject: Battery Charger hookup on Positive Ground Car?
Sent: Tuesday, May 23, 2006
From: owner-triumphs@autox.team.net [On Behalf Of Paul Willoughby]

I was just about to hook up an automatic trickle charger to my positive ground TR4 when it dawned on me that I wasn't sure which way to hook it up. Rather than burn up my battery, I thought I should double check with the list first.

On a common negative ground car, the red charger lead goes to the battery + terminal and the black lead goes to the battery - terminal. Is it still the same hookup for a positive ground car?

-Paul Willoughby

Subject: Battery Charger hookup on Positive Ground Car?
Date: Tue, 23 May 2006
From: <Dave1massey@cs.com>

<paulwillou@socal.rr.com> writes:

> On a common negative ground car, the red charger lead goes to the battery + terminal and the black lead goes
> to the battery - terminal. Is it still the same hookup for a positive ground car?

Yes, it is. The only difference is the red lead now goes to the battery terminal that is attached to the chassis. On a negative ground car the black lead would connect to the battery terminal that is attached to the chassis.

If you choose to make one of the connections to the car chassis or the engine block this could be important.

-Dave

Subject: Battery Charger hookup on Positive Ground Car?
Date: Tue, 23 May 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

<Dave1massey@cs.com> wrote:

>...The only difference is the red lead now goes to the battery terminal that is attached to the chassis... If you
> choose to make one of the connections to the car chassis or the engine block this could be important.

Indeed, I was taught that the final connection should be the ground (+ in Paul's case) and should be to the engine block. The idea is that the last connection is the one that may spark and you don't want a spark right there at the battery. Maybe not too critical when hooking it up but after the battery has been charging for awhile could be dangerous (Hydrogen gas in the area of the battery) so the ground is also the first one you disconnect, again to keep any spark away from the battery..

True? Or old wives tale?

-Geo H

Subject: Battery Charger hookup on Positive Ground Car?
Date: Tue, 23 May 2006
From: "Randall" <tr3driver@comcast.net>

> Indeed, I was taught that the final connection should be the ground (+ in Paul's case) and should be to the
> engine block. The idea is that the last connection is the one that may spark and you don't want a spark right
> there at the battery. Maybe not too critical when hooking it up but after the battery has been charging for
> awhile could be dangerous (Hydrogen gas in the area of the battery) so the ground is also the first one you
> disconnect, again to keep any spark away from the battery..
>
> True? Or old wives tale?

I believe there is some basis in fact for this, but not a whole lot. It's true that an overcharged battery emits a very explosive mixture of hydrogen and oxygen. If the battery is being overcharged, a spark near it could be disastrous. It's even happened to me once, although both the spark and the overcharging were caused by my make-shift battery charger (and the fact the battery had a shorted cell). The resulting explosion and fire did a fair amount of damage ... no doubt would have been worse if I had my face over the battery.

But any decent battery charger should not make the battery out gas that much. It will significantly shorten the life of modern "maintenance free" batteries, where you cannot replenish the water lost.

So, I just try to keep my face away while making connections, and don't worry about using the engine block for the final connection.

-Randall

Subject: Battery Charger hookup on Positive Ground Car?
Date: Wed, 24 May 2006
From: <Davelmassey@cs.com>

I concur. Most times there may be no hydrogen gas present in significant quantity but it is a good habit to get into.

-Dave

Electrical/Battery

Subject: Battery charging
Date: Wed, 2 Jun 1999
From: Randall Young <randallyoung@earthlink.net>

Hi all :

The recent battery questions have stirred up an old project of mine: the perfect battery charger.

I used to have a document that described the 'ideal' charging cycle for lead acid starting batteries, but I've lost it. As I recall, it went something like :

- 1) Charge at constant current (amps not to exceed amp hour rating/4) until specified voltage. I think this number was around 14.5 volts, depending on temperature.
- 2) Taper charge (current depends on voltage) until higher voltage or time limit reached. I think this was around 15.2 volts, depending on temperature. The goal was to equalize the voltage on all cells by overcharging slightly.
- 3) Constant voltage 'float' at around 13.8 volts, again depending on temperature.
- 4) If float current rises to some value, repeat charge cycle.

Does anyone have a copy of this procedure, including the temperature compensation graphs ?

If I can find the information, is anyone interested in instructions to build one of these ? The price for a new unit is only around \$150 US, and parts to modify a 'dumb' charger will probably be \$25-50 if your electronics junk box isn't well stocked.

-Randall

Electrical/Battery

Subject: Battery for Negative Ground TR4A
Date: Mon, 08 Sep 2008
From: Brian Thomas <thomasb@queensu.ca>

Hi

The battery in my TR4A is toast and it's time for a replacement. I'm finding the type 27F that is in the car is a special order.

I chose 27F (12 years ago) instead of the Type 24 which I believe is the normal fitment as I could get it in black with a flat top and two "gang" vents. These I replaced with 6 OLD "round" style vents to give a period look and the LUCAS sticker applied helped to create this illusion.

The 27F (and probably 24) when installed in a negative ground car has the terminals on the firewall side. I'm wondering if anyone is using a type 27 in this app? The terminals would then be on the engine side. There doesn't appear to be a problem with the hold down bar (making contact with the terminals) but I'm concerned about the positive cable mounting shorting out.

I ask because type 27 is an off-the-shelf item.

Opinions?

-Brian

Subject: Battery for Negative Ground TR4A
Date: Mon, 8 Sep 2008
From: <Loumetelko@aol.com>

Brian:

The 4A was initially equipped with the group 27 battery. Whether it was a straight 27 or the 27F I don't know. The TRA guide only states that it was a group 27. A few years ago I used the same group 27 for both my 4A and the TR2, just had to remember to flip the post locations.

Is TS537 on the road yet?

-Lou Metelko

Electrical/Battery

Subject: Testing items off of a battery
Date: Fri, 30 May 2008
From: "Randall" <tr3driver@ca.rr.com>

> A serviceable substitution for the resistor is a common headlamp with test leads soldered to it.

I'll second that, with the added observation that a "burned out" bulb will do nicely. Almost always one filament burns out first, leaving the other available for testing. I keep a pile of H4 bulbs for just such purposes.

But of course a headlight bulb will only pass a few amps. If you're testing a starter, it isn't going to work.

Problem with using a 1 ohm resistor is that it will burn up quickly if you have a short, unless it's a really big (expensive) resistor. 12 amps times 12 volts is 144 watts. I find it easier and less expensive to just consider test leads as consumables ... if the smoke comes out, buy a new one. They're only about \$1/ea @ Radio Shack.

<<http://tinyurl.com/4k5bp3>>

Also, it's very handy to carry on trips, for "roadside tech sessions" and as temporary work around for switches & wires that don't want to do their job.

-Randall

Subject: Blowing Fuses
Date: Thu, 5 Jun 2008
From: "Randall" <tr3driver@ca.rr.com>

John,

Clearly you've got a short to ground somewhere, most likely in the wiring, IMO.

One way to avoid buying so many fuses is to temporarily jumper across the fuse with a headlight bulb. The bulb will light only dimly if at all if there is no short, but light brightly if there is a short. Thus giving you a visual indication of when the problem is resolved. However the bulb will limit the current enough to avoid damaging the wires (any more than they already are).

My first step would be to turn off the control for the dash lights. If that removes the short, you know the short is in the dash light wiring (which in my experience is the most likely place for it to be).

If not, I believe you can separate the two red wires at the fuse block, to see if the problem is at the front of the car or the rear.

Then examine the wires near each lamp holder for protruding bullet connectors, exposed wires, cracked insulation, wires running across sharp edges, etc. Also try wiggling the wires to see if the short goes away. If so, you're close to the problem.

Otherwise, you're going to need some special tools. There are commercially available short finders, like this one:

<<http://tinyurl.com/5l6kjt>>

Or you can sometimes "make do" with the headlight bulb as mentioned above, and an ordinary "Boy Scout" hand-held magnetic compass. The compass needle will deflect when it gets next to a wire carrying current.

Either way, the drill is to remove all the normal loads (tail lights, etc.) and then try to trace where the current is flowing. When you reach the end, you have to be near the short.

-Randall

Electrical/Fuses/Fuses box

Subject: Flashers - 4Way Flasher
Date: Mon, 24 Jun 2002
From: "Fred Thomas" <vafred@erols.com>

If you have a original Lucas flasher # 35010 with the raised lettering, then open the bottom of the unit carefully and remove the guts and reinstall a # 550 universal flasher guts, nobody, not even Andy M can detect the change of the components, bet ya.

-"FT"

Electrical/Fuses/Fuses box

Subject: Lucas fuse equivalents
Date: Sun, 26 Sep 1999
From: Dave Massey <105671.471@compuserve.com>

Ken Gano writes:

> I have been reminded that Lucas fuses were sized differently than US standards. It was suggested that a 30
> Amp Lucas are something like a 17 amp Buss. Does anyone know what the Buss cross
> reference for a Lucas 35 Amp? (or the 30 amp, for sure)

Ken and list:

The SAE fuses are rated at their holding current. That means a 20 Amp fuse will carry 20 amps forever and will open at a current level of 40 Amps or less (usually somewhere between 30 and 40 Amps). A Lucas fuse is rated at the current that will cause it to open.

For example, a 35 Amp fuse will carry 17 Amps forever and open at 35 Amps. Therefore when replacing a Lucas fuse with an SAE fuse divide the current rating by 2.

-Dave Massey

Subject: Lucas fuse equivalents
Date: Sun, 26 Sep 1999
From: SGeorge Richardson <gprtech@frontiernet.net>

I just happened to be working on the electrical system on my Jag XJ6 yesterday, and ended up pulling a whole bunch of Lucas fuses that were labeled with their current ratings.

A Lucas fuse is rated by what current it would blow at. U.S. fuses are rated by what current you can draw *without* blowing them, or the maximum continuous current. They don't really specify the current they'll blow at.

Anyway, these lucas fuses had both the Lucas "blow at" rating, and the maximum continuous current, i.e. the US rating labeled on them.

So here's your equivalents:

English Type	Buss Replacement
Lucas 50 amp - continuous 25 amp	AGC 30
Lucas 35 amp - continuous 17 amp	AGC 25
Lucas 30 amp	AGC 20
Lucas 25 amp	AGC 15
Lucas 20 amp - continuous 10 amp	AGC 10
Lucas 15 amp - continuous 8 amp	
Lucas 10 amp - continuous 5 amp	AGC 7 1/2
Lucas 5 amp	AGC 3
Lucas 2 amp - continuous 1 amp	

See the trend here? Each fuse is actually good for a continuous current that's about 1/2 of it's rating.

By the way, these Lucas fuses are either suffering from old age, or they weren't made very well. On removal, they often fall apart. They also exhibit higher resistance than I would care to see in an electrical system.

Take my advise and get good US equivalents.

Subject: Lucas Fuses, need the facts
Date: Sun, 06 Feb 2000

From: Randall <randallyoung@earthlink.net>

I have in my hand a genuine Lucas fuse, found in a TR3 fuse block, which it fits perfectly. Although it is very slightly shorter (1.20" instead of 1.25") than an AGC fuse, it is certainly much larger than a 5x20mm fuse.

And, since TR4s take the same fuse block as later TR3s, and AFAIK all TR3s took the same size fuses, I doubt seriously that a 5x20mm fuse will fit Art's fuse block.

According to the Haynes manual, the fuses in the fuse block on a TR4 should both be 25 amp, and the in-line fuse for the horns should be 35 amp. So, as easily obtainable replacements, I suggest AGC-15 for the fuse block, and AGC-25 for the in-line holder.

BTW, the catalog on Buss' web site lists both "North American standard" 5x20mm fuses, and also "British household" standard .25"x1.25" fuses. I'd say that makes physical size a pretty poor indicator of fuse standard

<g>
-Randall

Subject: Lucas fuses
Date: Sun, 06 Feb 2000
From: Randall <randallyoung@earthlink.net>

George Richardson wrote:

> The problem with the US system is that it's not clear at what point the fuse will blow. A 15 amp US fuse will
> not blow at 15.5, 16 or even necessarily 20 amps.

The same thing is true of a British 30 amp fuse...

Actually, I think you will find that all US spec fuses have a "minimum blow current", it's just not printed on the fuse, and varies with different fuse types and with overload interval (and temperature). For instance, AGC type fuses (which are a fast acting type, frequently used in cars) are rated to blow in 4 hours at 110% load, 1 hour at 135% load, and 2 minutes at 200% load (all at 25C).

-Randall

Subject: Lucas fuses - Dan Masters reply
Date: Sun, 6 Feb 2000
From: <ArthurK101@aol.com>

My comment to Dan:

> A question has come up again about the ratings on Lucas fuses. The usual miss information and half facts
> have surfaced. I have to admit that I started it when I said that I was going to replace my Lucas fuses with
> Buss fuses (because I didn't want to wait to get the Lucas'). I said that I would use 1/2 the ratings called for
> in the fuse charts in the car's shop/owners' manual.

>
> My understanding is that Lucas fuses are rated for "quick blow" at the marked rating. For example, a
> Lucas fuse with a rating of 35A will blow IMMEDIATELY at 35A. BUT it will also heat up and eventually
> blow if the continuous current exceeds 17.5A, depending on how long the current exceeds that
> amperage. This will protect a circuit rated at some amperage above 17.5 amps by allowing a short time
> surge up to 34.5A but would cause an immediate open for surges at 35A.

>
> Have I got the right explanation and is 1/2 the proper ratio to use when using Buss fuses?

Dan's answer:

You have it right. The newer Lucas fuses have two ratings printed on them. 35 amp in large print, and "17.5 blow" in smaller print. As with most things, it's a bit more complicated than that, but it's also true that there is a lot of leeway, both in the ratings of the fuse, and in the current carrying capacity of the wires, so the 1/2 factor is more than sufficient as a criteria. Unfortunately, you won't be able to find 17.5 amp Buss fuses, at least not readily, so you will have to split the difference. My recommendations are to use a 10 amp for the "red" fuse (the fuse feeding the parking, marker, and gauge lights), 15 amp for the "purple" fuse (feeding the horn, high beam flasher, and courtesy lights), and 20 amp for the "green" fuse (feeding all the loads that are on only when the key is on - wipers, reverse lights, brake lights, gauges, heater fan, turn signals, etc). If you find that the 10 or the 15 amp fuses blow often, move up to a larger size, but I would NEVER go over 20 amp

Electrical/Fuses/Fuses box

Subject: TR4 Electrical **Electrical: Trouble Shooting**
Date: Tue, 21 May 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

Tim wrote:

> I just took my TR4 '64 for a little spin. Not too far, when I noticed the temp and fuel guage is not working or
> the turn signals. Is this just a blown fuse or something else.

Tim:

Certainly could be a fuse. The TR4 has only a single fuse to cover everything powered by the ignition switch, except the ignition coil, starter relay and OD solenoid (which have no fuse at all). If it is the fuse, your brake lights also do not work!

Check the fuse holder when you replace the fuse: loose, dirty or corroded fuse contacts can cause the fuse to open for no apparent reason. I like to smear a little silicone dielectric grease on the contacts to help prevent any future corrosion.

Of course, the next problem is finding out why the fuse blew. It can unfortunately be difficult, but usually it's not too hard. In this case, I would start by trying to identify which circuit has the short. Turn everything off individually, turn the key on, and check the new fuse. If it doesn't blow, then try the turn signals, windshield wipers, heater fan, brake lights and overdrive if present (not necessarily in that order) to see which one blows the fuse. If it doesn't show up easily, write back to the list and we'll give you more advice than you can stand <g>

Another point to be aware of, all the books will say your car takes 35 amp fuses (or possibly a 35 and a 50). Those ratings are done with the European method, which is a value almost twice what American fuses are rated for. If you want to use American fuses, an AGC 20 is a reasonable substitute. DO NOT put in an AGC 35, it may not blow when there is a short, leading to unpleasant amounts of smoke and repair bills. As I posted earlier, TRF has the 'proper' Euro-spec fuses in stock (at least they did this morning).

You can also buy a circuit breaker that will clip into the fuse block in place of the fuse. Although they're fairly expensive (like \$10), the big advantage is that they will automatically reset, so that if you have an intermittent problem, you don't have to keep changing fuses (and driving without brake lights!)

-Randall

Electrical/Fuses/Inline

Subject: TR3 install in line fuses, where
Date: Sun, 04 Feb 2001
From: Randall Young <randallyoung@earthlink.net>

Gbouff1@aol.com wrote:

> I am in the middle of wire harness hell, on my 59 TR3A. During the process of installing a new harness
> remembered a thread about in line fuses quite a while ago. Does anybody have any recommendations on
> where and what amp size should be installed?
>
> Thanks for any input,
> -Gary

Gary :

I believe your car should already have the in-line fuse added by the factory, which connects from the headlight switch to the dash lightswitch. The fuse holder clips to the inside edge of the dash, below the ignition switch. The book says this should be a 35 amp fuse (Lucas rating method), but I use a smaller 10A fuse (US rating method). IMO this fuse is worth adding to earlier cars, as among other things it protects the wires to the taillights, meaning all the wires to the rear are fused.

My book contains the notation 'fitted USA only', does anyone know if this is true ?

Additional fuses worth considering (although I haven't tried them), with US ratings :

1) Fusible link (16 gauge for stock generator or alternator up to 60A, 14 gauge if you have a big alternator) at the starter solenoid, in the wire that goes to A1 on the fuse block. This protects the main wiring, especially the wires to the ammeter.

2) 30A in the wire from A1 on the control box to the headlight switch. Basically the 'master fuse' for everything but the horns, overdrive, and any added 'high power' accessories (radiator fan, stereo, halogen headlights, etc.) which should be controlled by relays fed before this fuse (and seperately fused).

3) 15A in the wire from the headlight switch to the dimmer switch. If you have added a headlight relay, then this fuse can go in the power feed to the relay, and a small 5A fuse goes in the line from the headlight switch to the dimmer switch.

If you plan to use high-power headlights (80w each or more), you will have to increase this fuse appropriately. You need some margin in the fuse size, to cover in-rush current, so add together the power of the two headlights (whichever beam draws more, but not both beams) and divide by 9 (giving a 33% margin), then round the result up to the next common fuse size. I designed for 100w high-beams, my relay has a 25 amp fuse.

4) If you have overdrive, I'd suggest a 'slo-blow' fuse in the power to the OD relay (wire from ammeter to C1 on relay). It may take some experimentation to find the smallest fuse that won't blow under normal operation, I'd start with 12A slo-blo. In addition to protecting from shorts in the wiring, this will hopefully also save the solenoid if it's 'pull-in' contacts don't open.

-Randall

Electrical/Horns

Subject: Horn Repair - Lessons Learned
Date: Wed, 8 Oct 2008
From: "Scott Butler" <scott@sabutler.com>

After the list's help with my starter relay, I moved on to repairing a non-functional horn. Not a horn button/switch, but the horn itself. I documented the process in hopes that someone else might find it useful.
<<http://www.sabutler.com/tr6hornrepair.asp>>

So, if you've got a horn that doesn't blow, this might be just the thing to fill your idle hours.
-Scott Butler

Electrical/Horns

Subject: Horns on a '60 TR3A
Date: Thu, 31 Aug 2000
From: Randall Young <ryoung@NAVCOMTECH.COM>

Yes, it's possible to adjust the horns, and even possible to partly disassemble and clean them (if they are the stock horns). However, first I'd be sure that they are getting a reasonable proportion of the battery voltage applied to them. The ammeter is not supposed to be in the circuit from the battery to the horns, so it should not show a deflection if you blow the horns with the engine stopped. With the engine running, it may show a deflection to the charge side, as the generator puts back the power drawn by the horns.

It's best to remove the battery ground strap, as the wire into the horns is hot at all times. You'll likely need to take the radiator braces loose from the inner fender, then unbolt the horn. Remove the screw and the top cover. Now is the time to connect a voltmeter across the two terminals and check the voltage when you blow the horns. If you aren't getting at least 11 volts (with the engine stopped), you need to look for the electrical problem(s).

One of the point contacts in the horn is threaded for the adjustment, with a jam nut. To adjust the horn, connect a 30 amp analog ammeter in series with the horn button. (The bullet connector near the horn is a good place.) Then reconnect the battery, and blow the horn while watching the ammeter. The target current is 8 amps. (Very early horns were 6 amps. I don't recall the switchover date, but think it was early TR2.) If the current is too low, loosen the jam nut and unscrew the contact 1 or 2 flats (decreasing the point gap), then re-snug the jam nut and try again. If the current is too high, screw the contact in (increasing the gap).

I've found that the push rod that operates the contacts is prone to corrode. To get to it, remove the wires and take the horn to the bench. Carefully remove the two nuts that hold the contact assembly together, noting the position and order of each piece. Now, you can remove the push rod and clean it and the hole it sits in. I used a thin film of silicone grease to lube mine, it seems to have helped.

-Randall

[SMTP:steve.crockett@analog.com] wrote:

> Is it possible to adjust the horns on a TR3A? Right now all I get is a kind of low burbling sound when horn
> button is depressed. Ammeter shows current flowing....I used to get sound when engine was revving above
> 1500, but now it has diminished to barely audible.

Subject: Re: Horns on a '60 TR3A
Date: Fri, 1 Sep 2000
From: <Lftlesl@aol.com>

<moag@ix.netcom.com> writes:

> Yes, they are adjustable. There are a couple pages on the procedure in the Factory Workshop (Bentley)
> manual. It states that it doesn't alter the pitch but if not properly adjusted it results in "loss of power and
> roughness of tone". Basically there is a lock nut under an adjusting nut towards the top center of the horn
> (after cover removed). After loosening the lock nut, turn the adjusting nut clockwise until contacts just
> separate (which stops horn from sounding) then turn back other direction 1/2 turn and tighten back down. The
> manual says to measure the amps being drawn as the means to do the adjustment --- latter style s/b 8 amps.
> Turning adjustment screw clockwise decreases the current.

Dave has it exactly right. I restored my horns several months ago (using advice from this list) and they work perfectly. Of course, they are now wrapped in newspaper waiting for the rest of the restoration...about three years away and counting.

-Les Landon

Electrical/Horns

Subject: Inoperative TR6 horns
Date: Wed, 22 May 2002
From: "David Brister" <david.brister@wanadoo.fr>

Jim and listers all,

I don't know if the TR6 steering and horn arrangements are the same as the TR4A but I solved this problem once and for all by grinding the teeth away from an old hacksaw blade and earthing the driver's end of the steering column with the blade attached with a self tapper to the bracket that carries the clutch and brake master cylinders. The 4A has a relay for the horns so minimal current is involved.

Also repaired the horn push about twenty years ago with the carbon electrode from a dry battery and a suitable spring from a ballpoint pen housed inside the pen barrel cut to the appropriate length. That is still working well.

-David Brister

Electrical/Horns

Subject: UHS
Date: Thu, 18 Feb 2010
From: "David Brister" <david.brister@wanadoo.fr>

Aplologies for having posted this before but it might be useful.

I put up with this problem for a few years but after adopting the following rather inelegant solution about 20 years ago the horns have worked perfectly ever since.

First I made a new plunger thingy. I took the carbon rod from a dry battery, which fitted well into the barrel of an old pen of correct diameter. I took a very light compression spring, same one from the old ballpoint, I think. I cut two pieces 10 mm or so from the carbon rod and glued them to the spring. They fit into a piece of the ballpoint barrel cut to the appropriate length.

Voila! A new plunger thingy.

Next I ground the teeth off an old hacksaw blade and bolted a suitable length of it to the master cylinders bracket so that the flat bore down on the upper part of the steering column.

Encore Voila! It's a perfect earth. No need to fiddle with bits of wire over the U-Joints or steering rack.

HTH, ATB
-David Brister

Electrical/Horns

Subject: Wind Tone Horn Update
Date: Thu, 22 Jun 2006
From: "Eureka Saws Co, Inc." <ambritts@ptdprolog.net>

Hello to all,

A quick update on my 1 good and 3 bad horns. Thanks to Randall I now have 4 good horns. So I will share my slow first repair (about 1/2 hour) and the next two in 15 minutes. Here's the down and dirty. Don't follow the handbook, you'll just waste time. Go right to the two nuts holding down the points. Loosen them up, but don't take them off. This move saves the misplacement of pieces on the reverse procedure. (Don't ask how I know) Now gently lift the top points up at the end while you lift out the pin with a pair of needle nose pliers. Wipe it down and clean with electronic parts cleaner. (It removes the gummy substance - old grease) Cut a small piece of 600 grit sandpaper. Spray some electronic cleaner in the hole. Roll the paper so it will fit in the hole and rotate it to clean the walls. Spray again with cleaner and dry.

While the pin is out run, the 600 grit against the points to clean them. Apply some white grease in the hole and on the pin. Reinstall the pin. Tighten down the two nuts that hold the points. Slacken the locking nut under the bottom points. Rotate clockwise until they touch and back off a quarter turn. Supply power with a set of leads. The horns will most likely sound horrible but it should provide sound. Adjust the nut above the locking nut in very tiny increments (counter clockwise mostly) until you bring the tone to the right level. Set the locking nut. It is that easy. Thanks again Randall.

-Alex Manzo

Electrical/Relays

Subject: Relays
Date: Tue, 30 Mar 2004
From: Dave Massey <105671.471@compuserve.com>

"T. S. White" writes:

> I have seen the subject of relays discussed here. I am an absolute vacuum when it comes to electronics. It has
> been suggested I put my fuel pump on a relay. Where do I get one and what would I look for, i.e. voltage,
> amps, watts, etc. Thanks.

You can find automotive relays at any auto parts store or any Radio Shack. You can also get them mail order from <Digikey.com> but they have a \$25 minimum. <Mouser.com> has no minimum and carries a very similar product line. I recommend the Pottter/Brumfield...er Tyco VF4 series relay. Get a 12 volt DC coil.

When wiring it up, connect the coil to a switched 12 volt source (green or white) wire and ground and connect one contact to 12 volts (brown wire) through a 5 amp fuse. Connect the other contact to the hot lead on the pump and the other lead from the pump goes to ground.

-Dave

Electrical/Relays

Subject: Relays -to use or not to use
Date: Tue, 26 Jan 2010
From: Gary O'Hagan <goh62agan@verizon.net>

List,

Where to begin? Should I even use relays? I have a basic understanding of relays and how they work but I need to know where I can draw power from to operate the switches. I'm assembling a TR4 with a neg earth and converted to an alternator. The fuel pump is replaced with an electric pump, and the fan is also electric. The pump and the fan are not wired in. My plan is to add a relay and fuse to each of these circuits. At the risk of having a design by committee I'd like some suggestions on how to proceed. The Advance Auto-wire site proposes relays and fuse panel for the fuel pump, horns and electric fan:

<<http://www.advanceautowire.com/>>.

Should I make the wiring de novo, or build it off of something like the JEGS site:

<<http://www.jegs.com/p/JEGS/JEGS-Electric-Fan-Wiring-Harness-Kits/758607/10002/-1>>.

The plan is to have a cutoff switch at the dash and inertia switch (if I can find one) for the fuel pump. Is there a simple way to wire this through the relay? There is the Advanced Auto-wire setup where power from the solenoid terminal or ignition wire -> fuse panel -> (splits) to both power in to the relay then out to each ground -> 1) switch 2) -> fuel pump. OR Do I wire power from the ignition switch through the cut off switch with standard relay wiring to ground etc. OR None of the above. OR It depends. The wiring for the fan would be similar except with a Thermostat and an on-off-auto switch.

Should I add relays to the horn and headlamp circuits?

Any good places to find switches, relays, wire, etc.?

The car has been apart for twenty years, after coming this far, I'd hate to turn the ignition and have it auto combust. I look forward to your easy to follow directions.

-Gary O

Subject: Relays -to use or not to use
Date: Tue, 26 Jan 2010
From: "Randall" <goh62agan@verizon.net>

Gary,

To a large extent, these are personal decisions. The factory wiring layout is actually adequate, so you don't really need to add the hassle and extra wiring for relays, if you don't want to. Of course you'll need to consider the requirements of any added devices, like your cooling fan & fuel pump, but they can be met without relays, if you want.

> The Advance Auto-wire site

If you want to totally rewire the car with high quality wiring, it's hard to go wrong with the AAW kit. And it can be installed differently than Dan's recommendation, to suit your own wants & needs, if desired.

> Should I make the wiring de novo

Well, that has always been my approach, but I am quite comfortable doing so. If you aren't comfortable with electrical stuff (and don't want to become so) then a more structured approach may be easier for you, both now and later.

> The plan is to have a cutoff switch at the dash and inertia-switch (if I can find one) for the fuel pump.

A quick Google shows inertia switches available at Amazon & Pegasus. No doubt other places as well.

> Is there a simple way to wire this through the relay?

Unless you are installing a high current racing (or fuel injection) type pump, I wouldn't bother with a relay. At

the low pressures & flows required by our cars, the pump just doesn't draw that much current. You can just wire it to the ignition switch, with the cutoff and inertia switches in series with the pump.

However, if you want to install a relay ala AAW, then the output of the relay becomes just like the output of the switch, and you can wire anything to it. That means the pump current still passes through your cutoff switch, and inertia switch.

Another approach is to use a purpose-made relay that senses whether the engine is turning and shuts off the pump if the engine dies. More expensive than a standard relay, but comparable to a relay plus inertia switch. These are used on many cars with Bosch fuel injection (my VW Rabbit had one with an integrated fuse as well).
<<http://tinyurl.com/ydbkqbf>>

> The wiring for the fan would be similar?

Fans typically draw pretty high current, especially when starting, so I would suggest using a relay here. That way, only the wiring to the relay & fan needs to carry the full fan current, the wiring to the dash & temperature switches can be smaller (and so can the switches).

My preference here is for a purpose-made relay that does more, eg:
<<http://www.jegs.com/i/Derale/259/16759/10002/-1?CT=999>>
includes a temperature probe and adjustable temperature. The AC input can be used for your override switch.

> Should I add relays to the horn and headlamp circuits?

Again, your choice. I had them on my TR3A, and will soon be adding them to my 'project' TR3. I want the horns & headlights as loud & bright as possible, and relays help achieve that goal by maximizing the power delivered to them.

> Any good places to find switches, relays, wire, etc?

Sorry, I don't have any single place to recommend. I get most of mine from flea-bay. However, this site:
<<http://www.madelectrical.com>>
seems to offer some quality components at reasonable prices. I particularly like this one:
<<http://www.madelectrical.com/catalog/cn-1.shtml>>
although I haven't actually ordered one yet.

-Randall

Subject: Relays -to use or not to use
Date: Sun, 31 Jan 2010
From: Gary O'Hagan <goh62agan@verizon.net>

Thanks for a lot of good information, most of which makes sense to me. I think I'm going to keep it simple and just start out with a wiring kit for the cooling fan. The JEGS kit:

> <<http://www.jegs.com/p/JEGS/JEGS-Electric-Fan-Wiring-Harness-Kits/758607/10002/-1>>

It looks foolproof and I already have a temp probe. The down side for me is where to put the probe. Do I put it and the wire into the lower radiator connecting hose at the connecting pipe or will that leak? The other option which I'm leaning toward is the derale kit:

<<http://www.jegs.com/i/Derale/259/16759/10002/-1?CT=999>>

as recommended by Randall. It has a fin probe which keeps it simple. But what do I do with the A/C connector? Can I just put a kill switch there? As always, I appreciate the help.

-Gary O

Subject: Relays -to use or not to use

Date: Sun, 31 Jan 2010
From: "Randall" <tr3driver@ca.rr.com>

Gary O'Hagan wrote (I think):
> But what do I do with the A/C connector?

That's where your dash override switch goes, if you want one. Otherwise, just tie it off and leave it alone.

Michael Porter wrote (I think):

> >> With a little imagination, you could probably work out a system for the electric fan so that the fan runs with
> >> the ignition off until the fan thermostat cuts out, but won't run with the ignition switch off if the manual
> >> override switch is on (that might take two relays, though).

Easy with the DeRale kit. Connect the yellow wire to "always hot" (this allows the fan to run anytime the sensor is above the set point); but power the override switch from switched power (so it will only override when the ignition is on). Only caveat is to be sure the fan can cool the sensor, so the fan doesn't run continuously on a hot day.

With a little more imagination, you could probably figure out how to put a timer on the yellow wire, to limit the fan to running say 10 minutes after the key is off. But that seems way over the top to me, especially for a lowly TRactor motor.

Good advice, but far too late ... <G>
-Randall

Subject: Relays -to use or not to use
Date: Mon, 1 Feb 2010
From: "Alex" <ambritts@bellsouth.net>

That's what I have done on my 59 TR3A. I have a period radio rack that is setup up with gauges and switches, The gauges are located in the radio speaker screen instead of a speaker. I have the fan wired with a relay to the rack. At the rack there is a period dash push/pull switch and two small (Radio Shack) diode lights under the switch. One red and one green. The fan will not run unless I pull the switch on. Then the red light comes on. When the fan comes on, the green light comes on. If the fan stops, the green light goes out. This enables me to know when the system is live and the fan is running/working properly. It all runs through a contemporary fuse block up behind the radio rack out of sight.
-Alex

Electrical/Switches/Ignition

Subject: FS Series Keys cut from code
Date: Sun, 16 Feb 2003
From: George Richardson <gprtech@frontiernet.net>

Normally I try to adhere to the rules about promoting goods here, but I just thought I'd add to Brad's mail about keys.

A while back I started a sideline business, particularly because I had trouble getting keys for my Jaguar, but also because I became interested in Births keys when I bought a TR6 that had none. That business is Key Men -Keys for Classics at: <<http://www.key-men.com>>. Currently, I can supply key blanks for the entire line of postwar Triumph cars, and cut the keys for most of them.

The 62DG (FA codes), 62DP (FP codes), 62FS (S71B, FS codes), 62FT (FT codes) and WB1 (BL & RO codes) are all available from stock for \$4.95 each, and an additional \$5 to cut to code.

The MG1 (NH codes) is available for \$2.95 plus \$5 to cut to code. The FT6R (FR codes, some Spitfire & GT6) is a bit pricier, at \$5.95 each plus \$5 to cut to code.

If you ever need any help with codes or locks, I've got thousands of dollars of reference materials I can use to help.

Brad Eells wrote:

- > I researched FS series keys and head shapes awhile back. I found that keys precut to the cylinder codes or
- > having keys cut to code by a locksmith was prohibitively expensive - Up to \$25US per key!
- >
- > I recently receive a mailing from Triple-C catalog, a British motoring accessories sales company. They offer
- > FS series keys cut to code for only \$9.95 each. FS series keys are used in the TR4/4A only, I believe.
- >
- > They appear to offer only the 6 sided key head that is generally available in the US. I have acquired sets of
- > round and oblong FS blanks that I can have cut once I have the master keys from Triple-C.
- >
- > Ordered mine tonight. Email offline if you need know where you can locate the code for your locks.
- > You can order on their website at:
- > <www.triple-c.com>
- > -Brad

George Richardson Key Men: Keys for Classics - <<http://www.key-men.com>>

Electrical/Switches/Ignition

Subject: Lucas Ignition switches
Date: Tue, 20 Jun 2006
From: "Mike Denman" <mikedenman@sbcglobal.net>

I believe these Lucas ignition key switches are used on Triumphs although my current problem is with a Marcos. You can buy the key barrels separately so what is the "trick" to getting the old barrel and key out and replacing

it with the new barrel and key?

-Mike Denman

Subject: Lucas Ignition switches
Date: Tue, 20 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I believe these Lucas ... replacing it with the new barrel and key?

Probably varies with which particular switch you have. On the original switch for TR2/3 (and I think TR4 and Herald/Vitesse), you first turn the barrel to the 'On' position with the key, then there is a hole in the body where you push in a pin punch and depress a pin. Pull the key out still in the 'on' position, the barrel comes with it. Look at your new barrel to see where the pin is.

-Randall

Electrical/Switches/Ignition

Subject: New key or switch
Date: Tue, 6 May 2008
From: "Randall" <tr3driver@ca.rr.com>

> Should I replace the entire switch? Can a good locksmith make one? Suggestions/advice from the list please?

While I'll certainly never put Pete or George out of business; I have had good luck doing this myself. Basically remove the switch from the car, then the lock barrel from the switch (which likely requires tapping a pin out and possibly picking the lock). Then insert a new key blank (eBay, TRF, etc.) and note where the first tumbler sits on the key. File that spot on the key (small 3-corner file) until the tumbler just comes level with the barrel; then do the next tumbler, etc. Smooth out the ramps between the filed spots, remove any burrs, and you're done.

Now make a copy and save it for next time!

-Randall

Electrical/Switches/Steering Column

Subject: Control Head Wires - Installing electrical wires
Date: Thu, 30 Oct 2003
From: <Shrack04@aol.com>

My TR3 has an adjustable column and I could not get the wires to slide up and down because my tube was a little rusty inside. SO, I took a wire brush for cleaning a pistol, (357) screwed it to a cleaning rod for a rifle and spun it up and down in the tube with my electric drill. It cleaned it out really well and made it shine top to bottom. I then carefully pulled my wire out straight and worked them so they laid together really well. I bought some long heat shrink tubing and heat shrunk all the wires together. I coated what now looks like an umbilical cord with Graphite lubricate (dry) and pulled them through with a string. They seem to slide ok now. Just a thought,, 20 years and still not done..

-Kent Shrack

Subject: TR3 Control Head
Date: Thu, 30 Oct 2003
From: Geo Hahn <ahwahnee@cybertrails.com>

Do you have the bullet connectors in place on the ends of the wire? If yes, you need to either remove them or at least stagger them... they cannot all fit thru their side by side.

-Geo Hahn

Subject: TR3 Control Head
Date: Thu, 30 Oct 2003
From: George Richardson <gprtech@frontiernet.net>

I put a continuous stream of silicone spray lube on the wires and down the shaft. An old trick learned while building aircraft electrical cables 30 years ago.

-George Richardson

Electrical/Switches/Steering Column

Subject: TR4A headlight switch "flash to pass"
Date: Fri, 19 Nov 2004
From: "Randall" <tr3driver@comcast.net>

- > On my bone stock original TR4/A, the headlight switch, when pulled back to the driver will energize both the
- > low beam and the high beam (only if the low beam is active as far as I can tell. I cannot rule-out that it
- > simply energizes the highs and drops the lows.) When I do this with the low beams on, I can hear something
- > that sounds like a relay click under the passenger dash somewhere.
- >
- > Another non-original TR4a does not do this at all, pulling the stalk does nothing.
- >
- > I looked at the wiring diagram and I see nothing suggesting a connection to any relay. So, what is happening
- > with the "flash to pass" function here?

Tony, it's my opinion that your car has been modified in this area. Both the factory schematic and the one Dan Masters drew up say the "flash to pass" feature does not work the way you describe on a TR4A or even on a TR250. Dan's series of schematics show the "flash to pass" only energizing whichever headlight beam was selected by the dipper switch up until 69 TR6; after that it always energized the high beams even if the low beams were selected. My 71 Stag is also wired such that it energizes the high beams even if the low beams are selected.

But none of these show any relay associated with headlights.

- > How do I make the non-original car function in the flash to pass mode?

To make it function as original, make sure the green/brown wire is connected from the "green" fuse to the flash contacts in the headlight switch (brown wire). This wire should have power any time the ignition switch is on. Check the brown/blue wire coming out of the switch, it should have power any time the ignition switch is on and the lever is pulled to the flash position. Of course, a failed switch is a definite possibility. The brown/blue should be connected to the blue wire also coming from the headlight switch, which feeds the dipper switch.

Since I prefer energizing the high beams as the later cars do, I would possibly run a new wire from the brown/blue at the headlight switch to the blue/white wire at the dipper switch. But it wouldn't be as original.

-Randall

Subject: TR4A headlight switch "flash to pass"
Date: Fri, 19 Nov 2004
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

Interesting, My also bone stock (at least the headlight system) 1966 TR4A flashes the high beams regardless the headlights being on or off. If the headlights are turned on and the dipper switch is on the high beams there is no flash, if on the low beams it flashes the high beams.

-JVV

Subject: TR4A headlight switch "flash to pass"
Date: Thu, 25 Nov 2004
From: "jonmac" <jonmac@ndirect.co.uk>

Chris Kantarjiev wrote:

- > I think that the US DOT may have "forced" Triumph to leave this functionality out.

Don't think so, Chris. A headlamp flasher was an optional extra for US spec TR4A's, just as was IRS. I remember coding HF on production indent dockets many many times. One of those odd ball imponderables that

was no doubt entirely logical to the marketing people of the day, but not you and me :) To further compound the illogicality, ISTR a flasher was a standard feature on Spitfires and GT6 for the same market. 4A's going to everywhere else got a flasher as a normal line fit.

-Jonmac

Subject: TR4A headlight switch "flash to pass"
Date: Thu, 25 Nov 2004
From: Chris Kantarjiev <cak@dimebank.com>

> A headlamp flasher was an optional extra for US spec TR4A's, just as was IRS.

Funny, since it just took hooking an extra wire to the switch to make it work (a brown, as I recall) :-)

Subject: TR4A headlight switch "flash to pass"
Date: Sat, 27 Nov 2004
From: <spamiam@comcast.net>

Hmmm, was this optional "flasher" a separate piece of hardware? If so, what was it? As far as I can tell, the "flash-to-pass" is a function of the lighting switch. The one that is "off/ parking lights/ headlights. When the stalk is pulled toward the driver then it switches a separate circuit. The wiring diagram shows this separate circuit energizing the headlights before the dip switch, so it ought to power either the lows or highs depending on the position of the dip switch. In other words, nothing will flash if you already have your headlights on (at high or low).

The way it actually works is that it energizes the high beams only, so you will get a flash at all times except if you have the highs beams on (in which case you are unlikely to actually need the flash to pass feature). So, the wiring diagram is wrong, and the separately energized circuit enters the high beam wiring somewhere AFTER the dip switch.

An undocumented feature worthy of Microsoft!

-Tony

-----ORIGINAL MESSAGE-----
Subject: TR4A headlight switch "flash to pass"
Date: Thu, 25 Nov 2004
From: "jonmac" <jonmac@ndirect.co.uk>

Chris Kantarjiev wrote:

I think that the US DOT may have "forced" Triumph to leave this functionality out.

Don't think so, Chris. A headlamp flasher was an optional extra for US spec TR4A's, just as was IRS. I remember coding HF on production indent dockets many times. One of those oddball imponderables that was no doubt entirely logical to the marketing people of the day, but not you and me :) To further compound the illogicality, ISTR a flasher was a standard feature on Spitfires and GT6 for the same market. 4A's going to everywhere else got a flasher as a normal line fit.

-Jonmac

Subject: More on TR4 and 4A flash to pass
Date: Thu, 02 Dec 2004
From: <spamiam@comcast.net>

I corresponded with Dan Masters who is working on his TR4/4A manual. He is interested in the variation I have observed and discussed here a few weeks ago.

The issue was that the factory wiring diagram says that the flash to pass function of the headlights has power coming from a separate (fused) power source and then energizes the headlight circuit before the dip switch, so only the dip switch selected beams will flash. Therefore if your headlights are already on then there will be no "flash".

TR6's (and maybe TR250's too, but I do not know) will energize the high beams with the flash to pass, so if the headlights are on low beam, then the highs will come on as well. If the headlights are off, then the highs will flash. If the high beams are on, then nothing happens (in that case you probably do not need the flash to pass anyway)

My TR4A (73336L) with an original wiring harness will flash the highs only (like the TR6) with the flash to pass (pull backward on the lighting switch stalk).

Jerry Van Vlack said his car works the same. Does anyone with an original (functioning) TR4A harness NOT have this ability, and only flash whatever lights are selected by the dip switch? The way to tell is to have the headlights OFF and the car running, then pull back on the lighting stalk and then use the foot switch to try to switch high/low. If the highs stay on, then you have one like mine. If the lights change, then you have the type documented in the factory diagram. If nothing happens, then your harness is not correct.

Oh, also can you tell me your commission number. Maybe this was changed part way through the TR4A run.
-Tony

Subject: More on TR4 and 4A flash to pass
Date: Mon, 6 Dec 2004
From: "January Williams" <january@chemeketa.edu>

My Owner's manual for the 4A is "3rd edition 2nd print 5000/11/66" Looks to be the same wiring diagram as the PDF I have from someone on the list (sorry, forgot whom) although interestingly, the "Bentley" diagram in the pdf is labeled "Fig 91" and in my owner's handbook the diagram is labeled "Figure 56" Everything is the same including the missing lines from the "France only" legend for the horns, A3,A6.

-January

Subject: More on TR4 and 4A flash to pass
Date: Mon, 6 Dec 2004
From: "January Williams" <january@chemeketa.edu>

Are you sure that the cars reportedly without "flash to pass" really were wired, switched, or built differently? Isn't it more likely they maybe had bad bullet connections, frayed wires, burned out switch contacts, etc, more along typical Prince-Of-Darkness lines? I take it from the diagrams and switch parts that all 4s and all 4As had this in one or other form, and for that matter, all the later TRs as well although the switching details changed, and of course the wiring.

So, are you SURE that these cars were wired NOT to have flash-to-pass, or just not working properly??

(BTW I think Adrian's car is a solid axel with CT- not CTC prefix, and he's also a Brit without the "L" but this could be a "whole other" story)

-January

Subject: More on TR4 and 4A flash to pass
Date: Sun, 5 Dec 2004
From: "Anthony Rhodes" <spamiam@comcast.net>

I have an interesting tidbit of info. Adrian, the owner of CTC64xxx had NO flash to pass function in his car (4A). It appears to have been like a TR4 in this regard. I also own CTC64342, and it has NO flash to pass. I

always assumed that either the switch on the stalk was broken or that it was not hooked up correctly when it was rebuilt 22 years ago. I never bothered to check it out. Maybe these two cars are telling us that the wiring loom for the 4A had at least two versions. One without any(?) flash to pass, and one with a flash on high beam only. Maybe there were even some which had the flash energizing either the highs or lows, as the factory diagram suggests.

I think that we can say that in the general range of CTC73000 and up had the high only.

It appears that up to CTC64500 there was NO flash to pass function, but this needs to be confirmed. So, Dan Masters and I really need more info from TR4A owners, particularly the early cars. Any owners with cars in the 50K range? How about cars in the 65000 thru 73000?

Subject: More on TR4 and 4A flash to pass
Date: Mon, 6 Dec 2004
From: "David Hammond" <d_hammond@charter.net>

> I take it from the diagrams and switch parts that all 4s and all 4As had this in one or other form.

The TR 4's I have seen never had a flash to pass. The headlights are turned on from a knob on the dash. The only switch to go from high to low is the foot switch by the clutch. My means of "flashing" is to step on the switch twice. The only column mounted switches on the 4 was the blinker and overdrive (if installed).

-David R. Hammon

Electrical/Trouble Shooting

Subject: Generator/charging TR3 (control box suspicious)
Date: Sun, 2 Jun 2002
From: "Randall Young" <ryoung@navcomtech.com>

Ed, my next suggestion would be to check the voltage between the D and F terminals at the control box, with the engine running (and the red light on). If you find voltage here (with the red light on), the control box is bad (although cleaning the regulator contacts might resuscitate it for awhile).

If not, disconnect the wires from the D and F terminals, jumper the wires together and connect a voltmeter from the junction to ground. Start the engine and observe the voltage. This is exactly the test I suggested before, except now the wires between the control box and generator are in the circuit. If you get different results, the wires are bad.

> One thing I noticed that was strange IMO was the cut out never appeared to engage on its own, and only when
> manually engaged it did the indicator go off,

That's pretty much a given, the red light indicates the cutout is open ...

> however at the same time the amp meter read -15 .

Which indicates that current is flowing into the generator (it's trying to act like a motor), and thus the cutout should not have been closed. The cutout contacts are governed by both current and voltage, if the current is high enough they will stay closed regardless of the voltage or direction of current.

> Control box suspect?

Yes, based on your description so far, it's either the control box or the wiring to the generator. My guess would be it's the **field wire to the generator**.

-Randall

Electrical/Trouble Shooting

Subject: Help - ignition
Date: Sun, 30 Mar 2003
From: <lstein6@earthlink.net>

Tim, sounds like the ignition switch, but possibly the starter solenoid. If the gauges are moving when you turn the key, then you have positive voltage out of the switch and most probably positive voltage to the coil. On my old GT6 the starter solenoid was conveniently on the firewall next to the battery. The easy test is to jumper across it (the two big nuts with heavy wires) after you turn the ignition to 'on' and of course after the car is in neutral and the e-brake is set. The starter will turn so don't jump. You can also take a set of jumper cables, just the red cable, put one end on plus of battery and reach down and touch the starter where the heavy wire goes to it. Oh, take a test light or meter and put it on the + coil and turn the engine by hand so that the contact points open (remove dist cap to watch). Ok:

1. Put test light on dist + with key 'on' and turn engine by hand, watch for points to open. Should get +12v. This tells you ignition switch is working to power circuits.

2. After putting the distributor cap back on and everything set (choke etc.) for start, jumper across starter solenoid and see if the starter cranks.

If it does, check the starter solenoid, one of the smaller wires should have +12v when key is held in start position (you will need a helper for this unless you put the meter or test light on the windshield. Note: I did not say windshield :)) and can see it from the driver's seat. If you never see +12v on the starter solenoid with the key held in start position, then the wiring from ignition switch to starter solenoid is bad. If you do have the +12v at solenoid, then the solenoid must be bad. I forget what wire is the wire from ignition switch to solenoid. You need the schematic for that. On my GT6, the back of the ignition switch used to fall off, I don't know why. I ended up having to use electrical tape on it, hard (many wraps). That made everything go dead when it fell off. Good luck.

-Larry

Subject: Previous starter problem now wiring
Date: Tue, 1 Apr 2003
From: "Randall Young" <ryoung@navcomtech.com>

Hi Susan :

> Being a "woman" I have much to learn.

All of us "men" have been ignorant at one time or another ... I still am! So don't feel bad.

> As it turns out, the solenoid WAS dead. Just received the new one today and just now installed it. Now, the
> car starts when I push the button on the solenoid but not when I turn the key. The key does have to be on for
> it to start and when I turn the key of it shuts the motor off. My handy dandy husband would like to know how
> we can hot wire the thing so we can go from there.

If you momentarily connect a jumper wire from the small side terminal on the solenoid, to the big terminal with the cable from the battery, does the engine crank? If not, your new solenoid is not grounded or perhaps is bad (it does happen).

That small terminal should have a white/red wire on it (I think, might be wrong about the trace color), which runs to the back of the ignition switch. Try jumping from it to the brown with (white?) wire at the switch and see if that cranks the engine. If not, the wire is bad. If it does, the ignition switch is bad.

To "hot wire" it, go back to where it worked, and install a momentary (push button) switch that makes the connection that worked. In a pinch, two bare wire ends can make a switch, but be sure they can't touch accidentally.

PS, it helps if you tell us each time what car you have. Some of us can't remember yesterday ...
-Randall

Electrical/Trouble Shooting

Subject: No Horn
Date: Mon, 01 Jul 2002
From: "Tom O'Malley" <tom.omalley@verizon.net>

you wrote:

- > My son and I just installed a new wiring harness in the TR6 (1976). The job seemed to go pretty smoothly.
- > Dan's book was invaluable. I would recommend it to anyone about to do electrical work on the TR6.
- >
- > When all was said and done - Started the car and everything seems to be fine except for the horn. If we put
- > power to the relay, horn blows! Press the horn button - nothing!

Do some troubleshooting at the horn relay first. With all wires still connected, jumper C1 & C2 <purple/yellow> and solid purple, and confirm that the horn sounds. Next, jumper W1 <purple/black> to ground and check again. If all this works then you've got a problem with the horn button, horn wiring or possibly a bad ground in the column. Do TR6's have that flexible coupling as do Spits? Is there a ground strap across yours?

-Tom O'Malley

Electrical/Trouble Shooting

Subject: Speaking of ignition switches
Date: Tue, 27 Jul 2004
From: "Randall" <tr3driver@comcast.net>

> I didn't have time to try to diagnose the problem this morning. I'll play around with it this evening, but in the
> meantime, does anyone know of any possible cause other than a faulty ignition switch?

Faulty solenoid (eg broken return spring or welded contacts); short in wire from switch to solenoid, short across solenoid (don't laugh, it happened to me once).

But IMO the switch is the most likely culprit.

I would start by pulling the side wire off the solenoid and reconnecting the battery. If the engine still cranks, it's either the solenoid or a short right at the solenoid. If it doesn't, connect a test lamp from the wire you pulled off (which should be white/red) to ground. It should light, if not your gremlin has gone back into hiding. Then pull the white/red wire off the switch and see if the lamp goes out. If so, time to replace the switch.

-Randall

Electrical/Trouble Shooting

Subject: TR4A wiring
Date: Mon, 30 Sep 2002
From: "Randall Young" <ryoung@navcomtech.com>

> Ok the new wiring harness is not a plug and play concept. Help, my front parking lights and rear running
> lamps as well as my instrument lights are on when I start the motor. If I operate my headlamps (only my low
> beams work) the ignition switch won't shut the motor off. I need to shut off the headlamp switch to shut the
> motor off. What am I doing wrong...

Here are some thoughts that may help:

Obviously, you've created a short between the two circuits, which interestingly are the two circuits present at the fuse block in a TR4A. I think I would start by removing both fuses and seeing what happens. Removing one of them should disable everything normally powered by the ignition switch, except the coil and 'IGN' warning lamp. The other one should disable all the marker, tail and dash lamps (but not the headlamps).

Another likely suspect IMO is the wiring around the headlight switch, as it gets both switched and unswitched power. If the feed from the ignition switch were somehow cross-connected to the feed to the fuse block (from the headlight switch), that would cause your symptoms. Or, the switch itself could be bad.

I've got a TR4A wiring diagram that Dan Masters worked up, let me know if you'd like a copy. I understand it's not found in the factory manuals ...

-Randall

Electrical\Trouble Shooting

Subject: TR4A - Windshield Wiper Motor & Horn Issues
Date: Thu, 16 Jun 2011
From: G.D. Huggins <guy@genfiniti.com>

All,
Hope everyone is doing well. I spent some time last weekend wrapping up the testing of the electric components that are effective without the engine actually running. Most look great, and I am well pleased. However, two of the items I wasn't able to work out in the time allowed, and any help would be appreciated.

Windshield Wiper Motor

In the past, I have posted some questions/comments about the wiper motor. I removed it from the car long ago and overhauled on my workbench. I attempted to bench test, but could never get it to run. Well, once it was installed in the car and activated, it ran like a top! In fact, it runs too well.

It is a single-speed Lucas DR3A motor. (At one point I believed it to be double speed.) When I turn the key to the "on" position the motor comes on, just like it's supposed to. However, it is supposed to cut off once it hits the parking position, and does not, it just keeps running.

> From everything I know, this indicates that the circuit remains grounded. I even removed the parking plate
> and tried it again, and got the same results.

I tried pulling the double-speed switch to all positions, and it has no affect. (For some reason I have a single-speed motor and a double-speed switch). Things are wired thusly:

Motor

Green power wire on terminal "2"
Wire from switch on terminal "1"
Ground from terminal "E"

Switch

Wire to motor on terminal "5/6"
Ground on terminal "3/4"

Horn

I'm not really sure how this is supposed to work, but I have a hunch. The copper plate behind the steering wheel is always hot. (I know this because I have a full 12V on the plate when the key is off.) So, I add the steering wheel, then the three pronged thingy, then the spring rod thingy, then the button, making sure the spring rod contacts the bar on the back of the button. I push down on the button and get nothing.

My thought is that pushing on the button is supposed to create a ground, thus completing the circuit. But to what? By pushing the button, power will flow from the charged plate, through the spring rod, to the button's plate to what? What is there to ground against?

Can anyone offer any advice on these before I spend hours troubleshooting them?
As always, I thank you in advance.

Subject: TR4A - Windshield Wiper Motor & Horn Issues
Date: Thu, 16 Jun 2011
From: "Randall" <tr3driver@ca.rr.com>

> However, it is supposed to cut off once it hits the parking position, and does not, it just keeps running.

Try removing the wire from motor terminal 1, then turn the key on again. If it still runs continuously, you must have a short in the internal wire to the park switch. Not unusual for the insulation to crack and allow a short where it passes through the motor housing.

If removing the wire stops the motor, reconnect it and try disconnecting at the switch. If the results are any different, the wire itself is shorted somewhere.

If not, then the switch doesn't match what I think you have. Use an ohmmeter or powered test light to find a pair of terminals that are only connected when the switch is "on".

Horn

I'm not too familiar with the TR4/A steering column, but I believe the contact is supposed to ground the ring to the steering shaft itself. There should be a small braided jumper at the rubber flex joint, and then a ground wire directly to the steering rack that complete the circuit.

- Randall

Electrical\Trouble Shooting

Subject: TR6 electrical stuff stops
Date: Thu, 11 Aug 2011
From: Chip19474@aol.com

soknacki@soknacki.com wrote: When I turned on the blower, I lost power

I'm a little late with thoughts on this one but here's my input.....I think you may have two issues....1) the fuse block and 2) the blower motor.

Fuse Block - while they are not cheap to buy, they aren't terribly expensive either and the amount of grief and turmoil that an old fuse block can cause is, in my experience, just not worth saving a few bucks and getting out the sandpaper when things go screwy.

Blower Motor - since your trouble initially began when you turned the blower motor on during a rain storm, the culprit may have been (or still is) a blower motor that is pulling too much current when it operates (regardless of whether it's raining or not).

One quick way to prove this would be to remove the fuse from the white wire/green wire fuse slot and connect an ammeter in place of the fuse. Start the car (or turn the ignition to "on") and operate the blower motor. Dan Masters states on page 26 of his Electrical Maintenance Handbook that the "green fuse" (the fuse between the white wire and green wires) should see a total of 16.7 amps when every load on that circuit is on or working. In particular, he says that the blower motor should draw 4 amps when working. Given that the temp & fuel gauge will draw about .4 amp when you turn the ignition on, the blower should add another 4 amps when you turn it on. If the blower motor is drawing significantly more than 4 amps, you've got at least one culprit. The fuse block may still be partly at fault; a heavy current draw from the blower may just be the trigger.

The only way to really get to the blower motor is to remove the heater box which is really a pain! I think I'd try to find a simple cause for the high current draw like bad ground, crossed up wires...heck, maybe the problem is in the blower switch??

-Chip Krout

Electrical/Voltage Regulator

Subject: Control Box Q's
Date: Tue, 16 May 2006
From: "Randall" <tr3driver@comcast.net>

> Where to start? The amp meter will read +30 at 2500rpm, no load.

Assuming this is a factory-equivalent generator, then that says to me your control box is badly misadjusted. It should limit the output of the generator to around 20 amps under all conditions.

> The generator (dynamo) is new.

Having been through this myself many years ago, I can vouch that running for long under these conditions will get you a new, broken generator.

> The Control Box I put together from 2 into 1.

That sounds dangerous to me ... did you set all the mechanical clearances properly? Get the contacts lined up right?

Follow the right instructions in the Bentley? (You should have an RB106-2, not a RB106-1)

Specifically, with no power applied, what is the gap between the regulator coil end piece, and the moving armature? If you press the armature down with your finger, does it meet the end piece squarely? If not, you'll need to loosen the screws and move it around until it hits square, both side-to-side and front-to-back, then tighten the screws again. Then check/reset the gap to .015".

> The control box feels hot to the touch after driving.

It's normal for it to get somewhat warm, since there is a resistor in the base that dissipates a few watts when the battery is charged. Heavy charging might also get it warm.

> The past weekend I put a voltmeter to it and followed the procedures in Bentley and Haynes to adjust both the
> regulator and the cut out, not very successfully.

So, what happened when you tried? Obviously the cutout is working well enough, no need to mess with that for the moment. But it certainly sounds as though the regulator is not opening to limit the current (and possibly the voltage).

> Now it seems that the glow is gone, but the amp meter seems high. What next?

My first question is, what changes have been made to the wiring? Where are the fog lights connected in?

Are the wires to the A & A1 terminals the right way around? To find out, pull off the A1 wire and check with a meter or test lamp whether the A1 terminal stays hot (electrically, -12v to ground) or the wire does.

What voltage do you read at the battery with the engine not running and everything turned off? What's the voltage between the A and E terminals with the engine running at a fast idle? What does the A-E voltage do if you disconnect the wire from F?

That should be enough to get you started.

-Randall

Electrical\Voltage Regulator

Subject: Generator Pos to Negative Ground
Date: Mon, 30 Dec 2002
From: "Randall Young" <ryoung@navcomtech.com>

> In preparation to starting my TR3A up for the first time in over 3 years, I want to first convert my generator
> from positive to negative ground. I understand the process to do this but want to be sure I have it correct
> when no electrical are hooked up. Basically, I have the battery. Can I run a ground wire from the negative
> terminal on the battery to the chassis and put the positive battery cable on the battery but not hooked up to the
> starter. Then using small jumper wires, make the contact to the generator to change the polarity to negative
> ground?

Yes, that's fine (assuming you have the engine ground strap in place and the generator bolted to the engine).

Note that you want to only connect to the small (Field or F) terminal on the generator, not the larger (D) one. You can just tap the terminal, as a small jumper may not be able to carry the field current (roughly two amps) for very long.

-Randall

Scott, all you need to do is connect the negative battery terminal to the frame of the generator and the positive terminal to the field connection of the generator. Momentarily. You can do this with the generator out of the car all together. If the generator is already in the car and wired up then you can connect the battery negative to chassis and then pull the wire off of the field terminal on the generator and using a jumper, momentarily connect the field to +battery.

Don't forget to reverse the ammeter connections or it will read backwards.

-Dave

Electrical/Voltage Regulator

Subject: Polarizing the voltage regulator
Date: Thu, 11 Jan 2001
From: Randall Young <ryoung@NAVCOMTECH.COM>

Written by Susan Tucker:

> My TR4 system has been converted to negative ground. Can anyone tell me how to polarize the Voltage
> Regulator and generator? What connection do I touch with the positive/hot side of the battery? Do I
> take the positive of the battery to the field windings or to the brushes? Thanks for your help.

Susan :
Hot side of the battery to the field winding will do.

One painless and relatively spark-free way is to remove the cover from the regulator, start the engine, and manually depress the armature on the cutout relay. If that makes no sense, then use the factory method of temporarily connecting a jumper from the battery hot terminal to the 'F' terminal on the regulator.

Note that it's not the regulator that gets polarized, but the generator itself. When you start the engine, the design relies on residual magnetism left in the generator housing to generate enough voltage to make the cutout relay pull in. The 'polarization' process creates the magnetism with the right polarity.

-Randall

Subject: Polarizing the voltage regulator
Date: Fri, 12 Jan 2001
From: David Massey <105671.471@compuserve.com>

Susan,

It is quite easy to repolarize an electrical system. First, make sure there are no polarity sensitive electronic devices connected. Next, remove the battery. Third, swap the ammeter connections so it will read properly. Fourth, re-install the battery the other-way-round. Lastly, disconnect the wires on the generator. Find a small jumper/test lead and connect one end to the smaller terminal on the generator (field) and momentarily touch the now hot neagative battery terminal. Reconnect the generator wires and you're done!

If you have a radio or electronic ignition you'll have to deal with that. -Dave Massey

Subject: Polarizing the voltage regulator
Date: Fri, 12 Jan 2001
From: Steven Newell <steven@cravetechnology.com>

Susan, I just replaced my generator last weekend, and polarization is very easy. I followed these instructions from the Moss TR2-4 catalog (page 74), provided here FEORPO: (See below **Generator Polarization**)

Subject: TR4 Generator Polarizing Procedure
Date: Fri, 08 Nov 2002
From: Steven Newell <steven@newellboys.com>

"Pharr, Jeff" wrote:

> Some months back there was a nice description of a procedure used to polarize a new TR4 generator. I need
> that procedure again, but I was unable to find it using the archive search. Could someone please post that
> procedure again?

Jeff, there is a nice description in the Moss catalog on the page with the generator, and I cribbed those instructions for this post from 1/12/2001. The Moss TR2-4 catalog at the time had these on page 74, provided here:

-Steven Newell

Generator Polarization:

Any replacement generator must be polarized to suit the vehicle's electrical system, and therefore the following procedures must be adopted.

- 1) Fit the generator to the vehicle, but do not at this stage connect wires to the terminals.
- 2) Determine which terminal of the battery is "hot" (ie., not grounded to the vehicle), and connect a length of wire to the terminal. If it is inconvenient to connect the wire directly to the battery, it may instead be connected to the "battery side" terminal of the starter solenoid.
- 3) Taking the free end of the wire, hold it against the field terminal (the smaller terminal) of the generator for three to five seconds, after which time the generator is correctly polarized.
- 4) remove the temporary connector wire, and then restore the original wires to the terminals of the generator.

Electrical/Voltage Regulator

Subject: TR4 Electrical Issue
Date: Sun, 1 Jun 2008
From: Brian Jones <banc8004@comcast.net>

While I'd like to hold the Prince of Darkness responsible for my issue, its far more likely something I have done. I am puzzled, and wonder if anyone has a suggestion for resolution.

I reversed polarity on my car, following the set of directions available anywhere one might wish to look. However, my car is no longer charging.

I have been using the Lucas Fault Diagnosis Service Manual (actually a facsimile of same that someone photocopies and sells at some profit on e-bay).

The step-by-step testing tells me:

The armature circuit is 'almost' in range: 1.1 - 1.2V at 1500 revs (should be 1.5 to 3.0V). I put this down to a somewhat tired 45 year- old unit.

The field circuit is in range (delivering 2A at about 12V)

The dynamo leads are OK (if having been previously butchered by a PO, when the 6" pigtails at the dynamo end of the loom were cut off, inexplicably, then poorly reattached).

However, when I come to compensated voltage control, here is where things fall down.

The directions for test this are:

Remove and join the A and A1 leads, connect a voltmeter between D and earth, and increase the speed to get regulation voltage of about 16 - 16.5 volts.

I get nothing, nada, nichts.

The diagnosis suggests.... A faulty control box earth, however, the earth lead on terminal E is good. An open circuit shunt winding. If I have an 'open circuit shunt winding' what do I need to do to fix it?

I manually closed the coil on the control box (engine off, battery connected) and immediately had begun to let the smoke out of the loom, on the smaller wire on D that feeds.....the ignition light.

What have I done to cause this failure?

Any and all suggestions welcome. I am tempted to go back to positive ground just to see if things right themselves....

-Brian

Subject: TR4 Electrical Issue
Date: Sun, 1 Jun 2008
From: "Randall" <tr3driver@ca.rr.com>

> I manually closed the coil on the control box (engine off, battery connected) and immediately had begun to let
> the smoke out of the loom, on the smaller wire on D that feeds.....the ignition light.

>

> What have I done to cause this failure?

Aha, the light dawns. You must have a short to ground somewhere in the yellow wire between the control box and the warning light. Try disconnecting it at the control box (which will just disable the light, not the charging). Perhaps something shorted while you were swapping leads on the ammeter.

But, it seems to me that you (or the document you have) have skipped a step. Try removing the F and D wires from the control box, jumping them together with a voltmeter to ground, and starting the engine. You should

see 15v by raising engine rpm just slightly (no more than 1500 rpm). Don't let it go over 20v, though.

BTW, it's unusual for generators to degrade gracefully the way old engines do. Any minor fault tends to turn into a major one quickly. But, the 1.1 - 1.2 might indicate only that the residual magnetism in the housing is somewhat weak, due to the recent polarity change, so I doubt it's anything to worry about.

-Randall

Electrical/Voltage Regulator

Subject: TR4 Voltage Regulator/Ignition Light
Date: Tue, 29 Jan 2008
From: "Randall" <tr3driver@ca.rr.com>

> Is any of this suggestive of needed adjustment, cleaning or other maintenance required?

Yup, cutout relay inside the control box most likely needs adjustment. There's a procedure in the book, but most likely just turning the tension adjustment (on the frame behind the cutout contacts) in by 1/2 turn or so will fix the problem. If you go too far, the light won't go out when you start the engine.

> It only happens once a week or less so I can surely live with it.

Be sure to deal with it promptly; as the generator windings and probably the cutout contacts are being overloaded. Basically the generator is trying to act like an electric motor but is stalled because it's not strong enough to turn the engine.

-Randall

Electrical/Voltage Regulator

Subject: TR4 Voltage regulator
Date: Mon, 01 Sep 2003
From: Peter Fullam <pfullam@nycap.rr.com>

Hi List

My 63 TR4 was not keeping a charge on a nearly new Gold Die Hard battery. The problem was traced to the regulator when I measured about 11.6 volts across the battery terminals with the engine running. I reset the regulator and cutout air gaps, refaced the contacts and followed the factory manual on setting the open circuit voltage to 16.3 V or so. With the engine running at about 2200 RPM, I set the output voltage at 13.3 V. Cool, let's take a ride. Got out on the road, glanced at the ammeter and it's pegged off the top of the scale at 35 or whatever amps. Whoa, back to the house. I backed the setting down to about 12.2 V, which produced about 10 amps on the ammeter. But that setting would not carry the headlights, driving lights and electric fan. I raised the output to 12.5V, which draws 12-13 amps on the meter and stays above zero with the lights and fan on. In fact, the ammeter now reads +2A all the time, even with the battery disconnected..... It didn't used to do that.

In 40 years, this is the first time I've ever messed with a regulator. The manual is a little vague about a couple of things, like where to measure the open circuit voltage. I presumed terminals D and E on the regulator. It also doesn't say not to gag the regulator contacts tight when putting the cardboard strip in the air gap. The whole thing seems to run and charge the battery as God and Lucas intended. Did I miss anything? Should the amperage be that sensitive to the voltage setting?

Some other background:

When I got the car back from the paint shop last year, I didn't notice until I got home, that they left the main wire harness ground disconnected. I fixed that, but the generator went toes up two days later with 2000 miles on it. The regulator is 12 years old, but has less than 20,000 miles on it.

Any comments from the electrical gurus?

-Pete Fullam

Subject: TR4 Voltage regulator
Date: Tue, 2 Sep 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I raised the output to 12.5V, which draws 12-13 amps on the meter and stays above zero with the lights and
> fan on.

The TR regulator (also used on other Triumphs, like Heralds) is a bit odd in that it has only a single relay to regulate both current and voltage. Because of that, when it is set correctly, it will show a slight discharge at full load, and a slight charge at partial load.

> In fact, the ammeter now reads +2A all the time, even with the battery disconnected..... It didn't used to do
> that.

That should be impossible, unless you have the OD engaged or are blowing the horns. If that's not the case, then either your ammeter is off-center, or there is something connected to the battery side of the ammeter that shouldn't be there.

> In 40 years, this is the first time I've ever messed with a regulator. The manual is a little vague about a couple
> of things, like where to measure the open circuit voltage. I presumed terminals D and E on the regulator.

That should be fine.

> Any comments from the electrical gurus?

Not sure why things failed, but I will comment that it's almost impossible to accurately set the regulator by looking at the voltage with the battery connected. In effect, the voltage is set primarily by the battery, depending on its state of charge and rate of charge. And, having the voltage set too high (for example turning it up until the battery stays charged in winter driving) can fry the generator in fairly short order.

-Randall

Electrical\Voltage Regulator

Subject: Reversing polarity
Date: Thu, 1 Jun 2006
From: <TR250Driver@aol.com>

Hey Guys,

The TR4 battery has crapped. I have an original Lucas battery that looks way cool in the Four. It is dry and will need to be filled and charged. Problem is that the previous owner converted the Four to negative ground. I want to go back to positive. I know about the switch on the radio and the amp gauge wires but the generator scares me. Help,

-Darrell

Subject: Reversing polarity
Date: Thu, 1 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Problem is that the previous owner converted the Four to negative ground. I want to go back to positive. I
> know about the switch on the radio and the amp gauge wires but the generator scares me.

Strictly No Big Deal, Darrell. One method is to disconnect the field wire from the 'F terminal' on the control box, and brush it against the 'A terminal'. You should get some small sparks, but nothing too dramatic. Then reconnect the wire to the 'F terminal', it's all done.

Another method is to start the engine first, then remove the cover from the control box and jam the cutout relay closed with your thumb. No muss, no fuss, don't have to disconnect anything. Put the cover back on, you're done.

But don't forget that the wires on the ignition coil should be reversed also. (Assuming they were reversed before.) Although the engine will run with them reversed, you'll get somewhat easier starting and better fuel mileage with them the right way around. For an original coil on a positive ground car, the SW terminal should get the white wire from the harness, and the CB terminal gets the wire from the distributor.

Later coils are marked + and - ; on a positive ground car, the "+" terminal should connect to the distributor and the "-" terminal to the white wire.

-Randall

Subject: Reversing polarity
Date: Thu, 1 Jun 2006
From: <TR250Driver@aol.com>

<tr3driver@comcast.net> writes:

> But don't forget that the wires on the ignition coil should be reversed also. (Assuming they were reversed
> before.) Although the engine will run with them reversed, you'll get somewhat easier starting and better fuel
> mileage with them the right way around. For an original coil on a positive ground car, the SW terminal
> should get the white wire from the harness, and the CB terminal gets the wire from the distributor.

Thanks Randall,

The coil wires are reversed presently and are on my list if I get up enough nerve to let the sparks fly. Cheers,
-Darrell

Electrical/Voltage Stabilizer

Subject: Electronic Voltage Stabilizer
Date: Tue, 6 Aug 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> I have been running one for over ten years now. I had a model railroad buddy help me make it. The problem
> is that I can't remember how!

There are numerous ICs (Integrated Circuits) that make building this circuit easy. One such is the National LM317A. The data sheet has a sample circuit that will do quite well.

<<http://www.national.com/ds/LM/LM117.pdf>>

-Randall

Subject: Electronic Voltage Stabilizer - TESTED
Date: Sat, 10 Aug 2002
From: Dave Massey <105671.471@compuserve.com>

"M Brooks" wrote:

> Hi all,
> Well I got the IC 10v Voltage Regulators I had ordered and decided to perform a little test to see if ambient
> temperature did make a large difference in gauge readings requiring a correction.
>
> Here's the setup:
> I hooked the 10V regulator to a 12V power supply and then attached the regulated 10V supply to a 500 ohm
> variable resistor. The output of the resistor was hooked to a Fuel Gauge I had lying around and the other side
> of the gauge was hooked to the negative side of the power supply.
>
> After a little fiddling with the resistor I got the gauge to read 1/2 at room temperature, which in Florida is
> about 78 degrees F.
>
> Then I moved the whole apparatus to the kitchen and stuck the gauge in the freezer for 20 minutes - which for
> argument sake is at 30 degrees F.
>
> The indicator does, of course, read less full BUT only by the slightest amount! About 1/16" lower than at
> room temperature. This is with a difference in ambient temperature of about 58 degrees. I think that is quite
> an acceptable margin for error.
>
> I did find, however, that when I used a hair dryer set on cold, blown at the gauge it became very inaccurate
> and read nearly empty. I'm sure this is because the movement of the air was removing heat from the gauge's
> coil. Of course this is not really AMBIENT temperature and I'm sure that even with the top down at 70 MPH
> the amount of wind behind the instrument panel is negligible [;-)]
> -Mike Brooks

That's what I like: good, objective experimentation. Keep up the good work. Thanks for sharing the results.
-Dave Massey

Subject: Electronic Voltage Stabilizer - TESTED part 2
Date: Sat, 10 Aug 2002
From: "M Brooks" <mike@gsta.net>

Thanks for the encouragement Dave. Purists may scoff at an IC voltage stabilizer but if it works it's good, low-cost gauge insurance!

I tried the test on a Temperature Gauge exactly as described below and it was even more stable than the Fuel Gauge. I could see no difference between the readings at room temperature and the readings in the freezer.

I performed the test on both instruments several times and with the gauge reading several different levels. Every time the results were consistent.

I intend to install the unit in my friend's TVR for some real world testing.

-Mike Brooks

Subject: Electronic Voltage Stabilizer - INSTALLATION part 3
Date: Sat, 10 Aug 2002
From: "M Brooks" <mike@gsta.net>

Hi again everyone,

Got the Electronic Voltage Stabilizer ready for installation into the test bed TVR. What I did was disassemble an old 12V metal case relay I had in the junk pile and pulled out the guts. Then wired up the IC voltage reg so that there are 2 input spade terminals and 2 output spade terminals. This meant riveting the IC to the grounding case and soldering the input and output terminals to the appropriate locations. Easy. Stuck it back together and it's good to go.

Tested the unit with my trusty 12V power supply and gauges - works exactly as expected. Next step is to install it in the TVR 2500M I'm working on. My friend who owns the car has had it for something like 7 years and he drives it all the time. Obviously he knows the car inside and out and where all the gauges normally read with the original electro-mechanical Voltage Stabilizer. He should be the perfect guinea pig since he'll be able to tell immediately if the gauges aren't acting properly.

I'll post the results next week when he returns from NY and tests the car.

-Mike Brooks

Electrical/Voltage Stabilizer

Subject: Follow up on several dead voltage stabilizers
Date: Tue, 4 Jul 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

Well, I looked at all 3 dead stabilizers. It looks as if they all failed for different reasons! The old original looks as if the contacts just got too dirty and failed to close. Gauges therefore were reading ZERO.

The next one turns out to have been a solid state design! A resistor, transistor, and a diode (Randall is guessing it is a zener, but I can't tell, and it is blown. So is the transistor, but I can tell what it was by the numbers). The solid state parts died, and I will never know exactly why. IT resulted in the gauges reading HIGH. At the time it died, I was having a problem with bad silicone core ignition wires, so the transients may have been particularly bad.

The last one was another mechanical one, and this one had the heater wire for the bimetallic arm burn thru the insulation in an area. This made the resistance of the heater wire much less, and maybe it was getting too hot. The gauges were reading way too LOW, but not zero.

These things are not cheap! I had all parts on hand to make a well designed (I hope) regulator that should be tough enough for the automotive environment. It is installed and working. The problem with this type is that when the engine is OFF, then you may not be able to get a good 10 volts out of it. With the engine running, then the extra voltage from the generator will allow it to deliver a full 10 regulated volts. I can give the design to people if they are interested.

-Tony

Electrical/Voltage Stabilizer

Subject: Voltage Stabilizer
Date: Tue, 15 Aug 2006
From: "Terry Smith" <terryrs@adelphia.net>

I'd purchased a used TR4 electric temperature gauge for my '59 TR3A. With it came the voltage stabilizer.

I learned from Dave at TRF today, however, that these were typically positive ground. I have a negative ground car. What's happening is, my temp gauge is reading at the top end (super hot)...before I start the car. Moreover, since I hooked up my regular TR3 fuel gauge to the stabilizer too, and now it reads at the completely full level without a drop of gas in the tank, I'm worried I fried it.

I've ordered a later model negative ground voltage stabilizer. We'll see what it cures. Any ideas?
-Terry Smith

Subject: Voltage stabilizer
Date: Tue, 15 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> For what it's worth, I learned something today a lot of you certainly already know.

Well, I didn't (still don't) ... the factory voltage stabilizers were not polarity sensitive. It's just a heater, which gets hot no matter which way the electrons flow. It's only the aftermarket solid-state replacements that are polarity sensitive.

> What's happening is, my temp gauge is reading at the top end (super hot)...before I start the car.

Most likely indicates either a broken gauge, or the wrong sender for your gauge. Or possibly a short to ground in the new wire to the new sender. Having a broken (shorted) VS should only make it read about 1/4 scale too high.

> Moreover, since I hooked up my regular TR3 fuel gauge to the stabilizer too, and now it reads at the
> completely full level without a drop of gas in the tank, I'm worried I fried it.

Not likely ... are you sure the fuel gauge is properly grounded, and connected?

You won't be happy with it connected to an original voltage stabilizer (VS) anyway, the gauge will jump around every time the "stabilizer" switches. The "stabilizer" output switches from zero to full battery voltage plenty slow enough to see on a fast gauge (like the original TR3 fuel gauge) ... even a light bulb is fast enough to see it clearly.

-Randall

Subject: Voltage stabilizer
Date: Wed, 16 Aug 2006
From: <DaveImassey@cs.com>

HOWEVER, the fuel sender unit in the TR3 is quite different from the one used on the TR4 and on. They work quite the opposite and low resistance is equivalent to low fuel and high means low fuel. The TR4 and on sender is the other way round. Mixing and matching TR3 and TR4 parts in the fuel gauge system won't work as expected.

-Dave

Subject: Voltage stabilizer
Date: Mon, 25 Sep 2006

From: <Dave1massey@cs.com>

<TR4A2712@yahoo.com> writes:

> Hi Dave!

> I've been trying to catch-up on my 50+ TRIUMPH Digest readings & came across your post. There is one line
> in your post (... low resistance is equivalent to low fuel and high means low fuel.) That doesn't make sense to
> me.

> Question: Should this line read: (... low resistance is equivalent to low fuel and high resistance means HIGH
> fuel.)?

Oops, typo. On a TR4 (and 6 and 7 & 8) a low resistance will give you a full reading and a high resistance will
give you a low or empty reading. On a TR3 it is quite the opposite. That was the whole point of the E-mail.

> I know this may sound trivial, but:

> 1- I'd like to truly comprehend what you are trying to communicate.

> 2- I'm saving this post for future ref., & if I don't understand it NOW; then I'm sure to not understand it later

> on. TIA

The net result is that if the wire comes off of the fuel sender on a TR3 it will read full. If the wire comes off of
the sender on any TR after TR3 it will read empty. Likewise if you touch the fuel sender wire to chassis on a
TR3 it will read empty but on a TR4 et al. will read full.

This can be handy when troubleshooting.

How's that?

-Dave

Electrical/Voltage Stabilizer

Subject: Voltage Stabilizer question
Date: Mon, 24 Apr 2000
From: "Randall" <ryoung@navcomtech.com>

Bob Kramer wrote :

> No responses yet on the voltage stabilizer question I asked. I was looking for a simple way to determine if
> one is bad, or what else might cause the stabilizer to work when separated from the speedometer (not
> grounded) but fail when properly connected. I opened up one yesterday, and found what I think might be the
> problem. I think all 3 that I have are bad. The electrical engineers on this list can explain it better, but it looks
> like the unit basically has 2 sets of contacts that are connected only when the power is turned on. A wrap of
> the ground wire (connected via a tab to the VS case) around one of the contacts must form an electromagnet
> holding the contacts together. My guess is that this is done to prevent unwanted short term voltage
> disconnections when the sender drops its signal (sloshing gasoline?) to keep the gauge from registering
> bouncy readings.

>
> Therefore, I have determined that the ground coil must be bad, burned through the wire coating, causing a
> short to the case, and I need a new voltage stabilizer. Can anyone enlighten me as to whether my thinking on
> this is correct?

Bob :

I still don't know of a good test, but maybe I can clarify how it works a little.

The 'electromagnet' you found is actually a heater, the wire is resistance wire so running current through it produces heat. How much heat depends on how much current, which in turn depends on the voltage. The contact it is wound around is what's called a "bimetal strip", which is formed of two dissimilar metals such that it will bend (and open the contacts) when it gets hot.

So in operation, when the contacts are closed, the ignition circuit voltage (what we usually call 12 volts, but can actually be anywhere from 11v to 15v) is applied to the heater. The heater warms the bimetal strip until the contacts open, then cools off until the contacts close. The resultant output is a voltage that swings from 12v to 0v and back again, with the average being around 10v. (Some people have reported that the 10v average is also dependant on ambient temperature. Makes sense, but I haven't tried to measure it to be sure.) It should be relatively independent of how many gauges are connected, or what they are reading.

The gauges that run on the 'stabilized' voltage are also 'hot wire' movements, with a heater acting on a bimetal strip that moves the needle. They have a very slow response time, so will filter out the effects of gasoline sloshing, etc. as well as the 'chopped' voltage coming from the voltage stabilizer. IMO the whole arrangement was just to be cheap, I much prefer balanced gauge movements like my TR3 and Chevy have.

The best explanation I can think of for your problem is that the contacts inside the stabilizer are burnt or dirty, so that they will make contact once, but not repeatedly. I've found this to be common failure mode for cheap relays. Your 'worn through wire' explanation would work too, since a short to ground will cause the heater to draw too much current, and possibly chop the voltage so low that the gauges wouldn't work at all. Another possibility would be the bimetal strip being bent, thereby changing the calibration.

Substitution of a known good unit is the usual way to troubleshoot such things.

-Randall

Subject: Voltage Stabilizer question
Date: Mon, 24 Apr 2000
From: David Massey <105671.471@compuserve.com>

"Bob Kramer" wrote:

> No responses yet on the voltage stabilizer question I asked. I was looking for a simple way to determine if one
> is bad, or what else might cause the stabilizer to work when separated from the speedometer (not grounded)
> but fail when properly connected. I opened up one yesterday, and found what I think might be the problem. I
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> bouncy readings. Therefore, I have determined that the ground coil must be bad, burned through the wire
> coating, causing a short to the case, and I need a new voltage stabilizer. Can anyone enlighten me as to whether
> my thinking on this is correct?
> -Bob Kramer

If your gauges work with the unit not grounded but do not work with it grounded then you need a new one regardless of how it works inside.

For the record, the voltage stabilizer is a thermal device with a heater wire wrapped around a bimetal device that will open the contacts after it reaches a certain temperature. However after the contacts open the heater is shut off and the bimetal device will start to cool down which will close the contacts and the cycle starts over again. The stabilizer is factory adjusted to provide an average voltage of 10 volts. With this device there will be no fluctuations in gauge readings as the battery voltage varies with system load and engine speed. Voltage can change from 11.5 volts at idle with all loads on to 14.5 volts at speed with no electrical loads.

-Dave



Upper left: the resistance-wire wrapped bimetallic element of an old-fashioned thermal Voltage Stabilizer.
Lower right: a solid-state electronic voltage regulator that can be used to replace it.

How To: Replace Your MGB's Thermal Voltage Stabilizer

Install a Solid State Regulator Inside the Lucas Case

as published in *BritishV8 Magazine*, Volume XVI Issue 2, October 2008

text by: Curtis Jacobson
photos by: Jim Miller

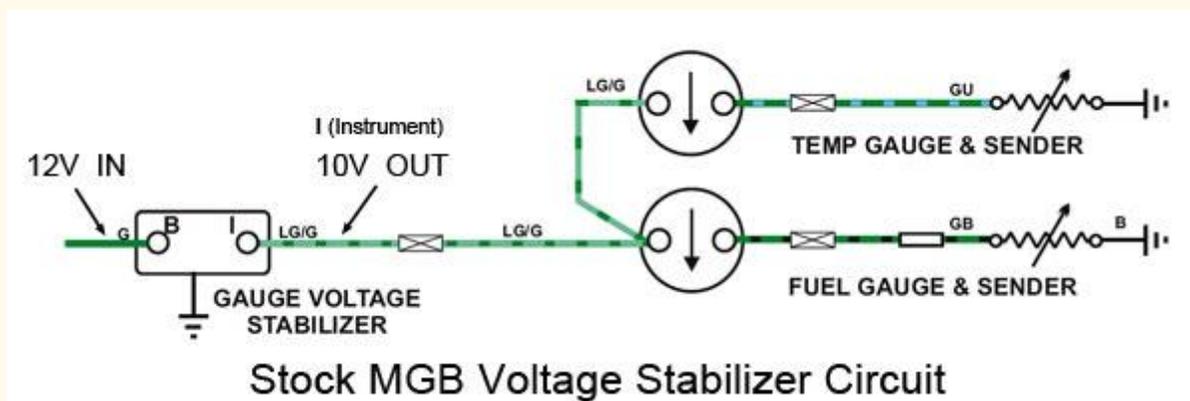
Notes: this article references MGB equipment, schematics, etc., and the information may not be transferable to other vintage cars.

Background Information

Are you using original fuel level and coolant temperature gauges on your 1968 or later MGB? Unlike modern aftermarket gauges, these two old-fashioned gauges are thermal ("bimetallic") devices. Their indicator needle is connected to a short beam constructed of two dissimilar metals. The beam is wrapped in resistance wire, which warms-up proportionally to the amount of electrical current passing through it. The gauge needle's position is determined by flexion of the beam due to the differing thermal-expansion rates of the two metals. To work properly, the MG fuel level and coolant temperature gauges need to be used with an external Voltage Stabilizer. (Note: the 1968-1972 MGB oil pressure gauge is also a thermal device. However, because of the unique nature of its sensor, it doesn't require a Voltage Stabilizer.)

The schematic drawing below, "Stock MGB Voltage Stabilizer Circuit" illustrates how the fuel and temperature gauges are wired. In summary, the gauges are designed to receive a constant supply voltage of 10 Volts and it's the job of the Voltage Stabilizer to provide it. The fuel level and coolant temperature sensors, downstream of their respective gauges, are connected through their mountings to chassis/ground. The sensors act like variable resistors; their resistance changes with fuel level or coolant temperature respectively.

The Voltage Stabilizer itself is nominally provided 12 Volts. However, we know from experience that the "voltage in" isn't so stable or predictable! A number of factors affect the supply voltage available, including: the battery's state of charge, the output of the generator or alternator at any given moment (which may be affected by engine RPM), and whether various loads on the system are "on" or "off".



Regardless of how stable or predictable the 12 Volt supply is, the Voltage Stabilizer's purpose is to iron things out. As a generalization, you might say: "If the Voltage Stabilizer provides more than 10 Volts, both gauges will read high. If it provides less than 10 Volts, both gauges will read low."

However, this generalization isn't strictly true - because the original MG Voltage Stabilizer doesn't actually regulate voltage at all! Instead, it cycles power "on" and "off" to achieve an **average** voltage (over time) of about 10 Volts. If you take an old-fashioned Voltage Stabilizer apart, you'll find a bimetallic element with a resistance wire wrapped around it (much like an automatic-reset circuit breaker, and not entirely unlike the gauges themselves.) Heat in the resistance wire causes the bimetallic element to bend. The bimetallic element actually bends back and forth quite rapidly, and in turn it rapidly opens and closes a set of contact points. Thus, it switches between a nominal supply voltage of about 12 Volts and a disconnected state (i.e. zero volts!) That suits old-fashioned, single-coil MGB gauges pretty well because they have a lot of mechanical dampening built into them. If your gauges are sufficiently damped, you may not see that their needles

constantly wiggling as the Voltage Stabilizer chatters on and off; you'll only perceive the "average" readings they're showing you.

By modern standards, thermal Voltage Stabilizers are inaccurate and inconsistent. Their output varies a lot between summertime and wintertime because their accuracy is affected by ambient temperature. Heat under the dashboard (e.g. when your windscreen defrosters are turned "on") can cause a significant shift in gauge readings. Output may also vary over the life of the Voltage Stabilizer as the bimetallic element fatigues, as internal contacts grow dirty, etc. If the resistance wire breaks, the Voltage Stabilizer will simply pass-through electrical current at continuous and unregulated voltage, so the old-fashioned thermal gauges will read high.

If your Voltage Stabilizer is old or broken, or if you just want to improve the accuracy and consistency of your fuel level and coolant temperature gauges, you may want to consider converting to a modern solid-state electronic voltage regulator.

IMPORTANT NOTE: if you replace your original MGB gauges with aftermarket gauges, you should probably remove and NOT replace your old-fashioned thermal Voltage Stabilizer. (Jumper across the Voltage Stabilizer connections.) Modern dual-coil gauges provides accurate information regardless of supply voltage, but they may not be adequately damped to accommodate the abrupt on/off cycling of a thermal Voltage Stabilizer.

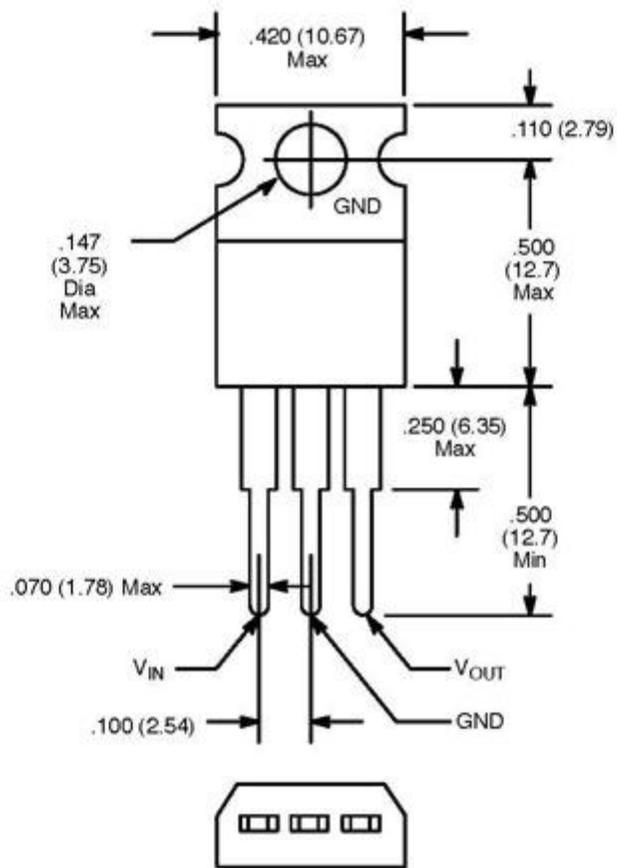
Solid state voltage regulators are inexpensive, but they may be difficult to find locally. The easiest places to purchase them are online. "Google" the part numbers to identify potential suppliers.

National Semiconductor's "LM2940T-10.0" and NTE Electronics' "NTE1953" are low dropout (LDO) solid-state voltage regulators. If you supply either of them with a DC voltage between 10.5V and about 30V, they will provide a constant output voltage of 10.0V. Similar to an old-fashioned bimetallic Voltage Stabilizer, they can't boost voltage: so if the supply voltage drops to below about 10.5V, these LDO's will "dropout" and simply pass through whatever supply voltage is available.

Note: there are other alternative voltage regulators that could also be used. One example is Texas Instruments' part number "UA7810CKCS" (a.k.a. "7810" or "LM7810") which frankly you're probably more likely to find at your local Radio Shack. The main advantage of the National Semiconductor or NTE Electronics devices is their somewhat lower dropout specification.

Also needed: just a few basics including a soldering iron, solder, about six inches of insulated wire, heat shrink tubing (or possibly electrical tape), etc.

Optional extras: a small LED lamp and a 1000 ohm resistor.



Solid State LDO Voltage Regulator Pin-Outs



left-to-right: V_{IN} , "GND", V_{OUT}

Make sure the solid state regulator is solidly grounded to the metal cover.

Directions

1. Disconnect the car's battery and remove the original Voltage Stabilizer from the car. (Note: the Voltage Stabilizer is mounted on the drivers-side firewall just above the steering column.)
2. Open the voltage regulator by carefully prying back the tabs that clamp the metal cover to the plastic base.

3. Cut and remove the old bimetallic regulator mechanism, being careful to leave enough of the two terminals for soldering wires onto them later.

4. Prepare your solid-state voltage regulator by cutting off the center of its three terminals. (This terminal is nominally a "ground" connection, and it would be redundant with the mounting tab in our installation. They're connected internally...)

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(Suggested contribution is twenty bucks per year. Feel free to give more!)

5. Using a short length of wire, jumper between the solid-state voltage regulator's V_{IN} (12V in) terminal to the "B" terminal on the plastic base. Carefully solder both connections.

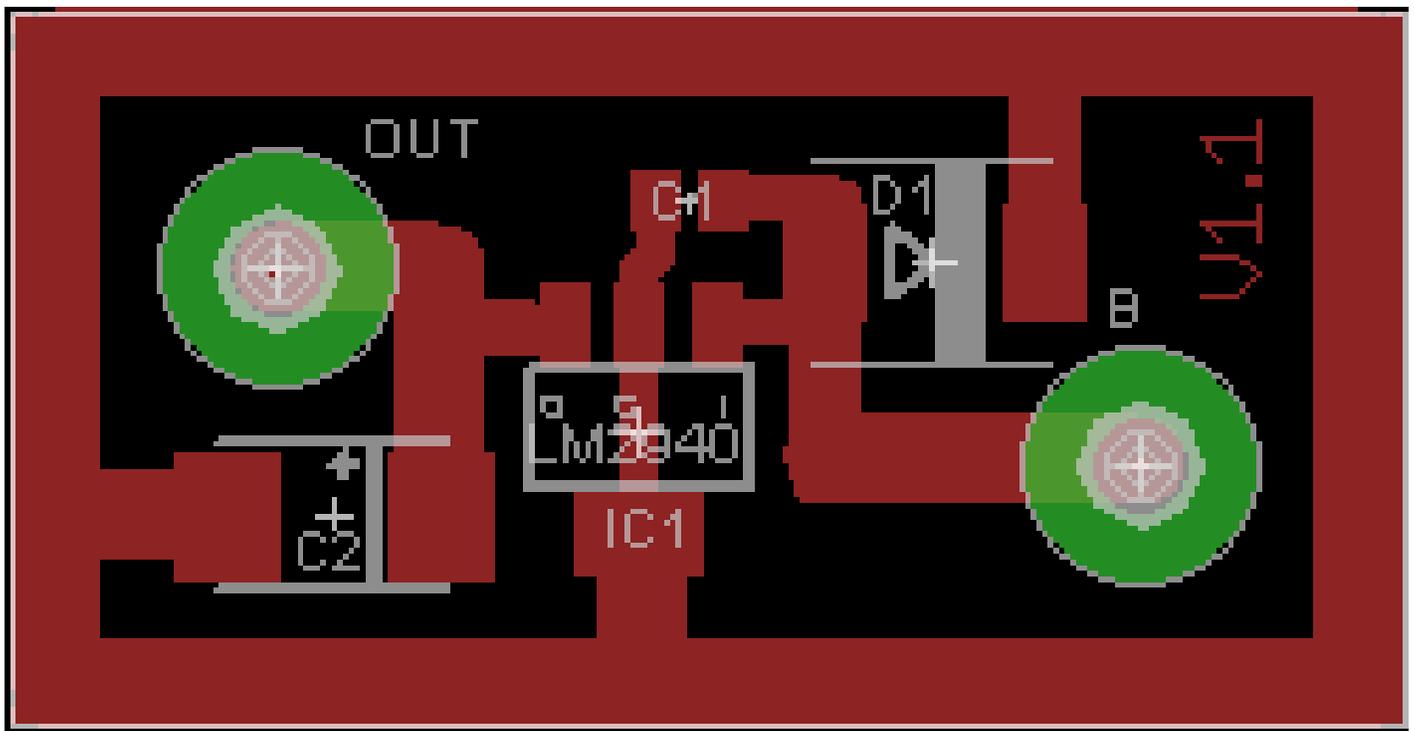
6. Using a short length of wire, jumper between the solid-state voltage regulator's V_{OUT} (10V out) terminal to the "I" terminal on the plastic base. Carefully solder both connections.

7. The LED indicator is optional. Its purpose is just to show that the system is powered and grounded, and that the voltage regulator is functioning. The LED is connected at one end to the voltage regulator's 10V "OUT" terminal, and at the other end it's connected to ground through a 1000 Ohm resistor.

8. To function properly, the solid-state regulator must be electrically well-grounded to the rest of the vehicle. Accomplish this by (first) connecting it to the voltage regulator's metal cover with a machine screw and nut. Note: the voltage regulator itself must in turn be grounded to the car by its mounting. If the fasteners are corroded or dirty, they should be cleaned at this time.



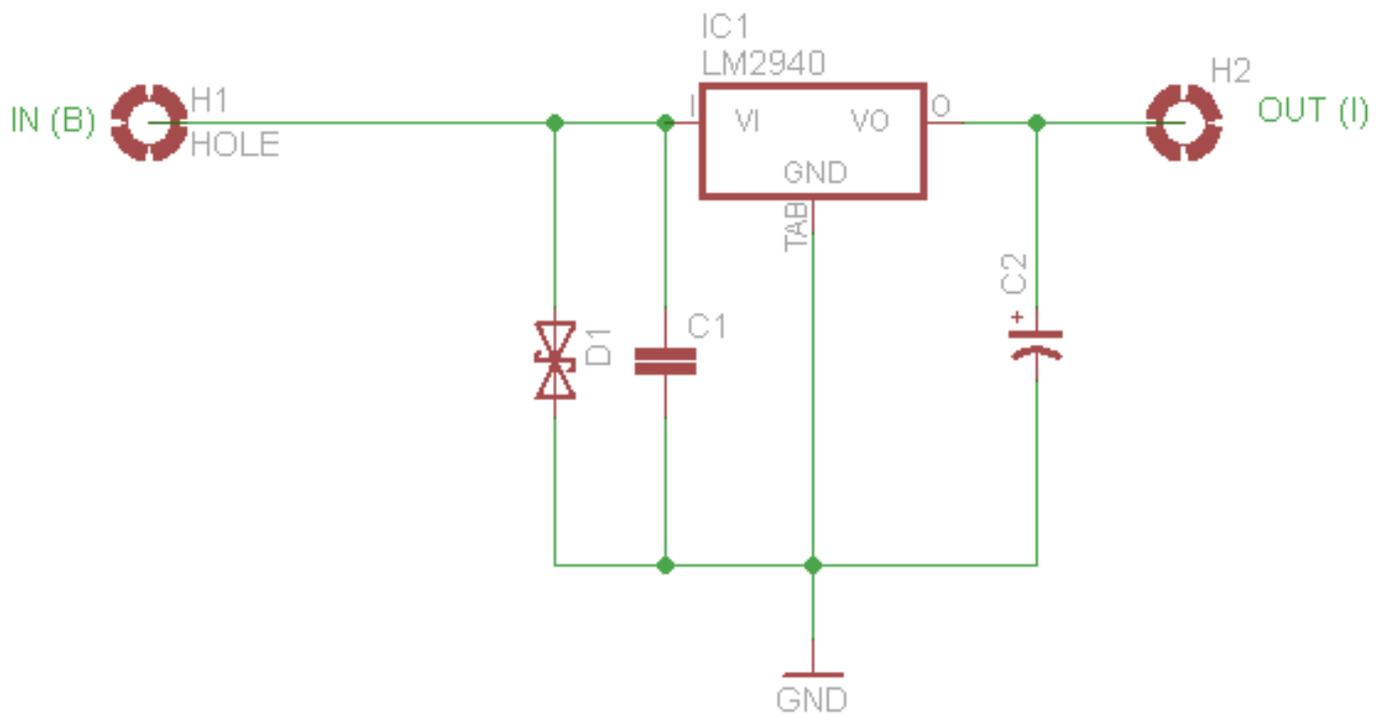
Gently fold the edges of the metal cover back over the plastic base.



D1: TVS/30v/300W/Bidirectional/SMDJ30CA

C1: 1uF/50v/C2012X7S2A105K

C2: 33uF/35V/B45197A6336K509



Electrical/Wiper Motor

Subject: Flick Wiper
Date: Tue, 4 Jan 2000
From: David Massey <105671.471@compuserve.com>

"David Hill" wrote:

> Hi, All.
> Anyone out there seriously clued up on electrics?
>
> In the muck and filth of winter, it would be really nice to have a flick wipe facility on both my classics
> (standard Lucas 2-speed wipers).
>
> I vaguely recall from the '70s that this was possible by putting in an additional feed to the wiper motor, via a
> momentary contact switch. The idea was that the wipers would wipe once when the switch was pressed, then
> park again.
>
> Question: Can this work and if so, which wire should be energised via the switch?
> -Dave Hill

Not as simple as all that, I'm afraid. You will need to get yourself a pushbutton with a form C contact arrangement (SPDT) This type of contact has three terminals marked NC(normally closed), NO(normally open) and C(common). Then you will need to find the Brown/Green wire and snip it. The Brown/Green wire to the switch gets connected to the C terminal. The Brown/Green wire to the wiper motor gets connected to the NC terminal and the additional feed gets connected to the NO terminal.

A simple NO pushbutton wired in won't do as the parking switch in the motor switches the normal 12 volt feed wire (Brown/Green) to earth in the parked position and tying in another 12 volt feed will creat a short and blow the fuse.

Sure, there are other ways to do it. This is just the first that came to mind but no matter how you switch in the 12 volts you will need to break the original feed temporarily.

Hope this helps. It's even tougher if you have parking wipers (as some american cars do).

-Dave

Subject: Flick wipers for Lucas 2 speed
Date: Wed, 5 Jan 2000
From: "Dave Terrick" <dterrck@pangea.ca>

David,

Don't ALL Lucas wipers "flicker" ??

Seriously, I did this modification to my TR6 some time ago (but the car has been gone for several years) and it worked just fine. I added wires to the back of the wipe/wash switch so that a momentary push on the washer button would trigger the park circuit. Since the washer lines always took more time to fill and spew blue than the momentary switch push, I never wasted fluif (wow, such a little typo and so much attention <BG>).

I read Dave Massey's post, and Dave perhaps you can refine this idea ...it worked for me but then again, nobody told me it wouldn't! The primary benefit of this setup is that no holes or additional switches need be installed. there ARE intermittent wiper controls available from pep boys or similar if you want something "modern" and don't care about originality.

If not: by memory, here is what to do:

1. Go to your local electronics store and get a diode (one way valve for electricity). Ask for something that can take an amp or two. They DO generate some heat, but only while restricting the current flow - i.e. when you are using the push/wipe function. (I'm sure somebody who REALLY knows power will give the spec, I just kinda winged it)
2. Fabricate the "harness. Identify the outgoing power to the washer pump. Identify the wire leading to the low speed wiper. Make a jumper wire that bridges the two lines, with the diode inline.

NB: What is important is that the power be allowed to run from the pump to the wiper but not from the wiper to the pump. If the diode is backwards, the reverse will happen and the pump will run whenever the wipers are on!!!

The momentary burst of power to the wipers forces them off park, and then the park circuit takes over and puts the blades through full sweep....provided they work, of course. That is the key to this arrangement - only a short burst of power is needed to do the job.

Now here's another completely different idea.... what about a turn signal flasher or similar? The idea is that, much like a mechanical voltage regulator, there would be an on/off pulse at a given speed. and, now that I'm thinking, I remember an optional relay on Volkswagen Golf's that allowed intermittent wipers for those who did not have them. It was a fairly expensive relay style thingy with an adjusticator knob. Again, switch "on" you then controlled the speed of the pulses.

-Dave T

If you re-read my post you will notice my exit strategy where I said there are other ways to do this...

Seriously, though, This is a clever way of providing a mechanism to actuate a single sweep operation. I have one reservation, however:

When the wiper switch is in the off position the low speed motor wire (Red/LightGreen) is connected to the Park Switch wire (Brown/LightGreen) and when the motor is in the parked position this wire is switched to earth (this provides dynamic braking to stop the motor and prevent it from coasting through the park region and continuing on to do another sweep).

Switching another 12 volt source onto this line when the motor is parked will create a short circuit and the currents are limited by the wire impedences. This short will be momentary only as enough current will flow to the motor to cause it to come off of park and the internal switch will switch to +12 and the sweep will commence. The original (Clear Hooters) switch on my TR6 would do just this when going over bumps due to an internal short. The new switch has been problem free for years.

Yes this works but it puts undue stress on the switches, wires, diode and fuses. If I designed a circuit like this my boss would justifiably chew me a new you-know-what and if anybody working for me did this I would do the same thing to him/her.

So as a person making a living designing circuits and systems I can not recommend this approach. But the washer switch is a neat idea. I recommend getting a SPDT relay from Radio Shack (or sim) and implement my design using the wire from the washer switch to activate the coil of the relay.

-Dave

P.S. Please note that these comments apply to the Two Speed wipers. For one speed wipers all one need do is switch the park wire to earth.

Electrical\Wiper Motor

Subject: Position for wiper wheel boxes
Date: Tue, 13 Jun 2006
From: <Dave1massey@cs.com>

<terryrs@adelphia.net> writes:

>> List,
>> I am progressing too slowly on the restoration of my TR3. I am just now reassembling the wiper and
>> assembly. I have a question:
>>
>> Do the two wiper wheel boxes go under or over the long drive-cable? If it goes under then that means there
>> is about an inch between the cable-drive and the body's sheet metal. If you say it 'goes over' the wheel box
>> then there is about 1/4" between the cable-drive and the body's sheet metal. My book doesn't say.....
>> -Paul Dorsey

> Paul, I'm probably confused. The long drive cable goes through the wheel boxes, not "over" or "under." The
> tubing that surrounds the drive wire fits into the slots at either end of the wheelbox, with nothing but wire
> actually "within" the box.
>
> But I'm probably missing what you're saying.

Yup. I think his question refers to the fact that the tube enters the wheel boxes offset from the center and is this
offset above or below the center line.

Unfortunately, I can't answer that. What I would do (and I will be doing this in a year or so) is realize that
getting it wrong will reverse the direction of the wipers and they will park in the wrong position (which would
be the right position for RHD vehicles) and then check to see if the cable is fully retracted or extended when
parked.

Or just hock it up any old way and adjust the parking position to where I want it.
-Dave

Subject: TR3 wiper wheel boxes
Date: Tue, 13 Jun 2006
From: "Chris Buckley" <chris.buckley@tz.knightfrank.com>

Paul Dorsey wrote:

> Does the long drive-cable "thread" through the wiper wheel boxes so that this cable is on the top or bottom of
> the wheel box as it sits normally under the dash of my TR3?
>
> If the cable goes on top then this cable-drive will be 1/4" from the body's sheet metal, but if it goes on the
> bottom of the wheel box then it will be 1" from the body's sheet metal.

Hi Paul,

I think I get you. The bit that the wiper slips on to obviously sticks through the hole. In my car I put the cable in
the lower of the 2 positions (about 1" below the scuttle plate and closer to the bulkhead / engine). Not 100% if it
was the right way but it seems to fit and work OK. For what it's worth, my TR is Right Hand Drive.

-Chris Buckley

Subject: Position for wiper wheel boxes
Date: Tue, 13 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Unfortunately, I can't answer that. What I would do (and I will be doing this in a year or so) is realize that

> getting it wrong will reverse the direction of the wipers

So instead of moving to and fro, they move fro and to? How do you tell the difference?

> and they will park in the wrong position

Except that the park position is fully adjustable on a TR3-4, and the adjustment gets lost when you remove the cable from the motor.

> (which would be the right position for RHD vehicles) and then check to see if the cable is fully retracted or
> extended when parked.

So, which is correct, extended or retracted? If we knew that, we'd know which way the wheelboxes go.

-Randall

Subject: Position for wiper wheel boxes
Date: Tue, 13 Jun 2006
From: <Dave1massey@cs.com>

<tr3driver@comcast.net> writes:

>> (which would be the right position for RHD vehicles) and then check to see if the cable is fully retracted or
>> extended when parked.

>

> So, which is correct, extended or retracted? If we knew that, we'd know which way the wheel boxes go.

The dilemma, indeed. From the point of view of an outside observer it would all work out in the wash. At the end of the day the wheel boxes can be installed in either position and the parking location adjusted to suit either RHD or LHD applications.

There may, however, be other considerations such as do the tubes foul with something under the dash in one position or the other.

One could install one wheel box one way, the other one the other way and have wipers that work in mirror image patterns the way some old American cars did.

-Dave

Subject: Position for wiper wheel boxes
Date: Tue, 13 Jun 2006
From: "Terry Smith" <terryrs@adelphia.net>

Ah, I just got squirmed under the dash (where I've been working this week anyway) to take a look.

Paul, I think the thing that makes the most sense, is to run the wiper motor first. The long gentle curve of the tube that sweeps under the dash will give you the fit for the proper location of the wheel box. I set up mine a few weeks ago this way, and have the same placement as Chris Buckley reports, which is the lower of the two options. I also tested the action for binding using a battery charger, and it worked smooth.

-Terry

Electrical/Wiper Motor

Subject: TR3 wiper adjustment
Date: Fri, 12 Mar 2010
From: "Randall" <tr3driver@ca.rr.com>

-----Original Message-----

I checked that the wiper spindles on my tr3 were working and self parking. I then fitted my wiper arms and blades, with the blade at approximately horizontal position on the windscreen. Turned on the wipers and they go across the windscreen ok but on the return stroke they went way past the horizontal, off the windscreen and on to where the lower windscreen to scuttle weather strip would be if I had one. They then want to complete the cycle and self-park at the horizontal position again.

How do I adjust please?

-Frank Fisher

> How do I adjust please?

Flip the wiper arms up so they don't hit anything; loosen the small screws in the top of the wiper motor gear box, and then turn the dome until the arms park at the limit of travel. Tighten the screws, lower the arms, and Robert is your family member.

> Tighten the screws, lower the arms, and Robert is your family member.

Oops, forgot to mention, you'll need to reposition the arms on the spindles.

> If you find out let me know, I put my wipers on today after rebuilding the motor and a new gear in the wheel
> box. You get some adjustment from the gear cover so that they will park in the proper spot but mine dropped
> down about 2-3" from the park position when they are running, much as you have described.

Just in case I wasn't clear before; first you set the park switch so they park at the limit of travel. This is best done before installing the arms, by just watching the shafts turn.

Then with the shafts parked as far as they will turn, install the arms so they are in the proper position just slightly above the edge of the windshield.

-Randall

Electrical/Wiper Motor

Subject: TR3 -4 Windshield Wiper motor, mounts
Date: Tue, 23 Nov 1999
From: Dianne and Peter Fullam <dfullam@albany.net>

Hi Scott,

I had the same problem on my TR4 last year. I lubed the new grommets with Ivory dish detergent. Squeeze the grommet into a football shape and stick one end of it into the hole so that the groove goes into place on the bracket. Use a small screwdriver to work the groove down into the hole so that it pops into position as you go around the grommet. It's a lot easier if you take the bracket out of the car first. Took about 5 minutes per grommet and no, I don't know how the factory did it.

-Pete Fullam

Subject: TR3 Windshield Wiper
Date: Wed, 24 Nov 1999
From: Terrence Begley <tbegley@lucent.com>

Hi Guys

Another method is the 'wire in the groove' which is similar to the way windows and windshields are installed. Had to wire up a test fixture at work and needed to install grommets. Wrap a thin piece of wire around the grommet in the groove. Place grommet against the hole with both ends of the wire coming thru the other side. Start pulling the wire out of the groove while pressing the grommet and see how the rubber sets itself as the wire is removed. Hope this makes sense as I am verbally challenged.

-Terry

Electrical/Wiper Motor

-----Original Message-----

Subject: TR3 wiper adjustment
Sent: Friday, March 12, 2010

I checked that the wiper spindles on my tr3 were working and self parking. I then fitted my wiper arms and blades with the blade at approximately horizontal position on the windscreen. I turned on the wipers and they go across the windscreen ok but on the return stroke they went way past the horizontal, off the windscreen and on to where the lower windscreen to scuttle weather strip would be if I had one. They then want to complete the cycle and self park at the horizontal position again. How do I adjust please?

-Frank Fisher

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Date: Fri, 12 Mar 2010
From: "Randall" <tr3driver@ca.rr.com>

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- Randall

Subject: TR3 wiper adjustment
Date: Fri, 12 Mar 2010
From: "Randall" <tr3driver@ca.rr.com>

Frank wrote:

> Tighten the screws, lower the arms, and Robert is your family member.

Oops, forgot to mention, you'll need to reposition the arms on the spindles.

- Randall

Subject: TR3 wiper adjustment
Date: Fri, 12 Mar 2010
From: "Randall" <tr3driver@ca.rr.com>

Frank wrote:

> If you find out let me know, I put my wipers on today after rebuilding the motor and a new gear in the wheel
> box. You get some adjustment from the gear cover so that they will park in the proper spot but mine
> drop down about 2-3" from the park position when they are running, much as you have described.

Just in case I wasn't clear before; first you set the park switch so they park at the limit of travel. This is best done before installing the arms, by just watching the shafts turn.

Then with the shafts parked as far as they will turn, install the arms so they are in the proper position just slightly above the edge of the windshield.

-Randall

Electrical/Wiper Motor

Subject: TR4A 2spd Wiper Wiring Question
Date: Wed, 28 Apr 1999
From: Cliff Hansen <chansen@access1.net>

Hi Mike,

When I took my working system apart, here's how it was wired at the switch. On the back of the wiper switch are four posts, shown in ASCII art with key to wire colors:

-A -B
-C
-D

Key:

A - black wire

B - brown/green wire

C - not used

D - large red/green wire

I don't have a TR4A specific wiring diagram, so I can't identify the function of each wire. My guess is that the black is ground, the other two wires connect to wiper motor, the brown/green for low speed and the fat one for high speed.

Electrical/Wiper Motor

Subject: Wiper boxes etc
Date: Tue, 12 Sep 2006
From: Bob Labuz <yellowtr@adelphia.net>

Just finished assembling the wiper boxes etc on the TR4 project. How did the assemblers at the factory keep their wits and not go crazy performing this task day in and day out?

I guess I am lucky with smaller hands. I don't think anyone with large hands could do this. I don't believe I had this kind of trouble with the TR3A.

But after getting all the tubes in place, the wire gear drive went in without a hitch. Thank goodness for small miracles!!

Did I do this job in the correct order? I don't think the assembly can be installed intact.

I started by installing the boxes, then the center and end tubes. Next I inserted the drive into the first box, center tube and end tube finally getting the lead tube in place. Then I tightened the box drive covers, connected the drive to the motor, tightened the nut and then finally the 3- 7/16 " bolts to the body. And getting the drive on the motor, tons of fun. plenty of room.

Now I have my brake and clutch mc assembly in place. I could see it would be easier to do if I did the wiper assembly first.

But what happens if the motor goes bad? Does that mean you have to take apart the brake/clutch MC assembly? I hope not.

Is there an easier way to do this just in case I have to replace something in the wiper assembly?

-Bob

Electrical/Wiper Motor

Subject: Wiper motor gremlin
Date: Tue, 15 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> Hi List, I have the old single speed wiper motor in my TR4A. It normally works fine but sometimes if: I go
> over a bump; reconnect the battery terminal after working on the car; turn on the ignition, the wipers move
> through 1/4 rev and park at 12 o'clock. They then use the same park spot if switched on and off. If left for a
> while, and then switched on and off they return to the original (correct) parking space. Any ideas? TIA

Not really, except it has to be something loose in the park switch. I'd start by having it apart for examination, cleaning and lubrication.

-Randall

Subject: TR6 wiper park
Date: Fri, 25 Aug 2006
From: "Ed Woods" <fogbro1@comcast.net>

Thanks Randall. You were right, with the cable connected the gear lifted a few thou and failed to trip the switch. I put a washer under the snap ring on the outside of the assembly which limited the vertical travel. It did the trick.

-Ed

Electrical/Wiper Motor

Subject: Wiper park problems - dirty rivets
Date: Sun, 14 Apr 2002
From: <PeterSchop@aol.com>

>> Is there anything that I can do to help the connectivity between the top metal plate and the rivets that go
>> through them?

> Peter :

> I would try tightening the rivets a little, by resting the outside end on something pretty firm (brass perhaps),
> and using a hammer and pin punch to stake the inside end a little more. Probably not a real high chance of
> success, but I can't think of anything else that won't be visible from outside.

> -Randall

Randall,

I did just as you said and pin punched the rivets from the inside. This now gave me continuity through the spark plug plate. I then hooked power up with hot going in terminal #1 and negative to terminal #3 (the body). I got a big spark and then nothing. I checked the continuity again through the rivets and I lost it. I took everything apart again, repunched the rivets and put it back together. This time I hooked hot to terminal #2 and negative to #3.

Worked like a charm. Motor turned for about two seconds then parked.

-Peter Schoppelry

Subject: Wiper park problems - dirty rivets
Date: Sun, 14 Apr 2002
From: <PeterSchop@aol.com>

Peter,

I have just been doing the very same thing this weekend on the wiper motor on my 4A.

Adrian wrote:

> Also the drive wheel has a different number of teeth and sweep angle. (120 degrees TR4A, 110 degrees TR4)
> Spitfire has 150 degrees I can only assume that this reduction of sweep angle is to clear the vent flap on the
> TR when open.

> -Adrian

Adrian,

I had to use two bad wiper motors to make one that worked. When my car had the fire in it, the wiper motor got so hot that the plastic drive gear looked like it boiled. The wiper motor off my parts car had no grease in the box and the drive gear shaft froze to the brass sleeve. I had to drill the rivets out that held the drive gear assembly together swap parts and put the good pieces back together. I now have a drive gear with 120 degrees stamped on it. Both came out of TR4's, one has a date of 6 62 and the other 2 63. I threw the old parts away so I don't know if it was 110 or 120 degrees. I also don't know which car the top plate came from which has the # stamped on it. The gear I have has 84 teeth on it. Can you confirm that this is 120 degrees?

Peter Schoppelry

Electrical/Wiper Motor

Subject: Wiper's carbon blocks-which way grooves go
Date: Tue, 23 Nov 2004
From: <ZinkZ10C@aol.com>

<CarlSereda@aol.com> wrote:

> Do the carbon block's grooves go parallel with the shaft and commentator or should they run perpendicular?

The brush (carbon block) grooves run parallel to the shaft. New brushes are grooved to allow quick seating.
-Harold

Electrical/Wiper Motor

Subject: Wiper Switch Hook-up
Date: Sat, 16 Apr 2011
From: "Carl TR" <cfmtr3a@verizon.net>

For the collective of wisdom of the list.

I have a 2-speed wiper motor from a TR4A that I am thinking about installing in my TR3 project. The original DR2 is non-functional (I guess too many days just sitting in high humidity).

There are three wires coming out of the motor that corresponds to the schematic at Advance Autowire <<http://www.advanceautowire.com/tr24a.pdf>> page 4.

Green (hot)
Brown/Green (fast terminal)
Red/Green (slow terminal)
Black is connected to the external housing (ground).

The switch I have is the same as:

http://s1001.photobucket.com/albums/af136/cfmtr3a/Information%20Items/?action=view¤t=TR4a_2-speed_pull-pull-push_switch.jpg
> From top down / back to front; Terminals are 1 4 6 7 8

Again referencing Dan's schematics: <<http://www.advanceautowire.com/tr2506.pdf>> page 2. The switch is more in line with what is on a TR6.

Is it possible to connect what I have or am I off-base. I don't want to go to the expense of different motor - but I can replace the switch if there is a better choice. What might be a suitable alternative? I don't know the terminal layout but one suggestion is the Lucas 39156 (54033632) which is a two-terminal light switch from a Stag.
-Carl

Subject: Wiper Switch Hook-up
Date: Sat, 16 Apr 2011
From: "Randall" <TR3driver@ca.rr.com>

> The switch I have is the same as: < http://s1001.photobucket.com/albums/af136/cfmtr3a/Information%20Items/?action=view¤t=TR4a_2-speed_pull-pull-push_switch.jpg>
>>From top down / back to front; Terminals are 1 4 6 7 8

Sure, that will work (assuming you really have the same switch, there are several different ones that look nearly identical).

Connect ground (black) to pin 1, slow speed (red/light green according to Dan's diagram) to pin 4, high speed (brown/light green " ") to pin 8.

Leave the others open.

The full switch logic is:

Off: 1 to 6 to 7

Low: 1 to 4 to 6 to 7

High: 1 to 4 to 7 to 8

> don't know the terminal layout but one suggestion is the Lucas 39156 (54033632) which is a two-terminal
> light switch from a Stag.

Took me awhile to find that one, it's only for a RHD, Mk II Stag. It's also kind of big, about 1.75" in diameter, and has five tabs (though two sets of two are parallel, so only 3 contacts). Wire it the same as above, the numbers 1, 4, 8 are molded into the back of the switch.

-- Randall

Electrical\Wiper Motor

Subject: TR2 wiper gearbox and motor greases
Date: Wed, 15 Jun 2011
From: Chris Simo <ccsimonsen@gmail.com>

Any newer/better products out there for greasing the motor bushings and grease for the wheel box?

I'm quickly running out of electrical things to fix on the TR2 – the motor on the wiper was frozen - the gear box white lube was quite hard and when I took that apart - the motor would not run on its own - Pulled it down and cleaned it up - used some semi-synthetic (whatever that is) [wheel bearing grease](#) on the front and back bushings and it spins like a champ - just don't know if that's the right grease for the long haul. Also - any recommendations on grease for the gears is welcome - I have an old tube of lubriplate but thought there should be something better in today's world.

Also - the needle bearings on the gear - any recommendation for grease type there? I figure I'm going to be sticking those pins in with a pair of tweezers....

-Chris

Subject: TR2 wiper motor refurb Part 1
Date: Thu, 16 Jun 2011
From: Chris Simo <ccsimonsen@gmail.com>

I finished the refurbishing last night. Thanks for the input on greases.

I ended up cracking open a new tin of synthetic wheel bearing grease and using that.

Teardown was interesting.

Things were pretty messy and really caked up with hard white-yellow grease. Hard dark brown grease caked around the cable slider part.

I didn't know how it went together so I wasn't about to pry on the gears. - I did not know if they were plastic or metal - they are metal (at least this one is.)

Under more gunk and the remains of a mouse nest - I found a little metal door on the bottom and removed the access screw.

Two shafts for the gears were there. One secured with a circle clip and one not. The straight cut gear did not have the circle clip. I used an automatic center punch on the center of the shaft to gingerly pop that gear out.

I found out later that the spiral gear did not need to be disassembled to remove - but I still think it was a good idea as in my case things were pretty jammed up. I removed the circle clip and washers and saw what I thought was an open ball bearing - it's actually needle bearings. Dabbed a bit of grease on the washer and stuck it back on - grease holding the washer in place and the roller bearings.

I figured - I better rotate the motor while extracting the bevel and used some needle nose to rotate the motor after each tap with the center punch. In hindsight - I should have just removed the back casing from the motor and separated the motor from the gear box by rotating the motor out of the gear. (That's how I reassembled it)

Any way - the gear was successfully removed without damage to either gear. There are two needle bearing sets on that shaft - one came out with the shaft and the other remained firmly in the case - which is why having the circle clip off was a good idea for me.

-Chris

Subject: TR2 wiper motor refurb part 2
Date: Thu, 16 Jun 2011
From: Chris Simo <ccsimonsen@gmail.com>

Routine clean up - managed to drop one set of the needle bearings and got to spend 20 minutes on my hands and knees....

I removed the insulation from the field wires and replaced with shrink wrap. Removed the brushes and holders - brushes are still about 3/8 inch long so I think they will last a while longer. Pulled the armature and cleaned up the interior of the motor - cleaned the bushings for each end of the motor and dabbed wheel bearing grease in each hole and just a finger coat on the shaft - wanted little or no excess, and greasing the motor shaft allows the grease to push out of the hole vs. - extruding it - (I was paranoid and pulled it apart to check).

Motor back together, took it to the car and fired it up - ran nice and quiet. Reassembly of the [gear train](#) was easy - I assembled the spiral gear and bearings as a unit - liberal use of wheel bearing grease and inserted each needle by hand - I tried to use tweezers but found my pointy fingers worked better. I filled the gearbox case with grease and pushed the gear/bearing assembly home. I then mated the motor to the gearbox - since I had fully assembled the motor - I ended up spinning the gear onto the shaft - worked fine. More grease packing and then inserted the straight cut gear. A few more screws and complete. No self park on this one - easy.

Now - how do I go about packing grease into the wiper cable?
-Chris

Subject: TR2 wiper motor refurb part 2
Date: Thu, 16 Jun 2011
From: Bob <yellowtr@adelphia.net>

> Now - how do I go about packing grease into the wiper cable?
>- Chris,

The only way I know is to remove the assembly, grease the cable and re-assemble.
-Bob

Bullet & Joint Connections

Electrical/Wiring Harness/Wire

Subject: Ignition wire originality question-Radio Static
Date: Mon, 5 Jul 2004
From: "Randall" <tr3driver@comcast.net>

> Personally, I consider radio static to be 'original' too.

FWIW, I have found the original resistors (one in the dizzy cap, and one at each spark plug) to be reasonably adequate at suppressing radio noise. Most of the remaining noise comes from the generator. Adding a 0.1 mfd mica cap across the generator output (right at the generator) will kill that too, but of course is not 'correct'.

And some radios (like my old Johnson CB) were sensitive to noise on the power wires. A 0.1 mfd from the key side of the coil to the engine block will help cut that down (and some 70's Triumphs came with such a cap), but the sure cure is an in-line filter in the power lead to the radio. If you've installed an alternator, this is the only way to keep the "alternator whine" out of the radio.

-Randall

Electrical/Wiring Harness/Wire

Subject: TR3A: Starting the Engine
Date: Thu, 5 Feb 2004
From: "Randall Young" <ryoung@navcomtech.com>

> Before I settle down to install the wiring harness and all that entails, I would like to consider starting my
> engine, as I seem to recall other Listers have done. My questions are:
> a.) Is this feasible?

Sure.

> b.) Is it a good idea?

Why not? Always helps keep my enthusiasm up!

> c.) What would be the minimum necessary wiring and electrical components to install to do this?

To crank, you'll need a battery, ground connection to engine (which can either be a cable directly to the engine block, or the stock strap to the body plus the stock strap from the body to the engine), cable to solenoid, solenoid, cable to starter.

To fire, you'll need a hot wire from the battery to the coil, and a point lead from the coil to the distributor. Of course, all the high tension equipment too (cap, rotor, wires).

But that's basically it, I've even been known to start them sitting out on the floor ... Don't forget to consider cooling and fuel issues.

-Randall

Subject: TR3A: Starting the Engine?
Date: Thu, 5 Feb 2004
From: <lstein6@earthlink.net>

I think it is a great idea to start the engine before finish. If something goes wrong, you don't have to undo some work. When I rebuilt the old GT6, I started the engine on the engine stand before putting it back in the car. All you need is the battery, long battery cables (good jumpers work), a small +12v wire (fused, switched) to the coil and of course a fuel line to the fuel pump. You can see a video of all that on my web site if you want. It's kind of funny & entertaining, really. Seeing the radiator bolted to a wood frame. Possibly the funniest is seeing me sweating bullets that the thing was going to smoke.

-Larry

Electrical/Wiring Harness/Wire

Subject: TR3A Switched Circuit
Date: Tue, 18 Jun 2002
From: "David Brister" <david.brister@wanadoo.fr>

David,

You would be very wise to arrange your electric fan circuit so that your "ignition on" (from the switched downstream side of the fuse box) wire energizes a relay which will carry the fan current, probably 10-15A or so. The fan current itself should perhaps come from the top of the starter solenoid in a big fat wire with a suitable fuse, (say 25A) in an accessible position. A relay rated at 30A costs equivalent of \$5 (US) in a car parts shop in UK. Or about 5 euros if you live here in France. Hope this makes sense.

-David Brister

Electrical/Wiring Harness/Wire

Subject: TR4 Driving lamps
Date: Sat, 22 Apr 2006
From: "Randall" <tr3driver@comcast.net>

> I'm in the process of wiring up a pair of vintage Lucas lamps, one spot the other fog, into my 64 TR4. I've read

> Dan Masters' directions for wiring into a 250/TR6. I am doing an alternator conversion, which means I will also change the polarity to negative ground. My questions are:

> 1. Any reason why I can't apply Dan's wiring scheme to the TR4?

I've not seen the article in question, but ISTR Dan doesn't like ammeters. My personal suggestion is always to add loads to the alternator/car side of the ammeter, so the ammeter still correctly indicates how much charge/discharge the battery is seeing. Connecting loads to the starter solenoid will cause the load current to look like charge current to the battery. Connecting the alternator here (as ISTR Dan suggests) will cause the ammeter to always read discharge, even when the battery is being overcharged.

> 2. If I put relays in the scheme, what size do I use? Sized for each lamp's amperage?

As a minimum, yes. However, an ordinary "fog light" relay is usually rated higher, like 20 amps, and will work just fine.

> 3. What size fuses in the in-line fuses?

> 4. The bulb in the spot is 48 Watt, meaning it draws 4 amps, right?

> Anything else I should be wary of?

Incandescent bulbs draw a lot of extra current when they are first turned on (which is why the bulbs in your house so frequently fail when first turned on) so the fuse needs to be a bit larger than the bulb rating. Ideally the fuse should be matched to the current capacity of the wire you use ... larger wire and fuses mean less resistance which means more light. So I'd probably do something like 14 AWG wire (which can handle up to 30 amps) and a 25 amp fuse.

-Randall

Subject: TR4 Driving lamps
Date: Sat, 22 Apr 2006
From: Chris Kantarjiev <cak@dimebank.com>

You might take a look at my article about this:

<<http://www.dimebank.com/tech/WiringDrivingLights.html>>

-Chris

Electrical/Wiring Harness/Wire

Subject: Wiring Harness Installation in a TR4
Date: Sun, 06 Feb 2000
From: "Sherman D. Taffel" <staffel@home.com>

Irv-

I just installed a new wiring harness in my TR4 yesterday. My Wood dash is not on yet, but the metal unit is complete, along with all dash crash padding top & bottom. In order to feed the harness to instruments, steering column, dimmer and wiper motor-you have to feed the harness in stages and carefully **BEHIND THE HEATER MOTOR**. In order to do this, I removed only the glove box. Then you can work both through and below the glove box area. Not a hard job, just work thoughtfully. After feeding the harness through the firewall the engine bay install the grommet from the front of the harness, working backward along the harness to the place it goes, and then 'pop' it in. Use of needle nose pliers to spread the grommet opening helps a whole lot in feeding through the individual wires and connectors. Have fun!

Electrical/Wiring Harness/Wire

Subject: Wiring harness tape
Date: Mon, 15 May 2006
From: "Graham Stretch" <technical-iwnet@wight365.net>

"Jim Wallace" <grandfatherjim@gmail.com> wrote:
> Will be installing a wiring harness made from an < www.advanceautowire.com > kit, and thinking about tape:
> has anyone tried that black tape that's rubbery, advertised as even good for plumbing repairs, and "welds" to
> itself though it has no glue? I wonder how it might stand up to weather.
> What other things have people used with success? I don't think I want to go with the non-adhesive stuff; it
> just seems like it would be difficult to work with.....
> - Jim Wallace

Hi Jim

I have used the sticks to itself tape (self amalgamating) and it is quite good for making a waterproof end like where the coax cable meets the satellite dish, other than that not so good. Insulating tape is good to start and finish a loom run, but for the main taping it has to be the non sticky loom tape, if possible make a pin board from your old loom and run the wires out on that. When taping the loom, tape from the ends of each branch back to the main run and then do the whole length of the main run from end to end, that way the end to end run will hold down the finish ends of each branch, the start of each run should be self supporting though a turn of sticky over the outside will hold it still while you get started and can be removed afterwards if you wish.

-Graham

Subject: Wire harness tape
Date: Mon, 15 May 2006
From: <FGFO1@aol.com>

Try using ice hockey tape. It's about 3.00 a roll at your local ice rink. its adhesive but with a very low tack. It's a cloth based tape also. So it will look kind of original. Easy on, easy off and stays on a long time.

-Frank Fisher

Subject: Wiring harness tape
Date: Tue, 16 May 2006
From: Chris Kantarjiev <cak@dimebank.com>

I suggest that you look to the good folks at British Wiring (contact info in the Monster List, <www.dimebank.com/monster>) for the proper wrapping tape, as well as wire, bullets and complete harnesses. They know how to do it right and will sell you all the best stuff...

-Chris

Engine

Subject: A RIDE ON THE DARK SIDE New car Engine Break-In
Date: Wed, 24 May 2006
From: "fred thomas" <frede.thomas2@verizon.net>

On a home rebuild or a machine shop rebuild, the very best way to seat the valves & rings is quick short burst in 1st gear, over and over again, but only in 1st gear and not winding them out, quick burst, this comes a very well known rebuild in my area. On a brand new car they are ready to go however you want to drive it why you bought it,

- "FT"

Subject: Breaking in engine in first gear
Date: Thu, 19 Oct 2006
From: "John Macartney" <standardtriumph@btinternet.com>

Being a dyed-in-the-wool old stuff shirt and (mostly) rejecting modern conventions, I fail to see what benefits anyone can gain from busting a gut to break in an engine by revving the hell out of it in first gear. In fact, I can't see why anyone with a newly rebuilt engine of any make would want to get the break-in period completed so soon. Surely, the objective of spending so much time and money in restoring an old car - of which an engine/gearbox rebuild is only a part (and old technology to boot) - is to be able to enjoy using the damned thing, trouble-free for as long as possible? With that in view, I still opine towards the technique we used at Standard-Triumph and this was to drive the car under light loads for at least 500 miles - and 1000 miles if at all possible. You don't use a heavy right foot, you don't rev it to the red line - or beyond and you just let it run happily under light load between 2500-3500rpm. Taking the car on a long journey with more or less constant running at varying road and engine speeds gets everything good and hot, so it beds in gradually. Everything will still be fairly *tight* even after 5000 miles - but at least the job will have been done properly. Thrashing the living daylights out of your Triumph, MG, Sunbeam, Jaguar or whatever it is, IMHO is an abdication of responsible ownership and a complete waste of all the effort you've put in to concluding your project.

-Jonmac

Subject: Bedding-in - rings vs. lifters
Date: Thu, 19 Oct 2006
From: "Michael Marr" <mmarr@notwires.com>

> If the piston ring bedding-in system described in that article is to be used, how does it affect the cam and lifter bedding-in? I was prepared to run the car for about 20 minutes at 2000 rpm, I think it was, to deal with the cam/lifter set, but from what is being said then it's "too late" for bedding-in the rings.....and I have to deal with both.....any input?

Personally, I think we are being far too analytical with this subject. This is what the official TR3 Instruction Book says:

"New Engines (see "Running Adjustments ") For at least the first 500 miles, the working surfaces of the engine will be bedding down. The power and performance will improve only if the vehicle is carefully driven at moderate speeds during the running-in period. The engine should not be driven at speeds exceeding 3,500 R.P.M. during this period, and the "running-in " should be progressive. The engine may "rev." fairly fast so long as it is thoroughly warm and provided it is not pulling hard. Do not let the engine pull hard at low speeds, always select a lower gear."

I have always run my engines in just this way and have never had a problem. The TR engine is very far from rocket science.

-Michael Marr

Engine

Subject: TR3 Engine rebuild
Date: Sat, Oct. 02, 2010
From: "Carl TR" <cfmtr3a@verizon.net>

Well - I finally got the breather pipe plug out. Major operation... Initial efforts resulted in the plug being pushed inwards. I eventually was able to drill a hole in it, threading a 1/4" lag bolt into the hole. I was then able to "reverse" the plug out by turning the bolt. Had to take off the oil pan and clutch slave to gain access.

I know this has been covered before but one old email and a more recent thread from the archives: Is the outlined process below correct?

-Carl

1997 email:

There are several ways to tackle this... here's what I did when I started my fresh motor the first time...

For some reason (dunno why) you're supposed to do the break-in with 30wt non-detergent oil. We took a pressure plant sprayer and filled it with oil, then adapted the nozzle end to fit into the oil pressure sending unit hole. Then we pumped that oil into the block this way. Theoretically, this pressurized to some extent the entire oil galley, and I even remember reading the pressure (albeit less than 10 pounds or so) on the gauge. Once all the oil was in, then we fired it up. We ran it for 1 hour, then dumped the oil and changed the filter, poured in fresh 30 wt (no plant sprayer this time), replaced the sending unit, then started it up again. After about 500 miles I changed the oil and filter again, and did another 500 miles. After that first 1000 miles I switched over to Mobil 1- 15W50.

2004 thread:

TERJE_KOLBEINSEN@bluezone.no wrote:

I've just completed assembly of the chassis / drive train of my 1957 TR3. Yesterday I turn the engine around for the first time using the starter (no ignition yet) and my question is: Am I right to worry not being able to get oil pressure readings during this short, slow RPM turning?

Is there anything I could do to ensure oil is transferred through the system?

Dave Massey wrote:

You should see oil pressure when turning the engine on the starter but since this is a fresh rebuild it may take quite some time to prime the pump. If you have the spark plugs removed the starter will turn the engine more quickly with less of a load on the starter so you can turn it for longer periods than if the plugs were installed.

Since this is a fresh rebuild did you pack the oil pump with some grease? The pump depends on oil filling the clearances and without it (if the pump was dry) air will bleed pass these clearances and it will not pump well at all. Packing it with grease (both petroleum jelly or the special engine assembly grease are good choices) will close off the clearances within the pump and it will prime more readily. Without oil or grease it may take several minutes of cranking before you get pressure.

I highly recommend that you verify oil pressure before you attempt to start the engine.

Randall wrote:

> Since this is a fresh rebuild did you pack the oil pump with some grease?

The pump on the TR3 hangs down into the oil, there is no need to prime it with grease.

But the comment about spinning the engine with the plugs out, and it taking some time to build oil pressure, is right on target. After all, you've got that great big filter canister to fill, and the pump only puts out a little

bit per revolution.

In theory you can take apart the distributor drive and turn the oil pump with an electric drill until it fills all the passages, but IMO it's a lot of work for no gain. As long as you've smeared everything with assembly lube, it won't hurt at all to turn the engine with the starter, especially with the plugs out.

Paul Dorsey wrote:

At VTR recently, I was told to prime a newly rebuilt engine by using a drill motor to spin the distributor shaft and temporarily produce oil pressure prior to starting the engine. I thought this sounded like overkill, is it?

Jack Drews wrote:

It may be overkill if you're doing your own work on your own car because if you need to solve a problem, your labor is "free", but my opinion is that it's a good thing to do. I've built quite a few TR engines for vintage racers and for cars being restored. I always fill the whole system by turning the pump over with a drill. You can do the same thing with a crank-type spin-on wrench but by using an electric drill and 30 weight startup oil, the speed of the drill will produce 50 to 60 psi. For cars with oil coolers, sometimes remote oil filters, and lots of hose connections, I like to get the whole system full, check for leaks prior to startup, and make sure that the pump is primed.

But then, I also run each engine on a test stand before giving it to the customer. This is especially important to me since about half the engines I build are installed by the owner, not me. I started running the engine on a stand after I shipped an engine from my shop in Illinois to a customer in Colorado. He had a massive oil leak at the rear of the engine, and I went to Colorado and fixed it.

I've run into some really goofy things and saved myself and my customers from a lot of grief by running each engine on a stand, and pressurizing the system will uncover some but not all of these problems. For example, the aftermarket rear seals don't work 100% of the time. Occasionally I have to replace them (but since I've found out what to alter I've had a 100% success rate). I had an engine that had a timing cover leak -- the pulley seal was misidentified by the vendor. It had the right OD but an incorrect ID. I didn't notice that there was no lip seal tension when I put the front pulley on - one more thing to check. I particularly like the ability to run in a new camshaft myself and retorque the head, something that customers cannot be trusted to do, I've found out the hard way. Water pumps are troublesome too and some are leaky, and rather than try to justify to a customer a policy of replacing them all, I use the customer's present pump and replace when necessary.

Engine

Subject: Engine Rebuild
Date: Wed, 13 Feb 2002
From: "Randall Young" <ryoung@navcomtech.com>

> At what point would a Triumph engine require an overhaul? Is there some mileage point where one should
> start to think about it?

There is no way you can trust the odometer reading on a car this old (minimum 20 years) anyway. Even ignoring the fact that speedos fail and get replaced, how many times has it rolled over? As others have commented, mileage really isn't the thing to be looking at anyway. Gross neglect or abuse can ruin an engine in 10,000 miles or less, quality care can extend it to 200,000 miles or more.

Things to look for:

Engine rattle when first started cold (sitting overnight or longer).

Blue smoke while driving, especially after decelerating for a bit then suddenly opening the throttle. If you can follow the car, puffs of blue at shifts, is another clue the valve guides are tired. Constant blue, worse on acceleration, is usually rings. Just sitting, you can usually see a haze on the rear paint that also indicates oil burning.

Lots of oil leaks, or disconnected PCV system, usually indicates excessive blow by.

And of course, low oil pressure at hot idle.

But, as someone already commented, the body work is more important, only because it's more expensive to fix. Just because an engine is 'tired', doesn't mean it's unreliable either.

-Randall

Subject: Engine Rebuild/Any TR
Date: Wed, 30 Jan 2002
From: <mporter@zianet.com>

Ed Lancaster writes:

> I take pride in the fact that I have done all the work on this car so far. I would like to preserve this record if
> at all possible. To those on the list who have tackled this project: What do you think? Is this doable by an
> amateur mechanic or is it a job best left to professionals.

The most notable problem any decent amateur mechanic has in doing a first rebuild is:

- 1- Determining what can be done at home, and what needs to go to the machine shop.
- 2-What can/needs to be replaced?

Sometimes, only experience helps. But, here are a few good rules of thumb:

Head--send it off to the machine shop. Have it degreased, bead blasted, if necessary, checked for straightness, and make sure the shop checks the valve guides, the core plugs, etc. Let them do the work necessary for valve grinding, etc.

Crank--same goes as above. Have it cleaned, checked for cracks, journals resized or polished, as is necessary. Have them check for grooving at the rear main seal area, and install a Speedi-Sleeve, if necessary.

Connecting rods--take them to the machine shop, too. Have them checked for straightness and big-end roundness. I've run into a couple of six-cylinders which had a stretched big end on the #1 rod.

Pistons--clean and inspect. Are all the ring lands straight and true? Is the piston pin fit still good?

Block--off to the machine shop. Let them hot-tank it (check for any attached aluminum doo-dads first--they'll melt away), check the saddles for straightness, check the bores for size and roundness and any tapering, and let them advise about need for boring oversize.

The rest is a matter of _careful_ inspection. Pocketing on the lifter running surfaces? Replace. Scoring on the camshaft journals or lobes? Replace, or find a good regrind. Is the Oil pump beyond spec? Replace. It's a good idea to replace the valve springs, anyway, even if they look okay. Springs do get tired after long usage. Are all the push rods straight? Check them. Etc., etc. Look at everything. If it looks worn, it probably is.

The rockers and shaft are probably worn to some degree, but the advice there is to send them out for rebuilding, rather than replace all the components. There's at least one rebuilder in CA which does a good job (actually improves on the original) for the price of about six new rockers.

The remainder, then, is thorough cleaning, degreasing, and careful reassembly. Most of the assembly work is detailed decently in any of the reprints of the factory manuals, but, just in case you don't remember what went where, keep a camera on hand during disassembly, and take a picture any time you think order of assembly might not be apparent to you later.

New timing chain and tensioner, etc.

While everything is at the machine shop, give the neglected parts a good looking-over. Most of us could care less about what the condition is of the distributor and its drive, for example, as long as it works, but having it rebuilt will go a ways toward smoother running.

And, as you've probably realized already--there's lot of advice here.

-Cheers.

Subject: Rebuilt Engine Still Stuck
Date: Wed, 24 Apr 2002
From: Doug Hamilton <douglasehamilton@shaw.ca>

Others have covered the importance of not swapping main or rod bearing caps so I'll just mention a point that an old LBC mechanic told me to check on my rebuild if you have a 3 main bearing engine such as your TR2-4/A you should always check the crank and block are true when reassembling, by installing the crank with just the front and rear bearings and caps and putting a dial indicator on the exposed center main and measuring the run out at the center main while turning the crank over. If things aren't true the block needs to be check for alignment and the crank needs to be checked for straightness.. As a general rule I always check all the measurements on the parts I've had machined before reassembling my engines after all your machinist can have a bad day just like you can. The minimum I would do is plasti-gauge all the bearings on reassembly so you have some confidence that everything is fitting together properly. One thing I haven't seen any one else say but should be obvious use all new bearings and make sure to strip and clean everything you've had a major engine failure here. Clean the rocker arms and shaft, oil pump, etc anywhere that could be contaminated with metal bits from the engine failing you don't want to do this again in another 300 miles. Also you don't have to be a genius to do a good job rebuilding an engine but you do have to look after all the little details.

Good luck

-Doug Hamilton

Subject: Rebuilt Engine Still Stuck
Date: Tue, 23 Apr 2002
From: "bschwart@postoffice.pacbell.net" <bschwart@postoffice.pacbell.net>

>>> It may be possible that I have used the center main cap from the donor engine instead of the original one >
>>> that was in my engine. I cannot see any difference in the center main bearing caps.

- > This may be your first mistake -
- > The bearing caps are mated to each block (one reason why they are numbered)
- > As well as each rod and cap. You cannot just use one from one engine and one from another. The only way to
- > use different parts from different engines is to have them assembled then bored and or align bored (the
- > procedure that your machinist was describing). If this is done (correctly) then all the bores are true and set as
- > they were from the factory. The block must be disassembled, the cracked cap **MUST** be replaced and the
- > whole thing align bored - basically starting from scratch.

Subject: TR2/3 Rebuilt Engine Still Stuck
Date: Wed, 24 Apr 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

- > Others have covered the importance of not swapping main or rod bearing caps so I'll just mention a point that
- > a old LBC mechanic told me to check on my rebuild if you have a 3 main bearing engine such as the your
- > TR2-4a you should always check the crank and block are true when reassembling, by installing the crank with
- > just the front and rear bearings and caps and putting a dial indicator on the exposed center main and
- > measuring the run out at the center main while turning the crank over.

This actually only checks the crank for straightness, it won't detect a defect in the block. You can do the same test with Plastigage, by checking the center main clearance with the crank in 3 different positions.

-Randall

Engine/Bearings/Cam

Subject: Engine break-in (LONG)
Date: Fri, 16 Aug 2002
From: "Fred Thomas" <vafred@erols.com>

Today I visited a engine rebuilding shop and the owner gave me his instruction sheet for breaking in a newly rebuilt engine, some neat points and I will post this using his exact writing instruction sheet:

- 1- Adjust lifters, carburetors and timing as close as possible before starting.
- 2- Remove the coil wire and build oil pressure before starting the engine.
- 3- Start engine and observe oil pressure gauge and set engine speed for 25 mph until normal operating temp is attained, observe oil pressure & engine temp and run engine at this speed for several minutes, shut engine down and retorque cylinder head & manifolds.
- 4- Recheck carb adjustment, valve adjustment & timing (Valve seating may cause valves to tighten)
- 5- Repeat starting procedure as above (build oil pressure first, see # 2)
- 6- After starting motor make a test run at 30 MPH and accelerate rapidly to 50 mph doing this at least 10 times. If traffic conditions do not permit this procedure, accelerate the engine rapidly several times through the intermediate gears during the check run.
- 7- In town driving is ideal for breaking in new motors. The first 0-100 miles should be accomplished with short burst of speed, the object is to apply a load to the engine for a short period of time and in rapid succession, soon after engine warm up. This action thrusts the piston rings against the cylinder walls with increased pressure and accelerated ring seating, during the engines first 0/100 miles the engine should not be allowed to "coast" continually (such as flat highway driving), more importantly **DO-NOT** allow the engine to lug or overload for the first 500 miles. Towing or driving in mountainous terrain is a terrible way to break-in a new motor. Your motor should never be allowed to "pink" from carrying a load, "Especially before it is completely broken in".
- 8- Most engines break-in between 500 to 1000 miles, readjustments may be required at that time to the carbs, ignition and valves, and manifolds.

I thought this was very interesting especially the short bursts of speed and in-town driving, he says oil pressure and normal temp are a must for good engine break-in and the total life of the engine. "FT"

Subject: Engine break-in (LONG)
Date: Fri, 16 Aug 2002
From: <ZinkZ10C@aol.com>

<vafred@erols.com> writes:
Good stuff cut from above.

>> I thought this was very interesting especially the short bursts of speed and in-town driving, he says oil
>> pressure and normal temp are a must for good engine break-in and the total life of the engine. "FT"

Yep, all true. Running a autocross and limiting RPM would be good as well. During normal operation, the piston rings are forced outwards (and some are designed to twist) under load. Running an engine at constant speed and /or light load will not push the rings outward so the cylinder walls will glaze from excess oil baking onto the bores.

Running the engine under a short moderate load pushes the rings out to scrape off high spots, then while coasting, engine vacuum draws fresh oil up the walls to wash off small metal particles. All good practice.

When building my Formula Ford engines (1.6 L Kent for Brit content) the rings are installed dry with just a light coating of oil on the skirts. This is the recommendation from Total Seal rings.

A crankshaft needs zero break-in if the clearances are set right (loose is better than tight). Rubbing items such as

push rods, rocker arms, valves, timing chains and cam shafts do need a longer term break-in period. Running too fast creates more localized heat while these parts run in.

The cam break-in for most designs (cam in block) needs 1500 RPM. The only reason to run an engine at a elevated speed for cam break-in is to assure ample supply of oil (thrown from the rotating crank shaft, mostly rods) to the lobes and lifter faces. Many overhead cam engines have oil jets spraying directly at the lobes, elevated RPM might not be needed in this case.

Some valves are ground with a interference fit on the faces, The seat at 45* and the valve at 44* for example This allows the valve and seat to hammer each other into each other creating a thin hardened layer that is more durable than the base metal. This also assures a perfect seal between the two but it takes a bit of run time to do so. It will cause the valve lash to tighten up and the engine runs in though. I doubt a performance valve grind would use mixed angles and the valves would most likely be lapped in anyway. Mixed angles are more of a production line engine issue.

-Harold

Subject: Engine break-in (LONG)
Date: Mon, 19 Aug 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> While there seem to be plenty of good reasons to break-in with bursts of load (which means driving in the
> traffic for most of us without a rolling road), cam shops insist that you break-in the camshaft 20 minutes or
> more at 2000 rpm, like Harold says, to insure good cam lubrication.

There's definitely no single answer to engine break-in. Just to illustrate the point, Kas Kastner recommends letting the engine run at low rpm, just above idle, for several minutes, to work harden the surfaces of the cam and lifters.

-Randall

Engine/Connecting Rod

Engine/Gudgeon Pin (Wrist Pin)

Engine/Bearings/Main

Subject: TR 3 Main journal bore
Date: Wed, 3 Dec 2008
From: "Randall" <tr3driver@ca.rr.com>

Bob Nogueira <peter@nosimport.com> wrote:

>> My Machine shop just called and said they could not find the dimensions for the main bearing bore. (This is
>> not the measurement for the crank journals but rather the size of the bore that holds the main bearing shells.
>> It is not in my manual. Anyone happen to know it?
>> -Bob

Peter Caldwell wrote :

> Vandervell says:
> F. C. & R.M. 66.675 - 66.687mm or **2.6250" - 2.6255"** (in.)

Which nicely matches the figures given in the factory workshop manual, page B1.

-Randall

Engine/Bearings/Thrust Washers

Subject: Thrust washer's direction
Date: Tue, 29 Jan 2008
From: Bob Labuz <yellowtr@adelphia.net>

<DLylis@aol.com> wrote:

> If I may raise an old subject once again. I just want to check with the list. I am helping a friend rebuild his 3A
> motor and as most often happens when three or four guys work together questions come up that might not be
> raised when working alone. This one has to do with thrust washers. The factory manual says to put them in
> with the 'white metal side against the crank shaft". The thrust washers (TW) that were received from the
> supplier are steel on one side and brass/bronze (?) on the other. The yellow metal side has oil grooves in it. As
> the TW's were being installed with the steel side against the crank (because it is white metal) I said NO.
> First the steel side has slightly raised numbers stamped into it, and the yellow metal side has the oil grooves
> which should go against the rotating member. Turn them around. This is the way I have installed these things.
> All agreed that my logic was correct, "but it says. . ." I never questioned the yellow metal side with the oil
> grooves against the crank as correct until this. What say others?
> -David Lylis

David,

You are correct, the washers are inserted so the "groove" sides are against the crankshaft.

-Bob

Subject: Thrust washer
Date: Tue, 29 Jan 2008
From: <jeyoung_2@yahoo.com>

I will hazard a guess here. Perhaps the original thrust washers were babbitted on one side. Babbit metal is white compared to steel which is more Grey. Babbit was once used as bearing material in rods (Ford T for one). Thus the white side goes against the crank where most of the wear would take place. For the ones with bearing bronze rather than babbit, the bronze should be against the crank. A "modern" version of the instruction would be: "Put the bearing surface against the crank". A true WAG.

-John Young

Engine/Bearings/Thrust Washers

Subject: Thrust Washers
Date: Thu, 4 Mar 2004
From: "Randall Young" <Ryoung@navcomtech.com>

> Unless someone can bring new information to the table, I think my options are to pick either .003" which is
> too tight or .008" which is too loose.

Get some fairly fine sandpaper (300 wet or dry should do, use it wet), lay it on a flat surface (MDF or a sheet of glass) and dress down the oversize thrust washers by .001". It will only take a few seconds, as they are very soft. ISTR this is even described in the TR2/3 service manual.

> I understand that this is a real weakness in the TR4 engines so I want to get it right.

It's actually not a weakness in the TR4 engine ... the problem is with the TR250-6 engine which has only half as much thrust surface as the TR2-4 engine. The 6 pot is also known for letting the washers fall out of place when they're well worn, but I've never heard of that happening with the TRactor motor.

You could probably "get away" with either the .003" or the .008" ... the danger with going too tight is that thermal expansion may remove all the clearance which would make the bearings overheat and weld, while the larger clearance allows the crank to bang into the washers every time you depress the clutch, which will shorten their life somewhat. But since it's so easy to do right ...

-Randall

Engine/Bearings/Thrust Washers

Subject: TR4A - Measuring Crankshaft End-Float
Date: Thu, 25 May 2006
From: "Guy D. Huggins" <guy@genfiniti.com>

Listers,

I am attempting to measure the crankshaft end float as described in the Workshop Manual. According to it, you take a feeler gauge and measure the space between the central bearing cap and the thrust washer.

My issue is that I cannot move the crankshaft to one extreme end in order to create this space. The crank rotates freely enough, but I can't get it to slide end to end.

Using Plasti-gauge I measured the clearance between each crank journal and bearing to be:

Front - .002"

Center - .0015"

Rear - .002"

These measurements are all within range. I was contemplating backing off the center cap bolts a bit to loosen the tension, but would this create an inaccurate measuring scenario?

Any suggestions?

-Guy D. Huggins

Subject: TR4A - Measuring Crankshaft End-Float
Date: Thu, 25 May 2006
From: "Randall" <tr3driver@comcast.net>

> According to it, you take a feeler gauge and measure the space between the central bearing cap and the thrust washer.

I think you've misread the manual, Guy. The measurement should be taken between the thrust washer and the crankshaft thrust surface. Since the washers sit in a notch in the cap (otherwise they would fall out), you can't get in between the washer and cap with a feeler gauge.

> My issue is that I cannot move the crankshaft to one extreme end in order to create this space. The crank rotates freely enough, but I can't get it to slide end to end.

That sounds like there is something wrong. What happens if you try to slide a thin (like .002") feeler in on each side of the center cap? Are you sure that all the thrust washers are the same thickness (or at least are paired upper and lower)? Seated properly in the notches?

How hard are you prying on the crank to move it end-to-end?

> I was contemplating backing off the center cap bolts a bit to loosen the tension, but would this create an inaccurate measuring scenario?

Yes, I believe it would. The cap might tilt slightly and throw the measurement off. However, you need to identify and fix the problem, so this might lead you in the right direction.

Generally TRactor motors don't have thrust washer problems like the TR5/6 motors do. But I've learned through the years not to ignore anything 'odd' during an engine rebuild. Almost always, it comes back to bite you.

-Randall

Subject: TR4A - Measuring Crankshaft End-Float
Date: Thu, 25 May 2006
From: "Graham Stretch" <technical-iwnet@wight365.net>

Hi Guy

If the engine is in the car, the clutch pedal can be used to push the crank forwards, if out of the car use a lever on the flywheel or front pulley to move the crank to one extreme.

-Graham

Engine/Block

Subject: Coating the inside of block
Date: Mon, 13 Aug 2007
From: <DLylis@aol.com>

What is the conventional wisdom in coating the inside of a block? I have used Glyptal years ago, but now I am reading that this may not be a good idea.

-David Lylis

Subject: Coating the inside of block
Date: Mon, 13 Aug 2007
From: Beth Lang <mlang@easystreet.com>

David,

For what it's worth, the factory apparently coated the inside of the TR3 block that I am currently rebuilding with some sort of black compound that dried with a glossy surface. It appears to be in pretty good condition considering that its 50 years old and has been soaked in motor oil for who knows how many 10's of thousands of miles.

-Mike

Engine/Block

Subject: Compression ratio
Date: Fri, 03 Oct 2003
From: Ted Schumacher <tedsimx@bright.net>

T. S. White wrote:

>The discussion of compression ratio leaves me with a lingering thought, God help me. I just had my block
>bored too. But I didn't think boring the block would change my compression ratio. Does it in fact do this or
>do the ratios of the components remain the same even though the dimensions change?

Hello list!

Here is the formula for compression ratio. $CR = \frac{V1 + V2}{V2}$. V1 is the volume of the cylinder. V2 is the volume of space above the piston at TDC (top dead center). Example - V1 = 450 cc's; V2 = 50cc's so 450 plus 50 = 500 divided by 50 (V2) = 10:1. Making the bore bigger increases compression. Having domed pistons reduces V2. Dished pistons reduces V1.

-Ted Schumacher

Engine/Block

Subject: TR Restart
Date: Tue, 23 Apr 2002
From: "Frank & Sandy Crowe" <thecrowes@hotmail.com>

Hi, and welcome back into the world of TRs!

>> 1. The engine has not been turned over in 12 years. I am going to add "mystery oil" to each of the
>> cylinders, and let it sit for about a week, before I even attempt to turn it over. Any other suggestions?

I would NOT turn the engine over without some help to the rings and bearings.

I have a '54 Swallow Doretti (Aluminum body with a TR2 drive train) which had been parked for 25 years.

First thing I did was to pull the plugs and spray a goodly quantity of Kroil penetrating oil into each cylinder (use what you like, but Kroil seems to be one of the best penetrating oil.) Repeat for several days to make sure things are loose.

Squirt some motor oil into each cylinder to get some lubricant in there.

Change oil and filter. Pull the valve cover and pour oil over the valve train.

To flush the old oil from the bearings, I made a small tank out of big PVC pipe, put a tire valve stem at one end, poured oil into the other, screwed in a small valve, pressure gauge and appropriate fitting to adapt to the oil pressure line coming off the engine. With air pressure in the tank, I could pressurize the engine before ever turning it over (by hand the first time.) This way when I hit the starter (remember, no plugs) I could crank the engine over and verify I had oil pressure.

After everything was up and working I put the plugs back in, put some fuel in the carbs (fuel pump needs work - and get rid of that old gas!) pressurized the oil galley and hit the starter - and surprise!!! The engine started with no choke or throttle and came right up to idle!

-Frank

Engine/Block

Subject: TR2/3 Rebuilt Engine Still Stuck
Date: Wed, 24 Apr 2002
From: Doug Hamilton <douglasehamilton@shaw.ca>

Others have covered the importance of not swapping main or rod bearing caps so I'll just mention a point that a old LBC mechanic told me to check on my rebuild if you have a 3 main bearing engine such as the your TR2-4A you should always check the crank and block are true when reassembling, by installing the crank with just the front and rear bearings and caps and putting a dial indicator on the exposed center main and measuring the run out at the center main while turning the crank over. If things aren't true the block needs to be check for alignment and the crank needs to be checked for straightness. As a general rule I always check all the measurements on the parts I've had machined before reassembling my engines after all your machinist can have a bad day just like you can. The minimum I would do is plasti-gauge all the bearings on reassembly so you have some confidence that everything is fitting together properly. One thing I haven't seen any one else say but should be obvious use all new bearings and make sure to strip and clean everything you've had a major engine failure here. Clean the rocker arms and shaft, oil pump, etc anywhere that could be contaminated with metal bits from the engine failing you don't want to do this again in another 300 miles. Also you don't have to be a genius to do a good job rebuilding an engine but you do have to look after all the little details.

Good luck

-Doug Hamilton

Subject: TR2/3 Rebuilt Engine Still Stuck
Date: Tue, 23 Apr 2002
From: <bschwart@postoffice.pacbell.net>

>>>It may be possible that I have used the center main cap from the donor engine instead of the original one
>>> from my engine. I cannot see any difference in the center main bearing caps.

>This may be your first mistake -

>The bearing caps are mated to each block (one reason why they are numbered)

>As well as each rod and cap. You cannot just use one from one engine and one from another. The only way to

> use different parts from different engines is to have them assembled then bored and or align bored (the

> procedure that your machinist was describing). If this is done (correctly) then all the bores are true and set as

> they were from the factory

>The block must be disassembled, the cracked cap MUST be replaced and the whole thing align bored -

> basically starting from scratch -

Subject: TR2/3 Rebuilt Engine Still Stuck
Date: Wed, 24 Apr 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> Others have covered the importance of not swapping main or rod bearing caps so I'll just mention a point
> that an old LBC mechanic told me to check on my rebuild if you have a 3 main bearing engine such as the
> your TR2-4A, you should always check the crank and block are true when reassembling, by installing the
> crank with just the front and rear bearings and caps and putting a dial indicator on the exposed center main
> and measuring the run out at the center main while turning the crank over.

This actually only checks the crank for straightness, it won't detect a defect in the block. You can do the same test with Plasti-gage, by checking the center main clearance with the crank in 3 different positions.

-Randall

Engine/Block/Connecting Rod

Engine/Block/Crank

Subject: TR6 crank pulley - Where's the timing marks? Now what?
Date: Sat, 24 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I bought a crank pulley (harmonic damper) from Moss but they apparently didn't think that telling people that
> the pulley doesn't come with timing marks was important. It certainly wasn't mentioned in their catalog or by
> the salesperson when I called to order one.
>
> So now what should I do? Etch some marks to match my old broken crank pulley (which God only knows if
> it's slipped on the rubber between the two pieces)? Take it to a machine shop to have it marked? Any
> suggestions are appreciated.

Mount it on the crank, build/buy a piston stop, and mark it yourself, on your engine. See
<<http://www.cranecams.com/?show=article&id=3>> for detailed instructions on how to find TDC. Then use a
little math to measure off from there to where your timing marks should be.

A serviceable piston stop can be made from an old spark plug. Break away the ceramic and either tap the body
for a bolt, or weld in a bolt. Or any hotrod shop will be glad to sell you one.

-Randall

Engine/Block/Pistons

Subject: Decarbonization
Date: Fri, 12 May 2006
From: "Randall" <tr3driver@comcast.net>

> Since the head is off of the 3B, not a practical solution anyway.

I know that, Darrell, I was just kidding.

> For all Listers, if you could see the amount of carbon build up on the top of Pistons on motors that have been
> run a few miles, I would say you would all be saying "Off with her Head."

Honestly, it's never been that much of a problem for me. My pistons seem to get coated pretty quick, just a few thousand miles, and then don't build up much beyond that. Still run just fine. But if I am putting back used pistons, I usually take off the deposits with careful use of the wire wheel on my shop grinder.

* One caution, you should probably wear some sort of breathing protection while working, and shower immediately afterwards. If the pistons haven't been cleaned since there was lead in the fuel, that "carbon" may be mostly lead oxide. I don't mean to sound alarmist, but I have a healthy respect for lead poisoning.

-Randall

Subject: Decarbonization
Date: Sun, 14 May 2006
From: Michael Porter <porterm@zianet.com>

Gerald M Van Vlack wrote:

>At any rate if anyone among us can define how to determine if I have too much carbon build up in my engine
> without a tear down. ...

Actually, Jerry, there's a fairly simple way to determine precisely that. Most cars will exhibit some drive ability problems, including those you mentioned. But, to determine if accumulated deposits (of all types) are the cause, the oscilloscope will tell a great deal. Accumulated deposits interfere with the spark plug's ability to fire (effectively), the electrodes become electrically insulated and the resistance increases--that simply adds to the voltage required to produce an arc. With an oscilloscope connected, spraying small amounts of water a little at a time into the intake will steam-clean the chamber, including the plug electrodes. If they're heavy with deposits, the difference in the amount of voltage required to fire the plug before and after water treatment will be noticeable--I've done this many times, and the differences can be substantial--often 12-15kV and occasionally more.

A second way is to track valve lash over time. Typically, valves lose clearance with wear, partly because of valve seat pounding (which eventually deforms both valve and seat) and partly due to valve face and valve seat ablation. If clearances begin to increase, particularly on the intakes, that's a strong sign of carbon accumulation. Over time, that accumulation becomes severe enough to cause irregular compression readings.

Cleaning the chambers doesn't hurt anything, if done a little at a time (the process can be sped up somewhat by also spraying small amounts of carburetor cleaner into the intake, but these days, for most cars, one has to be sure that the cleaner is compatible with catalytic converters).

-Michael D. Porter

Subject: Decarbonization
Date: Sun, 14 May 2006
From: Michael Porter <porterm@zianet.com>

Gerald M Van Vlack wrote:

> I just knew that one of our extra tech guys would know. I don't have an oscilloscope handy, I have however
> seen the results of water leaking into a cylinder. That plug will be clean as will the piston top. But my
> question was also how much is too much? I expect every engine has some build up especially if they run a
> bit rich.

How much is too much? That depends upon the drive ability, and likely any changes in compression. Every style of engine behaves somewhat differently because of combustion chamber shape and the way it has been machined, even how it was rebuilt if it has been rebuilt.

Lots of variables, but the primary one should be drive ability. If the performance is degraded in any way which can be measured, then that's probably too much. For example, if the car ran fine from the get-go, but over time, with no change in quality of the fuel used, the timing has to be retarded to prevent pre-ignition, that's too much. If the carburetors are set properly, and the idle speed is correct, all other parameters within specification, but the engine runs on after the key is shut off, then that's too much carbon accumulated.

If compression starts to vary from normal because of carbon build-up on the valves, that can have a noticeable effect on smoothness of idle and low-speed torque. Not too long after Toyota introduced batch-fire L-Jetronic injection in the early '80s, they found that the number of complaints over rough idle, in the period of ownership of two to three years, increased--especially in areas like southern California and Arizona where people didn't spend a lot of time driving in the rain.

The modified L-Jetronic system that Toyota used was a sort of batch fire arrangement where all the injectors fired at once, delivering half the fuel required once each revolution. The principle was that on one of those two revs, fuel would puddle up on the hot closed intake valve and fry off, and mileage would be better because of better vaporization. What actually happened was that the lighter volatiles fried off, but the heavier components did not, and they stuck to the valve head, and gradually cooked down to carbon, which then gave good purchase for more carbon to build up. Over time, that began to affect air flow at low speed and more gradually, encouraged carbon to build up on the intake valve face and seat, affecting compression.

They developed a shop tool which blew walnut hulls through the ports to clean the valves of carbon and then sucked (most) of the hulls back out of the cylinders, which worked (sort of). By the time that tool was in general use, most cars had fuel injection and fuel formulation (mostly detergent levels) was changed to accommodate that, and the problem became much less prominent.

So, the short answer--drive ability problems with all other settings correct is the determining factor in how much is too much.

But, doubtful I'll make the Summer Party. I'm still out of work after 2-1/2 years, and without income coming in, that kind of frivolity sort of cuts into the food budget. :)

-Michael D. Porter

Subject: Decarbonization
Date: Sun, 14 May 2006
From: <TR250Driver@aol.com>

Guys,

The one thing I picked up from Haynes was to grease the gaps around the circumference to prevent carbon from falling into the cylinders. Carb cleaner, WD-40 and a blunt instrument (my thumb nail) along with an old tooth brush did the trick. Of course my nail is worn back on one side and quite gross looking at the moment. I finished by polishing the tops with Brasso, again a tip from Haynes.

-Darrell

Subject: Decarbonization
Date: Sun, 14 May 2006

From: Doug Mathews <mathews@uga.edu>

List,

One of my instructors at school is a Ford Master Certified mechanic and he knows his stuff. The following is what he told me he did on carburetor cars (of course they are standard center top mounted carbs).

He runs up the RPM and then pours water into carbs, not great buckets but a fair amount to listen to him describe it. He says it works.

It sounds reasonable, of course you would have to be careful not to get too much in at once for all the obvious reasons. Not sure I'd try it the first time w/o someone there who had done it before.

-Doug

----- Original Message -----

>Subject: [TR] Decarbonization

>From: "Cosmo Kramer" <tr4a2712@yahoo.com>

>Sent: Sunday, May 14, 2006

>

>> Hi list!

>> Other than taking the car out on long high speed drives & hitting the hills, is there any other way of
>> decarbonizing the tops of the pistons WITHOUT moving the engine's head?

>>

>> Maybe spraying something down the throat of each carb? [Like carb cleaner? either? raw gasoline?]

>>

>> Also, I've been told, that carbon on the head is another way of not having petro flow down the cylinder
>> wall. What's your opinion? TIA,

>> -Cosmo Kramer

Subject: Decarbonization

Date: Mon, 15 May 2006

From: "Michael Marr" <mmarr@notwires.com>

Sorry about the late reply, too - I was on vacation. Seems to me that, back in the day, there was a product available in the UK called RedEX, a petrol additive. We used to pour some in the spark plug holes and then fire up the engine, to, supposedly, remove carbon. Don't know if it worked but it sure made a lot of impressive smoke! I don't know if it is still made, because I haven't lived in the UK since 1973. Also, as I said, it probably didn't really work but everybody swore that it did...

-Michael

Subject: Decarbonization

Date: Mon, 15 May 2006

From: <[BearTranserv@aol.com](mailto: BearTranserv@aol.com)>

The old wives tale to fix this, supposedly used by VW mechanics, is to rev the engine to a very high idle and slowly pour a small coke bottle of water into the intake through the carb, just enough to make it stumble a little, but never enough to stall the engine.

Never tried it, I just heard about it. If you try it, let us know how you come out.

-Robert Houston

Subject: Decarbonization

Date: Mon, 15 May 2006

From: "jim williams" <sportsix63@yahoo.com>

I've talked with several mechanics that long ago when you had to decarbonize engines a trickle of water was used. I was also told that rice had been used. I can see water but rice? I know for a fact getting one hot will clean it out.

I badly overheated a Dodge truck 25 years ago. It was a state forest vehicle. It pinged all the time, having it run for years just around the park. Because it was the only vehicle at the shop I took it on a 200 mile trip. On the way back it got really hot. So hot that I thought it was ruined. After setting over night, I added some water, & fired it up. Ran great and never made another pinging sound.

-Jim

Subject: Decarbonization
Date: Mon, 15 May 2006
From: <ZinkZ10C@aol.com>

Sure, see what they make of it. The Coke bottle is a good idea, as then even if you accidentally drop the bottle, it won't put a big slug of water into the engine.

All you need is a used engine, a bore scope and water. A light bulb soldered to wires that fits in the spark plug hole, works too. View the piston carbon, do the water trick then check again.

Carbon (actually lead build up) isn't the issue as in days past, unleaded fuel leaves no lead deposits and a cleaner combustion chamber.

-Harold

Subject: Decarbonization
Date: Tue, 16 May 2006
From: "Mark Hooper" <mhooper@digiscreen.ca>

If the engine isn't dieseling or obviously choked up, do you really want to remove all the carbon? I have heard it mentioned by hoary old mechanics that the carbon buildup is good for tightening the piston/cylinder clearance up and for raising the compression ratio a bit. Getting the excess flaky bits off the piston tops I can go for, but carefully polishing and cleaning could actually be counter-productive. Or is that just an old myth from the dawn of time when dynamite-powered cars were still on people's minds?

-Mark

Subject: Decarbonization
Date: Tue, 16 May 2006
From: "Randall" <tr3driver@comcast.net>

> Carbon (actually lead build up) isn't the issue as in days past, unleaded fuel leaves no lead deposits and a
> cleaner combustion chamber.

Actually, even unleaded fuel leaves some deposits, due to the various additives. Unfortunately, unlike lead and carbon, these deposits are much harder and hence more permanent. This results in "octane creep", where engines require higher octane gasoline as they age.

On the other hand, I just found a study where a research group took 28 cars and drove them 15,000 miles on a test track while comparing combustion chamber deposits, and monitoring their effect on emissions. 3 different fuels were used, to provide low, medium and high rates of deposit accumulation.

What they found was interesting, higher CCD resulted in higher NOx (no surprise there, NOx production is related to compression ratio), and better fuel mileage! Other emissions were not affected.

-Randall

Subject: Decarbonization

Date: Wed, 17 May 2006
From: "Graham Stretch" <technical-iwnet@wight365.net>

Hi Cosmo

I used to have a Herald at school, I did a Redex decoke, completely filled an area about 40 ft by 60 ft bounded on 3 sides by 2 storey buildings with acrid soot, did it by adding Redex down the carb whilst increasing the throttle opening progressively to maintain running, ended up with about 3/4 throttle holding at about 1500 rpm! Car ran a bit better after that!

-Graham.

Subject: Decarbonization
Date: Mon, 19 Jun 2006
From: Jim <cartr4a@ameritech.net>

There was a thread a while back about decarbonization and I thought I'd post a follow up.

My TR-4A was pinging like crazy no matter where I set the timing. My timing was so far off I had no power. Still, pinging and run-on after turning it off and the hotter the temp got the more pinging. So I tried the suggestion of dumping a small bottle full of water into the carbs one at a time at high revs. I repeated this 3 or 4 times.

Well today it was 85 degrees in Chicago and engine temp was a little over half...but NO pinging! My timing is back where it should be and the power has returned. Feels like a whole different car!

Thanks to those who suggested the water trick and discussed this topic. I thought I was headed for an engine rebuild, but it sure feels good now!

-Jim

Subject: Decarbonization
Date: Mon, 19 Jun 2006
From: "Chris Simonsen" <ccsimonsen@gmail.com>

I'm not sure if I cheated but, I feed my vacuum line and put a hose with an aquarium clamp and hooked it to my (clean) windshield washer bottle. I used the aquarium clamp to slow the feed to water so I could barely keep it running at 1500 rpm.

I filled up the washer bottle with Distilled water and drove around while it sucked water. Not sure if it cleaned anything but I put 4 bottles of water through on trips to work..... I don't have data to show it runs any better, but in my mind it seems to runs better.....

Before anyone else tries this I have to ask if this was a prudent thing to do.

Adding this little bit of water under driving loads - would this hurt anything? I've heard of water injection on turbos so I figured it couldn't hurt (but the water there evaporates before it hits the piston in the turbo application). Maybe hurt no more than a leaky head gasket?

-Chris

Engine/Block/Pistons

Subject: TR pistons
Date: Tue, 21 Jan 2003
From: "Lumia, John" <jlumia@ball.com>

Mitch wrote:

> Just received a set of .020 over AE Hepolite pistons from TRF along with King small & large bearings. So far
> everything looks like nice stuff. I was disappointed not being able to locate Vandervil bearings but TRF said
> the Kings are a good replacement. I was also told to avoid Country brand. No specific reason, just not the
> same quality as Hepolite. I'll let you know in about 2 months.
> -Mitch

Mitch,

I have been through the wringer recently on the main bearing thing. First off, County is a distributor for King Bearings. County gets the bearings from King and has them put their name on the bearings and on the box, but I believe the King name is on the box somewhere as well. King has a website, I spoke to their VP of Sales and Mktg in the US at some point and he was helpful. I started out with King (County) but switched to Clevite because they had bearings that were a little thicker out of the box. Both vendors specs say the bearings should be .0720" thick (standard bearings that is), King came in a little under that but in spec (ie $\pm .0005$ "), while Clevite was just a little over nominal, but I was able to make up about a .001" clearance that way. Supposedly the suggested clearance is .0017" to .0036", but I think you will find that somewhere around .002" is a good number. This is also based on Clevites rule of thumb that bearing clearance should be .001" per inch. In my case, I ground down the main bearing caps to give me a final clearance of .002". But other than that, both mfg I talked to make their bearings the same way, meaning they are bi-metal design. King also offered to hand pick bearings that were thicker if it would help reduce clearance.

-John Lumia

Engine/Block/Pistons

Subject: TR3A pistons
Date: Fri, 3 Aug 2007
From: <DLylis@aol.com>

My workshop manual says to orient the pistons according to a 1/32" split in the skirt. My new pistons have no such split, nor did the old ones, and there is no indication on the crown of the piston as to how these should be oriented relative to the bearing caps, etc. The old ones were marked STD with 86MM bores, so I assume they were TR4, and the new ones are 87MM.

Can someone shed some light on this? TIA
-David Lylis

Subject: TR3A pistons
Date: Fri, 3 Aug 2007
From: <tr3driver@ca.rr.com>

> My workshop manual says to orient the pistons according to a 1/32" split in the skirt. My new pistons have ...

In that case they can go either way.
-Randall

Engine/Block/Pistons

Subject: TR4 Engine Piston Installation
Date: Tue, 09 Sep 2008
From: Tony Drews <tony@tonydrews.com>

Thomas Boggiano wrote:

> Hi All
> I installed the new pistons this evening in the new sleeves. All the rings gapped to .015 or .016. When I put
> the Crank in everything rotated nice an smoothly, As I put each piston in it got much harder to rotate
> everything, and after the last piston was installed it is now almost impossible to rotate anything. It really takes
> a lot of force to move a piston down or rotate the crank.
>
> On a new install how difficult should it be for all this to move? If I have to take it apart now would be a good
> time to do it.
> -Tom

New rings on honed liners add a fair amount of drag. There are two things you want to be sure of:

1. Rod bearings are correctly sized and don't bind
2. Pistons are properly fitted to the liners

For #1, when two pistons are at the top and two at the bottom it should be pretty freely turning. Once you are moving the pistons up and down it should be harder. If it's still hard when the pistons are at top and bottom, you've got something wrong in the bearing area - either wrong sized bearings or the caps got mixed up. Each rod cap is individual to that particular rod.

For #2, you need to measure the pistons and liners before assembly. There should be 3 / 4 / 5 thousandths difference depending on what kind of pistons they are. I believe this is normally measured 90 degrees from the wrist pin hole, but it's good to measure both directions. Also, measure the liners at multiple points.

With all new stuff, it should take less than, say, 15 ft lbs to turn it over. The force required will go up as you add cam and valve train, though.

- Tony Drews

Engine/Block/Plugs & Core

Subject: How to clean Oil Passages in Block?
Date: Mon, 05 Jan 2004
From: "Jack W. Drews" <vintr4@geneseo.net>

<Amiddlesworth@netscape.net> wrote:

- > I'd like to run a brush trough the oil galleries in my TR3 engine (which is down to the bare block now).
- > How do I get the "Welch plugs" out? And what do I do to put a plug back in?
- > -John Middlesworth

The plugs in the ends of the oil galleries are aluminum and the holes are threaded. The only way I've found to remove them is to drill a series of holes around the periphery of the plug, making sure that you don't nick the threads in the block.

Replacing them is a chore. I've tried screwing straight socket head plugs in, but of course those are not guaranteed to be leak proof, even with thread sealant.

Until I find a better approach, I currently tap the holes with a 3/8" NPT tap and screw in socket head pipe plugs. This is difficult because tapping a tapered thread into these holes requires a very long wrench for leverage. There is also the problem of creating chips which may very well go down into the oil passages to the main bearings. I prevent this by stuffing the holes with paper towel scraps and then carefully pulling them out and blowing out the holes.

In addition to the difficulty of tapping the holes, the socket head plugs don't usually screw far enough into the front of the block to make them flush, so I carefully grind off the tops of those plugs so the front plate goes on flat. The rear one can stick out a couple of threads without interfering with the flywheel.

This is all a lot of work and although I do it to every block I'd be hard pressed to defend the all this monkey business. It is necessary if you have the block dipped in a caustic tank for cleaning, because the caustic melts the aluminum. If you don't have the block "tanked", the old plugs are okay.

By the way, if anybody has a head "tanked", the big plug in the top can be treated the same way, but the aluminum push rod tubes in some heads will actually disappear. If anybody does this, don't throw away that late model head -- I have a shop that will replace them for a quite reasonable price.

-uncle jack

Engine/Block/Plugs & Core

Subject: Oil gallery ends plugs and oil gallery plugs
Date: Sun, 31 Aug 2008
From: Tony Drews <tony@tonydrews.com>

Randall wrote:

>> It my understanding that no one is making those. Everyone I have talked to that have needed them have had
>> a machine shop start with a bar of steel and fabricate them from scratch. Where they also a pipe thread?
>> Requiring re-taping of the galley?
>
> I don't know offhand, but I've got plenty of spare blocks if you want to come measure one. Or better yet, cart
> it away <G>
> -Randall

There's a pipe thread that's close to what's in the block originally. Re-tap them with this, and put brass pipe thread plugs with an Allen head ends. Just tap it deep enough that at least the front plug doesn't interfere with the front plate. Also, if you go too deep with the front plug, make sure you don't block the feed to the front main - I had to grind a bevel on the backside of mine since I got a little overzealous with the tap. I shove some paper towel down the gallery before tapping so as little crap as possible gets in the gallery, and then I clean it out very well before assembly. Works best on a bare block that you can clean all passages thoroughly after tapping.

The tap and plugs are 1/2"-14 NPT.

- Tony Drews

Subject: Oil gallery ends plugs and oil gallery plugs
Date: Sun, 31 Aug 2008
From: "Tony Gordon" <triumph@2simpleusa.com>

It's probably BSP (British Standard Pipe) not NPT, but they are so close in terms of diameter and TPI (the only difference is the 55 deg. thread form instead of the 60 deg. of the US one) that I would guess it would work.

-Tony Gordon

Subject: Oil gallery ends plugs and oil gallery plugs
Date: Sun, 31 Aug 2008
From: Tony Drews <tony@tonydrews.com>

Hmm. I could have sworn that's what I used that tap for. I'm not totally sure of the size, but I'm sure of the technique. Maybe I borrowed a larger tap from uncle jack... The original threads are straight threads, so you really have to glue whatever you stick in there in place. If you go to the NPT thread / plug deal, they are tapered and you're sure of no leaks.

- Tony

Subject: Oil gallery ends plugs and oil gallery plugs
Date: Sun, 31 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

Pipe threads are sized by the nominal inside diameter of the pipe; while bolt threads are sized by the nominal outside diameter of the bolt. As a result, 1/2" pipe threads are actually slightly larger than 3/4" bolt threads. But bolt threads are not designed to seal, so pipe threads are appropriate for this application (especially at the front, where the plug has to not protrude or it will interfere with the front plate).

-Randall

Engine/Block/Plugs & Core

Subject: Plug on Top of TR3 Head
Date: Thu, 28 Aug 2003
From: "Bill Brewer" <bbrewer@qnet.com>

Last month I posted an email to the list regarding the aluminum plug on top of the head on a TR3. My original plug was about 1/8 thick (down from the original 1/2 thick plug). Bob Schaller's book "More BS About Triumphs" recommended checking it. I got an aluminum repro plug from MOSS, but it fit loosely after I ran a 1" 12 TPI tap through the hole. A 3/4" pipe plug wouldn't thread in.

Turns out that a 3/4" pipe tap will thread into the hole pretty easily. I think that it is 11-1/2 TPI. I ran the tap in and cut new pipe threads easily and will fit a brass pipe tap from the local hardware store.

Don't take chances next time you re-do your head. Take out the original catholically reacted plug and replace it with a brass pipe plug instead.

I wish that I had just done this in the first place instead of all the screwing around I did.

-Bill Brewer

////////////////////////////////////
NOW! Private E-mails between Bill Brewer & Cosmo Kramer
////////////////////////////////////

<bbrewer@qnet.com> wrote:
Bob Schaller's book is available from TRF for about \$10. If they don't have it, I can photocopy it for you. The book is more of an 8 X 11 pamphlet. It is a collection of his articles from his Triumph club. It is an excellent publication. Bob died several years back.

My plug on top of the head was original and had something like "S&S Plug, then some #'s" stamped in it. It looked great and my best bud and I decided not to change it. I ran a power wire brush over the top of the head and the outer 1/16 of the plug blew away as aluminum powder. It had catholically reacted (dissimilar metals). We pushed a screwdriver through the soft aluminum and it came right out. It was originally 1/2" thick, but had eaten away on the underside until it was down to the last 1/16 or last 1/8" thick..

I got a new plug from MOSS and measured the threads (I am an amateur machinist) and they were 1" 12 tpi threads. That is 1" diameter, not 1" deep. The new MOSS plug is 1/2" thick, as original.

A pipe plug wouldn't thread into the straight threads, but they would allow the pipe tap to start threading in so I could cut new threads in the head. The pipe tap didn't say the tpi, but it appears to be 11-1/2 tpi. I don't have a thread gauge for pipe taps. Sorry about the confusing way of explaining things.

I bet that your great looking plug on the top of your head is a lot thinner and weaker that you might think. My brass one will be solid as a rock when they bury me in TS72747 someday.

If you would like, I can take a digital photo and email it to you to show you what my plug looked like when I pulled it out.

Thanks for the advice on the freeze plugs. I'll get myself one. Can the plug be installed with the engine in the car?

-Bill Brewer

----- Original Message -----

Subject: Plug on Top of TR3 Head
Sent: Sunday, August 31, 2003
From: ebk@buffnet.net
To: Bill Brewer

Bill Brewer wrote:

Hi Cosmo,

In Bob Schaller's book "More BS about Triumphs" he said to be sure to check the plug because catholic reaction between dissimilar metals eventually causes the plug to fail. It is a real day runner when your coolant and engine oil mix. The plug is aluminum. It originally was 1/2" thick. Mine varied between 1/16th and 1/8" thick.

I got a new plug from MOSS and measured the threads (I am an amateur machinist) and they were 1" 12 tpi threads. That is 1" diameter, not 1" deep. The new MOSS plug is 1/2" thick, as original.

> I too am an amateur who worked in a machine shop for a short peered of time by was laid off & therefore had
> to stop going to school for my journeyman's degree. :-\ So I do understand what you have expressed in the
> above statement.

A pipe plug wouldn't thread into the straight threads, but they would allow the pipe tap to start threading in so I could cut new threads in the head. The pipe tap didn't say the tpi, but it appears to be 11-1/2 tpi. I don't have a thread gauge for pipe taps. Sorry about the confusing way of explaining things.

>Thanks for taking the time to explain in more detail. I think the reason the pipe plug wouldn't fit in all the way
> is because the plug's threads are slightly tapered. That might explain why you could 'start' the tap. I was told
> by an old machinist not to chase the treads on an engine block [especially the ones holding the Head Stud
> Bolts inside the main block], because you're enlarging the treads fit slightly, thus causing a class 'B' fit. Also
> British threads are different from American threads, even if the taps state the same size. One is pointed, & the
> other has rounded portions on the edges of the threads.

I bet that your great looking plug on the top of your head is a lot thinner and weaker that you might think. My brass one will be solid as a rock when they bury me in TS72747 someday.

> YES! This is one of the reasons I chose NOT to have the lead plug [I believe it to be] removed, because it
> DID 'look' so good. Not I don't know how old you are, but I gather you are stressing the point that the Brass
> Plug will 'out last' the original plug. :-

If you would like, I can take a digital photo and email it to you to show you what my plug looked like when I pulled it out.

> YES, PLEASE do take the time to show me this, & if you happen to have a photo of what the hole in the head
> looks like with the old plug out, too. This way I can decide if I need to remove the head off the block or if it
> can be done safely in the car.
> Thanks for the advice on the freeze plugs. I'll get myself one. Can the plug be installed with the engine in the
> car?

- Bill Brewer

=====
> I was able to do it without removing the head. BUT! I used a different style of Freezer Plug than one would
> receive from Moss. Moss's plug is like the original plug [concave]. The replacement Plug is the 'American'
> style [Flat with a 1/32 edge lip]. The original size [47/64"] is Moss's plug, but I didn't want to spend \$5.00 in
> shipping for a \$.95 Freezer Plug. :-\ So I went to my local auto parts store & took a chance on a 3/4" plug,
> just 1/64 larger [as described previously].

> Installation:

> I cleaned the head groove well [which might have opened up the opening a touch :-\]. Then I placed a bead
> [Red Loktite] around the head groove [AGAP] & one around the outside of the Freezer Plug lip. Placed the
> plug in the head & used a socked [1 1/8" :-\] inside the plugs lip to force it in place [force was place more on
> the lower portion of the head than squarely. Because I was afraid that if it was cocked to the top that I
> wouldn't have room to swing a hammer to place it squarely in at the bottom of the head]. I noticed that one
> edge of the lip was flush with the head & the opposite edge was not. :-\ So I used a hammer to place that
> edge lip flush with the head. Now I knew it was squarely in place. Then I took the socked [remember the back
> side of it against the inside portion of the plug] with an extension in it to drive the inside of the plug flat. Thus
> expanding the edges outward for a TIGHT fit.

> -Cosmo Kramer

////////////////////////////////////
<bbrewer@qnet.com> Wrote:

Hi Cosmo,

I ran a 1/2" pipe tap in the threads. The threads are a little different, but it cleans up nicely and makes a better seal. I used Teflon tape on the threads and really torqued that bad boy in there. The plug I bought was hollow on the inside so I knew that it would "give" and compress rather than splitting the head or something. It has worked great.

My neighbor is restoring another old TR3 that I gave him (basket case that I had got for free). He put in a MOSS stock AL plug and it went right in and sealed up. On my engine, there was nothing left of the threads. They had eaten away with the aluminum.

Also, at one point I was trying to clean up the threads to use my AL plug and I used a 1/2" or 3/4" round wire brush from a hardware store that was used to clean up copper pipe fittings before soldering them together.

Good luck!

-Bill Brewer

----- Original Message -----

Subject: Plug on Top of TR3 Head
Date: Friday, August 27, 2004
From: ebk@buffnet.net
To: Bill Brewer

Bill Brewer wrote:

> ... My plug on top of the head was original and had something like "S&S Plug, then some #'s" stamped in it. It
> looked great and my best bud and I decided not to change it. I ran a power wire brush over the top of the head
> and the outer 1/16 of the plug blew away as aluminum powder. It had catholically reacted (dissimilar metals).
> We pushed a screwdriver through the soft aluminum and it came right out. It was originally 1/2" thick, but
> had eaten away on the underside until it was down to the last 1/16 or last 1/8" thick. ...

Hi Bill!

Bad & good (?) news! I blew a head gasket back in June of this yr. :-(BUT! I now getting ready to install the new Head Gasket on & have had a brass Head Plug made to replace the AL one. :-) Now I read how you removed the old Al Plug, but I'm wondering if you had to clean the treads in the head? If so, then what was the procedure?

I'm afraid to doing damage to the threads in the head & causing the head to be ruined. :-(If you can remember or have any suggestive INPUT in this, then I would be interested in this operation.

ALSO! Did you use anything on the treads when installing the BRASS Head Plug back in?

TIA,

-Cosmo Kramer

Engine/Block/Plugs & Core

Subject: TR6 Oil Gallery plug
Date: Thu, 13 Mar 2003
From: Michael Graham <mgraham@achilles.net>

-James Tschaikowsky wrote:

>The aluminum oil gallery plug on the engine block of my 1976 TR6 leaks oil, (plug is rounded of and
> located between fuel pump and oil filter. I would dearly like to remove it (ideally without having to pull
> the engine first). Have any of you found an effective strategy for removing one of these plugs?
> -James Tschaikowsky

Hi James

Here is some information I posted on the TR6 mailing list a couple of years ago while I was rebuilding the engine in my six:

Plug above oil filter (TRF part PU1404) is a 3/4 by 16 threads (UNF), which I am replacing with a hex-socket set screw (SPAE-NAUR part 478-007)

Plug at front end of oil gallery (TRF part# 118632) is a 1/2 by 20 threads (UNF), which I am replacing with a hex-socket set screw (SPAE-NAUR part# 478-001 or 478-002)

I plan to seal the set screws using Teflon tape. James: This did not work, I ended up using a product called Gasket Red 474 made by Kleen-Flo (a silicone gasket maker) ... this worked fine

Anyone who hot tanks their block should take care to examine these two plugs, which in my case were "eaten" when the block was hot tanked. Removal of the plug from an old block was impossible without drilling and collapsing the plug with a punch.

-Mike Graham

Engine/Block/Sleeve Cylinder

See: "Piston liner clearance"

Subject: Engine Rebuild-Cylinder Liners
Date: Mon, 25 Jun 2007
From: <N197TR4@cs.com>

<Dlylis@aol.com> wrote:

>> I spent some quality time in the TR3A this weekend and the engine knock I communicated with you about
>> previously has become concerning. I switched from Shell Rotella 40W to what I had been running before
>> which is Castrol 20W- 50 and at cold start the knock is most concerning, however at temp (185) the knock
>> is gone. My oil pressure is 30 at idle and 70 at speed. I have decided to move on correcting the problem. As
>> I said in my last email I have little experience with the wet liner motors and my first question is, should I
>> bore the old sleeves and replace with oversized pistons or replace entirely? I am not one to be foolish with
>> money but I am not going to miss a meal if I replace the sleeves, and want to do the best thing. Although I
>> am getting varied opinions as to whether or not this is piston slap, I agree with you that this is likely the
>> cause of the noise given the symptoms. The one thing I can't get a conclusive read on is removing the plug
>> wires one at a time and identifying the offending piston. I am unable to get a fix on it with a stethoscope.
>> As always, TIA.
>> -David Lylis

Randall wrote:

Hi David,

Personally, I have always just replaced the liners if the old ones needed to be bored. Boring liners is an unusual operation; most machine shops don't have the equipment or the know-how; and I would rather not serve as guinea pig while they learn.

However, there are places around that do bore them, and apparently with good success. I believe Joe Alexander (ARE) posted that he had developed a jig to do them and was offering the service, so you might check with him.

Having the engine apart is the surest way to identify the problem ... if its piston slap, then the damage to the piston and/or cylinder wall will be obvious. On my engine with the noise, I had put it together knowing there was major damage to the wall in #3 ... you could see the taper easily with the naked eye ... but couldn't afford a proper rebuild at the time and so resolved to just keep driving it until it quit. It never did quit, even though I put some serious mileage on it; and as it happened I sold that engine (as non-running) without ever having the pistons out again. Funny part was, it never burned much oil either, only used maybe 1 quart per 1000 (which was mostly leaks, IMO).

-Randall

Dave,

Uncle Jack & I have been having them bored for about 17 years with good success. It seems apparent that the OEM liners are superior in metallurgy.

More recently, I worked with a former John Deere employee who has a performance racing engine shop. We came up with operations that simulate much of what we did with the John Deere cylinder liners (without the automation). Several TR3/4 race cars now use these remanufactured liners, & a few street cars, also.

I have been sending folks directly to J & L Performance Engines with NFI on my part. This keeps the price low and affordable, even with shipping.

If anyone becomes serious about doing this, I will try to help facilitate the process.

(Just as a sidebar, I just installed Chevrolet Con Rods in my TR4 race car, Carrillo Performance at Chevy Prices). -Joe Alexander

Engine/Block/Sleeve Cylinder

Subject: TR2/3 Engine Woes = Now Success!!
Date: Tue, 6 Nov 2001
From: "Rob Blubaugh" <blubaugh@rcsc.k12.in.us>

Hello listers and THANK YOU!

On a recent post I expressed some frustration on finding water in the oil of my just finished rebuild of my TR2's TR3 engine. Thanks to everyone, especially Bob Kramer, Randall Young, Paul Burr, Pete Ryner (sp?), Jeffrey Barteet, and Mike Kitchener. From the group there were several first rate suggestions, but more importantly some wonderful words of encouragement, support and empathy. Yes, some of you have BEEN THERE and have DONE THAT with probably more reason for frustration than I have had. Your response shows me once again what this list services is all about and how valuable it can be. Thanks again to all who responded. I hope I have not missed anyone.

There is good news to report. The machinist who did my shop work is a good old fellow who is patient with a novice and is particular about his work. I told him about the water in the oil and he suggested that I relax and reassess things. He offered that sometimes an engine will leak on a first run after a rebuild and then seat and seal through pressure, vibration and heat expansion alone. He also said that in the old days it was commonplace to place sealant pellets in the water jacket of a finished head to help seal from the inside out following rebuild work. He suggested that I change the oil and run the engine again to see if it still "milked" the oil. I did, and I got no water in the oil at all.

I still decided to use a block seal. I was advised not to use the pellet material that would fix a leaking radiator. If it can plug a hole in the radiator, it could possible plug places where water is supposed to flow inside the engine. Instead I used a sodium silicate material from K&W. This is a material that cannot be mixed with antifreezes or it will plug the cooling system. I drained and flushed the engine and then ran the engine with the cooling system closed for a least twenty minutes and then flushed some more. During this run time of about forty-five minutes in all (without the sealer) there were no leaks at all. Finally I ran the engine with the sealer for about thirty minutes and I blocked air flow to the radiator to increase the heat and pressure in the system. Again there was no water in the oil. I then drained the cooling system and left hoses, petcocks, etc. open to allow for drying. I let it sit for 36 hours and then filled the radiator and engine with clear water, fired the engine and flushed thoroughly again. Still no leaks and no water in the oil! Next step will be to add the antifreeze mixture and do a road test. I am fully confident that it will be ok. I have even refitted the front apron and the hood. I have the transmission tunnel cover in place and everything is ready to go. (On refitting the slave cylinder the clutch is working fine too.)

One problem remains. The flex lines from the fuel feed line to the banjo fittings were shot and leaking badly. My fuel pump gave up during the year of being in a box. It delivered only a trickle of fuel, just enough to leak but not enough to feed the engine. The carb bowls leaked badly too. In trying to tighten the new bolts and the new gaskets where bowl bolts to the carb I over did it and ruined the new gaskets. New parts should be in tomorrow from Moss. Wouldn't you know it, that is when our beautiful Indian summer is forecasted to end. I DON'T CARE! Even without a heater and without windows (I do have new side curtains) I am going to drive the beast!

My confidence is renewed. Again, thanks listers!

-Rob Blubaugh

Engine/Block/Sleeve Cylinder

Subject: What's wrong with this TRactor motor? Leak-Down Test
Date: Mon, 6 Mar 2006
From: <ZinkZ10C@aol.com>

Sounds like the rings have not seated in yet or one is broken. Put the head back on (you can use the old gasket) leave the rocker arms off, then pump air into each cylinder. Either rotate the motor to BDC or stand clear when you apply air. A leak down test tells you much more than a compression test. A compression test tells you there is a combustion chamber leak, but a leak down test tells you where the leak is.

It is normal to have a hiss past the rings and on a high mile motor slight exhaust valve leakage. Even slight intake valve leakage will greatly reduce power and there should be zero leakage in to the cooling system.

To test for cooling system/compression leak without having water in the system, seal off the coolant hoses, then put a latex glove over one hose port. If it inflates, there is a leak. This test might not be valid if the used and reinstalled gasket is in poor condition.

-Harold

Engine/Block/Sleeve Cylinder

See: "Engine Rebuild-Cylinder Liners"

Subject: Piston/liner clearance
Date: Tue, 10 Apr 2007
From: "Randall" <tr3driver@ca.rr.com>

> I'm currently tearing down and old '59 TR3A engine for a rebuild as a project with my 13-year-old son. My
> question has to do with what acceptable clearance is between the piston skirt and the sleeve. The workshop
> manual I believe says 0.007", but does not say where to take the measurement.

The measurement in the book should be taken as basically at any point between the skirt and the cylinder. But essentially all of the skirt wear happens in the area perpendicular to the pin, so that's usually the only place you need to check.

> I'm thinking my set of pistons/sleeves is shot because I have about .023" clearance in one direction
> (perpendicular to the piston gudgeon pin). But across the gudgeon pin I have only about .003" clearance.

Yup, at least the pistons are shot. Generally that means the sleeves are too, but it might be worth checking. The bore wear happens almost entirely at the top of the cylinder, so taking another measurement at the very bottom will tell you how much of the wear is in the cylinder.

> Before I go out and spend \$500 or so on new pistons and liners, I thought I'd ask exactly how/where the
> measurement should be taken.

Ideally, of course, you would use a micrometer and a bore gauge to measure them both. That would also let you check directly for ovalness and so on. But what you are doing is a time-honored method used by "shade-tree" mechanics since the Model-T days, so IMO you are just fine.

> Also, if it does turn out that I need new pistons/liners, any recommendations would be welcome.
Sorry, can't help with that one.

-Randall

Subject: Piston/liner clearance NOW REBORE?
Date: Wed, 11 Apr 2007
From: "Paul Dorsey" <dorpaul@negia.net>

I have not previously weighed in on this issue, also my weight should be tiny since I've yet to run my car (although the engine has 2 hours of driveway run time on it!)

It didn't take too much convincing to get my highly respectable local engine shop to bore out my liners and re-use them. But then again, they have limited British training or experience. I was very fortunate in having a friend give me a used set of Homolite pistons and pins. My engine shop installed Hasting brand rings and so now the output (after the boring) is 2138cc's instead of the 19something.

I believe the engine shop said it upped it from a 93 to a 97MM piston? Since the shop seemed proud of their job on these liners, I wonder why this isn't done more often? But, the proof is in the pudding and I may be in for a surprise. Thanks,

-Paul Dorsey

Subject: Paul Dorsey's Rebores
Date: Tue, 17 Apr 2007
From: <N197TR4@cs.com>

Paul,

Rebore with OEM Liners is a good thing using typically superior liner materials. I have been doing this for my race & street engines since 1991. I took it a step further with fixture development so that boring can be done more in a 'production mode'.

This FIXTURE resides in Iowa and is available to any and all wet sleeve TR folks who would like to use it. Rather than have one more finger in the pie, I am turning this operation solely over to a well respected performance engine builder. I think it will be about \$20 per liner.

At the same time, con rods could be shipped for reconditioning, at \$10 per rod.

I can provide the details, and step aside, if anyone is interested. Regards,

-Joe Alexander

Subject: Questions about your fixture' & liner work

Date: Wed, 18 Apr 2007

From "Cosmo Kramer" <tr4a2712@yahoo.com>

<N197TR4@cs.com> wrote:

>Paul, ... Rebore with OEM Liners is a good thing using typically superior liner materials. ...

I'm not clear on this. OEM = Org. equipment material, Right?

Then how could the OEM be something different than 'typically superior liner materials'?

>This FIXTURE resides in Iowa and is available to any and all wet sleeve TR folks who would like to use it.

> Rather than have one more finger in the pie, I am turning this operation solely over to a well respected

> performance engine builder. I think it will be about \$20 per liner

Then do I understand that to use this 'fixture', one has to have, him/engine builder, do it? Therefore shipping the engine block with the liners [Still installed] & the connecting rods, would have to be done in order for this 'Engine Builder'? Then wouldn't all this weight in shipping to & from, plus labor, be equal to MORE expensive than purchasing a Piston, liners, & ring kit?

>I can provide the details, and step aside, if anyone is interested.

What details are you willing to send, if everything is being done by the 'Engine builder'? Also what do you mean by: 'step aside'?

YES! I'm interested, BUT also confused. So would you PLEASE try to answer all my questions & requests?

TIA,

-Cosmo Kramer

Subject: Questions about your fixture' & liner work

Date: Thu, 19 Apr 2007

From: <N197TR4@cs.com>

Cosmo! Good to hear from you.

OEM is 'original equipment manufactured. The spin cast materials used then is not the same as those used in current reproductions.

The fixture and equipment to bore a quality liner from OEM liners is at J & L Performance Engines, and a few of the Friends of Triumph utilize this service for our race engines....I was going to offer this service, through me, but decided that folks could go direct to J & L and I would 'step aside'.

It would be about \$120 including shipping to have them done. Con rods could be done at the same time for about \$10 per rod and a little more shipping.

If you elected to do this I would support you through the process, if necessary, as a courtesy to you.

If you proceed, I have all of the contact information. Regards,

-Joe Alexander

Subject: Questions about your fixture' & liner work
Date: Thu, 19 Apr 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi Joe!

Thanks for straightening me out on 'OEM'. I gather that the OEM liners are 'Quality' worth boring out?

Also, I didn't get a direct answer if one is to ship the block WITH the OEM liners or JUST the OEM liners alone? I do understand that the Connecting Rods would be shipped with the bottom & just the Connecting Rod {no piston or gudgeon pin}, attached with the connecting rod bolts holding these 2 pieces together, right?

-Cosmo Kramer

Subject: Questions about your fixture' & liner work
Date: Thu, 19 Apr 2007
From: <N197TR4@cs.com>

<TR4A2712@yahoo.com> writes:

> Hi Joe!

> Thanks for straightening me out on 'OEM'. I gather that the OEM liners are 'Quality' worth boring out?

Absolutely!

> Also, I didn't get a direct answer if one is to ship the block WITH the OEM liners or JUST the OEM liners
> alone?

Our new fixture is designed to eliminate using the block as a fixture. The process is similar to what we used at John Deere for tractor liners.

> I do understand that the Connecting Rods would be shipped with the bottom & just the Connecting Rod
> {no piston or gudgeon pin}, attached with the connecting rod bolts holding these 2 pieces together, right?

Yes, just the con rod...no piston.

-Joe

Subject: Engine Rebuild-Cylinder Liners
Date: Mon, 25 Jun 2007
From: <N197TR4@cs.com>

<Dlylis@aol.com> wrote:

> I spent some quality time in the TR3A this weekend and the engine knock I communicated with you about
> previously has become concerning. I switched from Shell Rotella 40W to what I had been running before
> which is Castrol 20W- 50 and at cold start the knock is most concerning, however at temp (185) the knock is
> gone. My oil pressure is 30 at idle and 70 at speed. I have decided to move on correcting the problem. As I
> said in my last email I have little experience with the wet liner motors and my first question is, should I bore
> the old sleeves and replace with oversized pistons or replace entirely? I am not one to be foolish with money
> but I am not going to miss a meal if I replace the sleeves, and want to do the best thing. Although I am
> getting varied opinions as to whether or not this is piston slap, I agree with you that this is likely the cause of
> the noise given the symptoms. The one thing I can't get a conclusive read on is removing the plug wires one
> at a time and identifying the offending piston. I am unable to get a fix on it with a stethoscope. TIA,
> -David Lylis

Hi David:

Personally, I have always just replaced the liners if the old ones needed to be bored. Boring liners is an unusual operation; most machine shops don't have the equipment or the know-how; and I would rather not serve as guinea pig while they learn.

However, there are places around that do bore them, and apparently with good success. I believe Joe Alexander (ARE) posted that he had developed a jig to do them and was offering the service, so you might check with him.

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-Randall

Dave,

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I have been sending folks directly to J & L Performance Engines with NFI on my part. This keeps the price low and affordable, even with shipping.

If anyone becomes serious about doing this, I will try to help facilitate the process.

(Just as a sidebar, I just installed Chevrolet Con Rods in my TR4 race car, Carrillo Performance at Chevy Prices.

-Joe Alexander

Engine/Block/Sleeve Cylinder

Subject: TR4 Engine sleeve install
Date: Wed, 11 Jun 2008
From: "Brian Induni" <308gtsi@roadrunner.com>

Tom,

When I rebuild the wet sleeve engines, I make sure the block is spotless first. This means having it hot-tanked, rinsed, and forced air dry. Then I make sure the sleeve seats are clean, clean, & clean. Then I used the slightest amount of silicon sealant on the F8 gasket (and use good quality - you'll pay again for poor quality gaskets!), set the gasket in place, slide in the sleeve, and hold in place with a little pressure from a head stud. Never had one leak in 30 years...

-Brian

Subject: Engine sleeve install
Date: Wed, 11 Jun 2008
From: "Randall" <tr3driver@ca.rr.com>

> I am about to have new sleeves put into my TR4 block and was wondering what if anything beyond the figure
> 8 gasket people used to seal the sleeves.

I like to use Permatex #3 (aka "Aviation Form-A-Gasket") on the seat in the block and on the ledge where the "Fig 8" gasket sits. That's reasonably close to the Wellseal the book calls for. I believe you can get genuine Wellseal @ TRF, but the Permatex has always worked for me.

-Randall

Engine/Block/Water Spigot

Subject: TR 2/4 block drain petcock
Date: Fri, 25 Apr 2008
From: Randall <59tr3driver@gmail.com>

> The original petcock on my block has pretty well had it with the spring corroding to nothingness.

I found it fairly easy to source a spring from the junk box, and cut it to length with a Dremel cutoff tool. I also lapped the tapered part of the valve into the body a bit with rubbing compound, then cleaned and lubricated it with silicone valve stem grease (didn't have any stopcock grease on hand). Then I smeared some silicone on the new spring as a preservative, too. Then a new flat washer and cotter pin completed the overhaul.

The result looked original and worked great for many years (probably still works but I haven't tried it since the car got wrecked).

-Randall

Engine/Cylinder Head/Body

Subject: Engine Stud installation
Date: Fri, 9 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I am replacing several manifold studs.....having never replaced a stud, Can you confirm best method? Do I
> simply use 2 nuts and tighten the outside nut to torque setting, then loosen the two nuts?

That's one method, but no need to worry about torque setting. Just get them good and tight, then turn the nut closest to the head to loosen the stud.

Or, there are any number of "stud remover" tools on the market. I generally use one like this:

<<http://www.sjdiscounttools.com/skt92502.html>>

(although mine came from Sears). There are lots of different styles, with different characteristics. The one above will damage the threads (if there isn't an untreated area for it to grip). In a pinch, you can even use Vice Grip pliers (aka mole grips).

> Does one use anti-seize or loctite for this application?

For manifold studs, I generally use anti-seize. Never had one come out on its own, but sometimes they are a PITA to remove. The anti-seize seems to help.

-Randall

Engine/Cylinder Head/Body

Subject: Head thickness
Date: Fri, 03 Aug 2007
From: TeriAnn Wakeman <twakeman@razzolink.com>

"Ed Woods" <fogbro1@comcast.net> wrote:
> What's the original thickness of a TR4 head?

An unshaved high port Triumph head is **3.330" tall**. For more see <www.tjwakeman.net/TR/FAQ_heads.htm>
-TeriAnn

Engine/Cylinder Head/Body

Subject: O-ringing a TRactor motor
Date: Fri, 8 Oct 2004
From: "Randall" <tr3driver@comcast.net>

First, let me point out that I did this as a solution to a specific problem. I do NOT recommend it be done to all engines. Nor is it the best solution to the specific problem, it's just the one I chose (mostly because it was quick, easy and cheap) at the time.

The specific problem was a TR3 motor that always leaked compression, in spite of numerous attempts to fix it (including different gaskets, different gasket treatments, different liners, head milled, new fig 8 gaskets, etc.) That problem was eventually traced to the liners not sitting evenly proud of the block, and being too low on one side (which of course was the side didn't check the first few times). Appears to be a manufacturing defect in the block (?) since the problem is on all cylinders and the liner seats don't appear to be badly corroded or have been recut. The block was from a 56 TR3 I bought for its overdrive, and didn't appear to have a great many miles on it. Perhaps this is why.

I got the wire idea from Ken Gillanders at British Frame and Engine, who said the racers sometimes do something similar when they can't keep the head sealed. Of course they are generally using modified solid metal gaskets while I had to use (for other reasons) a stock (TR4) composite gasket. The wire ring may also be written up in the Competition Preparation manuals, but I don't have one handy to check.

I used 26 AWG bare copper wire from McMaster Carr. ISTR Ken saying "half hard" but I don't recall what MMC called it. The roll is still out in the garage, I might be able to find a part number if you want. I prepped the gasket first, by cleaning with a Scotchbrite pad where I was going to solder to it, and then painting it with flux. Then I used rosin core eutectic (63/47) electrical solder and a Weller soldering gun (just what I had handy, probably makes no difference at all) to tack the wire in place around each cylinder, right next to the crimp in the original gasket. Didn't run a continuous bead, just tacked it often enough to hold it in place securely. The ends were overlapped slightly, and buried in solder together. Remainder of the installation was as normal, no 'magic' chemicals or anything.

The result has worked fine for quite a few years now, I've even reused that head gasket twice and it still doesn't leak. I really hadn't planned it as a long-term solution ... long term solution was to rebuild a different block ... but I still haven't done that (yet) and the copper ring has worked out perfectly.

Ken later suggested super glue instead of solder to hold the ring in place on the gasket, but I've never tried that.

I've also read of a similar trick used on supercharged motors, where they machine a small groove into the head around each cylinder and pack the wire into the groove. I think my mod has the same effect, but saves getting the head machined.

-Randall

Engine/Cylinder Head/Body

Subject: Storing your Head!
Date: Fri, 12 Jan 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi List!

I happen to have a spare TR4/A head lying around. I was thinking of getting it magna fluxed, to see if it's NOW worth rebuilding.

The questions that I have are:

Could a head 'warp' by lying around?

Is there a 'specif' way of storing a head? Like storing a Crank.

I was thinking of taking a 1/4" or thicker steel plate & mount it to the cylinder side & torque the bolts/nuts to 105 ft #, to prevent it from warping after it's rebuilt. Is this a good or bad idea?

Feel free to answer to me or the TRIUMPH List, NOW that I'm back on line. TIA,
-Cosmo Kramer

Subject: Storing your Head!
Date: Fri, 12 Jan 2007
From: "Doug Mathews" <mathews@uga.edu>

Cosmo,

I think you are supposed to store them on the end, not flat. Just make sure they cannot fall over!

-Doug

Subject: Storing your Head!
Date: Fri, 12 Jan 2007
From: <[BearTranserv@aol.com](mailto: BearTranserv@aol.com)>

<tr4a2712@yahoo.com> writes:
> Could a head 'warp' by lying around?

A four inch piece of cast iron would spontaneously warp, but a 1/4" steel plate would stop it? I don't think so. Should be no self-warping and I personally don't think the steel plate would help.

-Robert B. Houston

Subject: Storing your Head!
Date: Fri, 12 Jan 2007
From: "Alain" <triumphworks@gmail.com>

Quick question while talking about heads and crankshafts and since Ted Schumacher seems to be online. How does one correctly store both items prior to an engine rebuild.

Head - flat?

Crank - vertical in crated wooded box?

Ted Schumacher <tedtsimx@bright.net> wrote:

Cosmo, we always have heads magnafluxed and pressure tested. Magnaflux only shows external cracks. Pressure test shows internal.

-Ted Schumacher

Subject: Storing your Head!
Date: Fri, 12 Jan 2007

From: <jar@aldermanroad.net>

The head off a TR four cylinder is not about to warp just lying around. They rarely warp on the engine, even when overheated.

Just lay it flat, wrapped in an appropriate sized plastic bag. That's what the machine shops do.

Subject: Storing your Head! - Summary
Date: Sat, 13 Jan 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi List!

Thanks to everyone that replied to this thread. Most of this summary was posted on the TRIUMPH List, but I'd like to give a summary for the people that look this thread up in the archives or just happen to have joined the list. The general consensus was:

1- Besides having the head magnafluxed, you should also have it 'Pressure Tested' to check for inertial problems, too.

2- No, the head will not warp if not mounted & left lying around alone.

3- No, it doesn't matter in which position [side, edge or end] it's stored on.

4- It was strongly suggested to lightly oil the unit & wrap it in a plastic bag [like a garbage bag], without any holes in it, to prevent it from rusting.

-Cosmo Kramer

Engine/Cylinder Head/Body

Subject: TR Engine Head Removal
Date: Wed, 16 Jan 2002
From: "BOB KRAMER" <rgk@flash.net>

----- Original Message -----

Subject: TR Engine Head Removal
From: "Randall" <ryoung@navcomtech.com>
Sent: Wednesday, January 16, 2002

> Scott:

> The dead blow mallet probably won't hurt, but IMO won't help either. I've also had trouble with the edge of
> the block crumbling away, if I pried between the head and block too enthusiastically.

>

> One technique that seemed to work fairly well for me was to make up a plate with bolts that thread into the
> rocker cover stud holes, and then pry between the plate and the top of the cylinder studs. Soaking things in
> PB Blaster (or your favorite penetrating oil) may help too, as sometimes water gets into the area between the
> studs and head, causing all sorts of corrosion.

>

> Another that I've heard of is to pack #1 and #4 with rope through the spark plug holes, and then use the starter
> to turn the engine over. The rope is soft enough to not hurt anything. You may have to repeat this several
> times, turning the engine backwards by hand each time, and perhaps adding more rope as the head starts to
> come free. You can use the battery, cables and solenoid off of the car to power the starter, the only thing you
> need to add is a longer ground cable which can be obtained at the local parts house (or junk yard). May need
> to scrounge some shorter bolts too, since the bell housing won't be there.

>

> You can also try removing the studs first, which makes it much easier to get the head off (but of course ruins
> the studs).

>

> Don't know about the engine stand, I've always pulled the head before I got to the stand. But, you might be
> able to rig a suitable catch (nylon straps or a wooden platform) and turn the engine upside down to get gravity
> to help. That head is darned heavy!

> -Randall

>

>> Suhring wrote:

>> I am having difficulty removing the head of the engine on the '59 TR3 restoration. The engine is currently
>> on a 3 leg stand, have removed the rocker, push rods and bolts. I can't get the seal to release.

>>

>> Will I be in trouble if I use a rubber dead blow mallet to "wack" the head to get it to release? Should I take
>> the engine off the stand so as to get better leverage with the engine on the ground? Since I plan to have the
>> head and block cleaned and checked out at a local shop, should I let them do the dirty work?

Whatever happened to the rope trick? Feed rope into both ends through the spark plug hole and crank it over to
pop the head off.

-Bob Kramer

Subject: TR3 Engine Head Removal
Date: Wed, 16 Jan 2002
From: <Tr3bob@aol.com>

Hi Scott,

A dead blow would be acceptable....you won't damage anything. I also read somewhere that there's a rope(?)
technique where you:

1- Rotate the crank so that the piston is at the bottom of stroke.

2- Feed a length of rope (nylon?) into one spark plug hole.

3- Rotate the crank and compress the rope.

They say it works every time.....never had to try it though.

-Bob Stahlbush

Subject: Engine Head Removal
Date: Fri, 9 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> Can anyone help with advice born of skinned knuckles and hard experience pass on some wisdom to help me
> get this head off? I've tried some wood-softened blows with a hammer, laterally.

There's a nice write-up at: <<http://www.team.net/www/triumph/mainStag.html>>

Scroll down to "Cylinder Head Removal". Although written for a Stag, the basic idea should work fine on a TRactor motor. Obviously ignore the overhead cam stuff ... no need to remove the front pulley or timing cover on a TR motor.

-Randall

Subject: Stuck cylinder head tips (reprise)
Date: Sun, 3 Feb 2002
From: <Bristol7@aol.com>

> -----Original Message-----

> Subject: Stuck cylinder head tips (reprise)

> Sent: Sunday, February 03, 2002

> From: Behalf Of <Bristol7@aol.com>

>

> I had this problem on my departed 72 TR6 (which is apparently now resting in good health in a Dutch garage)
> and I solved it pretty easily and quickly. After "undressing" (follow the instructions in the ROM) the head as
> you mentioned below, I took a long, steel cylindrical bar (like you find in a barbell set) and inserted one end
> into the number 3 or 4 exhaust port on the head. I gently levered up and the head separated from the block
> with a nice popping sound and a splash of coolant. No damage done and it only took about two minutes to
> complete. Good Luck! Let us know how you come out.

> - Kirk Yonker

Thank you Hugh, however I am decidedly NOT good..... only lazy..... BTW, do not try this method on a head made of aluminum...such as you find on TR7's and 8's!! You will have "headaches"!

-Kirk

<hfader@usa.net> writes:

>> Damn Kirk! You're good. I looked around in the basement. Found an old broom stick. Put the stick in one of
>> the center intake ports and pulled up on it. Head came right off!!!

I thought I was going to monkey around with this for days.

Thanks very much for the tip.

- Hugh Fader

Subject: Stuck cylinder head tips (reprise)
Date: Sun, 03 Feb 2002
From: suhring <suhring@lancnews.infi.net>

Hugh:

Just went through this with my '59 TR3 head. What ended up working for me was backing out the head studs. I used a jam nut as the base nut and then a metal lock nut (not the nylon type) as the top nut, cranked them together and then unscrewed the stud using the jam nut. Had to use plenty of PB Blaster, but they backed out. With the studs removed, a good smack with the rubber mallet released the head and it could be lifted off.

-Scott Suhring

Subject: Stuck cylinder head tips (reprise)
Date: Mon, 4 Feb 2002
From: "Robert M. Lang" <lang@isis.mit.edu>

Sally or Dick Taylor wrote:

[good advice removed for brevity...]

> Worse case scenario...Take off the pan, drop the crankshaft, pull the pistons out the bottom, and proceed to
> whack the head from the bottom up. Big job, and can mean engine or tranny removal.
> -Dick T.

TR6 pistons will not remove from the bottom. The block has webs cast into it for the cam bearings and the main bearings that interfere with the pistons' path. Sorry - this will not work.

Moral of this case - "crack" the head from the block before you start tearing the motor completely down.

Note: The rope trick is not as severe as you might think, but if I were building a motor I'd want to know that this was done in the process so that I would check the rods and crank to make certain they are not bent in the process.

The head tends to stick to the studs on the side of the motor where the intake/exhaust stuff hangs on. I'm not sure why, but I've theorized that moisture can enter the stud bores in the head or that a couple of the intake/exhaust stud bores enter into the head stud bores allowing corrosion to occur. Bottom line - lots of penetrating oil will help your cause.

I've also made up a "plate" that attaches to the rocker shaft stud holes. I then hook that to my 3-ton chain fall and lifted the head free. Severely stuck heads will usually come free with this process. It's a lot easier to do this with the motor still in the car, the extra mass works for you when you try to lift. I haven't got the front wheels off the ground (yet), but the process can unload the front suspension!

-rml -Bob Lang

Engine/Cylinder Head/Body

Subject: TR head rebuild
Date: Fri, 5 Dec 2008
From: <Catpusher@aol.com>

"Bob Nogueira" <nogera@worldnet.att.net> wrote:

> Well the beat goes on, just returned from the machine shop that is rebuilding the head for my engine. They
> pressure tested it and say there is a very tiny leak around the edge of the aluminum plug that is located under
> the valve cover in the center of the engine (to see a picture of the offending part go to
> <<http://www.texmog.com/Head.htm>>. The leak is very small and definitely around the edge not through the
> plug itself. They are reluctant to try tapping the plug in more since neither they nor I know how it is affixed
> nor if a replacement is available. Note they pressure tested it at 40 lbs and I had them drop it to 20 psi (he
> lowest the gauge would register) and the tiny bubbles remain.
> Any suggestions or advise out there?

The plug is threaded into the head and usually leaks only after extreme heat or chemical cleaning. The very late factory TR4A heads had the outer top of the plug peened after installation (hint)

A race track fix is to drill and tap the center of the plug, and run a set screw into the hole after putting a stout flat washer with on OD larger than the plug over the top of the plug. Use sealer under the washer and on the setscrew. A copper flat sealing washer under the head of the setscrew is a good idea. When you tighten the set screw, it pulls on the plug threads in the head and helps seal them. I raced ahead with this fix for many seasons, and no water ever leaked into the oil.

-Hardy

Engine/Cylinder Head/Rocker Arm

Subject: Cast valve cover fix
Date: Mon, 20 Jan 2003
From: <JRossi727@aol.com>

Hello Mark,

This is what I do. I use aviation gasket sealer. Apply it to one side of the gasket. And don't be afraid to use some of it. Have the valve cover upside down. Set the gasket on the lip of the cover. Then use masking tape to secure it in place. Set right side up and put some weight on it. Let this seat over night. Remove the tape. And you are ready to go.

-John,

Engine\Cylinder Head\Rocker Arm+Push Rods

Subject: Push Rod Oil Leak
Date: Mon, 08 Jul 2002
From: "Jack W. Drews" <vintr4@geneseo.net>

jernigan wrote:

> ----- Original Message -----
> Subject: push rod oil leak
> From: jernigan
> Sent: Monday, July 08, 2002 2:40 PM

> I have just finished a ground up res. on a TR4A 1966 IRS. The problem is oil leaking around the push rod
> tubes. The head was redone by the local machine shop. What I need to know is this common on the 4A head
> and is there any way to fix other than taking off the head and replacing the tubes.

There are a couple of things you can do.

To seal the bottom ends, clean all the paint you can off of the joint between the tubes and the head and apply a very small bead of J. B. Weld around each tube. Obviously this works best on a head that has not yet been painted, but you can at least slow down the leaks this way. It's hard to get at the backside but you can get at most of the circumference.

For the upper end, epoxy inside the valve cover usually doesn't stay put. However, there is a green Loctite compound available which is made to creep into assembled joints. Clean the upper ends off as well as possible with lacquer thinner or Loctite primer -- the cleaner the joint, the more likely it is to work. Then put a little bead around the top of each tube where you see the tube ends inside the valve cover. I'd leave all this at least overnight before getting oil on it again.

By the way, if you want to know a procedure for replacing the tubes, let me know -- I don't want to waste bandwidth if no one is interested.

-uncle jack

Subject: Push rod oil leak
Date: Tue, 09 Jul 2002
From: "Jack W. Drews" <vintr4@geneseo.net>

TR4 heads can develop oil leaks at the push rod tubes because of damage, aggressive cleaning, and milling, which removes some of the swaged area at the head face.

Mild leaks can be attacked with JB Weld around the outside and green Loctite (the wicking kind, don't remember the number) around the top side. If tubes are badly damaged and must be replaced, this can be done by driving out the old tubes, reaming to a couple thousandths smaller than .750 (run the reamer at low rpm!), cutting aluminum tubes to length and pressing in. The aluminum tubing is the standard .750 diameter available in hardware stores. It should be parted off with a lathe and not cut with a hacksaw, in order to make the ends exactly square. When reaming, set the head down on the drill press table and ream until the end of the reamer just kisses the table -- do not ream all the way through. This leaves a small reverse chamfer at the bottom. Then press or drive the tubes into the holes, and use red Loctite. The final operation is to swage the top end with a tapered tool.

If anybody wants a complete kit for doing this, the shop that does it for me will make them up a kit with all the tools and a supply of cut aluminum tubes for \$100. E-mail me if interested.

-jack

Engine/Cylinder Head/Rocker Arm+Push Rods

Subject: Fall in to the GAP
Date: Tue, 21 Mar 2006
From: "Randall" <tr3driver@comcast.net>

> When you shorten the push rods don't forget to check your rocker geometry as you set the length.

Contrary to popular opinion, the rocker geometry is set by the height of the pedestals and the length of the valves and the shape of the rockers. If you don't change those things, you will not change the rocker geometry. Hence there is no need to check it after just milling the head and installing shorter push rods to match.

The push rods should be shorter by approximately the amount milled from the head, but the adjusters will make up for any small errors, again without affecting rocker geometry.

-Randall

Engine/Cylinder Head/Rocker Arm+Push Rods

Subject: Valve Lash
From: <Ryoung@navcomtech.com>
Date: 4/18/2003

Oops, sorry for the confusion. Here's the Dr. Young Patented Simplified Method for setting valve lash:

Turn the engine until both valves on #4 cylinder are slightly open. Set both valves on #1 cylinder.
Turn the engine until both valves on #2 are slightly open. Set both valves on #3
Turn the engine until both valves on #1 are slightly open. Set both valves on #4
Turn the engine until both valves on #3 are slightly open. Set both valves on #2

That's it. In general, the rule is to turn the engine until one cylinder has both valves slightly open, which (for most camshafts) means that cylinder is at TDC. Of course, there is a small range where both valves are open, and for some camshafts it may not be exactly centered on TDC; but it is always close enough to set the valves on the opposite cylinder (which is also at or near TDC on its compression stroke, hence both valves are fully closed).

It actually matters not at what point in the sequence you start, or even if you turn the engine forwards or backwards, as long as you make sure to set all 4 cylinders. I frequently do it backwards, starting with whatever cylinder comes up to TDC first, just because I like to put the transmission in 4th and push the car backwards to turn the engine. It's less wear and tear on the starter, and easier to position the engine accurately.

> My cam specs stated .018" for this cam. Therefore; [what you are saying is:] if I have the Valve Lash set
> .006" to tight, then I could be doing damage to the engine?

It's possible, yes.

Exhaust valves lead a very hard life, the exhaust gases are like a cutting torch. If the valve head is ever allowed to get as hot as the gases, they will cut right through it. What keeps it cool is the time (roughly 3/4 of each revolution of the camshaft) that it spends in contact with the valve seat. By having the valve lash set too tight, you are reducing the time it spends sitting on the seat. Also, the clearances go down as the valve heats up and expands.

So, it's best to stay within .005" or so of the cam manufacturer's spec. Of course, there isn't a clear line, I'm not saying that there is a single point where .001" tighter will instantly cause damage, but the tighter the lash, the greater the chance of damage.

-Randall

Engine/Cylinder Head/Rocker Arm/Tappets

Subject: How bad did I mess up?
Date: Thu, 20 Mar 2003
From: Mark Hooper <mhooper@pix-cinema.com>

-----Original Message-----

Subject: How bad did I mess up
Date: Wednesday, March 19, 2003
From: Ronnie Babbitt <rbr3a@cox.net>

In my efforts to freshen up the motor on my new sports six, I removed all external components. I taped some plastic around the head covering the Valve assembly. I then began to sand blast the block preparing it for paint. After painting the block I removed the taped plastic. I had not considered that some of the sand had adhered to the tape and a few grains fell on/into the head. I vacuumed up the few grains but I can not be certain that any fell into the push-rod tubes.

Any suggestion, I would like to keep from removing the head if at all possible. But if I must I must.
-Ronnie Babbitt

Hi Ronnie:

Taking off the head would only risk spreading the contamination no? As long as all is assembled the sand grains are trapped above the lifters. So you just need to wash them out.

Consider using a 1/4" plastic tube taped onto a shopvac and sucking out each of the push rod tube holes. You might want to thin down the oil in there with a bit of varsol. Gasoline would probably be too farmable and do something nasty to the shopvac. Put some water in the shopvac so that the varsol will fall into it as it enters the vacuum instead of being vaporized and sucked through the motor.

I used the vacuum trick to get some bits out that I dropped down the holes by mistake. It worked quite well.
-Mark Hooper

Engine/Cylinder Head/Rocker Arm/Tappets

Subject: Regrinding TR3 lifters?
Date: Mon, 13 Aug 2007
From: Beth Lang <mlang@easystreet.com>

I am getting ready to drop my TR3 camshaft off at Oregon Cam Grinding Inc. to have a stock profile regrinding done on it. Normally I would install new lifters on a reground cam, but I have read so many negative things about the lifters that are currently available. The folks at Oregon Cam Grinding say that they can regrind my old lifters to the proper profile for \$4 each. I have done some searches but haven't found much discussion regarding regrinding old factory TR3 lifters. Has anyone had any good or bad experiences with having lifters reground?
-Mike

Subject: Regrinding TR3 lifters?
Date: Mon, 13 Aug 2007
From: <tr3driver@ca.rr.com>

> Has anyone had any good or bad experiences with having lifters reground?

It's my understanding that the result has the same problem as some of the new lifters; they are too soft. At any rate, I had some original lifters reground years ago by Babe Erson, and after only 10,000 miles or so, they had started to spall and break up.

Since then, I have heard Kas Kastner's advice to **run a new camshaft/lifters at a fast idle for 20 minutes or so** (which contradicts many other's advice about driving the engine). He claims that will work to harden the lifters and cam lobes.

Also, Greg Solow (The Engine Room) and Ken Gillanders (British Frame and Engine) both have new lifters that work. (Likely others too, those are just the ones I've heard about.) Greg does a 100% test on his new lifters, while Ken has a solution from a different engine.

There is also the whole fuss about reduced ZDDP levels in modern motor oil being a problem for "flat" lifter engines, but I'm not convinced that applies to stock TR motors. Still, it wouldn't hurt to throw in a can of GM's EOS additive during break-in (which contains ZDDP).

-Randall

Subject: Regrinding TR3 lifters?
Date: Tue, 14 Aug 2007
From: "Kentech HomeTech" <kentech0822@verizon.net>

The new lifters I purchased recently from Ken at BFE each had a tiny triangular divot at the top indicating to me that they all had been individually hardness tested. Ken said at least 50 on the Rockwell scale, then mentioned running @ 2500rpm or so for 20 minutes after initial startup, and using proper cam lube at assembly as well. They are phosphated and have a drainage hole drilled, cost was \$11 each + s&h.

-PeterK

Subject: Regrinding TR3 lifters?
Date: Tue, 14 Aug 2007
From: <AMfoto1@aol.com>

Hi Mike,

Have they actually inspected each and every one of your cam followers and signed off that they can be reground? They need to be able to remove any and all pitting on the face, and they cannot have any cracks. If they pass initial tests, when done right regrinding is a good option if you are totally certain they are originals. The originals were good quality, the problems have been some softer replacements offered over the years. You

could have them tested for hardness, too. I think you want more than Rockwell 50... more like 54 or 56 if memory serves. There are also some guidelines in Kas Kastners books about how to lighten the stock lifters very effectively and safely, if interested.

The alternative is new followers, such as Ken at <www.britishframeandendine.com> offers. He's got two types, one being the GT40 lifter with a special sleeve, ala Racetorations. High quality, but about twice the price. Also I've heard occasionally they are not a good match with the end of the push rod, so that's something to check. Also, <www.bpnorthwest.com> and <www.tsimportedautomotive.com> probably can help. Greg Sulow at The Engine Room in Santa Cruz Calif. might have really high end followers available, if you want to spend some serious bucks. Last I heard he was experimenting with ceramic!

Your cam probably needs to be hardened before putting it back in service. This is not normally done during regrind. And, are you replacing the push rods, too? Is the rest of the rocker assembly being rebuilt?

Be sure to read up on proper cam shaft lube and break-in. The first 10-20 minutes are critical. Cheers!

-Alan Myers

Subject: Regrinding TR3 lifters?
Date: Tue, 14 Aug 2007
From: <ZinkZ10C@aol.com>

Try reading this thread

<<http://speedtalk.com/forum/viewtopic.php?t=6401&sid=f28431aae38c6849d550604183a37c3d>>

Subject: Regrinding TR3 lifters?
Date: Wed, 15 Aug 2007
From: Beth Lang <mlang@easystreet.com>

Thanks all for the feedback on regrinding lifters. I have decided to give it a try. I dropped my cam and lifters off at Oregon Cam Grinding earlier today. Very nice to talk to! The main warning that they had is related to the zinc content in modern motor oils. I need to keep my costs low if I want to get my car back on the road in the near future. I am just doing the basics to the engine at this time. Rings, bearings, valve grind, cam grind and timing chain. If it lasts 40K miles I will be happy. I have a second engine on which I plan to do more of a performance rebuild for in the future.

-Mike

Engine/Cylinder Head/Rocker Arm/Tappets

Subject: Rockwell Hardness Testing -- Cams and Lifters
Date: Thu, 12 Jun 2003
From: Don Mallin <dmallin@attglobal.net>

There were some questions about how Cams and Lifters were hardness tested, so I asked Steve Gruenwald, owner of Integral Cams, how they did it. His reply:

Dear Don:

We use a Rockwell hardness tester to hardness test the lifters. It creates a small pin mark in the lifter face. When we grind the lifters again, sometimes this pin mark cleans up before the other wear marks and sometimes not. It depends on how bad the lifters are worn. Rockwell hardness checking is generally classified under "destructive testing" but it's not literally that brutal and in this case it only means that the part can't be used "as is" after testing. We certainly would not want to hardness check the lifters after grinding and polishing them because the little pin mark would cause rapid cam and lifter wear in an engine. So the only bad thing about this testing method is that we can't test an already new set of lifters without having to grind again and polish them afterwards. Another question I am often asked is:

When we grind again the lifters, to make the pin mark go away, are we grinding off the hardness layer and will the lifter now be soft? The lifters are chill cast which has a broad diffused hardness band so we don't have to worry about instantly grinding through the hardness band like you would if the lifters were induction hardened. Please let me know how you like your cam.

-Steve Gruenwald, Integral Cams

Engine/Cylinder Head/Rocker Arm/Tappets

Subject: Tappets
Date: Tue, 17 Jul 2007
From: <KingR44916@aol.com>

I adjusted the valves and still a lot of tapping how to quiet them and will roller rockers do the trick?

Subject: Tappets
Date: Tue, 17 Jul 2007
From: "Terry Geiger" <tgeiger@shoalsbritishcars.org>

<KingR44916@aol.com> wrote:

> I adjusted the valves and still a lot of tapping how to quiet them and will roller rockers do the trick?

Roller rockers are quieter but a certain amount of tappet noise is to be expected from a TR engine, especially when compared to a modern vehicle.

TR engines are a solid tappet design, whereas most modern vehicles that use tappets utilize some form of hydraulic dampening to eliminate the noise and the need for frequent valve adjustments.

-Terry Geiger

Subject: Tappets
Date: Tue, 17 Jul 2007
From: "Mark" <mark@nashvilletn.org>

I always worry if I don't hear them, which means that they are too tight. A cast alloy valve cover will quiet them a little.

-Mark

Subject: Tappets
Date: Tue, 17 Jul 2007
From: "Jack W. Drews" <vintr4@geneseo.net>

"Terry Geiger" <tgeiger@shoalsbritishcars.org> wrote:

> Roller rockers are quieter but a certain amount of tappet noise is to be expected from a TR engine, ...

>Terry Geiger

Often what happens on older engines is that the rocker arms wear just where they contact the valve stem. That means that when you use the feeler gauge, it is bridging across the groove in the rocker and your clearance ends up greater than you think it is. You can get around this by buying a cheap feeler gauge and snipping the blade you want to use down the middle to make it half as wide.

-uncle jack

Subject: Tappets
Date: Tue, 17 Jul 2007
From: "Ed Woods" <fogbro1@comcast.net>

"Mark" <mark@nashvilletn.org> wrote:

> I always worry if I don't hear them which, means they are too tight. A cast alloy valve cover will quiet them a
> little.

> -Mark

Or just wait a few years. When you're hearing begins to fail, you'll no longer hear them!

-Ed Woods

Subject: Tappets
Date: Tue, 17 Jul 2007
From: "Ed Woods" <fogbro1@comcast.net>

This outfit will return a TR rocker assembly as new:

Rocker Arm Specialist
19841 Hirsch Court
Anderson, CA 96007
Tel (530) 378-1075 1(800)747-2767
fax (530) 378-1177
e-mail: <rocker@c-zone.net>
-Ed Woods

Subject: Tappets
Date: Tue, 17 Jul 2007
From: "David Brister" <david.brister@wanadoo.fr>

Amen to that! Sometimes I can only tell my engine is running by referring to the rev counter!
-David Brister

Subject: Tappets
Date: Fri, 20 Jul 2007
From: Ted <triumph66@gmail.com>

wbeech <wbeech@flash.net> wrote:
> You think your TR is loud, go out and get a vintage TR motorcycle, the correct valve noise is deafening.
> -Bill B

Actually, if you want to hear a loud TR, you should have heard [though I suspect many TR-listers have at previous VTRs] the Roadster Factory's TR4 Lemans 929HP car yesterday in front of the Sheraton's overhang. If you think the car is wonderful to look at, you should hear it in full rev in an enclosed space.

Dave Hutchison was giving hand signals to Kirk from South Carolina as Kirk adjusted the carb mixture. They both have to be deaf after that experience. It was akin to listening to a jet fighter, but quite a kick!

Kirk commented that the car needed some new fuel, and quipped "that fuel smells like varnish,... ah that car has original fuel, that's what it is, original fuel..."
-TL

Engine/Cylinder Head/Rocker Arm/Tappets

Subject: Tappets humor NO LOB
Date: Thu, 22 Aug 2002
From: Mark Hooper <mhooper@pixelsystems.com>

Ah Fred, your mechanic may be in for a raise if he uses a new trick. My preferred method of adjusting my TR6 valves is to have a 1/2" wrench in one hand, and a flat screwdriver and the barrel of a mechanical stethoscope in the other and the car warmed up and running. I grip the stethoscope probe betwixt base of thumb and forefinger, and the screwdriver with the rest of the fingers of my left hand. With these instruments parallel and facing opposite direction to my thumb, I can turn the screw of the tappet adjuster and press the probe of the scope against the center rocker at the same time. I hold the wrench in my right hand and loosen just enough to let the screwdriver turn the adjuster without losing any tension on it. A second person holding the scope probe against the center of the rockers makes this job a cinch.

The above setup allows me to listen very closely to the clicking of the tappets as I tighten the adjusters. I tighten just to the point where the clicking starts to disappear and then back off a fraction. This ensures that the cam lobes actually have some free space and are not holding the valve open during the compression and power stroke.

It takes a little practice to keep the wrench and screwdriver on the adjuster with them hopping up and down, but you would be surprised what you can do with a little patience. You have to have your idle below 900-1000 rpm or you won't manage it, but below that it's not really too difficult.

This is the only method I have ever found that got the minimum of valve clatter without finding you had partially uncompressed cylinders at hot engine conditions.

BTW don't forget to block off the pipe leading from your valve cover to the carbs or the idle will be too erratic to adjust.

-Mark Hooper

Adjusting your valves easily by Jeff (Cosmo) Kramer

Do you dread Adjusting your Values? Have a hard time moving from TDC to the next valve for adjusting? After you do finally adjust the valves, do you wonder if you really got the Cam in the best position when you were trying to adjust each valve?

Well **IF** you have Justin Wagner's Valve Cover Gasket & follow my tips, then your worries are over. My tips are pointed at the TRIUMPH 'Wet sleeve engine', but can possibly be adapted for others, too.

1- Mark the leading edge of the pointer that is attached to the Timing Cover with white paint. (I used whiteout.)

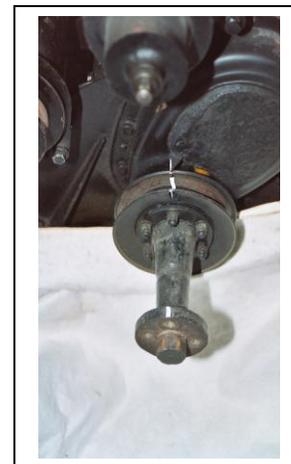


2- Mark the inside of the Crankshaft Pulley, in line with the 'pointer mark', when the engine's #1 piston is at TDC with the white paint. (Again, I used whiteout.)

(See Fig. #1)

3- Follow the TDC Crankshaft Pulley mark out to the other end of the Damper (Fan Extension) & make a mark to be seen later on.

(See Fig. #2)



4- Remove the Dog Bolt, Fan, & Damper.



5- Using a protractor, make 3 more marks, 90 degrees to the TDC mark made on the 'fan end' of the damper.

(See Fig. # 3-4)

6- Then make notches at each of the four 90 degree marks that you made on the 'fan end' of the damper so it can

accept a 2" curve Spanner Wrench. (I had my machinist do this.)

7- Assemble all parts back in the proper locations.

8- Now if your Cam & Crank Sprockets are in correct sink with the Timing Chain, then you are guaranteed of getting each Tappet 180 degrees from the apex of the cam's lobe.

9- Starting with the engine's #1 piston at TDC, adjust Valve #1.

10- With the Transmission in neutral & using you Spanner Wrench, rotate the Damper 90 degrees in the engine's proper direction to adjust the next Valve (Clockwise when standing in front of the radiator & looking at the engine from the front towards the back of the car). Use your manual to follow the proper sequence of adjusting your Valves. Now! Wasn't that simple, painless, accurate, & EASY?



Engine/Cylinder Head/Valves

-----Original Message-----

Subject: Valve guides
Sent: Wednesday, February 06, 2002
From: Hugh Fader <hfader@usa.net>

On the way home from work, I stopped at a machine shop that was highly recommended to me. The owner told me that he did not recommend bronze guides. Said that cast iron was harder and would last longer under normal road use. This is not what I thought. Any opinions?

- Hugh

Subject: Valve guides
Date: Wed, 6 Feb 2002
From: jim wallace <wallaces@superaje.com>

Randall wrote:

>I suppose it could be due to the slightly higher thermal coefficient of expansion of bronze ... but since the
> guide id would normally get bigger as the bronze expands, the ME problem of what actually happens when
> it's in a cast iron hole is beyond my skills. Anyone else care to take a whack at it?

+++++

Ken G. told me that reaming the guides to greater than "modern" specs (0.002" and 0.003", as you mentioned elsewhere) is necessary because in a TR3/4 head there is a lot of mass (of cast iron) in the vicinity of the guide i.e. the heat is not removed from that area very well.

-Jim Wallace

Subject: Valve guides
Date: Wed, 6 Feb 2002
From: "Hugh Fader" <hfader@usa.net>

On the way home from work, I stopped at a machine shop that was highly recommended to me. The owner told me that he did not recommend bronze guides. Said that cast iron was harder and would last longer under normal road use. This is not what I thought. Any opinions?

- Hugh

Subject: Valve guides
Date: Wed, 6 Feb 2002
From: Mark Hooper <mhooper@pixelsystems.com>

I must admit that in my Strength of Materials classes at school they always said that "Hard on Soft" was the way to have a long-lasting machine. Perhaps the exhaust head overrules that.

-Mark Hooper

Subject: Fuel, Spark and Compression - Which one is it?
Date: Sat, 23 Feb 2002
From: "Randall Young" <ryoung@navcomtech.com>

John:

I believe it's a definite possibility. I once helped a friend who had assembled a motorcycle motor (which was a 4-stroke) with the timing chain off by one tooth, and it would consistently foul plugs in just a few minutes of running.

However, it's not hard to check cam timing (with the stock cam) with just the rocker cover removed. If you trust your TDC mark, it's even easier. Assuming the TDC mark is good:

First turn the engine until #4 exhaust valve is just closing, and the crank is at TDC. Set the valve lash for #1 intake and exhaust to .050". You can stack multiple feeler gages together for this. It doesn't matter if the value is not exactly .050", as long as they are the same. Now turn the crank forward one full turn, coming back to TDC and stopping. You have to stop on the mark, you cannot turn the crank backwards (or the reading will be inaccurate). If you do pass the mark, turn it two full turns forward and stop on the mark. Now measure the lash on #1 intake and exhaust (without moving the crank). If they are equal, then the cam is perfectly timed. If the intake is tighter than the exhaust, the cam is retarded. I don't recall the slope offhand, but one way to find how far it is retarded (or advanced) is to split the difference of the readings (assuming one of them is not .050"), and then turn the crank another two turns, stopping when the readings are equal. You can now measure how far the mark is away from TDC, and compute the angle from that.

When you are done, turn back to TDC with #4 intake closing, and reset the #1 valve to .010".

-Randall

Subject: Fuel, Spark and Compression - Which one is it?
Date: Sun, 24 Feb 2002
From: "Randall Young" <ryoung@navcomtech.com>

> Can you explain the theory behind this for us? Is there a variation that works for the other cams?

Hugh:

This works for any cam that is 'symmetrical', Ex: has the intake open the same number of degrees before TDC as the exhaust opens after TDC. I believe all of the Triumph's factory cams were this way, but there might be exceptions. One exception is the TR8, which of course was not a S-T designed motor. Probably half of the aftermarket cams (especially the older profiles) are this way, but you have to check the timing specification to be sure. These are frequently listed as a sequence of four numbers, eg 72-on TR6 stock cam was 18-58-58-18. In this case, we need to know if the first number (intake opens) and last number (exhaust closes) are the same.

Another feature of all camshafts is that they have very definite ramps in the valve motion. They cannot just 'snap' the valve open and shut, they have to gently (well, relatively <g>) lift the valve off its seat, then accelerate it smoothly, and decelerate it to its open position. Closing works the same way.

Armed with that, it should be easy to see how the test I outlined works. At TDC between the exhaust and intake stroke, the intake valve should be just opening and the exhaust should be just closing. Both will be slightly open, this is known as the overlap period. The exact amount that they will be open by varies with different camshaft profiles, but to check cam timing, all we need do is see that they are the same. By increasing the lash to .050" or so, we make it easy to measure the amount of lift with a simple feeler gage.

Let me know if I've missed anything.

-Randall

Engine\Cylinder Head\Valves\Guides & Seats

Subject: Advice on cylinder head
Date: Tue, 5 Feb 2002
From: "Arakelian, Peter" <arakelianp@mossmotors.com>

Hugh

When I did my '71 TR6 head, I had seat recession on one of the valves. Took the shop all new valves, springs, guides, keepers, retainers. Used Stellite valves, manganese-bronze guides, and let the shop find hard seats. Told them to make it for unleaded use. It has worked very well. My opinion is that if it's out and apart, do everything at once to upgrade. Keeps you from wondering about it later. These are all unleaded upgrades.

-Peter Arakelian

Subject: Advice on cylinder head
Date: Tue, 5 Feb 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

Hugh, the bronze valve guides need to be reamed after installation, to a slightly larger clearance than would be used with original-type cast iron guides (which normally don't have to be reamed). In a nutshell, the guide holes in the head are not precisely machined, some are smaller than others, and the bronze guides 'crush' a bit as they are pressed in, making the hole smaller. The larger clearance is because bronze does not 'self-lubricate' as well as cast iron, the extra clearance is needed to keep the valves from sticking.

According to Ken G. at BFE, the clearance between the stem and guide should be .002" intake, .003" exhaust. The machine shop that installs the guides should know what to do with these numbers <g>

-Randall

> One final question: I recall reading that the bronze inserts need some special treatment or else the valves may
> stick. Any advice on this?
> -Hugh

Subject: Advice on cylinder head
Date: Wed, 6 Feb 2002
From: <LaJoMor@aol.com>

I believe, to the contrary, that the manganese-bronze valve guides ARE self-lubricating...I have never heard of cast iron being self-lubricating...

-Larry M

Subject: Advice on cylinder head
Date: Wed, 6 Feb 2002
From: "Randall Young" <ryoung@navcomtech.com>

Well, to some extent I'm just repeating what I've been told, and read in books. Gray cast iron was frequently used in old machinery, and it's self-lubricating qualities (or perhaps I should say, relative freedom from galling) were one of the reasons it was preferred for things like the guide ways on my mill and lathe. It was even used for engine piston rings up into the 50's, when better alloys of chrome became available. See for example <<http://www.ironcasting.org/Gray%20Iron%20-%20A%20Unique%20Material.htm>> which states "Gray iron is also known for its resistance to galling and seizing. Many explanations have been given for this behavior, such as the lubricating effect of the graphite flakes and retention of oil in the graphite areas. "

There are literally hundreds of standard bronzes, and countless more special alloys. I don't know exactly which one is used for the valve guides, so I'm not certain of the comparative specifications. But, almost everywhere you find a bronze bushing, it's really sintered bronze, where the sintering creates pores that are filled with oil.

Thus the instructions (for example) to soak TR2/3/4 starter bushings in oil for 24 hours before installing them. Modern Oilite is 18% mineral oil.

I have seen unreamed bronze guides stick, and Ken G. says the solution is to ream them. I suppose it could be due to the slightly higher thermal coefficient of expansion of bronze ... but since the guide id would normally get bigger as the bronze expands, the ME problem of what actually happens when it's in a cast iron hole is beyond my skills. Anyone else care to take a whack at it?

-Randall

Engine/Cylinder Head/Valves/Springs

Subject: Valve Springs
Date: Thu, 28 Apr 2011
From: fogbro1@comcast.net

Listers,

For those who care about such things, the later TR4s and the TR4As used identical double spring sets on the intake and exhaust valves. But we all know that. What do not seem to be widely published, are the dimensions of those springs. They are:

Outer Spring:

3-1/2 working coils
Free length? 1.67"
Solid length max 1.052"
The outer spring ID is .898"
wire diameter .162"
gives an OD of 1.222"

Inner Spring:

Free length? 1.63"
Solid length max 1.02"
The inner spring ID is .648"
wire diameter .12"
gives and OD of .888" (Tight Fit)

The dimension of the machined recess around the base of the valve guides into which the springs fit apparently remained the same as that of early cylinder heads: considerably greater than OD, of the above outer spring.

So the cylinder head I have on hand has proven to be a TR4A head (confirmed by Terri Ann's web page and Ted Schumacher) and the springs and collars I purchased are correct, even though they did not appear to be so. On with the rebuild!

-Ed Woods

Engine/Cylinder Head/Valves/Springs

Subject: Valve Spring Compressor
Date: Mon, 4 Feb 2002
From: <ZinkZ10C@aol.com>

<suhring@lancnews.infi.net> writes:

>> I got a compressor that has 2 legs that attach to the spring and then you screw down the center piece that is
>> supposed to compress the springs. This "pulls up" the springs rather than compressing them.

Block the head up so a opening valve cannot contact the bench. Take a piece of ~ 1 1/4" dia. pipe or deep well socket place it on the valve retainer, then strike the pipe with a hammer. Hit hard enough to jar the valve keepers/cotters but not hard enough to unsprung the whole assembly. (Over time the tapers of the keepers and retainers become stuck.)Then use the screw type compressor to remove. The lever type is more for a on the engine repair using air to prevent the valve from dropping.

After the spring is off, check the tip (rocker side) for any sharp edges that would scrape the guide. Use a file to dress the edges.

-Harold

Engine/Cylinder Head/Valves/Springs

Subject: Valve Spring Compressor recommendation wanted
Date: Tue, 21 May 2002
From: Scott Tilton <sdtilton@yahoo.com>

I've got both types of valve spring compressors from Sears. Yeah they are marginal, but they will work. I've used both of them on both TR6 and TR4 heads during the past couple of weeks.

The big "C" type is strong enough to compress the springs. What it often isn't strong enough to do is to unseat the retainer from the valve locks.

Put the compressor in place and give it a couple of clicks to put some pressure on the spring. If you crank it too much, the C will deform too much, it will get cock-eyed and start falling off.

With a good bit of pressure on the spring. . . give the retainer a fair whack with a block of wood or soft hammer.

That will free the valve locks from the spring retainer. Put a few more clicks on the compressor and the spring will compress on down.

-Scott Tilton

Subject: Valve spring compressor recommendation wanted
Date: Mon, 20 May 2002
From: Darrell Walker <darrellw@inetarena.com>

Does anyone have a recommendation for a good valve spring compressor? I've tried the "overhead" style, but they don't seem to be able to compress enough (and I'm not sure how they work with multiple springs), and I have a "C" clamp type (with a lever, not a threaded clamp) from Sears that just flexes when trying to compress (are TR springs that stiff)? Some parts places have a lever type, but it looks like they would only work with "American" style valves (need the rocker stud). Any help appreciated!

Subject: Valve spring compressor recommendation wanted
Date: Tue, 21 May 2002
From: <ZinkZ10C@aol.com>

<darrellw@inetarena.com> writes:

>> I have a "C" clamp type (with a lever, not a threaded clamp) from Sears that just flexes when trying to
>> compress (are TR springs that stiff)?

Make sure you place a socket or pipe on the valve retainer and give it a hit with a hammer before using the spring compressor. Over time the tapered valve locks become wedged on the retainers causing them to stick.

The hit must be hard enough to jar the keepers not dislodge them. When scraping* old aluminum heads I'll hit the keepers directly with a hammer to pop the keepers.

-Harold

Engine/Cylinder Head/Valves/Exhaust

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Camshaft

Subject: Measuring camshaft lobes
Date: Tue, 10 Apr 2007
From: "Terry Geiger" <tgeiger@shoalsbritishcars.org>

----- Original Message -----

Subject: Measuring camshaft lobes
Sent: Tuesday, April 10, 2007
From: "Mark Hooper" <mhooper@digiscreen.ca>

> I want to measure the total lift on my TR6's camshaft lobes. I'm looking to verify the grind that was done
> during the engine rebuild in 1992. The engine sat idle for many years after the rebuild before re-start in the
> early 2000s. So, what with the time passed, the disappearance of both the machine shop and the paperwork I
> am just not sure what I have in there. Then add in some rather strange power limitations I am seeing and the
> recent news of fast wear due to modern oils and you get the idea that I would like to characterize the lumpy
> stick that is so central to > the engine's performance.
> It seems to me that dial gauges with the required precision would not have the range required. Is there a
> standard kit for performing this measurement? I would like to be able to just pull the plugs and measure the
> rise and fall of the pushrods, or even the rockers if there is a formula for removing the angular movement
> error.
> -Mark

Mark,

I don't know if this is the proper way to do it but I use a dial indicator with a magnetic base. I remove the rocker assembly and simply put the tip of the dial indicator in the end of the pushrod. I make sure everything is reasonably aligned (dial indicator straight and pushrod straight) and then rotate the engine by hand with the spark plugs removed. By observing the lowest reading to highest reading, I can determine the total lift of the camshaft lobe. This does not calculate valve lift, only the lift of the camshaft lobe. If you want to know valve lift then you would multiple the cam lobe lift by the ratio of the rocker arm. Stock US rocker arm ratio is 1.46:1. I assume you would have to subtract the valve clearance to get the actual valve lift?

This is a good write up on camshafts for TR6: <http://www.hottr6.com/triumph/tr6cams.html>

-Terry Geiger

Subject: Measuring camshaft lobes
Date: Tue, 10 Apr 2007
From: "Mark J. Bradakis" <mark@bradakis.com>

Yes, dial gauges have the required range to do this, the total travel you need to measure will only be on the order of half an inch. Why pull the plugs? You won't be turning the engine fast enough to generate any compression. You can usually get a good measurement off the valve retainer, though it would be better to pull the rocker shaft and measure from the valve stem itself.

Oops, I meant push rod. If you don't pull off the rocker shaft and do measure off the valve retainer, don't forget to allow for the rocker ratio.

-mjb.

Subject: Measuring camshaft lobes
Date: Tue, 10 Apr 2007
From: "Mark Hooper"

Hi Mark:

Thanks for the note. I will just look for a dial gauge kit with the required range then. I was in the midst of typing a note about that rocker ratio when your update arrived. It is an issue with me since I still have the roller rocker setup from Jim Swarouth installed. I need to make up a couple of rollers to replace some that have flattened a

bit, but the kit is still there and seeming to work well. That being said, I am investigating the entire concept. Since I have had impassioned notes from quite knowledgeable listers claiming that it is folly to build the rocker ration above 1.55 unless one is running a race engine. I seem to recall that Jim's kit was at 1.65 or even 1.75, which would perhaps give some insight on my seeming loss of power at the high end.

-Mark

Subject: Measuring camshaft lobes
Date: Tue, 10 Apr 2007
From: "R. Ashford Little II" 70TR6@mindspring.com

Mark,

While far from an expert, Richard Good has a set of "experimental" 1.85:1 roller rockers on his personal car, and he sells both 1.55 & 1.65 to one roller rockers. So there must be some good in the higher ratios especially when running a hotter cam.

-R. Ashford Little

Subject: Measuring camshaft lobes
Date: Tue, 10 Apr 2007
From: "Mark Hooper" <mhooper@digiscreen.ca>

-----Original Message-----

Subject: Measuring camshaft lobes
Sent: April 10, 2007
From: Ted Schumacher

Mark,

If you have a cam grind other than stock, measuring total lift with a dial indicator is misleading. Cam lift is given as X amount of lift at a specific checking clearance. If you do not have the specs for the cam, you don't know what was used for checking clearance. For example, an S2 cam is .409" lift at the valve at a checking clearance of .013". This means the cam is rotated off the heel of the cam .013". This is to ensure the lifter is actually coming up the cam ramp. Most modern cams are measured at .050" checking clearance, which is probably more accurate. But, either way, if you don't know the point at which the cam lift was measured, you cannot get an accurate lift number. Please let me know if we can help.

-Ted

Hi Ted,

I very much appreciate the informed advice. However, sad as it is to say, my first order of business is very simple; to see if all the lobes on the stick are the same. Other than exhaust/inlet difference, I assume that all cylinders should have identical readings. Thus, I'm first working on detecting any obvious wear (both measured and visual) and then I'm going to sit down with a strong drink and interpret your note and ask for help on figuring out just how warmed up my cam is. What sort of variation should be regarded as normal, versus the indication of a badly worn lobe? While I realize that I will probably be unable to detect wear on the attack or decay sides of the lobes, I am still hoping that the worst wear would be on the tip as being the point with the greatest pressure and smallest surface area bearing the load. That should give me something to compare cylinder to cylinder.

-Mark

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Chain & Tensioner

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Cover

Cosmo Kramer wrote:

>Subject: Timing Chain Cover Putty

>Date: Sat, 29 Apr 2006

>From: "Guy D. Huggins" <guy@genfiniti.com>

>

>Listers,

>In cleaning my timing chain cover for painting I accidentally grounded off a significant part of the sound

> deadening putty on the front. I was planning on applying some JOB Weld to takes it place.

>

>Does anyone have any other suggestions?

>-Guy D. Huggins

Hi TR Members & Guy

I've written this into the list before, but many people may not have seen it because it was of NO Interest to them at that time. Here is what I have suggested:

1- Mask off the Timing Cover (TC) that is NOT to have the 'Sound Deading material on it.

2- Spray the TC with 'Wurth' [I think that's the name of the company?] Rocker Panel Schutz. You can spray on light coats- by spraying far away from the TC. OR You can spray on heavy coats- by spraying closer to the TC of what one be if spray painting with a can.

NOTE: Thicker coats will take a longer time to dry, but will give you more 'deading sound'.

3- After thoroughly dry, then paint spray the TC the color [usually black] you want.

This method has worked great for me in the past 8 yr. that it's been on.

-Cosmo Kramer

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets

Subject: Cam Timing (again) TR2
Date: Mon, 27 Sep 2004
From: John Gillis <jgillis@gemini.tcd.ie>

Hi all,

Can I run this by the collective. I have tried out a cam timing method I read in an old TR Register mag, but would like comments.

- 1. Find true TDC of the crank using timing disc dial gauge and rotating both directions.
- 2. Take the inlet timing data for your cam, in this case 15degrees BTDC and 55 ATDC, add these together along with the 180degrees of TDC to BDC then bisect the angle. On the timing disc this works out at 110degrees ATDC. This is the midway point of the inlet cam.
- 3. Find the maximum lift of the cam on inlet NO1 using your dial gauge and again rotating both ways to find the mean. Leave the cam in this position.
- 4. Rotate the crank clockwise to 110degrees ATDC.
- 5. Fit the cam wheel and chain without moving either crank or cam.

The trouble I found is after following this and then rotating crank with the dial gauge on No1 inlet I thought I would see the cam start to lift at 15degrees BTDC, but it did not it was more like 55degrees BTDC. I did note that the methods used in manuals are all based on No4 cylinder, could this be the problem? Would appreciate help on this one, I'd like to move on to the next bit!

-John

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets

Subject: Ignition Timing
Date: Sun, 24 Oct 2004
From: "Randall" <tr3driver@comcast.net>

> When I gapped the points, I also painted a white mark on the pulley near the timing point (even with
> the small hole). (dumb question, but the cylinder to the front IS the Number 1 cylinder, correct?)

Yes, that's right.

> My dilemma is: Today, I put an inductive timing light on the car. The mark that I painted on is an easy 1 1/2"
> to 2": to the right (carb side) of the timing point. I did no further adjustments to the points or the distributor,
> figuring I should leave well enough alone for now, until I get some input from the pro's out there. The idle is
> a bit high, around 950, but I blame this on the state of the carbs.

Terry, I'm not sure I follow you here, but it sounds like your timing is too fast. 'Normal' timing for a TRactor motor is 4 degrees BTDC, which is only about 3/8" on the edge of the pulley. The timing hole is supposed to be at TDC (all referenced to #1 on compression, of course).

Of course it's also possible that your timing mark is off, either by the pulley having been assembled incorrectly, or the key between the pulley hub and crankshaft being broken or missing.

Another possibility is the advance mechanism inside the distributor, perhaps a spring is broken or slipped off.

If the car is drivable, I'd try setting the timing by the "road test" method outlined in the book, basically warm the engine thoroughly and then try to get it to knock by lugging it in high gear. The book says you should just be able to make it knock, I like to retard a couple of degrees from that point just for safety.

If that doesn't work (or can't be done), my next step would probably be to observe whether the centrifugal advance is working. With the timing light connected, slowly rev the engine up and watch the timing mark. It should advance smoothly over a range of about 15 degrees as you rev the engine to about 4000 rpm, then retard smoothly over the same range as you let it back down.

-Randall

Subject: Ignition Timing
Date: Sun, 24 Oct 2004
From: "Randall" <tr3driver@comcast.net>

>>> [Terry] I put an inductive timing light on the car. The mark that I painted on is an easy 1 1/2" to 2":
>>> to the right (carb side) of the timing point....

>> 'Normal' timing for a TRactor motor is 4 degrees BTDC, which is only about 3/8" on the edge of the
>> pulley....

> Now I'm confused. The 4 degrees or 3/8" would be static timing but wouldn't that be advanced more
> than a little at idle (950 RPM)?

Good point. I don't have the late TR3A advance curve handy, but the TR2 advance curve would allow something like 4-6 degrees of advance at 950 rpm (475 distributor rpm). Still a lot less than 1.5-2".

-Randall

Subject: Ignition Timing/Adj. carbs
Date: Sun, 24 Oct 2004
From: John & Patricia Donnelly <pdonnell@san.rr.com>

Hi Terry,

You wrote:

> Over the last few days, ... Number 1 cylinder, correct?)

The firing order is 1,3,4,2. The distributor rotor turns counterclockwise. Check your wiring.

> My dilemma is: ...

The timing is done statically, meaning that you set the advance without the motor running. There are two ways to do this, and depending who you talk to will tell you differently. But basically, either set the crankshaft at 4 deg and turn the distributor until the points open, or, set the distributor and turn the crankshaft (in the correct direction) and adjust the distributor to get the points to open at 4 deg. I've been in a habit of doing both. And, lastly, road test the car and do any fine adjustments at the distributor adjust screw.

> The idle is a bit high, ...

Before rebuilding or adjusting the carbs make sure the timing is correct first. Once you are absolutely sure it's correct then you can make any adjustments to the carbs. If you can't adjust, or find leaks, then rebuild.

There's lots of literature on how to do this but the best advice I can give is to start from a "known" starting point. This means that BOTH mixture adjustment screws are set to the same spot before adjusting. Only work on one carb at a time. And, clear out the piston chambers frequently by "revving" the engine. If you get confused, go back to the starting point.

Adjusting the twin carbs is difficult, even for a "pro". If you error, then error on the rich side. The best tell-tale of mixture is the spark plugs. Run the car for a couple hundred miles, then check the plugs. They will tell you if the mixture is too weak or rich.

Lastly, the idle speed is the last thing you set. You make an initial setting, and adjust as you progress in the carb tuning, but it's the final setting.

-John

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets

Subject: Re-using timing chain gear
Date: Mon, 2 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> I'm planning to change the chains, but I would like to reuse the good sprockets. Is this advisable or should I
> change the whole lot? As mentioned the gears have only done about 7k miles.
> -Sujit,

I guess it depends on how certain you are that the other sprockets are good, and have no wear whatsoever. I have always heard that timing chain sprockets should always be changed with the chain, because they wear to match each other. If only one side is changed, the new will quickly wear to match the old.

If it were my car, I'd be replacing all the sprockets; and testing the new ones for hardness.
-Randall

Subject: Re-using timing chain gear
Date: Wed, 4 Jul 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi List!

I use to work as a bicycle mech. & still do at times. I have found that it's best to replace the sprockets & chain together at the same time, as Randall has stated. If you replaced JUST the chain, then the NEW chain would 'skip' on the worn out sprocket(s), but not on the sprockets that weren't worn. Now if you replaced JUST the worn sprockets on the Freewheel Cluster, then the chain would not 'skip', but cause the chain to 'wear-down' faster to causing it to skip again, when it was worn out.

Going on that info., I was going to change both Cam & Crank Sprockets with the Timing Chain & Tensor when I rebuilt my engine back when... When I went to order these items, I was told by a person that has been working on these engines for over 50 yr., not to get the sprockets because the 'old sprockets' were made better than the new now day ones. This may be because my 'old sprockets' were never used more than 5 yr. I've had no problems with this set up for the past 7 yr., from when I started using this arrangement.

So go figure it out on what is best.
-Cosmo Kramer

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets

Subject: Timing marks on a TR4
Date: Sun, 22 Aug 2004
From: "David Brister" <brister@tiscali.fr>

IMHO timing the TRactor engine whether static or with the strobe light is best accomplished by getting it somewhere near, then making little adjustments with the venire until you can just get pre-ignition using full throttle at 2000rpm or so in top gear.

You can get it near to 4 degrees static by jacking up one back wheel, then turning it in top gear (which is an easy way to turn the engine in either direction) taking up the backlash by rotating the road wheel forward until the hole in the pulley is about 1/2" short of the pointer on #1 cylinder compression stroke. Then with your venire adjustment in the middle and the distributor clamping screw loose, and the points correctly gapped, with the aid of a timing, light fiddle around till you just have the points breaking. Clamp it and go out on the road.

Hope this doesn't offend too many purists!

David Brister.

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets

Subject: TR4A Engine Timing - Compression Stroke
Date: Wed, 2 Jun 2004
From: "Randall Young" <Ryoung@navcomtech.com>

> Quick question - Since the crankshaft rotates twice for every full turn of the cam, there are two different
> strokes for every piston. Starting from TDC (#1 piston), is the first rotation of the crank the compression
> stroke or is it the second rotation?

Depends on whether you start at TDC after the compression stroke or TDC after the exhaust stroke. They're both known as TDC ... although TDC after compression is usually the one you're interested in, since that's the reference point for ignition timing. And of course it's different for each piston, although again #1 is usually the one you're interested in (for the same reason).

> And where is TDC of the compression stroke (I know, at top dead center, but before the stroke starts or after -
> basically the first or second TDC)?

Not strictly accurate, but generally when someone says "TDC on compression", they mean TDC at the end of the compression stroke. That's the only TDC adjacent to the compression stroke (which technically begins at BDC and ends at TDC).

> Just want to check before I set up the final timing on my new engine.

Good idea ... they don't run worth a cr*p with the timing off by 180 degrees... and I've got the frostbitten toes to prove it!

-Randall (it's a long story)

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets/Cam

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets/Crank

Subject: Crankshaft woodruff key
Date: Thu, 07 Mar 2002
From: Barry Schwartz <bschwartz@pacbell.net>

> I'm starting on my first engine tear down and have reached the woodruff key on the crankshaft. Haynes says
> pull it out with pliers - who are they trying to kid. I'm a little hesitant to try pounding under it with a
> screwdriver to force it out - is there a list-approved method other than that?

A trick I learned a long time ago is to use a "wire cutter" commonly referred to (by me anyway) as "dikes (sp)". Just use the jaws parallel to the crank and grab the key with them as close to the surface as possible Then lever or wedge the key out using the back portion of the jaws to grab the long edges of the key and the front portion to lever against the crank surface kind of like a pry bar. It should be only a light press fit, and yes upon installation it is simply tapped into place until it bottoms - Never had a key that I couldn't remove using this method and never damaged any surfaces either. It's simple and effective.

-Barry Schwartz

Engine/Cylinder Head/Valves/Springs/Front Valve Train/Sprockets/Crank

Subject: TR3 & 4 Timing Chain Cover Seal
Date: Sat, 16 Aug 2003
From: "Gerald Van Vlack" <jerryvv@alltel.net>

List,

If anyone is interested, the Speedi-Sleeve part number for the Fan Hub to Timing Chain Cover Seal for a TR3 or 4 engine is #99174. It fits over the fan hub diameter that the seal rides on and creates a new smooth surface for the seal to rub against if the fan hub has a groove worn into it from the old seal. Installation tool and instructions are enclosed with the Speedi-Sleeve. The Chicago Rawhide P/N is 17387 and it is supposed to be a double lip oil seal. I just purchased them this morning from the local Bearing Supply house.

-Jerry Van Vlack

Engine/Cylinder Head/Valves/Springs/Guides & Seats

Subject: Advice on Cylinder Head
Date: Tue, 5 Feb 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> One final question: I recall reading that the bronze inserts need some special treatment or else the valves may
> stick. Any advice on this?
> -Hugh

Hugh, the bronze valve guides need to be reamed after installation, to a slightly larger clearance than would be used with original-type cast iron guides (which normally don't have to be reamed). In a nutshell, the guide holes in the head are not precisely machined. Some are smaller than others, and the bronze guides 'crush' a bit as they are pressed in, making the hole smaller. The larger clearance is because bronze does not 'self-lubricate' as well as cast iron, the extra clearance is needed to keep the valves from sticking.

According to Ken G., at BFE, the clearance between the stem and guide should be .002" intake, .003" exhaust. The machine shop that installs the guides should know what to do with these numbers <g>
-Randall

Subject: Advice on Cylinder Head
Date: Tue, 5 Feb 2002
From: "Arakelian, Peter" <arakelianp@mossmotors.com>

Hugh

When I did my '71 TR6 head, I had seat recession on one of the valves. I took the shop all new valves, springs, guides, keepers, retainers. Used Stellite valves, manganese-bronze guides, and let the shop find hard seats. I told them to make it for unleaded use. It has worked very well. My opinion is, if it's out and apart then do everything at once to upgrade. It keeps you from wondering about it later. These are all unleaded upgrades.
-Peter Arakelian

Subject: Advice on cylinder head
Date: Wed, 6 Feb 2002
From: <LaJoMor@aol.com>

I believe, to the contrary, that the manganese-bronze valve guides ARE self-lubricating...I have never heard of cast iron being self-lubricating...
-Larry M

Subject: Advice on cylinder head
Date: Wed, 6 Feb 2002
From: "Randall Young" <ryoung@navcomtech.com>

Well, to some extent I'm just repeating what I've been told, and read in books. Gray cast iron was frequently used in old machinery, and its self-lubricating qualities (or perhaps I should say, relative freedom from galling) were one of the reasons it was preferred for things like the guide ways on my mill and lathe. It was even used for engine piston rings up into the 50's, when better alloys of chrome became available. See for example:

<<http://www.ironcasting.org/Gray%20Iron%20-%20A%20Unique%20Material.htm>>

Which states, "Gray iron is also known for its resistance to galling and seizing. Many explanations have been given for this behavior, such as the lubricating effect of the graphite flakes and retention of oil in the graphite areas. "

There are literally hundreds of standard bronzes, and countless more special alloys. I don't know exactly which

one is used for the valve guides, so I'm not certain of the comparative specifications. But, almost everywhere you'll find a bronze bushing. It's really sintered bronze, where the sintering creates pores that are filled with oil. Thus the instructions (for example) are to soak TR2/3/4 starter bushings in oil for 24 hours before installing them. Modern Oilite is 18% mineral oil.

I have seen not reamed bronze guides stick, and Ken G. says the solution is to ream them. I suppose it could be due to the slightly higher thermal coefficient of expansion of bronze ... but since the guide id would normally get bigger as the bronze expands, the ME problem of what actually happens when it's in a cast iron hole is beyond my skills. Anyone else care to take a whack at it?

-Randall

Engine/Cylinder Head/Valves/Springs/Intake

Engine/Cylinder Head/Valves/Springs/Keepers & Retaining Collars

Engine/Emission & Manifolds

Subject: Carbs and Manifolds
Date: Sun, 28 Jul 2002
From: Scott Tilton <sdtilton@yahoo.com>

Just for the record, according to my experiences this weekend . . . An early TR4 intake manifold meant for H6 carbs, will NOT bolt up to an engine that has the later TR4A exhaust manifold.

Well, that's not exactly true.

It will bolt up . . . and while from the top, it will appear that the edge of the intake manifold is snug up against the cylinder head, but the bottom edge will be far enough off it that you can almost snake a pinky finger up in the gap. And of course if you don't happen to notice this little fact . . . all the cranking in the world isn't going to make your car start since you aren't pulling any air through the manifold or carburetors.

The problem is that the balance tube, that connects the front and rear cylinders, interferes with the exhaust tubes coming off cylinders 2 and 3. While it might be possible grind off enough material off the two manifolds to actually make them fit . . . it appears to be a significant amount of grinding so I decided to try another route.

I bolted up the early H6 carbs to a later TR4A intake manifold. The results are some carbs that are WAY off the engine . . . but it seems to work okay. The hood still closes even!

-Scott Tilton

Engine/Emission & Manifolds

Subject: Changing engines breathing system (closed->open)
Date: January 1, 2009
From: <TR4A2712@yahoo.com>

Hi Randall!

Thanks for the reply. Now I'm wondering if it would be a good idea to install the 'Lower Breathing Pipe' & KEEP the PCV, too? What's your thought on this idea?

Also in reading some past threads that I've been keeping in my "TR4/A E-mail Repair Manual" (actually past threads that I've collected over the past 10+ yr. of being on the TR Digest List related to anything to do with TR4 or TR4A's) there is a thread regarding of checking the 'straightness' of the crankshaft by leaving the front & rear main Bearings & removing the center main bearing cap. Installing a dial gauge on the center crankshaft journal & rotating the crankshaft to see if there is any deflection in the needle movement. The only thing is that it was NOT mentioned if there is any deflection, then how much is acceptable? What's your view point on this Subject? I would GREATLY like an answer ASAP being that I was planning on doing this tomorrow (Sat.1-31-09) & then checking my E-mail on Mon. (2-2-09). I'm getting to the point of wanting to order all my parts from MOSS before 2-13-09 because they have a FREE SHIPPING deal going on until then.

Because of me pulling the engine & tranny, to have the OD Tranny sent out to Quantumanichis to have it repaired, & to attempt to reseal that rear engine seal from leaking. (But the chances for that to actually happen, are slim. BUT it's worth a try?) In any case, this 'Simple' little project has exploded to rebuilding the Main & Connecting Rod Bearings, New Clutch Pad, a New Electronic Distributor, & Jet Hot coating the Exhaust Manifold in Jet Hot coat of Sterling Silver colour. Plus I've started to Sand blast & sand to want to 'polish' the intake manifold. This is what I'm asking if the PCV should be kept because I do have two TR4 Intake Manifolds that I could polish (1- either the 'breather tube' for the PCV, & 1- WITHOUT the tube).

I'm also wondering if I should purchase a Damper for the fan extension with my plastic 6 blade Fan that does NOT have any rubber or 'damping qualities'? I would most likely be purchasing this Damper from Ken Gillanders of BEF. So I also would like your input on this question, too.

-Cosmo Kramer

Subject: Adj. the conventional Rear Seal on wet sleeve eng.
Date: January 1, 2009
From: Randall <tr3driver@ca.rr.com>

Randall wrote:

> What I call the front plate does not need to come out to remove the crank.

Good! I'm glad that I will NOT have to do this, & therefore NOT having to touch the Front Plate Gasket, RIGHT?

> Not quite. The front of the sealing block touches the front plate gasket, so it may tear the gasket when you
> pull it out. If so, just 'butter' the sealing block with Hylomar, and leave out the torn portion of the gasket.
> You will need to remove the timing cover and timing chain; the filler piece over the front main cap; the 4 rod
> caps and the 3 main caps; but that should be all that is required.

Thus: I'll need to replace the 'T' cork tabs used to seal the Front Main Bearing Cap, which means I have to go through all the motion of setting the gears & timing chain correctly, again. RIGHT?

> Yes, you'll need to replace those little cork tabs. But you should be able to mark the current position of the
> timing gear, and put it back the same way, which is much easier than setting it the first time.
> You can leave the timing gear in place on the crank and so not even R&R the shims behind it.

My Healey friend said that he left a little of the 'Felt Packing' sticking out each end of the Rear Seal so when placed together, this would make less chance of the oil leaking out. BUT this seems 'counter productive' by leaving a Larger Gap at the seems of the two halves to cause MORE oil to leak out. What is your viewpoint on this?

- > I think you may have the two things confused. The felt is to seal the sides of the rear main cap to the cylinder block, and has nothing to do with the aluminum crankshaft seal. I agree that leaving a small amount of the felt protruding is a good idea, as the pan will then compress it and ensure a good seal.
- > This is mentioned in the TR3 workshop manual (Which says to leave only 1/64" sticking out).
- > Also, with the engine not running, the crankshaft will "fall down" and take up all the clearance on one side of the main bearings.

Mind you, this engine is on an Engine Stand that will be upside down. So when you say 'fall down' this in reality is moving it up closer to the top of the engine, RIGHT?

> Yes.

Also, if I do go with your Idea of removing the PCV & installing the Breather Tube, Then I'll need to plug the opening going to the Valve Cover & Intake Manifold, RIGHT? Thus making the TR4A engine's 'breathing system', like that of the TR3's 'breathing system', RIGHT?

> That's right, if you are worried about appearance, you could probably just plug the line and leave it in place.

> -Randall

Subject: Changing engines breathing system (closed->open)
Date: Friday, January 30, 2009
From: "Randall" <tr3driver@ca.rr.com>

> Now I'm wonder if it would be a good idea to install the 'Lower Breathing Pipe' & KEEP the PCV, > too? What's your tough on this ides?

The problem with that is that the factory PCV system expects to pull a slight vacuum on the crankcase. Since the lower tube will be open to the atmosphere, this will represent a vacuum leak that may be large enough to cause mixture problems.

Also, it will be sucking air up through the tube off the road, which is very likely to carry grit and such with it. The TR2-3 setup flowed the other way, because air flowing past the angle cut on the tube created a slight depression. But the vacuum from the PCV will be stronger, and hence pull air upwards.

You might be able to build a workable system by replacing the lower tube with a tube that only sticks up, and putting a filter on the top. Then I don't know about the vacuum leak problem, but perhaps using an American style PCV valve would limit the flow enough to not upset the mixture too badly. I'm considering a variant of this approach myself, but haven't tackled it yet.

> The only thing is that it was NOT mentioned if there is any deflection, then how much is expectable? What's > your viewpoint on this.

If it came from a running engine, then the crank must be pretty straight. I've never bothered checking the run out myself; but I believe anything over .001" would be too much. There are places that can straighten them, if necessary.

> In any case, this 'Simple' little project has exploded.

They do have a way of doing that. I've always tried to concentrate on keeping my plans small, because of all the people I see that wind up having their car off the road for years and year. Since I also want to join Jonmac partway, TS13571L is going back together almost entirely stock at first. I'm undoing several of the POs mods, and only adding the front sway bar and something for brake lights. I'll save the other modifications for later.

> I'm also wondering if I should purchase a Damper for the fan extension, with my plastic 6 blade fan that does > NOT have any rubber or 'damping qualities'?

My opinion is that it is unnecessary for a stock motor (meaning one that will never see over 5000 rpm for any length of time). I ran TS39781LO for almost 20 years with no damper or fan extension. Did have some trouble after about 10 years, as the hub came loose on the crankshaft, but I believe that was because the original conversion did not clamp it firmly in place. After making sure it was clamped (and Loctited), I had no further

problems.
-Randall

Engine\Emission & Manifolds

Subject: Does anybody have a spare crankcase breather pipe they would sell?
Date: Sat, 10 Mar 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I added one to my 64 TR4 and it reduced the leaking quite a bit, prior it seemed to be oozing oil out of every pore. If it is now sending oil out the breather tube it isn't enough to be noticeable so all in all I considered it a good thing.

I dremeled a slot in the center of the plug then inserted a stubby screwdriver and twisted it out. I had the oil pan off thinking I might push it out but you can't really get at the back side of it -- though that did enable me to be comfortable that I wasn't introducing any metal bits to the internals.

They come up on E-Bay quite often -- the 'winning' bid varies a lot so patience may eventually get you one for short money.

-Geo

Engine/Emission & Manifolds

Subject: Exhaust Manifold Studs
Date: Mon, 25 Mar 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

Cosmo wrote:

- > Hi List!
- > I'd like to carry Jim W.'s question a step further. If one was to use Anti-seize grease on the studs, then the nuts
- > would be able to come off much easier & the stud out of the Exhaust Manifold. Now would it be better to put
- > locktite on one side [the one in the Exhaust Manifold while putting anti-seize grease on the other side [side
- > that has the nut], OR would it be better to put anti-seize grease on both sides?
- > -Cosmo Kramer

Cosmo:

That connection gets too hot for Loctite. Use anti-seize on both sides, and fresh lock washers under the nuts to keep everything tight until you want it loose.

I haven't had any trouble with the studs wanting to come out of the manifold when I undo the nuts, but if you do,peen the ends of the studs lightly.

-Randall

Subject: Manifold Studs
Date: Sun, 12 May 2002
From: "Michael D. Porter" <mporter@zianet.com>

Bill Miller wrote:

- > I don't believe this is correct. Everything I have ever been told, and from what I have read on ARP website
- > and others is that you should:
- > First: Chase and clean the holes.
- > Second: Well lubricate the studs.
- > Third: FINGER tighten the stud only.
- >
- > Not being an ME, I really don't want to start an argument, but from racing to street, I've never heard to torque
- > a stud, just the opposite.

I'm not entirely sure about either of these requirements, but I'll offer some possible reasons for both. In the case of the methodology Randall cites, torquing the stud may be necessary in any case when the stud is not further retained by a nut. If the stud acts as a hanger or locator and there is no nut, the need to torque it would be apparent, and the only means of doing that would be to bottom it in the thread bore.

However, when the stud is used to retain something in conjunction with a nut, when the nut is torqued, the stud will engage all threads (both the body studs and the nut threads) and the loading on all threads will be according to the torque applied.

Moreover, if a stud, used with a nut, is bottomed in the bore and torqued, the stud itself at that point is loaded in compression. Torquing the nut then loads the stud in tension. I have the feeling that the effect of that would be a reduced total load on the stud, even though the individual torques of the stud into its bore and the nut on the stud are to specification.

The other concern about driving the stud into its stud bore to lock it is the matter of initiating cracks. One of the required specs of a high-strength fastener is that it has rolled threads, to minimize failure from cracking. Trying to lock the stud into its bore by running it out of thread could have the effect of creating microscopic deformations which could be starting places for cracks.

-Michael D. Porter

ebk wrote:

> So if I understand all of this correctly, then I should:

> 1- Chase [run a tap] the threads in the Head/block.

> 2- Lub both ends of the stud. [I like to use a good grade of copper anti-seize grease].

> 3- Finger tighten the stud into the head/block until it will not turn any more. [bottom out or run out of threads on the stud end]

> 4- Install Gasket, if necessary, & items. [valve cover, intake/exhaust Manifolds, fuel pump, ...]

> 5- Install lock washer/nylon nut.

> 6- Torque nut to specs. [see manual]

> Right?

Well, for a head stud, I'd use the original specification cylinder head nut (new ones), along with the correct head nut washers.

As for oiling the stud, while that may be ARP's recommendations for theirs, it's important to remember to check the manual if you're using stock parts. Most torques are listed as dry. If the manual says oil the head stud threads, you can be reasonably certain that the torque spec in the manual is correct when oiling the threads.

This is important, because the oiled torque spec is lower than for torquing when dry. Oiling the threads and then torquing to the dry torque spec results in over torquing the nut. This is simply because not all the dry torque applied results in load on the nut and stud--some of what you read as torque on the wrench is overcoming drag of the dry threads.

Otherwise, you've pretty much got the drill. I hope that helps.

- Michael D. Porter

Engine/Emission & Manifolds

Subject: Exhaust popping
Date: Mon, 10 Apr 2006
From: "Randall" <tr3driver@comcast.net>

> What (if anything) does exhaust popping (backfiring) on deceleration indicate about the carb mixture setting?

I believe it generally indicates the mixture is too lean *during deceleration*. But it says little or nothing about the mixture under other conditions.

-Randall

Subject: Exhaust popping
Date: Mon, 10 Apr 2006
From: "Jack Williams" <jackandangie@comcast.net>

> What (if anything) does exhaust popping (backfiring) on deceleration indicate about the carb mixture setting?

> ...

> -Kurtis Jones

Popping on deceleration may also indicate an exhaust leak.

Jack

Subject: Exhaust popping
Date: Tue, 11 Apr 2006
From: "Roger Helman" <rhelman@gmail.com>

You might check your carbs. They could be running rich. Mine were way to rich. Because they were leaking air (need to be rebushed) I had them set way to rich to keep it from stalling at idle.

Car would backfire and detonate when I would shut it down.

It was all fixed when I switch to Webbers

You can do a simple pressure check to rule out leaky valves.

-Roger

Cosmo Kramer <tr4a2712@yahoo.com> wrote:

>> What (if anything) does exhaust popping (backfiring) on deceleration indicate about the carb mixture
>> setting?

>> -Kurtis Jones

>

> Popping on deceleration may also indicate an exhaust leak.

> -Jack

Hi List!

I was told that this popping noise is when 'deceleration' was caused by bad engine valves NOT seating correctly. Which is what Jack has stated [I think?].

Question: Is there any other way for this 'exhaust leak'?

-Cosmo Kramer

Randall's reply to Cosmo Kramer:

I'm not Jack, but I'm pretty sure he was talking about an exhaust/air leak, like at the manifold flange, or a hole in the muffler.

-Randall

Subject: Exhaust popping
Date: Tue, 11 Apr 2006
From "Dave Connitt" <dconnitt@fuse.net>

-----Original Message-----

Subject: Exhaust popping...
From: Cosmo Kramer <tr4a2712@yahoo.com>
Sent: Tuesday, April 11, 2006
To: Dave Connitt

Dave Connitt <dconnitt@fuse.net> wrote:

> Cosmo,
> Back in the day,... deceleration when the exhaust pipes were loose. I think what was happening was unburned
> fuel exiting the combustion chamber out the exhaust valve would be exposed to fresh air sucking into the leak
> and re-ignite causing the popping. ...
> -Dave Connitt

>> Hi Dave!

>> So what you're saying is the 'popping' was external of the engine, actually, in the exhaust system, right?

That is what I discovered was the problem on my old Honda. The exhaust pipes connected to the head with a "gasket" ring between them. There was a metal ring on the outside of the exhaust pipe that clamped that all to the head. If the exhaust leaked, air would be sucked into the gap between the pipe and the head and it would backfire like crazy. Once the clamp was tightened, the backfiring went away. Since the engine had carbs instead of fuel injection it was probably running rich. Speed was everything back then when gas was \$.25 per gallon!
-Dave

Engine/Emission & Manifolds

Subject: TR3 & TR4A Manifold Swap
Date: Wed, 30 Apr 2003
From: <CarlSereda@aol.com>

Bill Brewer Wrote:

- >A friend gave me a TR4A [2 into 2 exhaust manifold] (versus the TR3A, 4 into 1). He claims that I'll get a 5
- > horsepower gain out of it. He also gave me the 2 into 1 down pipe.
- > Originality police aside, does it really give you a horsepower gain?
- > Is there any conflict using it with a TR3A intake manifold?
- > Does it fit okay in a TR3 engine bay?
- > Does anyone else use one on their sidescreen TR?
- > And no, if I don't use it I am not going to sell it on E-bay. I will give it back to my friend.
- > -Bill Brewer

Bill,
The TR4A '4 into 2 into 1' exhaust manifold and twin down pipe can fit TR3's - but - you need to use a different 'Y' and 'connector pipe' at the twin down pipes rather than the standard TR4A 'Y pipe'. The two special pieces are available from Moss and others for about \$75. The special 'Y collector' and 'connector pipe' comes in two separate pieces instead of the 'one piece' TR4A version to allow some jiggling to fit the piping through the narrower non-IRS type frame. I've read the 4A exhaust manifold enabled easier revving and an extra 4 horsepower at the top end of the range - but - you also need the late TR4 'gas-flowed' intake manifold (fitted mid-production TR4s and later), the TR4A cam, and the 4A spec'd distributor to get those four horses.
-Carl

Engine/Emission & Manifolds

Subject: TR4 closed circuit breather
Date: Thu, 24 Jan 2002
From: "Don Marshall" <marshall@nefcom.net>

"Westerdale, Bob" <bwesterdale@edax.com> wrote:
> Has anybody come up with a way to get that \$%&* plug out of the hole where my breather tube ought to be?
> (engine is in the car, considering plastic or small thermonuclear device....)
> -Bob Westerdale

Hi Bob:

I just went through this exercise, also with the engine in the car. There's probably a better way, but here's what I did and it wasn't so difficult once I figured it out.

- 1: I drilled a hole in the plug, about 5/16" as I recall, keeping as close to the center as possible but it doesn't have to be exact. My car happens to have a 1" round hole in the inner fender that allowed reasonable access to the plug with a long drill bit, or in my case a short bit in a long extension that can be found at hardware stores or Home Depot, etc. If you don't already have such a hole and don't want to drill one in your tub, you'll need an angle drive for your drill.
- 2: I then drove the plug a little farther into the hole to break it loose. Again, by using the aforementioned hole in the inner fender, I was able to work from the outside of the engine compartment and used a long drift to hammer the plug in about 1/4" or so.
- 3: Sprayed the plug with PB Blaster and let it soak awhile
- 4: I got a large lag bolt (similar to a huge sheet metal screw), I used a 1/2" x 3", and got it started in the hole I had drilled in the plug. Then I removed the lag bolt and put it through the center of a 1 1/8" half inch drive socket, backed by a washer, with the open end of the socket toward the engine. I screwed the lag bolt back into the plug (through the socket) until it was tight, making sure the socket stayed centered around the plug hole. After it was tight and with the socket centered over the hole, I continued to turn the lag bolt SLOWLY AND GENTLY. Since the bolt couldn't screw any farther in because of the socket, the plug was pulled out of the hole and into the well of the socket. I found this step was easier working from under the car.
- 5: Then I cleaned the hole and poured some oil through it to wash any drill fragments into the pan, where hopefully they'll settle to the bottom and be cleaned out by the oil change I'm going to do Saturday.
- 6: Caveats - this worked well for me, your mileage may vary, etc., etc. I was very careful screwing the lag bolt in to avoid stripping out the hole in the plug and it came out fairly easily. If this doesn't work on your plug, I don't know any other way except to pull the engine. The little "access" hole, in the inner fender, really made it easier. I don't know why this car has one, the other TR4 and the TR3 don't, but given a choice between pulling the engine and drilling and then plugging a 1" hole I'd drill the hole in a heartbeat.

Good luck, and if the description isn't clear enough let me know and I'll send you a picture of the lag bolt/socket/plug rig.

-Don

Subject: TR4 closed circuit breather
Date: Thu, 24 Jan 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

Another possibility (if Don's method fails) is to enlarge the hole a little, and use a cut-down toggle bolt. Cut down the wings of the toggle bolt so they only spread to a little less than the diameter of the plug, then enlarge the hole to about 1/2". Assemble into the big socket like Don did, then stick the wings of the toggle bolt through the hole and let it expand behind the plug.

Personally, I'd want to pull the pan either before or after, flush thoroughly with carb cleaner and wipe with a rag. Guess it depends on how much you value your oil pump, and trust your oil filter bypass not to open. :>)
-Randall

Engine/Emission & Manifolds

Subject: TR4 Crankcase venting pipe
Date: Wed, 15 Oct 2008
From: John Dunham <john.dunham@amphenol-tcs.com>

Hi all,

Finally after 5 years of restoration my TR4 is on the road. What fun! I do have a question for the list. I neglected to notice during my engine build that my crankcase venting hole (where the funny shaped pipe goes) has been plugged with what looks like a freeze plug of sorts. I subsequently have a light breeze of air puffing out from underneath my crappy cork valve cover gasket. I don't mind the slight bit of oil spray on my distributor & have since ordered a silicone valve cover gasket, but I am wondering what is the best thing to do?

I can probably seal up my valve cover gasket & have air puff out of my vented filler cap, but I am not sure if this is good. I think the natural airflow is for air to come in from the vented cap, thru the motor & out the crankcase vent pipe. Do I risk trying to get the plug out, trying not to drill out any metal shavings into my crankcase? I know there have been some PCV discussions before but I am unclear on what the conclusions were. I also see some fancy catch cans out there that sure look nice (but may be unnecessary for a road car) is there any harm I can do to running it the way it is? The motor idles great & runs strong as it is, but I don't want to impose any harm.

Thanks as always,
-John D

Subject: TR4 Crankcase venting pipe
Date: Wed, 15 Oct 2008
From: CarlSereda@aol.com

John D. Wrote:

> > ... I think the natural airflow is for air to come in from the vented cap, thru the motor & out the crankcase
> > vent pipe. Do I risk trying to get the plug out, ...

John D,

Congrats on getting your resto on the road!

IMO for the first 23,000 TR4s or so I would go with the totally 'open-breather' setup as the factory did for TR3s and most TR4s. Filtered air drawn through 'gauzed oil cap', and crankcase gases drawn from draft tube under car are left behind (you might smell a little old-fashioned sport car fumes at a long stop light though!) The original design provides internal engine cross-drafting, helping cool engine and of course relieving pressure. If you want to reduce crankcase fumes into atmosphere you might consider getting the late TR4 smog set-up - it draws gas from inside valve cover to carbs (admitting air through a pin-hole in oil cap since the draft port is plugged), but you forfeit engine's internal cross-drafting system. Some TR4A folks simply dump the SMITH's smog gear and drop a rubber hose from valve cover to below the engine, it does let pressure out (and fumes into atmosphere). TR draft tubes come up on eBay a few times a year. Loosening the crankcase draft plug with a chisel or screwdriver or auger would enable you to grab edge and/or draw out with magnet. Add a little gasket sealer at draft tube/crankcase connection. Oil drip from end of draft tube should be minor or non-existent if you have good piston rings. Good luck,

-Carl

Engine/Emission & Manifolds

Subject: TR4A PCV valve
Date: Thu, 15 Feb 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

TJ <btmfdchn@aol.com> Wrote:

> Greetings... Has anyone tried fitting a more compact domestic type PCV valve in place of the big ugly one
> found on the TR4A engine (and most other English cars of the period)? Things would look much tidier with a
> valve routed from the back of the valve cover to the intake manifold. They are simply one way valves but I'm
> guessing they may be rated for flow.
> -TJ

Hi List & TJ!

I have been looking for others replies on this & haven't seen any. This caused me to do some research by asking others this question. This is what I've learned:

Yes, there are many different PCV's out on the market for these reasons:

- 1- Cubic displacement has some effect on this.
- 2- The amount of vacuum also has an effect on the type of PCV to run.
- 3- Compression ratio has NO effect, as well as the choice of which device is used for fuel delivery. {carb vs PI}.
- 4- The choice of PCV is governed but the manufacture.

Now, if any one wishes to make comments on what I have presented in this thread, then PLEASE feel free to do so. I'm only going on others input that was given to me.

I have e-mailed TJ about what his objective was & he replied that it was for looks of streamlining the hose in the engine compartment, as original stated.

-Cosmo Kramer

Subject: TR4A PCV valve
Date: Mon, 19 Feb 2007
From: <btmfdchn@aol.com>

<goodparts@verizon.net> wrote:

> I am sure the PCV would work fine the TR4A engine. I am not sure of the hose sizes you need. The PCV I
> used is 3/8" on the manifold side and 1/2" on the crankcase side. The PCV by itself it \$7.
> -Richard

<btmfdchn@aol.com> wrote:

Greetings...

I am interested in your PCV conversion but my application is TR4A. The tubing would be different but would your valve work? I am curious about valve selection criteria. Other than physical size, are that rated for flow or engine size?

-TJ

Greetings Cosmo...

This was Richard's response: I've sent him another question, primarily the only selection criteria was hose sizes but not flow rate? Perhaps it's not that big a deal. Don't know. I haven't been able to find any information on flow rates other than that they vary. I may wind up using something that will fit and from an engine of 2 to 2.5l.

-TJ

Engine/Emission & Manifolds

Subject: TR4 Manifolds
Date: Mon, 11 Dec 2006
From: TeriAnn Wakeman <twakeman@razzolink.com>

<jimmuller@rcn.com> wrote:

>>> I know there were a couple of different TR4 manifolds; are they interchangeable?

>

>> Exhaust or intake?

>

> I wouldn't think they are interchangeable. One points up and the other points down. Not the same at all.

That was good for spraying tea over the keyboard & screen. In the future, I'll try to remember to read Jim's postings in between sips of tea and not during.

> -Jim Muller without a TR4 manifold

I don't have one either :)

BTW- all the TR3-4A intake manifolds will bolt to all the high port heads and all the exhaust manifolds will do the same. But as Jim pointed out it is not a good idea to switch between intakes & exhaust.

Though it would be interesting to see a four tube exhaust header standing up a foot or more above the bonnet pointing to the front with a big 2-1/2" SU sitting on the collector face into the air stream. It would be the ultimate ram air set up with really long intake runners for low end grunt ;)

-TeriAnn

Engine/Emission & Manifolds

Subject: TR-4A Crankcase Ventilation Valve
Date: Sun, 24 Sep 2006
From: "Ben Zwissler" <bjzwissler@comcast.net>

Hello,

I'm trying to tune a newly rebuilt TR-4A motor. I inherited two PCV valves with the car when I got it. I thoroughly cleaned and then reused the one that was installed on the engine, but I'm getting a lot of flow through the valve at idle. So much, that when I block the hose, the idle speed will drop from 1200 rpm to 600. This seems like way too much flow and I'm also having trouble getting a reliable low idle and adjusting the carbs rich enough. I assume this is because lots of air is flowing through the PCV without going through the carbs.

I disassembled the spare PCV valve and although identical externally it has significantly different parts internally. I checked the parts catalogs, manuals, etc, but they don't show enough detail to know how it's supposed to go together. So I'm looking for advice on how the valve should be assembled and what parts are correct.

Both valves have the same lower housing. It has the hose connections and appears to have a spring loaded check valve in the base. This spring holds the valve closed (up). Manifold vacuum opens the valve, so I assume it's for backfire protection. Both valves also have the same metal cap installed which has a large, domed area and each is stamped with the same numbers.

Internally, valve #1 has a metal spring between the lower housing and a metal disc with a rod attached which is small enough to go through the hole in the housing and press on the check valve. The spring holds the disc up. On top of the metal disc is a rubber diaphragm that seals the assembly, but is not attached to the metal disc. My assumption is that manifold vacuum pulls the diaphragm down against the check valve limiting flow at idle and increasing flow at high power, low vacuum conditions where the PCV flow would be a small fraction of the air entering the engine.

Valve #2 has a similar metal disc, but instead of a small rod it has a large rod with a taper forming a cone at the end that seals against the hole to the check valve. Again, I'm assuming high vacuum pulls the taper into the hole, closing off flow. It also has a double rubber diaphragm which completely encloses the metal diaphragm, keeping the disc centered.

So, my questions are:

- 1) Is one of these styles "right" and the other "wrong" or are they just different versions that are functionally equivalent? Or, is the large cone section simply missing from the straight rod? How should the "loose" rubber Diaphragm be installed? I'm not sure how to ensure the metal disc/rod is centered.
- 2) How much drop in idle speed do people experience if flow through the valve is blocked? Is my valve "leaky"?

-Ben Zwissler

Subject: TR-4A Crankcase Ventilation Valve
Date: Mon, 25 Sep 2006
From: Raymond Hatfield <iron_horse819@yahoo.com>

Hi Ben,

Here's a very basic question - does your engine have a road draft tube? What you're describing sounds like you have a second vent to the crankcase and your engine is pulling air from outside thru the engine, causing your fast idle condition.

-Raymond L. Hatfield

Engine/Emission & Manifolds

Subject: TR6 ANSA exhaust - now quieter after installing inserts
Date: Mon, 1 May 2006
From: "Lanoway, Brian" <Brian_Lanoway@standardaero.com>

I had commented on the List last week that my new Moss-supplied ANSA TR6 exhaust system was too loud for my tastes - it was hard to hold a conversation at any steady throttle setting. It seemed to really boom at 2500 RPM where I do most of my driving in 3rd and 4th, straight or OD. The ANSA system has a lovely, rich, multi-toned sound, but it's tiresome on a longer drive - and could be embarrassing (ex. Harley-like) in traffic.

A while back, Mark Hooper from this List suggested that I try the motorcycle baffles produced by JC Whitney. Mark had used these on his Falcon Sport system and said they made a 'whale of a difference'. These are simple, inexpensive, stainless steel baffles, about 4 inches long, that you insert in a straight portion of your exhaust pipe. They come in two sizes: 1.25 and 1.50 inch diameter.

Here's the JC Whitney web link:

<http://www.jcwhitney.com/autoparts/Product/tf-Browse/s-10101/Pr-p_Product.CATENTRY_ID:2006266/showCustom-0/p-2006266/N-111+10211+600001975/c-10111>

I took the TR6 to a local Midas shop last Saturday to have these installed. They simply cut the two exhaust pipes in the middle of a straight run, inserted the baffles, tack welded them in place and butt welded the cut pipes back together. Other than the butt weld, the whole affair was quite invisible - you would never know they were there.

Do the inserts work? Absolutely, I would say that the exhaust note is now about 15 to 20% quieter, the lovely ANSA sound and multi-tones remain unaffected, and it now meets my subjective loudness tolerance level. On the whole, the ANSA system with the inserts is marginally louder than the stock system, but not so much so that it's irritating.

So, for anyone who has an aftermarket exhaust system that's a bit too loud, you should try these inserts. They won't cut the sound level down by half, but they will take the edge off and they're virtually invisible from the outside. Mark Hooper, if you're out there, thanks for the great advice.

-Brian Lanoway

Engine/Emission & Manifolds

Subject: Triumph 2 questions
Date: Fri, 13 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> So...is there any special manifold gasket or trick that can keep me from having to go through this each year?

Jack's gaskets are probably the best trick. But I solved the problem on my TR3A many years ago by: Make sure both manifold surfaces are flat and in-line with each other. If necessary, take them to a shop and have both milled flat just like a cylinder head. I dressed mine up with careful filing and checking with a straight-edge. Check the head surface, too. I took all the studs out and lightly dressed it with a flat file, discovering high spots around the stud holes.

Make sure the stud threads are clean and not distorted. Also check the lengths to be certain the nuts are not bottoming on the threads. There are 4 different lengths of studs available (although early cars only used 3 of them). Also be sure the locating pins are in place and that the intake fits cleanly over them.

Make sure the exhaust manifold isn't fouling on the engine block, where it sticks out below the head surface.

I removed the bolts between the intake and exhaust manifolds. Mostly because I didn't want all that heat going into the intake (cold air means more power), but I think it had a positive effect on sealing as well. The exhaust manifold expands significantly when it gets hot, and will pull the intake away from the head if they are fastened tightly together.

Put a heavy flat washer between the lock washer and the manifold on the outermost studs.

Replace the lock washers with new, every time you take them off. (Ok, I check to see how far they spring back and only replace the ones that have lost their spring. But that is frequently all of them.)

Most important, retorque the nuts at least yearly.

> 2) Wavering speedometer. I had my speedometer (and other gauges) rebuilt by MO MA. Now the speedometer is wobbling back and forth over a 15 mph range while I'm driving. Oddly, it seems steady when the car is cold and at lower speeds. Could the speedometer transmission sending gear be a problem?

More likely the cable, IMO. Slim chance it might be the speedo head (although I've never heard of MO MA making such a mistake, they're only human); one quick check is to temporarily connect the tach to the speedometer cable and see if it wavers too.

-Randall

Engine/Gasket

Subject: Could a steel shim head gasket be the answer to blowing head gaskets
Date: Tue, 23 Sep 2008
From: <emanteno@comcast.net>

Allan Reich <areich@telus.net> wrote:

> Greetings ...
> Still having problems with my TR3 and blowing head gaskets (and other stuff). Talking to a respected british
> car mechanic today, discussing my problems and told him my cylinder compression readings were 170 to
> 175, and he suggested that was pretty high and could be a problem. So the thought came to me that maybe one
> of the Moss Steel Shim head gaskets could be an answer. I understand they were originally used to lower the
> compression ratio in countries with lower octane gas. Have any listers had experience with this?? Would you
> use a regular gasket as well? If both, which would go on the block first?

The steel shim gaskets are typically used on race engines to increase compression. They are a huge PITA to install, because to get them to seal properly, you have to SuperGlue .0015 copper wire onto the gasket to mate up with the top of each liner. Then, when you torque the head, the copper wire crushes and effectively that is your seal. I had one for a while on my vintage race TR4, but found it was way easier to go back to the stock head gasket. I lost a bit of power, but I never had one fail at the track. My cylinder compressions were about 200-210 per cylinder.

-Irv Korey

Subject: Could a steel shim head gasket be the answer to blowing head gaskets
Date: Mon, 22 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> Still having problems with my TR3 and blowing head gaskets

How's your liner protrusion? Preferably check in 4 different places for each liner. On my TR3 motor that ate head gaskets, the liner tops proved to not be parallel to the top of the block. So the protrusion checked fine on the side I always checked, even though it was nearly non-existent on the other side.

Can you spin a new nut easily all the way down the head stud threads (all 10 of them)?

Had the calibration of your torque wrench checked?

Using proper (hardened) flat washers between head nuts and head?

Both head and block deck flat?

> ... he suggested that was pretty high and could be a problem.

Once again, the reading on the gauge means relatively little, except when compared to other readings taken with the same gauge. But I've built engines that produced between 190 and 200 psi, and didn't blow a stock gasket.

> So the thought came to me that maybe one of the Moss Steel Shim head gaskets could be an answer. I
> understand they were originally used to lower the compression ratio in countries with lower octane gas.

They were found in the compression lowering kit, but it also included a spacer and a regular head gasket. Used alone, they actually raise compression ratio.

If you do want to lower the compression ratio (which will reduce maximum power, maximum torque, and fuel mileage); a better way IMO is to modify the combustion chambers per Kas Kastner's Competition Preparation guide.

-Randall

Subject: Could a steel shim head gasket be the answer to blowing head gaskets
Date: Tue, 23 Sep 2008
From: Brian Jones <banc8004@comcast.net>

I don't think cylinder pressures of 175 lbs are the cause of your problem. One can run higher pressures successfully.

In what condition are the two mating faces of the head and block? My '63 TR4's head was scored from having been cut to increase compression, years ago. My block's mating face was showing its age, but not too bad when cleaned up. While I was having new valves cut at a local machine shop recently, I asked them to clean up the face of the head. It came back looking like a new piece of steel having had a thou or two shaved off. This greatly improved the odds of success in sealing the block to the head with a copper 'sandwich-type' gasket. (I think I got my gasket from Moss.) I believe the 'sandwich' gasket is more compressible than a solid copper gasket, and therefore more forgiving.

I'd previously used Wellseal on the scored head. With this fresh face, I coated the gasket with the Permatex copper spray: <http://permatex.carshopinc.com/product_info.php/products_id/42287/80697>

I found it helpful to prepare the gasket ahead of time. I gave it several coats. I was more certain of good, even coverage, compared to spreading Wellseal around with a putty knife. Among several advantages, the copper spray improves heat transfer from head to block, which may in turn improve the chances of a durable seal.

-Brian

Subject: Could a steel shim head gasket be the answer to blowing head gaskets
Date: Tue, 23 Sep 2008
From: David Ljung Madison <team.net@daveola.com>

Allan Reich says:

> So the thought came to me that maybe one of the Moss Steel Shim head gaskets could be an answer.

Irv Korey replies:

> The steel shim gaskets are typically used on race engines to increase compression. You have to Super Glue
> .0015 copper wire.

I think you're talking about two different things. There are also shim head gaskets that are thicker than normal head gaskets and can be used as a head gasket replacement or stacked with a head gasket, though I think the head needs to be torqued down more if you're doing that.

Moss mentions part 694-505: "...as part of the compression lowering kit.."

I had a similar problem on my TR3A because the head had been milled down too many times by a previous owner (who had, interestingly, complained about overheating problems). I had to replace a number of head gaskets in order to combat this. I have a shim somewhere that I only briefly used, and as Murphy's law would expect, right after buying that shim I managed to finally find a replacement TR3A head from a junkyard.

I would recommend finding a new head that is of the correct thickness and avoid dealing with the gaskets if at all possible. After pulling the head a number of times it gets a little tiring. :)

And if you're looking for a faster way to pull the head than the Haynes manual, check out "Faster Head Removal" under:

<<http://triumph.Daveola.com/Album/Head-Gasket>>

(But only if you think the head has come off in the last decade, or if you have a lift, otherwise the standard route might be easier).

-Dave

Subject: Could a steel shim head gasket be the answer to blowing head gaskets
Date: Tue, 23 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> I think you're talking about two different things.

Nope, they are the same thing.

> There are also shim head gaskets that are thicker than normal head gaskets

Not in steel. Steel that thick would not deform and act as a gasket. And lots of folks seem to have a hard time getting the solid copper gaskets to seal.

> though I think the head needs to be torqued down more if you're doing that.

Nope, at least not with the original studs. Over torquing is counter productive; it results in permanently distorting the studs and an overall reduction in clamping force.

> Moss mentions part #694-505: "as part of the compression lowering kit."

Which also includes a flat steel spacer, to be used between a regular gasket and the "shim steel" gasket. It's the entire stack that lowers the compression, not just one component of it.

FWIW, on my engine with the inadequate liner protrusion, I found that adding the 20 AWG "half hard" copper wire to a stock head gasket was easy and very effective. Super glue didn't occur to me, so I used ordinary 'electronic' grade solder and a soldering gun. It took perhaps 1/2 hour sitting at the table to add wires around each cylinder, in the groove formed where the two original sheets of copper are crimped together. Didn't solder the entire length, just tacked it in place at several points around the cylinder opening. Ends of the wire were overlapped slightly and sealed with solder. The result worked great, both with the head milled too far to run on pump gas and with a later standard head. I even reused the same gasket!

-Randall

Subject: Could a steel shim head gasket be the answer to blowing head gaskets
Date: Tue, 23 Sep 2008
From: Tony Drews_<tony@tonydrews.com>

I've seen over 225 psi on my race TR-4 motor. Seems I had close to 250 on at least one cylinder. Head gaskets aren't a problem for me (since I quit using the shim and copper ones, anyway), although I go maybe 1000 (very hard) miles between rebuilds. Liner protrusion is the key. You need a few thou (say 2 to 4 thou), but not too much. You can adjust this to a point by making custom figure 8 gaskets out of proper thickness shim stock. This can be carefully done with scissors. They should be reasonably flat, although I have a thou or two difference between the lifter side of the block and the opposite side. The stock (Payen AE-330) composite gasket handles this fine. I highly recommend Payen over the slightly cheaper stuff available. ALL LINERS SHOULD HAVE VERY SIMILAR PROTRUSION - any differences will quickly cause head gasket leaks.

You can get ARP head studs and increase the torque a bit too, but that's probably overkill for a street car.

I presume you're doing the water in the oil thing instead of the "blowing all of the water out of the radiator" deal (caused by combustion gases in the water passages). Water in the oil can also be caused by fig 8 gaskets. I've seen that caused by poor cleaning of sealing surfaces, or by uneven surfaces on the sealing surfaces.

Combustion gases in the water are generally caused by no liner protrusion, or differences in liner protrusion, or a cracked head, or even a cracked liner.

I don't recommend an additional gasket - you've just doubled the number of surfaces that can leak.

By the way, I coat the block / liners / head / head gasket (and fig 8 gasket) with Gaskacinch - seems to help things seal without being overbearing. Be careful on the fig 8 deal - I got a little on the surface between the liner "foot" (the protrusion below the fig 8 gasket) and the block and then couldn't assemble (and had a heck of a time disassembling).

If you are totally sure that the fig. 8 surfaces are good, the fig. 8 gasket has no burrs, but you have a liner that sticks up a few thou more than the others, it is possible to shorten it using a plate of glass with a sheet of sandpaper / fine emery cloth taped to it. Carefully run the top surface across it in a figure 8 pattern - check length frequently as going to far ruins the liner. You have to be VERY meticulous in this to not get the top of the liner slanted too. Takes less time that you'd think. BE ABSOLUTELY SURE this is necessary before doing. Usually there's a piece of grit on a figure 8 sealing surface instead of a liner that's too long.

One other thing - There's a slight chance that too much advance causing ping would cause head gasket problems.

-Tony Drews

Subject: Could a steel shim head gasket be the answer to blowing head gaskets
Date: Tue, 23 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> You can adjust this to a point by making custom figure 8 gaskets out of proper thickness shim stock.

FWIW, Mordy Dunst can laser-cut custom Fig. 8 gaskets in a variety of thicknesses. Don't recall the price, but it wasn't much.

<<http://www.headgasket.com/>>

-Randall

Engine/Gasket

Subject: Figure 8 Gaskets
Date: Tue, 23 Sep 2008
From: Gary Nafziger <nafziger@yaho.com>

I'm not into re-building my tr-3 engine yet but have some questions concerning liner protrusion, blowing head gaskets etc. Several members have mentioned that the protrusion is higher on one side of the block than the other. How do you handle this? You can't add 1/2 of a figure of a figure-8 gasket to one side to (in effect) tilt the liner making the protrusion equal on top. So do you then just add gaskets to get a happy medium?

-Gary N.

Subject: Figure 8 Gaskets
Date: Tue, 23 Sep 2008
From: <DLylyis@aol.com>

Gary,

I am not the expert here but have rebuilt my 3 motor and did not encounter such a thing, but I would imagine that the degree to which you have this is part of the equation, whether or not you use steel or copper Fo8s, and if it is too severe then you would want to check the sleeves to see that the problem is not there or machine the block back to flat. As I recall the tolerances for "proudness" is .003 - .005" so we are not talking about much variation. I used copper Fo8s because when I assembled with steel I found that the results were marginal when the sleeves were clamped in place. The coppers were about .001" thicker and gave me the results I wanted.

-David

<<http://www.walleepop.com/?NCID=emlcntuswall00000001>>

Subject: Figure 8 Gaskets
Date: Tue, 23 Sep 2008
From: Tony Drews <tony@tonydrews.com>

There's no "fix" that I'm aware of for the "beveled top" liners. The sandwich gasket will accept a small amount of this, as long as the liner protrudes the whole way around it. The usual fix is to get another block. That's getting harder and harder to do over time. Machining block or liner is fraught with peril and usually a waste of money. It may be good until the next rebuild, but then nothing seems to fit right. As long as all of the liners are doing the same thing (as far as protrusion is concerned), there's some but not too much protrusion all the way around the liner, a thou to maybe 3 thou difference side to side can be tolerated. Mine are 1 to 2 thou difference from passenger side to drivers side of the block. The problem is in the block, not the liners. I have equal protrusion on all 4 liners. It seals just fine.

- Tony D

Subject: Figure 8 Gaskets
Date: Tue, 23 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> Several members have mentioned that the protrusion is higher on one side of the block than the other. How do
> you handle this?

Normally, they will both be within tolerance, so just assemble and don't worry about it. The stock head gasket deforms a long way as you torque down the head nuts (which is part of the reason they must be tightened in stages) and so can make up for some difference.

> You can't add 1/2 of a figure 8 gasket to one side to (in effect) tilt the liner. There's not enough room in the
> block to tilt it that far, anyway. They are a very snug fit at the bottom, and fairly snug at the top.

I've not tried having the block machined to correct the condition. Don't see why it wouldn't work, but if Tony

says it doesn't, it probably doesn't. I've got some extra blocks, just in case <G>

-Randall

Subject: Figure 8 Gaskets
Date: Wed, 24 Sep 2008
From: Tony Drews <tony@tonydrews.com>

The issue with trying to machine the block is that in order to true the top surface you have to remove too much metal. All you really want is a thousandth or two off of one side of the block, but... Then you need to shorten the liners. Then the pistons are too tall, so you need custom pistons. Then the next poor sap who takes the motor apart can't figure out why none of the new parts fit. :)

One other thing to watch out for that I'm not sure we mentioned - the block can crack next to the head studs. It is possible to get this fixed, but typically that's when we start looking for a new block too.

- Tony

Subject: Figure 8 Gaskets
Date: Wed, 24 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> The issue with trying to machine the block is that in order to true the top surface you have to remove too
> much metal. All you really want is a thousandth or two off of one side of the block, but...

I'm no doubt showing my naiveté, but I still don't see why a competent machinist couldn't do that. I've seen it done to heads, and done it myself on a much smaller scale. If necessary, it could even be done by hand.

But you're quite right, taking .010" off the block is going to cause all sorts of problems in other places. And since it would appear that my 'defective' block is already somewhat short (pistons kiss the head with a .010" gasket), I probably won't try fixing it.

-Randall

Subject: Figure 8 gaskets
Date: Wed, 24 Sep 2008
From: <FGFO1@aol.com>

I think the key to getting an out of kilter liner back to where it should be is to machine the bottom of the liner not the block. If you have tried rotating the liner 4 x 90 degrees and it's always the same side that's higher by the same amount, then for sure it's the block. But you can compensate for that by having a good machinist take off a thousand or two at the base of the liner. He does this by setting up the liner in his lathe and dial gauge it off of square by the amount you desire to be removed. If you try it 4 x 90 and it's different each time and/or the difference follows the bad side round the block, then it's your liner. And that is very easy for a machinist to square up.

Then I supposed it's just a case of using 2 liners if you had to remove too much metal. It's a precision job that should not be trusted to anyone under 40.

-Frank Fisher

Engine/Gasket

Subject: Head Gasket for TR3A - smooth up or down
Date: Thu, 26 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> I would appreciate advice and lister's expertise ... but I don't want to count the "ups" and "downs" to
> determine the answer

Personally, I don't believe it makes much difference. It would seem that the gasket makers don't think so either, otherwise they wouldn't have redesigned with the extra oil hole, allowing it to be fitted either way.

Most likely, IMO, you have something else wrong, besides which way the gasket is fitted.

I fought head gasket problems on my TR3 engine for many years, until I finally happened to check liner protrusion on both sides. Turns out they were low only on one side (!) apparently due to a manufacturing defect in the original 1956 cylinder block. The moral is to check every liner on both sides, every time.

Some other tips picked up along the way:

Take a new hardware store nut and spin it down the studs. It should turn easily all the way to the bottom of the threads. If it binds about 2/3 down, then the stud is distorted and should be replaced.

Use a straightedge and feeler gauge to check that the head surface is flat, checking in several different places and directions. I've found that my ordinary carpenter's square is straight enough. You can double-check your Straightedge if you find a low spot, by moving the straightedge and seeing if the low spot moves with it.

The flat washers under the head nuts are special items and are important; hardware store washers are too soft and the wrong size. If yours are missing or wrong, replace them. I believe they are now available from TRF et al. Same goes for the nuts. I wound up with a set of 'tall' nuts from BFE, but the original spec nuts are fine, IMO. Just don't use hardware store nuts (even grade 8).

Get an accurate torque wrench, and follow the sequence given in the owner's manual. I like to go in 3 steps, first all to 40 ft lb, then all 80, then all 105.

BTW, the owner's manual specifies that the head gasket should be installed smooth side down.
-Randall

Subject: Head Gasket for TR3A - smooth up or down
Date: Thu, 26 Jul 2007
From: <terryrs@comcast.net>

Also Allan, are you re-torquing the head when you're supposed to? I think it's at 2K miles, but forget exactly when and it's too hot and humid (read I am too lazy) to look it up.
-Terry

Subject: Head Gasket for TR3A - smooth up or down
Date: Thu, 26 Jul 2007
From: Allan Reich <areich@telus.net>

Geo & Kathleen Hahn wrote:
> One other thought... I don't think you said where the previous gaskets blew. That might be a clue to the nature
> of the problem. My own experience was a failure between #2 & #3 which is probably the weak point on the
> gasket.
> -Geo

Geo
The first failure was #4 between #3 and #4, and the second was both #3 and #4 .. between #3 and #4. I forgot to mention that because of my overheating, I did fabricate a "Geo Hahn Air Dam" out of aluminum. It didn't help much, so I think my problems are deeper than a little air. I am going to take off the nose-piece and remove the rad and get it taken apart and cleaned (or rebuilt).
-Allan

Subject: Head Gasket for TR3A - smooth up or down
Date: Thu, 26 Jul 2007
From: Allan Reich <areich@telus.net>

Terry wrote:
> Also Allan, are you re-torquing the head when you're supposed to? I think it's at 2K miles, but forget exactly
> when and it's too hot and humid (read I am too lazy) to look it up.
> -Terry

Terry:
I torqued the head to 105 lbs in steps of 10 from 55. I then ran it 15 minutes to get it warm, let it cool a bit, then re-torqued to 105. The car only had about 800 miles on the new gasket when it went. I was planning to re-check at 1000 miles
-Allan

Subject: Head Gasket for TR3A - smooth up or down
Date: Thu, 26 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> I forgot to mention that because of my overheating, I did fabricate a "Geo Hahn Air Dam" out of aluminum.
> It didn't help much, so I think my problems are deeper than a little air.

I was never quite sure of the explanation, but when I was driving with a leaking head gasket, the temp gauge would do all sorts of odd things. One of them was to climb way past center when I first hit the freeway in the morning, then suddenly drop back well below center. Sometimes this cycle would repeat, but usually it only happened once while the engine was warming up. Best I could tell, the leaking combustion gases would prevent water circulation with the thermostat closed, maybe by air-locking the pump or something. Then the water would boil in the head, and the expanding steam would somehow start the circulation process. Once the thermostat opened, it would even out, and be fine for the rest of my commute.

Also FWIW, I've overheated other TR3A engines and never lost a head gasket that way. I even drove home once with no fan belt, by stopping occasionally to add more water.

So IMO while a leaking head gasket may well lead to overheating; overheating shouldn't lead to a leaking head gasket unless you actually manage to crack the head.
-Randall

Subject: Head Gasket for TR3A - smooth up or down
Date: Thu, 26 Jul 2007
From: Allan Reich <areich@telus.net>

"Randall" <tr3driver@ca.rr.com> wrote:
> > The flat washers under the head nuts are special items and are important; hardware store washers are too ...

Randall:
Thanks for the great advice . I will try to follow it. I'm not sure how accurately I can check the measurements.

I found reference to "smooth face downwards" under heading 17 re the "Low compression kit" -page 27 of "Service Instruction Manual" but couldn't find it elsewhere in that book. So I went out and found Kenneth Ball's "Triumph TR2, TR3, and TR3A 1952-62" Workshop manual and it also said on Page 13 "a new gasket smooth side down".

Based on simple principles, there are different surfaces on the block side (4 sleeves, block) and only the head up top, so without knowing anything else, I would conclude that smooth side to many surfaces and non-smooth to the single surface ie Smooth Side down. But that may be too simple.

-Allan

Subject: Head Gasket for TR3A - smooth up or down
Date: Fri, 27 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> Thanks for the great advice .. I will try to follow it .. not sure how accurately I can check the measurements.

A set of feeler gauges is a very basic tool, required for TR ownership, IMO. As long as there aren't any sudden dips, .001" or .002" curvature in the head probably won't hurt anything, IMO. The head gasket should crush enough to make it up.

> I don't have flat washers .. I only have lock washers.

Augh! Should be no lock washers there! Lock washers are useful only in relatively low compression joints; they are never used for head nuts. The torque on the nut will keep them from turning ... retorquing is required because the head gasket continues to crush, not because the nuts back off.

> Do you think the "Moss" hardware is better than going to a fastener outfit ... what grade would I specify?

Yes, I do think you should buy the hardware from a LBC vendor. The washers are a non-standard size; and I've been told that the proper nuts are a special class of thread. The originals would not have been graded by the US System, so even Grade 8 is just a guess.

> I found reference to "smooth face downwards" under heading 17 re the "Low compression kit" -page 27 of
> "Service Instruction Manual"

I was referring to P/N 510528, which is variously titled "Instruction Book" or "Practical Hints for the Maintenance of the TR3", depending on edition. It's the TR2-3 equivalent of an owner's manual, delivered with every new car. The one I have handy is the 2nd edition, and the comment about the head gasket is on page 26, step 4 of "Decarbonizing and Valve Grinding".

It says:

A new gasket must be fitted each time the cylinder head is removed. The plain side of the gasket must be downwards against the cylinder block and should be coated on both sides with "WELLSEAL" or similar non-setting sealing compound.

-Randall

Engine/Gasket

Subject: Replacing oil pan gasket
Date: Tue, 13 May 2008
From: "Alex" <ambritts@bellsouth.net>

As an additional thought to Bob's answer, after flattening/straightening all the bolt/screw holes in the pan, apply the Ultra-black to the pan and place the gasket on. Center accordingly and let sit over night until the silicone seals. This approach sets the gasket firm to the pan so you can easily move it and place it when ready. Then apply a bead to the block and attach making sure to torque to proper settings. This approach has been spelled out on the Buckeye site (I believe) for valve cover gaskets and works exceptionally well. I've used it for both gaskets on both my cars. It is much cleaner and will minimize the mess.

-Alex Manzo

Subject: Replacing oil pan gasket
Date: Tue, 13 May 2008
From: Robert Lang <lang@isis.mit.edu>

Hi,

To the advocates of using sealant on both sides of the gasket, I need to ask - with sealant on both sides, how do you remove the pan without cocking up the gasket? Not that you'd ever need to remove the pan. :-)

I always seal to one surface (usually the surface on the part that is removed to perform service) and assemble dry to the other surface. This way the part can wiggle when you install and the whole thing can come apart for service when needed and in a lot of cases (like the oil pan) you can re-use the gasket.

Then again, I'm not a mechanic by trade...

-rml

Engine/Gasket

Subject: Oil Seals – Straighten the Sump Pan edge
Date: Tue, 30 Mar 2010
From: Brian Jones <tr4zest@gmail.com>

Terry,

Randall's advice about a straight edge is good. I went about it differently, though. Outside of daylight hours, put a flashlight (I used a small, free-standing camping light) on a flat surface, like a kitchen counter. Invert the oil pan over the light and look edge-on at the point the pan meets the flat surface. Streams of light will guide your work. Over-tightened bolt holes stand like mini volcanoes where the tight bolt has compressed the gasket and stretched the steel. This method works for me because it gives you the 'whole picture', instantly.

I didn't have or need an anvil. I put a piece of hard wood (oak, or similar) flat on the surface. Mine was a left-over oak tread, but you'll use what you have. I used another piece of oak end-grain on to flatten the lip, helped by a bfh. Check your work as you go with the light.

Once I had the pan as flat as I could get it, I glued the gasket to the pan very carefully and thoroughly with a 'modern' sealant and allowed that to dry for a day, inverted on a flat surface. I cleaned up the sealing edge of the sump and then used a non-hardening sealant (Hylomar, I think) to seal between the pan's gasket and the sump when I fitted the pan. I put Hylomar on the bolts as I put the thing together. It has proven to be dry.

In the same way, as I have gone over the car, it has been my practice, where I can, to secure the gasket to the thing I can remove, and use a non-hardening sealant between that item and 'the car' - like the timing cover, for example. When it comes to remove it, the gasket should come away with the part. Scraping clean something in your hand for a new gasket, on the bench, is a lot easier than cleaning up the other mating surface in or under the car. It also helps, I think, to have on assembly, one half of the joint sealed and cured, rather than have bolts squeezing oozing goop on both sides of the gasket. Gradually tighten all bolts in turn, so you evenly bring the two mating faces together.

The advantage of fixing the gasket to the part you can remove was brought home recently. I had to remove (for the first time) my timing cover. The gasket was fixed very securely to the block with a very hard adhesive. It took HOURS of scraping to remove it. In the car, access to scrape and clean the front of the block is, let's say, impeded.

-Brian

<terrys@comcast.net> wrote:

> All right, I'm ready. Done? It's time to move on it. Gadfrey.

>

> I'm using the original oil pan and a valve cover from E-Bay. The valve cover leaks, even with that terrific
> silicon gasket. The oil pan, I'm not sure, but there's oil everywhere under there. The front and rear seals
> are new. The rear is the modified new type.

>

> What valve cover do people recommend? And if anyone has a good one hanging around, I'm interested.

>

> But before that, what exactly is it about oil pan distortion caused by erratic torquing of the bolts. ISTR
> discussion that this is noted as a reason for them not to seal properly, and has almost certainly happened on
> my 50 year old pan. Is that a myth?

>

> I fail to see the humor in dead pan. Or is it, dead-pan humor???

> -Terry Smith

Engine/Gasket

Subject: TR6 Stripped Bolt Hole in Front Sealing Block
Date: Fri, 16 Aug 2002
From: <ZinkZ10C@aol.com>

I'm not sure what you mean by a sealing block as I am not familiar with TR motors. I have however built many other motors and can offer a temporary fix. (I had worked as a auto mechanic for nearly 20 years and had my own shop for 10)

From what I gather, an oil pan flange bolt striped out. The bolt spacing for such a part is usually 2 to 3 inches so losing one bolt won't cause much of a problem at the ones on either side can compress the gasket and keep most of the oil in the pan.

The temp fix: With the pan bolted to the engine, clean the outside of the pan flange and the block side of the mating surface. Lacquer thinner works wonders. Use a bead of RTV (silicone sealer) around the edge to seal the pan to the block. If the striped bolt goes into oil, plug the hole with RTV and wipe some on the pan hole.

When building my Formula Ford motors, a bead of RTV around the outside of the pan assures no oil leaks. This is much better than applying the sealer to the gaskets as clean up is much quicker, just take a razor blade and cut the RTV. In a emergency the pan gasket can be reused as it will come off of the block cleanly. A dry gasket has a less likely chance of skidding and crushing out since there isn't any sealer to provide lubrication.
-Harold

Engine/Oils

Subject: Oil Type SM
Date: Sun, 09 Apr 2006
From: "J.C. Hassall" <jhassall@blacksburg.net>

<johno8@aol.com> wrote:

> The guys on Ford Barn, a web site for Model A, & T and flathead ford's are recommending that we do not use
> type SM motor oil in our old cars. The EPA has forced the oil industry to take zinc out of oil, and that will
> cause wear on cams. The diesel oils still retain zinc in their oil. They are recommending to use, Shell Rotella
> T, or Castrol Tecton that is type SJ or any oil that carries the type SJ specs, which contains zinc.
>
> Comments from old LBC owners?
> -John Layzell

John,

The May issue of Circle Track mag. has a very interesting article on breaking-in flat tappet engines. Quoting a section:

"Engineers at Comp Cams recently did some pretty exhaustive research on engine oils and how well they protect flat-tappet camshafts. As you might expect, many of the oils failed the test, but there was a surprise. According to Comp, 'Because of the more severe loads in diesel applications, many of the better diesel-use motor oils have high-pressure friction inhibitors as good or better than any of the previous automotive oils. The current API ratings to look for are CI-4 Plus, CI-4 and CF-4. Oils that meet these standards should be recommended at least through the flat-tappet break-in period along with Comp Cams' Pro Cam Lube applied to the cam and lifter and Comp Cams' Camshaft Break-in Lube oil additive.'

Some of the diesel oils that meet these standards are:

Castrol Tecton Extra SAE 15W-40,
Chevron Delo 400 Multigrade SAE 15W-40,
Mobil Delvac 1300
Super 15W-40 and Shell
Rotella T Multigrade SAE 15W-40."

-Jim Hassall

Subject: Oil Type SM
Date: Sun, 9 Apr 2006
From: "R. Ashford Little II" <70TR6@mindspring.com>

I own a '95 Isuzu Trooper and was speaking with a knowledgeable Trooper person recently about a lifter noise that I am experiencing. He recommended Shell Rotella to possibly remove the shellac on the lifter walls. His rationale was that diesel oils have higher detergents than standard motor oil and that this might help me out.

I've not tried it, but I'd be interested in hearing how this could impact our LBC motors.

-R. Ashford Little II

Engine/Oils

Subject: TR4 Oil and Grease
Date: Wed, 26 Jul 2006
From: "Randall"

> Recommendations please on which oil brands and types have worked well for you in both the gearbox and the
> differential of a non-overdrive early TR4.

I don't have an early TR4, but I use Valvoline full synthetic gear oil in my TR3A and Stag differentials. I credit it for making my TR3A differential (which was noticeably worn when I got it) last all these years and miles. I've been using Valvoline "racing" 20W50 motor oil in my (overdrive) gearboxes, but now that they've reduced the amount of zinc in it, I may try something else. Redline MT-90 looks good to me, and others have reported good results with it.

> The same for suspension grease.

I've tried several different kinds, never noticed any difference in them. I believe any quality modern grease will be so far beyond what these cars were designed for that it makes no difference. I generally buy Sta-Lube brand (just because it's readily available), with either "moly" or "teflon" additive, but ordinary lithium grease is probably just as good.

I should perhaps add that I don't observe factory service intervals. I change engine oil every 6 months/5000 miles, and the filter every time. I check differential and gearbox levels when changing oil. Lube the chassis about once/year; and change the gearbox/differential oil every 2nd or 3rd year. I'm not recommending this regimen, just reporting what I use since that may make a difference to my experiences with lubricants.
-Randall

Subject: TR4 Oil and Grease
Date: Thu, 27 Jul 2006
From: "oliver"

I use a product, and you can get it in all sorts of weights, in trannies, diffies, engines, etc, made by Schaeffer Oils < <http://www.schaefferoil.com> > which I think is superior, it has molybdenum.

I also had an MGB overdrive tranny that was really crunchy in 1 and 2; we put redline in it and it made a huge difference.

Engine/Oil

Subject: ZDDP availability?
Date: Mon, 13 Oct 2008
From: "dorpaul" <dorpaul@bellsouth.net>

List,
I was told that our older cars (without cat. converters) needed ZDDP. Several oil labels mentioned having this including: Valvoline 20w-50 Racing Oil, (I think) Rotella Diesel Oils, etc.

I was also told about STP Red label but cannot find it locally. Then I read somewhere that it didn't have that much zddp. Maybe:

<<http://www.bobistheoilguy.com/forums/ubbthreads.php?ubb=showflat&Number=476990&fpart=1>>

I was then told about "GM E.O.S. Assembly Lubricant", part # 1052367, Grade 8.800, and locally I called the Cadallac dealer who said it was discontinued several years ago, but, might be coming back.

The chevy dealer has some at \$21.00

This additive is also in valvoline's synpower oil, and other synthetics, but, I wish to avoid synthetics for break-in.

EBay doesn't show it, does anyone know where I can get it for less than \$21?

-Paul Dorsey

Subject: ZDDP availability?
Date: Mon, 13 Oct 2008
From: <WLSSErv@aol.com>

Paul
I was told that Castrol 4T 4 stroke motorcycle oil, ratings SG, SH, 20W50 has plenty ZDDP, and should be a lot less expensive.

-Walt

Subject: ZDDP availability?
Date: Mon, 13 Oct 2008
From: Allen Hess <allenhess@mgcarclub.com>

Buy Brad Penn break-in oil. After that buy Brad Penn 20W50 Racing Oil. I bought it in the Spring for \$4/qt. from a local distributor (Rochester, NY) <<http://www.bradpennracing.com>>

-Allen Hess

Subject: ZDDP availability?
Date: Mon, 13 Oct 2008
From: Oliver <sumton@sbcglobal.net>

I believe there are two previously unmentioned brands that will work for us. One is spelled something like Admahl? and the other is Schaeffer <<http://www.schaefferoil.com/>>

I use Schaeffer; its running now about 4.50?/qt. for 20w50; it's a partial synthetic (derivative of dinosaur juice), but has molybden in (sorry about the spelling in this - can't get anything right), which functions similarly to the zddp.

You have to buy \$300(?) minimum, so we get together on it. I also use it in my daily driver (5-20). its interesting stuff - from the demos I've seen it protects your engine way better than dinosaur juice or most

synthetics.

caveat - I'm no engineer, nor do I have any stake in any of this stuff except I want my engines to last!

From the prices I'm seeing being thrown around, I'd say this is a pretty good deal.

Subject: ZDDP availability
Date: Mon, 13 Oct 2008
From: "Arakelian, Peter" <arakelianp@mossmotors.com>

Since you asked, Moss carries two specific solutions:

1. #220-805: an additive which restores ZDDP levels- \$10.95

2. #220-810/220-815: 20W-50 oil blended with correct levels of ZDDP- 69.95/case or 6.95/qt. Much info. is on the web site.

-Peter Arakelian

Subject: ZDDP availability?
Date: Mon, 13 Oct 2008
From: Tony Drews <tony@tonydrews.com>

Valvoline VR-1 20w50 "For racing use only" non-synthetic oil is available locally at Autozone and Farm and Fleet for somewhere in the \$3 to \$4 per quart range. Lots of ZDDP - with that and a non-radical cam you don't need any further additive.

EOS was discontinued but came back. Price went up. But, the bottle is 8 oz (or the new version is reputed to be 16 oz) and you only need 4 oz at an oil change.

Be careful because some oils that had sufficient ZDDP a year or so ago have reformulated. Brad Penn is good stuff too (more expensive).

- Tony Drews

Subject: ZDDP availability?
Date: Mon, 13 Oct 2008
From: "dorpaul" <dorpaul@bellsouth.net>

Thanks,

Which non-synthetic do you think is better for street use:

Valvoline VR-1 20w50 "For racing use only" (so stated probably for legal reason only, which in fact, is stated in an article) or Valvoline 20w50 w/'new' GM EOS shown at:

<<http://www.gmpartsdirect.com/results.cfm?singlepart=1&partnumber=1052367>>

The price of either choice is about the same, in the long run.

- Paul Dorsey

Engine/Oil/Cooler/Core

Subject: TR3A oil cooler
Date: Thu, 26 Jul 2007
From: <DLylis@aol.com>

I am looking for some guidance on the location of an oil cooler on a TR3A. I have only seen race prepared and the cooler is mounted behind the valence with a cutout for air passage. I prefer not to do that for my car which is a street car. Is mounting it forward of the crank fixture behind the grill too much obstruction for the radiator? (My radiator no longer has a crank hole). This is a 13 row cooler and I am assuming the stainless hoses are long enough to go there. An electric pusher fan is being installed.

-David Lylis

Subject: TR3A oil cooler
Date: Thu, 26 Jul 2007
From: <BearTranserv@aol.com>

<DLylis@aol.com> writes:
> An electric pusher fan is being installed.

You may find the pusher fan is too much obstruction for the radiator. Mount it as a puller if you can.
-Robert B.

Subject: TR3A oil cooler
Date: Thu, 26 Jul 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I recall Bob Schaller installed his behind the grille. Crossing Texas in June he made some roadside 'adjustment' to the grille to combat overheating:

<<http://www.cybertrails.com/~ahwahnee/bobs.JPG>>

Yes, that dark patch is the hole he cut on the grille in front of the oil cooler. OTOH, he was pulling a trailer in 100+ degree heat.

-Geo

Subject: TR3A oil cooler
Date: Thu, 26 Jul 2007
From: <AMfoto1@aol.com>

<DLylis@aol.com> writes:
> I am looking for some guidance on the location of an oil cooler on a TR3A. I have only seen race prepared ...

Hi David,

I'd suggest not putting the oil cooler that far out in front of the radiator. It will mess with the air flow to the radiator too much. I agree, too, with Robert B., you'd be much better off configuring the elec. fan as a puller, behind the radiator. (When rigged as a pusher, it actually blocks quite a bit of airflow.) By rigging it instead as a puller, you will find you have another alternative location for the oil cooler, that makes for relatively pretty easy installation.

The best solution for a street car - given that you don't want to cut an intake - would be to put the oil cooler smack up against the front of the radiator. It's helpful that standard 10, 13 and 16 row oil coolers are usually the same width as the tall TR3/4 radiator (at least all the ones I've seen).

Putting it against the front of the radiator will not disturb air flow much and the slightly pre-warmed air really shouldn't reduce the radiator's effectiveness significantly (and will be more than offset by the additional cooling provided by lower oil temps). This suggestion is actually taken from Mocal's website a few years ago. In a

nutshell, they stated that if the cooler and the radiator must share the same air flow, the cooler should be as close as possible just in front of the rad. Use a few rubber spacers to help keep them from vibrating against each other, I'd suggest.

In fact, depending upon how it's positioned, an elec. puller fan can then serve both the radiator and the oil cooler. You'll need to remove the mechanical fan from the front of the engine to configure the elec. fan as a puller. Leave the fan hub extension in place, it also serves as a sort of primitive harmonic balancer (there are true harmonic balancers available from:

<www.britishframeandengine.com> <http://www.britishframeandengine.com>
, and others, if you'd prefer to remove the hub ext. entirely).

Be sure to use a thermostat in the oil coolers lines, to keep from overcooling the oil. That would be almost as bad as overheated oil. Mocal now offers a neat oil cooler take-off combined with a 185 degree thermostat. It's just a sandwich plate that works well in combination with a spin-on filter and spin-on filter converter on a TR. Photos of this installation on my TR4 can be seen at the "Triumph Owners" link below. Cheers!

-Alan Myers <<http://www.triumphowners.com/640>>

Subject: TR3A oil cooler
Date: Mon, 30 Jul 2007
From: <DLylis@aol.com>

OK, this has gotten a little more interesting. I have asked a number of people the question of the best location for the oil cooler and I have been told by one old timer, to lay it flat over a cutout in the shroud where the crank guide is. He said that there is plenty of airflow at speed to make it effective and it will not interfere with the radiator. What say the list?

Frankly, this does not sound like a good idea to me, but I am open!

-David Lylis

Subject: TR3A oil cooler
Date: Mon, 30 Jul 2007
From: <MMoore8425@aol.com>

<DLylis@aol.com> writes:

> OK, this has gotten a little more interesting. I have asked a number of people the question of the best ...

David,

I don't know if you plan on seriously racing your car or not, or what your objective is. My objective in my car was to provide as much cooling as reliably as I could to both the engine and the oil. I installed a finned cat oil sump. It holds a whole lot more oil (7 qts?) and gets cooling air across the fins under the car. I also installed a temp gauge-but that's not needed. I am pleased with it.

-Mike Moore

Subject: TR3A oil cooler
Date: Mon, 30 Jul 2007
From: "v6spitfireguy@cox.net" <v6spitfireguy@cox.net>

<DLylis@aol.com> wrote:

> OK, this has gotten a little more interesting. I have asked a number of people the question of the best
> location...

I'll give you my two cents worth. On my 40 Ford Pickup, I had a slight problem with overheating at idle, only with the air conditioning on. This is with a large aluminum radiator, mechanical seven blade flex fan with a shroud, in a puller configuration. The air conditioning condenser was mounted center, right in front of the

radiator (less than 1/8 inch spacing) and the transmission cooler mounted right in front of the condenser (also less than 1/8 inch) but in the lower half . I re-arranged the mounting of all three items, with the same positioning vertical and horizontal positions, but I spaced the items apart with about = inch between them instead of them being so close together. The temp gauge now never waivers, even with the air on!

I have my GT6 oil cooler mounted out in front of the radiator, factory style and its probably about 6 inches away (not able to measure it at the moment) from the radiator.

-Barry Schwartz

Subject: TR3A oil cooler
Date: Mon, 30 Jul 2007
From: <DLylis@aol.com>

Mike,

Thanks. I am in tropical Florida and before I even start the car it is half way to overheating in the summer. I don't plan on racing but ... As a 3 owner I am sure that you realize that of the 17" of vertical radiator 5" is below the crank hole and therefore below the grill airflow. I have removed the crank hole when I recored and am considering reshaping the metal shroud where the crank support sits in front of the radiator by sloping it downward toward the bottom tank of the radiator and mounting the oil cooler there directly in front of the radiator. I don't want to cut a hole below the grill as the racers do when it is mounted in that position.

-David Lylis

Engine/Oil/Cooler/Lines

Subject: Oil hose to cooler
Date: Mon, 20 Aug 2007
From: <tr3driver@ca.rr.com>

> Also, where does the lower end of the auxiliary oiler connect to the block?

As I recall, mine went to the rearmost blanking bolt along the oil gallery (that bulge that runs along the LH side of the block at about the level of the oil filter head).

> I'm hearing that the aux. oiler may not be such a good idea after all. Any thoughts?

I agree, not such a good idea, IMO. As long as you keep the passage through the rocker shaft open, the valves & rockers will get enough oil but not too much. The external feed puts way too much oil on top of the head, which results in excessive oil burning unless you also add valve stem seals, which in turn rob the stems of the oil they need for long life.

After a leaking seal caused a broken piston, I retired the oil feed.

-Randall

Engine/Oil/Cooler/Lines

Subject: TR4A Oil Cooler Sandwich Plate Installation
Date: Sun, 21 Mar 2004
From: "Jeff Tedder" <jtedder68@cox.net>

List,

I posted under this subject a while back, and got a few responses about mostly 250's and 6's. So this morning, in preparation of setting the body back on the complete frame this afternoon, I attempted to install the oil cooler sandwich plate.

Basically the installation consists of screwing four sleeve-like pieces (a hollow, threaded hole that you bolt the filter head bolts into, and a threaded portion that screws into the block) into the oil filter head holes in the block. The interesting part is that the threaded portions are not threaded all the way to the sleeve. But the untreated portion, coupled with the length of the sleeve is longer than the thickness of the sandwich plate, which means that the sleeves would stick out past the plate and cause the filter head not to be flush with the plate. However, the holes in the block have a non-threaded portion to them as well, so if I just simply screw the sleeves down to where they need to be to not extend past the plate, using some of that non-threaded portion.. SNAP!

OK, now that the first sleeve is broken off (notice that, due to my experience with these types of mishaps, I actually stopped at one, instead of trying the other three to see if they'd snap off too) with the bolt part in the block, I'll just use my easy-out to get it out. SNAP!

OK, so now that the easy-out is broken off in the broken off bolt, I guess it's time to put the car on the trailer and tow it down to the machine shop to hopefully have the bolt and easy out-removed without messing up any of the other parts of this generally fully restored rolling chassis, postpone my body reunification for yet another week, and spend the rest of Sunday doing something else.

-Jeff Tedder

Engine/Oil/Cooler/Sensor

Subject: Aux oil
Date: Sun, 29 Aug 2004
From: "Kentech Motorsports" <kentech@midmaine.com>

The caveat with oil coolers as I've learned is that if you live in a colder climate, the oil stays too cold at first and this can result in sludge in your engine. So if you get one, use an in line oil thermostat that opens to cool the oil once it reaches 180F.

-PeterK

Engine/Oil/Cooler/Sensor

Subject: Best TR4 location for Oil Temp Sensor?
From: "Ken Gano" <triumphs@consolidated.net>
To: "J.C. Hassall" <jhassall@blacksburg.net>
Date: Tue, 11 Nov 2003

I had a similar concern on my TR3. When I tried to plumb it into the oil pressure gauge fittings it was too far away to get any reading. I finally removed one of the oil galley plugs on the block and had a machine shop make me an adaptor. I'm sorry I do not recall the threads, but it was a standard in that they were able to take a standard (fine thread, as I recall) bolt, bore a hole through the center and braze on the NPT female fitting that matched my (VDO) oil temp sender. Now it reads fine and after an hour or so on the highway the oil and the water temp come to almost equal points (oil is always a hair cooler and it takes a fair amount of time to get it to temp, but I have an oversized sump and an oil cooler, so I am guessing this is normal) 2 1/8" gauges are available in numerous faces on the street rod market. I used VDO "Gold Heritage" which is an antique white style. Look at VDO, Autometer, Boyd's, etc. until you find a gauge face style you like. Smiths, Lucas, Jaeger, etc. may even make an exact match.

-Kg

-----Original Message-----

Subject: Best TR4 location for oil temp sensor?
Date: Tuesday, November 11, 2003
From: <owner-triumphs@autox.team.net>

List Gurus,

I plan to add an oil temp gauge in my TR4. Where's the best location for the sensor? I'm thinking about poking a hole in the side of the sump to weld a fitting. No, I haven't settled on the sensor/gauge yet. What say y'all? How about sensor/gauge recommendations? I'd like a gauge which will fit inside a standard Lucas gauge - I have an NFG water temp gauge I'd like to adapt.

-Jim

-----Original Message-----

Subject: Best TR4 location for oil temp sensor?
Date: Thursday, November 13, 2003
From: J.C. Hassall <jhassall@blacksburg.net>

Ken,

I had another thought today. Does the sensor block the oil gallery? I'm concerned about that, but haven't had a chance to look at the block. What do you think? Obviously it's working for your engine.

-Jim

>2 1/8" gauges are available in numerous faces on the street rod market. I used VDO "Gold Heritage" which is > an antique white style. Look at VDO, Autometer, Boyd's, etc. until you find a gauge face style you like. > Smiths, Lucas, Jaeger, etc., may even make an exact match.

>-Kg

Subject: Best TR4 location for oil temp sensor?
Date: Thu, 13 Nov 2003
From: "Ken Gano, home" <Triumphs@consolidated.net>

One other thought comes to mind in this regard. The plug I chose is right above the oil filter. Pick another because I knock the sensor wire off about every time I remove the oil filter. No big deal as it is on a clip and I just push it back on, but it's one of those annoyances that could have been avoided simply by choosing another hole :-)

-kg

Engine/Oil/Filter/Canister

Engine/Oil/Filter/Spin-on

Subject: INSTALLING - Spin-on Oil Filter adapter
Date: Tue, 02 Dec 2003
From: <ebk@buffnet.net>

Hi List!

OK, I've followed the list's advice on putting red loc-tite on the center male threads of the spin on adapter that goes into the Oil Filter head, painted the outside & Oil Filter to match, used a thin coating of Hylomar HPF [Sorry Randall, I couldn't find the 'Non- HPF' ;-)], & went to install it with NO Luck! :- (Again I'm asking the list. :- (

I recalled that another list member had this same problem & I don't know how he did [if he did, or gave up & went back to the canister] to get the center adapter to thread into the center part of the Oil Filter Head that's on the block? I'm having the Same Problem in that: It can be installed without the outside O-ring but NOT enough threads on the center adapter piece to catch the threads when that O-ring is installed. :- (Did others have this problem? What was their solution?

Thoughts:

- 1- See about getting a 'Less depth' outer flat style O-ring? Or May be an O-ring might work?
- 2- Don't use the flat style O-ring & use some gasket dressing, BUT What type?
- 3- Have the Oil Filter Adapter's edge, that meets the outside flat style O-ring, milled down? If so, then how much? Will milling it down effect the inside portion of the Oil Filter Adapter to bind & not have a good seal?

- Cosmo Kramer

Subject: INSTALLING - Spin-on Oil Filter adapter
Date: Tue, 2 Dec 2003
From: "David Brister" <david.brister@wanadoo.fr>

I had this same problem with the kit I bought from Moss. I wrote to the makers of the kit who sent me a spigot which did the trick. From memory you need about 35mm of thread to get into the original oil filter head and as supplied by Moss there just wasn't enough thread.

I lost a lot of email after a computer crash including my discussion with the kit makers, but you should be able to get in touch with them through www.thinkauto.co.uk and I had great service from a chap with an email info@thinkauto.co.uk. He sent me a spigot that was just right.

-David Brister

<haighh@mossmotors.com>

Hi Harry!

The measurements that I have taken of the Oil Filter Adaptor are as follows:

From end to end of the stud [The entire unit] = 1.973" From the end to the inside surface [were it would tread into the Oil Filter Head, that's mounted on the engine block] = .771" Therefore the center portion [the 'nut'/holy base :-D] = .428" The Oil filter adapter's base [Alum. part being held 'permanently' on the Oil Filter Head & is the base for the spin-on oil filter] = 1.270"

I purchased this unit on 1/23/02, from:

Moss Motor Ltd
440 Rutherford St.
Goleta CA 93117

Thank you for going through all this trouble for me.

-Cosmo Kramer

<PeterAra@MSN.COM> <haighh@mossmotors.com>

Peter Arakelian wrote:

Harry spoke with me. And he is on the trail. I also made sure he had the other E-mailings about the problem. He'll get to the bottom of it, I'm sure.

-Pete

Cosmo Kramer wrote:

Happy Holidays Pete & Harry!

This is the latest info. That I've obtained from a TR List Member who had the same problem. He obtained a 'Spigot' that fit & was comparing the difference between mine & his. I thought that I sent my Spigot measurements to Harry with the other info. that he had requested from me. Harry- If You don't have that info. , then PLEASE let me know. I'm sure there is a solution to the problem. Thanks guys for ALL the time, help, & understanding in dealing with my problem. I just hope the Mocal Co. will be able to 'recall' all the improper spigot before more are sold to others. :-\ -Cosmo Kramer

|||||

<jtedder68@cox.net> wrote:

Some interesting results in my measurements (I attempted to take some pictures, but my digital camera's not charged – if you want a picture of anything in particular, then please let me know):

End to end – Old adapter = 1.857", new adapter = 1.757", your adapter = 1.973"

Short-end stud (end of stud to top of closest flat part of the adapter) – Old adapter = .641, new adapter = .623"

A couple of further notes – I test mounted my new adapter to my existing Tecalmit filter head, and it fits fine – I have to screw the adapter screw in a LONG way – at least .25 - .375" – not like what you described with getting hardly any turns on the adapter screw before it's tight. The only really noticeable difference is the amount of threads on the oil filter side – the new adapter is shorter than the old one, but obviously both would work. I don't know what car this is - is it possible you got an adapter kit for a purolator filter head and you need one for a Tecalmit filter head, or vis versa (I think the threads are course on one and fine on the other, so they wouldn't even be interchangeable, but I might be wrong)?

Since both of my kits fit perfectly, I'd say the best course of action is to return the kit you have and order a new one – the kit that I got (TR4A Tecalmit filter head) from TRF is P/N TRFEL401.

Hope this helps!

-Jeff

<ebk@buffnet.net> to jonmac

jonmac wrote:

Cosmo

- > From your description, it sounds as if the centre bolt is too short. I do know of several people who
- > have experienced the same thing. DON'T attempt to have the spin-on filter housing machined. DON'T
- > try to run the engine without the 'O' ring inside the housing or use an alternative compound to build up
- > an alternative type of ring. Persevere with the bolt. Are you sure you removed all traces of former
- > rings that held the old canister in position?

NO, I've checked this twice. It almost sounds like words in a Christmas song :-D .

- > You only need one but you have to ensure the circular slot into which it fits is entirely free of debris
- > and clean.

That it is. I can see shinny Al all around.

- > I normally use a screwdriver to chibble out the rubbish and then a few cotton buds to ensure it's really
- > clean. I then apply a smear of grease to the new ring before pushing it gently home. You also ought to
- > grease the depression in the adaptor cover to hold the O ring in place while you line it up and fit it.

That's a good idea, because I was using Hylomar HPF. Thinking that this would be a gasket dressing to seal the adaptor base to the Oil Filter Head. :-\

- > As you gradually tighten the centre bolt, periodically twist the adaptor back and forth to make sure its
- > seating properly on both the sealing rings.

Once I get the center adaptor unit to catch a thread of the Oil Filter Head, I was planning on rotating the adaptor base; as I would normally do if installing the canister.

- > Once it's in place, you shouldn't have to remove it. Leave the filter unfitted until just before you finally
- > tighten the bolt.

I was planning on leaving everything sit as you said for a couple of days [thus giving the loc-tite time to set. Then I was planing on installing the spin-on filter at a later date.

- > Ideally, the filter should hang vertically but neither do on my two Triumphs as the clutch m/c is in the
- > way.

I can't get mine to hang vertically, because the Oil Filter Head is mounted at a 45^ angle so the filter is @ the 4 o'clock position.

- > Both are positioned at about 7 o'clock - but they appear to work fine. Good luck
- > -Jonmac

Thanks for taking the time to reply & making VERY GOOD suggestions.
-Cosmo Kramer

<ebk@bufnet.net> wrote:
Hi List!

First of all, I'd like to thank all the people that replied to both my threads on this Spin-on Oil Filter Adaptor installation thread. I want to give a special Thank You! to Peter A. & Harry H. of Moss/USA, & Ted S. going to bat for me at Mocal.

I feel like such a jerk :-[, in the fact that I spent some 'quality' time & have it installed, But I have not installed any Motor Oil in to the engine, but I don't expect it to leak [other things I have to do before that]. After cleaning off the HPF & tried to install the Mocal Oil Filter OUTSIDE Gasket with grease [Thanks Jomac!], & it still would NOT fitting! I then tried the old gasket that was removed [when I removed the 'old' paper Oil Filter], & was able to get the ring deeper in the groove & had the Spigot catch the threads of the Oil Head. I then removed the old gasket & installed a New gasket out of one of my new Oil Paper Filter :-(. But it was worth it because the Spin-on Adaptor Unit is installed with the spin-on Oil Filter installed. :-)

-Cosmo Kramer

PS - I also took Jonmac's idea of NOT using any loc-tite on the spigot threads at ALL. I felt that if I do the next oil change at home & run into a problem, I can then try the loc-tite.

ALSO, I just found out, from Moss/USA, that 2 outside [O-ring/Gaskets were suppose to have been in the kit.

Engine/Oil/Filter/Spin-on

Subject: TR6 Spin on Oil Filter
Date: Mon, 11 Mar 2002
From: Irv Korey <emanteno@attglobal.net>

<jay_welch@juno.com> wrote:
> Spin-on Oil Filters -
> Mobil 1 M1-209
> Wix 51516 [same as: NAPA 1516 or 1348 (smaller)]
> Motorcraft FL400S
> Fram PH3600
> A/C Delco PFL400A
>
> It must be angled towards the front to avoid the slave area.

Also, Purolater PL20195 or P20195.
Ditto on the installation tip above.
-Irv Korey

Subject: Oil Filters for Spin-on Oil Heads
Date: Sat, 3 Aug 2002
From: <RayAntoky@aol.com>

Popnglo writes:
> <RayAntoky@aol.com> writes:
> > I followed Fred's instructions about removing the ball/spring relief valve to soak in spirits to remove any
> > possible deposits. Upon removing the ball with the telescoping magnet device, a piece of metal chip about
> > five-eighths by one quarter inch came up with it.
> > -Ray,

> How's Brooklyn in the heat recently? Can you forward Fred's instructions, I seemed to miss these.
> Also, I caught the P/N for the NAPA/Wix, but didn't see the P/N for the Puralator. Was it posted? Do you
> have it?
> -Ed

Verbal instructions from Fred were to loosen the hex nut on the o/p valve, turn the screw out while counting the turns. If you had it all the way down and had low OP you won't need to keep the setting. The next step was to use a telescoping magnet to fish out the ball and other metal debris if any. Best to not keep the spring compressed too much initially and adjust from there. Soak the spring and ball in spirits for 20 minutes. Replace and push ball down with a long stick, you can reverse the magnet, and if you had any debris come up your Oil Pressure should be higher already. The filters that fit are as follows:

> Motorcraft FL-400A ,

AC X21+,
Purolator PER195,
Purolator PurONE PL 20195
WIX 51516 same as NAPA GOLD 1516

> > Mobil-1 M1-209 AC Delco Ultraguard Gold UPFL-400A (same as Mobil-1),
> > > -Ray Antoky

Subject: Napa Oil Filter

Date: Thu, 12 May 2011
From: "Bob Danielson" <75tr6@tr6.danielsonfamily.org>

There's two NAPA Gold that fit. The 1516 fits most cars and the 1361 is a little shorter in case the frame interferes.

Here's the complete list:

AC PF-56
AC PF952 (short)
AC Delco Ultraguard Gold UPFL-400A
Bosch 72-143
Bosch 72129 (short)
Bosch 72161
CarQuest 85516
Champion C104 (short)
Crosland 529 (short)
Fram PH3512 (short)
Fram PH-3600
(Fram PH-3614)
Full PH-400
Halfords HOF200 (short)
K&N HP-2009
Kralinator L38
Lee LF-42
Mann W719/36
Mobil-1 M1-209
Moss 235-950
Motaquip VFL123 (short)
Motorcraft FL-276
Motorcraft FL-313 (short)
Motorcraft FL400A
NAPA Gold 1516
NAPA Gold 1361
Purolator L10101 (short) (was PER 101)
Purolator L20064
Purolator L20195
Sears 45197
STP SO-400
Unipart GFE173 (short)
Unipart GFE443
Wix 51335 (short)
Wix 51516

Engine/Oil/Head

Subject: Cleaning Oil Heads
Date: Sat, 3 Aug 2002
From: <RayAntoky@aol.com>

Popnglo writes:

> <RayAntoky@aol.com> writes:

>> I followed Fred's instructions about removing the ball/spring relief valve to soak in spirits to remove any
>> possible deposits. Upon removing the ball with the telescoping magnet device, a piece of metal chip about
>> five-eighths by one quarter inch came up with it.

>> -Ray,

> How's Brooklyn in the heat recently? Can you forward Fred's instructions, I seemed to miss these.

> Also, I caught the PN for the NAPA & Wix, but didn't see the PN for the Puralator. Was it posted? Do you
> have it?

> -Ed

Verbal instructions from Fred were to loosen the hex nut on the o/p valve, turn the screw out while counting the turns. If you had it all the way down and had low OP you won't need to keep the setting. The next step was to use a telescoping magnet to fish out the ball and other metal debris if any. Best to not keep the spring compressed too much initially and adjust from there. Soak the spring and ball in spirits for 20 minutes. Replace and push ball down with a long stick, you can reverse the magnet, and if you had any debris come up your Oil Pressure should be higher already. The filters that fit are as follows:

> Motorcraft FL-400A ,

AC X21+,

Purolator PER195,

Purolator PurONE PL 20195

WIX 51516 same as NAPA GOLD 1516

>>> Mobil-1 M1-209

AC Delco Ultraguard Gold UPFL-400A (same as Mobil-1),

-Ray Antoky

Engine/Oil/Head

Subject: Low TR6 oil pressure - Cleaning the Oil Head
Date: Mon, 8 May 2006
From: "Lanoway, Brian" <Brian_Lanoway@standardaero.com>

I suffered from low oil pressure in my TR6 - with a newly rebuilt engine - for 8+ years. Like the Kelly Green TR6 in Dave Massey's post, the pressure in my TR would drop to 20 PSI at 3000 RPM and near zero at idle when hot. I tried everything to get the pressure up. I calibrated my pressure gauge, I rebuilt the oil pump and I inspected my new main bearings - only to find nothing wrong. I grew to believe that it was the nature of my engine and like Dave, I convinced myself that good, healthy oil pressure is over-rated if your engine is also running well....and then I came across Fred Thomas' post to this List in April, 2004 on low oil pressure - which I've copied below. It seems that Castrol oil leaves a film on the pressure relief valve - which prevents the valve from seating properly, which in turn prevents the engine from reaching a healthy oil pressure. The solution Fred put forward was unbelievably simple - if you also happen to be using Castrol 20/50 oil (which I think most of us do): take the pressure relief valve out, clean it with lacquer thinner, put it back in and presto, the oil pressure should be right. This ran against years of commercial indoctrination that Castrol GTX could never do anything wrong. Nevertheless, I cleaned the valve, put in a different brand of oil, and I've had wonderful oil pressure ever since. This little bit of TR tribal knowledge is invaluable and it needs to be repeated on the List on a regular basis. It does work (if everything else is OK with your engine) and it can save hours and hours of frustration and extra work for those searching for a solution to their inexplicably low oil pressure.

-Brian Lanoway

Here's Fred Thomas' original post:

"Fred Thomas" <vafred@erols.com> wrote:

When I'm on a long trip I do not amble along, I drive on the fast side, returning from VTR S/E (868 miles less than 13)normal oil pressure is 65lbs at cruise and 40 at idle, well suddenly the pressure dropped to 50, then 40, then 35 cruising, and ==5==at idle, I did make it home with no engine noises, oil was full and clean, normal oil leaks, filter tight, still 40 & about 5, I called Ken Gilanders @ British Frame & Engine his first comment was you are using Castrol 20/50 aren't you, the pressure relief valve in the filter head gets some sort of coating on it and this effects the pressure, take the valve assembly apart and clean it in "Lacquer Thinner" and reinstall it then all will be well again, and that's what I did and it is well again, might be a good tip for T/R owner to remember should this happen to you "FT"

Subject: Low TR6 oil pressure - especially if you're using Castrol oil
Date: Mon, 8 May 2006
From: <Dave1massey@cs.com>

<Brian_Lanoway@standardaero.com> writes:

> if you also happen to be using Castrol 20/50 oil (which I think most of us do): take the pressure relief valve
> out, clean it with lacquer thinner, put it back in and presto, the oil pressure should be right.

Check the spring whist you are in there. A broken spring can do the same or similar thing.

-Dave

Engine/Oil/Head

Subject: Oil pressure
Date: Fri, 28 Nov 2008
From: Tony Drews <tony@tonydrews.com>

<DLylis@aol.com> wrote:

> Well I hope I am not appearing to the list as the relative that just won't go home after Thanksgiving dinner,
> but I have another question.
>
> I left with a couple of friends this morning to go for a drive in our Trs. After about 20 -30 minutes we had to
> pull over (older crowd) and I noticed that my oil pressure dropped to 20 psi at 700 rpm idle. That seems odd
> as it is usually at 60 psi (newly rebuilt), but upon acceleration the needle jumped up into the normal zone of
> 70 - 80 psi at 2500 - 3000 rpm with no wavering; just steady as always. Throw in the clutch and back to idle
> and back to 20 psi. That is a very wide swing.
>
> I left the group and went home to check this out. I opened the sending pipe at the bulkhead and put in an after
> market gauge and got the same result. I hooked up my electronic tach so I could get some readings for this
> post and at 600 -700/20 psi. 1000/45 psi. 2000 70 -80 psi. Hmmm, I shut off the car to scratch my head for a
> moment, and when I restarted it, 20 psi. I goosed the throttle and the needle jumped up as expected. Back to
> idle but this time 60 psi. I shut off the car, restarted, 60 psi at idle.
> Any ideas? There are no untoward noises and the car runs and idles very well.
> -David Lylis

First off, 20 psi at 700 rpm idle is an acceptable oil pressure if it jumps back up once the revs climb. Oddly behaving oil pressure can be caused by a little piece of gunk caught in the pressure bypass. That's the big screw with the locknut that protrudes from the oil filter housing. Sounds like your piece of gunk got dislodged, and the "problem" fixed itself.

- Tony Drews

Subject: Oil pressure
Date: Fri, 28 Nov 2008
From: "Randall" <tr3driver@ca.rr.com>

> and when I restarted it, 20 psi. I goosed the throttle and the needle jumped up as expected. Back to idle but
> this time 60 psi.

My guess would be that the pressure relief valve in the oil filter head got stuck open somehow.

A cleaning and inspection wouldn't be out of place, but being lazy I'd probably leave it until the next time it happens.

And if you're using Castrol motor oil, you might want to switch try another brand.

-Randall

Engine/Oil/Head

Subject: Oil Pressure Banjo
Date: Thu, 29 Jun 2006
From: "Eureka Saws Co, Inc." <ambritts@ptdprolog.net>

----- Original Message -----

Subject: Oil Pressure Banjo
Sent: Thursday, June 29, 2006
From: "Terry Smith" <terryrs@adelphia.net>

> Hello, everyone.
> Just to be absolutely sure, I've checked list archives (search function isn't working right now), my manuals
> (they don't show it), and the Moss catalog, which does seem to indicate, that the banjo fitting for the Oil
> Pressure Gauge goes to the filter head stud, not one of the bolts.
>
> This is on the upper left of the filter head.
>
> Do I have this right, before I start my engine for the first time this weekend? Thanks yet again, everyone,
> -Terry Smith

Hi Terry,

The banjo bolt attaches to the lower oil filter housing bolt. Looking at it from the side of the engine with the oil filter pointing toward the rear, it is the bolt bottom left. Remember that there are two copper washers, one thin and one thick. The thin one goes on the side of the banjo bolt facing the engine. The thick one- goes on the outside next to the acorn nut.

-Alex

Subject: Oil Pressure Banjo
Date: Thu, 29 Jun 2006
From: "Randall" <tr3driver@comcast.net>

That's right, Terry, it's definitely the stud. There is a special nut used here with a seal over the top, so oil can't leak past the threads.

Note that the copper washers are two different sizes, too.

-Randall

Engine/Oil/Head

Subject: TR4A Engine Rebuild Update - Round 7
Date: Sat, 18 Nov 2006
From: "Guy D. Huggins" <guy@genfiniti.com>

Listers,

I've reached the point on the rebuild where I am adding on all the misc. engine items like the oil filter, fuel pump, distributor, etc. From this I've got a new round of questions I am hoping you folks might be able to assist with.

Here goes:

1. I have the Tecelmit oil filter. The oil pressure line secures to the hole that has a slot on the block-side of the filter head. I assume it is this slot from where the pressure is taken. However, the slot does not go through the head itself (which would of course cause a serious leak), but extends only to the bolt hole. When you secure the line, you place a copper washer, the line fitting, another copper washer, & then the nut. How in the world does this get the oil pressure to the line? I just don't see how this works so I fear that I've got something wrong. Can anyone explain how this mechanism works, or point me to a source that can?
2. How does one test the dizzy vacuum unit? Is it possible to apply so many PSI of vacuum and you should see the plate in the dizzy move by so many inches?
3. Does one need to apply gasket sealer for the oil filter gasket?

-Guy D. Huggins

Subject: TR4A Engine Rebuild Update - Round 7
Date: Sat, 18 Nov 2006
From: "C E White" <BN_Knight@ameritech.net>

Guy,

I'm not the best expert to answer this but here is what I have on my '65 TR4A. The washers have two different inside diameters. The washer with the larger inside diameter goes next to the block, then the line fitting, then the washer with the smaller inside diameter, then the nut. The space around the ID of the first washer allows the oil to pass between the block and supply line.

-Chuck White

Subject: TR4A Engine Rebuild Update - Round 7
Date: Sat, 18 Nov 2006
From: Bob Labuz <yellowtr@adelphia.net>

Guy,

This is correct. If the copper washers are not new you must heat them up to a cherry red and let them cool before you compress them with the nut. The heating makes the washers soft and insures a leak free fitting.

- Bob

Engine/Oil/Pump

Subject: Oil Pump Pressure
Date: Sun, 16 Dec 2007
From: "Randall" <tr3driver@ca.rr.com>

> The engine fired up with the first turn of starter & as I was checking the oil pressure from the gauge, there
> was none.

Which is exactly why I much prefer to spin a new engine with the starter (plugs out) until the oil pressure comes up.

> There is oil that is coming from the plugs in the oil gallery when I removed it, as well from the oil filter
> housing assy where the oil pressure line comes off to the sending unit. Disconnecting the oil pressure line at
> the oil gauge line connection, there is no oil coming out.

Seems to be pretty clearly indicated a blockage between those two points, then. If oil will flow out at the filter housing, it should also flow out at the open end of the line. Slowly perhaps, but it should happen.

> My question to the list is:
> 1. Is the pump faulty?

It seems unlikely to me; although anything is possible. The pump design is pretty basic, about the only failure that could cause no pressure at all would be if the rotor was slipping on the shaft or the outer ring was missing.

> 2. What other areas would you check to see if the oil pump is circulating oil?

When you spun the pump with a drill motor, was there a load on the drill motor? If not, I'd be looking at the drive to the pump. I've heard tales of replacement rotors being only pressed onto the shaft instead of being located with a pin, and sometimes the press fit isn't enough to carry the load.

But if it did pick up a load, then I'd say there is a problem with the line to the gauge.

It's also worth checking the pressure relief valve.

> 3. Rather than replace the rotors again, would I be better off with a new pump

I can't see why. Again it's pretty basic, anything sufficiently wrong to prevent oil pressure should also be obvious. If you can't find the problem, you're probably looking in the wrong place.

-Randall

Engine/Oil/Pump

Subject: Oil Pump priming
Date: Thu, 19 Nov 2009
To: Tom Boggiano <boggiano@charter.net>

Tom Boggiano wrote:

- > I am at the point of my engine re-rebuild that I need to prime the oil pump and have a couple of questions:
- > What do you all use to turn the oil pump with, A drill and what in the shaft? A long handled screw driver?
- > On the TR4 engine does it turn anti - clockwise?
- > If anyone has a gadget they used could you send me a picture?
- > -Tom

Tom, I just used the distributor drive shaft. Put #1 at TDC, pull the dist and distributor drive gear and turn the shaft CCW using a 1/2" drill; it'll take a minute to build up pressure. When reinstalling the drive gear, orient the woodruff key directly opposite the block (if the block is "12 o'clock", the key should be at 6 o'clock) and the drive gear should just drop right into place, pointing to the #1 exhaust pushrod tube. It's very simple & very easy.

As a lark I created a YouTube video. If you want it, I'll look up the number.

-Jim

Engine/Oil/Pump

Subject: Packing an oil pump
Date: Sat, 23 Dec 2006
From: "Randall" <tr3driver@ca.rr.com>

- > I've heard it helps to pack the oil pump with Vaseline after a rebuild to hasten the build-up of oil pressure.
- > What exactly does that mean? Pack the screen and extension, or remove the pump and pack the body?

Disassemble the pump, and pack the gears. The idea being that it will pump Vaseline faster than air, so you'll get oil pressure faster. Personally, I'm not convinced it's a good idea, but YMMV. As long as you've used plenty of assembly lube, the few extra seconds it takes to build pressure with the plugs out isn't going to make any difference.

- > A second question, the rod bearing clearance measures .0015", which I know is within the tolerance range.
- > The main bearing clearance measures .00175, but Bentley doesn't even mention checking this. Is that within
- > range, or does it really matter?

It does matter, but that is within range. Also be sure to check that you can turn the crank by hand after the main caps are torqued up (as the book mentions).

-Randall

Subject: Packing an oil pump
Date: Sat, 23 Dec 2006
From: <ZinkZ10C@aol.com>

<DaveImassey@cs.com> writes:

- >> BTW- I've seen instances where a dry pump won't even prime itself. Even after several minutes on the
- >> starter (without plugs) and still there's no pressure. After dropping the pan and greasing up the oil pump
- >> the oil pressure built up very quickly, indeed.

There are ways around that. Loosen the oil filter or remove the oil pressure sender/ gauge line. This way the pump isn't pushing against a head. Completely filling the oil filter with oil makes the condition worse, add just enough oil to the filter to wet the paper.

When building a motor I install the filter, turn the motor upside down, fill the pump pickup tube then install the pan. After the motor is flipped back over, over a few qt of oil are added to the pan and the oil pump drive spun. Using this method I've primed engines by turning a screw driver by hand.

-Harold

Subject: Packing an oil pump
Date: Sat, 23 Dec 2006
From: <jar@aldermanroad.net>

The trick in rebuilding an engine is the use of special grease on all the journals during reassembly. This includes cam bearings and lobe faces, rocker bearings, mains and rods, wrist pins, etc. You should be able to get the grease at a NAPA or similar store, especially one that supports a machine shop. What makes this grease special is its load bearing capability and that it rapidly dissolves into the new oil with no noticeable effect on the oil. If you can't find that, then use good molybdenum "white" grease.

The cylinder walls should be wiped down with 30 W oil, and the pistons likewise. The timing chain, gears, oil pump interior, distributor shaft, etc. should all be coated with 50W (usually a "racing") oil.

One other "trick" is not to install the distributor until the engine is ready to start. Take an old distributor shaft minus the driving gear, attach a drill, & then spin the oil pump to fill all the oil galleries. However, this can be a bit difficult because old shafts are not so common, I have heard of folks actually making a dummy shaft to do this. A bit on the complicated side.

Another trick is to remove the spark plugs, the just spin the engine for five or ten seconds. This will pretty effectively fill all the oil galleries prior to the first run.

If you do all this, you should have no worries when starting the engine.

-Cheers.

Subject: Packing an oil pump
Date: Sun, 24 Dec 2006
From: <Dave1massey@cs.com>

The TR6 oil pump (and the TR8 the two pumps with which I am familiar) oil pump are designed with inlets and exits on the top part of the pump which puts the pump in a bit of a well which will hold enough oil to prime the pump. Also, if the engine hasn't been sitting too long the oil film will still be on the pump gears which will allow the pump to prime.

The TR3 (and I suppose the TR4) pumps mounted below the oil line in the sump and priming is not necessary.

-Dave

Subject: Packing an oil pump
Date: Sun, 24 Dec 2006
From: <jar@aldermanroad.net>

The real issue in the Triumph four cylinders is that the oil galleries be filled as quickly as possible. As mentioned, with these engines the oil pump is semi-submerged, with the pickup definitely always below the surface of the oil. If the assembly grease, or a similar high-bonding coefficient grease is used on the moving parts such as the journal bearings, there should be no problem on startup..

-Cheers.

Subject: Packing an oil pump
Date: Sun, 24 Dec 2006
From: <pethier@comcast.net>

My former British car with the French engine had a horizontal spin-on filter. When the oil pump would lose prime, it was a simple matter to spin off the oil filter and use an oil can to shoot oil into the hole at the base of the filter plate until it would not take any more oil. This would fill the oil pump with oil. Spin the filter back on you were good to go.

-Phil

Subject: Packing an oil pump
Date: Mon, 25 Dec 2006
From: "Frank & Sandy Crowe" <thecrowes@hotmail.com>

Or do what I did - build a small pressure tank that injects oil into the engine and fully primes the pump and fills all the galleys and bearings prior to even turning the engine over. Mine was a PVC pipe with a tire valve stem on one end, pipe adapters on the other with 3/8" pipe fittings, a gauge and a valve, with adapters to fit where your oil pressure gauge goes into the engine. Fill half full of oil, pressurize to about 60 psi, hook it up, & open the valve to pressurize the engine, then turn over your starter and see if the engine is generating oil pressure. Works great.

-Frank

Subject: Packing an oil pump
Date: Mon, 25 Dec 2006
From: "John Herrera" <[jrherreira90@hotmail.com](mailto:jrherrera90@hotmail.com)>

A hand-pump-up garden sprayer with suitable fittings works well for this. In fact, we used to put a few quarts into the engine with the sprayer to make sure all the passages were oiled.

-John H.

Engine/Oil/Pump

Subject: TR6 stripped bolt hole in Front sealing block
Date: Fri, 16 Aug 2002
From: <ZinkZ10C@aol.com>

I'm not sure what you mean by a sealing block as I am not familiar with TR motors. I have however built many other motors and can offer a temporary fix. (I had worked as a auto mechanic for nearly 20 years and had my own shop for 10)

From what I gather, an oil pan flange bolt striped out. The bolt spacing for such a part is usually 2 to 3 inches so losing one bolt won't cause much of a problem at the ones on either side can compress the gasket and keep most of the oil in the pan.

The temp fix: With the pan bolted to the engine, clean the outside of the pan flange and the block side of the mating surface. Lacquer thinner works wonders. Use a bead of RTV (silicone sealer) around the edge to seal the pan to the block. If the striped bolt goes into oil, plug the hole with RTV and wipe some on the pan hole.

When building my Formula Ford motors, a bead of RTV around the outside of the pan assures no oil leaks. This is much better than applying the sealer to the gaskets as clean up is much quicker, just take a razor blade and cut the RTV. In a emergency the pan gasket can be reused as it will come off of the block cleanly. A dry gasket has a less likely chance of skidding and crushing out since there isn't any sealer to provide lubrication.
-Harold

Engine/Seals/Front

Subject: Early TR4 - Timing Cover Oil Seal
Date: Tue, 5 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> The old seal innards had aged and disintegrated when I took the cover off. I think I know which way round
> the replacement should go, but I am (obviously) not 100% sure. I have attached 2 pics (I hope). I would
> appreciate opinions on #1 or #2.

Unfortunately, you cannot send graphics (or indeed any attachment) through the list.

Your new seal should have a closed side and an open side, the open side goes towards the inside of the engine.
-Randall

Subject: Early TR4 - Timing Cover Oil Seal
Date: Wed, 06 Sep 2006
From: <lbc.resto@comcast.net>

Thanks Randall, that's what I was thinking, but there is an inner lip that made me unsure. My original seal was within a metal "frame" closed at both ends.

-Ian

Engine/Seals/Front

Subject: TR3 & 4 Timing Chain Cover Seal
Date: Sat, 16 Aug 2003
From: "Gerald Van Vlack" <jerryvv@alltel.net>

List,

If anyone is interested, the Speedi-Sleeve part number for the Fan Hub to Timing Chain Cover Seal for a TR3 or a 4 engine is #99174. It fits over the fan hub diameter that the seal rides on and creates a new smooth surface for the seal to rub against if the fan hub has a groove worn into it from the old seal. Installation tool and instructions are enclosed with the Speedi-Sleeve. The Chicago Rawhide P/N is 17387 and it is supposed to be a double lip oil seal. I just purchased them this morning from the local Bearing Supply house.

-Jerry Van Vlack

Engine/Seals/Piston Rings

Subject: Four rings on a TR3 motor?
Date: Thu, 9 Mar 2006
From: Bill & Skip Pugh <anabil007@comcast.net>

I can actually answer this, as the same thing happened to me, I was informed by Ken Gillanders (siq) ... once he quit laughing and go up off the floor ... that those 4 ring pistons with one ring below the wrist pin were ... TRACTOR pistons ... and were never designed to exceed 2500 RPM for any length of time. I replaced all of mine with Ken's piston/sleeve kit and have had no further problems.

>List,

> I just pulled one of the old pistons out of my ailing motor. I was surprised to see below the three ring grooves
> (with rings in them) a fourth groove with no ring in it. This groove had holes drilled through the piston wall. I
> haven't seen anything like that in my manual or in the catalogs selling new replacement pistons. What's up
> with that fourth groove?
> -Bill Pugh

Subject: Four ring pistons
Date: Fri, 10 Mar 2006
From: "Jack W. Drews" <vintr4@geneseo.net>

Well, somebody has to say it.

The first set of pistons I bought for my vintage racer, ten years ago, were four ring pistons. I conferred with ring manufacturers and we all agreed that with the advances in ring technology in the last 40 years, the fourth ring was excess baggage. I used those pistons with three rings for three years in my race car. They were fine. I wouldn't hesitate to leave off that bottom ring. No modern car uses such a thing. The pistons performed just fine, too, even with the 6000 rpm redline that I saw on a regular basis.
-uncle jack

Engine/Seals/Piston Rings

Subject: Installing Pistons - TR4A
Date: Wed, 2 Aug 2006
From: "Guy D. Huggins" <guy@genfiniti.com>

Listers,

Last night I got the rings placed onto the pistons and pistons mounted to the con rods. Sometime soon I will be placing the pistons into the liners and have a question for the list.

What do you recommend as a lubricant for this?

I've read many sources that say only to use motor oil in the liners because other lubes may interfere with the rings setting. I even had one fellow at a parts shop recommend tranny fluid of all things.

The bottom line is that the engine will sit for over a year after the rebuild is completed, so I fully expect to squirt something into the cylinders before I attempt to start it. But, for now, what should I use for assembly that will not cause harm when I do get around to starting the engine?

-Guy D. Huggins

Subject: Installing Pistons - TR4A
Date: Wed, 2 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> What do you recommend as a lubricant for this?
> I've read many sources that say only to use motor oil in the liners because other lubes may interfere with the
> rings setting.

Since it's a one-time application, I'm very dubious that any kind of assembly lube is going to interfere appreciably with ring seating. At best it will only last a few seconds once the engine is started.

That said, I just use ordinary motor oil, liberally applied from a pump oil can.

> I even had one fellow at a parts shop recommend tranny fluid of all things.

Would probably work just as well. The pressures and scuffing are minimal here, it's not like a cam lobe or something.

> The bottom line is that the engine will sit for over a year after the rebuild is completed, so I fully expect to
> squirt something into the cylinders before I attempt to start it.

In that case, you might want to use something with more "body", like 40 or 50 weight motor oil. Tranny fluid (I think) will be more apt to run out and leave dry spots. I once left a motor sit with the pan off for over a year after running it with Valvoline 40 weigh racing oil ... I was astounded at how much oil was still in the bearings after all that time.

I would also be careful to smear all the exposed cylinder walls with heavy motor oil, if you live in a humid climate. A friend's freshly rebuilt MGA motor froze up in just a few months of storage in Indiana.

I didn't think of this until just now ... might not be a bad idea to back off the rocker shaft nuts on a motor to be stored for a long time. That would both relieve the pressure on the valve springs (which can sometimes take a set from being compressed for a long time); and also keep outside air/humidity from being sucked into the cylinders every night. Or at least reduce it some, maybe.

-Randall

Subject: Installing Pistons - TR4A
Date: Wed, 2 Aug 2006
From: "dixie" <dixie4.wales@virgin.net>

STP oil additive is the best fluff for a rebuilt engine that will stand after rebuild.

That is possibly why someone has suggested gear oil. It is sticky and will stay in the journals and piston rings until use.

Another is Chainsaw chain oil. A lot cheaper than STP, it does not smell like cat pee, and it works!

Someone, years ago, suggested grease, not a good idea. Ask someone who knows!!!!

-Adrian

Subject: Installing Pistons - TR4A
Date: Wed, 2 Aug 2006
From: "Jim Bauder" <jimbpps@cox.net>

Guy,

I have always used motor oil. I would keep the cylinder walls wet by squirting oil in the cylinders every 6 months or so while you are finishing up the rest of the car.

-Jim

Subject: Installing Pistons - TR4A
Date: Wed, 2 Aug 2006
From: "Jim Bauder" <jimbpps@cox.net>

Great idea to loosen the valve adjusters!

-Jim

Subject: Installing Pistons - TR4A
Date: Wed, 2 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> Great idea to loosen the valve adjusters!

I actually had in mind loosening the 4 nuts that hold the rocker shaft to the head. Don't suppose it makes much difference, but it's only 4 nuts rather than 8, and your valve adjustment should still be in the ballpark after torquing the rocker shaft nuts back down. I'm also not certain the adjusters have enough range to let a fully open valve close.

-Randall

Engine/Seals/Piston Rings

Subject: Piston & Ring Orientation
Date: Sat, 29 Jun 2002
From: <ZinkZ10C@aol.com>

<darrellw@inetarena.com> writes:

> Also, is there a recommended way to space the ring gaps? I can't find any mention in Bently's or Hayne's.

Regardless of what the books say, I space my rings as follows:

Three piece oil ring, bottom rail with the gap in line with the wrist pin. (You keep the expander gap 90* to the wrist pin), top rail 180* from the bottom rail. Middle compression ring, gap in line with the wrist pin and 180* from the top oil ring rail.

Top compression ring, gap 180* from the middle ring.

I like to keep the ring gaps away from the piston skirt area of the bore to reduce the chance of a scratched bore. The oil ring expander doesn't touch the bore so location doesn't matter as long as it is not lined up with a rail gap.

The rings do rotate a bit in their bores so don't be too concerned with exact gap location.

-Harold

Subject: Piston/ring orientation Thrust side
Date: Sun, 30 Jun 2002
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Folks

The best way to find the thrust side of a piston is to rotate the crank in the direction of rotation until no 1 piston drops down the bore half way, then look at the con rod, the thrust side of the piston is the side being "pointed" to by a line through the con rod out of the wrist pin (little end) to the bore surface. Hope this makes sense! The reason it is the thrust side is because the downwards force of combustion trying to turn the crank, it is pushing on the con rod at an angle to the bore not straight down the bore, it is this angle that causes one side of the piston to rub down the bore and the other not to touch.

-Graham

Subject: Piston / ring orientation
Date: Sun, 30 Jun 2002
From: "Jack W. Drews" <vintr4@geneseo.net>

Various manufacturers give different instructions for placement of the gaps, and some give no instructions at all. It is generally accepted that the gaps should not line up. Total Seal recommends the following, whether you use conventional rings or their gapless rings:

Top ring -- gap on the side of the manifolds

Second ring -- gap on the side of the spark plugs

Third ring, assuming that it is a ring with upper and lower rails -- top oil ring gap over one end of the piston pin, bottom oil ring gap over the other end of the piston pin

This satisfies everything everybody has said about thrust side, etc.

Engine/Seals/Piston Rings

Subject: Ring Gap
Date: Sun, 28 Mar 2004
From: "Randall Young" <Ryoung@navcomtech.com>

> When installing new piston rings, what is the best way to measure the gap, to ensure that the gap is sufficient?

Use a piston to push the rings down to the bottom of the bore that the ring will be installed in (where it's worn the least) and use a feeler gauge to measure the end gap. The piston ensures that the ring is square to the bore.

-Randall

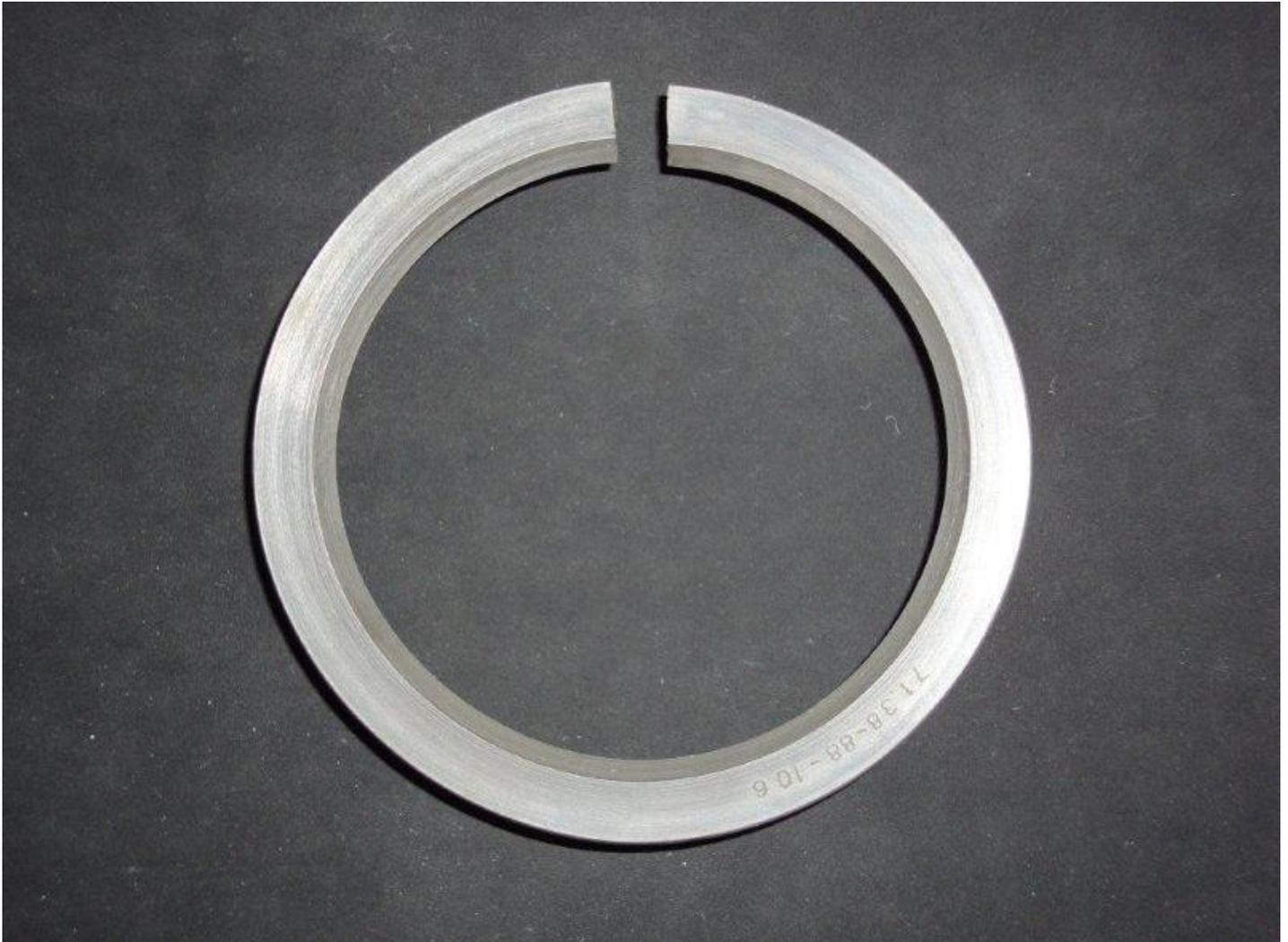
Installing of the Chritian Marx Seal

What is this all about?

The main idea is to have the best of both – the wear free stock seal that will last ages – and the split lip seal ring that will catch oil that is leaking through the stock seal assembly. So even when the rubber seal fails the stock seal will remain intact and will continue to work.

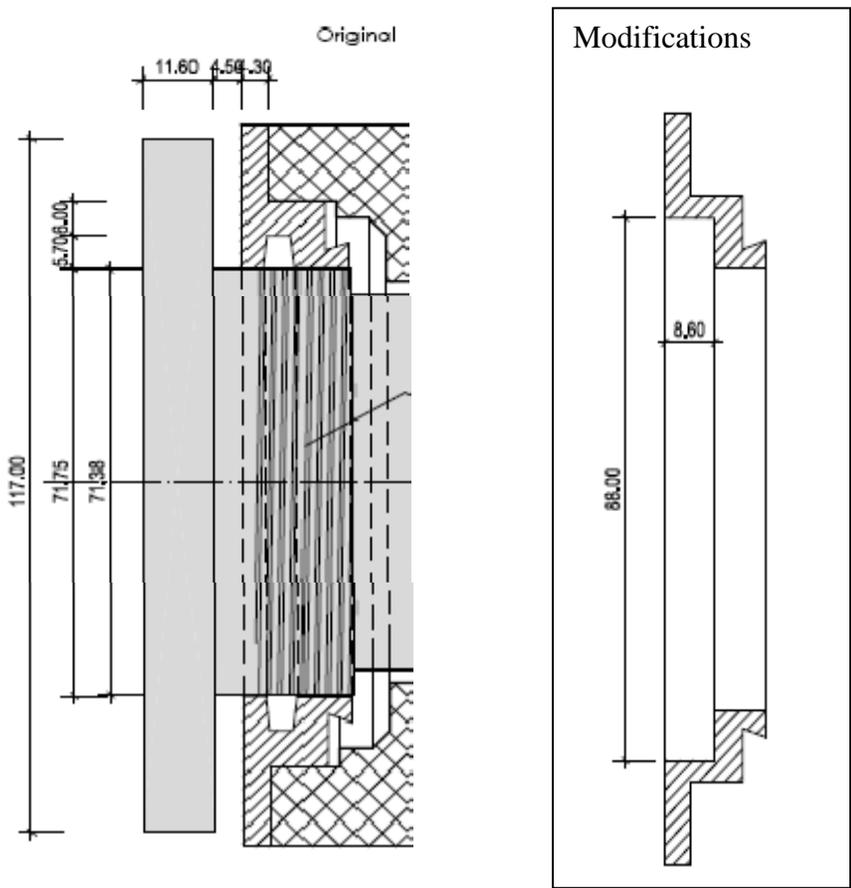
Design

This split lip seal is made to run besides the scroll of the stock crank so there is no need of reworking the crank to fit the lip seal. Only the aluminum stock seal has to be reworked on a lathe which is quite a low cost conversion compared with grinding the crank which is needed for other lip seal conversions. The lip seal is made out of VITON. This stuff can stand high temperatures and high surface speed that might occur on a crank at maximum revs. So this lip seal is made for racing purpose.



1. Changes to the stock aluminum seal ring

The ring has to be changed as shown. It will be easier to use a centering tool but to clamp it to a lathe chuck is in most cases precise enough. The diameter that keeps the lip seal later has to be concentric to the scroll inside.

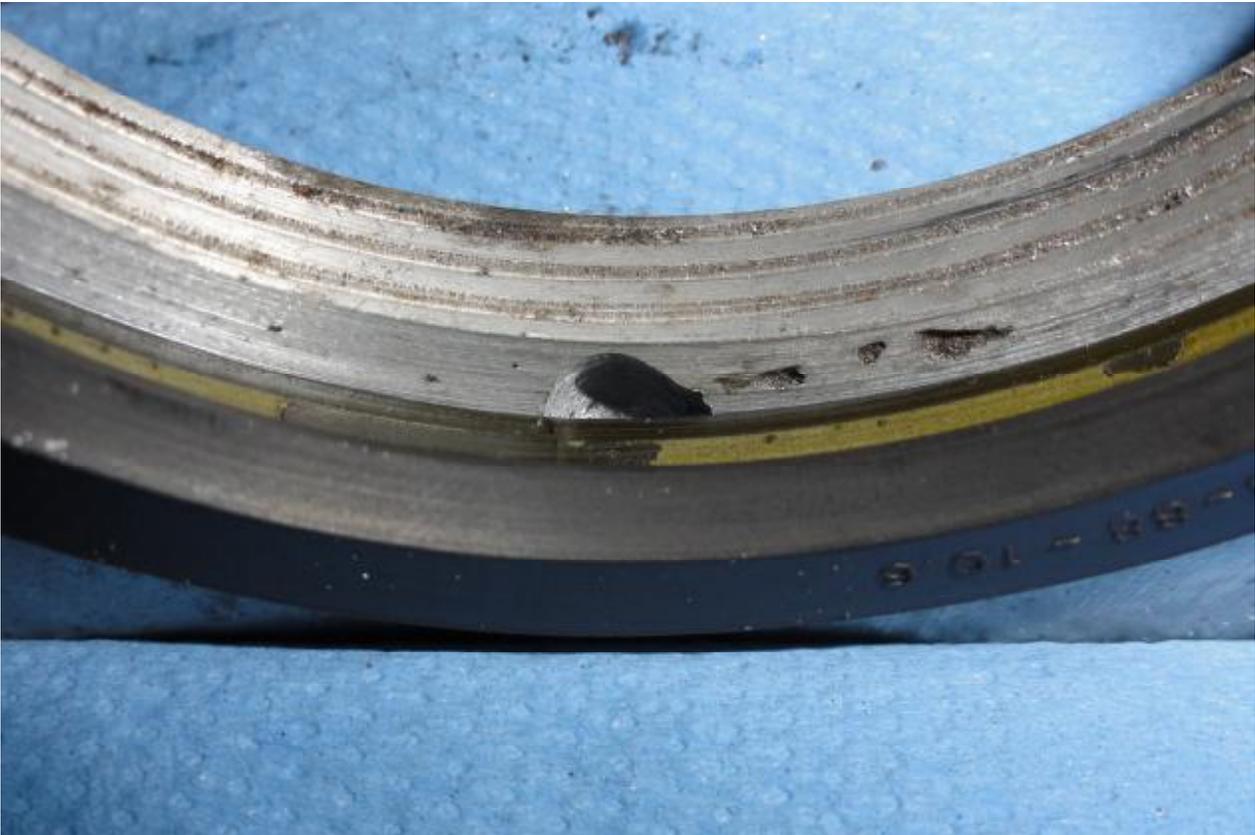


Check with a holder to center the ring. All measures are in [mm]

The draining hole of the aluminum seal will be blocked by the new lip seal so you need to enlarge the draining area as shown. Use a press drill and a high speed grinder with cutting tools to do that job. Take care not to damage scroll and don't grind through the sidewall or a bad leak might occur. Enlarge the fixing bolt holes of the aluminum ring to have chance to center in Properly



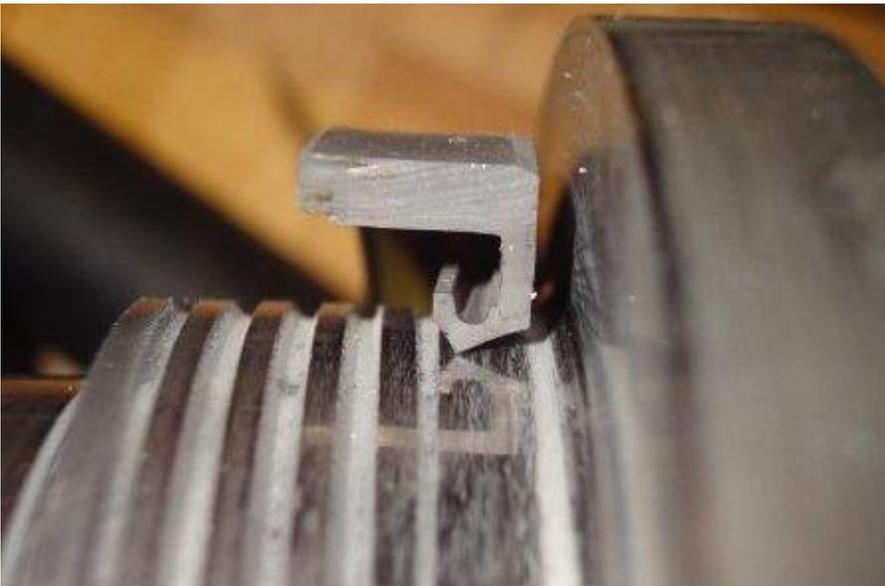






Preparing the crank

Not much has to be done to the crank. Just remove dirt and roughness of the surface on which the lip seal will run. Slightly polishing would be the best but is not mandatory.

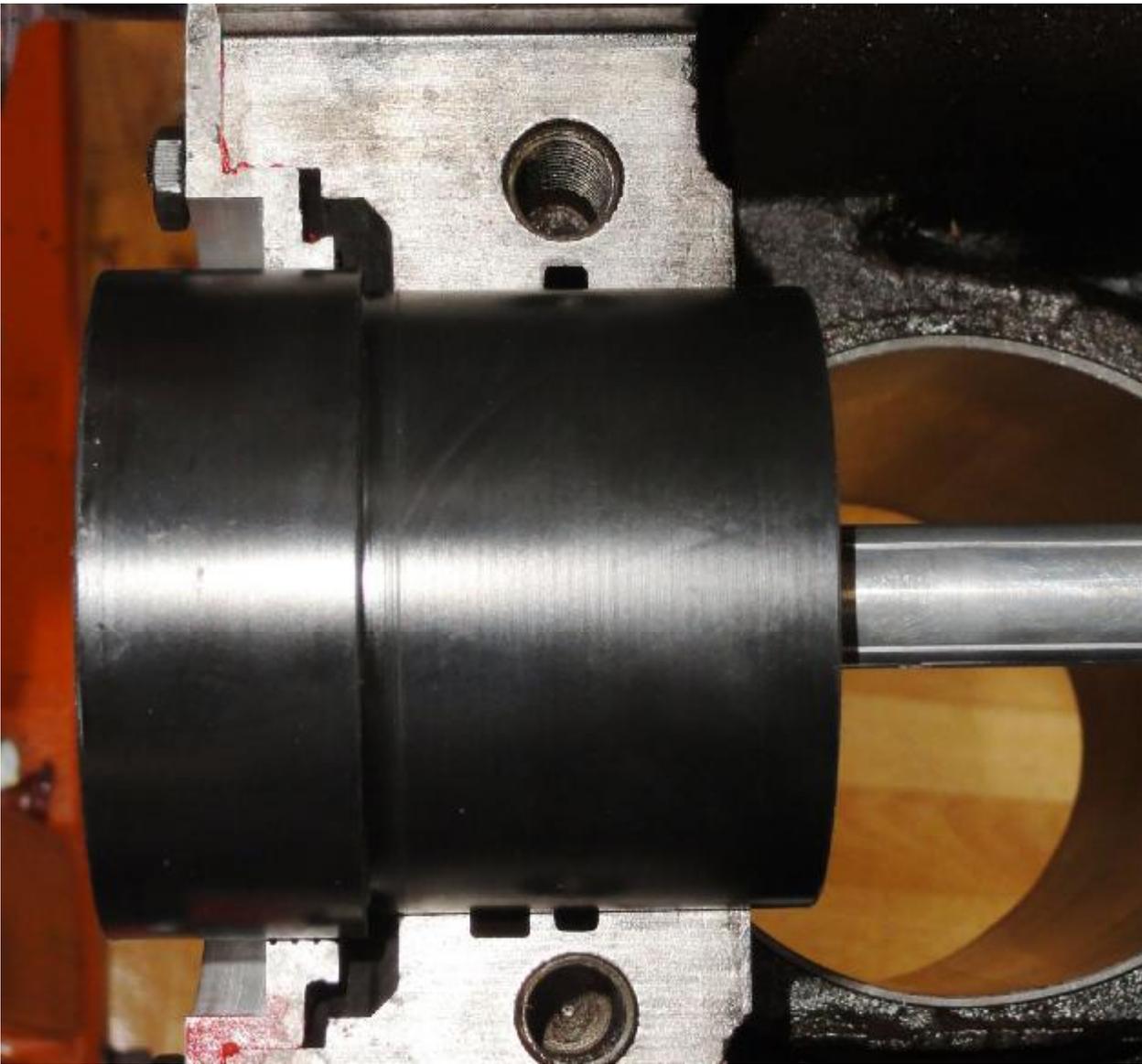




Assembling of the crank and the lip seal to the block

1. First clean all parts with brake cleaner and dry it thoroughly.





2. Use an alignment tool to fit the stock aluminum seal properly to the engine block. The factory manuals have the same **CRITICAL** error. The alignment tool drawing where the tool fits inside the seal in the factory manual needs to be changed to 71.57mm [2.818"]. It's a mistake!



3. Use silicone liquid gasket to seal the aluminum ring to the block.

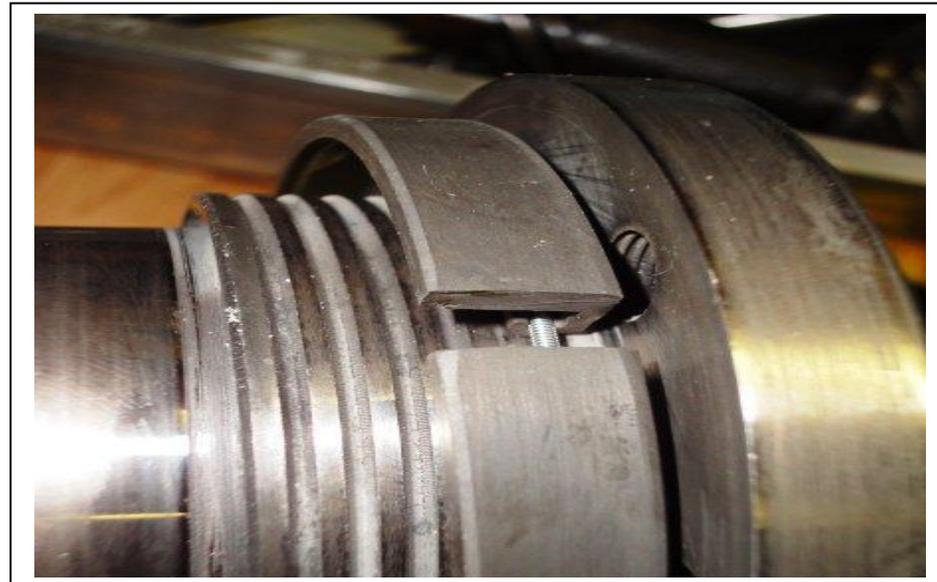


4. When installing the aluminum ring to the bearing cap take care that you don't block the draining hole with silicone. Put a paper tube inside the opening (hole) while, you're installing the ring. It is mandatory for a proper function of the lip seal that the draining hole is open to relieve the oil into the sump.

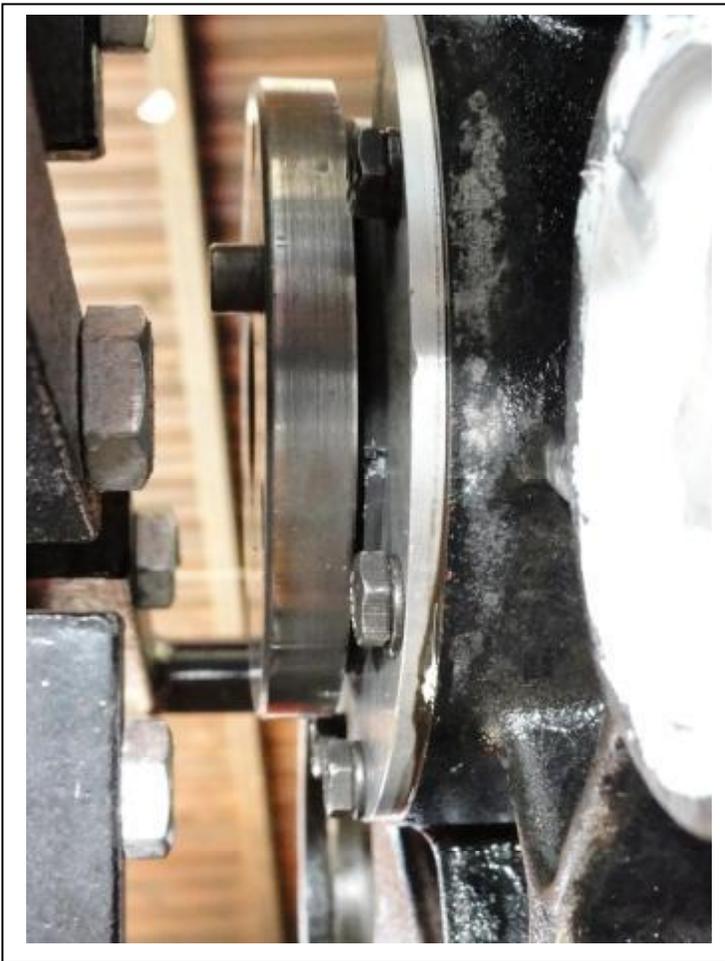
5. Next step is to center the aluminum ring with the still flexible silicone.



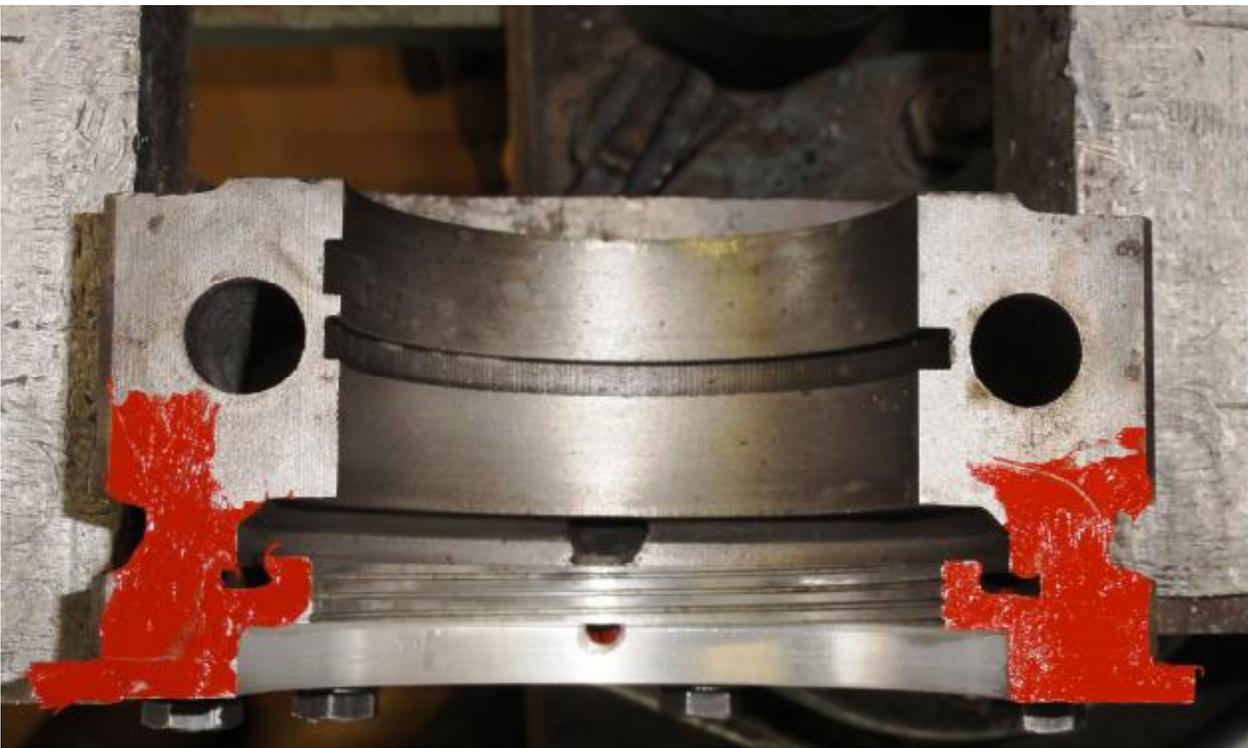
6. Put the bearing cap in place to the block with the centering tool inside and torque up the bearing cap bolts. Tighten the aluminum ring bolts slightly. Tap the aluminum ring half's gently into place. Tighten the fixing bolts of the aluminum ring more and tap again. After that, torque them up.



7. Install the lip seal to the crank. The spring can be opened closed to be wrapped around the crank journal. Be careful with the spring. Fit the lip seal at the journal area and put the spring into the notch of the lip. Open the ring carefully and slip it over the scroll area. Take care not to damage the lip seal with touching the sharp scroll edges. Put a little smear of silicone on the contact face where the lip seal closes to have a better seal. Use a small wood or screw driver for this job.

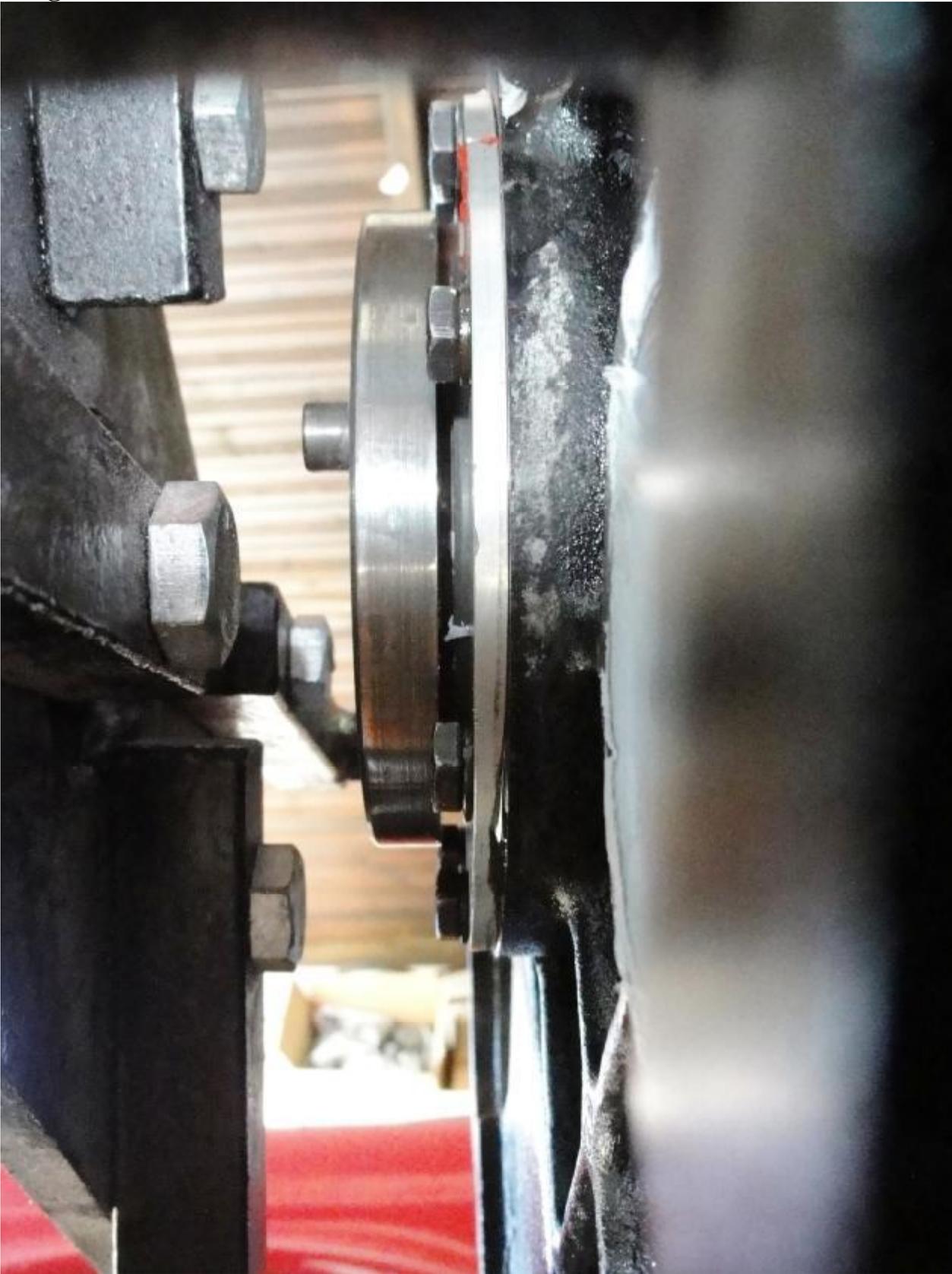


8. Install the bearing shells to all mains. Oil them. When putting the crank to the block take care that the split of the lip seal is showing towards the cylinder head. When the crank has its rest on the bearings push the lip seal towards the aluminum ring. Use a larger screw driver for this job. Be careful not to damage the rubber parts.



9. Put some silicone on the contact surface on the bearing cap as shown in the photo. Install the bearing cap to the engine block and torque some turns up. Again push the lip seal to the aluminum ring while you torque up the bearing cap bolt to full. Look all over that the lip seal is sitting straight in the aluminum ring. A little amount of silicone will be squeezed out of the split of the lip seal.

Congratulations – well done!



Now give a little oil from outside to the lip seal before you start your engine.

Engine/Seals/Rear/Conversion

Subject: Oil Seals
Date: Mon, 29 Mar 2010
From: Frank Fisher <yellowtr3@yahoo.com>

---Original Message-----

Subject: Oil Seals
Sent: Mon, March 29, 2010
From: Randall <tr3driver@ca.rr.com>

Randall Wrote:

- > I may be wrong here, but I recall something about wrong specs for the crank grind for the modern seal.
- > Yup, been lots of folks burned by that one. If you search the archives, I think you'll find several posts on the subject, including a suggestion to modify the spring in the new seal. There's also a tech article on the TRSC's web site giving a half dozen or so other things to check for.
- > Oddly enough, the scroll seal was actually intended as an improvement. Considering that some of us are still running the original seal over 50 years later I think testifies that the goal was met! With the seal materials and technology available at the time these engines were designed, most seals would be leaking significantly by 30,000 miles. The biggest problems with it are the later so-called PCV systems that allow pressure to build up in the crankcase; and a typographical error in the workshop manual.
- > - Randall

I'm sure I'm going to regret saying this, because as soon as I do Murphy's Law will intervene. I bought the new scroll kit from the roadster factory I had the crank ground to the instruction size and had it polished. I drilled the extra drain holes as instructed. Where I differed from the instructions was as follows:

I made the joint in the seal to the top of the motor

I made sure everything was spotlessly clean of oil (modern silicone RVT? Sealants are extremely intolerable of oils)

I then wiped with a barley oily finger the part of the crank that was to be at the joint in the seal. not even wet.

I laid a bead of silicone in the seal housing where the joint would be.

I caulked the ends of the seal with silicone, liberally.

I wrapped the spring so the spring joint was at the bottom of the motor

I carefully drooped the crank and seal in place, being careful not to rotate the crank

I bolted it down tight left it alone for about 5 days to let the silicone cure.

So far I have put 2,000 miles on my new motor and I don't have a drop of oil anywhere.

Chalk me up as one for the modern seal and let's see how long it lasts

-Frank

Subject: Oil seal update needed
Date: Wed, 31 Mar 2010
From: Tony Drews <tony@tonydrews.com>

Gary Nafziger wrote:

- > I've been reading about rear crank main oil seal fixes on tr-3's for some time but the last posts were confusing
- > to me (not difficult) lol. I wasn't aware that the specs were wrong for the crank re-grind ect.....
- > What are the correct fixes/grind for the crank? Which technical articles are the best to follow?
- > -Gary n.

Here's an excerpt from Uncle Jack's TR-3/4 engine building tips:

If you are going to install the aftermarket rear seal, have the seal surface of the crank turned to 2.525 whatever the current instructions may say. These seals are leaky and they need all the help they can get. The lip tension is too low. Therefore, measure the length of the spring and alter it to be exactly 8 long.

Also:

Put a very small amount of RTV along one edge of the seal groove in the aluminum housing. Also put a very light coat of liquid gasket sealer on the surfaces against which the seal housing will go. (This is for the aftermarket rear seal. TFM)

5. Install the seal on the crank. Arrange the seal so the split will be on the upside / top after the engine is right side up. (This is for the aftermarket rear seal. TFM)

The full "tips" page is here:

http://www.tonydrews.com/uncle_jacks_engine_building_tips.htm

My custom billet crank came with the crank diameter turned slightly too small (ARRGGHHH) so I have been trimming a little bit off of one edge of the seal with a very sharp knife and shortening the spring a bit under 8". I got that to work last year - we'll see how that works out with this year's rebuild...

-Tony Drews

Engine/Seals/Rear/Conversion

Subject: Rear Crank Seal
Date: Sun, 24 Oct 2004
From: "Dave Connitt" <dconnitt@fuse.net>

List,
I just wanted to thank all those that helped me out on the rear crank seal issue. Turns out my crank scroll area is OK at 2.519. The only thing I have to check is to make sure the seal spring is 8-1/8" long. The knowledge on this list never ceases to amaze me. Check it out!
-Dave Connitt

Engine/Seals/Rear/Conversion

Subject: TR4 Rear Main Seal
Date: Mon, 7 Jul 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> Okay what can you very informative folks enlighten me with this subject. Awhile back I posted that the little
> beast was having clutch problems, and later to learn that the, and suspected, throw out bearing, is shot, too.
> Anyhow, to make a long story short, I took it to a qualified mechanic, to take care of those problems. He told
> me he owned a TR, so quite familiar. Anyhow, he is very paranoid about the replacement of the rear main seal
> and specifically no guarantees that it won't leak.

According to people who should know, the setting mandrel is an absolute necessity, and the dimensions shown in the factory manual for it are wrong. The dimension that is shown as 2.822" should actually be **2.818"**. The factory tools were the smaller size, but it's been reported that the replicas sold by Moss are even bigger than the (incorrect) larger size.

Another problem is worn engines that have enough blow-by to develop pressure in the crankcase. The factory seal will not resist any pressure at all. The only cure is to fix the blow-by (although converting to a TR3-style road draft tube might help as a band-aid).

There have also been reports of poorly made seals, with too large a radius next to the corner of the block. Check carefully that the seal lays flat against the block and doesn't rock against the corner. The easiest fix is to radius the block a bit with a round file.

One last thing, in case you're tempted by the "high tech" seal conversion: double check the correct diameter before having the crank ground down. Apparently some vendors (Moss) were at one time telling people to grind to 63mm. The correct dimension is **2.500"**. The difference is only .020" or so, but it does make a difference. I hope this helps.

-Randall

Subject: TR4 Rear Main Seal
Date: Tue, 8 Jul 2003
From: <MRobe33243@aol.com>

Another modification to the rear seal modification that in order to reduce oil pressure on the seal the mod calls for drilling two additional 3/8" holes on either side of the center hole at the same angle on the rear main. I have that mod and I have no problems.

-Bob Roberts

Subject: TR4 crank seal
Date: Tue, 8 Jul 2003
From: <CarlSereda@aol.com>

>> One last thing, in case you're tempted by the "high tech" seal conversion:

>>

>> Double check the correct diameter before having the crank ground down. Apparently some vendors (Moss)
>> were at one time telling people to grind to 63mm. The correct dimension is 2.500". The difference is only
>> .020" or so, but it does make a difference.

>> -Randall

Hello TR2-4A rear crank seal scroll grind-er-off-ers, I noticed that a high end TR motor rebuilder didn't machine the entire scroll-seal off a TR crank shaft recently when retrofitting with upgraded rubber seal kit. He left an oil thrower built onto the shaft as originally designed - I imagine this keeps the hot shooting oil that's emitted from the rear bearing from directly hitting the new rubber seal. Anyone contemplating removing a TR2-

4A crankshaft scroll might want to consider this smart design - seems to make a lot of sense - I have a picture for those interested.

Carl

Subject: Modification to new rear oil seal
Date: Thu, 15 May 2003
From: "Bob Roberts" <MRobe33243@aol.com>

Hi listers:

A while back I asked for help with the specs on turning the crank down to accommodate the new seal,(I had misplaced my spec sheet) and received a lot of help. All were in agreement and I had the crank turned down thanks to their help. Well, I found the spec sheet and the specs agreed with what I used. There was one thread among the replies that referred to oil leaks after installation, my sheet instructed the user to drill two holes on either side of the rear main oil hole parallel to the center one and exiting on the bearing surface. This is designed to reduce oil pressure at the seal site. I had done this some time ago when I first received the specs. No one in reply had mentioned this mod so I thought I'd forward this just in case.

-Bob Roberts

-----about a year later-----
Subject: TR-4 Rear Main Seal
Date: Tue, 03 Aug 2004
From: "Jack W. Drews" <vintr4@geneseo.net>

I chased this problem for a couple of years, talked with BFE Moss, called the manufacturer in the UK, etc etc. Many engines go together and are dry but some leak like a sieve, my own included.

As a result of all my whining they increased the diameter to turn the scroll by .025. They did this because I discovered that the ID of the seal was 2.500 and they specified turning the crank to 2.500. Huh?

I still think the problem is insufficient lip tension. To verify this for yourself, take a new rear seal, put the spring in, and slide it over the newly turned scroll surface and feel the tension. Now, by comparison, do the same thing with the seal that goes in the timing cover, over the pulley snout. That little bitty front seal must have at least twice the lip tension!

The way I deal with this problem is to take the spring supplied with the aftermarket seal kit and shorten it to 8". I've measured the length of the spring from five new kits and found them to be anywhere from 8" to 8-3/8" Just snip it off with a side-cut pliers and bend a new hook on it. So far, it's solved the rear seal leak 100%.

However, I must point out, I do more vintage race engines than street engines. Therefore I can't vouch for longevity in street engines. Racers take things apart frequently so we don't get to see 50,000 mile checks. However, I've personally done it to every street engine I've built after we stumbled onto this. My reasoning is that we TR owners seldom put more than 5000 miles a year on our cars, and I'm pretty confident that this fix will last for many years at this rate.

Bob wrote:

> Several years ago I installed the "new improved type" seal sold by Restorations. It has always leaked however
> not as bad as the old scroll type. I read where they later said that the instructions for turning the crank were
> wrong and the it should be cut down less than what they instructed. Well the leak has increased recently.
> Anyone know if they have a "improved, new improved type seal for those of us who followed the instructions
> and turned too much off the crank?
> -Bob Nogueira

Subject: TR-4 Rear Main Seal
Date: Tue, 3 Aug 2004
From: "Paul Dorsey" <dorpaul@negia.net>

I just ordered a Rear seal conversion kit from TSI and I was told that the manufacture no longer recommends milling the crankshaft down to 62.5mm but instead to 63.5mm (in order for the crankshaft to exert more pressure on the seal.) Is this possibly the fix your after?

-Paul Dorsey

Subject: TR-4 Rear Main Seal
Date: Tue, 3 Aug 2004
From: "Randall" <tr3driver@comcast.net>

> I just ordered a Rear seal conversion kit from TSI and I was told that the manufacture no longer recommends
> milling the crankshaft down to 62.5mm but instead to 63.5mm

Paul, I'm not sure if Ted sells the same seal kit that Racetorations and BFE do ... but I have a set of instructions from Racetorations that have the 2.500" (63.5mm) dimension scratched out, and 2.520" hand-written in.

You might want to double-check that the 63.5mm dimension isn't someone's "senior moment" before having your crank ground.

-Randall

Subject: TR-4 Rear Main Seal
Date: Wed, 4 Aug 2004
From: "Jeff Tedder" <jtedder68@cox.net>

The instructions for my rear main seal that was obtained from BP Northwest and installed about a year ago stated to grind the crank down to 64mm ± 0.1mm. Unfortunately (for me), the instructions DID NOT say to hook the spring to itself that came with the kit - only to put it into the seal groove. So guess what? Now I get to change the seal before I have even started the motor.

Anybody have an opinion if this will REQUIRE the rear main cap to be removed? Or is it possible to separate the two seal shells, hook the spring, and put the shells back in without taking the pan off? I have one opinion that says yes, but my recollection was that there wasn't enough room between the block and the flywheel flange to get the shells out. Anyone replaced this?

-Jeff Tedder

-----Original Message-----

> I just ordered a Rear seal conversion kit from TSI and I was told that the manufacture no longer recommends
> milling the crankshaft down to 62.5mm but instead to 63.5mm

Paul, I'm not sure if Ted sells the same seal kit that Racetorations and BFE do ... but I have a set of instructions from Racetorations that have the 2.500" (63.5mm) dimension scratched out, and 2.520" hand-written in.

You might want to double-check that the 63.5mm dimension isn't someone's "senior moment" before having your crank ground.

-Randall

Subject: TR-4 Rear Main Seal
Date: Thu, 05 Aug 2004
From: "Jack W. Drews" <vintr4@geneseo.net>

It is not possible to correct this with the engine and transmission in the car. The little bolts holding the aluminum housing to the block will not come out with the flywheel in place.

You can either pull the engine/transmission, or just pull the transmission. It is guaranteed to leak without the spring attached.

Here's how I did the last one:

- 1. Remove transmission
- 2. remove flywheel
- 3. Remove pan
- 4. remove main caps
- 5. Pry the crank down just a little bit -- that's all it will come down -- rods don't have to be disconnected from crank. Remember the two bolts through the front plate and into the front main cap.
- 6. Now you can get the whole thing loose and fix it.

Sorry to be the bearer of bad tidings.

-uncle jack

Engine/Seals/Rear/Standard(Conventional)

Subject: Adj. the conventional Rear Seal on wet sleeve engine
Date: Friday, December 26, 2008
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

"Randall" tr3driver@ca.rr.com wrote:

Hi Cosmo!

> 2- What IS the *CORRECT* dimension that the Mandrel should be for the _Wet Sleeve Engine_?

The area that is marked 2.822" in the book should actually be 2.818". I got that information from Hardy Prentice; but others have independently verified it.

> 3- I was planning on leaving the Crankshaft in the engine (engine is out of the Garage Queen NOW, my > TR4A), because I really don't want to have to remove the Front Engine Plate,

I don't follow you here, Cosmo. What I call the front plate does not need to come out to remove the Crank. You will need to remove the timing cover and timing chain; the filler piece over the front main cap; the 4 Connecting Rod Caps and the 3 Main Bearing Caps; but that should be all that is required.

> Then remove the Crankshaft. Loosening the outside bolts & moving that (original) seal in against the > Crankshaft. Followed by tighten the outside bolts & calling it done. What is the list's input on this? Please be > specific on this reply.

While I have not tried that myself, I believe the problem is that the two halves of the seal will butt together and leave an opening that is larger than the scroll area on the crankshaft. So if one side is touching the scroll, the other side will have a much larger gap and hence leak.

Also, with the engine not running, the crankshaft will "fall down" and take up all the clearance on one side of the Main Bearing. When it is running, the Crank floats on a layer of oil, meaning it moves upward by perhaps .001".

> 4- If I have to remove the Crankshaft, is it a good idea to repack the felt into the engine DRY, as one Healy > friend has mentioned?

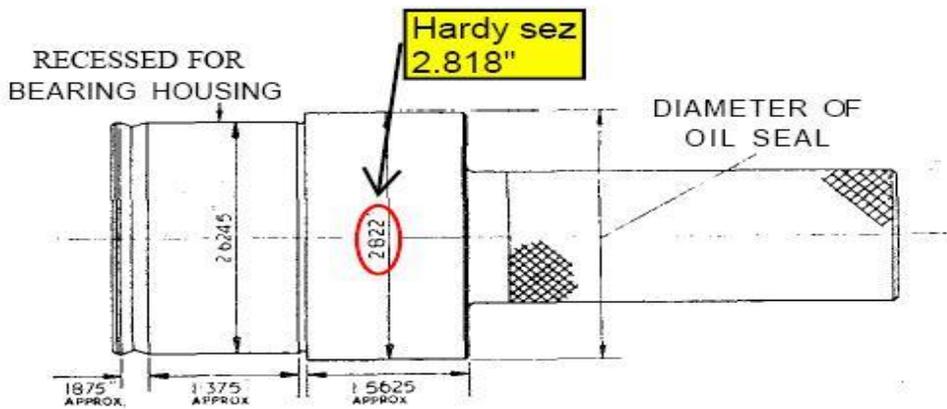
I do not believe so. If you put it in dry, there is effectively no way to seal the pores of the felt, which guarantees that it will at least drip.

But again I've not tried it that way, I cut the felt into short sections and soak it in sealer as the book directs. I use Permatex #3 Aviation Form-a-Gasket here.

> 5- Any 'secrets' you may have on how to stop this Rear Main Seal from leaking? It would be GREATLY > APPRECIATED!

It's my opinion that part of the reason it leaks so badly on the later TR motors is the "PCV" system that was required for US emissions law at the time. The system works OK as long as the throttle is closed (meaning there is manifold vacuum and relatively little blow-by past the rings); but allows pressure to build up in the Crankcase under heavy throttle (when there is little or no manifold vacuum, and maximum blow-by).

Although I feel there are ways to make a PCV system that works even at wide open throttle; probably the easiest solution is to fit a "road draft" tube from an earlier TR and block off the "PCV" system connection to the Intake Manifold. The large diameter open tube ensures there is no pressure buildup.



 Subject: Adj. the conventional Rear Seal on wet sleeve eng.
 Date: Thursday, January 1, 2009
 From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Randall wrote:

> Hi Cosmo!

>> 2- What IS the *CORRECT* dimension that the Mandrel should be for the Wet Sleeve Engine?

> The area that is marked 2.822" in the book should actually be 2.818". I got that information from Hardy
 > Prentice; but others have independently verified it.

>> 3- I was planning on leaving the Crankshaft in the engine (engine is out of the Garage Queen NOW - my
 >> TR4A), because I really don't want to have to remove the Front Engine Plate,

> I don't follow you here, Cosmo. What I call the front plate does not need to come out to remove the crank.
 Good! I'm glad that I will NOT have to do this, & therefore NOT having to touch the Front Plate Gasket,
 RIGHT?

> You will need to remove the timing cover and timing chain; the filler piece over the front main cap; the 4 Rod
 > Caps and the 3 Main Bearing Caps; but that should be all that is required.

Thus: I'll need to replace the 'T' cork tabs used to seal the Front Main Bearing Cap, which means I have to go
 through all the motion of setting the gears & timing chain correctly, again. RIGHT?

> Then remove the Crankshaft. ...

>> What is the list's input on this? Please be specific on this reply.

> While I have not tried that myself, I believe the problem is that the two halves of the seal will butt together
 > and leave an opening that is larger than the scroll area on the crankshaft. So if one side is touching the scroll,
 > the other side will have a much larger gap and hence leak.

My Healey friend said that he left a little of the 'Felt Packing' sticking out each end of the Rear Seal so when
 placed together, this would make less chance of the oil leaking out. BUT this seems 'counter productive' by
 leaving a Larger Gap at the seam of the two halves to cause MORE oil to leak out. What is your view point on
 this?

> Also, with the engine not running, the crankshaft will "fall down" and take up all the clearance on one side of
 > the Rear Main Bearing.

Mind you, this engine is on an Engine Stand that will be upside down. So when you say 'fall down' this in
 reality is moving it up closer to the top of the engine, RIGHT?

> When it is running, the Crank floats on a layer of oil, meaning it moves upward by perhaps .001".

Also, If I do go with your Idea of removing the PCV & installing the Breather Tube, Then I'll need to plug the
 opening going to the Valve Cover & Intake Manifold, RIGHT? Thus making the TR4A engine's 'breathing
 system' like that of the TR3's 'breathing system', RIGHT? -Cosmo Kramer

Engine/Seals/Rear/Standard (Conventional)

> -----Original Message-----

> Subject: F & R Seal on TR 4 cyl. eng.
> Sent: Sunday, February 17, 2002
> From: <owner-triumphs@autox.team.net>

> Hi List!

> I'm at the point of installing the Felt Gasket into the Rear End Bearing Cap. I know what the book states [of dipping felt into gasket & pack into both groves. I did act on the last thread [12/01] of purchasing more felt {which I did}.

> Questions:

> 1. Should the felt soak in the gasket selack & installed as:

- > a) ONE long felt, OR!
- > b) Cut-up into 1" lengths?

> 2. Is there a better way or a better product to use instead of the gasket sheleck?

> There was on gent on the list who said that he used felt & pouring gasket selack [packing well], but hadn't started the engine , so wasn't sure it worked.

> Would ALL responses please be sent to me & I will send a summary to the list. I'm on TR Digest mode & I'm only 65 away from being caught-up to today [2-17]. ;>) TIA,

> -Cosmo Kramer

Subject: F & R Seal on TR 4 cyl. eng. Engine: Rear Bearing Seal

Cosmo :

The factory method works very well, so I've never tried another. Do cut the felt into short lengths, and do find or make a tool to 'tamp' them into the slot with. No need to "let it soak", just brush the shellac on and install it. You can dip the felt into the shellac, but that makes a bigger mess, and wastes shellac.

-Randall

Subject: F & R Seal on TR 4 cyl. eng. Engine: Rear Bearing Seal

Michael D. Porter wrote:

> You have to use a sealer which is liquid enough to soak into the felt thoroughly. The thicker the sealer, the less likelihood of it soaking in enough. The last time I did a TR4 engine, I poured a small bottle of Indian Head gasket shellac into a bowl, dumped all the pieces in and let them soak, then turned them every so often, sort of like a mechanic's marinade.... <smile>

> -Michael D. Porter

Cosmo,

I was the guy who started the last string on the rear seal. Mostly relating to the correct size for the mandrel on the seal - there was some controversy over the correct diameter that remains unsolved to date.

Based on an E-mail from Kas, I cut the felt into 1" pieces and soaked in a modern non-hardening Permatex sealer that I cut slightly with lacquer thinner so it soaked in. I used all the felt for both sides on one side and used the felt from a second gasket set for the other side.

I used a ground off screw driver and pounded on it unmercifully with a large rubber mallet. I did get some leakage around the bearing cap/block flange as I flailed away. I think I've achieved a good seal but of course, I won't know until it's fired up!

The greatest concern with leakage seems to be with the factory original aluminum scroll seal and its proper placement. Some don't believe that it can be properly installed and leak free and have gone to the modified crank and lip seal.

All I can do is wish you luck, hope this helps!

-Brad

Subject: F & R Seal on TR 4 cyl. eng. Engine: Rear Bearing Seal

ebk wrote:

> I was planning on cutting the felt into 1" pieces that have been soaked in gasket Shellec/alcohol solution & > pounded into the block. Anything Else?

I cut them a little shorter -- seems to work better for stuffing them in. I hold each one with long-nosed pliers and wear rubber gloves. That darned gasket shellac is hard to get out from under fingernails.

> I haven't thought about the 'cork "T" gaskets in the front.

These are a bitch no matter what you do. It took me awhile to tumble to the fact that they are larger than the cavity in the alum block into which they fit. I trim them off with a razor blade to fit the T-shaped slot before I start. Then, to help stuff the whole mess into the opening in the block, I usually resort to helping them in with a thin pocket knife blade.

-uncle jack

Subject: F & R Seal on TR 4 cyl. eng. Engine: Rear Bearing Seal

Cosmo:

>> "modern non-hardening Permatex sealer"? Then it would help me even more. I'm wondering why Kas told >> you to use that stuff instead of Gasket Shellac?

Kas didn't recommend the stuff - Permatex High Tack Gasket Sealant # 9814. I spent a lot of time on Permatex website and this stuff seemed to be the best application. Most Mechanics today just blob the silicon stuff all over everything hoping it will seal. The silicone stuff is designed to replace a gasket not seal it.

<<http://www.permatex.com/products/prodidx.asp>>

Permatex has a huge variety of sealants for various applications. I am using the same stuff in spray can form as well for a thin even coat that soaks into the gasket

<<How critical is it to pound the corners, in your opinion? >>

I figured that if I was able to pound twice as much felt into the hole than the factory provided with this method (round shaft) that I had a pretty compressed felt pack. I would think it's going to seal way better than the factory manual procedure. Kas said the secret was "to pound the hell out of it"...I did!

-Brad

Subject: F & R Seal on TR 4 cyl. eng. Engine: Rear Bearing Seal

Hi List!

I first wish to thank everyone who responded to my question.

1- I received mixed reports on this question. One person said to use the felt as all one strip & another said to cut the felt into sections. It's interesting because I have found two different written manuals with the **SAME** mixed response, too.

One person said to soak the felt in the gasket shellec & another person said this could be done, but will only add to the mess. Also It was noted that the thicker the gasket shellec is the harder it will be to absorb into the felt.

[No one mentioned about cutting the gasket shellec with anything]. Instead the person would 'spread' the gasket shellec onto the felt & then insert it into the engine.

2- No one responded that there could be or has done it another way than using the felt packing [All agreed to use the felt].

To the person who asked for this report to be posted to the TR List & also asked about tools to insert the felt into the engine:

I used a 1/4" steel rod about 7" long & ground down one edge slightly so it would fit inside the channel, I was told by a club member that a small 'single bladed' screw-driver could be used, but make sure it's long enough.

-Cosmo Kramer

Engine/Seals/Rear/Standard (Conventional)

Subject: TR2/3 Installation of rear seal
Date: Thu, 02 Sep 2004
From: Angelo Graham <a3graham@admmail.uwaterloo.ca>

Hello List:

I'm asking about experiences installing original rear seal on TR wet sleeve engines. Did most make up a mandrel according to manual specs and use this to center seal halves? Any other techniques to center seal? It seems centering using mandrel, then removing and installing crank, then re-installing seals leaves lots of room for losing original setting. At this point in engine re-build, so wondering if going off and making up a mandrel and following the book is the way to proceed. Thanks for any insights.

-Angelo Graham

Subject: TR2/3 installation of rear seal
Date: Fri, 3 Sep 2004
From: "Kentech Motorsports" <kentech@midmaine.com>

I have a factory tool (weighs in at 7 = lbs) and it measures 2.822 . It is indeed a very tight fit as Randall stated but it's not the Moss plastic tool, it s the real deal.

-PeterK

> Asking about experiences installing original rear seal on TR wet sleeve engines. Did most make up a
> mandrel according to manual specs and use this to center seal halves? Any other techniques to center
> seal? Seems centering using mandrel, then removing and installing crank, then re-installing seals leaves
> lots of room for losing original setting.

Not really. You remove and reinstall the rear main cap with the seal half firmly attached, which is a fairly major piece of kit.

> At this point in engine re-build, so wondering if going off and making up a mandrel and following the
> book is the way to proceed. Thanks for any insights.

The dimensions shown in the book are supposedly wrong and result in too much seal clearance. According to a long-ago post from Hardy Prentice (I think), the 2.822" shown in the book should actually be 2.818". And Brad Eells replied that the nylon tool sold by Moss was 2.823", even bigger than the too-big dimension shown in the book.

-Randall

Subject: TR2/3 installation of rear seal
Date: Thu, 02 Sep 2004
From: "Jack W. Drews" <vintr4@geneseo.net>

I've never used the mandrel, because the one a buddy of mine owns is the wrong dimension. I did re-install the stock rear seal on two TR's and they have been remarkably free of leaks, but don't tell anybody how I did it, because I'm sure it's wrong. It sure worked great, however.

The problem I find with the stock design is that the darned holes aren't usually big enough to jiggle the thing around and center it. Also, since the two ends butt against each other, you can hardly close it down top-to-bottom.

What I did was:

- 1)file the ends of both halves just a few thou -- set it on a file and drag it back and forth with the full contact face on the file.
- 2) take a rat-tail file and make all the bolt holes a little bigger.

- 3)install the top half loosely on the block, put the crank in, and look at the side clearance between the seal and the crank. even it up with a feeler gauge.
- 4)yeah, I know this is the wrong thing to do, but -- tap the seal vertically toward the centerline of the crank until it touches the crank.
- 5) tighten the bolts on the top half.
- 6) follow roughly the same drill on the bottom half that's on the main cap, but in this case you can't use a feeler gauge, so just even up the outside edges. I think it was manufactured as one piece anyway.

And if it leaks, don't blame me. Remember that I told you that this would probably not work. Sure worked for me, though.

-uncle jack

Subject: TR2/4A Rear Crank Seal by Hardy
 Date: Sat, 4 Sep 2004
 From: <Catpusher@aol.com>

Perhaps someone will save this, it took some time to dig it out.

I spent months researching this item for my championship TR3. I also have done quite a number of street motors.

Making the factory seal work is not that difficult. The factory TR4 manual is a bit better than the TR2/3 one, but both have a CRITICAL Error The alignment tool needs to be 2.818" where it fits inside the seal. The rest of the drawings in the TR2/3 & TR4 factory manuals will work. I was given a tool made to the workshop manual size, and the motor that I built leaked oil running on the dyno (no G forces in the sump) very badly.

To make the tool is much less expensive than one of the "ruin your crank for other uses" kits.

Rule A- If the seal is working OK do not mess with it. There is never a need to boil one of these blocks. The water jacket can be cleaned by hand/grinder. Just glue the old fig 8 gaskets in to protect the fig 8 seats.

- 1. use the tool to check the seal's ID for size and roundness.
- 2. hand work can usually make the seal fit the tool very well or try another seal
- 3. Install the tool in the block and rear main cap first and carefully check that the seal halves will fit in the block recess with the tool in place. There have been seals made where the step OD was too big (the part just in front of the flange that the seal retaining set screws go through) A problem here can be fixed by a hand file. If you omit this step, you can destroy the seal and not realize it until too late.
- 4. Use silicone seal between the seal and block. Use it also on the seal split line, but VERY thinly so that it does NOT block the internal threads.
- 5. Do not move the seal when you tighten the set screws.
- 6. Do not hash the seal when you lay the crank in place.
- 7. Follow the manual carefully. The felt cap sealing needs to be soaked in something like aviation permatex, short pieces at a time, and then be driven in. A hex key works OK.

Let's face it, millions of miles on thousands of motors have been covered with this seal. My race motor uses this seal, as does my street TR3A.

Good Luck from a TR3 Racer
 -Hardy Prentice

Engine/Seals/Rear/Standard (Conventional)

Subject: TR2/4A Rear Crank Seal installation
Date: Wed, 14 Apr 2010
From: Catpusher@aol.com

TR2/4A Rear Crank Seal installation by: Hardy Prentice

I spent many months researching this during 25 years of racing my TR3 at the National level. I have also built quite a number of TR2/4A race and street motors. I have been a TR owner since 1961. Making the factory seal work is not difficult with a factory TR2/4A crank.

The factory TR4 manual images are a useful addition the TR2/3 ones, but both factory manuals have the same CRITICAL Error. The alignment tool drawing in both factory manuals needs to be **changed to 2.818"** where the tool fits inside the seal. The rest of the drawings in the TR2/3 & TR4/A factory manuals will work. The tool seal and bearing surfaces must be concentric. The handle is not necessary, and thick walled tubing can be used to save cost and weight. I was given a tool made to the workshop manual(s) sizes, and the motor that I rebuilt using it leaked oil very badly running on the dyno (no G forces involved)!

Previously, I had used the back end of a crank with the flywheel flange sawed off, with used main brg. shells with thin paper (or thread) inside to fill the normal bearing clearance, and .0025b to .003b feeler gauges between the seal and threaded crank surface. (If you know the seal is working OK, feel free to reuse it as is, resealing the main brg cap sides to the block recess, and avoiding any damage to the seal.)

1. Use the tool to check the seal's ID for size and roundness by holding the seal ID to the 2.818b surface of the tool. Illumination behind the seal and the tool help.
2. Hand work can usually make the seal fit the tool very well, or try another seal. (I made a jig from two rear main caps to size the seals in a lathe)
3. Install the tool in the block and the rear main cap first and carefully check that the seal halves will fit in the block recess with the tool in place, and the rear brg. cap torqued. There have been seals made where the seal step OD was too big for the block/cap ID. A problem here can be fixed by a hand file or grinder applied to the seal step OD. ****If you omit this step, you can destroy the seal and not realize it until too late.****
4. Use a small amount of silicone sealant between the seal and block where the seal flange is bolted to the back side of the block/cap. (Go to the next step **before** the sealant sets.)
5. By hand, press the seal half's evenly towards the centralizing tool, then do not further move the seal half's when you tighten the seal set screws. Allow time for it to set. During final assembly, also use a small amount of silicone sealant on the seal split line, but VERY thinly, so that it does NOT block the internal threads of the seal.
6. Do not hurt the seal when you lay the crank in the block.
7. Follow the manual(s) carefully. The rear main cap sealing felt needs to be soaked in something like aviation Permatex, short pieces at a time, and then be driven into the recess on each side. A B<b hex (Allen wrench) key works well as a driver.
8. The tool can be used to align a seal with the crank in place...Interested?

Subject: TR2/4A Rear Crank Seal installation
Date: Wed, 14 Apr 2010
From: "Randall" <tr3driver@ca.rr.com>

Hi Hardy, thanks for the detailed description. You wrote:
> (I made a jig from two rear main caps to size the seals in a lathe)

Does this mean you removed material from the mating faces and then bored the seal back to round? (Kind of like line-boring an engine block)

> 8. The tool can be used to align a seal with the crank in place...Interested?

Someone was asking that very question recently, plus I'd like to know how you do it. Please tell us.

- Randall

Subject: TR2/4A Rear Crank Seal installation
Date: Fri, 16 Apr 2010
From: <Catpusher@aol.com>

Hi Randall, thanks for all of your great posts!

tr3driver@ca.rr.com wrote:

> Hi Hardy, thanks for the detailed description. You wrote:

>> (I made a jig from two rear main caps to size the seals in a lathe)

> Does this mean you removed material from the mating faces and then bored the seal back to round? (Kind of
> like line-boring an engine block)

>> 8. The tool can be used to align a seal with the crank in place...Interested?

> Someone was asking that very question recently, plus I'd like to know how you do it. Please tell us.

> - Randall

After the one seal failure on the dyno, where the oil actually made it to the ceiling of Huffaker's dyno room (most embarrassing, although Joe was understanding) I spent a great deal of time asking many people what they knew about this kind of oil seal. No one could tell me how deep the threads in the seal needed to be, so I bored a number of seals, and they all worked with some reduced depth. In addition to dressing the split line, one can hammer on the seal face to close the ID; an old school secret from a dear departed friend.

I wanted to test the length of the first message, to see if MJB's wonderful system would truncate the end; as that is a most appropriate part of this fine system. I will soon post how to change a seal in place, but part one had to be posted first.

BTW: do to no fault of my own, the dyno day was on the Friday when I had to make it to Barstow, CA by Sunday night to arrive at the Atlanta ARRC in time. It was very late when I returned to SF Friday, with the TR motor where the GT6+ passenger's seat normally was (also how I drove the motor to the dyno) I had to pull the crank, as I had not yet figured out how to avoid that, install a used crank seal with the old, modified crank, and put it back together with the good crank. I then had to install the motor in the racecar, pack, hook the TR3 to the back of the E Type, and drive. I was very happy when the race motor had no leak after the first track session at Road Atlanta, as that was my first chance to find out.

-Hardy

Engine/Seals/Rear/Standard (Conventional)

Subject: TR4 rear aluminum seal
Date: Tue, 10 Jun 2003
From: <CarlSereda@aol.com>

Carl Wrote:

- > Does anyone believe in staying with the original aluminum crankshaft seal on TR3-4A's anymore?
- > When properly set up aren't they virtually drip free? It's an old design used for at least a decade.
- > Is it really worth grinding down the crank and retrofitting a new housing for a rubber seal?
- > -Carl

John,

Brand new aluminum crank seal is highly recommended. I don't know the make of your mandrel but please read the following email about the incorrect TR3-4 factory mandrel dimensions. Got this note from one of Kas Kastner's

-Carl

<Catpusher@aol.com> wrote:

"I certainly have made the factory setup work well, even on my National Championship racing TR3 (my street TR3A was a snap). If the seal is working, do not mess with it, but read the workshop procedure. The TR2/3 and TR4 factory manuals do have a too large OD on the tool drawing. It should be 2.818" where it fits inside the actual seal. An old crank with the flywheel flange cut off and 0.003" feelers will work too; use sewing thread between the crank journal and used bearing shells to remove any play.

It does help to check that the seal ID is round and the correct size, and that the seal OD that fits into the rear of the block/cap has room to move around to centralize

One should drive the bearing cap felt in after soaking it with aviation permatex, and apply a hint of silicone seal to the seal split line; too much will get into the seal threads. Do use silicone seal between the block and the seal, and the cap and seal.

Hardy Prentice man of many rear crank seals & TR projects"

Having decided to stick with my original rear crank seal, albeit with careful fitting using the centralizing tool and finding an original in as good condition as possible ... ANY COMMENTS.

-John

Subject: TRactor motor Rear Seals
Date: Tue, 10 Jun 2003
From: "Randall Young" <ryoung@navcomtech.com>

Has anyone experienced poor quality of replacement, scroll-type rear seals for the TRactor motor?

I've heard only that the mandrel dimensions given in the manual are wrong, the seal area of the mandrel should be only 2.818" diameter, not 2.822" as shown. (Moss reportedly was selling a mandrel that was even bigger at 2.823").

-Randall

Engine/Seals/Rear/Standard (Conventional)

Subject: TR4A Rear Oil Seal Tool Alternative
Date: Mon, 15 May 2006
From: <CarlSereda@aol.com>

> I am thinking about an alternative to using the rear oil seal mandrel tool. Would it be possible to use the actual
> crankshaft itself? Seems to me that the actual crankshaft to be used with the rear oil seal would be a far more
> accurate measure than some tool.

Guy,

A very successful TR3 racer, Hardy Prentice, still uses the original style rear oil seal effectively on the race track. Hardy once told me you can wrap sewing thread around the main crankshaft journals (to take up the approx .0015"-.0025" gap between shells and journals) then wrap the scroll (crossing the scroll somewhat diagonally I imagine with the thread) to take up the .003" factory clearance specs there. You're basically building up the journals and scroll to close clearances there by physically centering the crank and seal. Not sure about thickness of thread or how many times to wrap etc - but seems very doable..

-Carl

Subject: TR4A Rear Oil Seal Tool Alternative
Date: Wed, 17 May 2006
From: <CarlSereda@aol.com>

Ps;

Guy,

I also meant to write:

After centering your rear scroll seal, remove all the thread from the crank journals and the crank scroll - then reassemble again clean. You wouldn't want anything left in there that will end up getting shredded and pumped through your engine's lubrication system.

-Carl

Engine/Systems/Fuel Injection (PI)

Subject: TR3/4 injection anyone?
Date: Wed, 30 Jan 2002
From: francois wildi <fwildi@yahoo.com>

Hi,

I am collecting ideas and options for the rebuilt of the spare TR3B engine that I intend to do sometime later this year. After making sure that I would not be upset, the engine shop manager who did the work on my Healey mentioned that I could envisage the installation of a fuel injection system. He showed me the brochure of a (seemingly) small outfit that produces systems that are fully programmable and are advertised to fit 4 cylinder engine 'up to 200 bhp/liter'. Since I want to keep it as a street engine, I was not thinking about going above that limit anyway...

The company is called Simple Digital Systems <www.sdsefi.com> and their kits sell for a steep \$1300 including programming module (plus fuel pump, injectors, and all the plumbing mods).

Anyway, I just wanted to know if anyone has experimented or heard of EFI on TRactor engines.
-Francois Wildi

Engine/Systems/Supercharged

Subject: Supercharged TR6
Date: Fri, 20 Feb 2004
From: "Fred Thomas" <vafred@erols.com>

"Burlen Fuel Systems" <www.burlen.co.uk> 011-44-1722-334221, order their catalog, a very good book to have and remember they hold the patents for S/U's, I expect this is where most rebuild shops order their needles from "FT"

Subject: Supercharger for TR3-6 ???
Date: Fri, 27 Feb 2004
From: "Randall Young" <ryoung@navcomtech.com>

Kelvin Dodd of Moss Motors came to speak at our local Triumph club a few days ago ... one of the things he mentioned was that Moss is considering offering supercharger kits for the TR4 and TR6 (as well as other cars). These kits will not be cheap, but they will be complete, bolt-on kits including a brand new supercharger (most likely an Eaton), all necessary parts, and detailed step-by-step instructions intended for the average DIY.

I've installed one of their kits on a friend's Mazda Miata /MX5, and while I won't say it was dead easy, it was pretty simple and went on in a short afternoon. My friend absolutely loves it. It did lower his overall gas mileage somewhat, but then he is a lead foot and you've got to burn something to get that extra power! Had a few teething problems, but a few calls to Moss quickly got things sorted out and the new parts are holding up much better. He's got perhaps 40,000 miles on it now with no other problems.

Kelvin didn't have any details, but my personal guess is that we're talking roughly 6 psi of boost, which should translate to an increase in power at the wheels of roughly 30-35% across the entire rpm band. Might be possible to run a little more boost on late TR6 with their lower compression ... the Miata kit can be built to either 6 psi or 8 psi with the higher boost buying another 15% or so on power but requiring some other changes to the engine like modifying the distributor (and losing the smog exemption).

If you think you would be interested in buying one of the TR kits, at a price of \$3000 to \$4000, please email Kelvin at doddk@mossmotors.com. Let me emphasize, they are only considering offering these kits, this message is only to judge how much interest there would be if they do decide to offer them.

I have no financial interest in this, just thought some list members might like to know of this unique opportunity to influence one of our vendor's decision to possibly offer something new for our cars.

-Randall

Subject: Supercharger for TR3-6 ??? (Part 1)
Date: Thu, 11 Mar 2004
From: Joe <supertr6@earthlink.net>

Don,

VIS stood for Vintage Induction Systems, a company owned by Peter Boutcher. (VIS: 603-964-6062). He produced a limited number of supercharger kits for the TR-6 and TVR cars. I believe it all came about because a doctor in the NE decided he wanted a blower for his TR-6 (see British Car Magazine for the story). Peter later refined the original design and sold under 20 of the kits for TR-6 owners. (Rumor had it he was going to run another batch if enough people showed interest, but, don't hold me to that). The kit consisted of: Eaton 62 supercharger and 2 bypass valves, instructions, heat shield template, silver heat tape (not enough!), the aluminum manifold, air bypass collar, throttle linkage, 2 pulleys (large and small), blower mount brace, front blower mount with tension pulley, fasteners, sneeze valve, acetone cleaner, sandpaper, thread locker, gasket maker, and gaskets. What did not come with the kit was the specially built HD-8 carb and the K&N 3 inch air filter. The carb came from Joe Curto who knew exactly what to give me. I believe it was part Jag and part Healey with a small hole drilled in the butterfly to get it to idle correctly. Installation was mostly straight

forward. The only real "problem" was not enough clearance on this car for the bypass collar connection to the aluminum manifold. Planed it down and it worked fine. I had a professional do the installation and was glad I did. The system produces around 5 PSI with the large pulley and 10.5 with the small.

Dyno figures later.

Subject: Supercharger for TR3-6 ??? (Part 2)
Date: Fri, 12 Mar 2004
From: Joe <supertr6@earthlink.net>

Don/et al,

Was it worth it? Heck yes! With the large pulley on her you get a great acceleration from about 3K in 2nd, 3rd, and 4th. Passing on the interstate in no problem, same with merging at speed. You can hear some "whine" of the blower at idle, but nothing intrusive. With the small pulley you get kick your a** scary acceleration. (Can you say chew up and spit out MGs and Miatas) I am changing to a set of Hawk brake pads to slow my butt down. If that doesn't do it, I may put the large pulley back. The only other option is the \$1K brake setup from Rimmer.

The VIS kit was \$700 in 99.

The rebuilt carb with UVC needle was \$236 from Curto in 99.

The blower was \$1050 shipped from Magnuson as a "deal" to VIS in 99.

The SU blank and filter was \$61.69 in 99.

The installation (because I was too chicken to do it myself) was \$600 (and included the Falcon Headers install) by British Sportscar Works. Hope this helps,

-Joe

Subject: Supercharger for TR3-6 ??? (Part 3)
Date: Fri, 12 Mar 2004
From: Joe <supertr6@earthlink.net>

Don/ et al,

Last week I got the TR back from a local shop that specializes in BMWs. The good thing is they have a mechanic on site that is a crew chief for a Turner Motorsport car. (For those of you who don't know Bimmers, that is a big deal). We did a bit of modifying to the system. First, the intake manifold was WAAAAAY off plane. Since it is originally designed for 2 carbs and not a single intake plenum/manifold that was no big deal. Well, for this application, it was a big deal. Had a leak I never knew about in the firewall side connection. I had the intake manifold made "straight" and true. I had special gaskets made for the intake to blow manifold connection. The nuts on the forward intake connection were wired to stay on. The fireside connection had support tubes put inside the aluminum blower manifold to keep it from deforming when it was tightened AND when making boost. (Gotta love a race mechanic) Did I really NEED to do all that? Probably not, but, hey, I haven't spent that much on her in the last 3 years. I also wrapped my headers with header wrap and put thermal wrap on the heat shield and re-wrapped the bypass line.

Engine/Systems/Supercharged

Subject: Supercharger woe
Date: Sun, 14 Mar 2004
From: "Michael D. Porter" <portermd@zianet.com>

Bill McLeod wrote:

> This is a question from a friend who is running a DOHC 4 cylinder with a supercharger (it's not British, but
> what the heck) and a DCOE side draft carb. The car has awesome power, and idles fine, but when he hits the
> go pedal, it just flat dies. Sometimes it is the infamous WAAAAH and it will go if he nurses it. Other times it
> just quits, dead. He says the accelerator pump is putting out gas. The car also has factory electronic ignition.
> Once he gets it up into the higher RPMs, he says it is scary, scary fast! Any suggestions from those of you
> who run superchargers or work on them? Thanks,

Here are a couple of WAGs:

Accelerator pump may be working, but it may not be the right stroke, or may need larger pump jets and orifices. My general guess about this carb in combination with a supercharger would be that mixture distribution isn't very good just off idle--that may require copious amounts of extra fuel to get it going. Gasping and dying would indicate that there's just not enough supplemental fuel just off idle when the throttle is opened sharply.

A shorter stroke on the pump, combined with larger jets will get more fuel into the engine in quick order, but mileage will really go down.

The other thought is that a DCOE isn't the best carb for this application. A DCOE works best when it has a nice sharp vacuum pulse on intake--the low-end metering really does need this sort of sharp pulse--and that's not likely with the carb mounted upstream of a supercharger. A large constant-depression carb or fuel injection would be among the possible fixes.

-Cheers

Subject: Supercharger woes
Date: Sun, 14 Mar 2004
From: Mitchel Seff <ms6453@optonline.net>

Hey Bill,

Do the basics,

- 1) Check for proper timing advance.
 - 2) No air restrictions (if it's not a no fuel condition then it's lack of air when the SC needs it)
 - 3) Get a boost & vacuum gauge to monitor what's happening
 - 4) DO NOT LET THE CAR GO LEAN
 - 5) One other thought, if the car uses a vacuum operated by-pass valve, check it for proper operation. If it's binding it will not allow boost. It could be an internal or external unit so check carefully.
- Did the car ever run properly or is this a new problem?

-Mitch Seff

Engine/Systems/Supercharged

Subject: Super/Turbo charging a TR 4 pot? (was Classic Motorsports Article on Supercharged TR6)
Date: Fri, 18 Jan 2008
From: Don Spence <dkspence@telus.net>

<triumphs-request@autox.team.net> wrote:

> > and when will superchargers be available for the 4 cylinder TR?

>

> A bit over 50 years ago (assuming of course you mean TR2-3 rather than TR7) ... but not likely ever again.
> Moss has said they might do, if they feel there is enough market to make it profitable, but it seems unlikely to
> me. Not enough cars remaining in the hands of those interested in modifying them.

>

> Still, it's not totally out of reach of the DIY. Not sure if he's still on the list, but we did have someone who
> rolled their own for a TR6.

> -Randall

What about the possibility of using a turbo charger & inter cooler from say a Mazda 626GT or Ford Probe. Both used a 2.2L 4 Mazda sidewinder engine with turbo and inter cooler. The capacity seems about right. Would the TR engine take the added stresses?

Subject: Super/Turbo charging a TR 4 pot? (was Classic Motorsports Article on Supercharged ...
Date: Fri, 18 Jan 2008
From: "Randall" <tr3driver@ca.rr.com>

> What about the possibility of using a turbocharger & intercooler from say a Mazda 626GT or Ford Probe.
> Both used a a 2.2L 4 Mazda sidewinder engine with turbo and intercooler . The capacity seems about right.
> Would the TR engine take the added stresses?

I believe so, as long as you keep the rpm down. Biggest problem IMO will be to keep it from detonating (knocking).

Both the increased pressure and the increased intake temperature tend to cause knock, and we pretty much already use all the octane available with pump gas (unlike the stock 'emissions' TR6 which has substantially lower compression). The intercooler would help (by lowering temperature), but it's still going to be hotter than naturally aspirated.

Turbos also suffer from throttle lag; basically the time it takes the turbo to spin up once you open the throttle and the engine starts making more exhaust gas. There are ways to alleviate it, but not eliminate it entirely. I was interested in turbocharging my TR3A until my wife bought a turbo charged minivan. Had good power once it got going but significant lag problems, IMO. Very un-sportscar like ... I used to imagine Scotty saying, "Aye Aye Kyeptain", before things would start happening.

IMO a supercharger is the only way to go on a TR, in spite of poorer overall efficiency.

-Randall

Subject: Super/Turbo charging a TR 4 pot? (was Classic Motorsports Article on Supercharged ...
Date: Fri, 18 Jan 2008
From: <tr3driver@ca.rr.com>

<tr3driver@ca.rr.com> writes:

> and when will superchargers be available for the 4 cylinder TR?

A bit over 50 years ago (assuming of course you mean TR2-3 rather than TR7) ... but not likely ever again. Moss has said they might do, if they feel there is enough market to make it profitable.

I'd think the MGB supercharge would be easily modified for the TR4 as the displacement is similar...no?
-Robert B. Houston

Subject: Classic Motorsports Article on Supercharged TR6
Date: Fri, 18 Jan 2008
From: "Randall" <tr3driver@ca.rr.com>

> I'd think the MGB supercharge would be easily modified for the TR4 as the displacement is similar...no?

Finding a suitable blower isn't the hard part; it's getting it hooked up to the motor in a reliable fashion that's a pain. Especially if you want to include some sort of valve so the blower isn't sucking power even when it's not doing anything useful (what I believe Accel used to call a "priority valve").

Blowing into the carbs isn't such a good idea, as they don't like changes in air density (and a blower is all about increasing air density). So now you have to link the blower outlet directly to the intake manifold, and a carb to the blower intake (ignoring the priority valve that needs to connect in both places).

Unless of course you convert to fuel injection at the same time, (Which is probably a good idea, but a whole other ball of worms as well).

Blower sizing also depends on how much boost you plan to run, and what ratio you set up between the blower & the crankshaft. As I recall, the MGB is only 1800cc, so if you keep the same drive ratio, it's blower will make less boost on a 1991cc TR3, less on a 2138 TR4, and even less if you've put in the 87mm liners. Of course you can overdrive the blower ...

-Randall

Subject: Super/Turbo charging a TR 4 pot? (was Classic Motorsports Article on Supercharger ...
Date: Fri, 18 Jan 2008
From: "Randall" <tr3driverca.rr.com>

> Randall, with the greatest respect, I can't entirely agree with your comments about turbo lag.

No worries, John. But if it took major automakers 20 years to deal with the problem, what chance does the DIY have of dealing with it?

Amusing story : Never having heard of the GTti, I Googled it ... the very first link showed someone talking about replacing the clutch twice because "turbo lag means you really have to ride the clutch ..." <G>
<http://www.carsurvey.org/review_19409.html>

I suppose I should have kept reading the literature as I'd really like to know how they eliminated the problem (although one of the secrets may be those tiny engines, which also use tiny turbo chargers with less inertia to overcome).

> But whether a turbo on a TR6 is a viable fitting, I would have my doubts.

Well, Moss seems to have done a respectable job with the TR6 supercharger; and a turbo charger is just a particular type of supercharger. In theory a turbo is more efficient, because it gets at least some of its energy by recovering waste heat; and uses a more efficient (but high speed) turbine as a compressor. But translating that into improved performance still looks tricky to me.

And someday I promise to try out that TR3 supercharger sitting in my garage ...
-Randall

Subject: Super/Turbo charging a TR 4 pot?...
Date: Sat, 19 Jan 2008
From: John Herrera <jrherrera90@hotmail.com>

> Well, Moss seems to have done a respectable job with the TR6 supercharger; and a turbo charger is just a
> particular type of supercharger. In theory a turbo is more efficient, because it gets at least some of its energy
> by recovering waste heat; and uses a more efficient (but high speed) turbine as a compressor. But translating
> that into improved performance still looks tricky to me.

Randall is correct as usual. Turbo charger is a contraction of turbo-supercharger, the official name. Turbo is the combination form of turbine, a device that is spun by fluid, exhaust gasses in this case. The gasses enter the turbine hot and under pressure. They expand in the turbine and leave the turbine cooler and under less pressure. The pressure and heat energy become mechanical energy when the turbine spins. The turbine spins the compressor, unlike a mechanical supercharger, in which a gear train or belt turns the compressor.

Another difference between turbo chargers and superchargers is that superchargers compress the intake air after it is mixed with the fuel, and turbo chargers compress the air before it is mixed with fuel. On airplanes anyway. I have never read or heard why this is done or if the opposite could be done. Seems to me that superchargers on fuel-injected car engines would compress the air before it is mixed with fuel, but what do I know?

Does anyone know? Curious,
-John H.

Subject: Super/Turbo charging a TR 4 pot? ...
Date: Sat, 19 Jan 2008
From: "Rick" <patton@suscom-maine.net>

John Herrera wrote:

> Seems to me that superchargers on fuel-injected car engines would compress the air before it is mixed with
> fuel, but what do I know? Does anyone know?
> -John H.

Hello John,

I have supercharged and fuel injected my TR6 and it compresses the air before adding fuel. It's certainly been a challenge but the results are a 0-60 time of 5 seconds with no lag at all. There's not much more that I can do to the original engine and keep it in one piece. Right now it is without distributor full sequential multi-port fuel injected supercharged and intercooled. Runs about 8 to 8.5 psi of boost and flywheel horsepower is near 200.

A unique feature is that the throttle is between the blower and the intake and that allows me to run without the blower. The blower is an Eaton M62 set up for use in a Mercedes C2 series with an electric clutch just like an air conditioner. With a flick of a switch it goes from mild to wild. You can see the set up at:

<<http://topshamautoparts.com/tr6/superengine.htm>>

-Rick Patton

Subject: Super/Turbo charging a TR 4 pot?
Date: Sat, 19 Jan 2008
From: "Randall" <tr3driver@ca.rr.com>

John Herrera wrote:

> Another difference between turbo chargers and superchargers is that superchargers compress the intake air
> after it is mixed with the fuel, and turbo chargers compress the air before it is mixed with fuel. On airplanes
> anyway.

I've seen it done both ways on cars; in fact somewhere I have a book talking about the advantages and disadvantages of using turbos in "blow through" or "suck through" carburetor configurations. One problem with configuring a turbo for "suck through" is that it must have seals capable of handling the vacuum created when the throttle plates are closed (like at shifts & cruise conditions). Apparently most turbos don't have such seals. And when they do have the seals, the seals are troublesome. But that book was written a long time ago, so that may no longer be true today.

Probably a different book, but I've also seen a photo of a Paxton belt-driven supercharger (which used a turbine compressor) blowing into a carb.

> Seems to me that superchargers on fuel-injected car engines would compress the air before it is mixed with
> fuel, but what do I know?

Certainly for port or direct injection. But maybe not for TBI ?

-Randall

Subject: Supercharging a TR4
Date: Sat, 19 Jan 2008
From: Brian Jones <banc8004@comcast.net>

Close to my home in SE Pennsylvania, a company called Judson once made superchargers for VW beetles, and, among other cars, TR4s. You occasionally see one for sale on e-bay. Expect to pay up to \$3,000 for a complete set up.

This website mostly addresses VWs, but you'll find links to TR stuff.

<<http://www.vwjudsonregister.org.uk>>

-Brian Jones

Subject: Supercharging a TR4
Date: Sat, 19 Jan 2008
From: John Herrera jrherrera90@hotmail.com

My friend has a Judson supercharger set up for a TR3 that he bought on e-bay quite a few years ago. It's beautiful; all crackle black and polished aluminum. He took it to a shop for installation on his TR3, but they refused to install the supercharger without first going through the engine innards. I think they were right to do so.

-John H.

Subject: Supercharging TR4
Date: Sat, 19 Jan 2008
From: "Dave Connitt" <dconnitt@fuse.net>

List,

Here is a interesting article describing installing a Judson supercharger on a TR4A that I came across awhile back.

<<http://www.v8triumph.com/JS.htm>>

There were several problems encountered such as severe overheating, stresses to the water pump bearings due to the fact that the supercharger was driven off the front pulley. Not insurmountable problems but problems just the same. The website is an interesting read. It seems the author's solution was to replace the 4-cylinder with a Rover V8. That is linked to the same site and is also an interesting read. Enjoy the read and remember, for every cold day there is a warm one coming up!

-Dave Connitt

Subject: Supercharging a TR4
Date: Sat, 19 Jan 2008
From: <pethier@comcast.net>

<jrherrera90@hotmail.com> wrote:

> My friend has a Judson supercharger set up for a TR3 that he bought on e-bay quite a few years ago. It's
> beautiful; all crackle black and polished aluminum. He took it to a shop for installation on his TR3, but they
> refused to install the supercharger without first going through the engine innards. I think they were right to do
> so.

The fastest way to find the weakest part of an engine is to supercharge it.

-Phil Ethier

Engine/Systems/Turbocharged

Engine/Trouble Shooting

Subject: Oddly nearly overheating
Date: Tue, 11 Apr 2006
From: <ZinkZ10C@aol.com>

<spamiam@comcast.net> writes:

< Oh, man. I REALLY don't want to have to strip the engine. I can't afford a rebuild!

Before things get out of hand here, use a known good temp gauge. Know any racers that have a tire temp pyrometer?

Sediment at the bottom of the block will not cause the engine to overheat. Very little heat is transferred from the bottom of the cylinders to the cooling system. Most of the heat from this area is transferred to the oil. Having a drain valve clogged is common to many engines and nothing to worry about.

For years, drag racers have filled most of the block (like within 1" of the top) with a substance called "Hard Block" this is done to stabilize the cylinders and prevent them from splitting. Some people use the cars on the street and have reported no change in cooling temp. If they had an oil temp gauge however the oil temps would be elevated.

As for the heads, most of the heat is transferred here. I know of no engine that has a sediment problem, I suspect yours does not either.

Running water through a cooling system does remove loose silt. I tend not to like chemical cleaners as any clogging is likely to be in the radiator and the only real fix is to remove a tank and rod it out. Your car has a couple year old rad correct? It is unlikely it is clogged so soon.

Next up is to check the head gasket. The only external way is to use compressed air. All other methods are a waste of time.

Make sure the car is in neutral and your hands are away from the fan and belts. Remove the rad cap. Turn the engine until # 1 is TDC on the firing stroke. Remove the spark plug and install an air fitting (there is an adapter made for this or use a compression gauge with the check valve removed) Apply air in a short burst, if the motor rotates turn it backwards to TDC. When the motor is at TDC it will not rotate.

Apply full air (100 PSI is enough, more is OK) stand clear of the rad cap flange, if the head gasket is sufficiently bad, coolant will spray from the rad. If coolant does not spray, leave the air attached and look for small bubbles. Continue to the other cylinders, following the firing order saves time here.

You will get a hissing sound from the crank case due to piston ring leakage. Some leakage out the exhaust is semi normal on an older or high mile motor. Leakage from the intake manifold sometimes occurs, if this is the case a valve grind is looming on the horizon. None of these leakages will cause an overheat.

Lastly you might have fins corroded away from the water pump. I've only seen this a couple of times in all my years of working/running a shop.

-Harold

Subject: Oddly nearly overheating
Date: Tue, 11 Apr 2006
From: <BearTranserv@aol.com>

<terryrs@adelphia.net> writes:

> Are you sure the water pump is moving water?

Easy to check, crank it up and take a heater hose loose. The water should squirt quite nicely. As I remember the water pump is not too hard to remove and inspect either, at least easier than pulling the engine and stripping it.

-Robert Houston

Subject: Oddly nearly overheating
Date: Wed, 12 Apr 2006
From: Mark Macy <pmmacy@sbcglobal.net>

> I looked at the basin and saw the Day-Glo orange coolant looking reasonably clean and some black
> particulates at the bottom.

Tony:

Are you using "dex-cool" or some other type of permanent anti-freeze? A friend of mine with a 'modern car' repair shop is continually telling me that this stuff will 'gel' and gum up radiators and heater cores. I stick with the green stuff in my TR's and completely change it every 4-5 years.

-Mark Macy

Subject: Oddly nearly overheating
Date: Wed, 12 Apr 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

Well, I fixed it. Since it was simple, I bet you all can guess what the answer was.
So, here is a summary of the story:

Engine had always run with the temp gauge at the "d" in "Made in UK", just under the 50% scale on the gauge.

I just found it to be running at 7/8ths! Otherwise everything seemed fine. The engine was running fine.

Inspecting the engine, I found it not to FEEL excessively hot, but 160 vs. 212 might be subtle to my hands. The coolant was well topped up.

After thinking about it, I replaced the thermostat, but nothing changed. I replaced the sender and nothing changed. I was beginning to be sure that something was plugged in the radiator.

Other than the radiator (or engine), there was one other component that could be the culprit and still have a normal cooling system... I believe it was Randall who suggested it. I had almost dismissed the possibility because that component is less than 1 year old, and the other gauge it controls seemed to be reading fine. That gauge is the fuel gauge. I thought about it and decided that it was POSSIBLE that the fuel was reading high. I happened to have a spare new stabilizer, so I replaced it.

PRESTO..... The temp started to read perfectly!!!! And the Fuel started to read 1/3 full instead of 3/4 full. I looked in the tank, and 1/3 is more likely correct than 3/4!

So, Thanks to everyone for their help. I WILL drain, rinse and refill my coolant, and I will use the green stuff instead of the orange Dex-Cool which has a reputation for clogging some cars. I am so relieved that I do not have to mess with the engine nor the radiator, at least not now.

-Tony

Subject: Oddly nearly overheating
Date: Wed, 12 Apr 2006
From: "Randall" <tr3driver@comcast.net>

There is an easy test for the VS, just connect a test lamp across either the temp sender or the fuel tank sender and turn the ignition on. If the VS is working, you can see the lamp flash on and off.

-Randall

Engine/Trouble Shooting

Subject: Oil pressure
Date: Fri, 22 Aug 2008
From: Gary Nafziger <nafziger@yahoo.com>

Just got finished re-torquing the head, setting the valves fine tuning timing ect., after 250 miles on new engine overhaul.

Took off for a test drive this evening and within 100 feet noticed no oil pressure. The pressure has been awesome since overhaul so not sure what's up. Pulled off the line at block and didn't notice any plugs there. I took apart a spare guage in order to understand how they work. Next step will be to take out ball/spring doohickey and check. How does one check pressure at the block? Hook up spare guage and see if there's pressure? *sigh*
-Gary N.

Subject: Oil pressure
Date: Fri, 22 Aug 2008
From: "Randall" <tr3driver@ca.rr.com >

> Next step will be to take out ball/spring doohickey and check.

IMO, it's not worth looking there. Even with a broken spring, you should see some pressure.

> How does one check pressure at the block?

A couple of things come to mind (assuming this is a TRactor motor). One is to start the engine very briefly (or even just spin it with the starter and the spark plugs out) with the line to the gauge disconnected (or removed from the filter head), and see if oil sprays out of the line/opening. Obviously that's kind of drastic, but if you really have no oil pressure at all, you want to keep engine run time to an absolute minimum or it soon won't run at all (and will be much more difficult to fix).

Those Bourdon tube type gauges can fail suddenly, but I've never seen a TR version fail completely like that. What I have seen happen is the drive to the oil pump shear off, due to a bound-up pump. Since the weakest part of the drive is right at the pump, the distributor keeps turning (and hence the engine still runs fine until the bearings lock up due to lack of oil).

I was doing about 70 when it happened to me (oil pump sucked up a piece of FOD through the broken screen), but got the engine shut down before the bearings were ruined. Even the pump was OK (once I got the broken locktab out of it), so the shaft and pan gasket were the only casualties. But I changed the rod bearings anyway, just because I had the pan off.

But a friend of a friend (of a friend) didn't notice his loss of oil pressure until the bearings overheated ... time for a new crankshaft.

-Randall

Subject: Oil pressure
Date: Fri, 22 Aug 2008
From: <DLylyis@aol.com>

Gary,

I have a friend who had the same problem with a freshly rebuilt 3A motor. All of a sudden in very few miles the oil pressure went to zero. I helped him out with the second rebuild and this is what I found. Go to the Moss catalogue Internal Engine. Part 32 #325-180 had sheared (god knows why) and the part 33 #836-510 was permitted to slip up inside part 31 #836-520, and disengage the shaft from the oil pump. His first assessment of

the situation was that the combination of part 31 and 33 was too short and was made wrong, but after closer inspection I found that the pin was sheared. The shaft would engage enough to build oil pressure but the slightest amount of play would allow the tang to slip out and the pump stopped rotating. Going inside the sump to see if the pump was engaged did not reveal this. It happened when the motor was running. I am not sure, but it appears that the dizzy was tightened down mighty hard with the tang not engaged in the slot of the pump shaft. This is a long shot that this would happen twice in the same universe, but it is worth a look. It may be for a different reason, but make sure your shaft and the pump are engaged at all times.

-David Lylis

Subject: Oil Pressure
Date: Sat, 23 Aug 2008
From: Jay Holekamp <jholekamp@sbcglobal.net>

Have a look at the oil pump drive system by removing the distributor and carefully inspecting the shaft and the tang at the bottom of the shaft. Try to turn the pump by hand using a long flat blade screwdriver. You might find the slot at the top of the pump shaft sheared off. Last Oct, while driving to SE VTR at Jekyll Island GA, the oil pressure on my TR4 suddenly went to zero. The cause was failure of the two inter-meshed pump vanes which wore to the point they would no longer turn, shearing the slot at the top of the pump shaft. The failed pump was 'rebuilt' in '95 (some 25,000 miles ago) and the rebuild kit components failed - more substandard aftermarket parts from an unknown source. In the course of rebuilding the engine last winter, we used an oil pump made up of the best combination of original used StanPart pieces I could find.

-Jay

Subject: Oil pressure more info
Date: Sat, 23 Aug 2008
From: Gary Nafziger <nafziger@yahoo.com>

The problem is zero oil pressure. I've blown through the oil line from block to guage, ok. I took apart guage and it seems ok.....can't blow through that. LOL taken off oil pump and it looks good. The tang is not broken or twisted. The tang measures little over 1/4 of an inch on end of pump shaft. It fits up into slot in the drive ok. My question is? Is it possible for the dizzy (or the drive off the dizzy) to spin on the oil pump shaft without seating in the slot? Because I had the dizzy out of the car and back in, just prior to the drive where I noticed no oil pressure. Since nothing seems to be visibly wrong, I'm thinking that might be the only reason.
Gary N.

Engine/Trouble Shooting

Subject: * She Croaked again *
Date: Sat, 20 Mar 2004
From: "Wayne" <wayne@brazinski.com>

Hi everyone!

Well the TR broke down again- at least this time in the shopping mall and not the highway. The symptoms are really odd. I have some chores to do before I get out to the garage so hopefully you will be able to steer me in the right direction when I go to troubleshoot:

- 1) Car quit suddenly - just like the time the white wire came off the coil, and like the time the rotor went bad.
- 2) Checked for a spark with the HT lead on the coil (leads to the dizzy) -Nice healthy spark between coil and wire
- 3) There is no spark at the plugs.
- 4) Using a Pertronix electric ignition (maybe I should go to points)

My buddy and I were stumped after changing out the dizzy cap and wires and having nothing else to change out (no spare rotor or spare points/ignition) we tried the HT lead again. This time the car fired up with me holding the lead about an inch away from the coil! I shoved it back in and the engine died. We did it again and the same thing happened. Wierd. Then the car stopped turning over. I'm not sure of the starter has crapped out or not, but think it might be the battery going dead. The electric fuel pump is still going but the engine won't turn over... Hmm... Any ideas ?

-Wayne

Subject: * She Croaked again *
Date: Sun, 21 Mar 2004
From: "Randall Young" <Ryoung@navcomtech.com>

IMO you're looking at another rotor failure. It's still a high enough resistance that if you open a spark gap, the voltage will build high enough to fire the plugs, but without the gap, the voltage gets bled off through the carbon track inside the rotor first.

I'd further guess that you've got a bad plug wire or connector, or just possibly a bad plug itself. It's letting the voltage rise too high before the plug fires, and the repeated stress is eventually breaking down the material in the rotor. Switching to points might well solve the problem ... because they won't produce so much voltage and hence you'll know you've got a bad wire <g>

-Randall

Subject: * She Croaked again *
Date: Sun, 21 Mar 2004
From: David Massey <105671.471@compuserve.com>

Rotor. There is a rash of weak rotors out there. Your symptom can be explained this way:

The rotor can not withstand the full coil voltage and will break down and provide a current path to the distributor shaft and the plugs, does not get enough voltage to spark. When you hold the coil wire an inch from the coil, some of that voltage is dropped in the arc and the voltage at the rotor is reduced to a point where it does not break down for the plugs get enough voltage to support spark. I doubt the car would run well under all conditions in this state, however since the plugs need more voltage under full throttle than at idle.

This is an interesting phenomenon but I have heard of a case where a car would start and idle fine but once the throttle was opened the car would die. This symptom would cause one to check everything but the ignition. In this case, it was a bad rotor.

-Dave

Subject: * She Croaked again *
Date: Sun, 21 Mar 2004
From: "Wayne" <wayne@brazinski.com>

Thanks for the 5 replies guys! I will post results when the parts come in and I get them on. To a man you suggested that the rotor was bad. There were also a few additions but the rotor was the main item.

- Mike Porter

OK- Since the connections for the starter seem fine, and the battery is fully charged, I guess I might need a rebuilt starter. As I have the TR4 gearbox with OD does this mean I have the older starter (I'm TS269084L) per original or a newer one because of the gearbox? Hmm...

Also- Regards an Alternator conversion - I see Revington TR has one - does anyone know of a source here in the US? I know Randall Y. has built his own, but I guess I'm a bit afraid to try and do it!

-Wayne

Subject: * She Croaked again *
Date: Sun, 21 Mar 2004
From: "Randall Young" <Ryoung@navcomtech.com>

Somehow, I think there's an extra digit in that number.

> per original or a newer one because of the gearbox? Hmm...

Impossible to tell from that information, the TR4 gearbox will work with either starter. Makes a lot more sense to look at the starter, the difference is obvious. The later starter only sticks out of the engine about 7" and is one straight housing (except for the flange and end plate). The earlier starter is about 9.5" long, and has a necked-down portion near the engine.

I'd also double-check the solenoid and cables before changing the starter. One way to do this is to wire a test lamp directly at the end of the starter, from the terminal to a housing bolt (clean off paint if necessary). Watch the lamp while you try to crank the engine ... if the problem is really the starter then the lamp should glow fairly brightly. If it doesn't light at all, the problem is electrical and outside of the starter.

-Randall

Engine/Trouble Shooting

Subject: TR-4A: The car won't start
Date: Thu, 18 Apr 2002
From: john donnelly <pdonnell@san.rr.com>

Hello John,

You wrote:

> My 1966 TR-4A won't start. The car is in the midst of a rolling restoration and doesn't get much use. (Just a couple of hundred miles in four years.) Are there any suggestions on how to approach this problem?

The best approach is to start at the beginning, and work from there. Remember that you need three things to make the engine go bang; spark, compression and fuel. Check in that order.

1. Check points. Probably best to replace if they got oily. Otherwise use brake cleaner to clean, then file contacts flat. If they got oily, then they're probably pitted. Set at .015".
2. Check wiring internal to distributor and to coil. Replace or tighten as needed.
3. Check condenser and wiring. Replace if any doubts.
4. What color are plugs? Should be tan/sand colored. Check the gap, it should be .025-.027".
5. While you have the plugs out check the valve/rocker gap. (It's easier to turn the engine by hand with the plugs out). It should be .010" cold. Inspect for broken springs.
6. Meter the sparkplug wiring. It should be zero for solid core, or a few ohms for resistive.
7. Check the timing. Set at static zero to begin with, then advance using the distributor adjustment screw one mark.
8. Disconnect the white wire going to the "+" side of the coil, and check the compression. It should be within 10-20 lbs of each other. Any wild readings need to be rechecked. Squirting a teaspoon of motor oil into a cylinder will affect a reading if there is a ring problem, not valves.
9. Reconnect the white wire, and connect a timing light to #1, and try to start. Repeat on all cylinders. Light should flash on all cylinders. Flashing means you're getting spark. That's good.
10. Pull the tops of the carb reservoirs, check for fuel and "stuff" in the bowls. If you have a fuel pump with the lever pump a few times to see if there's flow. You can do the same by pressing the solenoid button. Make sure the ignition is off.
11. Check the float height. It should be 3/32". Use a drill bit to measure.
12. Based on the plug color you might want to adjust the carbs leaner/richer (probably leaner) a few flats at a time. Or, if unsure, set the jets to the initial setting of "two turns" and try to start.
13. Open the choke wide open and try to start. This would indicate an air leak. Once you get it running, use carb cleaner around the carb's throttle shafts and manifold to locate.

Hopefully you found the problem in one of the above steps.

-John

Subject: TR-4A: The car won't start
Date: Thru, 18 Apr 2002
From: "Bob Westerdale" <Bob.Westerdale@ametek.com>

John-

Pull out a plug, re-connect the plug's HV lead, lay the plug on the valve cover (or make a ground connection to the plug's body in other way), and have someone crank the engine, If you do not see a spark, it's probably your points.... Pop off the dizzy cap, observe the points- rotate the engine until they're closed. Pull off the coil's HT lead, stuff a short piece of wire (any type will do) into the HT socket, and bend the wire so it comes to within about 1/4" from the side of the head or valve cover. Using an insulated poker, flick the points "open" and observe the spark jumping from the temporary wire to the motor. No Spark? See if the coil has power on the + (Low Voltage) side, then see if there is the same voltage on the other side of the coil, with the points still closed. If it reads the same on both sides of the coil, either your points are fried or the little flexi-wire that connects the points to the dizzy's feed thru is broken. If you have spark in all the right places, but still none at

the plug's gap, they may have broken down internally (Especially common in Champions) and you'll need a new set of NGK's or Bosch plugs.

-Bob Westerdale

Engine/Trouble Shooting

Subject: TR4 - Sudden Oil Pressure Drop
Date: Tue, 19 Jun 2007
From: <lbc.resto@comcast.net>

When I got the barn-find last year it was in a non-running condition. As I had the sump off for a look-see I decided to change the con rod bearings on spec. The crank journals seemed reasonable and I put standard size bearing shells back in. I also dropped the center main bearing cap to look at that bearing; it all looked reasonable. I also changed the thrust washers. I used lots of assembly lube and babied the RPMs; I still haven't taken it above about 3500RPM and I don't gun it or labor it.

From the time I got it running last fall until yesterday afternoon it had 70PSI pressure at 2000 and about 40PSI at idle. Took it out tonight and I noticed that it only reached 30PSI at 2500RPM and about 15PSI at idle.

Symptoms:

I have done 2 oil changes after about 250 miles each and it gets dirty quickly. I put that down to the block flushing through.

A few days ago, I started to notice a bearing knock sound at startup, but it quickly went away.

I would appreciate any ideas as to the suddenness of this?

Subject: TR4 - Sudden Oil Pressure Drop
Date: Mon, 18 Jun 2007
From: "Jim Muller" <jimmuller@rcn.com>

<lbc.resto@comcast.net> wrote:

> Took it out tonight and I noticed that it only reached 30PSI at 2500RPM and about 15PSI at idle. ...
> I would appreciate any ideas as to the suddenness of this?

Perhaps your carb float bowls or fuel pump are leaking gas into the manifold, thinning the oil? Does the dipstick smell like gas? Does the oil level seem higher than it was before?

-Jim Muller

Subject: TR4 - Sudden Oil Pressure Drop
Date: Tue, 19 Jun 2007
From: <DLyis@aol.com>

Interesting, I have a 3A and have the same issues. It did exactly the same as you described. My center main was worn a little more than I would like but the journals are ready for a regrind so I did not change the mains. The odd thing is, that at operating temperature, the knock goes away and only returns upon:

1. cold starts, or
2. after being shut down for a half hour or so, and then very briefly.

My oil pressure has declined a little but at 185 degrees I have 25 at idle and 50 - 70 at speed. This is marginal at idle, but I am old by other 3A or 4 guys that it is not unusual. I am assuming that you cleaned the bottom of the sump before replacing?

That your oil gets dirty after 250 miles is odd. Did you change oils? I was using Castrol 20-50 and changed to Shell Rotella Diesel 15-40. My symptoms came immediately so I never ran the car other than for diagnosis with this oil in it. I then replaced the rod bearings and went to Rotella 40 Diesel. After a few hundred miles I am going to go back to Castrol 20-50 and see what happens.

The motor runs great and cranks up to 4000 rpm and idles relatively quite at temp. This is not particularly bothersome to me other than I do not want to find out what the issue was by looking through a hole in the block. I have used a stethoscope to try to isolate the problem but cannot seem to locate it. Fuel in the oil is a concern,

so I would give it the sniff test. The villain here is the fuel pump diaphragm. If you have not rebuilt your fuel pump do so right away.

You say that you replaced the rod bearings to spec. If the bearings removed were .010 and you replaced with standard size, then that is your problem. Did you check the bearing stamping on the back to be sure you were putting in exactly what came out?

-David Lylis

Subject: TR4 - Sudden Oil Pressure Drop
Date: Tue, 19 Jun 2007
From: <Dave1massey@cs.com>

One possibility that is easy to check is the oil pressure relief valve may be varnished up and stuck. Take it out, clean it up and reinstall and see if anything changes.

-Dave

Engine/Trouble Shooting

Subject: TR4 oil pan leak, something else?
Date: Thu, 6 Jul 2006
From: "Randall" <tr3driver@comcast.net>

> He replaced the motor mounts, then replaced the timing chain gasket and timing chain cover oil seal. He
> started it up, and it still leaked as much as before.

You didn't mention what was done with the surface of the front hub that the seal rides on. I've found that even grooves too small to catch a fingernail in can sometimes leak, even with a new seal. If I can't easily polish it back shiny, I do something to renew the surface. An "old-timer's" trick is to replace the seal again, but leave the new one sticking out of the cover slightly, so it rides on a different area of the hub. But a better solution, IMO, is to install a Speedi-sleeve on the hub.

Was the timing cover checked for flatness? New sealing washer used on the timing cover support stud? The area between the front plate and the sealing block checked for signs of leakage at this joint? Bolts from the front plate into the block (both cylinder and sealing) checked for tightness?

> He's going to 18-20# tonight with advice from a local Brit-car specialist with care not to strip the holes in the
> front sealing block.

It won't help, can only make things worse. Were the bolt lengths checked to be sure they don't bottom in the holes? Hole and bolt threads inspected for damage?

> If he torques the bolts down and it still doesn't stop the leak, should he look to replace the oil pan (I have a
> nice spare for him) or should he have his local Brit car specialist look into replacing the front engine plate?

I'd be looking at the front plate. Lots of them seem to get distorted over the years, especially if the engine has been in an accident.

> Or has he missed another big leaker in the lower front end of the engine?

Certainly wouldn't hurt spending some time trying to isolate the source of the leak. Is the bottom of the timing cover staying dry? That would rule out the front seal. Is the leak heavier on the generator side? It might be the bolts that hold the generator mount to the engine block (which communicate with the inside of the crankcase and hence can leak oil).

Try washing the area thoroughly at the local car wash, then inspecting it immediately on arriving home.

Just replacing everything that might be leaking gets kind of expensive after awhile.

-Randall

Engine/Trouble Shooting

Subject: TR4A Engine Tests - Questions
Date: Tue, 6 Feb 2007
From: "Guy D. Huggins" <guy@genfiniti.com>

List,

I want to run some tests and have questions regarding this. Hoping the list can help.

1. Testing the vacuum advance on the dizzy - Is this a simple matter of applying vacuum to the unit and watching for the points plate to move?
2. Cylinder compression test - Does it make any sense to perform a compression test by turning the crank by hand? Would the compression vary according to piston speed? It seems to me like the compression should be the same, regardless of the rate of travel.

-Guy D. Huggins

Subject: TR4A Engine Tests - Questions
Date: Tue, 6 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

- > 1. Testing the vacuum advance on the dizzy - Is this a simple matter of applying vacuum to the unit and
> watching for the points plate to move?

Depends on what you are testing. If you are just looking for leaks and basic operation, then that's all you need to do.

- > 2. Cylinder compression test - Does it make any sense to perform a compression test by turning the crank by
> hand? Would the compression vary according to piston speed? Seems to me like the compression should be
> the same, regardless of the rate of travel.

There are several reasons that speed affects the reading. Probably the most significant is that the rings are never a perfect seal to the bore ... remember those end gaps?

Try turning the engine by handed, I think you'll find that the speed dependency is very definite. Turn it slow enough, and it turns fairly easy (meaning there is no significant compression). Turning it fast enough to develop 'normal' compression readings by hand is basically impossible ... you can't put that much torque on the crankshaft.

Even the starter would have a hard time, if it weren't for the effect of the flywheel.

-Randall

Subject: TR4A Engine Tests - Questions
Date: Wed, 07 Feb 2007
From: "Mark J. Bradakis" <mark@bradakis.com>

- > Does it make any sense to perform a compression test by turning the crank by hand?

No. You'll lose all your compression through the ring gaps moving the pistons that slowly.

-mjb

Engine/Trouble Shooting

Subject: Why Won't She start?
Date: Mon, 27 Jan 2003
From: Randall Young <ryoung@navcomtech.com>

----- Original Message -----

Subject: Why won't she start
Sent: Thursday, January 30, 2003
From: <JutH1685@aol.com>

> Success this afternoon! But only for 5 seconds! I PROPERLY applied the starting fluid into the carbs and
> cranked the engine. It fired, revved, & then stalled, so I think maybe there is a problem with fuel delivery?
> I'm leaving it in the sun this afternoon, but its only 16 degrees, so we will wait and see. If that doesn't work,
> are there any suggestions? Thanks!
> -Justin ...
> still nothing. I added heat and waited a day and tried today, turns over, but no ignition. I also used my new
> 500w (\$9.95 at sears, what a bargain!) halogen tripod lamp, which gets really hot, near the carbs to warm
> them up, nothing. Now I'm new to the whole car deal, so what should I check next? What do I look for in
> the points, condenser, etc.?

Justin, the details depend greatly on your particular car (which I've forgotten if you posted it before), but when I'm stumped, I always look at the basics: fuel, air, compression, spark (not necessarily in that order). With those 4 items (at the proper time and in the proper proportions), it has to run!

Start with a quick ignition/plug test:

Pull one of the plugs and inspect it for problems. If it's all gummed up with deposits, or wet with fuel, or the gap is significantly larger than spec (.025" for most Triumphs); invest in a new set of plugs before continuing. Put the plug wire back onto the plug, and lay it on a grounded surface (like the rocker cover stud/bolt), then have a helper crank the engine while you watch for spark at the plug. If necessary, you can hold the plug in place, being careful to only touch the metal shell and to hold it firmly against a ground (otherwise you may get a shock, which is unpleasant but rarely dangerous). I have an old plug with a wire and clip soldered to the shell, that's used for such problems. If you lack a helper, some Triumphs have an under the hood starter button (be sure the ignition is on); or you can buy (or build) a remote starter switch. (Currently on sale for \$3.50 at HF, and a good tool to own)

<<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=35448>>

The spark should be strong and regular, blue or perhaps orange. If it's yellow, the coil may be wired backwards.

If the plug was wet with fuel, try cranking for awhile with the ignition on, choke off and the accelerator floored. Check the plugs again, if they're wet again then the engine is somehow getting too much fuel (or not enough air).

My favorite way of diagnosing "no fuel - no start" is to squirt some "starting ether" down both carbs. You'll need to either lift the pistons, or better yet use a long nozzle to get under them. Then try cranking. If the engine now fires (even if it doesn't stay running), you've got a fuel delivery problem.

Quick & dirty compression/timing check:

Remove a plug and hold your finger over the hole. Crank the engine in short bursts, until you feel air pressure forcing your finger off the opening. Now pull the dizzy cap and make sure the rotor is pointing towards the cylinder you pulled the plug from. Sounds silly, but I sure wish I'd done this to my first TR3A, instead of spending two days standing ankle-deep in snow, trying to get it started; and then riding in it for over an hour while being towed home.

Of course, all of these can be followed up with more detailed, accurate tests, but for me, these usually either find the problem, or get the engine running.

Oh, one last comment, Heat will not help to start a car that already has liquid water (or worse yet, ice) in the fuel lines. It's a preventative measure, not a curative one.

-Randall

Subject: Car won't start
Date: Tue, 28 Jan 2003
From: <lstein6@earthlink.net>

I just got back to reading the list (been sick). Perhaps all these things have been mentioned, and if so, I apologize. Here's my list:

1. Put a timing light on any spark plug wire (a timing light with battery and inductive pickup is an excellent investment). Crank the engine in neutral of course and just see if you get nice flashing light. If you do, you know you at least have spark.
2. My choke still isn't working on my TR7. So I keep a can of starting spray in the car. I don't even have to pull off the air cleaner, just 1 long spray into air intake of air cleaner and it starts right up. That would tell you if you have fuel problem. If it stalls in 2 or 3 seconds it's definitely fuel problem.
3. Pull fuel line off before it goes to carbs. Get good metal or thick plastic cup, disconnect coil wire and crank engine for a few seconds, you should see 'blurb, blurb, blurb' of gas as engine cranks. If nothing, you have fuel starvation.

These three items can be done in a matter of a couple minutes without any real work. Next, pull plugs and look at them. Are they white (as in no gas)? Are they black and or wet (as in flooded)? With plugs out you can do compression check (just a great thing to have as a reference). Balance is most important as in the numbers should be within 10 lbs for best. Can be as low as 100 lbs and be okay (I think, but the experts here know better than me). Next you can do a static test on the timing, with plugs out, turn engine with fan till #1 piston at top (flashlight), balance wheel is pointing at (whatever is right 0 degrees to +12 degrees ?) and rotor is pointing at #1 plug wire, hook up simple 12v light bulb or voltmeter and turn distributor to get it to just turn on. I hope this helps, let us all know what it was,

-Larry

Subject: Why won't she start
Date: Thu, 30 Jan 2003
From: "Kinderlehrer" <kinderlehrer@mindspring.com>

Suggestion #1:

Go inside, get a big fire going in the fireplace, and make yourself a nice hot toddy. Stay there until spring.

Suggestion #2:

Ok, so if you are really determined to get the car running,

- a) Put dry gas in the tank. Give it a chance to work.
- b) Disconnect the fuel line at the carbs, put the end of the fuel line into a jar, and crank the engine. If the jar fills up, the problem is in the carbs.
- c) If there is no gas there, then work backwards. Start with the easy, replace any gas filters. Then disconnect the line before the fuel pump, if gas flows (assuming you are not on a steep hill) you probably need a fuel pump, if not keep working back until you find the blockage - could be ice in the tank. BTW, are you sure there is gas in the tank?
- d) You got fuel into the jar; therefore everything should be ok up to the carbs. Check the floats - are the bowls full? Then the valves may be stuck or dirty (or frozen). At this point it would be helpful to know what kind of carbs you have. I hope that helps.

-Bob

Front Suspension

Subject: Average life expectancy of wheel bearings?
Date: Fri, 29 Mar 2002
From: "Michael D. Porter" <mporter@zianet.com>

"R. Ashford Little II" wrote:

> How often or at what interval should the wheel bearings be replaced? I've got a TR6.

It depends to a considerable extent on degree and type of maintenance, driving conditions and on the type of lubricants used. Older Triumphs have particular problems with especially front wheel bearings, because there's only a felt wiper installed at the inner bearing. If you have to go through lots of water on the roads where you drive, that felt wiper allows quite a bit of water to be introduced into the hub.

Many people don't realize that the greases commonly used and specified for the bearings in older cars are soap-based. Driving through lots of water then flushes out the water-soluble constituents of the grease, leaving the fiber fillers, which have very poor lubricating capacity. This inevitably leads to accelerated bearing wear.

Another consideration is the melting point of the grease used. Particularly in cars with disc brakes, under hard use, brake temperatures can go beyond the melting points of older greases, causing them to run out, which cause eventual bearing failure.

The last consideration in bearing life has a lot to do with the kind of maintenance they receive. Many cleaning solvents in use today leave a very fine film of residue, which can prevent grease from contacting the surfaces to be protected. If a bearing is cleaned with a commercial solvent, it should always then be washed in gasoline, which will strip off the solvent film, and allowed to air-dry. It's also very important, if the bearing is dried with compressed air, to not let the rollers or races to spin when doing so. Doing such will cause early failure of the bearing, because, without lubricant, the bearing surfaces are easily damaged.

Also, one must be careful in how the bearings are packed. There are pressure packers which work well, but taking the time to properly hand-pack a bearing works just as well with no additional expense. It's not enough to smear the bearing with grease. Rather, the grease should be worked into the bearing by filling the palm of the hand with grease, then dragging the bearing into palm, effectively wedging grease into all the small spaces of the bearing.

Today, fortunately, there are many good synthetic greases which are not completely soap-based, and do not wash out easily, and have high melting temperatures, and I would recommend any good grade of synthetic bearing grease suitable for disc brake use.

As for replacement intervals, it depends upon the condition of, particularly, the races and the rollers during inspection. If the rollers show signs of scoring around their diameter, they will not last much longer and should be replaced. Same for scoring of the races, or if there are signs of any discoloration or bluing on the roller cage. If one is using a non-waterproof NGLI #2 grease, I would inspect bearings every 12,000 miles. Using waterproof high-temperature NGLI #1, or a good waterproof synthetic grease, rated for disc brake use, that interval could probably be increased to 30-40,000 miles.

If there are none of the above signs of wear, there's no reason the bearings, for normal street use, can't be cleaned, repacked and re-used until they do show signs of wear. Racing would be another matter, particularly because the high braking loads in racing create sustained high temperatures in the hubs, and inspection and/or replacement should be on a greatly accelerated schedule.

-Michael D. Porter

Front Suspension

Subject: Front suspension removal
Date: Tue, 13 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> Is there a website that details the removal of the front springs and how to make-up the threaded rod Spring
> Compressor?

Not that I know of, but I'll take a stab at describing what I did. It's not the only way, probably not even the best, but has worked well for me on several occasions.

Hardest part of making one is finding something to use for the bottom plate ...

I used an old generator pulley half from a VW Bug that happened to be lying around. Whatever you find, drill it to fit over the shock mount studs, and a center the hole around 3/4" (which the pulley half already had). On top of that, you'll need:

- (1) About 15" of 3/4" threaded rod,
- (2) 3/4" flat washers,
- (3) 3/4" nuts

Remove the two nuts at the top of the shock, that's hold it into the spring tower, along with the metal & rubber washers.

Arrange the car so there is some upwards force on the A-arm, enough to lift it off of the stop attached to the frame. If you have a wheel ramp, put the wheel on it. I didn't, so I used a jack and a length of 2x4 under the A-arm just inboard of the trunnion. Remove the two bolts that hold the stop to the frame, plus the 4 nuts for the shock and the shock itself with the brackets still attached.

Lock two of the nuts together at one end of the threaded rod, then put a flat washer and your drilled bottom plate onto the rod. Insert the rod through the spring pan, fitting the plate onto the studs & letting the rod protrude through the shock hole in the tower. Put a flat washer & nut on the end of the rod.

Now turn the rod, using the two locked nuts, while holding the uppermost nut with a wrench. Tighten until the spring pan is roughly parallel to the frame/floor. Now you can remove the support under the A-arm.

Remove the nuts &/or bolts that hold the spring pan to the lower A-arms. Then push the A-arms upwards so the pan slips off the studs, and loosen the threaded rod (from the bottom again). Guide the spring pan outwards so it slips over the frame rail, and continue to back off until all the spring pressure is gone.

Rest should be easy. And reassembly is, as they say, the reverse.

> Also how do I tell which of the upper wishbones is the front and which is the rear one.

The top is rounded; the welds (or open side if you have the older design) go on the bottom.

-Randall

Subject: TR4 Front suspension removal
Date: Wed, 14 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> Well I decided to have a go and seem to have hit a snag. The back of the spring pan hits the chassis which is
> stopping the spring and damper from dropping. I undid the bump stop and jacked the pan up and undid the
> bolts holding the plate under the damper then undid the 6 pan bolts. I have put in the two guide bolts and
> dropped the jack but the spring and damper won't drop. Do I jack it up again and lever the pan out. Should the
> damper have come out separate to the spring?

Yes, the damper has to come out first. Then you put the spring compressor in its place. That relieves the pressure on the A-arms, so you can undo the nuts/bolts and swing them up to the top of their travel. That should let the spring pan drop off the studs so you can pull it horizontally out away from the frame and lower it (by undoing the spring compressor).

-Randall

Subject: TR4 Front suspension removal
Date: Wed, 14 Feb 2007
From: William Babbitt <wbabbitt@sbcglobal.net>

Jim,
You're treading on dangerous ground. The energy in a compressed spring is enough to do real damage TO YOU.
Bolt it all back together.
Then, remove the shock absorber.
Then, install a spring compressor where the shock absorber was.
Then remove the pan bolts. You'll notice at that point that you can raise the A-arm and get the pan to clear the frame. Slowly loosen the spring compressor to lower the pan and spring together.

The spring compressor is essentially a threaded rod that goes up the center of the spring. If you're handy, you can make your own, but make sure it's sturdy enough. You can probably get a look at the basic design in the TRF catalog. Good luck, and protect your fingers!

-Bill

Subject: TR4 front Suspension
Date: Fri, 16 Feb 2007
From: Jim and Andreas Vassiliadis <diggle@clear.net.nz>

First, thank you for the helpful replies on reinstalling the new springs and shocks.

I have done the low side but not the second side that had not sagged. I have also had my back leaf springs tensioned, again. Now the car looks like it is riding high in the front. Previously it was high in the back and sagging on the driver's side. The new Standard springs from Victoria British were 11.4inches high. I thought they were supposed to be 11inches. I removed the old spring and packer. Will the new springs settle down? I suppose I should install the other side. Also the new damper seemed to be a bit shorter than the old one.

-Jim

Front Suspension

Subject: Rubber bushings
Date: Sat, 14 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> Normally I would use some grease to hold the rust at bay but grease (at least general purpose grease) will
> cause or hasten the deterioration of rubber products. Any advice on what to use and what has worked for other
> members would be appreciated.

Well, silicone grease won't rot the rubber. But, the rubber is not supposed to slide on the pin, and I suspect greasing the pin would allow it to slide. The best solution is to just keep the rubber in good shape (by replacing it every couple of years, in my experience). The rubber itself will seal and protect the pin, IMO, it only starts to rust when the rubber is torn and allows air (water, salt, etc.) to get to the pin.

I got tired of changing those darn rubber bushings every few years, and switched to Nylatron bushings sliding on replaceable stainless sleeves. Not original at all, but last much longer.

-Randall

Subject: When to change rubber bushings
Date: Sun, 15 Jul 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi list!

Since Mike D. brought up the topic of rubber bushings & Randall Y. replied, "So likely the best solution is to just keep the rubber in good shape (by replacing it every couple of years, in my experience)".

My question to the list is:

Can anyone place a length of time, on the average, of how many years they should be changed? OR
When is it advisable to change these rubber bushings?

Yes I know oil will deteriorate the rubber so if they look 'mushy' or are cracking, that these are good indications. But other than looks, what other signs should be noted? TIA,

-Cosmo Kramer

Subject: When to change rubber bushings
Date: Sun, 15 Jul 2007
From: <L1J1S@aol.com>

mushy, cracking and noise.

-Larry

Subject: When to change rubber bushings
Date: Sun, 15 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

"Cosmo Kramer" <tr4a2712@yahoo.com> wrote:

> Yes I know oil will deteriorate the rubber so if they look 'mushy' or are cracking, that these are good
> indications. But other than looks, what other signs should be noted?

On my daily driver TR3A, I could hear the clunks as metal hit metal when the bushings were failing.

But maybe current bushings are made of better stuff; certainly the original ones were.

-Randall

Subject: When to change rubber bushings
Date: Sun, 15 Jul 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

The bushings on my TR4 are likely original, which would make them 43 years old. Still just fine... too bad we seem to have lost the formula for that batch of rubber.

-Geo

Subject: When to change rubber bushings
Date: Sun, 15 Jul 2007
From: "Mike Denman" <mikedenman@sbcglobal.net>

Hi group,

I have a couple of items to contribute to the list (at last). The front suspension of my wife's TR3 was completely worn out with every single component showing signs of severe wear and poor maintenance by the previous owners.

The first problem was the front left lower suspension fulcrum. Both of the bushings were rusted onto the fulcrum and the threaded portion of one end of the fulcrum was broken off. One of the previous owners had managed to drill and tap the broken end of the fulcrum to accept a smaller bolt with a large washer. Clever and it must have been hard to do but not the safest idea in the world. The hole was also drilled quite a bit off center. So, the question I posed to the list a couple of weeks ago was "how hard is it to replace the lower fulcrum (which is welded into place) with the body on the car?"

I didn't get an answer from the list but I can now say that it can be done but it certainly isn't a picnic. I spend an entire morning making some temporary brackets that were bolted to the frame that would allow me to position the new fulcrum in exactly the same place as the old one. Of course, if the old fulcrum has been pushed out of its original position by an accident etc. then the new fulcrum will also be in the "wrong position" by the same amount using this approach. However, the brackets proved to be invaluable. The original factory holes through which the fulcrum passes are oversize (probably to allow adjustment by the factory welders to compensate for dimensional tolerances in the frame). So the original holes do not aid in the final positioning of the fulcrum. Both brackets (one on each end of the fulcrum) must be cut away to get the fulcrum into place. The brackets are fairly simple so I made new ones instead of trying to save the old ones by grinding away all the welds etc. The whole process took me almost three days but the new fulcrum is now in place and all the suspension components on that side seem to line up correctly. The final verdict will come, of course, when I have the front end aligned.

The second "solution" involves the age old problem of rusted on bushings. I spent 4 hours getting one rusted-on bushing off the bad lower fulcrum. This was, of course, before I decided to replace the entire fulcrum. Over the years I have tried all types of "solutions" for this problem of rusted-on bushings and none of them have worked very well. Today I thought of a new solution.

First I tried out the new solution on the bad fulcrum that I had removed from the car to see if it would work. I certainly didn't want to make things worse and the new solution sounds fairly drastic at first. Using my new method I had the rusted-on bushing off in less than five minutes and I didn't even get dirty! So what is the magic solution you ask? Well, I would still spray the rusty bushing with WD-40 or PB blaster or your favorite penetrating oil solution and leave it over night. Then take an appropriately sized nut (in my case a 3/4" inch nut drilled out to 19/32") and drill it out to fit over the bushing. Tack weld the nut to the bushing in 4 places. Don't go crazy with the welder. It doesn't require a lot of weld and you don't want the weld to penetrate deep enough to hit the fulcrum shaft. You also need to keep the flats of the nut clear of weld. Once the nut is welded to the bushing take an impact wrench and socket and remove the bushing. I was able to get my bushing off easily with the lowest setting on the impact wrench. It doesn't take much to break the bushing loose. I think the "big secret" is the impact wrench. The impact wrench is what makes the difference. I hit upon the idea after reading an article in the Triumph archives about using a pipe wrench and a lot of heat to remove the rusted on bushing. The

pipe wrench idea got me thinking about how to apply rotational force to the bushing. Then I thought about how hard it is to get a generator pulley nut or alternator pulley nut off with a wrench and how easy the nuts come off with an impact wrench. This solution really works. Of course, you need enough room to get to the rusted on bushing with an impact wrench but it is worth a little extra effort to move things out of the way to allow the use of an impact wrench. Comments?

-Mike Denman

Subject: Front suspension
Date: Mon, 16 Jul 2007
From: "Jack W. Drews" <vintr4@geneseo.net>

you wrote:

> Both of the bushings were rusted onto the fulcrum and the threaded portion of one end of the fulcrum was
> broken off. ...

Thanks for sharing this with us! There are a couple of great ideas in your write-up that I will use on other things.

Would you mind it if I forwarded your message to the big Triumphs list and the FOT list?

-uncle jack

Subject: Front suspension
Date: Mon, 16 Jul 2007
From: "Mike Denman" <mikedenman@sbcglobal.net>

Not a problem... use as you see fit. That is the wonderful thing about the list... the ability to share ideas.

-Mike

Subject: Front suspension
Date: Mon, 16 Jul 2007
From: "Kentech HomeTech" <kentech0822@verizon.net>

A trick to remove the inner fulcrum sleeves from the fulcrum that worked for me was to use a carbide burr on the sleeve to make a couple of flats on the sleeve to fit a wrench. You can't grip the round sleeves with vice-grips otherwise because they are hardened. PB Blaster overnight first as you suggested then apply heat from a torch up into the end of the sleeves while rotating the sleeves back and forth with the wrench.

Wear leather gloves, those babies get hot!

-Peter K

Subject: When to change rubber bushings
Date: Mon, 16 Jul 2007
From: "Anthony Rhodes" <spamiam@comcast.net>

"Geo wrote:

> The bushings on my TR4 are likely original, which would make them 43 years old. Still just fine...

It does constantly surprise me that we seem to have inferior "rubber" parts these days. Maybe even the OEM parts are not so great either. Just yesterday I was in the local Pep Boys and a guy was looking at some sort of rubber plug. He was on a cell phone commenting to someone about how crappy the rubber was. He said something like "These #\$\$^& parts made in India. The rubber lasts a few weeks"

I assume it is a combo of cost and that the old parts were made with environmentally unfriendly processes. To tell the truth, I would GLADLY pay more to have the assurance that the "rubber" will have the longest lifetime reasonably possible.

-Tony

Subject: Front suspension
Date: Mon, 16 Jul 2007
From: <hdriider570@peoplepc.com>

I have used a nut splitter successfully quite a few times now. I place it as far onto the sleeve as I can, tighten till it starts to split the sleeve and then use the tool as a lever to twist, the now, slightly larger diameter sleeve off. It has never left a mark on the underlying pin and works very quickly.

-Edward Hamer

Subject: Front Suspension
Date: Wed, 18 Jul 2007
From: <TRDOCTOR@aol.com>

The easiest thing that I have found to remove the sleeves from the front suspension is an impact chisel and ear plugs. You can do both sides in 5 minutes. Use the fork shaped chisel and angle it in the direction you want the sleeve to go. Just be sure to use the ear plugs since it is REALLY LOUD with your head under the fender!!

-Sam and Carol Clark

Subject: When to change rubber bushings
Date: Fri, 20 Jul 2007
From: Brian Jones <brianjone5@mac.com>

Tony wrote:

> It does constantly surprise me that we seem to have inferior "rubber" parts these days. Maybe even the OEM
> parts are not so great either. Just yesterday I was in the local Pep Boys and a guy was looking at some sort of
> rubber plug. He was on a cell phone commenting to someone about how crappy the rubber was. He said
> something like "These #\$\$%^& parts made in India. The rubber lasts a few weeks"

This is because rubber isn't rubber anymore. Not genuine rubber-rubber anyway. The global demand for rubber far exceeds the number of rubber trees planted. This manually collected crop cannot meet the demand of 6 billion people.

We're dealing with different synthetic formulations aimed to replicate, or rather, vaguely approximate real rubber.

I can imagine how much R&D went into the synthetic rubber used in the India plant for the low-cost Pep Boys parts referenced above. Zip.

-Brian

Subject: When to change rubber bushings
Date: Fri, 20 Jul 2007
From: "Nolan" <foxtrapper@ispwest.com>

One of the things I've always found interesting with rubber bushings and gaskets is the vast difference in the OEM quality. European cars have the absolute worse. They tend to start falling apart after just a few years. At the other end are the American cars. Those last for forever it seems. The Japanese cars are pretty good as well, but they don't survive rubbing as well as the American rubbers.

As for aftermarket replacements, I've had them fail as I'm installing them. It's quite annoying to watch a new tie-rod end boot split as you're installing it. Some were better, and lasted to the end of the week. India and Israel sourced pieces seem to be the worse.

As for our Triumphs, I mostly wish someone would make oem equivalent pieces, not sorta-equivalent pieces. Especially when it comes to things like window scrapers and the like. As in flocked on the inside so they actually slide on the glass, and rounded edged, not square that feels sharp under your arm.

Subject: When to change rubber bushings
Date: Fri, 20 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

Brian Jones <brianjone5@mac.com> wrote:

> This is because rubber isn't rubber anymore. Not genuine rubber- rubber anyway. The global demand for
> rubber far exceeds the number of rubber trees planted. This manually collected crop cannot meet the demand
> of 6 billion people.

Thing is, cars haven't used natural rubber (for the most part) for the last 70-80 years. World demand outstripped supply way back in the 1920's, leading to the development of Neoprene in 1930, and Buna-S in 1933. WW2 cut off the US's supply of natural rubber, and we've been using synthetics ever since.

There are literally hundreds of different synthetic rubbers, though, and obviously some sources are using either cheaper versions, or not curing them properly. Even natural rubber has to be carefully treated to be useable, and if the treatment isn't done right, it will fall apart rapidly.

-Randall

Subject: When to change rubber bushings
Date: Fri, 20 Jul 2007
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

"Nolan" <foxtrapper@ispwest.com> wrote:

> One of the things I've always found interesting with rubber bushings and gaskets is the vast difference in the.
> oem quality. European cars have the absolute worse. They tend to start falling apart after just a few years. At
> the other end are the American cars. Those last for forever it seems. The Japanese cars are pretty good as
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>

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> tie-rod end boot split as you're installing it. Some were better, and lasted to the end of the week. India and
> Israel sourced pieces seem to be the worse.

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> As for our Triumphs, I mostly wish someone would make oem equivalent pieces, not sorta-equivalent pieces.
> Especially when it comes to things like window scrapers and the like. As in flocked on the inside so they
> actually slide on the glass, and rounded edged, not square that feels sharp under your arm.

I know a little about rubber components as I sold them to the OEM's for the last 20 years and I did stay at a Holiday Inn Express on several of my business trips!

Others have said and they are correct, that there are many different compounds as well as polymers to choose from when developing a rubber part. Ideally you start with a set of performance parameters such as temperature, fluids, dynamics and environmental conditions before your design a rubber part. Each of the synthetic polymers as well as natural rubber do well or not so well in specific applications. Natural rubber is the best for dynamic applications such as engine, transmission, suspension, differential or even wiper motor mounts. It's not so good around oils and fuels. When our cars were made the engineers selected available polymers for specific applications and then had parts designed for those applications.

Designs took into account cost as well as performance. Other synthetic polymers such as EPDM are excellent for Ozone resistance and are used in window and door trim areas or perhaps truck seals. Nitriles are generally good for oils and greases and with each additional performance constraint came added costs. Today compounds can range from pennies a pound to several dollars per pound for the ones needed to withstand high temperatures or very aggressive fluids. I could go on but hopefully you get the general idea of how a particular rubber polymer was selected and are still selected for automobile applications. Many times two different chemists will arrive at a compound formula that meets the performance requirements but have significantly different costs. In today's automotive world cost is the driving factor and sometimes takes priority over performance much to the disgust of the engineer and chemist who worked so hard to develop the right parts.

Moving to our parts (or any collector car parts) made at relatively low volumes for a small group of consumers and by folks both in the US and overseas the cost becomes even more important to the small group of suppliers. I will guess that original drawings or material specifications as well as performance criteria are long gone and now the production of parts is left to trying to duplicate dimensionally some old stock part and the selection of an appropriate compound and polymer is left to the supplier to decide based on very little performance criteria. Couple that with little or no actual testing as well as sourcing in some 3rd world nation it doesn't surprise me that we get what we get when it comes to rubber parts made for our cars.

-JVV

Subject: When to change rubber bushings
Date: Sun, 22 Jul 2007
From: "Anthony Rhodes" <spamiam@comcast.net>

Jerry,

I wonder if you, or anyone else on this list, have the expertise, interest, and time to offer some help to our suppliers when they arrange to have "rubber" parts made. Maybe it is only important when we see certain parts failing prematurely (like steering rack boots).

I have heard (Nth hand) that the VTR is considering how to have a centralized (I.E. VTR based) reproduction parts advisor. This would be similar to what some of the Clubs in the UK do. I would assume that the VTR committee would be working hand-in-hand with the UK-based committees to have a world-wide unified source of design info for use by manufacturers and suppliers.

-Tony

Front Suspension

Subject: Suspension Question
Date: Sun, 25 Mar 2007
From: <Dave1massey@cs.com>

<75TR6@tr6.danielsonfamily.org> wrote:

> I'm about half way through the rebuild of my front suspension and have a question or two. Haynes says that
> the upper wishbone nuts on the fulcrum pins should be left loose until the car is sitting on all 4 wheels (and
> with 2 people in car!). So, how loose is loose? Finger tight? Are there any other components that should also
> be left loose so the car can settle? Right now I haven't tightened anything down. Loose enough to allow the
> rubber bushes to rotate.

When you tighten the nuts the rubber bushes compress and lock into place and henceforth any suspension travel will deform the rubber. If you tighten them with the car off the ground there will be a preload on the rubber and they will fail prematurely. All the other bushes on the TR6 front suspension are nylon and will rotate in normal operation anyway so there is no need to wait to tighten these.

BTW if you are fitting poly bushes you can skip this part.

> *Almost forgot.... only the right side of the car has shims located behind *the bracket on the lower wishbone.
> What are the shims for and should they be *behind all 4 brackets?

These are used to adjust the camber and caster. My advice is that as soon as you finish the rebuild you should get the front end aligned. (If you have also rebuilt the rear or have no plans to get a four wheel alignment) The will adjust the number of shims to achieve the specified camber and caster values. Putting an arbitrary number of shims will not do any good. Leave them as is for now.

-Dave

Subject: Suspension Question
Date: Sun, 25 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

<75TR6@tr6.danielsonfamily.org> wrote:

> Haynes says that the upper wishbone nuts on the fulcrum pins should be left loose until the car is sitting on all
> 4 wheels (and with 2 people in car!).

Bob, just in case you missed it in Dave's reply: You can safely ignore this step. Leaving the nuts loose is only for when you are using the original rubber bushings. Nylatron won't care.

-Randall

Subject: Suspension Rebuild Question
Date: Fri, 30 Mar 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

I've finished installing Good Parts nylatron rebuild kit for the front suspension. The only torque setting he gives is for the lower wishbone bolt that goes through the trunnion. Other than that I've been told to just tighten everything else "down".....which I've done. So, should I be able to move the suspension up and down by hand? I'm still on jack stands and can't imagine being able to do any vertical movement by hand.....that's a big spring to compress with my old muscles.

One other thing....Haynes says to knock the old wheel bearing races out with a "drift". How does a drift differ from a long flat punch? I've got a big assortment of punches but nothing called a drift.

Next up....Uncle Jack's stub axels and then Good Parts solid rack mount.

-Bob Danielson

Subject: Suspension Rebuild Question
Date: Fri, 30 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

<75TR6@tr6.danielsonfamily.org> wrote:

> I've finished installing Good Parts nylatron rebuild kit for the front suspension. The only torque setting he
> gives is for the lower wishbone bolt that goes through the trunnion. Other than that I've been told to just
> tighten everything else "down"which I've done. So, should I be able to move the suspension up and down
> by hand? I'm still on jack stands and can't imagine being able to do any vertical movement by hand.....that's a
> big spring to compress with my old muscles.

The time to check for free motion is before you install the spring pan & spring. You can't make any useful vertical check once the spring is installed.

> One other thing....Haynes says to knock the old wheel bearing races out with a "drift". How does a drift differ
> from a long flat punch?

"Drift" is basically British for "punch". However, in that particular case, and especially if this is your first time, you might consider using a brass punch, to avoid the chance of the punch gouging the sides of the bearing housing/hub. It takes a bit of skill/experience to avoid damaging the hub with a steel punch.

I'm not certain, but I think I recall that TR6 front hubs have notches in the hub for the punch to hit the back of the bearing race. If so, you'll want a round punch rather than a flat one. I use a proper drift (which in American is a particular variety of punch with a long tapered, round shank, also sometimes called a "taper" or "alignment punch").

-Randall

Subject: Suspension Rebuild Question
Date: Fri, 30 Mar 2007
From: Greg <one_second_zero@yahoo.com>

I really wish I had found Uncle Jack's axle stub kit BEFORE I did my front end rebuild. :- (I would have definitely done that upgrade. I did do the good parts bushings, springs, Spax shocks, and good parts solid rack mounts. Good results.

- Greg H

Front Suspension

Subject: TR4 suspension assemble
Date: Thu, 30 May 2002
From: David Delano <ddelano_98@yahoo.com>

Just completed my '61 TR4 front end work and had the same concerns you have... Here are my tips:

If you can remove the upper pivot pin (4 bolts on the top of the shock tower) it is a lot easier to install the upper A-arms and bushings off the car, then just bolt the upper pivot pin to the top of the shock tower and you are ready to continue... If the bushings won't slide on easily then use a little (50/50) water/liquid soap mix to help slide them on.

This stuff will dry out of your bushings over time so they will retain their proper friction characteristics.

If you have removed the lower A-arms and the sleeves that slide over the lower pivot pins then you are in good shape there - this part should slide right together without much difficulty. I installed the nylon bushings into the lower A-arms first and then slid this assembly over the sleeves to complete the lower assembly. Make sure you install the pinion assembly in between the lower A-arms at the same time since these three parts all interconnect and need to be installed simultaneously.

The old bushings on the outer (lower) A-arms can be difficult to remove but look at your new ones and note that they are slotted (split). The originals are this way as well so this makes removal easier if you don't have a shop press. I used a hack saw (slid the blade through the old bushing and then mounted the blade in the hack saw frame) to cut a corresponding split in the bushing (just through the bushing and not into the A-arm). Remove the hacksaw blade and use a thin screwdriver to pop (pry) out the old bushing pieces.

The new bushings are a tight fit so a shop press is ideal. If you don't have one then a good solid copper hammer or other soft metal hammer can be used to drive the new bushings into the A-arms. Be careful not to flare the bushings or otherwise damage them using this method (somewhat crude). Even a small block of wood with a traditional hammer will influence them into the A-arms if needed.

You can test fit the pinion assembly with the newly inserted lower bushings to see how much (if any) reaming will need to be done. I was lucky and my pinion assembly was somewhat worn and fit just about perfectly with the new bushings. If you are not so lucky then you will need to use a hand reamer or other reaming method (drill bit) to clear away just enough surface material in the new bushing to allow for a nice snug fit with the pinion shafts.

From here on out it is assembly in the reverse of removal. It is a lot easier to install your new shocks if you jack up the spring so that the lower A-arm is about horizontal.

One last tip (with rubber bushings) the factory recommends fully loading the car (with people, etc.) before tightening the upper A-arm nuts. The theory is that that the rubber bushings have the opportunity to position themselves in their sleeves before being tightened. I used Poly bushings that don't twist like rubber so I did not do this.

-Dave D.

Front Suspension

Subject: TR6 toe-in
Date: Mon, 26 Aug 2002
From: "Lumia, John" <jlumia@ball.com>

Hugh Fader wrote:

- > Just went back out and adjusted the toe-in to 1/16" and took a ride. I found that each turn of a tie rod changes toe-in by 1/16". Don't know if others have observed this, but it seems a good thing to remember.
- >
- > The change is dramatic. Part of what felt like loose steering was poor alignment. It now feels much tighter, just because the wheel wants to return to center. I was about ready to take the car off the road and rebuild the suspension. Still needs it, but it can wait till winter now.
- > Has anybody bought the toe-in gage that Harbor Freight has for about \$12. Did it work for you?

Hugh

I don't know if the Harbor Freight tool will work, although it is priced right. In general I have found that it is difficult to use these devices because something on the car gets in the way. You need clear access from one side of the car to the other at a level that is ideally around the center of the tire.

I made my own alignment device out of an old laser, the kind that is a tube about 14 inches long and 2 inches in diameter. But you can use this idea with the inexpensive laser pointers that are available. The idea is to fabricate something that will pick up the rim at two points, say a two by four of appropriate length. Secure your laser pointer to the 1 1/2" edge of the 2x4, and make sure it doesn't move throughout the alignment process. Also, rig the laser to be on all the time if possible, so you introduce any errors associated with turning it on and off. With your alignment tool resting against the rim, point the 2x4 with laser horizontally at the front wall of your garage and have an assistant mark off the location of the point. Turn the tool around and point it to the back wall or garage door and again make a mark. Now repeat for the other front tire, at which point you have 4 marks. Measure the distance between the front marks (A) and also measure the distance between the rear marks (B). Also measure between the distance between the front and back wall (C). Finally, measure the diameter of the wheel (D). Now using a little trigonometry and a calculator, the total toe-out (X) can be calculated as follows:
$$X = (B - A) * D / C$$

For instance, if A = 60", B = 61", C = 240", D = 15", then the toe-in is +0.0625", or 5/8". A negative number means toe-out. Note that this is total toe, which really is all you should need. You can also use this method to do rear wheel toe-in, but with an additional step that mimics a 4 wheel alignment. Since the measured rear wheel toe-in is a relative measurement, you need to get an absolute reference relative to the frame. I have done this by making a measurement from the frame edge at the front wheel opening to the laser beam as the laser is aimed from the rear wheel in the forward direction. Thus if the toe-in is correct, and the distance from the frame to the laser beam is equal on both sides, then you're done. If not, you will have to make some shim adjustments to the rear brackets on one side or the other.

If you don't have a garage, you can do something similar outside with a set of cardboard boxes or something else suitable. I have used this method on all my cars and have never experienced any adverse tire wear, although I must admit it is tedious, time consuming, and maybe not worth the trouble considering you can usually get a two wheel alignment for \$19.95 and a 4 wheel alignment for \$39.95. Once I did this alignment after a front end rebuild, and brought it into a shop to have the alignment checked anyway. He said it was lucky I got it back together in spec after doing all that rebuild work, LOL!

-John

Front Suspension/Lower Wishbone + Trunion

Subject: Front Suspension rebuild question TR4
Date: Sat, 20 Dec 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I am in the midst of dry fitting all the components of the front suspension and have a question on the
> the bush that I put into the lower front A arm seems just slightly too small to fit over the trunion. The
> rear A arm fits fine on the trunion. Do these bush need to be reamed?

Yes. 5/8" as I recall.

-Randall

Front Suspension/Lower Wishbone + Trunnion

Subject: Early TR4 - Front Suspension Trunnions
Date: Sat, 2 Sep 2006
From: <CarlSereda@aol.com>

– Original Message -----

I am replacing the front suspension trunnions (3 degree version) with Moss ones. They screw on nice until about 1/2 inch from the end of the vertical link then they bind up. By the time that they are at the bottom, they are very hard to turn. The old ones were nice and smooth all the way down. Any suggestions?

Also, once I am past that (hopefully), how do you adjust the steering lock stop as it is offset?

-Ian

Ian,

1) Early TR4s had 0 degree and later TR4s had 3 degree. Maybe you're mixing incorrect pieces and that is causing the binding? Should screw on easy and remember to use grease - gear oil wasn't used until TR4As with the real short trunnions.

2) Maybe your new trunnions are defective.

3) You can adjust the steering 'lock stops' by rotating that piece so that it hits before the tires rub on body parts - then cinch it down.

-Carl

Subject: Early TR4 - Front Suspension Trunnions
Date: Sun, 03 Sep 2006
From: "T. S. White" <tswrace@pacbell.net>

I replaced my trunions this spring with TRF 3 degree trunions. If you screw them down to the suggest point the top ball joint will bind. You need to back them off an extra turn. The top ball joint will still bind at full rebound.

- Tom

Front Suspension/Lower Wishbone + Trunnion

Subject: Stuck bushing on Suspension Arm...Help!!
Date: Tue, 23 May 2006
From: "Randall" <tr3driver@comcast.net>

> I've got a stuck bushing on my front suspension arm. I've been using WD-40

First thing to try would be some real penetrating oil instead of that Water Displacement stuff. Kroil or PB Blaster works much better.

If that doesn't work (and it probably won't), the only solution may be to cut down through the rubber bushings and the bolt with a hacksaw. Lots of work, but if you're careful you can salvage all the other pieces.

Another alternative might be to drill through the center of the bolt. Start with a small drill, then keep increasing the size until one edge breaks through. That should loosen it enough to drive it out.

-Randall

Subject: Stuck bushing on Suspension Arm...Help!!
Date: Wed, 24 May 2006
From: "Dave Connitt" <dconnitt@fuse.net>

Hi Kelvin,

If you have a propane torch, try the melted 'candle method'. It really works. The wax melts and runs down the bolt through the rust. It acts as a lubricant once inside the problem area. Position the assembly so the threaded end of the bolt is pointing "UP". Gravity will be on your side then. Heat the threaded end of the bolt with the torch and melt a regular candle down the threads. It might take 10 minutes or so of heating and melting. Thread a nut on the end of the bolt so you don't screw up the threads as you pound on it. Not so much to save the bolt but just the threaded shaft of the bolt from mushrooming out from beating on it. Continue doing it until the bolt pounds out. Laugh if you want guys but this really works! Good Luck,

-Dave Connitt

Subject: The candle trick works!
Date: Mon, 29 May 2006
From: "J.C. Hassall" <jhassall@blacksburg.net>

Thanks to whoever posted the noted about melting candle wax to loosen impossibly frozen hardware. I had a 1/4 inch bolt on which I was ready to use a block of C4. Figuring I had nothing to lose, I used four heat cycles of MAPP torch on the bolt head, followed by pressing a candle against the threads and against the bolt head. The bolt all but unscrewed itself.

hth someone else. Frankly I thought it was hokie, but the trick worked!

-Jim

Subject: The candle trick works!
Date: Mon, 29 May 2006
From: "Kinderlehrer" <Kinderlehrer@comcast.net>

Would the candle trick work on something that is not threaded, like a ball joint or silent block pin?

-Bob

----- Original Message -----

Subject: The candle trick works!
Sent: Monday, May 29, 2006
From: "Dave Connitt" <dconnitt@fuse.net>

> Jim,
> That was me.. I laughed at it too but it really does work. Throw away your PB Blaster and steal one of the
> wife's candles.
> -Dave Connitt

Subject: The candle trick works!
Date: Tue, 30 May 2006
From: "Dave Connitt" <dconnitt@fuse.net>

Bob,
That's hard to tell since a ball joint is more or less an interference fit. If there is a way for the wax to get down in there it wouldn't hurt that's for sure. Next time I have to do that, I will try if I remember! It is pretty amazing how well it works on threaded joints. I will say that I used the technique to free up a head stud on my TR4A that was keeping me from removing the head. The stud had rusted to its hole in the head so it wasn't really the threads that were the problem. It took a little longer since the head was a giant heat sink but it eventually worked. I just heated the stud, then melted the candle on top of it. You don't have to get the stud "red hot" or anything just hot enough to quickly melt the wax. Probably took about 15-20 minutes of heating the stud and melting wax down the thing. Some old farmer probably thought of this when he didn't have anything else to try and just passed it on.
-Dave Connitt

Front Suspension/Lower Wishbone + Trunnion

Subject: TR3 Grease fittings
Date: Fri, 3 Aug 2007
From: "Mike Denman" <mikedenman@sbcglobal.net>

What thread are the grease fittings on a TR3 front lower suspension "A" arm? Is it a BSP? Tapered or straight?
Or something else? Thanks,

-Mike Denman

Subject: TR3 Grease fittings
Date: Fri, 3 Aug 2007
From: <tr3driver@ca.rr.com>

Mike Denman <mikedenman@sbcglobal.net> wrote:
> What thread are the grease fittings on a TR3 front lower suspension "A" arm?

Mine are 1/8" NPT.
-Randall

Front Suspension/Lower Wishbone + Trunnion

Subject: TR3 lower fulcrum pin removal, revisited
Date: Tue, 8 Jan 2002
From: richard triplett <rtriplett25@yahoo.com>

Mark Gendron <mgendron@speakeasy.org> wrote:
> Was there any response to Richard's request? If so, please re-post or forward.

Mark,

When I first came across this problem, there was a lister who gave me a pretty good description of what needed to be done to remove the lower fulcrum pin. I lost the name and information, though, and haven't heard from him since. Here's what I remember/did though:

The lower fulcrum pin is attached to frame by four welds. The outer two welds are easy to grind down. The inner two welds (welds to shock tower) are quite a bit thicker and harder to grind down. But grind you must. I bought a dremel tool with shaft extension. This seems to be absolutely necessary, unless you want to cut into the shock towers and/or frame, as there's just not enough room for anything else. You just have to be patient. I used eight 1" fiberglass reinforced discs before it was over, and spent over 20 hours on it. Finally, I cut out the rear 'ear' and the pin came right out. It seems you have to remove this part to get the new pin in. I'm fairly happy with the results, as when I insert the new pin, it fits snugly enough that there's very little play to mess up the original geometry of the pin to frame.

I will be taking the frame down to a welder Thursday and will finally be through with this most annoying chapter in what is sure to be a long restoration. I will post back if I find that I screwed anything up.

-Richard

Front Suspension/Lower Wishbone + Trunnion

Subject: TR3A upper ball join lubrication
Date: Thu, 05 Jun 2008
From: <amcewen2@cogeco.ca>

Hi Listers,

I don't think my driver's side upper ball joint is getting proper lubrication. When I apply grease it all escapes out the edges of the flat top plate where the grease fitting is attached, the rubber boot doesn't seem to be full and certainly there's no grease overflow in that section. I've tried it both with the road wheel loaded and unloaded (and full steering lock while unloaded).

The ball joint is only a season old so I'd really rather not pull the spring etc... Any suggestions for resolving this while the parts are in situ? Compressing the spring further would seem counter productive, extending it more somehow?

Loosening the nut? Not sure if I could pry against the upper A arm (to free the spring load) without damaging the rubber boot.

Or am I just going to have to break down and pull the suspension apart? sigh...

Thanks.

Subject: TR3A upper ball join lubrication
Date: Thu, 5 Jun 2008
From: "Randall" <tr3driver@ca.rr.com>

Somehow, replacing a part just so you can extend its life seems counter-intuitive to me. I'd probably just leave it alone, until the (defective) joint wears out, and then replace it with a good one. The grease you've put on top of the ball should work its way into the joint as you drive the car.

But you should be able to change the ball joint without removing the spring. I used to take mine loose all the time, to replace those pesky short-lived rubber bushings in the inner pivots. Just support the suspension a bit (jack and block of wood behind the trunnion) while you undo the nut that holds it to the upper A-arms (to get clearance to remove the nut). Then you can pull the vertical link out enough to work on the nut that holds the ball joint to the vertical link. Not sure if there is room to get in there with the "3 finger" separator; if not, use the 2 hammer approach.

You might try using a BFH to peen the corner of the casting down onto the top cover. Or, you could try cleaning it up really good, and laying a bead of JB Weld around the seam between the top cover and the casting. I doubt that would work, but it might be worth a try.

Yet another approach might be to pull a corner of the boot down and use a grease needle to fill the boot with grease. That should work its way up into the joint as you drive.

-Randall

Subject: TR3A upper ball join lubrication
Date: Thu, 5 Jun 2008
From: "acs25m@swbell.net" <acs25m@swbell.net>

All lister,

I had the same problem with the joints on my 250. The problem was that underneath the zerk fitting was a plastic washer. It wasn't strong enough to stop the grease. Remove the plastic and replace with a stainless fender washer of the proper size and no more problems. Give it a try.

John Maneke

Subject: TR3A upper ball joint lubrication
Date: Thu, 05 Jun 2008
From: <amcewen2@cogeco.ca>

Thanks John,
My direct replies to your email bounce back so I'm replying via list:

Mine isn't leaking around the zerk itself but around the edges of the larger flat section (~1.5" dia) the zerk is screwed into.

-Art.

Front Suspension/Lower Wishbone + Trunion

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: Jim and Andreas Vassiliadis <diggle@clear.net.nz>

My car has 3 degrees negative caster because the top wishbones are on the wrong side. Before fixing this problem I thought that I would have a look at the trunnions to make sure the left and right handed are not transposed. Well they are both marked PT NO 5L02202, with the markings on the front side of the left and rear side of the right. I assume that I have either 2x 0 degree trunnions or 2x left Trunnions. I also assume that the 0 and 3 degree trunnions look different. If they do can someone tell me if there is a photo somewhere of the different types and also can someone tell me if they recognize the part #. I looked the part nos up on Moss but they are not current numbers. There is also a patent no on them if that helps.

-Jim Vassiliadis

Subject: Trunnions later TR4 with 3 degree caster
Date: Thu, 13 Mar 2008
From: "Randall" <tr3driver@ca.rr.com>

> I also assume that the 0 and 3 degree trunnions look different. If they do can someone tell me if there is a
> photo somewhere of the different types

Jim, I don't have a photo, but the 3 different trunnions (0 degree, 3 degree left, 3 degree right) look virtually identical. To see the difference, you must look closely at the angle between the pins that stick out, and the threaded bore for the vertical link. With the 3 degree versions, you can just barely see that the bore tilts a bit relative to the pins. If memory serves, it tilts to the rear (of the car).

-Randall

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: <Dave1massey@cs.com>

<tr3driver@ca.rr.com> writes:

> >I also assume that the 0 and 3 degree trunnions look different. If they do can someone tell me if there is a
> >photo somewhere of the different types

>

> Jim, I don't have a photo, but the 3 different trunnions (0 degree, 3 degree left, 3 degree right) look virtually
> identical. To see the difference, you must look closely at the angle between the pins that stick out, and the
> threaded bore for the vertical link. With the 3 degree versions, you can just barely see that the bore tilts a bit
> relative to the pins. If memory serves, it tilts to the rear (of the car).

In addition, the 3 deg right and 3 deg left have opposite handed threads. That means you can't fit 0 degree trunion to both sides without swapping out vertical links. (I expect the 0 deg trunion will fit one or the other but I'm not sure of that either) It is still a possibility, however. My TR6 had two 3 deg left trunion on it. A PO had fitted up a left hand vertical link and trunion on the right side (probably after an accident) which made for some really bizarre handling. Once I got that sorted out handling improved greatly.

It is possible that you have early trunion and later upper arms which weren't meant to work together. Sometimes mix-n-match doesn't work so well.

-Dave

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: A Daniel Cronin <adcronin@ameritech.net>

It's my recollection that TR2-3B and probably early 4 vertical links also had a finer thread and more of it than the later 3 degree links on 4A and 6's. As far as the left and right hand threads goes, I have a pair off the car and on the bench and if it will help, can let the list know which thread goes on what side!

-A. Daniel Cronin

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: "Randall" <tr3driver@ca.rr.com>

> It's my recollection that TR2-3B and probably early 4 vertical links also had a finer thread and more of it than
> the later 3 degree links on 4A and 6's.

Not sure about the thread pitch, but the length was definitely longer on TR2 through the end of TR4 than on 4A through 6.

> As far as the left and right hand threads goes, I have a pair off the car and on the bench and if it will help, can
> let the list know which thread goes on what side!

The threads remained the same on both sides through the end of TR4. The trunnions were "handed" due to the angle between pin & vertical link; but the links were the same from side to side (hence the threads were too).

-Randall

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: "Randall" <tr3driver@ca.rr.com>

> In addition, the 3 deg right and 3 deg left have opposite handed threads.

I disagree. The late TR4 had the same vertical link on both sides, so the threads could not have been opposite handed. That changed with the TR4A.

-Randall

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: <Dave1massey@cs.com>

<adcronin@ameritech.net> writes:

> It's my recollection that TR2-3B and probably early 4 vertical links also had a finer thread and more of it than
> the later 3 degree links on 4A and 6's. As far as the left and right hand threads goes, I have a pair off the car
> and on the bench and if it will help, can let the list know which thread goes on what side!

My guess is they are right hand thread. But if the pitch is different, then they are not interchangeable regardless of the direction.

-Dave

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: <Dave1massey@cs.com>

<tr3driver@ca.rr.com> writes:

> > In addition, the 3 deg right and 3 deg left have opposite handed threads.

>

> I disagree. The late TR4 had the same vertical link on both sides, so the threads could not have been opposite

> handed. That changed with the TR4A.

So are you saying the TR4 had different links than either the TR3 or the Tr4A-6?

-Dave

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: "Randall" <tr3driver@ca.rr.com>

> So are you saying the TR4 had different links than either the TR3 or the Tr4A-6?

No, the TR4 vertical links were the same as TR2-3. When the caster was added, the link itself did not change, only the location of its upper end relative to the lower end. The A-arms, ball joint, trunnions, steering levers, etc. all changed to tilt the link, but the link itself did not change until the redesign with the TR4A.

-Randall

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: A Daniel Cronin <adcronin@ameritech.net>

<tr3driver@ca.rr.com> writes:

>> So are you saying the TR4 had different links than either the TR3 or the Tr4A-6?

>

> No, the TR4 vertical links were the same as TR2-3. When the caster was added, the link itself did not change, only the location of its upper end relative to the lower end. The A-arms, ball joint, trunnions, steering levers, etc. all changed to tilt the link, but the link itself did not change until the redesign with the TR4A.

> -Randall

Regarding my earlier post on having a pair of links on the bench and could advise which side took left hand and which took right, that comment was in reference to 4A through 6 Vertical links, and in my cars the pitch on the earlier cars was finer and longer in length than on the 4A - 6 cars

-A. Daniel Cronin

Subject: Trunnions later TR4 with 3 degree caster
Date: Sat, 15 Mar 2008
From: Jim and Andreas Vassiliadis <diggle@clear.net.nz>

My first thought was that the whole lot was reversed 28 or so years ago (I've owned him for 23years). It sounds like I might have to inspect them off the car for that angle between The vertical and the pins. Thank you for the info.

-Jim

Subject: Trunnions later TR4 with 3 degree caster
Date: Sat, 15 Mar 2008
From: Jim and Andreas Vassiliadis <diggle@clear.net.nz>

Actually, I was hoping that they were marked L or R or even in French D or G. I had a look at the washers and they both seem flat normal ones. It seems that the only real way to easily tell is to take both off and to compare the slope of each of the trunnions surface.

-Jim

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: <Dave1massey@cs.com>

<tr3driver@ca.rr.com> writes:

- > No, the TR4 vertical links were the same as TR2-3. When the caster was added, the link itself did not change,
- > only the location of its upper end relative to the lower end. The A-arms, ball joint, trunnions, steering levers,
- > etc. all changed to tilt the link, but the link itself did not change until the redesign with the TR4A.

So it doesn't hurt the trunnions to crank them a couple degrees out of shape, then. My TR6 wasn't happy at all with the trunnion cranked 6 deg out.

-Dave

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: "Randall" <tr3driver@ca.rr.com>

- > So it doesn't hurt the trunnions to crank them a couple degrees out of shape, then.

No, I didn't say that. The late TR4 took different trunnions than the TR2-early TR4; and being a "couple degrees out of shape" is the only difference between the three different trunnions (0 degree both sides, 3 degree right and 3 degree left). It is apparently possible to assemble them that way, but unless things are badly worn, the result will be binding.

-Randall

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: <DaveImassey@cs.com>

<tr3driver@ca.rr.com> writes:

- >> So it doesn't hurt the trunnions to crank them a couple degrees out of shape, then.
- >
- > No, I didn't say that. The late TR4 took different trunnions than the TR2-early TR4; and being a "couple
- > degrees out of shape" is the only difference between the three different trunnions (0 degree both sides, 3
- > degrees right and 3 degrees left). It is apparently possible to assemble them that way, but unless things are
- > badly worn, the result will be binding.

Now you're confusing me. You said they didn't change trunnions (or vertical links) when they added caster to the TR4. Now you say there are 0 and 3R and 3L trunnions. Are these 3 deg trunnions different than what is used on the TR4A-TR6?

-Dave

Subject: Trunnions later TR4 with 3 degree caster
Date: Fri, 14 Mar 2008
From: "Randall" <tr3driver@ca.rr.com>

- > Now you're confusing me. You said they didn't change trunnions (or vertical links) when they added caster to
- > the TR4.

Well, I certainly didn't mean to say that ... what I tried to say is that the vertical link did not change. The trunnions DID change, and became different from side to side.

- > Are these 3 deg trunnions different than what is used on the TR4A-TR6?

Yes, they are unique (AFAIK) to late TR4. As I said, visually they look nearly identical to the earlier trunnions, the only difference is the 3 degree angle between the pin for the A-arms and the threaded bore for the vertical link. I believe they were literally the same casting, just machined slightly differently.

The 4A-6 trunnions look very different (starting with not having a pin at all but a hole for a bolt).
-Randall

Front Suspension/Lower Wishbone + Trunion

Subject: Use of Polyurethane Bushings
Date: Wed, 30 May 2007
From: Greg Perry <rgperry@earthlink.net>

Hello List,

Has anybody considered the effect of using polyurethane bushings on the suspension (frame) mounts or suspension arms? Are there any occurrences of suspension failure due to using polyurethane bushings? I have read were modern cars have stamped control arms that may twist when using polyurethane bushings. I have polyurethane bushings on my TR6.

Inquiring minds want to know! Any thoughts?
-Greg Perry

Subject: Use of Polyurethane Bushings
Date: Wed, 30 May 2007
From: Hugh Barber <tr6nut@verizon.net>

Greg Perry wrote:
> Has anybody considered the effect of using polyurethane bushings on the suspension (frame) mounts or
> suspension arms?
> -Greg,

IMHO, most of our failures are due to age and rust. I haven't heard of any failures directly attributed to polyurethane bushings.
-Hugh Barber

Subject: Use of Polyurethane Bushings
Date: Wed, 30 May 2007
From: <MMoore8425@aol.com>

Gregg, once upon convinced I myself that urethane upper control arm bushings in a TR3 COULD make it harder to steer and I didn't use them for that reason.

If the upright to which the spindle is attached is not very closely aligned with the turning axes, colinerar within a hundred though or so, when you steer the car, you force lateral motion in the upper control arm. The amount of force it requires to turn then is directly proportional to how stiff the bushings are. I was fortunate at the time in having access to a large number of uprights/ spindles. We measured them all and most were all pretty sorry in that there was a lot of eccentricity.(We measured by chucking one turning axis in a lathe and watching the other as we rotated the part). My theory was that those cars would be harder to steer, especially with hard bushings.

-Mike Moore

Subject: Use of Polyurethane Bushings
Date: Thu, 31 May 2007
From: "Nolan" <foxtrapper@ispwest.com>

An A-arm mounted with polyurethane bushings slides on the bushings. This creates zero torque about the pivot point.

An A-arm mounted with rubber bushings flexes the rubber bushing to move, because the rubber adheres to the a-arm and the frame mount. This creates torque about the pivot point. The more the motion, the more the torque.

As such, a stock rubber bushing is more likely to bend an A-arm than a polyurethane bushing is.

Now with suspension bind, things change a bit. Take a Spitfire with its swing axle rear and the radius rods. It's a bind design, and for that suspension to move, the radius rod uses rubber bushings that allow for stretch as the suspension moves up and down. If you replace the rubber bushing with a solid bushing, the spring, body tub, and vertical upright has to do the flexing instead, and cracking can result. Urethane is far from solid though, so it still works, but more stresses are imparted onto the metal bits and pieces.

Front Suspension\Lower Wishbone + Trunnion

Subject: Squeaky front suspension TR3
Date: Sun, 10 Jul 2011
From: "Randall" <TR3driver@ca.rr.com>

> I made the comment that I was fed up with my squeaky upper A arm rubber bushings.

FWIW, I was reading through some old TSOA newsletters; and one of them has the comment that "**squeaks and groans**" from the front suspension are usually from the **_lower_ inner pivots**.

"The Standard-Triumph Service Department now recommends application of a solution of alcohol and glycerin to the bushings."

-- September 1960 issue, Triumph TSOA Newsletter

Of course this is referring to rubber (back then), because there wasn't anything else.

- Randall

Front Suspension/Spring + Shock

Subject: TR4 suspension
Date: Thu, 25 Jan 2007
From: "Mark Vaden" <markvaden@gmail.com>

Hi List,

I want to prepare my 62 TR4 for autocross, and I am focusing on the suspension right now, and I have some questions.

- 1) I noticed that Moss does not offer front competition springs. Is this because the front springs are stiff enough? I read somewhere that the front springs are rated to 300ft lbs per inch which is stiff by modern standards. Does anyone else offer competition springs for a 62 TR4?
- 2) Which front sway bar should I use? I see that the roadster factory has an addco 3/4 and 5/8. Also Moss lists one in the beginning of their catalog, but when I try and find it on the web page, it is not there.
- 3) Should I use a rear sway bar?
- 4) What are people's opinions about the competition leaf spring?
- 5) I read somewhere that you can reverse the upper A arm, thereby lowering the car. Is this something worth doing?
- 6) Are there any other upgrades that I should make? I already have replaced the bushings with poly bushings.

One more suspension question - Has anyone tried the spax adjustable shocks. I have used the Koni's in the past, but it seems like a pretty big advantage to be able to adjust the shocks on the car.

Thanks again,
-Mark

Subject: oops forgot to ask about shocks
Date: Thu, 25 Jan 2007
From: "Randall" <tr3driver@ca.rr.com>

> One more suspension question - Has anyone tried the spax adjustable shocks. I have used the Koni's in the
> past, but it seems like a pretty big advantage to be able to adjust the shocks on the car.

I have them in several places ... honestly I don't think the adjustment is all that helpful, unless you're trying to squeeze the last 0.1 second out of your lap times. There are a lot of other modifications that are more helpful.
-Randall

Subject: TR4 suspension
Date: Thu, 25 Jan 2007
From: "Randall" <tr3driver@ca.rr.com>

> Does anyone else offer competition springs for a 62 TR4?

I'm surprised Moss doesn't have them. TRF has several different springs available, both stiffer and lowered. The ultimate source is Revington TR in the UK.

You might also talk to Ken Gillanders at BFE, <<http://www.britishframeandengine.com>>
Richard at Goodparts, <<http://www.goodparts.com>>
Or Ted at TSi : <<http://www.tsimportedautomotive.com>>

> 2) Which front sway bar should I use? I see that the roadster factory has an ADDCO 3/4 and 5/8.

I think if you'll read carefully, the 5/8" bar is for the rear. Not sure if a TR4 would respond the same (since it's track is wider), but the 3/4" ADDCO bar wasn't quite stiff enough for my TR3A once I got it setup with low, wide sticky tires, hard bushings and so on. I was planning to have Goodparts bend me a custom 1" bar before it got wrecked.

> 3) Should I use a rear sway bar?

Didn't we just go through this? For autocross, I'd guess you'd be better off without one ... but really, you have to be the judge of that. Depends on a lot of factors, including the driver, the course, and what diff you use.

> 4) What are people's opinions about the competition leaf spring?

I don't have one.

> 5) I read somewhere that you can reverse the upper a arm, thereby lowering the car. Is this something worth > doing?

I think your "somewhere" was mistaken. The upper A-arms have almost nothing to do with ride height. OTOH they have a lot to do with suspension geometry, and there are some substantial gains to be had there ... just not by turning the arms upside down. Keep in mind that, as we were just discussing, early TR4s are different than later ones; the later ones have the steering castor built into the upper arms (and trunnion) so reversing the arms will definitely not work. Early cars have zero caster, so I think flipping the arms won't do much of anything.

> 6) Are there any other upgrades that I should make? I already have replaced the bushings with poly bushings.

For a purpose-built autox car, LOTS. For starters, poly is too soft, you want Nylatron or Delrin on the race track.

I've forgotten where this started, but Ken likes to repeat it so maybe it's his: "Speed costs money. How fast do you want to go?"

-Randall

Front Suspension/Spring + Shock

Subject: TR4A Ride Height
Date: Thu, 15 Aug 2002
From: Ted Schumacher <tedsimx@q1.net>

Darrell, since this seems to be a "high interest" topic we will comment. Background: We supply a measurable amount of the total "uprated" TR3-6 coil springs sold in the country and have for many years. There are 2 separate issues. One is the ride height and the other is spring rate. Ride height is always based on the original factory dimension with one's tires and sitting in a level, unladen position. A TR6 sits at 28 5/8" measured from the ground to the highest point of the rear wheel arch. The front dimension is about 1" less. This would hold true for the 4A and 250. Visually, ride height can fool the eye. Example- you replace the original tires with a low profile set - say 2" shorter than the original tire. You now have an extra inch of space above the top of the tire and the wheel arch (2" taller equates to 1" above the tire). Your car is now sitting 1" closer to the ground but you have also increased the distance from the top of the tire to the wheel arch. Spring rate is the amount of weight needed to deflect the spring a given amount - normally 1". The springs we produce are 25% stiffer in the rear and 20% stiffer in the front. This equates to 475 for the rear springs and 392 for the front. There are some issues that come to play on rate. Normal spring industry standards are $\pm 5\%$ so a 500 pound spring could be 475 on one side of the car and 525 on the other - a 50# spread. Our springs are held to 2%. This is the tightest in the spring industry. The other thing that can happen is springs can "set" or sag. This normally occurs when a live coil - one that is not touching another coil in the normal ride position - contacts another coil. This is called coil bind. When this happens, most springs will then take a set and not return to their original free length. As part of the mfg process, our springs are set solid - all coils are armed against each other. If the spring returns to the original free length after this step, they are guaranteed never to set or sag. We have springs in use that are over 25 years old and still retain all the original characteristics. Sorry for the commercial but you needed to know these points to better understand the dynamics of the spring/ride height/rate. We have seen springs made in the UK that actually sagged within a few months. What you need to do is measure your car. See what you actually have for ride height,. If it is near the 28 5/8", you are in the ballpark. If not, rear ride height is adjusted by the notched trailing arm brackets. It can be raised or lowered. When you do this, you also alter the front ride height. Grab a ruler and start in.

- Ted Schumacher

Front Suspension\Spring + Shock

Subject: TR4A Front Suspension
Date: Mon, 11 Jun 2007
From: Michael Godley <mgodley@tiac.net>

Hello listers

I have a question about the front suspension on my 65 TR4A. Noticed during dis-assembly that there were no distance pieces on top of the front springs.

My springs are 9.75" in length and Moss has a specific part number part number 661-670 on their TR4A suspension page to be used with the "short springs" that are approx 9.5 ". Also my TR4-TR4A workshop manual shows a distance piece.

So is this a TR4 part, or should I have one on the 4A? FYI, I have had the car since 1974 and did some front end work 30 years ago don't recall them being in place or having extra parts left over at that time:)

Finally when using a distance piece is a third spring packing needed on top of the distance piece? That's how it is pictured in the Moss catalog...however not in my workshop manual.

Thanks in advance for your counsel

-Mike Godley

Subject: TR4A Front Suspension
Date: Mon, 11 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> Also my TR4-TR4A workshop manual shows a distance piece.
> So is this a TR4 part, or should I have one on the 4A?

There are different springs around, some used with and some used without the distance piece. If the ride height was OK before, then you must have springs designed to be used without the distance piece.

> Finally when using a distance piece is a third spring packing needed on top of the distance piece? That's how
> it is pictured in the Moss catalog...however not in my workshop manual.

Parts catalog also shows 3 packings. But it's not unusual for people to take one or more of them out, to lower the ride height a bit. Might cause some squeaks, though.

-Randall

Front Suspension/Upper Wishbone + Ball Joint

Subject: A-Arm question **Cross ref. To rear solid axles**
Date: Sat, 3 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Does anybody have a front A-arm upper and or lower out of their car that they could measure the width of the
> socket where the bushings fit with a set of micrometers or calipers? I am looking for TR6 but I believe the
> TR4 is the same (maybe).

I checked two TR4 arms, one was 1.135" the other 1.125". Plus or minus a couple.
-Randall

Subject: A-Arm question
Date: Sat, 3 Jun 2006
From: <Dave1massey@cs.com>

<trmarty@glwb.net> writes:

> Does anybody have a front A-arm upper and/or lower out of their car that they could measure the width of the
> socket where the bushings fit with a set of micrometers or calipers? I am looking for TR6 but I believe the
> TR4 is the same (maybe). I want to double check a calculation and don't really want to take the car apart if I
> don't have to.

The unit I pulled from my junk b... er spares supply measures 1.04 in or 26.4mm.
-Dave

Subject: A-arm question
Date: Mon, 5 Jun 2006
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

<Dave1massey@cs.com> wrote:

> <tr4a2712@yahoo.com> writes:

>> Hi List!

>> I don't believe that TR4 & TR4A Upper & lower A-arms are the same. I say this because I own a TR4/A &
>> bought a 'parts car' TR4 thinking that I could use a lot of the TR4 parts [if needed] to replace any possible
>> broken TR4/A parts. Well, when I went to disassemble both left side front suspensions & see which parts
>> could be interchanged with each other & I recall that none of the parts are interchangeable.
>> I would like the list members to state if they found this to be true or was it a fluke for me?

>> Therefore, if the arms are different, then which 'TR4' or TR4/A front suspension what actually measured?
>> I somehow think that the TR4 is close/same as the TR3 series. Therefore; TR4/A is close/same to the
>> TR250 -> TR6's. Is the TR6 front suspension the same as the TR7? I don't know my TRIUMPH's that well,
>> sorry :>(.
>> -Cosmo Kramer

> This is immediately evident when looking at the ball joints. The mounting is completely different. The
> diameter of the bushing probably changed with the change in ball joint. I don't know when the change
> occurred but I am willing to wager it changed at the TR4 - TR4A changeover.
> -Dave Massey

Thank You Dave for confirming this info. The reason that I asked this question is that you & Randall both mentioned that you measured a TR4 arm, But you didn't state if it was a TR4/A arm or not. Which I & you agree are different. Therefore my last question is:
When doing the measurement on the A-arms, was that really a TR4 A-arm or a TR4A A-arm?

The org. question was:

What's the measurement of a TR6 A-arm, & the measurements were taken NOT from a TR6 but a TR4 or TR4A A-arm.

I hope that I haven't confused the issue, but I'm NOT quite clear on the replies that were given.

-Cosmo Kramer

//////////

Hi List!

This is what I have received so far in regarding my concern about the org. TR6 A-arm question. Being on the TR Digest list, people may have replied to the org TR List, but I haven't received the most recent Digest, yet. So there may be others who have replied, but I don't know what their replies were, yet.

-Cosmo Kramer

Subject: A-arm question
Date: Mon, 05 Jun 2006
From: "Randy&Val DeRuiter" <deruiterville@hotmail.com>

Small clarification on the TR4 upper wishbone arms. I believe later model TR4s used the same upper arms as the 4/A -> 6 models. Changeover was around CT6390 per the Triumph parts catalog.

Lower wishbone assemblies changed out between the 4 and 4A models when they went to an adjustable camber arrangement. Regards,

-Randy

Subject: A-Arm question
Date: Tue, 6 Jun 2006
From: <Dave1massey@cs.com>

<tr4a2712@yahoo.com> writes:

> think 'size' as thickness,

Speaking of thickness, the later arms were made of thicker material because they are three sided. The older ones are four sided which makes for a stronger structure. So the factory compensated for the weaker structure by using a thicker steel. As you can see the new ones are stamped and the only welding is at the bushing tube. The old ones are welded the whole length. Cheers,

-Dave

Subject: A-arm question
Date: Wed, 7 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Ok, that may be so, but at the time you wrote the info. You did NOT state how late is 'Late TR4'.

That's true, I didn't. But I know Marty, and since I knew from his question that he was asking about the upper A-arms that are the same as the TR6, I assumed he would know I was talking about the later TR4 arms that are the same. It didn't occur to me that others would be saving so esoteric a piece of trivia, and so I wasn't very specific with my answer. Sorry about that.

> Also, a flag ALWAYS pops up in my mind when a person states "TR4", because I really wonder if that TR4 > info. [that they are talking about] will still pertain to the TR4A.

It's certainly good to think about that, since as I'm sure you are aware, there are a lot of differences between the two models.

To my way of thinking, the TR4A is distinct from the TR4, so I almost always specify which one I'm talking about. The situation is a bit different with the TR3 vs TR3A, since the factory never used the TR3A designation. Still, at least 90% of the time, I specify TR3A when talking about a TR3A. And just so you'll know, if I write something like TR3/A, that means I'm talking about both TR3 and TR3A.

> I understand that you would not have the com. # on parts taken off a car. [When I took the TR4 apart for parts, I also didn't record the com #.] Also, you mentioned the rear suspension, & this is the 1st time this end of the suspension came up in any conversations that I've had with others on this thread. At least I have not > comprehend this in any of the other threads that I've read.

I mentioned that only because the rear suspension change came even later in TR4 production than the upper A-arm change.

> The reason I stated this is because another list member pointed out to me that the org. question was about TR6 > A-arm BUSHING HOLE SIZE OPENING. Which I miss read & started all my confusion in understanding > the answers that were given.

I don't believe it was about the size of the opening, but rather the length of the socket that the bushing goes inside. However, since it wasn't absolutely clear, I've dropped a note to Marty (the original poster) asking for a clarification.

> You stated back some 5 yr. ago in one thread that you usually check your references before you send it out to > the list.

And that is still true today. I don't remember all of this stuff, at least not all the time, so much of my "wisdom" is just knowing where to look and having it close to hand. My point was that, in this case, the only reference I have is the parts in my garage and what I recall of where they came from. Cheers

-Randall

Subject: A-arm question
Date: Wed, 7 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Ok, this is opening up another topic, in the fact that I'm not clear on any change in the TR4's rear end as a > TR4. I am aware that the TR4A's rear end is wider than the TR3's or 4's. Do you happen to know how to > recognize the differences? I know that the TR4 had 2 different Rear axle mounting flanges [I believe].

The TR4 rear axle was wider than the TR3, and AFAIK this remained the same for the entire run. The extra length shows between the flange (where the brake backing plate & wheel bearing attaches) and the spring mounting pads, the difference is quite noticeable once you've seen both types. TR2/3 axles have only about 2" here, TR4 axles have almost 4".

The TR4A "solid" axle was slightly different, it has buffer pads opposite the spring mounting pads and it lacked the mounting bracket for the handbrake cable. But AFAIK, it was exactly the same width as the TR4 axle. The differential itself, and the half shafts (bearings, etc.) interchange with TR4. Of course, the IRS setup was totally different.

>> I don't believe it was about the size of the opening, but rather the length of the socket that the bushing goes >> inside. However, since it wasn't absolutely clear, I've dropped a note to Marty (the original poster) asking >> for a clarification.

I've heard back from Marty, he was indeed asking about the length rather than the hole diameter.

> That's what I'm working towards, but it takes time for me to get all my info. Organized for me to be able to do

> so. As you may recall, I've only been into this new house that I build some 5 yr. ago. The trouble is that I still
> haven't finished the house's interior all the way, & many of my books are still in boxes & keep roaming
> around.

The trick, IMO, is to get as much of it into electronic form as possible, and then know how to use it. All of the information about rear axles, for instance, can be found in the PDF version of the Moss TR2-4A catalog. It even has diagrams showing the visual differences. They haven't published in PDF form for a long time, so of course the prices are out of date, but the other information is (mostly) very good. And you can compare Moss part numbers to see if certain items (like rear axle half shafts) are the same between TR4 and TR4A.

-Randall

Subject: A-arm question
Date: Thu, 8 Jun 2006
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Randall <tr3driver@comcast.net> wrote:

>> Ok, this is opening up another topic, in the fact that I'm not clear on any change in the TR4's rear end as a
>> TR4. I am aware that the TR4A's rear end is wider than the TR3's or 4's. Do you happen to know how to
>> recognize the difference? I know that the TR4 had 2 different Rear axle mounting flanges [I believe].
>
> The TR4 rear axle was wider than the TR3, and AFAIK this remained the same for the entire run.

Now, somehow in the past I understood, that the TR4A solid R. axle went wider only at the change over from TR4 to TR4A. I was not aware of any changes to becoming wider in the TR4 run. I'll have to look into this future. When I go to Canada to visit my one friend that has several TR3's, TR4's, TR4A's, TR250's, & only 2 TR6's that I can remember. He doesn't really care for the 'Modern' cars vs the older ones. :>O

> The extra length shows between the flange (where the brake backing plate & wheel bearing attaches) and the
> spring mounting pads, the difference is quite noticeable once you've seen both types. TR2/3 axles have only
> about 2" here, TR4 axles have almost 4".

Thanks for this info. I'll have to store this to actual measure all his Rear Solid Axles. then record the com. # with it. Then may be a pattern will form?

> The TR4A "solid" axle was slightly different, it has buffer pads opposite the spring mounting pads and it
> lacked the mounting bracket for the handbrake cable. But AFAIK, it was exactly the same width as the TR4
> axle. The differential itself, and the half shafts (bearings, etc.) interchange with TR4. Of course, the IRS
> setup was totally different.

I'm aware of the differences in mounting pads for the springs, But I was under the impression that the TR4A was wider than the TR4 axle's, [1/2 shafts as you called them]. The actual hub attached to the 'axle' that has the spline teeth on the end, which slips into the sides of the Differential. Yes, I agree that the IRS is a different set-up, but I was under the impression that the insides of the differential of the TR4, TR4A or as you like to type it 'TR4/A' solid axle are the same/interchangeable with the TR4/A, TR250, & TR6 [up until '74] IRS insides. Do you believe this to be a true statement?

> I've heard back from Marty, he was indeed asking about the length rather than the hole diameter.

After I sent you the last E-mail I then went to check the org. post & you are right, again. [I don't have the ability to stop typing an E-mail & switch to other parts of my E-mail 'inbox', sent box, etc. without deleting or sending what I have composed.] Boy I must have been really tired when I read that 1st post, because I was way off on comprehending the question.

> The trick, IMO, is to get as much of it into electronic form as possible, and then know how to use it. All of

- > the information about rear axles, for instance, can be found in the PDF version of the Moss TR2-4A catalog.
- > It even has diagrams showing the visual differences. They haven't published in PDF form for a long time, so
- > of course the prices are out of date, but the other information is (mostly) very good. And you can compare
- > Moss part numbers to see if certain items (like rear axle half shafts) are the same between TR4 and TR4A.
- > -Randall

Could you send me the address of this PDF? So all I have to do is click on the address & it will pop up the form to view the pdf, OR does the PDF form have to be downloaded into my hard drive computer?

BTW- This was my 1st intention of collecting the TRIUMPH List's Info. on anything predating to the TR4A & then the TR4's. The big problem for me is when people mention TR6 suspension, Tranny or other parts that may be used on the TR4A's,. And of course to the other extreme of TR3's Info. working on TR4/A's. The 2nd intention was to store this info. & then print it out into a manual form to possibly use when on the road. I just LOVE it when people reply to a thread by saying:

Do this step 1st. Then do this, this, & this, to solve your problem. THAT's the STUF that's useful out on the road when doing repairs or problem solving ['Trouble Shooting' I call it].

-Cosmo Kramer

Subject: A-arm question
Date: Thu, 8 Jun 2006
From: "Randall" <tr3driver@comcast.net>

- > Now, somehow in the past I understood, that the TR4A solid R. axle went wider only at the change over from
- > TR4 to TR4A. I was not aware of any changes to ...

I've attached a copy of the Moss TR2-4A catalog in PDF form. Check on page 39, for #36 in the illustration. You'll see there that there are only 3 versions listed, one for TR2-early TR3, another for later TR3-3B, and another for TR4-4A.

- > Yes, I agree that the IRS is a different set-up, ... Do you believe this to be a true statement?

The insides are very similar, almost all of the parts will interchange. But they are not quite identical. The solid axle cars have a block in the very center, that transfers thrust from the outside rear wheel to the inside wheel bearing in a turn, which is not found in the IRS units (I believe, haven't actually torn one down to look). The Moss P/N is 674-150.

- > Could you send me the address of this PDF? So all I have to do is click on the address & it will pop up
- > the form to view the pdf, OR does the PDF form have to be downloaded into my hard drive computer?

It's much better, IMO, to have it stored on your hard drive. Otherwise it takes a long time for it to come up, especially if your Internet access is a little slow today. Moss no longer has them up, and I don't have a link handy to the private web site where they can be found. I think it might have been Francois Wildi, but maybe it was Dan Buettner.

- > I just LOVE it when people reply to a thread by saying: Do this step 1st. Then do this, this, & this, to solve ...

"Troubleshooting" is a very good word. But be careful, sometimes those step-by-step instructions assume something that may not be true in your case. If, for example, someone is complaining that their ignition warning light stays on even when the key is off, I won't bother telling them to test for failures that would only cause it to stay on when the key is on.

-Randall

Front Suspension/Upper Wishbone + Ball Joint

Subject: Suspension and steering work to be done
Date: Sat, 19 Aug 2006
From: "Randall" <tr3driver@comcast.net>

> For the hard bumps, I understand that the next likely candidate is the springs

The question here is whether you are bottoming out the rear suspension or not. One way to tell is to take some child's modeling clay (aka PlayDoh) and put it on the suspension stops, then go for a ride. If the clay gets mashed, then you've been bottoming out the suspension. If it is bottoming out, then stronger springs will help. If not, they will make it worse. BTW, even full shocks can be worn out.

> although my brother suggested that some tires on their own can give a very hard ride.

Very true, but they have more effect on small bumps than on big ones. If it seems like you can feel every little pebble in the road, that's likely tires.

> If I only need upper A-Arm bushings, can I replace the uppers with polyurethane if the rest are rubber?

Sure, although I believe the stock lower bushings are nylon, not rubber. Only the early TR2 had rubber lowers.

> Also, am I being foolish not to replace all of the front end bushings at this time?

IMO, no. The upper bushings are a lot easier to get to than the lower ones, and at least in my experience, the rubber "goes away" much faster than the nylon does (which is why I converted to Nylatron).

-Randall

Front Suspension/Upper Wishbone + Ball Joint

Subject: Tightening ball joints
Date: Tue, 5 Jun 2007
From: "McEwen, Art (MOH)" <Art.McEwen@moh.gov.on.ca>

Dumb question of the week:

I've put new ball joints on either end of my tie rods and one of the inner one just won't tighten, the lock nut will spin the ball inside the joint before it will fully tighten down on the steering arm. There's at least 1/16th of play between the nut and the steering arm that is causing too much play. How do I get the ball to be rigid while tightening the nut without affecting its movement afterwards?

-Art.

Subject: Tightening ball joints
Date: Tue, 5 Jun 2007
From: "Michael Marr" <mmarr@notwires.com>

Art:

What you need to do is to seat the ball joint in its taper just enough to provide enough torque to hold the ball joint while turning the nyloc nut. I have done this in the past by lightly tapping a wedge shaped object (a large screwdriver blade will do) into the space between the bottom of the nut and the top of the tie rod. Sometimes I have been lucky enough to seat the tie rod end using this approach and the nut can simply be tightened. On other occasions, I have had to leave the wedge in place and tightened the nut against the wedge, withdrawing it slightly with every movement of the nut, until the tie rod end seats.

-Michael Marr

Subject: Tightening ball joints
Date: Tue, 5 Jun 2007
From: <KPe9368405@aol.com>

While I cringed when I saw your message title, the only suggestion I have is don't use Ben-Gay - and don't ask me how I know.

Subject: Tightening ball joints
Date: Tue, 5 Jun 2007
From: <rx74evr@mchsi.com>

Michael,

Take a large c-clamp and tighten it around the upper ball joint (take the grease zirc out first so you don't damage it) and a point underneath the tapered hole where the stud goes in and gently apply pressure to keep the ball stud from turning in the joint while you tighten the nut. We do it every day here at the shop. Good luck!

-Paul Seedoff

Subject: Tightening ball joints
Date: Tue, 5 Jun 2007
From: <rx74evr@mchsi.com>

OOPS, misread the post, sorry Michael, my bad, disregard my last email advice....I thought you were asking about the upper joints...My Bad!

-Paul Seedoff

Subject: Tightening ball joints
Date: Tue, 5 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> I have done this in the past by lightly tapping a wedge shaped object (a large screwdriver blade will do) into
> the space between the bottom of the nut and the top of the tie rod.

Another method is to supply some force on top of the tie rod end, either by a big lever against some other part of the car, or big pliers gripping both the tie rod end & the center link.

Yet another technique (if you can get the nut off now) is to first seat the taper using a plain nut, then remove the plain nut and replace it with the Nyloc nut.

But now that I have an impact wrench, I find that just pulling on the tie rod with my free hand will provide enough friction to tighten the nut. Of course I only use the impact wrench enough to seat the taper, and do the final tightening by hand.

-Randall

Subject: Tightening ball joints
Date: Tue, 5 Jun 2007
From: "Michael Marr" <mmarr@notwires.com>

Thanks for reminding me, Randall. I have used the plain nut followed by the nyloc nut approach, too. That works fine too. I think I had to resort to the screw driver approach on a couple of occasions because I wasn't able to get the taper to grip even with the little amount of torque required to turn a plain nut.

-Mike

Front Suspension/Upper Wishbone + Ball Joint

Subject: TR3A upper ball joint lubrication
Date: Thu, 05 Jun 2008
From: <amcewen2@cogeco.ca>

Hi Listers,

I don't think my driver's side upper ball joint is getting proper lubrication. When I apply grease it all escapes out the edges of the flat top plate where the grease fitting is attached, the rubber boot doesn't seem to be full and certainly there's no grease overflow in that section. I've tried it both with the road wheel loaded and unloaded (and full steering lock while unloaded).

The ball joint is only a season old so I'd really rather not pull the spring etc... Any suggestions for resolving this while the parts are in situ? Compressing the spring further would seem counter productive, extending it more somehow?

Loosening the nut? Not sure if I could pry against the upper A arm (to free the spring load) without damaging the rubber boot.

Or am I just going to have to break down and pull the suspension apart? sigh...

Thanks.

Subject: TR3A upper ball joint lubrication
Date: Thu, 5 Jun 2008
From: "Randall" <tr3driver@ca.rr.com>

Somehow, replacing a part just so you can extend its life seems counter-intuitive to me. I'd probably just leave it alone, until the (defective) joint wears out, and then replace it with a good one. The grease you've put on top of the ball should work its way into the joint as you drive the car.

But you should be able to change the ball joint without removing the spring. I used to take mine loose all the time, to replace those pesky short-lived rubber bushings in the inner pivots. Just support the suspension a bit (jack and block of wood behind the trunnion) while you undo the nut that holds it to the upper A-arms (to get clearance to remove the nut). Then you can pull the vertical link out enough to work on the nut that holds the ball joint to the vertical link. Not sure if there is room to get in there with the "3 finger" separator; if not, use the 2 hammer approach.

You might try using a BFH topeen the corner of the casting down onto the top cover. Or, you could try cleaning it up really good, and laying a bead of JB Weld around the seam between the top cover and the casting. I doubt that would work, but it might be worth a try.

Yet another approach might be to pull a corner of the boot down and use a grease needle to fill the boot with grease. That should work its way up into the joint as you drive.

-Randall

Subject: TR3A upper ball joint lubrication
Date: Thu, 5 Jun 2008
From: <acs25m@swbell.net>

All lister,

I had the same problem with the joints on my 250. The problem was that underneath the zerk fitting was a plastic washer. It wasn't strong enough to stop the grease. Remove the plastic and replace with a stainless fender washer of the proper size and no more problems. Give it a try.

John Maneke

Subject: TR3A upper ball joint lubrication

Date: Thu, 05 Jun 2008
From: <amcewen2@cogeco.ca>

Thanks John,
My direct replies to your email bounce back so I'm replying via list:

Mine isn't leaking around the zerk itself but around the edges of the larger flat section (~1.5" dia) the zerk is screwed into.

-Art.

Front Suspension/Upper Wishbone + Ball Joint

Subject: TR4A Upper Ball Joint Removal
Date: Sat, 30 Jun 2007
From: Michael Godley <mgodley@tiac.net>

Hi Folks,

My front suspension is disassembled and the only items attached to the vertical link are the upper ball joint and stub axle.

The space between the link and the ball joint body is too large for the classic ball joint "fork", I have, to work.

Tried the tool I purchased...link below, but I'm concerned that this will strip/break long before the joint separates.

<<http://www.thetoolwarehouse.net/shop/TA-61900.html>>

Also, tried a few well placed blows with the brass end of the Thor hammer from the logical directions with the link in a vice or my trusty old Black & Decker workmate.

So what's next? Would a pro use a press, which I don't have....or some other tool...BTW, I tried the ball joint/pitman arm tool from Autozone tool rental program, but the jaws of the tool are too wide.

Any thoughts before I bother my friendly mechanic or machine shop? Thanks,
-MG

Subject: TR4A Upper Ball Joint Removal
Date: Sat, 30 Jun 2007
From: <DLylis@aol.com>

I have used the tool that you sent the link to. I tightened it and used PB Blaster liberally. Went in the house and went to bed. Came out the next morning, tightened some more; more PB Blaster. I think it was that afternoon that I found it apart.

-David Lylis

Subject: TR4A Upper Ball Joint Removal
Date: Sun, 1 Jul 2007
From: Bob Labuz <yellowtr@adelphia.net>

Mike,

I used that exact tool to remove both upper ball joints and the tie rod ends on the TR4 project.

For me it just worked as would be expected.

I tightened it, let it sit, tightened it etc. and over about 15 minutes the joint popped.

I believe it is of cast iron construction, so I was careful not to really use too much force.

-Bob

Subject: TR4A Upper Ball Joint Removal
Date: Sun, 1 Jul 2007
From: Greg Perry <rgperry@earthlink.net>

I used the open end of a large combination wrench to take up the slack when using the ball joint fork. The wrench is used against the top of the ventricle link while the fork is placed on top of the wrench.

-Greg Perry

Front Suspension\Upper Wishbone + Ball Joint

Subject: Upper Control Arm bushing torque
Date: Mon, 15 Sep 2008
From: <Brian.L.Jones@gsk>

I am doing some work on my front suspension, replacing springs and shocks ahead of the PA Reliability run next week <www.abrr.org>. The right front suspension on my TR4 was very tight (jacking under spring pan lifted the car, rather than compress the spring). The tightness was at the upper control arm bushings - they were very tight. I understand the assembly procedure is to let the car down on its wheels before fully tightening the slotted nuts to compress the bushings. What torque must I then tighten the nuts to? Is it, tighten, then back-off-a-flat process?

-Brian

Subject: Upper Control Arm bushing torque
Date: Mon, 15 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> The tightness was at the upper control arm bushings - they were very tight.

Brian:

There is something wrong with this picture. Those upper bushings are supposed to be fairly soft rubber, and the nut/washer is supposed to pull down against a shoulder, thereby limiting the force applied to the rubber. There should be no way to pull that joint up tight enough to lift the car as you've described, unless some of the parts are wrong or badly damaged.

> I understand the assembly procedure is to let the car down on its wheels before fully tightening the slotted
> nuts to compress the bushings. What torque must I then tighten the nuts to? Is it a tighten, then back-off-a-flat
> process?

I don't have a TR4 manual handy, but it should be the same as the TR3. The TR3 book gives 26-40 ft-lb, "to suit pin hole". No need to back off, unless you've overshot the hole.

Of course, if you're installing polyurethane or Nylatron bushings, the procedure may change.

-Randall

Subject: Upper Control Arm bushing torque
Date: Mon, 15 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> Maybe the bushings are wrong, though they look like Moss 630-130?

I assume you meant 680-130.

> The nut and washer can't pull down directly on the shoulder of the Fulcrum Pin - the rubber bushings have
> shoulders of their own. Tightening the nut/washer squeezes the control arm between the bushing shoulders on
> either side.

Those shoulders do get squeezed to some extent, but my recollection is that the washer still comes up against the shoulder of the fulcrum pin. The sleeve of the A-arm should be enough shorter than the gap between the washer and the flat of the fulcrum pin that there is room for the bushing to stick out.

Don't recall where I got them now, but I had a set of bushings that had much wider shoulders than stock, so there may have been someone selling poor reproductions of the bushings. As I recall, they were also tapered where they fit into the sleeve of the A-arm, while the originals were not.

Since I was tired of changing them every few years anyway, I converted to Nylatron and solved the problem forever.

-Randall

Front Suspension/Vertical Linkage + Hub

Subject: Average life expectancy of wheel bearings?
Date: Fri, 29 Mar 2002
From: "Michael D. Porter" <mporter@zianet.com>

"R. Ashford Little II" wrote:

> How often or at what interval should the wheel bearings be replaced? I've got a TR6.

It depends to a considerable extent on degree and type of maintenance, driving conditions and on the type of lubricants used. Older Triumphs have particular problems with especially front wheel bearings, because there's only a felt wiper installed at the inner bearing. If you have to go through lots of water on the roads where you drive, that felt wiper allows quite a bit of water to be introduced into the hub.

Many people don't realize that the greases commonly used and specified for the bearings in older cars are soap-based. Driving through lots of water then flushes out the water-soluble constituents of the grease, leaving the fiber fillers, which have very poor lubricating capacity. This inevitably leads to accelerated bearing wear.

Another consideration is the melting point of the grease used. Particularly in cars with disc brakes, under hard use, brake temperatures can go beyond the melting points of older greases, causing them to run out, which causes eventual bearing failure.

The last consideration in bearing life has a lot to do with the kind of maintenance they receive. Many cleaning solvents in use today leave a very fine film of residue, which can prevent grease from contacting the surfaces to be protected. If a bearing is cleaned with a commercial solvent, it should always then be washed in gasoline, which will strip off the solvent film, and allowed to air-dry. It's also very important, if the bearing is dried with compressed air, to not let the rollers or races to spin when doing so. Doing such will cause early failure of the bearing, because, without lubricant, the bearing surfaces are easily damaged.

Also, one must be careful in how the bearings are packed. There are pressure packers which work well, but taking the time to properly hand-pack a bearing works just as well with no additional expense. It's not enough to smear the bearing with grease. Rather, the grease should be worked into the bearing by filling the palm of the hand with grease, then dragging the bearing into palm, effectively wedging grease into all the small spaces of the bearing.

Today, fortunately, there are many good synthetic greases which are not completely soap-based, and do not wash out easily, and have high melting temperatures, and I would recommend any good grade of synthetic bearing grease suitable for disc brake use.

As for replacement intervals, it depends upon the condition of, particularly, the races and the rollers during inspection. If the rollers show signs of scoring around their diameter, they will not last much longer and should be replaced. Same for scoring of the races, or if there are signs of any discoloration or bluing on the roller cage. If one is using a non-waterproof NGLI #2 grease, I would inspect bearings every 12,000 miles. Using waterproof high-temperature NGLI #1, or a good waterproof synthetic grease, rated for disc brake use, that interval could probably be increased to 30-40,000 miles.

If there are none of the above signs of wear, there's no reason the bearings, for normal street use, can't be cleaned, repacked and re-used until they do show signs of wear. Racing would be another matter, particularly because the high braking loads in racing create sustained high temperatures in the hubs, and inspection and/or replacement should be on a greatly accelerated schedule.

-Michael D. Porter

Front Suspension/Vertical Linkage + Hub

Subject: Front Bearing Felt Seal
Date: Tue, 7 Oct 2008
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

OK folks.....we're having a discussion over in the 6-Pack Forum on the correct way to install the felt seal that goes in the front hub next to the bearings. When I installed Uncle Jack's stub axles he specifically told me to install it with the felt pointing toward the vertical link/engine. One of the guys in the Forum quoted Bentley & Haynes that said the felt goes against the bearing. I emailed Tony Drews and Tony came up with Pros and Cons about doing it either way. A Forum member emailed TRF, Moss, BPN and a few other LBC places and got a split response of felt facing bearing and felt facing vertical link. Everyone agrees about oiling the felt prior to installation.

We also know all about the benefits of Chicago Rawhide's seals so we're just focusing on the old fashioned felt ones that sit in a metal ring.

So what say the broader range of Triumph folks here on the Mail List..... Felt facing the bearings or felt facing the vertical link? And is there a mechanical/safety/scientific etc reason to support it?

-Bob Danielson

Subject: Front Bearing Felt Seal
Date: Tue, 7 Oct 2008
From: "Craig" <wensley_Tr@comcast.net>

If Jack TOLD you to do it his way (you do it).

Subject: Front Bearing Felt Seal
Date: Tue, 7 Oct 2008
From: "Randall" <tr3driver@ca.rr.com>

Bob Danielson wrote:

> When I installed Uncle Jack's stub axles he specifically told me to install it with the felt pointing toward the
> vertical link/engine.

That's right.

> One of the guys in the Forum, quoted from Bentley & Haynes that said, the felt goes against the bearing.

I would like to know the reference (page & version) for that; as I believe it must be a misinterpretation or misprint. I have a somewhat later version of the Haynes (copyright 1987) in my hands, chapter 11, section 2, paragraph 13 reads "Seat the grease seal on its spigot of the Vertical Link (VL) with the felt pad facing towards the center of the car." There is even a diagram on page 196, Fig 11.2, that shows the steel backing plate for the felt separately, and closer to the hub than the felt itself.

And that same sentence and diagram can be found in the Brooklands reprint of the Owners Workshop Manual (copyright 1993).

> I emailed Tony Drews and Tony came up with Pros and Cons about doing it either way.

Well, to my mind, the overriding "Con" of doing it wrong is that the steel backing will rub against the steel face of the VL. The result is going to be noise, galling, eventually smoke ... not good things for front suspensions. But feel free to try it for yourself <G>

As long as we are on the topic (though perhaps this has already been thrashed to death on 6-pack), I believe you should also set the bearing clearance BEFORE installing a new felt seal. Then mark the position of the nut (I use a Sharpie, but a center punch & love tap with a BFH would do fine) before disassembling to install the seal.

The problem is that the new seals are thick enough to defeat the more common method (given in many though not all manuals) of installing the seal first and then trying to set bearing clearance. The result of installing the seal first is that the bearing clearance (apparently) must be constantly readjusted for the first several hundred miles of operation, as the felt compresses and wears to its final thickness.

Setting the clearance first is in one of the Triumph factory manuals, though I forget which one offhand.

-Randall

Subject: Front Bearing Felt Seal
Date: Tue, 7 Oct 2008
From: Raymond Hatfield <iron_horse819@yahoo.com>

Hi Bob,

A data point for you - on my 65 TR4A (which was off the road since 1980) when I disassembled the front end, the felt was against the vertical link. I believe this is how it was done at the factory and dealerships, since this was the 1st place that serviced the car prior to it being 'retired'

-Raymond L. Hatfield

Subject: Front Bearing Felt Seal
Date: Tue, 07 Oct 2008
From: <auprichard@comcast.net>

Having restored two TR3s in the past 5 years, I am with Randall here, only I stripped some of the felt off the seal on the advice of an old-timer who told me "they don't make 'em like they used to". And there was a lot of felt.

-Andrew Uprichard

Subject: Front Bearing Felt Seal
Date: Tue, 7 Oct 2008
From: A Daniel Cronin <adcronin@ameritech.net>

I believe it should face the bearing. Reason being, it's a seal. It's supposed to keep the grease inside the stub axle. If the metal faces the bearing, things migrate past it. My two cents.

-Dan

Subject: Front Bearing Felt Seal
Date: Tue, 7 Oct 2008
From: <ZoboHerald@aol.com>

iron_horse819@yahoo.com writes:

> Data point for you - on my 65 TR4A (which was off the road since 1980) when I disassembled the front end,
> the felt was against the vertical link.

==AM==

That has been my finding over many years on Mayflower, TR, Triumph 10/Standard Pennant, Herald, Spitfire, GT6 (never had the front hubs off my 2000). This makes me suspect that felt-to-link is what Standard-Triumph intended. ;-)

-Andy Mace

Subject: Front Bearing Felt Seal

Date: Tue, 7 Oct 2008
From: "Randall" <tr3driver@ca.rr.com>

A Daniel Cronin wrote:

> Reason being, it's a seal. It's supposed to keep the grease inside the stub axle.

Actually, the book is very specific. It's a dust seal, to keep dust out.

Sorry, I meant to say the earlier books called it a dust seal. The terminology was no doubt changed to reduce confusion (thou I must say it didn't help <G>)

-Randall

Front Suspension/Vertical Linkage + Hub

Subject: Front Suspension rebuilt
Date: Fri, 15 Aug 2003
From: <McGaheyRx@aol.com>

<dmallin@attglobal.net> writes:

> There's no lip on my TR250 grease caps. I think I remember someone, maybe Bob Lang, say that you drill
> and tap the center of the grease cap, screw a bolt down against the end of the stub shaft and the grease cap
> comes off? Details? What size bolt and threads? Is there enough thickness to the grease cap metal to hold the
> threads, or do I need to weld a nut on it?

You don't need to go to that much trouble. I have one of those little slide hammers (get em at Pep boys for under 5 bucks) with a sheet metal screw in the end of it - drill tiny hole in center of grease cap, screw the slide hammer tip screw in just far enough to grip the cap, slide back briskly with little slide hammer and its off.

-Jack Mc

Subject: Front Suspension rebuilt
Date: Fri, 15 Aug 2003
From: "Hugh Barber" <tr6nut@sbcglobal.net>

Don,

>How do you remove the grease cap?

Supposedly, you can thread a screw into the hole in the cap and it will extract the cap from the hub. I say supposedly because I've never seen one that worked that way. I have used several techniques, but one that seems to work is to put the tip of an awl through the hole and lever the cap out. If you do this carefully and in small steps (first one way, then the other), the cap will come out intact and undamaged. If its damaged, new caps are available and don't cost much (\$5). Here is a mod you can do to ensure that subsequent removals are easy: Take two undamaged caps and silver solder machine nuts inside of the cap (behind the hole). The next time you need to remove them, just thread an appropriately sized screw into the hole/nut and it will extract the cap undamaged

>What do I do when the 35+ year old split pins in the slotted nuts break off?

This has never happened to me, but I would try to get as much of the old pin out and drive the rest out with a piece of steel rod or an old drill bit.

>Are the nuts and bolts at Lowes good enough -- grade 5?

Unfortunately, the real question is "Are the nuts at Lowes that are marked Grade 5 really Grade 5?" Additionally, the nylon locknuts that one gets at your local hardware store/home improvement store may not be graded at all. Also, there are some applications on a TR where special high-strength fasteners were used. These typically don't have SAE markings (so don't assume that Grade 5 will be good enough). In my younger days, I used to routinely replace all the fasteners on my TRs with Grade 5. Later I switched to Grade 8, on the theory that "higher grade is better". I have since read all of Carroll Smith's books and learned about how Grade 8 bolts can be brittle and learned about military spec bolts. On my race car, I'm now using AN and MS bolts in critical places. A good course I've found for high-strength SAE fasteners and high strength nylon locknuts is McMaster-Carr <<http://www.mcmaster.com>>. A good source for AN/MS bolts is Aircraft Spruce <<http://www.aircraftspruce.com>>. I have no financial interest in either, but have purchased items from both with good results. Hope this helps,

-Hugh Barber

Subject: Dust cap removal

Date: Mon, 6 Mar 2006
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

<<On another list ... way to remove a stubborn dust cap.>>

"Interesting"?? ... A big channel-loc or chisel & hammer or large flat blade & hammer all do the job just fine.
-Ed

Hi Ed & List!

I'm not familiar with this style of dust cap on a TRIUMPH car [I own a TR4A & it doesn't have this style of cap]. If I was to own a cap like this, then I would drill a VERY small hole in the center of the cap, insert a sheet metal screw into the freshly drilled hole & pull on the screw head to remove the cap. Once the cap was removed; I would then fasten a nut to the inside of the cap [Braze, weld, glue, etc.], so the next time of removal would be easier by using the correct size bolt #6, or whatever size to match the nut's threads] to remove the cap. Constant removal could destroy the cap if this extra step isn't taken. I hope this is clear to the reader. If there are any questions, then feel free to E-mail me. Thank you,
-Cosmo Kramer

Front Suspension/Vertical Linkage + Hub

Subject: Grease seals
Date: Sat, 03 Feb 2007
From: <ray@raysmg.com>

> David asked..."...the metal goes on the hub side and not the vertical link side. Yes?"

Correct. I just replaced mine during the (TR3) suspension rebuild. Turn the seal with the metal side down on the bench and soak the felt with oil...the seal will swell slightly. When it won't take any more oil, insert it felt side first on the stub axle until it seats. Carefully align your hub (both bearings in place) and put on the big washer w/flat and castellated nut. Tighten until everything snugs down...the hub will be difficult to turn. Back off the nut one flat to 1/4 turn; lock with cotter pin. After driving a few days, re-slug the nut.

-Ray McCaleb

Subject: Grease seals
Date: Sat, 3 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> Tighten until everything snugs down...the hub will be difficult to turn.

If you have just replaced the felt, I would suggest tightening to 10 ft lb. Sometimes the replacement felts are a bit thick, and this ensures that the felt is compressed and the metal backing forced into the hub.

> Back off the nut one flat to 1/4 turn; lock with cotter pin. After driving a few days, re-slug the nut.

Meaning to again tighten until the bearing drags, then back off 1/2 to 1-1/2 flats.

-Randall

Front Suspension/Vertical Linkage + Hub

Subject: Run out
Date: Mon, 10 Mar 2008
From: tom white <tswhitez123@hotmail.com>

Thanks to the list I have been working on my front wheel run out beginning at the hubs. Once I believe I saw a comment here that you could place the front grease seal in the hub and then tighten the hub on the spindle to seat it.

My experience was that the grease seal will not completely seat using this method. If it does not completely seat it produces run out at the hub. You need to seat it with a wood block and hammer making sure the lip of the seal has a uniform level at the back of the hub.

After turning the mounting face of the hubs I now have a run out of 0.003 on each side. That is down from 0.026 on one side.

-Tom

Subject: Run out
Date: Mon, 10 Mar 2008
From: "Randall" <tr3driver@ca.rr.com>

> My experience was that the grease seal will not completely seat using this method. If it does not completely
> seat it produces run out at the hub.

Just my opinion, Tom, that would indicate to me that you weren't getting the bearing properly adjusted. This has apparently been a common problem ever since the cars were new, as the factory revised the procedure several times in what looks to me to be attempts to solve this problem. At any rate, that seal cannot possibly produce anywhere near the normal forces on the bearing, so if it can cause the bearing to deflect, there is something else wrong.

To put it another way, any run out produced by that seal is not significant, because it will disappear when the hub is loaded.

Of course, you can get some apparent run out from the normal clearance in the bearings; so for an accurate measurement you really need to remove the clearance.

-Randall

Subject: Run out conclusion. (long)
Date: Fri, 14 Mar 2008
From: tom white <tswhitez123@hotmail.com>

I have resolved the shimmy in my front end. Along the way I corrected several problems. The first was run out in my hubs. Thanks to the list I had the mounting surfaces of the hubs trued. Then I discovered that my grease seals had to be firmly seated to prevent run out in the hubs.

Next came the wheels. I mounted them and measured the run out with a dial indicator gauge. Every time the gauge changed directions I marked the wheel with the run out number. Then I marked the mounting areas on the back of the wheel where the run out was excessive (Over 0.010). I then ground the mounting surfaces on the wheels that corresponded to the high run out areas. I used a pneumatic sander to do the grinding. I got the wheels down to 0.025 run out this way.

I then took the wheels to be balanced at my usual tire store. They again presented problems on their balancing machine. Their machine is the newest kind that actually mounts five pins into the lug bolt holes. So I took the

wheels to another shop that had an older machine that only mounted at the center hole of the rim. There I got a different result.

The problem I have had was caused by the powder coating on my wheels. I had removed the powder coating from the mounting surface on the back of the wheels but I didn't remove it from the center hole or the lug nut holes. I removed the powder coating from those areas and took the wheels back to the second shop for balancing. Once cleaned the balance changed and took a half ounce off of the weight needed.

I mounted the wheels and went for a test drive. The car has no shimmy in it anymore and steers like a Cadillac.
-Tom

Front Suspension/Vertical Linkage + Hub

Subject: Stub Axle & Vertical Link
Date: Wed, 3 Apr 2002
From: "Randall Young" <ryoung@navcomtech.com>

> I will be starting to reassemble the front suspension on my 59 TR3A soon and had a quick question regarding
> the stub axle and vertical link. Both sides have the stub axle held firmly in the vertical link. What does it take
> to get them separate? Just a bigger hammer??

You've removed the nut on the back, obviously, beyond that it just takes lots of force. I made up a puller from a length of pipe and what not. Don't pull them if you don't have to.

> Also, while I'm on the topic, how does one determine when the hub axle OR vertical link need replacing? Are
> there any measurements I could take?

In my case, the place where the outer wheel bearing sits on the axle was measurably (with a micrometer) out of round. The inner race would actually move up and down.

Herman van den Akker reported finding a vertical links that were apparently bent, such that the hole for the upper ball joint was not in-line with the trunnion. This was the source of hard steering on a car that had just had the entire front suspension rebuilt. ISTR he said he looked at 6 used links before finding a good one.

> They appear to be in good shape, to my untrained eye. I went ahead and got a front magic suspension kit from
> TRF that includes all bushings and trunnions. Are there any other components that often need replacing? (i.e.
> tie rod lever, upper fulcrum pin, etc...)

Definitely check the idler arm and steering box. The pins (both upper and lower) should be OK, but might need replacing if the bushes were allowed to wear completely out. It's not clear to me if the TRF kit includes all the nyloc nuts, but they should all be replaced. Don't know if it's still the case, but the trunnions I got were not drilled for cotter pins, so I used nylocs on them, too.

The lower outer bushes have to be reamed (at least the ones I got did), you might want to order a reamer. Personally, I've never had any luck with the adjustable reamers with the sliding blades, so I just bought a fixed reamer the right size. Being on a budget, I bought a 'chucking' reamer for about \$15 at Enco. My drill press chuck is big enough to hold it, but if yours isn't, it's not too hard to file flats on the reamer and hold it in a vise.
-Randall Young

Front Suspension\Vertical Linkage + Hub

Subject: TR3A stub axle removal
Date: Sat, 11 Aug 2007
From: <ZoboHerald@aol.com>

<tfansher@comcast.net> writes:

> ...wheel bearing problem with the driver's front. I had time to tackle it today and all went well until it was
> time to "tap" out the stub axle. I've beaten on the back side (with the nut on) for a couple of hours now and
> nothing. I got a 1.25" pipe and with a washer tried to use a nut on the front side to pull it out and applied a
> whack or two to the back side .. again nothing. I've sprayed it with brake cleaner [both sides] and PB Blaster..

Here's what worked for me many years ago. With the caliper out of the way, reassemble the rotor/hub (as best you can with the bad bearings) and put the wheel back on. Now you've got leverage to pull on while someone else "persuades" the back side of the stub axle to flee from its taper fit. Granted, when I did this it was on a bodyless TR4 rolling chassis, but it worked for me.

-Andy Mace

Subject: TR3A stub axle removal
Date: Sat, 11 Aug 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

<tfansher@comcast.net> writes:

> ... I had a wheel bearing problem with the driver's front. I had time to tackle it today and all went well until it
> was time to "tap" out the stub axle. I've beaten on the back side (with the nut on) for a couple of hours now
> and nothing. I got a 1.25" pipe and with a washer tried to use a nut on the front side to pull it out and applied
> a whack or two to the back side .. again nothing. I've sprayed it with brake cleaner - both sides - and PB
> Blaster. Any other tricks before I have to pull the vertical link and press it out? I REALLY don't want to
> do that. Also, the stub axle does need to be replaced due to scoring. Thanks in advance,
> -Tom

Hi Tom!

I don't know if this will work, but it's worth a try. From what I remembered the last time [10+ yr. ago], the stub axle is a taper part, right? Then take a 2 lb. hammer & place it on the one side of the vertical link perpendicular to the stub axle. While holding that 2# hammer, take another 2# hammer & hit the opposite side of the vertical link. This causes a vibration to loosen the taper part from the mating part.

-Cosmo Kramer

Subject: TR3A stub axle removal
Date: Mon, 13 Aug 2007
From: John Dombey <jdombey@infoscapecorp.com>

Tom,

I'm going to make a rash assumption that a TR3A front suspension is basically the same as a TR6 - if it's not, then disregard this.

One way I've used to get a better shot at the backside of the stub axle is to pop out the tie-rod (I know, pop out is really not a good description...), release the upper ball joint (just bolted to the A-arms on a TR6 - the travel of the lower A-arm and spring is limited by the shock absorber) and rotate the vertical link down to a horizontal position. I used large blocks of wood to support the vertical link on either side of the stub axle (rather than just at the top end and letting the trunnion take the load at the bottom - not nice to the trunnion, it's made of softer stuff). Then properly supported, I could beat the bejeezus out of the stub axle. I've done stubs on 3 cars - a TR6, a Stag and a TR8. The last two I had to take the vertical link (or whatever it's called on those) completely off of the car to get it horizontal. Once there, all of them came loose with a reasonable amount of beating.

-John Dombey

Front Suspension/Vertical Linkage + Hub

Subject: TR4-6 Front Hub spec
Date: Wed, 17 Sep 2003
From: "Jim Davis" <jdavis344@bellsouth.net>

Don Malling wrote:

> What are "modern" front oil seals, how are they different from the originals, and what advantages do they
> offer?
>
> I just bought a bearing kit and the oils seals seem to look like the originals on the car. Anyone?
>
> Do you folks use wheel bearing drivers to install the wheel bearing races? The drivers are kind of hard to find,
> so I bought these on eBay. Maybe they are junk? JCWhitney sells what appears to be the same thing for
> \$10.00 more.
>
> <<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=2342326112&category=11704&rd=1>>
>
> I was advised the drivers are helpful but maybe not required. A customer in the parts store said he used a
piece
> of pipe to do it. Bentley doesn't say much about R/R the wheel bearing races. Never did this before...
> -Don Malling

Don,

There was a thread on this subject some time ago and the consensus, best I remember, was that the replacement felt oil seals are too thick, so the hub has too much end play. A result of this is that the brake pads are pushed back off the rotor, causing the all too familiar "pedal goes almost to the floor" feel when the brakes are first applied.

The new seals look just like the timing chain cover seal, only smaller of course. The part # I received from some kind fellow lister who's name I have forgotten is **Car Quest #SLS 340823**. They were about \$2.50 each as best I recall and work great. They are a Federal Mogul part so if you have no Car Quest store near you another store may be able to cross reference for you.

I think I used a bearing driver when I installed the races in the hub some years ago, but I also use a brass drift for that kind of job. A pipe of suitable diameter would work I suppose.

-Jim Davis

Front Suspension/Vertical Linkage + Hub

Subject: TR6 Front Oil Seal
Date: Sun, 27 Jul 2003
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Jim

If I have understood your description correctly then you have them the wrong way round as the purpose is to keep the grease in rather than stuff out! The plain side should be facing outwards if my little as key pic works, the lower bit of the picture should face out. [__> <__]

-Graham.

----- Original Message -----

Subject: TR6 front oil seal
Sent: Sunday, July 27, 2003
From: "Jim Davis" <jdavis344@bellsouth.net>

> List,

> I'm in the process of installing modern oil seals on the front hubs of my '75 TR6. I'm doing it to replace the
> felt seals in an effort to reduce the excessive end play in my front wheel bearings. My question is: Which way
> around should the new oil seal go? Open side in or out? I installed mine open, or lip side out. This may be
> obvious to everyone but me, but I just want to be sure before I button everything up.

> -Jim Davis

Subject: TR6 front oil seal
Date: Sun, 27 Jul 2003
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Jim

It is very difficult to explain this by lip facing in or out as we all have different perceptions of which way the lip is facing when installed correctly. I tried the picture is worth a thousand words job! And have now increased the confusion. 8^(The seal will have a side which has text on, part NOS and what have you, you should have this facing the stub axle. If looking from the stub axle side of the hub you can see the spring on the inside of the seal and not the text you have it wrong, if you see the text you have it correct.

Hoping this does no more than eliminate some confusion!

-Graham.

Fuel System

Subject: Cruise Control
Date: Sat, 11 Aug 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Douglas Byam <dbyam@tds.net> wrote:

Cosmo;

> I'm very interested in your cruse control. Can you tell me where you went [local store, mail order, etc.] to get
> what parts [part #'s or a 'kit'] & how you went about setting it up? Do you by chance have a web site or know
> of a web site that you could give me that shows & explains this information?

> I bought it about six years ago from J.C. Whitney. It has a magnet on the drive shaft and an electric Servo.

This sounds something like how my bicycle computer works to detect: speed/distance/rate of travel, etc. Were the magnet is on the wheel & the 'Pick-up' with the wire running to the computer is on the fork [instead of the Drive Shaft Tunnel?].

> I'll look tomorrow and see if I can find the manual in the barn.

Thanks, but if you don't get to it tomorrow, that's OK. But I would like you to do the best you can, WHEN YOU CAN, on finding this info.

> I have some trouble with accuracy, it surges a bit trying to keep up with the terrain. I talked to the tech rep and
> he thought that by adding a second magnet, 180 deg apart would cure that and I agree. I just haven't had the
> ambition to take care of it so far.

I can TRULY relate to that!

> It's not really bad enough to go to the trouble. I think any generic Magnetically Controlled cruise can be
> adapted to the car but a vacuum servo would require a reserve tank.

OK, tell me ore about this 'Vacuum Servo'.

> I've been thinking about doing this for some yr. but I wanted to get some other things done first before going
> about in making changes. AGAIN, Thank you for all your time & willingness to work with me on this & the
> 'Cruise Control'.

> I'm happy to help you out, I hope you get your conversion done soon. You will enjoy it.

Well, I honestly don't know when I'm actually going to do this, but I'd like to do all the research 1st, followed by purchasing the parts & thus gaining the knowledge to install it as a 'Winter Project'. Remember I'm been thinking about doing this for the past 5 years when I heard Brad Kahler did this for his Oregon's VTR trip; [It has been on my 'A-Round-to-it List'], so you can see the rate of speed that I work at. This is why I'd like to obtain all the info. I can now on this subject.

-Cosmo Kramer

Subject: Cruise Control
Date: Sat, 11 Aug 2007
From: "Douglas Byam" <dbyam@tds.net>

Cosmo;

I'm headed for a class reunion this weekend so I'll look for the book Monday.

Regarding the Servo: Until the advent of automotive computers and sophisticated electronics most OEM's used

a parallel speedometer cable to drive a vacuum valve which regulated a Vacuum Servo, not unlike the Brake Servo only smaller. There was usually a mechanical valve mounted on the brake pedal to "dump" the vacuum (which in turn shut off the cruise servo) for braking.

Some aftermarket Cruise Controls now uses pulses, either from magnets or the cars distributor (back when they had one, like our Triumphs) and translated these pulses into instructions to the mechanism that controlled the servo, be it Vacuum or an Electric Actuator.

There have been many permutations and combinations of this technology. Now almost all OEM systems are controlled by the cars main Processor.

Stewart Warner had (quite a few years ago), what I consider, the finest After-market control. I used several of them on my cars. They used magnets on the driveshaft and a vacuum servo. I only suggest the Electric Servo to simplify the installation and also because the vacuum supply is limited on our LBC's. My cruise control still has a vacuum connection.

Perhaps you can see part of my installation in the photos I sent to you. I tucked the servo into the notch in the right fender that was intended for a optional brake servo. I'll send you photos early next week.

By the way where do you live? Regards,
-Doug Byam

Subject: Cruise Control
Date: Sat, 11 Aug 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Douglas Byam <dbyam@tds.net> wrote:

> Cosmo;
> Regarding the Servo: Until the advent of automotive computers and sophisticated electronics most OEM's
> used a parallel speedometer cable to drive a vacuum valve which regulated a Vacuum Servo, not unlike the
> Brake Servo only smaller. There was usually a mechanical valve mounted on the brake pedal to "dump" the
> vacuum (which in turn shut off the cruise servo) for braking.

A Ha! So that's how the cruise control works! I never had a 'Servo' thrown in before. There was a 'Brake Light Switch' installed on the clutch end of the Peddle Push Rods to somehow turn off the Cruise Control (CC), But I never did get the part on what had to be done to the SH6 S Carbs that are on my TR4A?

> Some aftermarket Cruise Controls now uses pulses; either from magnets or the cars distributor (back when
> they had one, like our Triumphs) and translated these pulses into instructions to the mechanism that controlled
> the servo, be it Vacuum or an Electric Actuator.

So I HAVE to get this servo, where is the best place to put it so if I do decide to remove it, then there will be NO traces of it being their?

Also, the magnets could go on our distributors OR our Drive Shafts, right?

There have been many permutations and combinations of this technology. Now almost all OEM systems are controlled by the cars main Processor.

> Stewart Warner had (quite a few years ago), what I consider, the finest After-market control. I used several of
> them on my cars. They used magnets on the drive shaft and a vacuum servo. I only suggest the Electric Servo
> to simplify the installation and also because the vacuum supply is limited on our LBC's. My cruise control
> still has a vacuum connection.

> Perhaps you can see part of my installation in the photos I sent to you. I tucked the servo into the notch in the
> right fender that was intended for a optional brake servo. I'll send you photos early next week.

OK! I'll be looking for them. Thanks again for taking the time & doing all this. Enjoy yourself! When you get back & settled in, then look for that stuff [Manuals] & take the pictures when you can. Remember, I'm just getting the info.

-Cosmo Kramer

Subject: Cruise Control
Date: Tue, 14 Aug 2007
From: "Douglas Byam" <dbyam@tds.net>

I did look for the "book" but didn't find it. I did find the box it came in! Don't know why I saved it all these years. It was made by Equus Products in CA <www.iequus.com>. I looked at their web site and it looks like they are no longer in the cruise control business.

I think the link that I sent to you on the Audiovox unit is as close as I could find to the one that I have. Regards,
-Doug Byam

Fuel System

Subject: VTR trips-cruise control
Date: Tue, 24 Jul 2007
From: <ZoboHerald@aol.com>

<vintr4@geneseo.net> writes:

I spent those days on the installation of a cruise control -- a commercially available Audiovox unit that sell for \$129 retail or about \$90 on eBay. It takes some ingenuity to do it, but its appearance is not overly obtrusive and it works wonderfully. It would work on the whole TR range, TR2 to TR6.

Somebody else installed a cruise of some sort but I don't remember who.

==AM==

Brad Kahler also did this awhile back on a Spitfire 4, and he put up a web page at:

<<http://www.141.com/triumphs/SpitCruise.html>>

-Andy Mace

Subject: VTR trips
Date: Tue, 24 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

<vintr4@geneseo.net> writes:

> Somebody else installed a cruise of some sort but I don't remember who.

Rumor has it that Herman finally installed a 'real' cruise control, instead of the bicycle lever he has used for so many years.

Doubt he was there, but one of our past club presidents, Brian Kemp has also had cruise control on his TR6 for many years.

-Randall

Subject: VTR trips
Date: Tue, 24 Jul 2007
From: Brad Kahler <brad.kahler@141.com>

I installed the system on my Spitfire about 6 months before leaving for Portland Maine and the 99 convention. In conversations with Bud who was going to travel with me he mentioned he would like to install a cruise control system as well. If I remember correctly I bought the parts and shipped them to him so he could install it. It worked well for him on the trip to Maine and he's been using it ever since.

The reversed OD escutcheon worked pretty well. It's hard to tell that the cruise wasn't factory installed. The only thing I had to do was to epoxy a washer on the backside of the escutcheon to hold the cruise stalk in the proper position because the hole in the escutcheon was slightly to large in diameter.

Worked quite well by the way!

Henry Frye and I tried to use the cruise during the TSD rally without a whole lot of success, but hey, it was worth a try!

-Brad

Cruise Control

My cruise control works off the coil, no need for tranny magnets. It is a SCS Frigette.

It has worked perfectly for the last ten years. The prices in this information are probably about ten years old too. I used an OD escutcheon to mount the stalk on the right side since my OD lever is on the left side.

Cruise Control Parts:

The cruise control system was manufactured by:

Cruise control

SCS/Frigette

P.O.Box 40557

Fort Worth, Texas 76140

(817)293-5313

Stalk - part # 204-2115 (\$35.00) will work for RH or LH installations.

Servo kit - part # SCS 4342 (\$180.00) with coil & on-board signal sensing electronics.

Above items were purchased from Progressive Automotive in Lincoln Nebraska.

Their phone number is (402)466-4505

INSTALLATION INSTRUCTIONS

These are typical installations for the vehicles listed. Pictures of all installations are not included. Discretion must be made by the installer, as to the best location of certain components.

Before beginning an installation:

- a. Make sure you have the proper kit.
- b. Read instructions completely.
- c. Lay out all parts on work bench and discard all boxes.
- d. Set park brake as safety precaution.
- e. Remove any existing lower dash panel or insulator pad at driver's side to allow access to the underside of dash.

DISCONNECT NEGATIVE BATTERY CABLE

COLUMN MOUNT CONTROL SWITCH LEVER

1. Determine the best possible location for the cruise control switch lever, either right or left side of steering column. Insure switch lever is positioned in line-of-sight and easily accessible to the driver. Mark location and remove the steering column covers. **CAUTION:** Lever should not obstruct any driver controls in any manner.

LEFT -ND

SWITCH LEVER HARNESS

MASTER CRUISE HARNESS

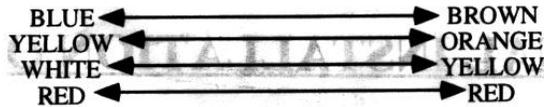
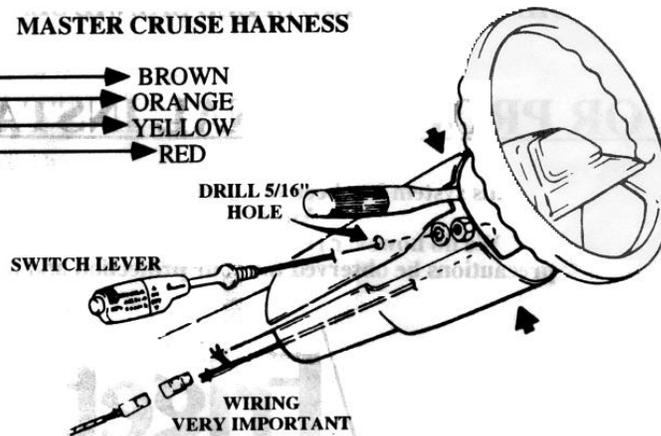


FIGURE 1

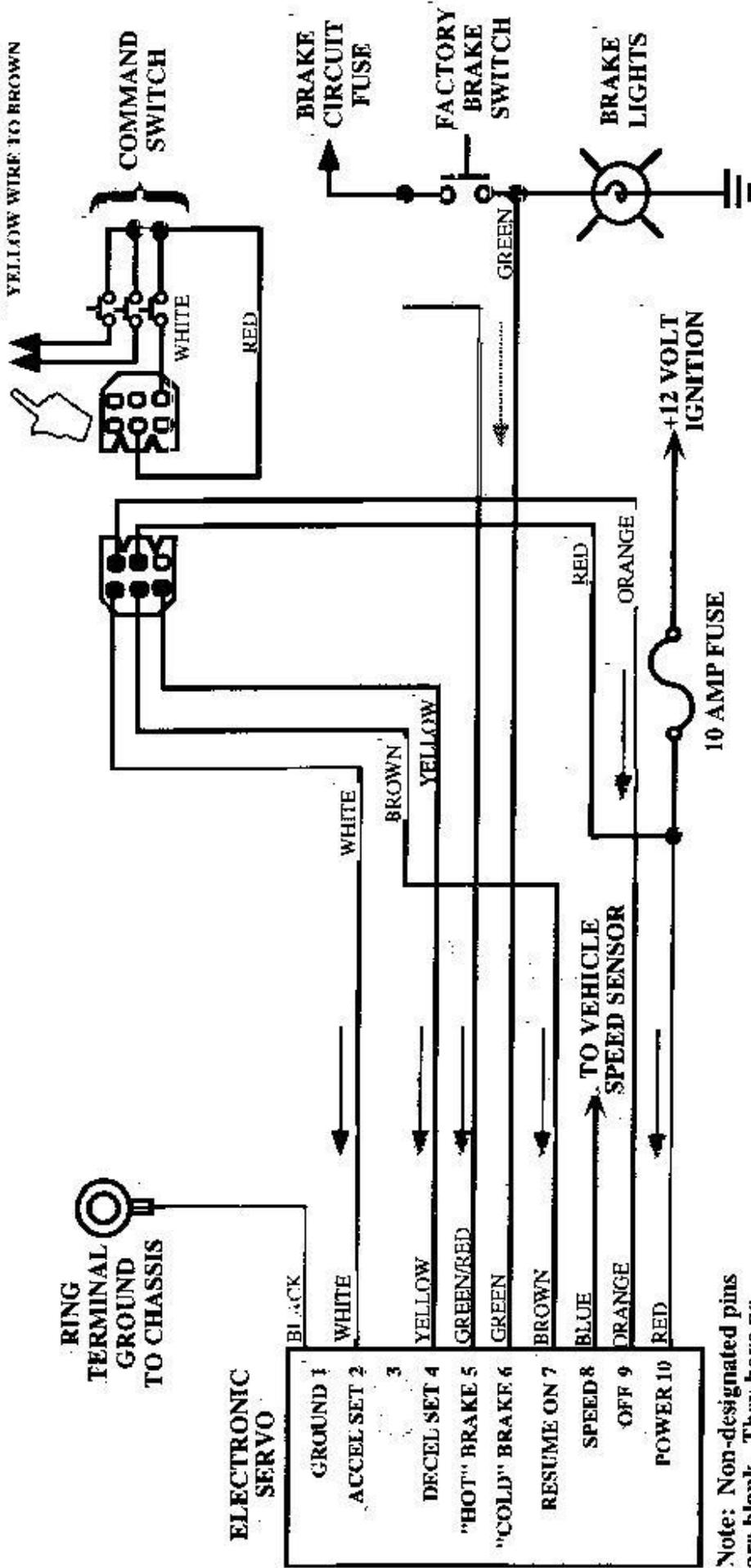


- a. Drill a 5/16 inch diameter hole and mount the switch lever as shown in **FIGURE 1**.
- b. **VERY IMPORTANT:** For installation to **LEFT SIDE** of steering column only- switch lever wires **MUST** be inserted into connector as shown in **FIGURE 1**. Insert and mate wire colors in connector as shown.
- c. Plug switch lever connector into mating connector from master harness.

204-2125 COMMAND SWITCH
 MATCH COLOR FOR COLOR
 RED/BLACK - PANEL DIMMER SWITCH
 BLACK - GROUND

WIRING DIAGRAM

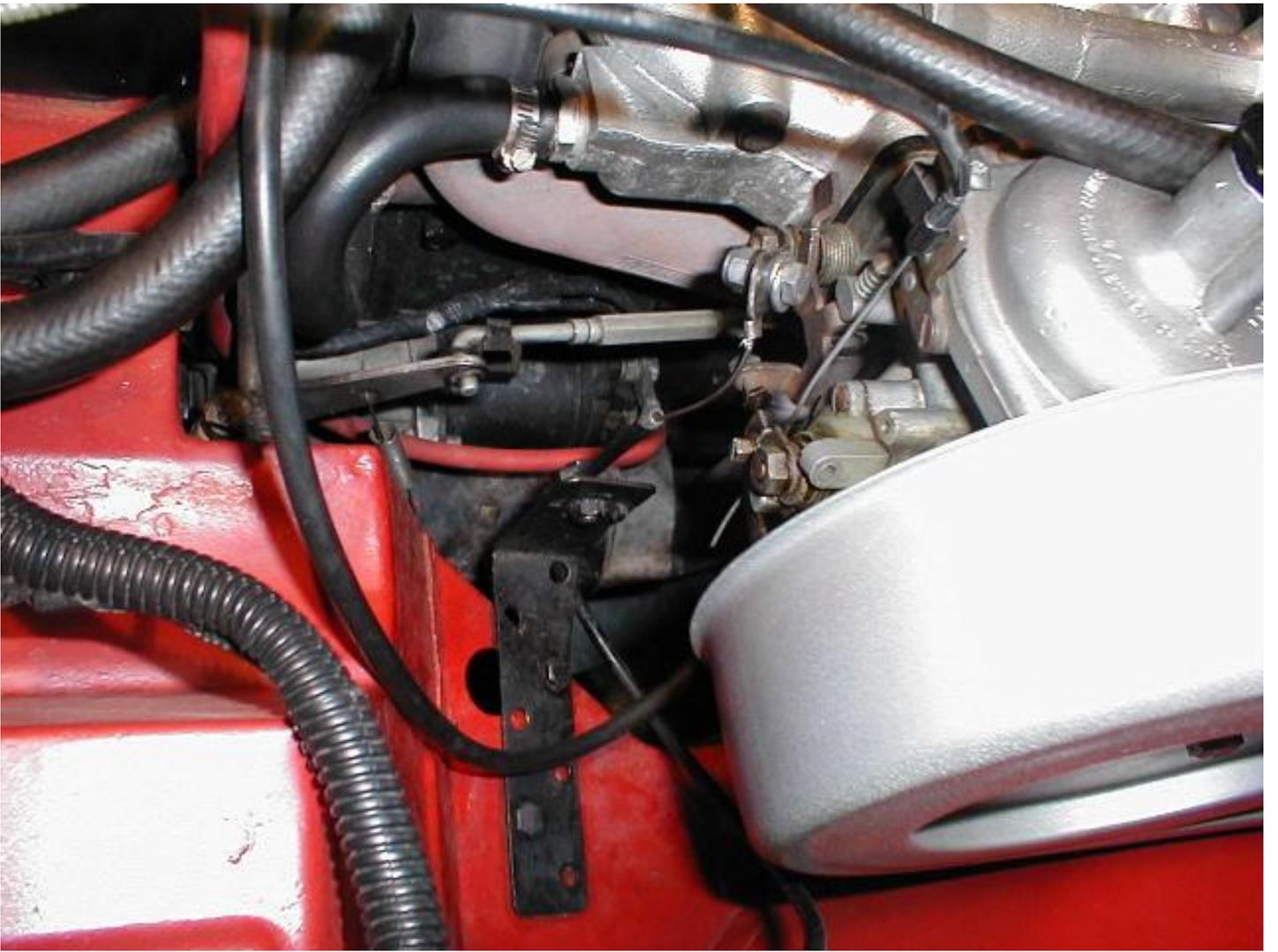
204-2115 COMMAND SWITCH
 FOR LEFT HAND MOUNT - BLUE WIRE TO BROWN
 YELLOW WIRE TO ORANGE
 FOR RIGHT HAND MOUNT - BLUE WIRE TO ORANGE
 YELLOW WIRE TO BROWN



**Note: Non-designated pins are blank. They have no function.

ARROW INDICATES
 VOLTAGE (+12V) TRAVEL
 DIRECTION

ARROW INDICATES
 VOLTAGE (+12V) TRAVEL
 DIRECTION WHEN
 VEHICLE BRAKE IS PRESSED













Fuel System/Carburetors

Subject: Balancing the Carbs
Date: Thu, 19 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> When balancing the carburetors, Bentley says to loosen the interconnection, and balance at 850 RPM and re-tighten. Then it says to bring the engine to 1500rpm and re balance with the idle adjusting screws. Do I > loosen the interconnection again when I do this?

I believe the answer is "no". It sounds to me like the second step involves adjusting the "idle trim screws" that bleed air around the throttle plates, rather than the position of the throttle plate.

> It then says to balance with the choke on. Once again, do I loosen the connector?

Are you sure this third step isn't talking about adjusting the choke (starting bar) itself? In any case, I'm pretty sure you don't loosen the clamp again, the clamp stays at the setting determined in step one.

But I don't have a TR6 Bentley handy (and my home computer is on the fritz), so I'm just guessing.
-Randall

Subject: Balancing the Carbs
Date: Thu, 19 Jul 2007
From: <MMoore8425@aol.com>

<tr3driver@ca.rr.com> wrote:

> When balancing the carburetors, Bentley says to loosen the interconnection, and balance at 850 RPM and > tighten, again.. Then it says to bring the engine to 1500rpm and re balance with the idle adjusting screws. Do > I loosen the interconnection again when I do this?

I've not tried it yet on my TR, but on my E Type I learned a trick about setting the mixture:

When you're adjusting the idle mixture and you have to turn the screw one direction or the other to see if it increases or decreases speed, it's more difficult to tell at higher idle speeds. The trick I learned is to reduce the idle speed to as low as you can idle reliably. On my E Type, I can reduce to 500 or so, and then you can really tell which way you need to turn the mixture screw! Best,

-Mike Moore

Subject: Balancing the Carbs
Date: Thu, 19 Jul 2007
From: John Mitchell <jmitch@snet.net>

Randall wrote:

>> When balancing the carburetors, Bentley says to loosen the interconnection, and balance at 850 RPM and ...

From the other replies that I've gotten, I'm told to loosen, balance at 850 and tighten. The choke is adjusted with just the fast idle screws while it's connected. I haven't really had a good explanation about the idle adjustment at 1500, but it seems if I do a good job at 850, then at 1500 it's pretty close.

-John

Subject: Balancing the Carbs
Date: Thu, 19 Jul 2007
From: John Mitchell <jmitch@snet.net>

<MMoore8425@aol.com> wrote:

> <tr3driver@ca.rr.com> writes:

> When balancing the carburetors, Bentley says to loosen the ...

>

>> interconnection, and balance at 850 RPM and re tighten. Then it says to bring the engine to 1500rpm and

Actually, I've had the best luck adjusting mixture by checking plug color. I was actually asking about balancing at Idle, but thanks for the advice.

-John

Subject: Balancing the Carbs
Date: Fri, 20 Jul 2007
From: "tom white" <tswwhitez123@hotmail.com>

Best results may be obtained with the following procedure:

1. Remove carbs from the car.
2. Disassemble and clean carbs thoroughly in carb cleaner.
3. Compare the components of the carbs to insure that each carb is using identical parts.
4. Reassemble the carbs with new gaskets and components wherever necessary.
5. Carefully place the carbs on the weight scales of a triple balance beam scale.
6. Adjust any weight difference by grinding metal away from the body of the heavier carb.
7. Replace carbs on the car and connect all linkages and lines.
8. Add oil to the dashpot.
9. Set mixture screw at 10 "Flats" from closed.
10. Start car and idle at 780 RPMs.
11. Enrich mixture screw until the engine begins to run faster.
12. Lean mixture screw until the engine begins to miss.
13. Enrich mixture screw one to two flats from the point where the engine began missing.
14. If the above procedure does not produce the desired results consult a LBC mechanic.

-Tom

Fuel System/Carburetors

Subject: Carb filter covers
From: "Kendall, Tom" <tkendallsprint@earthlink.net>

----- Original Message -----

Subject: Carb filter covers
Sent: Saturday, April 03, 2004
From: <ebk@buffnet.net>

Hi Tom!

I received some pictures from Richard M. today & saw your car. Did you make the red carb filter covers? or Did you purchase them? If you did purchase them, then do you recall where you got them? I've been thinking of something like that for awhile, but was wondering if it would restrict the air flow to make the carbs run richer?

-Cosmo Kramer

Thomas Kendall wrote:

Hi again,

Yes I did make the foam filter covers. Got a big K&N filter and cut it down the middle the cut again for 4 equal pieces. Cut them to have some stretch to get over the filters and then used 5 minute epoxy to join the ends. I use a filter oil I get at a heating and cooling supplier that I can wash out with Simple Green and Water.

I have seen one of our club cars that got a set at a motorcycle shop and they fit fine. We are both using the wire mesh filters. Hope to meet you some day,

-Tom Kendall

Fuel System/Carburetors

Subject: Carb Problems
Date: Sun, 27 Jul 2003
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Richard,

First if you don't know their state set the points and tappets to the correct gaps, preferably do the points with a dwell meter. Set the plug gaps, & then set the timing using a timing light. If this lot is ok, then balance the carbs. Disconnect the linkage between them then with the filters removed take a piece of small bore tube, 1/8 inch ID, I use an off cut of hard plastic fuel line as found on later Triumphs. Place one end to the carb throat, and the other near NOT in your ear and listen to the volume of the hiss, a common miss-conception is that you need musical tuning standard hearing, not true! You should adjust the idle screw on the loudest carb for a slower idle if the idle is high or the screw on the quieter carb for a faster idle if the idle is low. If the idle is correct but the balance is out a bit on each carb is needed. Once you are satisfied that they are correct re-connect the throttle linkage ensuring you do not move the throttle spindles and trap them in the new position with the clamps as this will put the carbs out of balance again. If this happens the idle will have changed, just slacken the clamp and try again. Sometimes holding the spindle in the closed position will prevent this problem but if the spindles are worn it will introduce other problems.

For the next bit there are a couple of methods not being one for the hard way, I use a combination of technology. I fit two colourtunes, one to the center cylinder for each carb, ie 2 and 5 and a CO meter in the exhaust to pass emissions. The other method involves the lift pin under the piston if it is fitted to your version of the carbs, never got this to work so won't go there! I'm sure there are others on the list who can make it work and will happily explain it to you!

By my method you adjust each carb until the colourtune is showing you exactly as the instructions will say, ie mainly (Bunsen) blue with the occasional yellow splash, I try to align the mirrors so I can see down each one without moving the head and being in a position to adjust each carb without falling in the engine. I have also found the best time for this is about an hour before dusk, so it is light enough to see to work but not so bright you can't see the Bunsen blue as this is much dimmer than the yellow! Be aware that changing one carb will have a small affect on the other as the carbs are cross linked. Once the carbs are providing the same fuel to each end of the engine I check the CO level and adjust each carb by the same amount to suit local and age related regulations locally 2.5 to 4.5% CO which I have found attainable by all my cars except the 2.5 PI, but including the 125,000 mile 1968 2000 MKI Saloon! I find the colourtunes to be very accurate with little (maybe half a flat 1/12 of a turn) or no adjustment to be within the specs, 4.5 is the max for the MOT, 2.5 is the min according to Triumph. I hope this helps you to avoid paying for this service!

-Graham.

Fuel System/Carburetors

Subject: Carburetor Synchronization tool
Date: Fri, 26 Jan 2007
From: "Randall" <tr3driver@ca.rr.com>

> Good! I hope it comes with direction.

It does, although they don't mention the off-idle checking. For that, you basically do the same setup as for idle synchronization, then open the throttle slightly and watch what the pointers do. Ideally they should rise together

-Randall

Fuel System/Carburetors

Subject: Cold Air Intake
Date: Fri, 4 Jul 2003
From: "Hugh Barber" <tr6nut@sbcglobal.net>

-----Original Message-----

Subject: Cold air intake
Date: Friday, July 04, 2003
From: <owner-triumphs@autox.team.net>

Hugh,

Great picture, nice job. I am thinking I will go this method, what was the thickness of the aluminum sheet? What did you use to cut the sheet stock?

> (from Home Depot) pop riveted together and sealed on the inside with silicone caulk. A picture of it is at:
> <http://thor.prohosting.com/tr6/tr6/tr-6_8.html>
> -David Templeton

David,

I used .063" for the rear plate (the one that bolts to the carbs) and .040" for everything else. To cut the metal, I used a combination of jig saw w/metal cutting blade, hack saw, tin snips, and files (depending on what seemed to work best. I mocked up the rear plate in cardboard first (so I would know where the bolt holes/breather holes/carb hole went) and used a bimetal hole saw and file to make the large holes for the carbs.

-Hugh

Fuel System/Carburetors

Subject: Float valves not leaking!!
Date: Tue, 6 Mar 2007
From: "Graham Stretch" <technical-iwnet@onwight.net>

Hi Folks

Seeing the message from Al Salvatore ref the sticking float valves reminded me that I was going to write in my latest struggle! We have a Dolomite Sprint running twin SU HS6's that was being waaaaay to difficult to sort out a running problem, so I started at the beginning and worked through the whole system, plugs, leads, cap and rotor arm, no points as it has newish electronic ign. Plugs very sooty, ah its running rich, well yes and no, the mixture was spot on when tested with colourtunes and co meter, I use both as it allows the mixture to be kept even on each carb. Then after ten minutes of running the sputtering would start, it was only whilst I was leaning in to the engine bay that I noticed that there was wet fuel around the throats of the carbs on the filter side of the jet, so it was running rich. took the tops off the carbs and found these funny things with ball bearings in for flow valves (are these Gross Jets by name as well as Grosse by design?) well I took them out and fitted some of the same style as the originals with the exception of a Viton tip which I have used before and found to be longer lasting than the brass to brass seat. And still it flooded after ten minutes or so, lids off again and check for dirt in the float bowl suggesting a reason for the flooding nothing and I mean spotless clean, then I had a moment of fleeting genius, inverted the lids and poured a small amount of water in the well where the float jet fits, blew into the fuel inlet using a length of rubber hose and watched the stream of tiny bubbles rise from the interface between the lid and the jet. I checked the other lid and got about the same result. So I PTFE taped the threads and refitted and tested. What do you know, the thing ran better than ever before with no sputtering and no wet fuel around the inside of the throat. I checked a plug and after a few minutes there was only a small trace of soot, woohoo! Now all I want to know is why it repaid me by dumping dot 4 all over the foot well from the clutch master and the ground from the clutch slave cylinder? Oh well another story maybe!

-Graham

Subject: Float valves not leaking!!
Date: Tue, 6 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

> took the tops off the carbs and found these funny things with ball bearings in for flow valves (are these Gross
> Jets by name as well as Grosse by design?)

Yup, that's them. But I believe the proper spelling is "Grose", after the inventor, Ansel B. Grose. Honestly, I don't think there is anything wrong with the ideal; it just seems to have a faulty execution with regards to SU & ZS carbs.

> and watched the stream of tiny bubbles rise from the interface between the lid and the jet.

Always something worth checking for!

> Now all I want to know is why it repaid me by dumping dot 4 all over the foot well from the clutch master
> and the ground from the clutch slave cylinder?

Would you like a copy of the report showing that conventional brake fluid can suck not only water, but salt (!) right through rubber brake lines ? Combine that with the steel pistons used in aluminum bores, and it's a wonder they work as well as they do.

-Randall

Fuel System/Carburetors

Subject: Fuel Gauge Floats
Date: Mon, 6 May 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> I have a couple of fuel gauges (Some from a Spit, TR6 & a GT6. All have a little fuel in the plastic floats.
> Does anyone carry replacement floats? If not, anyone had success sealing on old one? If so what did you use?

Bob, I haven't tried this on a plastic float, but I don't see why it wouldn't work. Get some "Hot Fuel Proof Dope" from a hobby supply store (it's used on model airplanes). Heat the float with a hair dryer (gently, don't want to melt the plastic or explode the float due to internal pressure) until all the trapped fuel boils off and escapes. (Obviously this should be in a well ventilated area.) Wipe the surface down with lacquer thinner or your favorite carb cleaner. Now paint the entire float with the dope. Let dry and apply a second layer (instructions on the bottle?) then let that dry thoroughly. The float should be good to go.

-Randall

Subject: Tank Floats
Date: Sun, 28 May 2006
From: "Randall" <tr3driver@comcast.net>

> This is what I have saved from a list member who replied to a similar question that was asked on this list
> some time ago:

As I mentioned in that post, I've never tried that trick. But I've since heard from others that it doesn't work. Apparently "hot fuel proof dope" does eventually dissolve in modern gasoline.

-Randall

Subject: Tank Floats
Date: Sun, 28 May 2006
From: Doug Mathews <mathews@uga.edu>

List,

I've seen plastic put in a small vial with acetone and the plastic dissolved in the acetone. The resultant mixture is then spread on the plastic parts to be bonded and the acetone/plastic mixture "melds" with the bonding parts, the acetone evaporates and you have what I'll call plastic "fusion". Anyone care to comment on whether this would work on the plastic float? Of course, the plastics will have to be similar.

-Doug

you wrote:

> I believe the initial post had a link to a pic of a plastic float... though I think a metal float would be correct for
> a TR3A.

> -Geo H

>

> Doug Mathews wrote:

>> List,

>> The float we are talking about ...is it metal or plastic?

>> -Doug

Subject: TR Floats
Date: Tue, 30 May 2006
From: <davgil@aol.com>

Cosmo,

I am on the digest so my information may duplicate that of others. I tried the Hot Dope technique that Randall described with very poor results. I also tried using a hot welding iron to mend the float, (which I believe is nylon and not plastic) again without success. I ultimately went to an automobile dealer parts shop and asked if they had an old sending unit laying around that they couldn't sell. I don't know what this one came from, but it had a float on it that I was able to attach to my TR6 float with ease. It simply required that I rebend the wire a little bit. This worked well for me, and they didn't even charge me for the float. In fact, they were about to discard the part when I checked on it. YMMV

David Gill

Subject: Tank Floats
Date: Mon, 29 May 2006
From: don spence <dkspence@telus.net>

Model airplane fuel is methanol and castor oil blend. Though some use different oil stock.

<Triumphs@Autox.team.net daily digest> wrote:

> Subject: RE: [TR] Tank Floats
> Date: Sun, 28 May 2006
> From: "Randall" <tr3driver@comcast.net>

>> This is what I have saved from a list member who replied to a similar question that was asked on this list
>> some time ago:

>
> As I mentioned in that post, I've never tried that trick. But I've since heard from others that it doesn't work.
> Apparently "hot fuel proof dope" does eventually dissolve in modern gasoline.
> -Randall

Fuel System/Carburetors

Subject: O-ring lubricant
Date: Fri, 8 Nov 2002
From: "Michael Hutchinson" <mahutchinson@aceks.com>

Patrick wrote:

> What is a good lubricant I can use for the o-ring of my carbs? I would image something that is not petroleum
> based. Thanks,
> -Patrick

Patrick,

The best o-ring lube I've ever found is automatic transmissions assembly lube. I've seen it under the trade name of Transgel. I've used it on every type of o-ring imaginable with no adverse effects.

-Michael

Fuel System/Carburetors

Subject: Synching carbs
Date: Sun, 23 Nov 2008
From: "John Macartney" <standardtriumph@btinternet.com>

I've been following this general thread for almost all the time (I think) that it's been running and I have to say I'm becoming disappointed in what appears to be the level of enthusiasm many are showing for the carb balancing device. Aren't we all getting a bit too over-dependent on gadgetry? What's wrong with the 'old fashioned' way described ad nauseam in a plethora of workshop manuals and car handbooks?

Mixture strength can easily be checked by pushing the palm of your hand against the exhaust tailpipe to verify misfires and smoke - and to then 'smell' the palm for richness or weakness. Yes, you really can 'smell' it! Having then initially set the slow idle, you can use a short piece of garden hose pipe to one ear to compare the level and pitch of intake hiss. One of my 'tools' (and I copied it from many colleagues) was to use an old twin tube stethoscope. That way, on a twin SU set up, you can hear the hiss in 'stereo' and do the fine tuning that way. I later graduated to a single tube stethoscope that in itself was extremely useful for diagnosing other internal rumbles and rattles before they became serious.

I guess some may think all this too non-scientific? For the record, I used those bits of equipment less than a month back to reset the carbs on the UK Raffle Spitfire before it went in for its annual (and mandatory) safety test. It fires up instantly from cold, the choke can be pushed fully home within two minutes and the exhaust emissions were within limits established for a car of its age. I'm no ace mechanic but you really can accurately set up a set of dual or triple SU's without having to resort to a colour tune and visual balancer and all achieving exactly the same result. What's more. countless thousands of people have done it too and its certainly not rocket science.

-Jonmac

Subject: Synching carbs
Date: Sun, 23 Nov 2008
From: "Jim Muller" <jimmuller@rcn.com>

John Macartney wrote:

> Aren't we all getting a bit too over-dependent on gadgetry? What's wrong with the 'old fashioned' way...

Well, I have several gadgets of a type called a auto-mobile carriage (a.k.a. horseless carriage) which I use to go to work every morning. My most favorite is something called a "GT6". The old-fashioned way (using my feet) would have me arrive at work two or more days after I'm suppose to start work every morning, not even counting the time to get back home again. Without these gadgets I would quickly get even more behind than I already am. I suppose I am over-dependent.

-Jim Muller

Subject: Synching carbs
Date: Sun, 23 Nov 2008
From: "Michael Marr" <mmarr@notwires.com>

I've used this method for almost forty years. Never felt the need for the new-fangled gauges and such. And I set the mixture by the "lifting the carb piston" method.

-Mike

Subject: Synching carbs
Date: Mon, 24 Nov 2008
From: <DaveImassey@cs.com>

<mmarr@notwires.com> writes:

> I've used this method for almost forty years. Never felt the need for the new-fangled gauges and such. And I
> set the mixture by the "lifting the carb piston" method.

One caveat: This works well on pre-1968 US model cars. Post 1967 cars do not tune up using this method. Why? The reason this works is because the designers and tuners profiled the needle to work this way. It is much more than just the nature of the beast. It shows just how clever these blokes were as it took work, attention to detail and ingenuity to design cars that were easy to work on. The 50's and early 60's model cars were designed to be maintained by their owners using only rudimentary tools. No need for expensive gas analyzers or even timing lights. Just adjust the timing to suppress preignition and you're good to go.

Why does lifting the piston work? First off, it only works if you lift the piston the prescribed amount. Lifting too much or too little will give you a false indication of mixture. But this works because the needles are profiled to run a bit rich at idle. Lifting the piston will lean out the mixture by a certain amount. If the jet is set properly the extra lean mixture will mix with the rich mixture already in the manifold and provide a more optimum mixture and the idle speed will pick up. After the rich mixture's effect is dissipated the engine will now be running lean and the idle will drop. **If the adjustments are off you will get a different response.**

When the US implemented emission controls the needle profile had to be changed because you can't meet the emissions standard with a rich idle. Post 1967 US models actually run a bit lean at idle and lifting the piston to set these will not only direct you in the wrong direction but lead to a frustrating experience since Strombergs simply cannot be adjusted enough to behave in the manner described above.

Also note that carbs that can be tuned using the lift the piston method come with a piston lifting pin on the side of the carburetor. If your carb does not have this pin it is likely you cannot tune it this way.

So, hats off to those clever blokes in the British motor industry but the system did have its limitations. Cheers
-Dave

Fuel System/Carburetors

Subject: TR4 carb questions
Date: Sun, 18 Jun 2006
From: Donald Mostrom <oshwega@yahoo.com>

I have a few questions concerning a carburetor set-up on my TR4. It originally came with Zenith-Stromberg 175 CD carbs. The rear carb started leaking gas rather profusely, and on taking it apart, the rear float had a hole in it. On checking the suppliers, this part is no longer available.

Questions:

1. Does anyone know of a supplier for floats to fit the earlier ZS 175 CD carbs?
2. Would the floats for the later ZS carbs from the TR250/TR6 fit these units from a TR4?
3. Moss et. al. have a nice price on a new set of SU HS6 carbs as used in the TR4a. I understand that the 4a's had a central throttle hookup. Has anyone used HS6's on an earlier car with the throttle hookup on the front of the carb set? And how complicated is that to do?

Subject: TR4 carb questions
Date: Mon, 19 Jun 2006
From: <CarlSereda@aol.com>

Donald,

Joe Curto, Inc. (New York) <www.joecurto.com> 'dipped' my suspiciously cracking Stromberg floats in fuel-proof doping for \$10.00 the pair. These floats are expanded foam and were cracking like they didn't like modern gas. He may also have other float fixes to offer. From California I sent my stripped carb bodies (2 SUs from Volvo 122S and 2 Strombergs from TR4) to New York for re-shafting. He did 4 carburettor shafts plus the float dipping, and replated linkage, plus shipping came to about \$125. I got it all back in about a week.

-Carl

Subject: TR4 carb questions
Date: Mon, 19 Jun 2006
From: "Chris Simonsen" <ccsimonsen@gmail.com>

Wow, the dipping sounds much easier than modifying the new style floats and using them.

Wished I'd known about that 7 years ago when my floats were cracked. I hope I saved them!

To use the newer style floats I cut the ear off of one of the new floats and also machined some spacers so things would line up and they work fine. I had a worry about how the new style float actuator arm lined up with the float valve, so I installed Grose Jets.

After several years now, no hang ups, no issues. (Oh man, I think I've just doomed myself...)

-Chris

Fuel System/Carburetors/SU HS6

Subject: Any ideas on why my choke won't? TR3A
Date: Mon, 4 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

Bob wrote:

> I've been struggling with this for some time now and can't seem to get it right. Ever since I rebuilt the carbs, I
> can't get the choke set up so that I can physically open it from inside the cockpit, have it return to closed
> without getting back under the hood, have the choke pull the jets down and advance the fast idle, and not have
> any leaks, all at the same time. I can do maybe any 2 or 3 at a time, but not all 4. Am I asking for too much?
>
> So far, I have replaced the choke cable, installed weaker springs, tried different combinations of gaskets on
> the jet assemblies. But when everything else seems to be set up right, I can't physically pull the cable far
> enough out to do more than take up slack in the linkage. A body building course comes to mind, but I'm too
> old for that. Anyone have any other ideas?
>
> These are SU's of course.

Bob:

When I first installed my new choke cable, I could pull the knob with just thumb and forefinger. After over 15 years of use, it's gotten stiffer, I now pull on the knob with index and ring finger, while pressing on the dash with my thumb.

Suggestions:

- 1) Replace the springs inside the jets with new ones from Moss or TRF. Resist the temptation to stretch them to stop leaks.
- 2) Polish the OD of the jets until they shine. HF sells modestly priced buffs and compounds. Smear a little 'moly' grease on them when reinstalling (don't know that this helps, but it doesn't hurt <g>)
- 3) Replace the jet return springs with new ones from Moss or TRF. Again, resist the temptation to stretch them.
- 4) Hopefully you already did this, but JIC disassemble the new choke cable, and coat the core with 'moly' or 'teflon' grease. When reinstalling, take nearly all the slack out of the choke linkage while tightening the nut that clamps the cable. IMO, 1/2 to 3/4" free travel at the knob is ideal.
- 5) Check the fast idle linkage, to be sure it isn't going 'over center' and trying to turn the cam the wrong way.

If all else fails, buy one of Jonmac's "factory approved choke holding tools" <g>

-Randall

Fuel System/Carburetors/SU HS6

Subject: Carb Questions
Date: Sat, 3 May 2008
From: "Randall" <tr3driver@ca.rr.com>

> I measured the play using a dial indicator in the center of the carb throat and I can lift the shaft .002, but I
> don't know if this is good or horrible???
002" isn't bad; but is that along the axis of the carb throat, or across it? My experience is that they tend to wear the most vertically (plus that's the axis that gives the most trouble, since it allows the throttle disc to drag on the bottom of the throat).

> Haynes says TESM.

It's just one of the many misprints in the Haynes, IMO. Both TD and TE needles were used in earlier cars; SM is the recommended replacement for all TR3/A/B. Check page 443 of the Bentley.

> Should I be using a richer needle to compensate for the elevation?

If anything, it should be leaner for high altitudes, I believe. The correct mixture is determined by the relative mass of oxygen and fuel; while carburetors mix by volume rather than by mass. At high altitudes, the air has less mass per cubic foot.

Wouldn't hurt to try a pair of slightly leaner needles (like the SL needles Moss lists); might improve your fuel mileage a bit. But I don't think it would be a big improvement, and it certainly won't hurt anything (except maybe your wallet) to keep your SM needles.

> BTW, all this should leave me with a spare pair of Stromberg 175s should anyone be in need you can contact
> me off list.

No, thanks. Got all I need (besides I prefer HS6).

-Randall

Fuel System/Carburetors/SU HS6

Subject: SU Carb tool set- Centering the jet
Date: Wed, 23 Apr 2008
From: Randall <59tr3driver@gmail.com>

"Brian Jones" <banc8004@comcast.net> wrote:
> The jet centering 'pin' doesn't fit in the jet – it's too big.

Frankly, I found even the genuine SU centering pin to be somewhat less than effective. Even after aligning with it, I found that the needle rubbed the jet hard enough to affect piston motion. Not sure exactly what the problem is; but I can see at least 2 potential problems with the basic design:

- 1) It assumes that the needle runs concentric with the hole in the carb body .. if it was all machined that accurately then there would be no need for jet centering at all !
- 2) The SU jet centering pin is a very light push fit into both jet & carb body; which means several .001" of clearance ... enough to allow significant misalignment.

What works for me is to remove the mixture nut and push the jet all the way up. Then fiddle with the jet housing until the needle fits cleanly into the (higher than normal) jet with the clamp nut firmly tightened (tightening the nut seems to always move the jet a bit). Then pull the jet out, reinstall the mixture nut and spring, and reinstall the jet.

This uses the base of the needle itself as the centering pin, so no question of machining tolerances stacking up; and having the jet higher than normal ensures there is actually some clearance with the jet in normal position.

YMMV of course, but I've used this technique many times and on several different TR3/As; works for me.

Oh yeah, I got a genuine SU tool kit from JC Whitney over 30 years ago ... they don't carry them any more <G>
-Randall

Fuel System/Carburetors/SU HS6

Subject: Cold Air Boxes
Date: Fri, 16 Jan 2004
From: "Randall Young" <ryoung@navcomtech.com>

- > Is it vintage legal to have a modified air cleaner to route cold outside air into the carbs (from ducting fitted to
- > the removed headlights) as an alternative to putting in the heat baffles between the carbs and Exhaust
- > Manifold? (Perhaps the first question should be whether this really is a good idea to improve power output)

On a related subject, does anyone know of float chamber lids that will fit SU HS6 carbs, but have an external bowl vent (ala H6 carbs)?

Stock TR4A HS6 carbs have the vents built into the lids such that it's difficult to add a hose to them, but IMO connecting the vent to the air box is a necessity for running a fresh air intake. Otherwise, any pressure difference between the top of the float chamber and the air box will affect the fuel flow and hence mixture. I could probably create something with JB Weld, but if they already exist ... (Thanks to Jack for pointing out this short coming in my planned street setup.)

-Randall

Subject: Cold Air Boxes
Date: Fri, 16 Jan 2004
From: Irv Korey <emanteno@attglobal.net>

Randall Young wrote:

- >On a related subject, does anyone know of float chamber lids that will fit SU HS6 carbs, but have an external
- > bowl vent (ala H6 carbs)? ...

They DO exist. I bought mine from Joe Curto (NFI). In my case, I run the vent hoses out of the engine compartment of the TR4 so that if a float sticks, the fuel will dump on the ground, not the header.

-Irv Korey

Fuel System/Carburetors/SU HS6

Subject: Compression Ratios, SU's and other stuff **Check Engine for more**
Date: Thu, 20 Mar 2003
From: Ted Schumacher <tedsimx@bright.net>

Hello list. Sorry to bomb the lists. Awhile back, there was some discussion on SU's vs Strombergs. Here is a simple answer. The Stromberg was used because it was a simple, already in-house carb that would be USA emission legal. Since it is basically a sealed unit with minimal adjustment range, it would not be capable of being "messed with" and thus remain EPA compliant. The Stromberg has a fixed main jet (which is also non-replaceable) with a very small selection of metering needles. In the case of the 175CD carb, you can choose from possibly 10 different needles. The HS6 SU, on the other hand, has 4 different main jets - .090", .100", .110" and .125" - which are replaceable. There are also many needles to choose from for each jet size. This allows you to tailor the carb to your cam, compression, altitude, etc without trying to compromise. Since the Stromberg is sealed or basically non-adjustable, the choice is fairly simple.

Compression ratio determination. There are all kinds of "cut this much off the head and you will have this compression ratio" figures. The problem is, unless you know the head has never been cut, you can only hope the source of the info used an uncut head to determine the compression numbers. Why not do it once and accurately? The ONLY way to accurately determine compression ratio is to measure cylinder and chamber volumes. Here is the formula. Use it and you will never have to worry. Compression Ratio (CR) = $V1 + V2$ divided by $V2$. $V1$ is the volume of the cylinder with the piston at bottom dead center (bdc). $V2$ is the volume of space above the piston at top dead center (tdc). By using this formula, you don't have to worry about piston shape. Be sure to add 3 cc's for the head gasket volume. Example, $V1 = 450$ cc. $V2 = 50$ cc. $450 + 50 = 500$ divided by 50 ($V2$) = 10:1. Simple and accurate. All you need is a milliliter burette and a level. Level the head on the bench and fill the chamber with liquid - we use acetone because it's easy to clean up with no residue. That gives $V2$. Fill the cylinder with acetone and determine $V1$.

How much compression is "safe"? With today's fuels, we limit CR to 9.5 on cast iron engines. It used to be the same octane - 93 - would allow you to safely run around 11:1 with stock cast pistons. Today's fuel burns very hot - it's a method of making sure they limit the unburned gasses going out the tail pipe. Because of these high burn temperatures and the increased pressure of higher compression. The cast pistons really get stressed. This can result in piston damage. Forged pistons can be used but this raises the cost. Hope this information is of benefit.

- Ted Schumacher

Subject: Compression ratios, SU's and other stuff
Date: Thu, 20 Mar 2003
From: Randall Young <ryoung@navcomtech.com>

> The ONLY way to accurately determine compression ratio is to measure cylinder and chamber volumes.
> Here is the formula. Use it and you will never have to worry. Compression Ratio (CR) = $V1$
> + $V2$ divided by $V2$. $V1$ is the volume of the cylinder with the piston at bottom dead center (BDC). $V2$
> is the volume of space above the piston at top dead center (TDC). By using this formula, you don't have
> to worry about piston shape.

Ted, I either disagree, or I don't understand what you're saying. The formula is right, but to get the right answer, $V1$ has to be the swept volume, and $V2$ has to be the unswept volume. If for example you have dished pistons (not sure why you would on a Triumph, but just for example), the dead space in the 'dish' has to be included in $V2$, but not in $V1$.

As an extreme example, my 1970 Audi 100LS had the combustion chamber entirely cast into the top of the piston, the head surface was flat! Your measurement method would give it an infinite compression ratio. (It was actually about 10.2:1, but the funky inverted hemisphere combustion chamber shape let it run without knocking on regular pump gas.)

Likewise, for domed pistons that come above the block surface, the volume of the dome must be subtracted from the measured V_2 . So, the shape of the piston must always be taken into consideration when measuring CR. Only when it's flat, and comes level with the block surface at TDC (which is the case for most stock Triumphs), can it be ignored.

If you do have a funky piston shape, one way to measure it is to compare the measured cylinder volume at BDC with the computed swept volume; the difference gets added or subtracted to V_2 . Perhaps this is what you meant to say?

-Randall

Fuel System/Carburetors/SU HS6

Subject: Correct part number for K&N air filters for 1.75" SU HS6 carbs for TR4A - K&N 56-9096??
Date: Mon, 2 Jul 2007
From: Alain <triumphworks@gmail.com>

Does anyone know if K&N 56-9096 are the correct air filters for 1.75" SU HS6 for a T4A?

Thanks for your help, Alain

<<http://74.221.35.132/developmentsites/k-n/product/56-9096.aspx>>

-Alain

Subject: Correct part number for K&N air filters for 1.75" SU HS6 carbs for TR4A - K&N 56-9096??
Date: Mon, 2 Jul 2007
From: Alain <triumphworks@gmail.com>

Mark <mark@nashvilletn.org> wrote:

> Alain,
> Those K&N's are 3.5 inches deep and I don't think there will be enough clearance between the carbs and the
> inner fender. I am using 1 3/4 thick K&N's with my SU's on my 4A and there is only about 3/8 inch
> clearance.
> -Mark

So should one use K&N pn 56-9327

<<http://www.knfilters.com/search/product.aspx?Prod=56-9327>>

From Summit, these look like they would also work, anyone use these tapered K&N filters on TR4 or TR4A with HS6 SUs

<<http://store.summitracing.com/partdetail.asp?autofilter=1?=KNN%2D56%2D9327&N=700+115&autoview=sku>>

Your car from your website looks to have K&N pn 56-1400

<<http://www.knfilters.com/search/product.aspx?Prod=56-1400>>

I think this is what you describe:

Height: 1.75 in (44 mm)

Inner Wire: No

Outside Diameter: 5.875 in (149 mm)

Top Material/Finish: Chrome

Weight: 1.1 lb (0.5 kg)

HIF SU seem to be designed for K&N pn 56-9330

<<http://www.knfilters.com/search/product.aspx?Prod=56-9330>>

Thanks,

-Alain

Subject: Correct part number for K&N air filters for 1.75" SU
Date: Mon, 02 Jul 2007
From: <mrV8q@aim.com>

HS6 carbs for TR4A - K&N 56-9096??

Does anyone know if K&N 56-9096 are the correct air filters for 1.75" SU HS6 for a TR4A?

Thanks for your help, Alain. Although it's not a direct answer, I'm using 56-1400s on my H6s, FWIW.....

Best,

-Kevin Browne

Fuel System/Carburetors/SU HS6

Subject: Gas Mileage
Date: Tue, 14 Oct 2008
From: "Anthony Rhodes" <spamiam@comcast.net>

"Brian Induni" <308gtsi@roadrunner.com> wrote:

> I know, who cares, right? Well, I've noticed that my 4A doesn't do so well with MPG as I would think it
> should. Not that I'm REALLY keeping track of mileage, but a trip in to town (5 to 10 miles, all around 25 to
> 35 MPH) shouldn't suck up an eighth of a tank. A quick calc tells me that it's less than 10 MPG. Sure I like to
> "get on it" but even so...
>
> Let me preface this conversation with - I've completely restored this car, frame off, total overhaul. There are
> *NO* leaks of any kind (OK, maybe a drop of oil on the floor over the course of a week) and everything
> works great. I've tried backing off the fuel mixture, but that tends to result in harder starting and slower
> response.
>
> Rebuilt carbs, Pertronix ignition, no smell of gas anywhere. I *DO* have dark sooty exhaust in the tail pipes
> though! Valves may be a bit tight, but if not they make a ton of noise... Any thoughts?
> -Brian

It is either malfunctioning carbs (like sticking pistons in the vacuum chamber) or sloppy rich needles. What needles do you have? I found that the stock TW were too lean for modern fuel, and RL was just about right.
-Tony

Fuel System/Carburetors/SU HS6

Subject: HS6 Carb Differences
Date: Tue, 7 Aug 2007
From: "Mark" <mark@nashvilletn.org>

I have two sets of SU HS6's that are different. One set has a 2 bolt flange on the intake side and the other set has a 3 bolt flange on intake side. The manifold sides both have the same 4 bolt pattern. The choke levers are different but similar in operation. The pair with the 2 bolt flange are installed on my 4A, any idea what the application for the other set with the 3 bolt intake flange are used with? It looks to me like the spare pair would bolt on and work fine, with the right needle.

-Mark

Subject: HS6 Carb Differences
Date: Tue, 7 Aug 2007
From: "Terry Geiger" <tgeiger@shoalsbritishcars.org>

"Mark" <mark@nashvilletn.org> wrote:

> I have two sets of SU HS6's that are different. One set has a 2 bolt flange on the intake side and the other ...

The HS6's on my TR6 have the three bolt pattern on the air filter side. They are ex-Volvo carbs that have correctly sized needles for the 2.5 liter engine in the TR6. Originally they would have been fitted to a B18 (1.8 liter) or B20 (2 liter) Volvo engine.

-Terry Geiger

Subject: HS6 Carb Differences
Date: Tue, 7 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

"Mark" <mark@nashvilletn.org> wrote:

> I have two sets of SU HS6's that are different. One set has a 2 bolt flange on the intake side and the other...

I have a set of replacement HS6 carbs sold for TR4A (I believe), that I have the 3-bolt intake pattern. Originals were 2-bolt, though.

As noted some Volvos had 3-bolt while earlier cars also had 2-bolt.

Best bet to discover the original application is to find the carb ID tag and compare it to Burlen's web site.

-Randall

Subject: HS6 Carb Differences
Date: Tue, 07 Aug 2007
From: <emanteno@comcast.net>

"Mark" <mark@nashvilletn.org> wrote:

> I have two sets of SU HS6's that are different. One set has a 2 bolt flange on the intake side and the other ...

Some MGB's used HS6's as well, so maybe that is what they are from.

-Irv Korey

Fuel System/Carburetors/SU HS6

Subject: Spitfire - one carb too rich
Date: Sun, 23 Mar 2003
From: Anthony Rhodes <ARhodes@compuserve.com>

David,

There are two reasons the carb can be running rich. The first is much more likely....

- 1) The fuel level is too high due to:
 - A) a needle valve not sealing (I had this several times) or
 - B) float sunk/not set to the correct height.
- 2) The Jet and needle are worn out and have WAY too much clearance. (I never had this) So, the first thing is to remove the air cleaners and look into the throats with the engine idling as best it can. What looks different between the two carbs? Is there fuel dripping out of the overflow/breather hole? If you have an overflow tube connected to a charcoal canister, then remove the tube from the nipple of the top of the float bowl. If it is leaking you know that you have a float issue.

Then remove the suction domes and pistons (after shutting off the engine) and look down at the jets. You should see the fuel level about 1/8" below the top of the jet (or where the jet is supposed to be if adjusted correctly). IF the float level is set wrong the level will be too high on the rich carb.

You ought to be able to diagnose the problem this way.

-Tony

Subject: Spitfire - one carb too rich
Date: Mon, 24 Mar 2003
From: Anthony Rhodes <ARhodes@compuserve.com>

OK so it seems that the fuel level is fine. If it is running rich (as it seems to be) then the needle and jet may be wrong.

You need a AAN needle in a .090 jet that has a RED plastic head, and, if present, blk/grey and blk/brn bands on the hose To check the needle number, you need to remove it from the piston and then remove it from its collar. The number is inscribed lightly on the shank on the needle.

One possibility or running rich is that the needle is not positioned properly. IF it is retracted too deep into the piston, then the jet can not be set high enough. I had this happen one to me on a biased-type of needle when I failed to place the spring properly on top of the needle in the piston.

The proper sequence is spring on top of needle, and needle inside of collar. This whole thing stuck into the piston and set there with the little arrow on the collar facing the (front or rear of the carb (check the arrow orientation before removing). The collar should be set flush with the bottom of the piston. The needle should be angled slightly off center and FREELY mobile with light pressure.

Does this help?

owner-triumphs-digest@autox.team.net wrote:
Subject: Spitfire - one carb too rich
Date: Mon, 24 Mar 2003
From: <david@robertson.org.nz>

Hi,

I decided to start from scratch. I've replaced points and plugs. Gap set correctly for both, dwell is within spec, timing is correct. So I'm confident the ignition system is OK.

I then took the piston chamber & piston off both carbs . Needles look fine. They're spring-loaded ones & I can't see any ridges or flat spots on them. The tubing attached to the jets looks much cleaner than the rest of the carbs - maybe recently replaced by previous owner? Both jets were very high. I adjusted them down to flush with the bridge, then another two complete turns. I turned the engine on the start for a few seconds with the coil lead out. I can see petrol a little down in each jet - not overflowing and there's no sign of petrol leaking from the carbs or float bowls.

I put everything back together & started it. It's VERY rich. Black smoke out the exhaust, won't idle at all. I adjusted them both up two complete turns and it idles but it's rough. Drives rough as well. I tried some more adjustments on the carbs individually - adjusting the rear one as far up as it will go seems to help, but even there it's too rich. If I lift the piston with the pin, the engine speeds up. Adjusting the front carb doesn't seem to do anything - it doesn't get better or worse. Lifting the piston doesn't change the engine but it almost stalls when I drop it back. I took plugs 1 & 4 out & they're both really sooty.

I'm suspecting that jets, needles or both are very wrong. Any comments? How do I tell what I've got? I guess I can just order the correct new ones & see if that helps but I won't be very happy if it's something else.

-David Robertson

Fuel System/Carburetors/SU HS6

Subject: Setting the float level on a SU H6 Long
Date: Sat, 8 Dec 2007
From: "Graham Stretch" <technical-iwnet@onwight.net>

----- Original Message -----

Subject: Setting the float level on a SU H6
From: "Randall" <tr3driver@ca.rr.com>
Sent: Friday, November 30, 2007

> > When setting the float level on the SU H6 carb, the manual says to pass a 7/16" rod between the float level
> > aluminum forked lever and the inverted lid. However, when this is done does this mean the needle
> > completely shuts off (with the mimicing of fuel by one's breath)? Or does it mean, 'that at 7/16"ths the fuel
> > level just begins to stop' or other?
>
> Paul, I don't actually think it's all that critical. Small errors in float level don't seem to cause a problem.
>
> But I take it to mean that the valve should be closed (unable to blow through it), with the fork dragging on the
> rod (on both sides).
> -Randall

Hi Guys,

I am taking a guess here that the question has arisen due to flooding? I had a run in with a Spit a few weeks ago, petrol pouring out of the rear carb car new to owner. Fit a pair of new needles and floats, the floats were not a pair and as they are reasonably cheap here we decided to remove the risk of a sinking float. Still fuel poured out, so having had a problem before with the seal around the thread that secures the float valve, I taped these with ptfе tape, yep fuel still leaked out! Time to get technical, got a low pressure gauge and measured the fuel pressure, 5 to 6 PSI. Looked for literature and found that SU's like 2 PSI so suggest to owner shell out for pressure regulator, he looked at the price and asked if I could think of any other way. As it happened I could, shorten the spring in the pump. (The pump works by the lever pulling the diaphragm down and filling the pump with fuel and then releasing the tension as the cam turns and the spring pushes the diaphragm up therefore the spring is what provides the pressure, when the flow is shut off and the pressure rises the spring is overpowered and the diaphragm is held down until the float level falls and allows fuel to flow again.) So we set about cutting the spring, this is a very crude way of reducing the spring rate by reducing its free length, we took a quarter at a time and eventually got to 2.5 PSI which as I have not had a return visit from the owner I guess was low enough. I have checked out several other cars with "NEW" fuel pumps and found that they all run in the 5 to 6 PSI range but some carbs seem to hold it back whilst others don't even when the float level is correct, though on 2 of the cars I have looked at there were signs of staining on the float chamber lids so these are probably running on the limit. I too have found that exact fuel levels are not too critical it just means that the mixture jet will not be at the same height on both carbs.

-Graham.

Fuel System/Carburetors/SU HS6

Subject: Start adjusting SU's
Date: Tue, 30 May 2006
From: "Randall" <tr3driver@comcast.net>

> 2) What is the nominal setting for SU's? I am going to say seven flats? I had them screwed down a lot until
> the 3B was "Happy". But they look way off and not even at all so with the bad head I feel a need to start
> from scratch.

The initial setting is supposed to be 2.5 turns (15 flats) from full lean. My approach has always been to set them to the engine, starting it with the choke pulled and making preliminary adjustments as it warms up. Be sure it's fully warmed up before making the final adjustment (or maybe even just a bit hotter than normal). Use the "diddle" pins to lift the piston slightly, the mixture is correct when the rpm lifts slightly and then falls back to the original speed. Once you get a feel for it, and everything else is just right, this test is very sensitive. If you can't tell the difference over two flats of the mixture nut, something else is wrong. I wouldn't worry about the nuts not being precisely equal, but if there is a big difference, there may be something else wrong.

Of course you need to center the jets and check for free piston movement before even starting to adjust mixture.

> 3) I am assuming that the timing will be OK since I was careful to set that to the book. Is there anything I
> should be doing before I turn the Key?

Make sure there is coolant and oil in the engine. Perhaps you've never forgotten it, but I sure have. Also be sure the rotor is inside the dizzy cap where it belongs, they don't run so good with it laying on the fender.

-Randall

Fuel System/Carburetors/SU HS6

Subject: Sticking SU piston
Date: Sat, 16 Sep 2006
From: "John Herrera" <jrherrera90@hotmail.com>

> The dome of one of my Su Carbs (H6) does not have correct alignment with it s body, so much so that it's
> piston gets stuck. Either loosening the three screws at it s bottom and/or unscrewing the damper oil gauge
> stick allows the piston to go up and down. But, of course, how do I fix it?
> Thanks, Paul Dorsey

Paul:
Sounds like you need to center the metering jet. The manual tells you how, so I won't go into it.
-John

Subject: Sticking SU piston
Date: Sat, 16 Sep 2006
From: <ZoboHerald@aol.com>

Paul, without knowing what might have been done to these carburetors otherwise, one thing I'd suggest is swapping the "domes" between the carbs, making sure to LEAVE the pistons in the original carburetor. It's always possible that these got mixed up at some point in the past, and I have seen that cause the problem you describe (pistons and domes are supposed to be a matched set).

NOTE: If this does NOT cure the problem, swap the domes back and keep looking....
-Andy Mace

Subject: Sticking SU piston
Date: Sat, 16 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Either loosening the three screws at it s bottom and/or unscrewing the damper oil gauge stick allows the
> piston to go up and down. But, of course, how do I fix it?

Sounds to me like time to find a new dome, piston and damper. The dome has a precision bearing interface with the dome, so much so that they are supposed to be a matched set. But from your description, the piston must be loose enough that the damper is deflecting it enough to make it bind.

Just replacing the damper (or perhaps even straightening the one you have) may make the problem appear to go away. But if the piston is that loose in the dome, you will have more trouble with it in the future.

Assuming of course that the piston/dome bearing has been lubricated ...
Randall

Subject: Sticking SU piston
Date: Sat, 16 Sep 2006
From: "Alan Salvatore" <6parts@charter.net>

If you take it apart and polish the copper tube it may slide better. I just had one that was stuck and it worked for me.
-Al

Subject: Sticking SU piston
Date: Sat, 16 Sep 2006
From: "fred thomas" <frede.thomas2@verizon.net>

If the needle is seated correctly and it still binds up, loosen the 3 screws holding the dome on and tighten them slowly and keep rotating from screw to screw, **"DO-NOT"** tighten one screw down all the way first, this may very well be your problem.

When you say you used gasket cement on the fuel pump, I hope it is on the gasket at the block and not the diaphragm, be very careful using gasket cement around fuel as it may very well get into the fuel system and leave you on the road side, the dome and piston are supposed to be a matched set, again I would not exchange the two.

-"FT"

Fuel System/Carburetors/SU HS6

Subject: SU Carb adjustment
Date: Wed, 28 Mar 2007
From: "Michael Marr" <mmarr@notwires.com>

> I have a question about adjusting a SU carb. Below the carb body on the jet, it has a nut, followed by a spring
> and then another nut.
> What should be the setting of the 2nd nut?
> -Al

The lower nut should bear against the clevis of the jet. This nut is adjusted up or down, to set the mixture at idle. If I remember correctly, this nut should be tightened until the top of the jet is flush with the "bridge" inside the carburetor choke. At that point, the nut should be turned out two full turns. This pulls the jet down to the nominal position at idle. It is from this point that you adjust the idle mixture, turning the nut in or out, one flat at a time, until the idle mixture is correct.

You can check the idle mixture by using the piston lift pin to lift the piston about 1/8". If the engine speeds up and continues to run at the higher speed, the mixture is too rich. If the engine speed drops, the mixture is too lean. If the engine speed increases momentarily and then drops back to its previous speed, the mixture is correct.

Needless to say, this adjustment should be done with the choke (or, more properly, the enrichment device) in the full off position.

-Michael Marr

Subject: SU Carb adjustment
Date: Wed, 28 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

I assume that's an H-series SU carb then, like found on TR2-early TR4 and early Spits. Other SU's were different.

> What should be the setting of the 2nd nut?

The bottom most nut is the mixture adjustment. The upper nut holds the jet assembly into the carb body and should be torqued down tight.

Or are you asking how to adjust the mixture?

-Randall

Subject: SU Carb adjustment
Date: Fri, 30 Mar 2007
From: "Alan Salvatore" <tr6parts@earthlink.net>

When I got the carbs, they were covered in sludge; so I disassembled them. They are now together. I guess, my question is, is there a starting point for the nut. I know the top nut is tight against the body. I thought there was a starting point for the bottom, like turn it all the way up and then 2, or 3 turns down. Thanks,

-Al

Subject: SU Carb adjustment
Date: Fri, 30 Mar 2007
From: "Joe Laurito" <trglory@comcast.net>

Tighten the nut all the way up, then back it off 12 flats. That will get you in the ballpark.

-Joe Laurito

Subject: SU Carb adjustment
Date: Fri, 30 Mar 2007
From: "Michael Marr" <mmarr@notwires.com>

That is what I was trying to describe in my initial e-mail, but apparently I was not clear! You should assemble the jet assembly and center it. Then, you should turn the lower nut clockwise while pushing the jet against the nut. Watch the top of the jet and when it is level with the "bridge" within the carburetor's choke, or throat, back the nut off (i.e counterclockwise) two turns. This is the starting position for the jet, from which you make final adjustments to set the mixture at idle, as I described in my previous e-mail.

-Michael Marr

Subject: SU Carb adjustment
Date: Fri, 30 Mar 2007
From: "Michael Marr" <mmarr@notwires.com>

The book says turn the nut until the top of the jet is flush with the bridge, but I have also used Joe's approach when the carbs are on the car and I cannot be bothered to scrunch down to look down the carburetor's throat. It works just as well.

-Michael Marr

Subject: SU Carb adjustment
Date: Fri, 30 Mar 2007
From: <jimmuller@rcn.com>

Joe Laurito pointed out:

> Tighten the nut all the way up, then back it off 12 flats. That will get you in the ballpark.

Be aware that until you get both carbs reasonably close to the correct mixture and they are balanced, all the tweaking of jets and lifting of pins etc. will be more or less ineffective. Which is to say they will not behave as "the book" says they will. So the process of tuning them is quite iterative, with much guesswork at the beginning. The closer to correct their starting positions, the easier it will go.

-Jim Muller

Fuel System/Carburetors/SU HS6

Subject: SU Carb problem (TR3)
Date: Wed, 22 May 2002
From: "Kinderlehrer" <Kinderlehrer@mindspring.com>

Mike wrote:

> Hello all,
> After many months, I'm trying to start the TR3 for the first time. Compression- no problem, Spark- No
> problem. After squirting starting fluid in the carbs- It runs for a few seconds. Visually there is gas leaking
> from the jets (from around the mixture nut) I think that is where the problem is. Yes I did rebuild the carbs.
> Maybe I didn't get it together right. Are there any tips you all have to seal this area and make sure it is
> delivering fuel correctly?
> -Mike Thompson

Mike,

I haven't just been there, I think I lived there. Of course that doesn't make me any smarter, but here is what I learned, aided by the collective wisdom of this list, naturally.

First make sure that the jet assemblies have the right washers and copper bushings in the right places. If your rebuild kit didn't come with new springs for inside the jet assembly, try to get them. Also make sure that an extra copper washer that goes on the top of the assembly isn't stuck inside the carb body.

If you have cork washers, soak them in oil for a day. The rubber ones don't have to be soaked but I don't think a light grease coating would hurt.

Polish the jets, (I didn't forget, Fred). I used some red jewelers rouge and a buffing wheel.

Put a light coat of grease on the jets, Randall recommended Molybdimum(sp?) so I bought a can of that.

Put it all back together. The large nut, I found, has to be pretty tight.

Observe leaking gas. Start over with another set of washers.

If you start with the jet adjusters turned out 1 and 1/2 turns, it should start and run well enough to be able to adjust it right. I put a mark on one of the flats with a permanent maker so I would have a reference as I fiddled with it.

-Bob

Fuel System/Carburetors/SU HS6

Subject: SU Carbs
Date: Sat, 30 Dec 2006
From: Bob Labuz <yellowtr@adelphia.net>

DLylis@aol.com wrote:

> My 3A is my first experience of any depth with SU carbs. I have been having idle problems although the car
> runs fine at speed. I have done the usual, but when I pulled out the jets to replace the seals I found perished
> O rings and the replacements provided are cork. What is the conventional wisdom here? When I shut off the
> car I would get a small drip of fuel that ran down the jet between the "keeper" and the jet. So I assume that
> when running if the upper seal was as bad the fuel would also feed into the carb in addition to what was
> being fed by the needle and jet. Also, I get play at the throttle shaft on both but when I use the old carb
> cleaner trick I get no change. I am assuming that any leak at the shaft is not significant enough to bother with.
> From what I can see, and I have not had the shafts out, the SU's do not have the rubber shaft seal that is used
> in the Z-S.
> -David Lylis

Dave,

Order the leak-free replacements from Moss. **Part # 365-420**. They are made out of nitrile or something.

-Bob

Subject: SU Carbs
Date: Sat, 30 Dec 2006
From: "Randall" <tr3driver@ca.rr.com>

> but when I pulled out the jets to replace the seals I found perished O rings and the replacements provided are
> cork. What is the conventional wisdom here.

The originals were cork. Perhaps the current cork replacements have gotten better, but some years ago I was having to replace them every year on my daily driver, so I switched to the O-rings from Moss. They seem to last much better.

While you're in there, polish up the outside of the jets where the seals ride on them. And I would suggest replacing the springs, even though they aren't included in the rebuild kit.

Another hard-to-find source of idle problems can be worn jets &/or needles. Wear on the needles is hard to see ... inside the jets is practically impossible. If you can't get the idle lean enough, or the engine seems lean at speed even with the idle right; try replacing the jets. This turned out to be the reason my Dad's TR3A overheated on the freeway.

Also check that the pistons move absolutely freely in the domes. You shouldn't even be able to hear them rub. The domes are soft, and the slightest ding in the side can screw up the mixture when the piston hits it.

> So I assume that when running if the upper seal was as bad the fuel would also feed into the carb

Yup. There's also a brass washer that can leak fuel into the carb throat if things aren't assembled just right, or the big nut isn't tight.

> Also, I get play at the throttle shaft on both but when I use the old carb cleaner trick I get no change. I am
> assuming that any leak at the shaft is not significant enough to bother with.

My experience has been that they don't leak much even badly worn ... I had more trouble with the butterflies dragging on the bore. I had to blip the throttle to get them to close.

> From what I can see, and I have not had the shafts out, the SU's do not have the rubber shaft seal that is used
> in the Z-S.

No, they don't have the seal. It's just brass on brass, but seems to work well, possibly because the bushings are longer than on the ZS. If you do take them out, be sure to replace the screws that locate the butterflies with new ones, and stake (deform) them into place. You really don't want one of those screws falling into the engine.
-Randall

Fuel System/Carburetors/SU HS6

Subject: Zenith or SU's?
Date: Thu, 31 Dec 2009
From: "Wayne Lee" <wayne@motorcarriage.com>

Hi Jim,

Yes, You have to consider the Springs as they enter into it just like the Viscosity of your oil in the Dash Pots. But, actually it's the other way around, the softer Springs will let the Pistons rise too soon as You say, but this makes the mixture too lean. It's when the Springs are too stiff or stiff enough as needed, that it will keep the Piston down and draw more Fuel through your Jet relative to the volume of Air through the variable choke effect or Venturi.

The same applies, but only momentarily when too thick of a viscosity Oil is used in the Dashpots. The thick oil restricts the rising rate of the piston, which then acts as the accelerator pump would on non CV Type Carbs.

I run the middle strength spring, I think green color code on mine.
-Wayne Lee

Subject: Zenith or SU's ?
Date: Tue, 1 Dec 2009
From: <jimmuller@rcn.com>

Wayne Lee wrote:

> But, Actually it's the other way around the softer Springs will let the pistons rise too soon as You say, but this
> makes the mixture too lean.

Ah, there is a wildcard here, which hasn't been mentioned. It's a question of point of view, really. Let me re-phrase my statement:

It depends on how well the needles are calibrated for the airflow rate. With fixed venturi and jet size the mixture normally gets richer as airflow goes up. So if the needles are chosen right for the flow rates for which the piston is still operational the mixture will begin to get richer as the airflow rises above that rate which tops out the piston.

Whether it runs rich or lean below that point depends on the needles and idle setting. You normally set the mixture at idle, but that may or may not get it right for part-throttle. You might notice lean running at part-throttle, and adjust them richer to compensate. That may even require too rich a mixture for idle. But the real point is this - it will undergo a mode change between flow rates above and below the rate, which tops out the piston.

On my own GT6 a PO had converted to MGB HS4's without changing the springs. Just as you say, they tended to run lean when the mixture was set properly at idle. Tweaking idle mixture and swapping needles could make it better, but the truly confusing behavior was that at full-throttle it screamed. I kept asking myself how could it run so well at full-throttle while so lean below that? The not so obvious explanation was the mode change to richer once the pistons topped out. Once I replaced the springs the rest of the behavior fell into place.

-Jim Muller

Subject: Zenith or SU's?
Date: Thu, 31 Dec 2009
From: "Wayne Lee" <wayne@motorcarriage.com>

I'm always aware of the "Point of View" element. That's what opens the door to these ill perceptions. An Increased Spring Rate will make any specific Needle run richer across the whole spectrum. No Exceptions!

Another common reason for this particular Conversion resulting in too rich conditions is making sure the fuel Bowls are the correct ones designed for the Spit and MGC. (AUD 2140) Just because you get Fuel Bowls that put them vertical doesn't matter, if you use the taller (AUC 1310) it will result in overly rich conditions because of Fuel levels in the Bowls that can't be corrected by Float level.

If you are running the Stock Springs from a Donor Carb they will have most likely at least the "Red Spring" 4.5 oz The Blue Spring (the lightest from the Midgets and spits at 2.5 oz wouldn't likely be on HS6's. You don't get into the Yellow or Green Spring Rates 11 and 15 oz respectively until you get into Healey territory which requires a richer mixture. You don't want to compensate for bad Needles with Springs. The Needle Profile or what Jim called "calibrated" is the most important part. Sort the Car out on the road using the Volvo Needle then see where you are rich. At idle or popping on the Highway. Then take it from there. The Springs should be your last concern.

-Wayne

Fuel System/Carburetors/SU HS6

Subject: SU HS6 Carb Body Rebush; How?
Date: Sun, 3 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

With extreme care and a generous dollop of luck, you can rebush them accurately enough that a reamer is not necessary.

What I did:

Clamp a piece of wood to the drill press table, clamp the table in place. The table has to not be unclamped, so you must leave enough room between it and the chuck for the following process. Using a long bit, drill a suitable hole in the piece of wood to take the shank of a center. I used a 5 flute countersink for a center, since it was what I had. Now chuck up a short drill bit the same size as the OD of the new bushing. ISTR it was 7/16", but I'm not certain. Measure the required hole depth, you want to leave a thin wall of original metal between the bottom of the hole and the carb throat. I used masking tape to mark the drill bit as my stop rod is not reliable.

Now carefully holding the carb body with one hole engaged on the center on the table, drill into the body on the other side to the marked depth. Since you haven't disturbed the table, the holes should be aligned. Smear a little Loctite on the new bushing, and press it into place (I used my bench vise with smooth jaws). Enjoy your favorite beverage while the Loctite sets, and then repeat the process for the other side.

If you can get the new shaft to go into both bushings but it's a bit tight, you can run it in using a drill motor to turn the shaft. In my case, I couldn't even get the shaft in place on the first carb, so I borrowed a 5/16" valve guide reamer from a friend and used the shaft of the reamer as a pilot, by wrapping a few turns of 'scotch' tape around it and running it through the carb first, then putting a wrench on the other side. My second carb did not need reaming (or running in) at all.

These were H6, but I believe the HS6 should be similar.

-Randall

Subject: HS6 Carb Body Rebush; How?
Date: Mon, 04 Mar 2002
From: Doug Hamilton <dougasehamilton@shaw.ca>

Jeffrey,

If the HS6 master kit is the same as the H6 "SU Master kit" and comes with the Teflon coated steel bushings instead of the brass bushings you can rebush your carbs without the reamer. Some of the brass bushings that come in these kits have to be reamed after installation. The difference on install is for the brass bushings the carb body has some splines(these must be removed for the steel bushing) in the hole to hold the bushing in place so when you drill out the old bushing you use a drill 1/64 smaller than the bushing (use a drill stop set to the correct depth). This leaves the factory splines in place and a small amount of the old bushing must be peeled out of the carb body with a dental pick or similar tool (this method insures that you will not damage the carb body). Then the new brass bushing is pressed in place but because the splines distort the new brass bush slightly then will need to be reamed.

My drill press set up was similar to Randall but I didn't have a drill center to work with. So I drilled a through the thickest part of my drill press table to the same size the throttle shaft, I then used a old shaft in the chuck to align the table and chuck with enough space for the carb body and the larger drill bit. I then slide the shaft through the table and the both sides of the carb body just below the bushing you are going to drill out, I held the shaft in place with a small set of needle nose vice grips through the throat of the carb. I then drilled the carb 1/64 smaller than the new bush as described above, but as I had the steel bushings I then changed bits to the same size as the bushing and carefully turned the drill chuck by hand to remove the splines in the bottom from the hole. Installation was the same as Randall described except I installed each bushing as I drilled them out so that my alignment for the second bushing was off the one I had just installed on the other side.

One of my shafts needed to be run in, the other was a perfect fit. Once you figure out a good jig for doing the job it is fairly easy to do.

-Doug Hamilton

Fuel System/Carburetors/SU HS6

Subject: SU HS6 to TR4 question
Date: Thu, 22 Jun 2006
From: Donald Mostrom <oshwega@yahoo.com>

> Has anyone out there done this switch? So far my search for ZS 175CD floats is a failure, so I'm looking at
> alternatives. Moss has a nice price on the HS6 set at the moment.

From what I've determined looking at the catalogues, the easiest way to go would to use the TR4A linkage from the throttle lever to, and including, the connecting rods between the throttle shafts and the choke shafts, and the mounting bracket and bell crank. Otherwise there's quite a bit of fabrication needed to make the set work.

If you should have a TR4A parts car, and would be willing to part with an HS6 setup, including linkage, please drop me a note. Thanks,

-Don Mostrom

Fuel System/Carburetors/SU HS6

Subject: SU questions
Date: Sat, 30 Jun 2007
From: "Paul Dorsey" <dorpaul@negia.net>

Doesn't the SU Carb dash pots/oil level/Carb dip sticks determine the carbs throttle reactions? Especially under load?

I think both SU's are suppose to act identical,...right?

Would there be any good likely hood that thinner oil in one carb might help synchronize their movements?

One of my SU H6's dip stick's presses laterally on the piston's tube, so that it doesn't operate correctly. Is this often corrected by simply bending the dip stick?

This unequal rubbing probably won't affect idle, will it? Thanks,
-Paul Dorsey

Subject: SU questions
Date: Sat, 30 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> Doesn't the SU Carb dash pots/oil level/Carb dip sticks determine the carbs throttle reactions? Especially
> under load?

That's one way to put it. The carbs don't actually respond to engine load though, just airflow.

> I think both SU's are suppose to act identical,...right?

Definitely.

> Would there be any good likely hood that thinner oil in one carb, might help synchronize their movements?

Not bleeding likely!! If there is some difference, you need to find what is wrong and correct it. The carbs should be identical in function; deliberately making one different is just going to make things worse.

> One of my SU H6's dip stick's presses laterally on the piston's tube, so that it doesn't operate correctly. Is this
> often corrected by simply bending the dip stick?

No, it should be corrected by replacing the damaged part.

> This unequal rubbing probably won't affect idle, will it?

Yes, it will. Any rubbing or binding what so ever will upset the mixture at all throttle settings (including idle).

And, even if it didn't affect it directly, anything that upsets idle mixture will also affect mixture at other throttle settings; since the mixture adjustment done at idle also changes the mixture for the entire range.

-Randall

Subject: SU questions
Date: Sun, 01 Jul 2007
From: "Jim Muller" <jimmuller@rcn.com>

Paul Dorsey wrote:

> Doesn't the SU Carb dash pots/oil level/Carb dip sticks determine the carbs throttle reactions? Especially
> under load?

The dashpot oil doesn't really affect operation under load. It acts to slow down the piston reaction when you first open the throttle, but the piston then moves into place fairly quickly. In other words, it acts as the accelerator pump in a conventional carb. After the first second or so when you step on the loud pedal the piston has settled into its new position.

> I think both SU's are suppose to act identical,...right?

Normally they would. Note that if their idle screw settings are different then the first little bit of throttle you give it will affect one carb more than the other. Also if the linkage isn't set to open them the same amount, one may open more than the other. This is just a mechanical thing. It isn't super sensitive but you do have to have them balanced mechanically before it makes sense to wonder why they don't seem to be behaving the same.

> Would there be any good likely hood that thinner oil in one carb might help synchronize their movements?

I wouldn't think so.

> One of my SU H6's dip stick's presses laterally on the piston's tube, so that it doesn't operate correctly. Is this
> often corrected by simply bending the dip stick? This unequal rubbing probably won't affect idle, will it?

It shouldn't affect idle. I wonder how the dipstick got bent! You may be able to straighten it, but I wouldn't be surprised if it turns out to be hard to get right.

-Jim Muller

Fuel System/Carburetors/SU HS6

Subject: Triumph TR4A HS6 air/fuel adjustment for higher altitude
Date: July 17, 2009
From: <tr3driver@ca.rr.com>

-----Original Message-----

> Subject: Triumph TR4A HS6 air/fuel adjustment for higher altitude
> From: Wiard Pless <wmpless@iprimus.ca>
> Sent: Friday, July 17, 2009
>
> Cosmo Kramer intends to be part of the Triumph Trans-American Charity Drive 2009 and will be using his
> TR4A equipped with HS6 carbs. He lives in the Buffalo, NY area and the area is relatively flat. Cosmo
> intends to drive to Seattle, WA, taking the northern route.
>
> With the set-up for lower altitude the car most likely will lose power thru the mountains. It would be very
> much appreciated if you could answer the foll. Questions:
>
> At what elevation should the air/fuel mixture be changed??
>
> How many flats should the jet adjusting nut be turned to weaken air/fuel mixture?
>
> Change the needle to a weak one - AUD 1117 CIW?
>
>
> I remember that many years ago I wanted to drive with a FIAT across the Alps to Italy. In the higher altitude I
> could not keep up with the traffic and had to pull over to the side. Did not know how to adjust the carb(s) and
> in the end I turned around.
>
>
> Again, many thanks for your help and best regards from Cosmo and myself
> -Wiard Pless
> PS Cosmo has to go a library to access the Internet

Hi Wiard (and Cosmo).

The SU carbs are actually very good at compensating for changes in altitude; the loss in power will be mostly due to thinner air (less oxygen per cubic foot) rather than poor mixture. So my suggestion for just a trip over the mountains would be to leave them alone. You may waste just a bit of fuel coming through the mountains, but IMO it's not worth worrying about unless you plan to stay up there for several days.

I live within 100' of sea level, and drove through Hoosier Pass in 2001 (elevation some 11,500 feet). I did stop to try adjusting the carbs on the way into the pass, but they took very little adjustment (less than 2 flats as I recall) and it made no detectable difference in performance.

- Randall

Subject: Triumph TR4A HS6 air/fuel adjustment for higher altitude
Date: July 18, 2009
From: <TR4A2712@yahoo.com>

Hi Randall!

Thanks for replying to Wiard. He has sent a CC to me. YES! I was planning on staying up near that alt. for about a week. I HAVE marked ONE flat on the nut for adjusting the mixture. This way I'll have a starting reference point when starting.

Because the air is 'thinner', I should turn this nut 'COUNTER CLOCK WAYS' (looking at the carb from the top of the Dash pot, DOWN towards the ground), thus LEANING out the mixture, RIGHT?

-Cosmo Kramer

Subject: Triumph TR4A HS6 air/fuel adjustment for higher altitude
Date: July 19, 2009
From: <tr3driver@ca.rr.com>

To lean the mixture, the nut (and jet) has to go higher, so that the needle blocks more of the opening. However, that is CCW, if you are looking down from the top, towards the ground.

-Randall

Fuel System/Carburetors/SU HS6

Subject: Trouble shooting SU Carbs
Sent: 11/20/02
From: <jmwagner@greenheart.com>

On the side of each carburetor... there's a little plunger that faces the ground... the purpose of this is to test mixture strength without having to put your finger or a tool into the carburetor intake itself... as your hand or the tool can alter the flow and distort the findings... (in theory)...

With the carbs independent of each other, and the car idling... you lift up on that plunger... ever so slightly...
As you lift...

The engine your start to rev a little higher, and then dip down a bit and level out... just a little higher than if you hadn't done it at all...

If when you lift it, the engine dies... that carb is too weak.

If when you lift it, the engine revs up a lot and doesn't level out... that carb is too rich...

There's always other factors involved, but that's the basics there... You adjust the jet accordingly... just a few flats at a time... and keep track of where you're at.. and what you've done... so you can back off...

Remember the value of pulling spark plugs:

White plugs = extremely weak...

BLACK FLUFFY plugs.= extremely RICH....

Wet with gasoline = car is not warmed up enough to truly test.. (in general)...

Wet with oil/oily sludge... Houston, you have a problem... :)

-Justin

> Justin wrote:

>> You have it right... do you have HS6 carbs?

>> -Justin

> Yes, I do.

> -Cosmo Kramer

Subject: Trouble shooting SU Carbs
Sent: 11/21/02
From: <jmwagner@greenheart.com>

Adjusting mixture is a fine little art... remember to re-adjust idle (for each carb) and balance... as you play with the mixture.. they're all inter-related. Ultimately, after you have balanced the carbs and you have the mixture where you want it... you will eventually drive the car, with plugs you have just cleaned... take it on the highway... take it to speed... get the motor hot... pull over... and check the plugs as mentioned before...

Another trick:

When you finally have the car driveable... and it's all warmed up... wipe out the exhaust pipe with a rag... drive the car at speed on the highway... pull over... (some where safe) and simply look at the color of the inside of the pipe....

Black... and you're rich... gray is better... etc...

Spark plugs are your best tool, however... because you don't want to drive on "white" powdered plugs... if you're running that weak... you are doing damage to the motor... so it's good to know what before you've put miles on the car...

The fear of pulling plugs out of a hot motor are justified... if they haven't been out in awhile... as you don't want to battle seized threads on a hot motor... risking thread damage... but if you just had the plugs in and out... the other day, for example, with a cold motor... you don't have to really worry about it seizing... etc. all food for thought... good luck.

-Justin

Fuel System/Carburetors/SU HS6

Subject: Using Volvo HS6 Carbs on TR's
Date: Wed, 22 Jan 2003
From: Dave Massey <105671.471@compuserve.com>

by "Jeffrey J. Barteet" wrote:

>Well, if you can find a set of TR HS6's on a 4A manifold with linkages, I'd jump on it with both feet. Me, I
> went the hard way buying the manifold from one guy, the linkage from another, and a pair of HS6s from a
> Volvo B20 from yet another. So now I have all the parts, right? Well, not quite.

Boy, that sounds familiar.

I went with the bowls in the middle but found that the Volvo shaft that goes between the carbs was just ever so little bit too short. Being the tinkerer type, I set about to make my own linkage. The tie shaft was easy. The shorter rod from the throttle pedal shaft was easy (1/4 inch steel rod, run a die and cut 1/4-28 threads) and the bell crank to tie shaft rod was as well (see above). But I had to fabricate my own bell crank mount which turned out to be a piece of 1/8 steel with a couple of sharp bends (made with the help of a torch since I have not brake that will bend something that thick) and a couple of iterations of trimming to get it to fit.

And the choke linkage was equally involved. I initially thought a TR6 choke linkage would work but it was too short. So I made a one to two adapter (anyone familiar with the Austin Healey choke linkage?) Which is a moving block with three holes and clamp screws - one for the single cable from the dash and two for the cables (bicycle brake cable) to the carbs. The cable sheaths are secured by a home-made framework that straddles the moving piece. And believe it or not, but this choke set-up is even more difficult to operate than the original.

I didn't attempt to adjust the float bowls thinking they were close enough to level. But I used TR4A needles and jets since the Volvo jets were shot and the Volvo needles won't work with the TR4A jets.

The results are less than stellar. My long term plans are to rebush the H6's and restore the car to original. All in all, it was a good academic exercise. I give myself a C. (OK, C-)
-Dave

Fuel System/Carburetors/Zenith-Stromberg

Subject: Carbs- Zn-St
Date: Wed, 25 Jul 2007
From: <Dave1massey@cs.com>

<KingR44916@aol.com> writes:

> I have a 76 tr6 been fussing with the carbs for a while can't seem to get it right had the distributor rebuilt by
> advance looks good but my problem is that I can't get the mixture down. If I lift the piston slightly it wants to
> stall I enriched the needle as far as it will go. I thought it was a vacuum problem so I clamped all hoses & still
> the same thing. I looked up everywhere what else effects the mixture is it possible for these needles to go bad.

How far are you lifting the piston? The lift the piston only works if you lift it the prescribed amount. How far is that? Most SU's have a piston lifting pin that will lift it that amount.

But your Z-S doesn't have one a piston lifting pin. That is because the needle is not trimmed for this effect to work. It worked on the old SU's because the carb designers designed it to do that. But they couldn't meet emissions with a rich setting like that so now the Lift-The-Piston method of tuning no longer works. Forget about it.

The only reliable way to tune these carbs is with a CO meter (Gunson or eq).

Check with your local club, someone's bound to have one.

-Dave

Subject: Carbs
Date: Thu, 26 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> If I lift the piston slightly it wants to stall.

You should only be lifting it a tiny amount, like 1/32"

> I enriched the needle as far as it will go. I thought it was a vacuum problem, so I clamped all hoses & still the
> same thing.

Did you plug the line from the brake booster and PCV? Also, you need to leave the bowl vent line open, as plugging it WILL affect mixture. Probably best to disconnect it from the canister, though, to be sure there is no pressure or vacuum in the line.

> looked up everywhere what else effects the mixture

Main diaphragm, bypass valve diaphragm, piston binding, thermal compensator, idle air bleed, dashpot vents (both bottom and top), vacuum leaks (including throttle shaft seals), jet position in the body, needle position in the piston, and float level. Probably more I've forgotten. Oh yeah, fuel. Gasohol runs leaner than 'real' gasoline and old gas is sometimes even worse.

Also a worn needle, worn jet, leaking cold start valve; but generally these can only cause too-rich mixture.

> Is it possible for these needles to go bad?

Yes, but only to the rich side. Of course, it's possible someone has put the wrong needle in there.

-Randall

Fuel System/Carburetors/Zenith-Stromberg

Subject: Damper O-rings in Zn-St carbs
Date: Sun, 1 Jun 2008
From: <Dave1massey@cs.com>

<moira.secrest@verizon.net> writes:

> Stromberg CD 150's. Somewhere I remember reading there's a little o-ring in the bottom of the piston that
> keeps in the damper oil? If so, how to access? Mine are completely shot. I assume I can get replacements off
> the shelf .. if I can get them out?

The O-rings are included in the rebuild kits. If you are like me you have consolidated all the leftover parts from all the kits you have bought and placed them in the bottom of a box somewhere in the garage.

Replacing the O-rings requires removal of the needle and needle adjuster. Remove the screw on the side of the piston and back off the needle adjuster completely to remove the needle. The retaining screw is brass and can snap off in which case you got trouble so take great care. With the needle out of the way push the adjuster out of the bore of the damper from the needle end using a properly sized dowel rod. There is a speed nut (actually in inverse of the speed nut, it grips on the OD, not the ID) keeping the adjuster located at the bottom of the bore and it will take an uncomfortable amount of force to push it out but it will come out. Do not loosen the speed nut. With the adjuster out of the bore the O-ring will be apparent and removal and replacement is straight forward.

Assembly is the reverse of the above. Good luck.

-Dave Massey

Fuel System/Carburetors/Zenith-Stromberg

Subject: Dash Pot Oil
Date: Tue, 18 Jun 2002
From: "levilevi" <levilevi@attbi.com>

----- Original Message -----

Subject: Dash Pot Oil
Sent: Tuesday, June 18, 2002
From: "Joe Donovan" <jxdonovan@attbi.com>

> -Got my own question in response to Brian's suggestion to use 40W. I use Marvel Mystery oil. One of my
> carbs loses the oil in about a day. Is this a problem with the carb or the oil?
> -Joe Donovan

Joe,
It's your carb. Specifically the o-rings in the air valve in the carbs that are leaky. You can replace the o-rings...at least I can on my 1971 ZS 175 CD-2 carbs.

The o-ring size is 2-010, call your local gasket/o-rings/seals place or you can call mine (**Rocket Seals in Denver 303-777-7024...NFI**) and tell them you want that size in Viton which is a oil-resistant compound of some sort and lasts a little longer than plain rubber. To get the old o-ring out take a long skinny punch (I've even used a pencil but they WILL splinter and jab you in the hand...not that I'VE ever done that) and drive the needle adjusting screw out the top of the air valve (of course you've removed the needle first). There's a star washer that holds the adjusting needle screw in place so make sure you cover the top of the air valve with a rag or you'll be chasing that star washer around the garage floor. Put the new o-ring on and reverse instructions (as Bentley says). You can use your punch to make the star washer go back in and sit down flat on the needle adjusting screw. Be gentle but make sure the adjusting needle valve and star washer are flush to the bottom of the air valve.

Good Luck. It's worth it to have the oil stay in there....makes for more consistent acceleration instead of wondering...Now what?
-Bud Rolofson

Fuel System/Carburetors/Zenith-Stromberg

Subject: TR4 - Floats for Stromberg CD175
Date: Sun, 2 May 2010
From: "Randall" <tr3driver@ca.rr.com>

My information is that there is a later float that will replace both the CD-175 and the later CDSE-175 and CDSE2-175 floats. My guess is, that's what Moss is supplying. Oddly enough, TRF only lists the float under a Zenith number (ZEB19470) which they do not have cross-referenced to any of the Stanpart numbers I found (512310, 516977, 519406). But I think there is an excellent chance that ZEB19470 will fit the CD-175 carbs, plus perhaps the CD-150 used on some GT6 & later Vitesse.

> Is my sometimes faulty memory correct that this is a new development? or old news?

Well, relatively new for Moss anyway. Their 2000 catalog showed it NLA. But it was listed as available in a 2004 Revington catalog, so I guess they weren't exactly unobtainium.

> Also -- is item 100 on that same page the paper filter some use in place of the oiled-wire original filter?

That's what I'm using, but it hits on the inner fender for a TR3/A. How much appears to vary by car, as it's much worse on my TR3 than on the TR3A. If it was a show car, I wouldn't use it.

ISTR the round TR4 filters (item 98) didn't hit as badly; but they were either NLA or I wasn't willing to pay the price, last time I stocked up on air filters. And of course for a TR3 you need to stop up the emissions fitting on the face.

-Randall

Fuel System/Carburetors/Zenith-Stromberg

Subject: Joe Curto - Kudos and TR4 ZS O-ring specs
Date: Tue, 10 Jun 2008
From: <Dean.Mericas@CH2M.com>

I just wanted to publically thank Joe Curto for simply terrific customer service.

Joe rebuilt the Z-S carbs on my TR4 about 9 years ago. The jet assemblies are starting to weep a bit of gas, and I called him to see if he could tell me the specs on the O-rings that I need to replace. He couldn't tell me the specs for the O-rings, and instead mailed me a new set, along with gaskets for the float bowls. This was all gratis for being a previous customer.

I mailed him \$5 for the parts, but also wanted to share the story with this group. We need to keep guys like Joe in business.

BTW, the "dash number" and size specs on the two O-rings in the jet assembly of a Z-S 175CD are as follows:

Large: -114 (13/16" OD, 5/8" ID, ~0.103" thick)

Small: -011 (7/16" OD, 5/16" ID, ~0.070" thick)

Now you know!

-Dean Mericas

Fuel System/Carburetors/Zenith-Stromberg

Subject: TR4A 175 CD Metering Needles
Date: Fri, 7 Jul 2006
From: <CarlSereda@aol.com>

-----Original Message-----

> Listers,
> I am rebuilding the Strombergs on my 4A. The needles in the carbs have 022 stamped on them. Mine is early
> (1965), and the factory workshop manual specifies a 2E needle (up to CTC 54939, then 2H is specified).
> Moss just shows two needles.....a 2A needle for TR4 and 2H for TR4A. Is anyone familiar with the 022
> size/designation? I have the profile for the 2H from an earlier post...does anyone have information on the 2E?
> The engine is stock except for 87MM pistons. Has anyone experimented with a different metering needle for
> this modification? Thanks
> -Mike Godley

Hi Mike,

First: During late TR4A production, pressure was on to reduce emissions - and Standard-Triumph changed the TR4A distributor and carb specs during production. The TR4A WORKSHOP MANUAL SUPPLEMENT dated 1967 - says static timing was retarded to TDC instead of 4* BTDC and vacuum and centrifugal advance were altered to EXTEND the operating range to permit this retarded static setting. It states SUs were being used and they specify weaker metering needles & jets and increased resistance on the damper plunger to counteract the weaker needle. I only mention these facts as it may indicate what might have been happening to the Stromberg settings around 1965-66 before the SUs were reinstated. My mid production TR4 didn't have any factory emissions equipment (open breather like the TR3) and I don't know what you are doing with your 4A emission equipment (intact? removed?) but for 2006 you might want the late TR4 carb and distributor specs rather than the later 4A's 'emissions driven' settings. I assume your Lucas distributor is marked 40795 A ##65, vacuum advance is stamped 2-6-3, and your Stromberg carbs are stamped 3043 near the air intakes (indicating carbs you have below); 1825 = TR4 1963 - early 1965 2A needle, natural color air valve spring 3043 = TR4A early 1965 only 2E needle, natural color air valve spring 3089 = TR4A May 1965 -1966 2H needle, red color air valve spring The 'Stromberg Spare Parts Schedule for TR4/4A' clearly shows that 3043's use 2E needles. Moss UK catalogue shows you can still buy; 2A, 2E, or 2H Stromberg needles for #10.95 each (see <http://moss-europe.co.uk/MossUK/ProductList.aspx?SubSubCategoryID=TR2_UTRIS008D>

You might be able to get these delivered cheaply through Moss USA since they bought Moss UK a few years back. You probably would be interested to know that both the 2A and 2E needles go with an air valve return spring p.n.# 019674 (in natural color) but the later 2H needles go with a 'more resistant' air valve spring p.n.#020685 (red in color).

Any of these 'needles' can be had for #6.40 and the 'air valve springs' for #3.80 at 'Gower and Lee' in the UK as listed below (in fact Jeff sent me a chart showing side by side comparison of needle profiles; 2A, 2E and 2H) which I will send to your email address directly (anyone else can let me know if they want it).

Also, somebody was looking for STROMBERG FLOATS.. Gower & Lee sells these new for #25 each. Jeff can be reached at:

Jeff Carter:
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P.O. Box 91
Bushey
Herts WD23 2ZG

-Carl

Fuel System/Carburetors/Zenith-Stromberg

Subject: O-rings, Z-Carbs
Date: Fri, 05 Feb 2010
From: Bob <rpeglow@optonline.net>

Hi Ronnie,

I used #12 O-rings purchased at Home Depot. Size on package says 13/16" O.D. x 5/8" I.D x 3/32". There is no rubber composition information on the package. These have been in use with E10 gas for about 2 years, no problems/leaks.

-Bob

Fuel System/Carburetors/Zenith-Stromberg

Subject: Problems with St-Zn Carb Floats for a TR4

Date: Mon, 30 Apr 2007

From: "Randall" <tr3driver@ca.rr.com>

> -----Original Message-----

> Subject: Problems with St-Zn Carb Floats for a TR4

> Sent: Monday, April 30, 2007

> From: On Behalf Of Cosmo Kramer

>

> Hi List!

> A friend of mine is having a problem with his TR4 Zn-St carb/Float Bowels. Below is his E-mail address.

> PLEASE reply to HIM [Dave], NOT ME! Because pic. can NOT be send to this TRIUMPH List, you will

> have to ask 'Dave' to E-mail you pics#: CIMG2134; CIMG2127; CIMG2130; CIMG2131; CIMG2132;

> CIMG2133 Here is what he wrote:

>> Dave Gildner <penguin@teksavvy.com> wrote:

>> Hi Jeff/Cosmo,

>> Here's a brainwave - send you some photos! I should have thought of that before. I'm showing the newest

>> float valve in the installed position, and the other two types that I have tried. The newest one is a

>> supposedly original-type needle-and-seat, the next oldest is the Grose Jet, and the oldest (which were in the

>> carbs when I bought the car) is also a needle-and-seat. But if you look at the two N&S ones closely, you

>> will see they are constructed differently. Are you familiar with the two types of N&S? Is one worse than

>> the other?

>> The newest one was purchased last September, so has very little mileage on it.

>>

>> In playing with the carb tonight, I was blowing into a rubber hose, pretending I was the gasoline. To my

>> surprise, I found that if I closed the valve by raising the float, then let the float down, the plunger would

>> often not drop down. That is not too strange, but when I blew into the hose, it was closed and stayed closed.

>> I could not blow any air through. The carb was in normal upright position at the time. So the "new" valve

>> stuck closed, at least against the pressures that I was able to generate by blowing. To me, this should not

>> happen.

>>

>> If it can stick in the closed position, I guess there is a possibility it could stick in the open position, at least

>> occasionally. So now I am thinking that the newest N&S valve is suspect. I think I'll remove it, and

>> probably put back one of the original old N&S valves. I can't remember if I experienced leaking with them,

>> it seems to me I just replaced them on spec, while the carbs were apart for rebuilding. But I have definitely

>> had leaking during the tenure of the Grose Jets.

>> That will be my next task, some evening soon. Regards,

>> -Dave

Dave:

I agree, you should be able to blow the float valve open even with relatively puny lung power. This problem seems to be becoming much more prevalent in recent years. I've seen many Triumphs with it and even had problems myself. I believe it is due to changing formulations of gasoline, rather than any variation in valve design. Personally, I dislike the Gross Jets. The problem seems to be that they require more force to hold closed against the fuel pressure than the original needle design. On most cars, I guess that's not a problem; but I've seen a significant number of cars where it is a problem. Perhaps their floats are a bit heavy, or their fuel pumps put out a little bit more pressure; but for whatever reason the float bowls overflow on occasion, dumping fuel out the vents. In every single case, switching back to one of the needle-type valves has solved the problem. From an engineering viewpoint, I feel the needles with the rubber (Viton) tips and the internal spring-loaded plunger should last the longest. But in practice I've not seen any difference, so I just install whatever comes in the kit.

-Randall

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Mon, 30 Apr 2007
From: "Pam and Dave Gildner" <penguin@teksavvy.com>

Hello Randall,

Thank you for taking the time to answer.

Yes, at times I'm experiencing the problem you mention, of fuel dumping out the bowl vents when the engine is running. That results in extra-rich mixture, stumbling, and stalling.

But I also experience the problem when the engine is off, sometimes. When the tank is full, gas flows right through the float chamber, up the needle, over the bridge and down into the intake manifold. If the intake valve is closed, the gas fills up the manifold for that cylinder. If the valve is open, I'm sure the gas ends up in the crankcase. Needless to say, I don't like the implications of that.

The most recent episode of this latter problem occurred with a brand new needle-and-seat valve. Previously, I had used a Grose Jet, and had the problem with that also.

Another person I have talked to thinks that the float in the TR4 is not hollow, but rather solid. He thinks that the solid ones eventually soak up gas like a sponge, becoming heavier. Do you have any experience with this? Does it seem plausible?

Another poster said they replaced the floats on their TR4 with "newer" ones (not specified). That implies they thought there was something wrong with the old ones, and that the newer ones would be better. I have e-mailed him back to ask which floats he used, and what the reason was.

Thanks and regards,

-Dave

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Mon, 30 Apr 2007
From: "Pam and Dave Gildner" <penguin@teksavvy.com>

> ----- Original Message -----

> Subject: Problems with St-Zn Carb Floats for a TR4

> Sent: Mon, April 30, 2007

> From: <ccsimonsen@gmail.com>

>

> Hi Dave,

> I had to make some of the newer style floats work with my TR4. I make some spacers to center the float and
> used a gross jet vs standard needle as the float arm did not quite hit the standard needle squarely. I have used
> this setup successfully for the last 7 years.

> -Chris

Hi Chris,

Thank you very much for replying, and for considering my problem.

The floats for my style of 175CD carb do seem to be unavailable at Moss, Roadster Factory, and Victoria British. I assume you found the same thing, which is why you went with newer ones.

Can I ask you the reason you replaced your floats? Was it because they are hollow and developed leaks, or were they solid and started to soak up fuel like a sponge? Or some other reason?

Can I also ask you what "newer" floats you used? Were they the floats from the TR250's version of the 175CD, which are VB part number 3-620 or Moss part number 365-505?

Thanks and regards,

-Dave

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Tue, 1 May 2007
From: "Pam and Dave Gildner" <penguin@teksavvy.com>

Thank you, Chris. It seems like this is the route I should follow. I do have a Dremel for making the adjustments.

Did you have to make any adjustments to the plastic parts of the float, or only to the metal parts?

I have both needle valves and Grose Jets on hand, and they all "look" fine from the outside, so if I need to use a Grose Jet with the later float, it's available.

Your advice has been much appreciated. Regards,

-Dave

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Tue, 1 May 2007
From: Cosmo Kramer <TR4A2712@yahoo.com>

Hi Dave!

Thanks for sending me your reply to Chris's E-mail, & Keep sending me all the others, because I'm saving this thread in my "TR4/A E-mail Manual", & I'd like **ALL** the correspondence from this thread.

If you having a hard time finding the floats, then phone:

Joe Curto

22-09 126th St.

College Point, NY 11356

78-762-SUSU (7878)

<www.joecurtoinc.com>

He really doesn't do E-mailing much, but you can try. Phone him, & ask him if he would sell you the floats & any other parts to fix the Zn-St. He REALLY has been in the business for over 40 yr. & knows his stuff, but he's more of a repair shop than a distributor.

-Cosmo Kramer

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Tue, 1 May 2007
From: "Chris Simonsen" <ccsimonsen@gmail.com>

my car had sat for some 11 years before I got it. That's a whole nuter story.....

But as a result, the floats were dried and cracked. It's totally unusable, & replacements NLA. Looked everywhere - bought some used and they were as bad as the ones I had.

I went with the later ZS floats from TRF. I believe the TR250 and early TR6 floats are one in the same. The float is a hollow cloudy plastic type vs. foam of the original. I weighed them for giggles and they were very close in weight and size - that way I figured I could use the same float level adjustment.

I did all my mods to the floats - none to the carbs. I carefully cut and trimmed until the float fit and biased the remaining arm to center as close as possible under the grose jet. It hit a little bit more than half on as I recall - but since it is a ball I did not worry. I was sure the needle would jam.

I used small brass spacers - chrome plated was all I could find at the hardware store. I trimmed them with a hacksaw (did not have a dremel at that time) and then used small washers to shim as required.

I made sure to deburr anything in contact with anything - I don't want metal shavings in the carb bowl or to wear away the insides of my carbs.

As I recall - it did not take all that long - with a dremel to cut and debur I think it would have been much faster. Have fun with the project - that is what about 1/4 of the fun with these cars are- the other 3/4's is the driving - to be honest - It took about 5 years of driving to get to that ratio - but it has been fun!!!

-Chris

Dave Gildner <penguin@teksavvy.com> wrote:

> ----- Original Message -----

> Subject: Problems with St-Zn Carb Floats for a TR4

> Sent: Mon, April 30, 2007

> From: <ccsimonsen@gmail.com>

>

> Hi Dave,

>

> I had to make some of the newer style floats work with my TR4.

> I make some spacers to center the float and used a grose jet vs standard needle as the float arm did not quite hit the standard needle squarely. I have used this setup successfully for the last 7 years. I hope this helps.

> -Chris

Hi Chris,

Thank you very much for replying, and for considering my problem.

The floats for my style of 175CD carb do seem to be unavailable at Moss, Roadster Factory, and Victoria British. I assume you found the same thing, which is why you went with newer ones.

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Can I also ask you what "newer" floats you used? Were they the floats from the TR250's version of the 175CD, which are VB part number 3-620 or Moss part number 365-505?

Thanks and regards,

-Dave

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Tue, 1 May 2007
From: "Pam and Dave Gildner" <penguin@teksavvy.com>

> ----- Original Message -----

> Subject: Problems with St-Zn Carb Floats for a TR4

> Sent: Tuesday, May 01, 2007

> From: Randall

>

> Hi Dave :

> I'm not certain, but I believe the TR4 ZS float is what's called "Nitrophyl" construction (or something like that
> anyway). It's not exactly solid, nor exactly hollow, but a kind of foamed plastic similar to that stuff for home
> insulation. I have definitely had problems with that kind of float, where the float would not hold the valve
> closed (although not on a TR). Drove me crazy on my Winnebago, as even new floats would fail within a
> matter of months, always at the worst possible moment. I believe what was happening was that the plastic
> material used was being attacked by some of the additives used in modern gasoline (possibly MTBE at the
> time), and becoming porous enough to allow fuel to soak into the float. With cool fuel it would still work OK,
> but hot fuel isn't as dense, so the bowl would overflow when the carb got good and hot (like pulling the motor
> home up a hill). However, another possibility is that something is shedding crud into the fuel, which is then
> getting caught in the valve and blocking it open. The soft fuel lines between the filter and the carbs are
> particularly suspect; I've seen this happen several times. You might try replacing all the soft lines and blowing
> out the hard lines, before blaming the floats. BTW, I was eventually able to source some brass floats for the
> motor home, which solved the problem permanently. Unfortunately I've never heard of brass floats for ZS
> carbs, so I suspect you are stuck buying new ones, and hoping they are made of plastic that will resist modern
> gasoline.

> -Randall

Hi Randall,

Thanks for the comments. It seems as though the weight of opinion is gravitating towards the float being the culprit. You mention that the carb on the motor home would overflow when hot but not necessarily when cold, and that was our experience also. We had it happen a number of times after driving a while on a hot day, but I don't remember it on cold days.

Of course, when the gas tank is full and the car is stationary, that's a different story. Presumably something is keeping the valve open, and the gas just runs from the (higher) tank to the (lower) carb, and right through it into the engine. I know it could be a speck of dirt caught in the valve, but I have always had 2 filters in the system (glass trap on the fuel pump, plus recently-replaced in-line filter). I have never seen any crud in the float bowl, the many times I have taken these carbs apart. I also pumped some gas into a clean glass measuring cup, and let it settle, and didn't see any dirt. I did that test twice.

The stock floats for TR4 175CD are not available at Moss, VB, or TRF. But one of the other e-mailers said that he adjusted early TR6 floats to fit the TR4 carb. His reason: the original floats were cracked when he got the car, and he couldn't get new ones. He says he has used that setup, with Grose Jets, for 7 years with no problems.

So if no other good ideas pop up, I think I'll order a TR6 float and try that idea.

Thanks and regards,

-Dave

Subject: Problems with St-Zn Carb Floats for a TR4
Sent: Sunday, May 06, 2007
From: "Pam and Dave Gildner" <penguin@teksavvy.com>

Hi Chris,

Thought I'd let you know the progress. I bought the TR250/TR6 float - was surprised that the store actually had 2 of the original TR4 floats in stock - they didn't know what car they were for - so I was able to enlighten them. They might be the last 2 in existence - but I didn't get them, even though they would have popped right in. For one thing, they were more expensive than the TR6 version, and for another, I didn't know how long they'd last before they soaked up fuel and gave me the same problem.

Had no difficulty with the trimming or the spacer (had something exactly the right size in a jar of miscellaneous hardware). I did have one unexpected hitch though - the shape of the bowl casting is such that it gets very close to the float hinge pin. With the spacer in place, the bowl casting contacted the spacer. Once tightened down, the float would no longer move. I considered grinding some clearance into the aluminum bowl, but decided to try extra gaskets first. Figured it would be less invasive surgery. I ended up with 3 gaskets stacked up, and that did it. It's not leaking so far - I hope it doesn't. I used the Gross Jet.

In testing, the valve seemed to be holding tight against pump pressure, although with all the activity the o-ring on the brass mixture adjustment knob (sticking out below the carb) decided to get a little loose and start leaking. I didn't have another one, so had to go shopping for that before proceeding. I got it all back together today, and no leaking so far. Car started right up, and after a little adjustment, we took a test drive which was successful.

Now, it's just a matter of time and observation, to see if this really has eliminated the problem.

Thanks very much for helping with this, and for making the suggestion of using the later floats. I doubt that I would have thought to try that, and even if I had, I would not have been too confident that it would work. Happy driving!

-Dave

> ----- Original Message -----

> Subject: Problems with St-Zn Carb Floats for a TR4
> Sent: Tue., May 01, 2007
> From: <Chris.Simonsen>

>

> I did not touch the plastic float part. Only trimmed the edges at the hinge and added the shims If you want to

> talk in person my cell phone is 919-426-9163 I live on the east coast turned out being pretty straight forward
> the spacers were the hardest parts.... Good luck!

> -Chris

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Tue, 1 May 2007
From: "Pam and Dave Gildner" <penguin@teksavvy.com>

Pam and Dave Gildner <penguin@teksavvy.com> wrote:

> Hi Chris,

> I guess I spoke too soon. Last night I started the car up and ran it (in the garage) until it was up to
> temperature. It started very quickly, better than usual. This morning, when leaving for work, I smelled
> gas. Yup, same thing, flowing through the same carb, into the manifold.

> -Dave

Hi Dave!

Thanks again for sending me this up-dated E-mail. It should be interesting on what his reply is. I'll still keep adding to the thread.

My 2 cents: It could be the Gross Jet (GJ), or not having the float set right. As I recall, you had to add some thickness to the gasket, right? So using the 'Float Gauge' will be of no help unless you calculate the additional thickness of the gasket, but that still is only guess work. You could go back to switching the GJ again, but that still may not work because they are GJ & not needles. If you purchase the needle & it STILL doesn't work, then you're back to where you started with more \$money\$ spent.

Suggestion that will be hard for you to accept: Have the carbs professionally rebuilt. Then if you Still have problems, you can go back to that person with a complaint.

Keep me informed on what's going on, & do you want to write up a summary of what's happened [No names mentioned] for me to submit to the TRIUMPH List, again?

-Cosmo Kramer

Subject: Problems with St-Zn Carb Floats for a TR4
Date: Tue, 1 May 2007
From: "Pam and Dave Gildner" <penguin@teksavvy.com>

Hi Jeff,

The extra thickness of the gaskets won't make any difference to the float setting. All the gasket does is effectively deepen the float bowl a little.

Last night I changed the valve - removed the Grose Jet, replaced it with one of the original needle type valves that were in the carbs when we bought the car. I also adjusted the float downward - to make SURE that even a small amount of fuel in the bowl would force the float up and close the valve.

I pumped the carbs full of gas manually with the fuel pump lever, but did not start the car. By this morning, the gas was flowing through and being caught in a dish I placed below.

I'm not entirely sure what I'm going to do next. Regards,

-Dave

PS- Jeff, to answer your question about the Damper or Dash Pot: I took off the top cover, then took out the air valve with its needle sticking out of the bottom.

For what it's worth, by the time I got home from work today, gas had climbed out of the jet of the spare carb, and was starting to make small pools in the carb, but not enough to drip out yet. So maybe that's progress!

-Dave

Fuel System/Carburetors/Zenith-Stromberg

Subject: Stromberg bypass valves
Date: Sun, 12 Aug 2007
From: "Scott Suhring" <suhringtr36@comcast.net>

-----Original Message-----

Subject: Stromberg bypass valves
Sent: Sunday, August 12, 2007
From: "Scott Suhring" <suhringtr36@comcast.net>

On Stromberg Carburetors, do the bypass valves have any effect on idle quality . Thanks
-John Mitchell

Yes. If the diaphragm is torn, you will not be able to get the idle below 1800 to 2000 RPMs.
-Scott Suhring

Subject: Stromberg bypass valves
Date: Sun, 12 Aug 2007
From: <DLylis@aol.com>

Indeed. If they are not functioning properly. You will find that your idle behaves like you have a vacuum leak.
-David Lylis

Subject: Stromberg bypass valves
Date: Mon, 13 Aug 2007
From: "James Henningsen" <trguy@cfl.rr.com>

John:

Yes - the bypass valves can cause idle issues (particularly higher idle). I have a modified street engine and I blanked off the bypass valves with a solid gasket to eliminate higher than desired idle. Check the VTR website for an article on the bypass valve idle issue.

<<http://www.vtr.org/maintain/zs-tech-tips.shtml>>

-Jim Henningsen

Subject: Stromberg bypass valves
Date: Mon, 13 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

> On Stromberg Carburetors, do the bypass valves have any effect on idle quality?

Only if they leak, or are mis-adjusted. Normally they should stay fully closed at idle, and only open during over-run (car pulling the engine).

-Randall

Subject: Stromberg bypass valves
Date: Mon, 13 Aug 2007
From: <Harrymague@aol.com>

John, sorry I took so long to get back to you. The attach file is from the British Leyland Technical Training Series. I hope it answers some of your question.

-Harry Mague

PS- For the net, I didn't attach the file. If anybody wants it, let me know and I'll forward it direct.

Fuel System/Carburetors/Zenith-Stromberg

Subject: Summary: ZS needles?
Date: Thu, 18 Sep 2003
From: Don Malling <dmallin@attglobal.net>

I bought new jets from Joe Curto some time back and he recommended and sold me the B1E Jag needle because of my stage II cam (274 duration and .425 valve lift) and 9.5:1 CR -- I think -- maybe it was the gas, are just a combination of things.

The engine and carbs are not together yet and I was going to go with the original needles B1AF, and keep the Jag B1E in reserve, but maybe I should go with the B1E right off. Maybe it's easier to lean out the B1E rather than "enrich" the B1AF with adjustments?

Maybe one of you more knowledgeable guys could call Joe and get the complete story. Tell him a bunch of his customers are a little unclear as to what to do. He's very nice to talk to, but I feel like I'm wasting his time -- not sure I understand everything he's telling me.

Joe Curto: <<http://www.geocities.com/jcurtoinc>> 718 - 762 - 7878
-Don Malling

Randall Young wrote:

>> I called carb guru Joe Curto, and explained the problem my car was having. Basically, hard starting, hard to
>> launch, rough idle, hot running. I suspected a lean mixture. The plugs read a little lean, too. Joe was not
>> surprised. He claims that gasoline is formulated leaner now, than when these cars were built.

> He's absolutely right, for most of the USA. The dirty word is 'oxygenate', usually ethanol or MTBE.

>> Joe sent me two ZS B1E needles as were originally used in Jags. Before I installed them, I measured their
>> diameter about 1/4" up from the point, and they are .010" skinnier than the stock needles.

> Cool tip ! Thanks!

> I thought I was going to have to start dressing them down by hand.

> -Randall

Fuel System/Carburetors/Zenith-Stromberg

Subject: TR4 Stromberg needle selection
Date: Tue, 4 Nov 2008
From: "Karl Vacek" <kvacek@ameritech.net>

The car is stock AFAIK, no mods to my knowledge or observation-- (I just bought it, but there are lots of reasons to believe it's very original. 175 CD Strombergs. I haven't run it since buying it -- it needs a full fuel system overhaul.

I bought carb kits for my '64 TR4 from Joe Curto, and he sent 2H needles, but all books call for a 2A needle for TR4's. TR4A's use a 2H needle, but they've got a different cam too. The needle specs show the 2H is roughly .009" thinner at most stations, so this is going to be a much richer needle.

I called Joe Curto and he said he meant to send this needle, as it's the "go-to" needle for TR4's. If that's so, why didn't the factory change the specs?

I know he rebuilds lots of carbs, but I hesitate to change from stock till I have a reason to do so.

Anyone got a Stromberg-equipped TR4? What needle do you use? Thanks!
-Karl

Subject: TR4 Stromberg needle selection
Date: Tue, 4 Nov 2008
From: <Chip19474@aol.com>

Karl wrote:
>If that's so, why didn't the factory change the specs?

Karl,
In a nutshell.....I'm guessing that the 2A needle was the "best match" in 1964 for performance and drivability over the entire range of rpm and was probably best suited to 1964 fuel composition (which included lead to improve anti-knocking).

Fast forward to the 21st century and, while performance and drivability concerns haven't changed, fuel composition certainly has and that's where more robust (richer) needles like the 2H can help. Try the 2H needles and see if they work well for you....I gave up stock needles many years ago and have never regretted it. I'm using B1E needles on my TR6 Strombergs (later adjustable needle style 175 CDs) which are quite a bit "thinner" than stock. My engine has been extensively modified so these needles work very well but I've fitted them on TR6 motors with lesser modifications and have gotten similar good response.

So, you could rebuild with 2A and see how it runs then swap out the needles for the 2H and compare - my preference would be to install the 2H and enjoy!
-Chip Krout

Subject: TR4 carb needles
Date: Wed, 5 Nov 2008
From: <CarlSereda@aol.com>

Karl wrote:
> The car is stock AFAIK, no mods to my knowledge or observation-- (I just bought it, but there are lots of
> reasons to believe it's very original. 175 CD Strombergs. I haven't run it since buying it -- it needs a full fuel
> system overhaul. ...

FYI:

The Stromberg Spare Parts Schedule says;

TR.4 1963 - early 1964 ID#1825 2A needle

TR.4A early 1965 only ID#3043 2E needle

TR.4A May 1965 - 1966 ID#3069 2H needle

also, the first two carbs use natural colored piston springs, the last one uses a red piston spring.

PS; very late in TR.4A production the carbs were leaned out for emissions control - but by then the carbs were SU's.

-Carl

Fuel System/Carburetors/Zenith-Stromberg

Subject: TR-4 Stromberg Piston
Date: Mon, 14 Jan 2002
From: "Jack W. Drews" <vintr4@geneseo.net>

David Massey wrote:
> Written by Scott Tilton
>> I was tinkering with the TR-4 again after a drive around the neighborhood. I noticed that the pistons in the
>> Zenith Stromberg carbs don't raise equally when I open the throttle.
>>
>> A quick check with a Unisyn tool shows equal suction at idle on the front and the back carbs.
>> Any thoughts on what I should check?

Often times this is because of the adjustment of the two arms on the center carb linkage shaft.

Notice that the throttle linkage is connected to the center shaft. Then notice that its motion is transmitted to the carburetors by two small arms on that shaft, that have little nubbins that fit into slots on the carb linkage. It is at this point that the mis-adjustment often occurs. Move one of the arms so that the nubbins contact the edge of the carb linkage slot at the same time.

Gosh, that's the best I can describe it, but I'm not sure I would understand what I said.
-uncle jack

Subject: TR-4 Stromberg Piston
Date: Mon, 14 Jan 2002
From: Scott Tilton <sdtilton@yahoo.com>

I'm not sure this is right for a TR-4 with Strombergs.

On mine at least. . .the linkage attaches at the front side of the front carb. The rear carb is downstream (mechanically) and is connected with a single rod (and springy connectors) running between the carbs.

I guess checking the diaphragm would be fairly easy . . . The car has sat for a long time without much use over the years.

A related question: how interchangeable are the parts? Can I take a air valve (piston) top cover from different carbs and still expect them to work together? (there are probably some issues about centering the jet or something of the sort)

-Scott Tilton

Subject: TR-4 Stromberg Piston
Date: Mon, 14 Jan 2002
From: "Williams, Bill (Atlanta)" <Bill.Williams@compaq.com>

Scott,

Checking the air valve diaphragm for damage takes about 2 minutes. Just remove the 4 screws from the top cover and lift it off. You'll see the black diaphragm. Check it for any cuts or tears. After inspection, look for a little tab off to the side of the diaphragm. That tab must sit into the corresponding tab on the carb body. You'll see it...it's hard to miss.

As far as switching parts around, the air valve piston and damper should stay with the original carb body. The other stuff, for the most part and depending on year, can be swapped around.

-Bill

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A related question: how interchangeable are the parts? Can I take a air valve (piston) top cover from different carbs and still expect them to work together? (there are probably some issues about centering the jet or something of the sort)

-Scott Tilton

Subject: TR-4 Stromberg Piston
Date: Mon, 14 Jan 2002
From: David Massey <105671.471@compuserve.com>

The Strombergs are less sensitive to this but as you say you may have to recenter the jet. The piston rides up and down in the cover on the dashpot bores and you may have to keep the piston and covers together as pairs. But it is possible that the manufacturing tolerances are good enough that you can swap them around.

The diaphragms are fully interchangeable. Also check that the springs are both there.

-Dave

Subject: TR-4 Stromberg Piston
Date: Mon, 14 Jan 2002
From: <ArthurK101@aol.com>

<sdtilton@yahoo.com> writes:
> Any thoughts on what I should check?

Scott, first see if the diaphragms are not torn. If they are OK, then check the springs on the piston shafts. They should be the same. Check the needles to see if they are seated properly and have no burrs. Then be sure that the oil in the dampers is the same weight in both (I have always used 20W -but others on the list use other weights) and that the dampers are full.

Also check the linkages between the carbs. Be sure the small bolts that close the spring like pieces on the shafts are tight. Let us know what you find, please.

-Art Kelly

Subject: TR-4 Stromberg Piston update
Date: Tue, 15 Jan 2002
From: Scott Tilton <sdtilton@yahoo.com>

So Last night I checked the rear stromberg first. (it is the one one with the slow rising piston.) The diaphragm looked fine and everything seemed to move smoothly. I cleaned it up and put it back together. AftErwards I checked the piston travel . . it fell smoothly all the way to the bottom and gave the required metallic click when it hit bottom.

So then I moved on to the front carb. It also seemed fine with the exception that it was missing the little washer that goes under the spring. (above the air valve piston)

I find it hard to believe that this ultra flimsy spring, much less the little washer that it rests on, can noticeably affect how quickly a piston rises or falls. None the less, I went and found another washer in a spare carb and installed it. (found that the same washer was missing in first two spares that I tried.)

Everything went back together and I started the car. Same result: rear carb piston doesn't raise as much or as fast as the front when the throttle is opened.

I shut the car off and decided to raise and drop the pistons and see if they fall at a similar rate . . . before I got there though. I noticed that I could feel a most definite difference in the amount of force required to lift the pistons. The rear is much harder. As if the oil in the rear carb was gear oil. (it wasn't of course)

I unscrewed the dampeners from the top and switched them, front carb to rear. Same result.

Right about then my wife came and gave me a disapproving look for not eating the food she had made for me. (rightly so)

That ended the night's investigation. Anyone want to suggest what to check out next or guess what I'll find?

Should I measure damper piston diameter or bore diameter? Is there some sort of vent hole that could be blocked? Could I try using a much lighter (thinner) oil in the rear carb? (not that it would be a permanent fix . . but more a diagnostic "what if" test.)

I could always try swapping parts from some of the spare carbs I have around.

And another thing. . . when I went to move the TR-4 out of the way this morning. . . (37degrees F here in No VA) it was like the damned thing was running on two cylinders! I could scarcely make it move.

-Scott Tilton

Subject: TR-4 Stromberg Piston update
Date: Tue, 15 Jan 2002
From: <ptegler@gouldfo.com>

This may sound funny... but to perform a test to determine the 'source' or the problem first.

Pull the carbs off the car. Use a vacuum cleaner to test how high/fast the piston rises

I use a cardboard tube with a hole in it and a second tube around which I can slide up the tube to close off the hole in the side of the tube to control how much vacuum the carb sees. This will allow you to determine the 'energy' required to lift the piston and to 'match' the pistons.

Now... the reason to go through this? It's an easy way to see if it's the engine piston balance problem front/rear not pulling the same air, not pulling enough air, verify a vacuum leak on your intake manifolds or some other problem.

BUT most important..... If using the vacuum cleaner, you can play with various 'ports' on the carb and not worry about gasoline or its effects on the engine (rich/lean etc) You can test it with/without dashpots etc.

-Paul Tegler

Subject: TR-4 Stromberg Piston update
Date: Tue, 15 Jan 2002
From: "elliottd" <elliottd@look.ca>

I suggest shut off the engine and with the air filters off, lift the pistons and look in the carb throats to see if both the butterflies are fully closed. Then manually turn the throttle to see if both the butterflys open the same amount at the same time. If the "springy" thing connecting the two butterflys is not adjusted properly, one butterfly may be fully closed and the other partly open. This may be causing the problem.

-Don Elliott

Subject: TR-4 Stromberg Piston update
Date: Tue, 15 Jan 2002
From: Scott Tilton <sdtilton@yahoo.com>

Hey Bob . . (et all)

Thanks for the reply . . those sound like good techniques. I might want to clarify the symptoms.

I haven't swapped the "pistons" meaning the air-valve diaphragm assembly. They seem to move up and down in their carb bodies' just fine. When I install the dampers (the little rods that screws in the top of the carbs) . . . then one carb has more resistance to in the air valve piston moving upwards. It doesn't matter if I swap the dampers (little rod that screws in the top) between carbs . . the rear carb always has the harder piston to move. The restricted movement is most definitely related to dampening effect and not the air valve or the needle dragging on anything.

-Scott

BOB KRAMER <rgk@flash.net> wrote:

> I haven't paid any attention to this thread so forgive me if I cover old ground. If the pistons are doing the same
> thing after swapping, i.e.; when you moved the piston the problem moved, than check to see if the needle is
> straight. You can also wipe a little lithium grease inside the bore as a telltale to see if the piston is rubbing. If
> you find it cocks to one side diagonally when lifted, it may be too small.

> -Bob Kramer

Subject: TR-4 Stromberg Piston update
Date: Tue, 15 Jan 2002
From: "ptegler@cablespeed" <ptegler@cablespeed.com>

Look very carefully at the little 'piston' at the end of the damper rod. The free floating collar on them are different lengths on different model carbs. You may have two different clearances of the ring vs. the rod.

-Paul Tegler

Subject: TR-4 Stromberg Piston update
Date: Tue, 15 Jan 2002
From: "levilevi" <levilevi@attbi.com>

Scott,

Maybe it's the air valve that is easiest to move has the problem not the one with more resistance. It could be that the o-ring in the front air valve needs to be replaced. There's an o-ring on the needle adjusting screw that is inside the air valves. This is assuming that you have carbs with adjustable needles. I'm not sure how ZS carbs on a TR4 are adjusted for fuel mixture so this may not apply. On my ZS carbs that o-ring holds the damper oil in the air valve so it doesn't leak out and get into the fuel mixture. Does your front air valve hold damper oil or does it disappear quickly? How about the back one? One better than the other?

If you have a bad o-ring in that front air valve then it might explain the symptoms you described....your rear air valve has more resistance than the front with the dampers in but not with them out (because the air or oil gets pushed out where the o-ring should be stopping it). Swapping dampers doesn't change the problem (cause the bad/missing/cracked o-ring is still in the front air valve). And that the air valve and dampers don't drag on anything (because it's the difference in pressure release not drag that's the problem).

Now this applies only if both air valves start out with the same levels of oil or air (no oil) in both...they're both fluids when you're comparing lift of the air valves or pushing the damper down into the air valve so it's a matter of comparison when your fluid density is equal in both. Given all that, it seems to me like you have a leak in your front air valve dampening system if the pressure/resistance is different and that means o-ring.

You can replace the o-rings...at least I can on my 1971 ZS 175 CD-2 carbs. The o-ring size is 2-010, call your local gasket/o-rings/seals place or you can call mine (Rocket Seals in Denver 303-777-7024...NFI) and tell them you want that size in Viton which is a oil-resistant compound of some sort and lasts a little longer than plain rubber. To get the old o-ring out take a long skinny punch (I've even used a pencil but they WILL splinter and jab you in the hand...not that I'VE ever done that) and drive the needle adjusting screw out the top of the air

valve (of course you've removed the needle first). There's a star washer that holds the adjusting needle screw in place so make sure you cover the top of the air valve with a rag or you'll be chasing that star washer around the garage floor. Put the new o-ring on and reverse instructions (as Bentley says). You can use your punch to make the star washer go back in and sit down flat on the needle adjusting screw. Be gentle but make sure the adjusting needle valve and star washer are flush to the bottom of the air valve.

As far as the car running roughing when you moved it. If you've been pushing/leaking damper oil (gee List I wonder what the best damper oil might be????) into the engine past that bad/missing/cracked o-ring maybe it fouled a plug or two. But then again that's just a guess too.

Hope this solves your problem. But if not maybe some leaky damper o-rings will get fixed which should improve your acceleration.

-Bud Rolofson

Subject: TR-4 Stromberg Piston update
Date: Tue, 15 Jan 2002
From: "Don Spence" <dspence@oanet.com>

The differential in resistance would indicate a difference in the "gap" that the fluid must pass through. I'd venture a guess that the faster rising piston is "loose" or worn, allowing a quicker / easier passage of the "restraining" fluid. Think in terms of shock absorbers. The softer the shock (less resistance) the bigger the jets or vents. Get hold of inside and outside micrometers and measure the bores and rod diameters.

-Don

Fuel System/Carburetors/Zenith-Stromberg

Subject: TR4A 175 CD Metering Needles
Date: Thu, 6 Jul 2006
From: Michael Godley <mgodley@tiac.net>

Listers,

I am rebuilding the Strombergs on my 4A. The needles in the carbs have 022 stamped on them. Mine is early (1965), and the factory workshop manual specifies a 2E needle (up to CTC 54939, then 2H is specified).

Moss just shows two needles.....a 2A needle for TR4 and 2H for TR4A.

Is anyone familiar with the 022 size/designation? I have the profile for the 2H from an earlier post...does anyone have information on the 2E?

The engine is stock except for 87MM pistons. Has anyone experimented with a different metering needle for this modification? Thanks

-Mike Godley

Fuel System/Carburetors/Zenith-Stromberg

Subject: Tuning ZS 175 Carbs
Date: Thu, 28 Feb 2002
From: "levilevi" <levilevi@attbi.com>

----- Original Message -----

Subject: Tuning ZS 175 Carbs
Sent: Thursday, February 28, 2002
From: "Geo Hahn" <geohahn@theriver.com>

- > I've set the TR4 carb mixture using the method described in Haynes of cranking the jet all the way up then
- > bringing it back down 3 turns.
- >
- > Seems to run okay but is there a method for dialing in a more exact setting?
- >
- > The manual describes lifting the piston 1/32 inch with the result being no change in engine speed if the mix is
- > correct... speeding up if to rich, stalling if too lean. Is that an adequate test? I'm willing to drive -- stop --
- > adjust -- rinse & repeat -- if that is necessary but would need to know what I am looking for, i.e. what are the
- > driving symptoms of too rich or too lean?
- >- Geo Hahn

Geo,
Pull the tops off the carbs, pull the air valve (with the diaphragm still attached and adjust your needle so that the "shoulder" of the needle is flat even with the bottom of the air valve. Both needles being set at the same reference point from the bottom of their air valve is the important part. Now when they're back together (and with the diaphragm nib in the right place) you get one full turn either to the right (rich) or left (lean) to adjust the fuel/air mixture...at least that's the theory. In practice you adjust them, and tweak them, and play with them until your plugs are a nice chocolate brown color (not black or chalky white) on the electrodes. Read them often. Just keep track of where you are from your reference point as you change the mixture...or the penalty is taking off the carb covers and starting over.

-Bud Rolofson

Subject: TR4 ZS 175 lifting pins
Date: Fri, 1 Mar 2002
From: Scott Tilton <sdtilton@yahoo.com>

- Dave Massey <105671.471@compuserve.com> Wrote:
- > George, the ZS carbs used on the TR4 had special pins for lifting the pistons for this test (as do most SU's).
 - > As I recall at least one of them is in an awkward position and is best activated by a screwdriver. Be sure that
 - > the idle is set low enough (800 RPM) that the pistons will be low enough for the pin to give significant lift. In
 - > other words, if the idle is so high that the pistons are already 1/32 there will be no lift and you will see no
 - > speed change which will be a false indication of correct mixture.
 - > -Dave

That is a pretty neat thing about the early strombergs. (Another is the dirt simple choke mechanism) I sometimes worry about the pins being a source for a vacuum leak. I don't think there is much worry about not getting 1/32" of lift. That is a TINY amount. I haven't measured it, but the lift pin on TR-4 Strombergs can probably lift it 3/8". And they are both reached pretty easily.

-Scott Tilton

Fuel System/Carburetors/Zenith-Stromberg

Subject: Zn-St 175 CD float adjustment
Date: Mon, 3 Sep 2007
From: "Randall" <tr3driver@ca.rr.com>

> Book says: .625 to .672 or 16 to 17 mm float height adjustment,

So, which one did you use? 16mm is .630" and 17mm is .669".

> I am going to say I have them set on the high side now.

Since height is measured above the float, setting the measurement high results in a low fuel level. If you are "running out" of fuel rather than getting too much, you might try setting the float height on the low side.

> What should I do to correct this problem?

I'm too lazy to look it up, but ISTR there being something about this problem in the "Competition Preparation" manual. Maybe it was for an SU carb, but IMO it would be worth looking up.

-Randall

Subject: Zn-St 175 CD float adjustment
Date: Mon, 03 Sep 2007
From: "Glenn A. Merrell" <StagByTriumph@tscusa.org>

The millimeter measurements are correct, the conversions to inches are wrong in 4 of the 5 repair manuals.

-Glenn A. Merrell

Fuel System/Fuel Lines + Tank

Subject: Building your own fuel lines 101
Date: Mon, 29 Apr 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> 1. Is steel best for fuel lines or is copper a better choice?

I like steel.

> 2. Fuel line for the TR3 is 1/4" ID correct?

From the tank to the original pump is 5/16" OD (which probably makes it 1/4" ID), from the pump to the carbs is 1/4" OD. The fittings at the carbs are 1/4" OD, so if you run 5/16" up there you'll need some sort of adapter.

> 3. If copper is better, can I purchase 1/4" ID line from home depot or do I need special tubing?

The 1/4" stuff from Home Depot is 'soft' tubing, it's prone to work harden and crack over time.

> If steel, is bulk brake line/adapters/unions OK to get from Autozone?

Yup.

-Randall

Fuel System/Fuel Lines + Tank

Subject: Correct I.D. Fuel Line Hose
Date: Sun, 20 Jan 2002
From: Randall <ryoung@navcomtech.com>

> Do any of the other listers know where to get the correct hose? I am going to say it is 8 mm I.D. but I am not
> sure on this.

8mm is way too big. The original tubes are slightly larger than 1/4", so that 1/4" id should fit snugly. 6mm would be very snug, but might be too tight to go on. If you can find it, 6mm or 7/32" emissions hose might work best, as it will be a little more 'stretchy'.

The problem is that normal manufacturing tolerances for the fuel line are enough to make the difference between staying on and slipping off at the most inopportune moment. Even if you could find NOS hose, it wouldn't do well either, as modern gasoline (at least in most of the USA) will 'eat' the old rubber components.

For minimum visual impact, I would suggest the spring clamps with the ears turned down where they don't show. You used to get 4 of these clamps (and suitable lengths of hose) with every fuel filter for my old Dodge Dart, it's a shame I always threw them away <g> You could even paint them (Magic marker ?) to match the hose, or get FT to powder coat them flat black.

-Randall

Subject: Correct I.D. Fuel Line Hose
Date: Sun, 20 Jan 2002
From: "Brad Eells" <bradlnss@lightspeed.net>

I faced this dilemma a few years back. I chose to use 3/16 ID hose that is a VERY tight fit. No problems in the last 15 years!
-Brad

Subject: Hoseclamps, fuel-line and otherwise...
Date: Mon, 21 Jan 2002
From: "Jeffrey J. Barteet" <barteet@barteet.com>

I won't address the issue of how worm-drive hose-clamps look in terms of originality under the hood of your favorite TR, but I will share this tiny tidbit of wisdom about them.

The quality of worm-drive hose-clamps vary tremendously, though they all cost about the same. I learned to look for the good ones from working on marine applications in salt water environments.

Most all hose-clamps have Stainless Steel bands, the part that goes around the hose. However, the worm screw and its housing are OFTEN made out of ferrous metal which will rust and become unsightly at best, or seize to become inoperable or sometimes 'disappear' in a marine environment which can lead to a failure at the seal. If this is a thru-hull seacock, it is very bad.

The good ones are ALL stainless, and are marked as such. They look better too and last forever and cost about the same if you shop right.

Here's the trick in finding them: They are found in the plumbing section of your nearby hardware store and come in all sizes.

The ones found at your average Auto-zone \ Pep-Boys \ Automotive Section are pure crap.
Just my \$.02.

-Jeffrey

Fuel System/Fuel Lines + Tank

Subject: Crud in fuel and new Ethanol blends
Date: Mon, 24 Apr 2006
From: <spamiam@comcast.net>

Hi, Joe!

You said you are worried about the new ethanol causing the gunk in the fuel system to become loose and clog important parts.....

Well, my philosophy about stuff like this is... if it ain't broke don't fix it.... sort of.

I would put a good inline filter in the fuel line before the pump. Make it one you can visually inspect for trapped crud, and get a spare filter too. They say that the paper filters are sensitive to water and lose flow with wet gas, so maybe avoid that type.

With a filter before the pump, all the crud will get removed before it hits any important parts.

The other option of the TR2-4A is to place it in the fuel line that runs horizontally across the front of the engine. It is easy to examine and access for changes. Since the carbs are the parts with the smallest orifices, this is where you really want to have the filtration anyway... probably... I guess. This will be my strategy for now.
-Tony Rhodes

Fuel System/Fuel Lines + Tank

Subject: TR2-6 Fuel Line Plumbing
Date: Sat, 12 Jul 2003
From: "Hugh Fader" <hfader@usa.net>

I just wanted to let everyone know that the problem is solved and my fuel system plumbing is complete. I guess others have been through this, but Scott Suhring sent me the solution. The compression beads for old fuel lines are longer and NLA. Take two regular compression beads and file off about 1/3 of each. Then put them both on the line and tighten the fitting.

Also, the inlet side of the pump is 5/16", not 3/8. The outlet is 1/4".

Also, I bought the spring type hose clamps from TRF. These are the type you normally get with fuel filters. They seemed too large for the 1/4" hose on the carbs. So I went with other clamps. I tried squeezing them together to make them tighter, but wasn't confident in the result. I suppose I'll give TRF a call.

-Hugh

Fuel System/Fuel Lines + Tank

Subject: TR4 fuel tank - feed thru holes in body
Date: Sun, 24 Sep 2006
From: "J.C. Hassall" <jhassall@blacksburg.net>

I'm preparing to reinstall the fuel tank in my TR4 and noticed that there are two holes in the body for the fuel line. Clearly only one is needed, but I've not been able to find a plug the correct size for the other (passenger side). I'm reluctant to just cover it with some fiberglass, so what's the real solution? Is there a plug (missing from the original car) which should go there? Chewing gum? TIA

-Jim

Fuel System/Fuel Lines + Tank

Subject: Vapor Lock? Fuel Lines
Date: Fri, 20 Feb 2004
From: "Arakelian, Peter" <arakelianp@mossmotors.com>

Check your fuel lines and filters for blockage from the tank to the fuel pump. A restriction can cause those systems. Sometimes the opening from the tank can become blocked with sediment, rust, poorly applied tank sealant. I've gotten stopped twice with similar symptoms.

-Peter Arakelian

Message text written by <[ebk](#)> wrote:

> Thanks for the reply & education lesson on 'wives tales'. I still don't understand where the extra fuel
> comes from to get gas fumes to the gas tank? I do gather that the line goes into the TOP of the tank, right? I
> own a TR4/A if that helps. Would I need a pump of some form, too?

OK, sorry, you need to put a TEE in the fuel line somewhere (close to the carbs) so that fuel is always flowing through the lines at a higher rate than the normal flow to the carbs. In order to keep the fuel pressure up where it needs to be the return line must have a restriction that will keep flow below the pump's capacity. It all takes some experimentation.

So the circuit would be like this:

The fuel will flow through the line from the tank to the engine mounted pump, through the pump, through the line to the carbs, and whatever fuel the carbs need will be drawn from that point. The rest of the fuel will flow through the return line, through the restrictor (which maintains fuel pressure at the carbs) and back into the tank. The flowing fuel through the lines will be cooler than if the fuel were static or moving more slowly as it would without the return line.

The return line can go back into the top of the tank but that isn't necessary, and your normal pump should be fine. The tricky part is sizing the return line restriction. Too big and the pump can't keep up. Too small and it won't help any. I guess a scientific way to do this is to measure fuel flow from the pump. This would be the pump capacity. Then select various restrictors and find one that will let one half of that flow rate pass back to the tank. That should leave plenty of capacity to feed the carbs. You can make restrictors (orifices) by getting some solid aluminum rod (steel will work but is harder to drill) and cutting pieces to a convenient length for attaching a tube to each end (say 1") and drilling different size holes through the center. Then splice them into a return line.

This is a lot of work and it may be easier to just insulate the line. But as an academic exercise it is interesting.
-Dave

Fuel System/Fuel Lines + Tank

Subject: Vapor Lock?
Date: Sat, 21 Jul 2007
From: "PBieling" <bielings@comcast.net>

The TR3 starts right up cold. I drive till it's good and hot. Then I shut it off. If I go to restart it right away it takes 20 seconds or so of running the new Moss starter till she fires up. It has been hot here in the northeast so, I am thinking vapor lock. Any ideas on how to cure it?

Subject: Vapor Lock?
Date: Mon, 23 Jul 2007
From: "wbeech" <wbeech@flash.net>

"PBieling" <bielings@comcast.net> wrote:

> The TR3 starts right up cold. I drive till it's good and hot. Then I shut it off. If I go to restart it right away it ...

I'm thinking that a heat shield may be in order here, I have a similar problem with my '58 TR3a. It starts and idles perfectly at operating temp of 190°F on the dial every time but after getting up to highway speeds, or mountain roads and it gets 'goog-and-hot' but still under 200°F, it will die every time I come to a stop.

Any suggestions from the list? Thanks

-Bill B

Subject: Vapor Lock?
Date: Mon, 23 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> Any suggestions from the list?

Joe Alexander is selling a very nice heat shield for just this purpose. Available for both TR3-4 and TR250-6 I believe.

Mine looks purty, but haven't had a chance to try it yet.

-Randall

Subject: Vapor Lock?
Date: Mon, 23 Jul 2007
From: <L1J1S@aol.com>

Randall, where can I see a picture of one? regards,

-Larry

Subject: Vapor Lock?
Date: Mon, 23 Jul 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Larry,

It's not on a TR3 but you can see a TR6 version at my web site under the Heat Shield link. I also have a link to Joe's site where you can see all of his products.

-Bob Danielson

Subject: Vapor Lock?
Date: Mon, 23 Jul 2007
From: "davewillner" <dwillner@ptd.net>

-Dave

Subject: Vapor Lock?
Date: Tue, 7 Aug 2007
From: "Terry Geiger" <tgeiger@shoalsbritishcars.org>

John Krause <jktr250@gmail.com> wrote:

> I have installed the Moss HS6 SU conversion in my 1970 TR6. I can start the car, but when it gets hot, the ...

What fuel pump are you running? It sounds like a stuck float valve in the rear carb or high fuel pressure. High fuel pressure will push the float valve open, overfilling the carb.

I run an electric pump with a fuel pressure regulator set to 2.5 lbs on my SU setup on my TR6. Also, the fuel line is on top of the intake manifold, away from the exhaust. I also run a heat shield (provided by Joe Alexander) to help keep things cool.

As a test, you could wrap the fuel line in some reflective heat insulation and see if that helps.

-Terry Geiger

Subject: Vapor Lock?
Date: Tue, 7 Aug 2007
From: "Mitch R. Meisler" <mrm@clking.com>

Terry Geiger wrote:

> What fuel pump are you running? It sounds like a stuck float valve in the rear carb or high fuel pressure. ...

I had the exact same thing happen to my TR4A which had Zs carbs. It turned out that I had swapped on K&N filters, and the chrome backers blocked two breather holes (one each carb) for the float, and caused the flooding and starting issues once the car got warm. May not be the case with yours, but if you switched filters, make sure that all holes are open. Drilling out the two holes (Jeff playa at Paltech figured out/corrected the issue) & solved it.

-Mitch Meisler

Fuel System/Linkage + Manifolds + PVC

Subject: Choke cable
Date: Tue, 2 Dec 2008
From: "Rick" <chandler.rick@comcast.net>

> "Now that its fall I find I need to use the choke on the TR3. My question concerns the choke cable. After
> you pull the cable out is it supposed to slowly return to the off position or stay where you put it.
> -Pete Bieling"

Pete,
The original cable comprised a knob, a 3" shaft, and the cable itself. The shaft was notched along one side with 3 detents, allowing for 3 positions of the choke, plus "full off". The cylindrical metal sheath that contained the notched shaft was slotted, and in that slot was a thin piece of metal, the "half-moon" that Randall referred to a few days ago. On the outside of this slot was a spring clip that retained the "half-moon" and forced it against the shaft and into one of the detents. To operate the choke, the driver simply pulled the choke out until the desired detent engaged. When the driver wished to reduce the choke, a simple rotation of the knob disengaged the detent, and the shaft was free to retract.

The Moss unit is an exact replica of the original choke cable, but with the bizarre omission of the "half moon" piece, so that no detent action is possible. As I recall, even the spring clip is present. I made my own "half moon" piece from a small piece of shim stock (the piece is approx 1/4" on a side and maybe 0.040" thick) and now have a fully functioning detented cable with choices of light, medium, and full choke available.

-Rick Chandler

Subject: Choke cable
Date: Tue, 2 Dec 2008
From: "Mo and Dave MacKay" <m.d.mackay@sympatico.ca>

Rick Chandler wrote:

> I made my own "half moon" piece from a small piece of shim stock (the piece is approx 1/4" on a side and
> maybe 0.040" thick) and now have a fully functioning detented cable with choices of light, medium, and full
> choke available.

I've looked in my copy of the Spare Parts Catalogue, but I don't see anything that resembles that "half moon" piece. Do you have a drawing of what it should look like?

I'd like to fabricate one for use with the replacement choke cable that I recently ordered. Having a choice of working detent would be appealing --- I keep losing the clothes pins that I've been using 'till now. Regards,
-Dave MacKay

Fuel System/Linkage + Manifolds + PVC

Subject: Hard choke
Date: Fri, 23 Jun 2006
From: Bob Labuz <yellowtr@adelphia.net>

Fred Thomas wrote:

> Anyone having trouble with the choke being hard to pull open is because the cable is run and connected
> improperly, check Bob Schallers book "More B/S About TR'S and he covers the correct installation. The fork
> on the end of the choke rod goes on the ==inside== of the ==jet lever== the pin/cable clamp then goes
> through the jet lever then through the fork, as washer and a cotter pin, the fork ==does not== go between the
> jet lever as it would appear to, why do you think the connecting pin # 39 is so long, these parts are listed in
> the Moss catalog as follows, # 33 # 36 # 37 # 39, so 37 goes completely inside and not through # 33.
> -"FT"

Fred,
All I can say to this is: You have got to be kidding?

I took a look at the diagram in my TR4 shop manual and although the figure isn't perfect, I do believe this is correct! All these years I have had it installed wrong on my TR3A. It just seems so nice and neat the "wrong" way. Will I ever stop learning from this list??? I hope not!
-Bob

Subject: Hard Choke Issue Resolved!
Date: Mon, 26 Jun 2006
From: "Francis P. Gowash" <fpgowash@cox.net>

Having put up with an almost ridiculously difficult to pull choke for heaven knows how long, I now can actuate it without bending the dash, raising my blood pressure and vocalizing loudly to unappreciative bystanders.

Thanks for all of the suggestions, but the one from Fred Thomas was the first I tried and it worked! The push rod linkage on the front carb arm does NOT assemble with the lever arm in the center of the fork. The fork should be on the outside of the arm. I can now pull the choke with one arm...WOW and I gained 3 washers thanks to the DPO.

I suppose that there is a mechanical advantage lever action going on here... although the old way seemed straight forward enough. Thanks again Fred for your help and the diagram. This list is great!
-Fran

Subject: Choke cable TR3
Date: Sun, 11 Feb 2007
From: "fred thomas" <frede.thomas2@verizon.net>

Moss USA parts book page 18/19 part illustration # # 33 "Jet Lever" goes on the far inside (NOT THROUGH) of # 37 Fork end,, then insert # 39 through lever then through fork rod end, # 39 pin goes through Jet Lever and the choke cable goes on through the hole in the pin, in plain words the linkage goes on the inside of the jet lever and not through it, the pin goes through both parts and insert the choke cable, I have Bob Schaler's picture of the correct setup just can't find it. When installed correct the throttle will stay out as desired.
-"FT"

Fuel System/Linkage + Manifolds + PVC

Subject: Idle Behavior
Date: Sat, 06 Jul 2002
From: Hugh Fader <hfader@usa.net>

> -----Original Message-----

> Subject: Idle Behavior
> Sent: Friday, July 05, 2002
> From: <levilevi@attbi.com>

> > Is there a way to get full throttle travel and have the pedal even with the brake and clutch?

> Unhook the linkage to the pedal arm and then use a brick or something to hold the pedal to the floor. Adjust the linkage so that the carbs are fully open and the linkage looks like it will hook up with the pedal arm. That's your first priority...getting full throttle with the pedal all the way to the floor. It should be close to level with the other pedals when you let up. If not to your liking you can adjust the pedal arm on the rod also. It just takes a lot of fiddling around with the available adjustments from the pedal to the carb linkage. Good Luck.

> - Bud Rolofson

> Rich---You're right about the gas pedal sometimes being set too high for leg comfort. I've seen TR's with this pedal higher than the brake/clutch pedals at rest. As you know, it can be set even with, or as much as an inch below the brake pedal. Sometimes a little re-curving is necessary with this (soft) metal, while taking advantage of the throttle stop adjustment bolt at the pedal base.

> Anyone doing any of the above should be sure that they're still getting full throttle at the carbs, without jamming them on "open." This can be checked by taking the spring clip off at the throttle linkage and working it by hand, then try putting this clip back on while at "full throttle." (Engine not running, of course.) The pedal should bottom out slightly before the linkage is used up. Also be careful that the carpet doesn't interfere in any way...

Spent about 1/2 hour more doing what Bud advised. A lot of interaction between the horizontal link, the vertical link, and the hinge that connects to the throttle shafts. Anyway, now have full travel of the throttle and the gas pedal is even with the brake. Works great! Thanks again all.

- Hugh

Fuel System/Linkage + Manifolds + PVC

Subject: Paul Dorsey....gas pedal linkage
Date: Wed, 24 May 2006
From: <tr3bob@aol.com>

Paul,
I've been able to remove and install the pedal linkage without removing the pins....with and without the engine in place.

I started by sliding the pedal into the hole and feeding it until I reached the flange with the donut. I then slid the shaft end back to the final rest position.

Obviously this is easier done with the engine out of the car, but with a little patience, can be accomplished either way. Make sure you have the spring and steady bracket and all the components on and in the right order.

I found the REAL challenge was to screw the bearing assemblies (donut and covers) to the firewall. Use a VERY short screwdriver or a Chapman set for the (8) screws.....(4) each side. Hope this helps
-Bob Stahlbush,

Subject: TR3 accel. linkage removal
Date: Sun, 4 Jun 2006
From: <L1J1S@aol.com>

Hello, I need to remove my accelerator linkage, with the engine in place. Can anyone advise me to the best method to go about this? Also, from which end to I remove the linkage from?
-Larry Schwartz

Subject: TR3 accel. linkage removal
Date: Sun, 4 Jun 2006
From: Bob Labuz <yellowtr@adelphia.net>

<L1J1S@aol.com> wrote:
> Hello, I need to remove my accelerator linkage, with the engine in place. Can anyone advise me to the best ...

Larry,
There was a thread about this last week. You have to remove the linkage through the driver's side. Remove both shaft pins, all screws etc. Pull the petal portion through and into the driver's compartment, the rest should just come off easy. Don't worry if you lose or damage the pins. TRF has them available for about a buck. This will be a job however since you won't have too much space to move around. I would remove the battery first just to have some extra wiggle room.
-Bob

Fuel System/Linkage + Manifolds + PVC

Subject: Tall Guy in a TR 3, Adjusting peddle height
Date: Thu, 4 Mar 2004
From: "Randall Young" <Ryoung@navcomtech.com>

> Randall,
> I never knew the pedals could be adjusted. How does one go about doing that?

For the throttle, there is both an adjustable stop under the pedal, and an adjustable link between the lever on the firewall (sorry, bulkhead) and the bell crank on the intake manifold. Set the adjustable link to get the pedal height you want, then adjust the stop so the pedal hits it just as the throttle plates go full open.

The brake and clutch both have adjustments at the master cylinder. If you're trying to move the pedals lower on a later car without the stops for the brake and clutch, you may have to add the stops back in (bolt with two nuts, through the hole in the bracket). But be sure you leave at least .010" free play in the linkage to the MC when the pedal hits the stop. On Lockheed (front drum) braked cars, I think the MC moves in its mount to set pedal height, but I'm not certain about that.

-Randall

Fuel System/Linkage + Manifolds + PVC

Subject: TR-6 Gas Pedal Bushing **May NOT pertain to TR4/A**
Date: Fri, 22 Mar 2002
From: Hugh Fader <hfader@usa.net>

> Someone posted some pretty detailed instructions on this operation recently. It involved using a bolt and
> socket to evenly draw the bushing into the hole. As I recall, you

This may have been me describing the various methods I tried. Here is a copy of my posting:
Well, I just finished the job (except for losing the throttle return spring as it flew under the car somewhere). I would not have predicted this to be such an ordeal. Thanks to all for your advice. I used a bit of everyone's.

Here are my lessons learned:

- 1. As many suggested, I fit a 3/8" bolt through the bushings, put in my electric drill and ran it against a file to take off about 1/8" from the diameter of the button shaped flange on the bushing. The material did not come off cleanly, it kind of softened up and shredded. I trimmed it with a utility knife.
- 2. On the passenger (right) side, I used the utility knife to cut 4 V-shaped slots in the flange to allow it to collapse as it passed through the bulkhead. On the driver side I attempted to do the same, cut off too much material and ended up with a flat side on the flange. I later cut a flat opposite the first. I have seen bushings made both ways intentionally. Neither seemed easier than the other to fit.
- 3. I boiled the bushings to soften them. I'm not sure if this helped because by the time I got the bushings part way into place, they were already cool.
- 4. I pushed the bushings through from the inside of the car. It seemed easier to work from there.
- 5. I attempted to press the bushings through with a bolt through the bushing, bulkhead, and a large socket. Helped a bit on one side. Just squashed the bushing on the other.
- 6. The basic technique for putting the bushing in place was to fit it part way through the bulkhead and push on the slot between the two flanges with a large flat screwdriver. After quite a bit of pushing and twisting it was mostly in place. Then, I put the screwdriver into the bushing hole and turned to get it well seated.
- 7. Replacing the shaft was tricky. Pull back the carpet at the lower left hand side of the floor just in front of the clutch pedal. The shaft must be angled up into the bushing from BEHIND the other two pedals. If you try it from in front of them, it will run into the cylinder head. There should be just enough clearance to get the tip of the shaft into the bushing. Then use a screwdriver against the angled part of the shaft next to the pedal to pry it up through the hole.
- 8. One thing I noticed when re-fitting the control lever onto the shaft: As pictured in the Bently book, the retaining bolt on the lever shows washers under the bolt head rather than the nut. Without thinking much about this, I re-assembled them this way. This gave a very small clearance between the bulkhead and the bolt head. In fact it was binding at one point -- a bad situation for the throttle. More sensibly putting the washers under the nut got rid of this problem.

I hope this helps anyone else that attempts this job in the future.

-Hugh Fader

Fuel System/Linkage + Manifolds + PVC

Subject: Twitchy Gas Pedal & Acceleration
Date: Wed, 16 Apr 2003
From: "Randall Young" <ryoung@navcomtech.com>

- > When I press down on the gas pedal it just has to move a little before the engine increase 1000/2000 RPM's
- > even when in gear. It makes for a jerky ride when coming from a stop. When driving hard it is less
- > noticeable, but it is difficult to accelerate slowly.
- >
- > The car is tuned, the carbs balanced with a unisync, the timing shows correctly. What's wrong? Do I have an
- > incorrect needle in the carbs, if so what type of needle will help? Any other thoughts as to what it might be?

Some things to try:

- 1) Check the angle that the crank on the front of the throttle shaft makes with the link to the bell crank mounted on the manifold. The more nearly right angle here, the less responsive the throttle will be. It's only attached to the throttle shaft with a pinch bolt, so it's fairly easy to change. You may need to change the length of the link to the bellcrank afterwards. Also check that the bell crank reaches a right angle at about mid-throttle.
- 2) I've found that lighter oil in the dashpots makes the throttle response a little slower. If you're running something fairly heavy, you might try ATF or 3-in-1.
- 3) Make sure that all the balls for the pivots are in good shape. They can do strange things when they wear oblong, as they usually do if they've not been kept lubricated.
- 4) Make sure the return springs are all in place and functioning. Each carb should have a spring, and there's another one on the firewall.

FWIW, I don't believe a Uni-syn is the best tool to use to balance a TR3. If you use the "SU toolkit" instead, you can get the carbs balanced as the throttle opens instead of just at idle. If you do it with a Uni-syn, the rear carb always lags a bit when you open the throttle.

-Randall

Fuel System/Petrol & Additives

Subject: Fuel stabilizer
Date: Tue, 4 Sep 2007
From: "Skip Gurnee" <skip47@powernet.net>

Hi David-

Here's something from Purdue:

(actually <<http://www.cfs.purdue.edu/extension/pdf/gaspump-handout-long.pdf>>

"If the gasoline will not be used for four to six months, will be exposed to direct sunlight, or will be stored much of the time at temperatures above 80-deg. F, add a fuel stabilizer/additive to the gasoline when you first buy it. Fuel stabilizers contain antioxidants, which will prevent gum and other compounds from forming in gasoline; biocides, which prevent microbial growth; and corrosion inhibitors, which prevent the formation of rust and corrosion. Fuel stabilizers/additives are available at auto parts stores.

Freshness of the gasoline is improved if the container or gas tank is stored in a cool place and is kept about 95% full. However, leave some headroom for gasoline to expand if it warms up in storage. Without an air space, expansion will force liquid gasoline out of the container or distort the container." Best,

-Skip Gurnee

Fuel System/Pump

Subject: Fuel Pressure Test
Date: Mon, 1 May 2006
From: "Randall" <tr3driver@comcast.net>

> What's the best way to check your fuel pump pressure? What kind of gage and how do you hook it up? I'm
> trying to check the pressure on my mechanical fuel pump.

Most automotive "vacuum test gauges" will also read fuel pump pressure.
For example:

<<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=4634992809>>

You'll need to add a tee into the fuel line, preferably right at the carbs. Your local auto supply house should have a gauge, tees and fuel line.

Permanently mounted gauges are also available, although less common. If you mount the gauge inside the cockpit, you should use a transducer designed for the purpose, to avoid having a fuel line inside.

-Randall

Subject: Fuel Pressure Test
Date: Mon, 1 May 2006
From: "Tim Hutchisen" <hakhutch@adelphia.net>

----- Original Message -----

Subject: Fuel Pressure Test
Sent: Monday, May 01, 2006
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

> What's the best way to check your fuel pump pressure? What kind of gage and how do you hook it up? I'm
> trying to check the pressure on my mechanical fuel pump.

Bob-

You will need a fuel pressure gauge capable of measuring fuel pressure down to 0 PSI. It would be installed between the fuel pump and the carbs. If you are running a stock mechanical pump, you should be somewhere around 2 1/2- 3 1/2 PSI. One should also check for fuel volume as well as it is possible to have fuel pressure within specs but insufficient volume. You should have a relatively full stream of fuel exiting the line each time the fuel pump pulses. If not, you may have blockage in the supply system. The poor man's way of observing all of this is to get a see-thru fuel filter and install it in-line with the fuel line just before the carbs, then you can observe the flow without a gauge.

Good luck,
-Tim Hutchisen

Fuel System/Pump/Electrical

Subject: Electric Fuel Pump
Date: Fri, 06 Apr 2007
From: "John Herrera" <jrherrera90@hotmail.com>

Dan wrote:

>Would like to install an electronic fuel pump as part of the upgrade for my TR2 project and would be
> interested in knowing what brand and what rate of fuel delivery a pair of SU SH6 carbs on a fast road motor
> might require. Would any old pump work if a regulator was used, or should one get as close as possible to the
> working pressures of the carbs alone. Should a fuel >finter be installed before the pump or after? Is the trunk
> the best location for the unit(s)? Thanks,
> -Dan

Dan,
Kas Kastner says that you need 35 gallons per hour flow for a race car. The SU's need about 2-3 lb/square inch pressure to operate. Insufficient flow can occur if you use a pressure regulator set to regulate at the pressure that the pump puts out unregulated. The Chief Boffin here at The High Speed Triumph Research Laboratory has experimented with this phenomenon. It makes the car run terrible. I forget the pump brand. It was cylindrical. I had a filter before the pump. I had a fuel cell in the spare tyre compartment/trunk, so I put the pump and filter where the stock tank goes. I don't know where you would put the pump if you have a stock tank.
-John

Subject: Electric Fuel Pump
Date: Fri, 6 Apr 2007
From: "THOMAS FANSHER" <tfansher@comcast.net>

I am in the process of redoing the TR3A engine and have converted to an electric fuel pump. As per Fred Thomas, I sourced the low pressure pump from JC Whitney and the pressure regulator from JEGS - both on line. The pressure is in the 2 to 2.5 pounds/in² range. I installed an inline glass filter - also sourced from JEGS - before the pump. I'll have another filter before the carbs, too. I think that's really important due to the crud in our old tanks. It's a cleanable filter and the filter element is also replaceable. I had a later 3A with the rear seat so I mounted on the vertical portion of the seat, just ahead of the tank. I ran a hot wire from a relay located on the heater support bracket/dash support along the rear wiring harness which runs on the passenger side on my car, then over the drive shaft hump to a bullet connector under the carpet behind the driver's seat, through the body and to the pump. It looks nice and should be well protected. The blanking plates for the old pump are available and will probably be mentioned in other replies, or get back with me on that. I can get you part numbers if you need them.

-Tom Fansher

Fuel System/Pump/Electrical

Subject: Electric fuel pump failure
Date: Mon, 2 Jul 2007
From: "Tom Wirt" <twirt@claycoyote.com>

I had put one of the cube electric fuel pumps in the TR3 this winter. The Vickie Brit one. Now, after less than 100 miles, out for a drive this weekend, it started making a loud metallic rapping at the same frequency as the normal pump buzz. It rapped a couple times with a few minutes between, & then became steady. Fuel supply became weak and then non-existent. Tilt.

Is this a normal indicator of one dying? Is there anything I might have done that caused it, other than bad pump? The pump is mounted directly onto the body tub under/near the fuel tank. Thanks for any help.

-Tom Wirt

Subject: Electric fuel pump failure
Date: Mon, 2 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

Tom, I've never had one fail, but I have noticed they are much louder when sucking air or vacuum. You might check for any restriction or leak at the inlet, especially if you have that filter incorporated in the inlet fitting as some do.

-Randall

Subject: Electric fuel pump failure
Date: Mon, 02 Jul 2007
From: "FRED E THOMAS" <frede.thomas2@verizon.net>

Tom, you did not state the volum of your F/P, it should be the 2 to 4 lbs. and not above that, also a pressure regulator is a good investment, make sure you have a good ground on the pump, I have the same pump for almost 10 years now, never a moments problem.

-FT

Subject: Electric fuel pump failure
Date: Mon, 2 Jul 2007
From: Don Spence <dkspence@telus.net>

Is your fuel tank vented to the atmosphere? I've experienced a vacuum build up in the fuel tank that caused the car to stall. I opened the fuel fill cap. Whoosh.... started up and was fine.

-Don

Subject: Electric fuel pump failure
Date: Mon, 2 Jul 2007
From: <Acey2525@aol.com>

I had the same problem but was out of fuel. I didn't know that my gauge was off by a 1/4 tank and had that loud metallic rapping exactly like you describe...I was sucking gas off the bottom of the tank. I drove miles like that and didn't actually run it dry but it sure was clanging. Mine's mounted on the inside fender wall about a foot from the master cylinder.

-Jack McMahan

Subject: Electric fuel pump failure
Date: Tue, 3 Jul 2007
From: "Tom Wirt" <twirt@claycoyote.com>

Thanks, Randall,

I'll check fuel supply from the tank. I did a clean and seal last winter, and it's just possible something flaked off and is blocking the outlet. The rapping noise would, I guess, indicate the little sucker is still trying to do something. Thanks again for the lead.

-Tom Wirt

Fuel System/Pump/Electrical

Subject: Electronic fuel pump
Date: Wed, 7 Aug 2002
From: Dave Massey <105671.471@compuserve.com>

"McMahon, Jack" wrote:

>Hi folks! My electronic fuel pump is talking to me like a woodpecker and the engine cut out on me twice
> today. I have one of those 3 inch square Moss solid state jobs completely by-passing the mechanical pump.
> It always made a little tic tic tic noise that I could only hear prior to firing the engine. Now I can hear it
> singing over the engine noise. Is there someone I can do other than just buying a new fuel pump? Thanks in
> advance for your help.

That extra noise is usually due to lack of fuel. It serves as your out-of-fuel indicator. [;-)] If you have fuel in the fuel tank then I'd look for an obstruction in the fuel line or vapor lock.

I suppose that the check valves in the pump could have gone bad but the usual failure mode is to not work at all.

BTW, the manufacturer requires (or else the warranty is void) a filter before the pump. If you don't have one then maybe the check valves are clogged with fuel line sediment in which case you not only need a new pump but a new filter, too.

So, what tests can you run before buying a new pump? I suppose the first question is: Does it do that all the time. If so then your job is easier. Just hook the pump inlet to a hose whose other end is in a Jerry can of fuel and see if the problem persists. If it does, try a new filter and then a new pump.

If not, then I would plug in a new filter and see if the problem re-occurs. If it does, get a length of hose and some copper line and make up a line that drops into the fuel filler, through the passenger compartment, to the pump inlet (for testing purposes only, of course) and see if that cures the problem.

If you are in a hurry you can buy a new pump, pull the tank and have it boiled out at a radiator shop and blow out the fuel lines with compressed air. That and a new fuel filter and your all set.

-Dave

Fuel System/Pump/Electrical

Subject: Facet Pump
Date: Sat, 13 Dec 2008
From: "Alex" <ambritts@bellsouth.net>

A few quick questions on the facet fuel pump. I am putting one on my 59 TR3A since I have now gone through my second mechanical one.

1. Behind the mechanical (tank to pump) or in front (pump to carbs)? I prefer behind because of the rubber hose availability, any pros and cons?
2. Wiring connections?
3. Any need to modify the mechanical or will the facet push/pull through it.
4. Does it require a pressure regulator? Thanks

-Alex Manzo

Subject: Facet Pump
Date: Sat, 13 Dec 2008
From: "Randall" <tr3driver@ca.rr.com>

Alex Manzo wrote:

- > 1. Behind the mechanical (tank to pump) or in front (pump to carbs)? I prefer behind because of the rubber
> hose availability, any pros and cons?

My personal preference would be to bypass it entirely ... the usual way for the mechanical pump to fail is for the diaphragm to start leaking; which will continue to leak even with the added pump.

- > 2. Wiring connections?

It would be safer to have some means of automatically disabling the pump in case of a serious accident. For example, Triumph Stags (and many other cars) have an inertial cutout that disables the pump in case of hard impact; while some VW Rabbits (and again other cars) have a time delay relay that disables the pump when the engine is not turning.

I would also want to have a separate fuse in the line to the pump, which could be as simple as an in-line fuse to the hot terminal of the ignition coil (if you are mounting the pump in that area).

- > 3. Any need to modify the mechanical or will the facet push/pull through it.

If it is working correctly, the Facet should push or pull through it. But then, if it were working correctly, you wouldn't need the Facet.

- > 4. Does it require a pressure regulator?

There are different models; the lowest pressure model does not require a regulator.

<<http://www.aircraftspruce.com/catalog/eppages/facetpumps.php>>

While I like the little rectangular Facets (they also make other different styles), they are noisy little buggers. I would suggest doing at least some form of 'soft' mounting, so the sheet metal doesn't amplify the pump noise. On the Stag, I bent a simple bracket from sheet metal, and used rubber grommets for sound isolation. I can still hear the pump at idle, but it's not objectionable to me.

-Randall

Subject: Facet Pump
Date: Sat, 13 Dec 2008
From: Bob <yellowtr@adelphia.net>

Alex wrote:

> A few quick questions on the facet fuel pumps. I am putting one on my 59 TR3A since I have now ...

I have the Facet pump on both my 3 and 4.

I mounted the pump just under the tank with a filter between the tank and the pump.

I replaced the mech. fuel pump with a blank.

Don't know if a regulator is needed but I put one mounted on the existing studs of the fuel pump (on top of the blanking plate.

I have another fuel filter just before the regulator.

For wiring, I made a 2 wire harness 1 for power and 1 for ground and connected the power to the White wire that goes to the coil and ran the harness to the rear pump along the driver's floor similar to the regular harness for the lights on the passenger side.

I also have a fuse between the coil connection and the harness.

I decided to hook the power to the coil so when I turn on the ignition, so does the fuel pump.

1 season on the TR3 and 2 on the TR4 with no problems. On my current 6 project I plan to use the same method.

-Bob

Subject: Facet Pump
Date: Sat, 13 Dec 2008
From: Rich White <rlwhitetr3b@hotmail.com>

Do you have an automatic cut off? I thought you needed one encase of an accident.

-Rich White

Subject: Facet Pump
Date: Sat, 13 Dec 2008
From: <pethier@comcast.net>

Get the "low pressure" version and you don't need a pressure regulator. I ran one on a Midget with SU's and one on a Lotus with a side-draft Weber. No problems. (OK, one spring the Lotus did not fire up. I disconnected the pump hoses and shot some compressed air through the pump in the forward direction. Everything worked fine thereafter.)

Put it close to the tank and be sure there is a filter between the tank and the pump.

Bypass the mechanical pump entirely.

Remember that a Facet pump is like me and not like an SU pump: It never shuts up. It keeps on ticking even when the carb is no longer calling for fuel.

-Phil Ethier

Subject: Facet Pump
Date: Sat, 13 Dec 2008
From: William McLeod <wbmcleod@gmail.com>

To amplify a bit on what Randall said, I have usually mounted my rectangular facets on the frame under the passenger area. The facets push gas very nicely, but don't pull worth a damn, so I mount them as low as possible so they have gravity feed.

Bill

Fuel System/Pump/Electrical

Subject: Fuel Pump & Regulator Thread Sealant
Date: Thu, 22 Jun 2006
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

As I slowly progress through the Facet fuel pump & Holley Pressure Regulator installation, I'm curious what others have done with regard to sealing these threaded fixtures. Facet states to just "lightly oil the threads" and to NOT use any thread sealant or Teflon tape. Holley recommends "thread sealant with Teflon in it". Both products are just standard NPT fittings with opposite recommendations. How'd you seal up yours? Thanks
-Bob

Subject: Fuel Pump & Regulator Thread Sealant
Date: Thu, 22 Jun 2006
From: "John Herrera" <jrherrera90@hotmail.com>

> opposite recommendations. How'd you seal up yours? Thanks

Er,umm... I'm guilty of Teflon tape usage.

But it was good for installing elbows that need to face a certain direction when tightened. You can adjust the direction by the amount of tape.

I leave the first two threads untapped.
-Anon

Subject: Fuel Pump & Regulator Thread Sealant
Date: Thu, 22 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> As I slowly progress through the Facet fuel pump & Holley Pressure Regulator installation, I'm curious what
> others have done with regard to sealing these threaded fixtures. Facet states to just "lightly oil the threads" and
> to NOT use any thread sealant or Teflon tape. Holley recommends "thread sealant with Teflon in it". Both
> products are just standard NPT fittings with opposite recommendations. How'd you seal up yours?

I use "PTFE pipe joint compound" from Home Depot. Last can lasted me almost 20 years, had to buy a new one last year for a whopping \$12. But "lightly oiling" is probably fine for sealing these threads. The advantage of the PTFE, IMO, is that it makes eventual disassembly easier.

-Randall

Fuel System/Pump/Electrical

Subject: Fuel Pump Blanking Plate
Date: Thu, 20 Apr 2006
From: Ted Stevens <trstevens@earthlink.net>

-----Original Message-----

Subject: Fuel Pump Blanking Plate
Date: Wed, 19 Apr 2006
From: "Terry Smith" <terryrs@adelphia.net>

> Well I have decided to replace my mech. fuel pump with an electric. Does anyone know of a source for a
> suitable plug to replace the fuel pump? Or do I have to make one from scratch? The car is a '63 TR4.

I recall (correctly, I hope) that a fuel pump blanking plate from a Chevy should work, and is available from any "speed shop."

Subject: Fuel Pump Blanking Plate
Date: Sat, 10 Jun 2006
From: <Dave1massey@cs.com>

<tr3driver@comcast.net> writes:

>> No, the studs are arranged differently on the TRactor motors.

>

> But I believe Frank Fischer has a TR3A, thus the blanking plates he is making should fit the TRactor motors?

Let's hope so. But I believe the blanking plates sold for GM cars that are said to fit TR's fit the TR6 and not the TR3.

-Dave

Subject: Fuel Pump Blanking Plate
Date: Sat, 10 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> But I believe Frank Fischer has a TR3A, thus the blanking plates he is making should fit the TRactor motors?

It turns out Frank is doing both types. TRactor motor plates are ready now, TR6 plates should be ready shortly. TR7 plates will be a little longer. (Must mea some TR7 had mechanical pumps ... What do the others use for blanking plates?)

-Randall

Fuel System/Pump/Electrical

Subject: Fuel Pump-Inertia Switch
From: <ebk@buffnet.net> writes:

<ZinkZ10C@aol.com> wrote:

I'm not sure if the inertia switch hung on that long (I closed the shop in Dec 97) 80's trucks with PI had the switch.

If you have an owner's manual it will tell you where and how to reset. If you have one it is most likely located in the passenger foot well on the kick panel, the box is 1" X 2" X 3" with a round red button or a rectangular white button on top.

-Harold

Hi Harold!

Thanks for the input. I'll check on this on a later date. I'm interested in this thread, because I'm thinking of setting up from the gas tank of my TR4/A a Manual Fuel Shut Off, [a 'Y' connection :-\], an In line Fuel Filter, an Electrical Fuel Pump, &/or [another "Y" connection :-\] then the rest leading to the hard Fuel Line. That goes to the Manual Fuel Pump on the engine & so on to the SU SH6 Carbs. This way I run off the Manual Fuel Pump all the time. Now if for some reason this Fuel Pump stops working, I can climb under the TR4/A, shut off the Manual Shut Off Valve. Reroute the fuel lines to the Fuel Filter that will go to the E-Fuel Pump & bypass the Manual Fuel Pump, which runs to the carbs. Then turn on the Manual Shut Off Valve & flip the switch to the E-Fuel Pump & be on my way.

I just don't know where the Inertia Switch would go in this system? Now if you have a BETTER suggestion on how I could do this, then PLEASE speak up! What I want is the Manual Fuel Pump to be used as my main source, & the E-Fuel Pump to be use as a 'stand by', so I'm NOT stranded on the road in a trip to a TRIUMPH event or on the way home from an event. TIA,

-Cosmo Kramer

Hi Cosmo,

First I guess the type of mechanical pump failures must be listed:

- Diaphragm leakage
- Check valve failure
- Actuator arm failure

For diaphragm leakage the mech pump must be removed from the fuel circuit, valves would do the trick.

For check valve or actuator arm failure the mechanical pump can still be in the fuel circuit. In this case a diaphragm (pop can type) or impulse (Facet looks like something out of a old TV set.) can be plumbed in and the electricity switched on to recover from a failure.

What type of failure have you been seeing?

For the inertia switch wiring it has 2 wires, just put it in-line with the positive pump wire (neg. would work too but it is better to cut off power rather than ground) There is not (as far as I know) any polarity to the Ford inertia switch.

Have I covered everything?

-Harold

Fuel System/Pump/Electrical

Subject: Quieting Facet Fuel Pumps
Date: Mon, 16 Aug 2010
From: John Macartney <macartney.john@yahoo.co.uk>
To: William Brewer <wsb1960tr3a@att.net>

William Brewer wrote:

I installed a Facet fuel pump behind the driver's seat under the rear seat/parcel shelf. I like the location. Good access and I can see the fuel filter by looking through the spoke wheels. I can also change the filter of fuel pump without jacking up the car. I mounted the pump on doubled 1/16th inch thick neoprene washers to buffer the noise.

So, now when I drive the car it sounds like a woodpecker pecking away under the parcel shelf. Damn the thing is loud. What is the best way to quiet it down? All my concocted ideas are unbelievably complicated and probably overkill. Any listers have a simple way to quiet this thing down?

-Bill in Tehachapi

When 'uncle jack' blew his fuel pump last year in Vancouver (it was the only failure we had of any sort) a BCTR member most kindly donated a new Facet pump he carried as a spare in his TR4. The donor told me that in his experience the operating pressure of that pump was about 8 psi and most Triumphs need around 2.5 to 3 psi max. To get round the clatter, he also donated a restrictor to put in the fuel line. This looked homemade and was a piece of drilled bar.

The bar had a small hole drilled through it - about 1/16th and was considerably smaller than the internal diameter of the fuel pipe. Held in place with a hose clamp on either end. Not sure what additional load that restrictor put on the pump itself but (a) it stopped the 'clacking' noise of the new pump on first start and (b) got us to California and then back to Denver CO with no further trouble. AFAIK, it's still there? Phil Ethier?
-Jonmac

Fuel System/Pump/Electrical

Subject: TR6 Electric Fuel pump conversion
Date: Fri, 27 Apr 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

-----Original Message-----

Subject: TR6 Electric Fuel pump conversion
Sent: Friday, April 27, 2007
From: On Behalf Of Jeff Nathanson

I'm sure this topic has been discussed before. But, maybe there has been more people who have converted from the stock mechanical fuel pump to an electric fuel pump. The first question - it is justifiable? Better starting? Less hesitation/misses? Reliability?

If the first answer is yes, then what would be the group's recommendation on the actual parts? Does it require a regulator? Where is best mounted? Does the fuel tubing need upgrading?

I have read many articles, and most don't come right out and say that this conversion was really worth the time, money and effort. Also, a completed list of parts are not listed. Thanks in advance,
-Jeff Nathanson

Jeff, I converted last year after my mechanical pump seemed to produce fluctuating pressure when measured with a vacuum gauge while driving. I started to document the process on my web site but never finished posting all the pictures. It does give you the fuel line sizes and links to suppliers for the Facet pump and the Holley regulator. You need a low pressure pump, filter and a regulator. You'll also need a blanking plate to cover the hole left by the mechanical pump. Frank Fisher makes an excellent one. You can re-use all the existing fuel lines. The pump and filter were located in the trunk next to the tank and the regulator was mounted on the inner LH fender.

My experience with it is probably not the best as I found that the Holley regulator was producing inconsistent pressure. I'd set it, drive for a few days and check it to find that it was now producing a higher or lower pressure. Reset it and same thing would happen. Others on the List have had much success with the Facet/Holley combination but not me. My 2006 summer of frustration was the final straw that led to my conversion to TBI.

-Bob Danielson

Subject: TR6 Electric Fuel pump conversion
Date: Fri, 27 Apr 2007
From: <Dave1massey@cs.com>

<jeffn@msystech.com> writes:

> I'm sure this topic has been discussed before. But, maybe there has been more people who have converted
> from the stock mechanical fuel pump to an electric fuel pump. The first question - it is justifiable? Better
> starting? Less hesitation/misses? Reliability?

I swapped out my fuel pump after the old mechanical pump started to fail. In hindsight I think the diagram was getting stiff because the new fuel formulations were incompatible with the old materials. Regardless, I installed an electric pump and now the carbs fill up before I start cranking. Whether that made the car start more quickly or not is undetermined. There should be no difference in running behavior between the two assuming either pump is in good condition. Reliability is a toss-up but finding a replacement for the electric pump will be easier if you break down on the road. Or you could pack along a spare pump/repair parts since they take up little

space.

- > If the first answer is yes, then what would be the group's recommendation on the actual parts? Does it require
- > a regulator? Where is best mounted? Does the fuel tubing need upgrading?

I mounted mine via one of the old pump mounting bolts so it is in the same location and the fuel line routing is mostly unchanged. A better location is back near the tank but would require more additional wiring. Plus hard mounting it to the coach work will serve as a sounding board for the pump's pulsing and may prove annoying so finding some sound isolating mounts may be required. Either way I recommend wiring in an impact sensor. These are used on every car built in the last 20 years and can be had for not much money. I got one from a Ford Probe for \$5. Be sure to mount it in the proper orientation (not which side is up and which side is forward). And fuse the line - especially if you mount it in the rear.

- > I have read many articles, and most don't come right out and say that this conversion was really worth the
- > time, money and effort. Also, a completed list of parts are not listed. Whether it is worthwhile is debatable. It
- > is easier to just rebuild the mechanical pump. There are slight benefits to the electric - mostly associated with
- > the availability of replacements. Whether it is worthwhile is a function of your priorities.
- > -Dave

Subject: TR6 Electric Fuel pump conversion
Date: Fri, 27 Apr 2007
From: "Randall" <tr3driver@ca.rr.com>

- > My experience with it is probably not the best as I found that the Holley regulator was producing inconsistent
- > pressure.

I've heard the same thing from other people ... basically many regulators don't work well with very low pressure drops across the regulator. So IMO, you should either use a pump that produces the pressure you need (the little "clicker" Facet has worked very well for me without a regulator); or a pump that produces substantially more pressure than you need, combined with a regulator to drop the pressure.

I agree an electric pump makes a worthwhile spare to carry on long trips. Easy to make a roadside conversion if your original pump fails, and also potentially handy for transferring fuel if need be. But I wouldn't convert just to "improve" the car. I've driven a lot of miles in various Triumphs, and only electric pumps have failed so badly I couldn't limp home (or to a gas station). The mechanical fuel pump is just one of the many ways a TR3 is better than a MGA, IMO.

- Randall

Fuel System/Pump/Electrical

Subject: Wiring Facet Pump & Oil Pressure Switch
Date: Wed, 14 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> The Facet fuel pump instructions strongly recommends wiring it to the Oil Pressure Switch (OPS) so that it
> won't pump fuel with the ignition switch on unless the engine is running. To quote them "This stops pump
> operation if the engine stops and the ignition switch is on." OK, now my OPS has 3 terminals (ground,
> anti-run valve & Oil Pressure Light (OPL)).

IMO, the easiest/best way to make this work, is to use the anti-run on solenoid connection to ground the pump
(or the pump relay coil). The ARS should still function as usual.

> Added to the mix is I have Dan's harness with 3 leads from the fuel pump relay: warning buzzer, inertia
> switch & fuel pump.

If you want to use an inertia switch, run the "inertia switch" lead to the switch, then the other lead from the IS to
the OP switch. Or if you choose not to include an inertia switch, just run the IS lead to the OP switch.

> Am I misunderstanding how the OPS works on the TR6?

No, I think you've got it exactly right. To use the 'normal' contact that operates the dash light, you would wire
the fuel pump relay so the pump only runs when the relay is not energized. This is possible with Dan's power
block (by exchanging the fuel pump and warning buzzer leads), but IMO it's better to use the other OP contact,
as above.

> Plus if they don't want the pump on until the engine starts, the only fuel the carbs get is what's sitting in the
> bowl. Right?

Only until the oil pressure comes up, which should normally be only a little bit of cranking. The switch closes
at a relatively low pressure, like maybe 10 psi, so it doesn't take much. If this is a concern, you can add a push
button switch that temporarily connects the IS lead to ground, so you can manually override the OP switch.

> How do you guys/gals have your electric pumps wired?

The one on my Stag has only the inertia switch, as original. I've already managed to hydro-lock the motor, by
leaving the key on with the engine not running and having a leaky float valve.

The VW Rabbit I used to own had a small electronic circuit inside the fuel pump relay, that monitored the
signal from the points and only powered the pump when the engine was turning. They had a reputation for
being unreliable, but I think that was mostly because the windshield always leaked water onto the fuse/relay
block.

> The only other thing I found in "googling" this OPS requirement is that it's required by the Coast Guard and
> FAA in boating and airplane applications. Maybe different for cars?

Well, certainly the Coast Guard and FAA have no "car" requirement. Our automotive safety standards being
what they are in this country, you can pretty much do anything that suits you in this area.

-Randall

Subject: Wiring Facet Pump & Oil Pressure Switch
Date: Wed, 14 Jun 2006
From: <Dave1massey@cs.com>

Your assessment is right. If you hook it up to the wire that lights the light it will run until you get oil pressure and then shut off.

The black wire is ground so you could wire it to that and it will run whenever the key is on (or you could just connect it to chassis, for that matter).

The third wire is for the anti-run-on valve. Power for that valve comes from a special contact on the ignition switch that is hot only when the key is in the off position. The third contact on the oil pressure switch is closed (connected to ground) whenever you HAVE oil pressure so when you shut down the valve will energize until oil pressure falls below the switch setting.

You could wire the pump up to this terminal and get the desired action. In theory, however, there is a sneak circuit in that the pump and valve will be wired in series once the switch switches. The pump and valve will pass current to the rest of the switched loads. They will divide up the 12 volts and they may continue to operate but even if they don't they will pass current and drain your battery in short order (overnight).

Worse yet, the voltage across the pump will be reversed. The pump may be protected against reverse polarity but my advice on reverse polarity protection on an aftermarket fuel pumps is "don't count on it." You could get a DPDT relay and work up a circuit that will do what you want.

My advice is forget wiring it into the oil pressure switch. If the car sits with the key on and the engine not running very long you'll burn the points anyway so not having the pump running for the short amount of time it is likely to see this situation is not of much benefit. Besides, when the tank is full you don't even need a pump to get fuel into the carbs so if your float valves aren't up to snuff you will still have problems.

I wired my pump to the ignition circuit (through a special fuse) through an impact switch. Any impact switch will do. I got one from a Ford Probe at the wrecking yard for \$5 that was mounted in the boot so it was clean and like new. This will shut down the pump in the event of a collision where a running pump may disgorge the contents of the tank into a burning wreck. This is a consideration worthy of a \$5 investment to prevent.

BTW there is usually a Front to these switches so pay attention when you mount it.

-Dave

Subject: Wiring Facet Pump & Oil Pressure Switch
Date: Wed, 14 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> However, there is a sneak circuit in that the pump and valve will be wired in series once the switch switches.
> The pump and valve will pass current to the rest of the switched loads.

Good point (which I missed before), although since it's only a relay coil for the pump, there won't be much current passed.

However, a simple diode in series with the pump relay will solve the problem.

> They will divide up the 12 volts and they may continue to operate but even if they don't they will pass current
> and drain your battery in short order (overnight).

The relay coil won't pass more than perhaps 100ma, which will take a lot longer than overnight to drain a car battery.

> Worse yet, the voltage across the pump will be reversed.

The relay doesn't care. And because of the relay, the voltage on the pump won't be reversed.

-Randall

Subject: Wiring Facet Pump & Oil Pressure Switch
Date: Thu, 15 Jun 2006
From: <Dave1massey@cs.com>

<tr3driver@comcast.net> writes:

> > However, there is a sneak circuit in that the pump and valve will be wired in series once the switch
> > switches. The pump and valve will pass current to the rest of the switched loads.

>
> Good point (which I missed before), although since it's only a relay coil for the pump, there won't be much
> current passed.

>
> However, a simple diode in series with the pump relay will solve the problem.

Relay? Did I miss something? Most people don't bother with relays for the small pumps since they only draw a few amps. But if you are using a relay then indeed a diode will solve that sneak circuit. But then you should put in an MOV across the relay coil (or the diode) to prevent the inductive kick back from over stressing the diode.

-Dave

Subject: Wiring Facet Pump & Oil Pressure Switch
Date: Thu, 15 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Relay? Did I miss something?

He said he was installing a Dan Masters wiring kit, which includes a block full of relays and fuses; one relay is for the pump. You may recall he talked about the wires from the block ...

> Most people don't bother with relays for the small pumps since they only draw a few amps.

"Most people" not including Dan Masters, I guess. Compared to the constant under-engineering our cars had originally, it's kind of refreshing to work with an over-engineered kit!

> But if you are using a relay then indeed a diode will solve that sneak circuit.

A diode will also work for the pump, just takes a bigger diode. It's still cheap.

> But then you should put in an MOV across the relay coil (or the diode) to prevent the inductive kick back
> from over stressing the diode.

A MOV (metal oxide varistor) seems both unreliable and overkill, IMO. Easier, cheaper, better, IMO, to just use an oversize diode that can take the stress. For the relay, a 1 amp, 50 volt diode should be plenty. For the pump, you could go really overboard with 25 amps, 200 volts, and still pay only a dollar or two for the diode. If you really want to be cheap, rob a diode from an old alternator <G>

-Randall

Subject: Wiring Facet Pump & Oil Pressure Switch
Date: Thu, 15 Jun 2006
From: <Dave1massey@cs.com>

<tr3driver@comcast.net> writes:

> "Most people" not including Dan Masters, I guess. Compared to the constant under-engineering our cars had

> originally, it's kind of refreshing to work with an over-engineered kit !

Dan is a retired controls engineer who worked for TVA in their nuclear power plants. It's natural for him to over-engineer things.

>> But if you are using a relay then indeed a diode will solve that sneak circuit.

>> A diode will also work for the pump, just takes a bigger diode. Still cheap.

Depends. If the pump has an onboard power supply bypass capacitor then no problem. But they may cut a few pennies counting on a more intimate connection to the battery and isolating it with a diode may cause additional stress on the electronics leading to premature failure. Not having cut one open and expecting different pumps from different manufacturers to vary I'd err on the side of caution and hang a capacitor across the power leads if I isolated it with a diode.

>> But then you should put in an MOV across the relay coil (or the diode) to prevent the inductive kick back

>> from over stressing the diode. A MOV (metal oxide varistor) seems both unreliable and overkill, IMO.

>> Easier, cheaper, better, IMO, to just use an oversize diode that can take the stress. For the relay, a 1 amp,

>> 50 volt diode should be plenty.

What's unreliable about an MOV? No less reliable than the diode. Much more so than the diode if you don't have some sort of spike protection. Here's what happens: when the oil pressure switch opens up the energy stored in the magnetic field in the coil of the Anti-Run-On valve will cause the voltage at the switch to drive negative in an effort to maintain the current level. Normally the voltage will rise high enough to jump the OP switch contact gap and the energy will be dissipated in the arc. But add in a diode and an alternate current path the voltage will rise until the reverse withstand voltage of the diode is exceeded and it avalanches. The problem with this is with very fast rise time situations, which this will be, the current doesn't spread across the whole cross section of the diode and will concentrate about the point where the bond wire is attached and the silicone at that point will become over stressed and convert to carbon (not really but it will fail and usually as a short).

I've been burned and burned bad (metaphorically speaking) for not using MOV's. If you don't like MOV's you should at least tie a .1 ceramic capacitor across the diode. This will slow down the rise time and let it avalanche at a slower rate.

> For the pump, you could go really overboard with 25 amps, 200 volts, and still pay only a dollar or two for > the diode. If you really want to be cheap, rob a diode from an old alternator <G>

For some reason this brings to mind the picture I saw of Bob Pease using a Volkswagen cylinder head as a transistor heat sink. I don't know why.

-Dave

Subject: Wiring Facet Pump & Oil Pressure Switch

Date: Thu, 15 Jun 2006

From: "Randall" <tr3driver@comcast.net>

> Depends. If the pump has an onboard power supply bypass capacitor then no problem.

Or is designed to withstand whatever transients it generates.

> But they may cut a few pennies counting on a more intimate connection to the battery and isolating it with a > diode may cause additional stress on the electronics leading to premature failure.

Could happen, I suppose. But given that the pump is apt to be on the end of some rather thin wires run the length of the car, tied in with who knows what other junk and powered through an overloaded switch, it seems unlikely to me that they are relying on the input to be low impedance. Batteries have pretty lousy high

frequency impedance anyway.

> I'd err on the side of caution and hang a capacitor across the power leads if I isolated it with a diode.

The "belt and suspenders" approach. Certainly won't hurt.

> What's unreliable about an MOV?

Pick up any "MOV protected" power strip. Odds are very good that at least one of the MOVs are non-functional. I've seen estimates as high as 90% "in the real world". They aren't entirely "one-shot" devices, but they come pretty close. If you dig through the spec sheet, you'll find that the stress that they will take more than 1000 times is many orders of magnitude less than the transients they are supposed to protect against. Even the "1000 lifetime" stress is many orders of magnitude lower than the advertised protection.

> No less reliable than the diode.

Even so, having them both in the circuit doubles the chance of failure. And the diode is required.

> Normally the voltage will rise high enough to jump the OP switch contact gap and the energy will be
> dissipated in the arc. But add in a diode and an alternate current path the voltage will rise until the reverse
> withstand voltage of the diode is exceeded and it avalanches.

Only if the diode reverse voltage is lower than the switch contact gap at that instant in time. This is why you need a diode with a voltage higher than the nominal supply voltage, so it doesn't break down when the switch opens. 50v might not be enough, but I think it is. Don't forget that the switch contacts move very slowly, meaning they are just barely cracked at this point ... doesn't take much voltage to jump them.

If not, \$.70 at Radio Shack will buy you a pair of 200 piv diodes rated for 30 amps surge. Still not enough? How about \$.60 each (pack of 3) for 1000 piv? And you still haven't spent the price of a MOV (assuming you can even find one, Radio Shack doesn't carry low-voltage MOVs).

> For some reason this brings to mind the picture I saw of Bob Pease using a Volkswagen cylinder head as a
> transistor heat sink. I don't know why.

I suppose it's a mine set thing ... some people see junk, others see possibilities. Big chunk of aluminum with fins ... sounds like a great heat sink to me! And I've been using a battery charger for many years now that was given to me with a blown diode pack ... works just fine with alternator diodes.

I suspect we lost all the non-EE types on the list long ago, so I'll shut up now. Time for lunch anyway.

-Randall

Fuel System/Pump/Manual

Subject: AC Fuel Pump rebuild procedure
Date: Tue, 02 Apr 2002
From: suhring <suhring@lancnews.infi.net>

<Popnglo@aol.com> wrote:

> Can anyone recommend a procedure (or suggest a site that has one) for rebuilding the AC fuel pump for a
> TR3A. I've picked up a used pump (thanks to Sumner) and TRF rebuild kit, however I have never done it and
> I thought that a procedure or any wise suggestion may come in handy before I start. In intend to replace this
> rebuilt unit for the aftermarket one that's on the vehicle now, keeping the aftermarket for a spare. Any
> suggestions, procedure or advice appreciated.
>
> Also, I intend to install the fuel tap at the time I install this rebuilt pump. My understanding is Triumph at the
> time of this vehicle's commission number had deleted this tap for cost saving (according to Piggot). In any
> case there isn't one. Is a petcock, similar to motorcycle type preferable? Or is there an alternative (MOSS or
> TRF units good quality repro's?). I'd rather stay original (my understanding though is that the original was
> prone to leaks), but what the heck, it's got electronic ignition and the gear reduction starter, as it is, among
> other things that may only gain points in the concord judging.
> -Ed

Ed:

I just rebuilt my fuel pump on the '59 TR3. Unless you are replacing the lever arm cross shaft and bushings, it is a pretty straight forward process. Clean and glass bead both half's of the pump (it will look new again), make sure the fuel passages are clean (blow out with compressed air), install the new valves that fit under the holding plate (be sure you put them in the correct orientation which the manual does a good job explaining) and install the new diaphragm with oil seal. This last step is probably the trickiest of all. Be patient and follow the manual (when you disassemble the old diaphragm, draw a diagram of the position of the tab before removing and the position it is in after turning the diaphragm clockwise to disengage the base of the shaft from the lever). Be sure the holes in the diaphragm line up with the correct holes that are threaded since if you line them up with the wrong holes, you can actually tap the threads screwing in the screws if enough force is used (don't ask).

Any questions, let me know.

-Scott Suhring

Subject: TR4 Fuel Pump
Date: Sun, 13 May 2007
From: <DLyilis@aol.com>

<tr3driver@ca.rr.com> writes:

When you were reassembling, did you check that pushing on the lever would pull the diaphragm down against the spring? This thing can be reassembled so that it looks like it is correct but is not. If the moving of the lever does not deflect the diaphragm it will do zip. The advice above should be followed before final reassembly.

-David Lyilis

Fuel System/Pump/Manual

Subject: Fuel pump
Date: Tue, 23 Sep 2008
From: <Dave1massey@cs.com>

Oliver <sumton@sbcglobal.net> wrote:

>Hi, all.

> I'm renovating a failed fuel pump. I see the kit has a pair of valves, and I see that they are placed in the "top" of the fuel pump "base." I see that they are in opposite ways, which makes sense.

>

> Should I replace them while I'm there? How do I get them out? How about putting the replacements in? And where does that little round gasket that comes in the kit go?

>

> Thanks! I'm trying to document all this so I can post a fuel pump renovation page.

You didn't say what car. The pump on the TR3 has a handy little retaining plate held in place with a screw. This plate secures the valves. Removing the plate allows the valves to be removed and replaced.

But if you have a TR6 the valves are "staked" into place. This means the valves are inserted into the bore in the pump base and then the material at the edge of the bore is deformed to close up the opening just enough to retain the valves. If look closely you should be able to see where the installer used a punch to secure the valves. To change out these valves you need to file or grind the deformed material enough to allow the valves to be extracted and replaced after which you can "stake" them in with a hammer and a punch.

-Dave

Subject: Fuel pump
Date: Tue, 23 Sep 2008
From: "Randall" <tr3driver@ca.rr.com>

> But if you have a TR6 the valves are "staked" into place.

Some of the replacement TR3 pumps also have the valves staked into place.

Personally, if the staked valves seem to work (can blow through them one way, not the other way), I leave them alone. There're too many stories of re-staked ones falling out. Some have even gone as far as fabricating a retaining plate similar to the earlier pumps, to hold the valves in place.

-Randall

Subject: Fuel pump
Date: Mon, 22 Sep 2008
From: "Greg Gelhar" <ggelhar@earthlink.net>

Oliver,

A while back I put my account of the rebuild process on Photo Bucket. Look here to see if you can use the information.

<http://s200.photobucket.com/albums/aa68/gmark_01/Fuel%20Pump/?action=view¤t=e9be68b7.pbw>

-Greg Gelhar

Fuel System/Pump/Manual

Subject: Fuel pump direction
Date: Tue, 12 Sep 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Paul Dorsey wrote:

> I've mixed up the direction of my fuel pump pipes (brass ends) and I don't know which pipe is the inlet that
> comes from the gas tank or which end is the outlet going to the carbs. However, one pipe allows me to both
> blow and suck and the other pipe only allows me to suck. Which is which please? No dirty jokes please.

Paul -- you may have a faulty (inlet) check valve (which might account for the 'no fuel' problem you were having).

At the inlet you should be able to blow, but not suck.
At the outlet you should be able to suck, but not blow.

And yes, I went out in the garage and got personal with my spare pump just to be sure this was true. Think I'll go brush my teeth.

-Geo H

Fuel System/Pump/Manual

Subject: Fuel Pump Rebuild
Date: Wed, 7 May 2003
From: <Popnglo@aol.com>

The pump is pretty easy. Start with a quality screwdriver that fits the slots in the screws snugly, as they may be pretty tight and you don't want the screw driver to slip out and bugger the slot or pump (or your fingers). Collect the screws and lock washers, then lift away the top. Press down on the metal plate in the center of the diaphragm, and turn it (and the diaphragm) 1/4 turn to disengage the pull rod. Note which way around the spring goes. There should be a new spring in your kit, but you can probably reuse the old one if not.

Unscrew the bail holding the sediment bowl on (if you haven't already), swing the bail out of the way and carefully remove the sediment bowl. Probably best to do this over a soft surface (like a towel), since the bowl has a disturbing habit of first refusing to budge, then jumping off into space when you least expect it. Remove the gasket and screen.

Look inside the top cover to see how the valves are held in place. Usually, there is a screw or two and some plates that clamp them in. If so, remove the screw(s) and shake out the valves. However, some pumps have the valves staked into place. If yours is one of these, then I would suggest leaving the valves alone unless you know for a fact they are bad. They last a very long time, and there's a limit to how many times the pump body can be re-staked.

Reassembly is, as they say, the reverse <g>
-Randall

On the fuel pump, remember exactly how the 2 filters are facing, 1 is up & 1 is down, you will see this as soon as you open the pump up, some are panned in place, some have a bracket & screw, when removing the cam arm, do not lose the return spring or washer spacers, be sure you reinstall the holding pin all the way in on reassembly. The original had a rubber gasket in place that is supposed to keep oil out, this is not needed and not in the rebuild kit, it was useless anyway. The main diaphragm must be locked into place for a good pumping seal, it is a very easy job. "FT"

Best Regards,
-Ed

Fuel System/Pump/Manual

Subject: Oil Leak from Fuel Pump? Correction and update (long)
Date: Wed, 11 Sep 2002
From: "Mike Kitchener" <mikek@wanadoo.fr>

Mike Kitchener wrote:

> I have this same problem on my 3A and am now convinced that oil is being blown out through the hand prime
> the shaft joints. These joints (leather?) are quite thin, 9/16" I.D. Only 40+ years old and the whole assembly is
> riveted together. I am currently trying to rebuild a spare pump, which also leaked oil, with the hand primer
> blanked off

The joint I.D. is smaller than 9/16", mine had worn away in the middle. Finally I decided to try and repair the pump and keep the hand primer. This is what I did:

When the pump was stripped of everything else. I marked the position of the external priming lever on its shaft then drifted it out on one side (surprisingly easy), extracted the shaft from the pump body after bending the lever for clearance, then drifted out the shaft from the lever on the other side.

The shaft was then drilled and tapped 4mm at each end, taking care not to break through the metal. Two joints, 20 mm O/D, 10 mm I/D, thickness 1.2 mm were cut out of an old inner tube and everything lined up and re-assembled using a short 4 mm screw and flat washer on each side. The vent hole was also blanked off with a 4 mm screw. I believe that it is not necessary when there is no seal on the diaphragm rod. After re-fitting and a test run, the pump has no signs of a leak, don't know how long that will last but at least the joints can easily be changed now. All that needs to be done now is the rear main seal, overdrive adaptor joint, differential input seal, etc.

-Mike

Fuel System/Pump/Manual

Subject: TR Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: Michael Godley <mgodley@tiac.net>

Folks,

The outlet fitting on the stock pump.....pipe from pump to carbs...leaks and so far I can't find a fix. It is the original pipe with original compression fitting (olive)...so I thought the compression fitting might be the culprit.

Recall reading a thread or two on this issue.....so I tried grinding 2 olives (per the Scott Suhring tech tip) to fabricate a "long" olive. Tried it twice and this did not work.

Trying to determine next step. I recall someone writing that replacement pipes come with the wrong compression fittings and will leak, and I did stop at several plumbing supply houses in Mass. to find a "long" olive without success.

At this point I would gladly replace the original line and fitting with an alternative if available, and looked on the paragon performance and summit racing sites....they have different fittings and adapters, but I am unfamiliar with the way they should be configured and don't know if they will work.

Any suggestions? e.g Can anyone give me a source and contact info for the correct compression fitting? Does a replacement pipe have the correct fitting or not?. Can anyone tell what parts I would need to use a different adapter and use SS braided line to make a new connection? Thanks

-Mike Godley

Subject: TR Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

Mike,

I just went through this in June 2005 after replacing the fuel line between the pump and carbs with 1/4 brake line. I used two 1/4" Delrin white plastic Teflon half ferrules back to back in place of the one long 5/16" brass ferrule. The Delrin material is compatible with gasoline. I think that the cost was .06 cents a piece. The Delrin half ferrules are available in the brass cabinet in the plumbing section of the local hardware store.

Now fast forward to July 2006 the original Delrin ferrules I installed previously started leaking. I believe that this was due to bending the new tubing away from the distributor after installation. The ferrules were cracked probably from over tightening to stop the leak.

TRF and Moss have the correct ferrule.

-Greg Perry

Subject: TR Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> TRF and Moss have the correct ferrule.

Greg, do you by any chance have a part number for this? It's been some years ago, but I called both TRF and Moss asking for this part, and they both admitted they didn't stock nor have any idea where to buy it. It's not been added to Moss' website, and of course is not listed in the SPC ...

-Randall

Subject: TR Fuel Pump outlet leak

Date: Mon, 25 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

Randall,

Here is a copy of the response email from John Swauger at TRF. The TRF part number is 102729. This is a 1/4 inch x 5/16 inch long brass ferrule. I got two for spares from TRF and put them in the glove box. Moss part number 370-857=\$0.60, both outfits call it a compression sleeve.

-Greg Perry

Re: Fuel line ferrel **102729** put them in the glove box

Greg,

In stock at \$0.75 each. Please note that we do not have a minimum order but we do have a minimum shipping charge of \$6.95 for orders up to \$20.00. You will want to add this to another order.

-John Swauger

Subject: TR Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Here is a copy of the response email from John Swauger at TRF. The TRF part number is 102729. This is a
> 1/4 inch x 5/16 inch long brass ferrule. I got two for spares from TRF and put them in the glove box. Moss
> part number 370-857 \$0.60 Both outfits call it a compression sleeve.

Thanks, Greg. But if you (and John Swauger) will pardon my saying so, I do not believe this is the correct part for the TR2-4 fuel pump. Moss has it listed as fitting a TR250/TR6, and they took an ordinary, modern-day compression sleeve.

Has anyone actually ordered one of these? And was it anything other than an ordinary hardware store compression sleeve?

-Randall

Subject: TR Fuel Pump outlet leak-Correction
Date: Mon, 25 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

>Apologies again and correction, T26S14G13 fits TR250 and TR6

>-Greg Perry

>

>Randall,

>My apologies, I just retrieved the ferrules in the original packaging. You're correct, the ferrule is 1/4" x 1/4".

> I have a TR6 and they're too short to work! Arrgh! My original Ferrule was 5/16 inch long. According to

> TRF product code T26S14G13 it fits TR2 thru TR6 I believe. It's a standard hardware 1/4 inch ferrule.

>Sorry,

>Greg Perry

Subject: Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

Randall,

I'll try to ammend my goof. Here are some websites that make old british brake and fuel lines.

<<http://www.stevsonmotors.co.uk/home.htm>> & <<http://www.fedhillusa.com/catalog.html>>

Scroll down about 3/4 of the page there are Vintage British Brake Line Nuts and Fittings Including 9/16 x 18 unf 37 degree to SU fuel pump 3/8-19bspp and 9/16 x 18 unf 37 degree to Smith's fuel Pick-up 1/4-19bspp
What type fitting does the tr4 /A use for the fuel pump outlet?

-Greg Perry

Subject: TR Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> What type fitting does the tr4 /A use for the fuel pump outlet?

Sorry, I haven't the faintest idea..

The threads are those of a standard 5/16" reverse flare, and in my experience a 5/16" sleeve will work if you use 5/16" fuel line to the carbs and a standard 5/16" reverse flare nut. Triumph apparently used a special nut to adapt 1/4" line to the 5/16" fitting, and that nut took a special sleeve.

I even managed to find a copy of the special nut once, in a dusty bin at my local auto parts house. But just like the original nut, it's too short to use with a standard 1/4" sleeve. The threads bottom in the fuel pump casting before pinching the sleeve enough to seal.

Something I've never tried: I wonder if you could make a suitable spacer by flaring the end of some 5/16" copper tubing, then drilling a 1/4" hole through it. Fit between the nut & sleeve, it might provide enough extra pinch to get a good seal.

-Randall

Subject: TR Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

What you describe is the same as the TR6 and what I went through. I also found the same 5/16" inverted flare thread by 1/4" pipe nut at the local autoparts store. I thought that I had the correct brass ferrules in the glove box until you pointed it out to me. The brass sleeve is 1/4" by 5/16" long. I have only found that two 1/4" delrin sleeves put back to back will work. The delrin is the brand name of the teflon white material made by DuPont. The delrin sleeves look like 1/2 of a regular hardware brass sleeves and are available in the brass fittings bins at the hardware store. Let me know if you find a source for the correct sleeve.

-Greg Perry

Subject: TR Fuel Pump outlet leak
Date: Mon, 25 Sep 2006
From: Michael Porter <porterm@zianet.com>

Greg Perry wrote:

>What you describe is the same as the TR6 and what I went through. I also found the same 5/16" inverted ...
Umm, small correction. Delrin is the trade name for acetal--not Teflon (which is the trade name for a particular chlorofluorocarbon compound).

Teflon would probably work better as a compression fitting, because it deforms more easily than acetal, which is somewhat hard and slightly brittle.Cheers.

-Michael D. Porter

Fuel System/Pump/Manual

Subject: TR3A Fuel Pump: Interesting
Date: Fri, 15 Mar 2002
From: suhring <suhring@lancnews.infi.net>

I took apart the original fuel pump that came with my TR3A (after taking apart the spare I had) and found something I had never seen in a AC fuel pump: The valves were held in place by a plate that was screwed into the housing. At first I thought someone got fed up with the "pinch" method of securing the valves (a real bugger to get them out when they are really secured), but after unscrewing the plate it is clear this was designed this way. The rest of the fuel pump is exactly like the spare one I have. I was amazed that after removing the plate, the valves just fell right out (which has never happened with the best of luck with the other method).

Is this a very close looking fuel pump to the original TR3 pumps or was this standard with the TR3s? Either way, it sure makes changing the valves a breeze.

-Scott Suhring

Fuel System/Pump/Manual

Subject: TR4 Repro Fuel Pump
Date: Tue, 12 Mar 2002
From: <BPAULTR3@aol.com>

<ArthurK101@aol.com> writes:

> "along the side of the road we found that the shaft was just hanging at one end - Whew! That was luck. Also,
> I noticed a month ago, when doing routine maintenance, that the shaft was moving out again.

A workable fix is to 'peen' the ends of the shaft with a punch. Set it up on an anvil with one end of the shaft on the anvil and center the punch in the other (upper) end and give is a sharp blow with a BFH. Should I dimple the end of the shaft enough to expand it right at the end, Turn it over and do the other end? This happened to me the day before leaving for Triumphest in 95. The shaft held up fine till I sold that car last year.

-Bob Paul

Fuel System/Pump/Manual

Subject: TR4A fuel pump fittings
Date: Tue, 20 Jun 2006
From: "Jeremy Kinney" <kinneyjr@msn.com>

First things first, thank you to all the folks so far who have been so helpful regarding getting my 4A back on the road. It is amazing how much is left to do. You can take a peek at: <<http://www.triumphowners.com/878>>.

My next dilemma concerns the line fittings at the fuel pump. The DPO used non-standard fittings that leak. I ordered new stainless lines and fittings from Classic Tube. When I tighten the fittings up there is play in the fuel line (it can be rocked up and down at the fuel pump). The tubes and fittings came with brass compression sleeves. Are they supposed to go between the flared end of the tube and the fitting to make everything tighten up? I thought I would ask before cranking away.

The illustrations in the parts manual are not that clear. There is a "bubble" between the end of the line and the fitting that might be a flare or a compression sleeve. My understanding is that the original fittings are different than what are available today. Thanks in advance,
-Jeremy

Subject: TR4A fuel pump fittings
Date: Tue, 20 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> My next dilemma concerns the line fittings at the fuel pump. The DPO used non-standard fittings that leak. I
> ordered new stainless lines and fittings from Classic Tube. When I tighten the fittings up there is play in the
> fuel line (it can be rocked up and down at the fuel pump). The tubes and fittings came with brass
> compression sleeves. Are they supposed to go between the flared end of the tube and the fitting to make
> everything tighten up? I thought I would ask before cranking away.
>
> The illustrations in the parts manual are not that clear. There is a "bubble" between the end of the line and the
> fitting that might be a flare or a compression sleeve. My understanding is that the original fittings are
> different than what are available today.

The original fittings had straight (not flared) line with compression sleeves. The compression sleeves were shaped differently than those commonly available today, effectively making them longer. The outlet fitting also had a special nut, designed to install 1/4" od line into a 5/16" fitting.

My solution was to turn a custom nut on the lathe for the outlet, with a longer straight section at the tip to make up for the shorter compression sleeve. Since the inlet nut was still in good condition, I just took off the last thread, so it could go deeper into the pump casting.

-Randall

Fuel System/Trouble Shooting

Subject: Fuel Pump Update
Date: Thu, 25 Mar 2004
From: "Fred Thomas" <vafred@erols.com>

Why not disconnect the fuel outlet line at the pump and turn the engine over, if gas comes out she's pumping, if not then put your finger over the outlet hole and see if you have any pressure, if not, then no gas is coming from the tank, the cam shaft does the priming, just to replace the pump does not really solve anything.

-"FT"

Fuel System/Trouble Shooting

Subject: Gas in oil
Date: Sat, 23 Jun 2007
From: John Mitchell <jmitch@snet.net>

Upon checking my oil, it smelled of gasoline, but I have not been able to detect and increase in the oil volume on the stick. When I had the engine out for bearings over the winter, I replaced the fuel pump with an NOS unit because the old pump had leaked into the crankcase and had caused the need for bearings. Being NOS would make me suspect the diaphragm leaking, but I think it could also be caused by a stuck float in a carburetor. Is there some way to sort out where the problem is without pulling the pan and looking for the drip? If I remove the fuel pump, how can I tell if it's leaking? Thanks for any advice.

-John Mitchell

Subject: Gas in oil
Date: Sat, 23 Jun 2007
From: "Glenn A. Merrell" <StagByTriumph@tscusa.org>

John Mitchell wrote:

> Upon checking my oil, It smelled of gasoline, but I have not been able to detect and increase in the oil ...

If I recall correctly there is only the diaphragm between the fuel and the crankcase. Another source of fuel in the oil as you correctly note are leaking fuel bowls that allow gas to leak into the cylinders and past the rings. The latter is evident with a lot of black sooty smoke on startup and a lot of carbon deposits inside your tail pipe.

If the fuel pump diaphragm is slightly leaking, you may smell gasoline in your oil but probably not detect any level change. This is because it will flash evaporate in your oil, escape through your positive crankcase ventilation port into the carburetors.

It is difficult to detect a slight leak. The arm of the fuel pump is in an oil spray area. If you take the pump off and look at the engine side, and it is washed clean of oil and smells of gas, it is a good size leak.

Older (New Old Stock for the most part) diaphragms were not compatible with ethanol, MTBE/TTBE. These additives in gasoline in the USA today will cause most OE NOS rubber seals and gaskets to swell and deteriorate rapidly.

The last diaphragm I purchased had a blue layer of some sort of synthetic on the fuel contact side with the SU logo on both sides of the diaphragm. This was a genuine SU replacement part.

Chances are if it is an NOS part or pump, or a cheap no-name knockoff, it will not be compatible with today's gasoline.

Who carries them? Ask around.

-Glenn A. Merrell

Subject: Gas in oil
Date: Sat, 23 Jun 2007
From: <TR250Driver@aol.com>

Mitchell,

Check your carburetors. If one or both of them are wet within the throat of the unit then the needle valve is not seating and shutting off the flow of gas which goes directly into the sump therefore you'll have this problem. Been there, the key is neither carb should be wet. If either is, then that is the problem. Then needle valve is weeping gas.

-Darrell

Subject: Gas in oil
Date: Sat, 23 Jun 2007
From: "Jim Muller" <jimmuller@rcn.com>

<TR250Driver@aol.com> wrote:

> Check your carburetors. If one or both of them are wet within the throat of the unit then the needle valve is
> not seating and shutting off the flow off...

One cause, possibly the most common cause today, so I've been told, is that newer gas formulations eat away at the inside of the older rubber fuel lines. Pieces then flake away and get caught in the float valves. Of course, rust and other kinds of gunk in the gas, I mean fuel, could do that too. The solution is to place a filter in the fuel line, and replace any rubber fuel lines, especially those downstream of the filter.

My GT6 accumulated a fair amount of gas in the oil once, so I rebuilt the fuel pump. It happened again, and then I had gas start to spill out of carb. I freed the valve, but then that happened again too. The fuel pump has a pretty good dirt entrapment system but a PO had installed a filter in the line. I replaced that filter and the rubber hoses. I haven't had a problem since. Of course, now it will probably happen again tomorrow...

-Jim Muller

Subject: Gas in oil
Date: Sat, 23 Jun 2007
From: John Mitchell <jmitch@snet.net>

Turns out you're right. I felt a slight dampness around the choke on the rear carb. I opened it up, and cleaned the needle valve thoroughly. I also threw some mystery oil in the gas tank. Who knows, maybe it will help. Changed the oil and filter, and am good to go (until the next time. :>) Thanks to everyone who made suggestions.

-John Mitchell

Subject: Gas in oil
Date: Sat, 23 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> The solution is to place a filter in the fuel line, and replace any rubber fuel lines, especially those downstream
> of the filter.

IMO, it's a good preventative maintenance to replace ALL of the soft fuel lines, every 10 years or so. Even without the problem of modern fuel attacking original lines, they get old and hard, and prone to cracking.

If memory serves, at least some TR6 have a soft line at the bottom of the tank, under the car. If it starts to leak on the road, you may not know you've got a problem until you've lost a significant amount of gas ... and you'll lose the rest of it trying to replace that hose.

-Randall

Gearbox/Overdrive/Electrical/Column Switch

Subject: Early TR4 OD wiring
Date: Mon, 14 May 2007
From: Cosmo Kramer <TR4A2712@aol.com>

Subject: Early TR4 OD wiring
Date: Mon, 14 May 2007
From: Allen Hess <allenhess@mgcarclub.com>

> This pertains to early TR4s, 62, 63, ?, and not 4A.

Why not the TR4A? Are you being precious? :>) As I believe that the TR4 & the TR4A will both meet the same requirements in this incident. Please correct me & explain the differences between them to me, being that I've only own TR4A's with OD. The TR4 that I bought for \$15 back in '72 doesn't count because I just stripped it for spare parts.

> I am installing an overdrive in a car which did not have OD. It is my understanding that the OD switch is on
> the right side of the steering column opposite the turn signal switch.

Yes, I've heard of this, but I thought that it depended on RH or LH drive, but I'm not sure or quite clear on this. So PLEASE write back to me once you have found out the correct story on this topic.

> Can anyone verify this?

Back, before I learned of this debate, I was told that the OD Switch went on the LH side of the column, & that's where I placed mine.

> I also need the location of the relay. This may become self evident when I begin to place the wiring later.
> -Allen Hess

Well, when I went to install my new OD Wiring I found the holes for the OD Relay on the right side of the tranny tunnel, on the underside of the side of the shelf, next to the heater or the battery box. At the back courier [towards were rear end of the car]. If you are where the passenger foot well is, it would be close to where the passenger's left knee cap would be when sitting in the seat. BUT REMEMBER! I own a TR4A, & you were only asking TR4 people to reply, so I may be of NO help to you.

PLEASE Reply back with the information that you have or have found out to confirm or rebuttal what I have stated for my TR4A. TIA,

-Cosmo Kramer

Subject: TR4 OD wiring
Date: Mon, 14 May 2007
From: <CarlSereda@aol.com>

Allen,

Yes - chrome stalked OD switch goes opposite side of turn signal stalk. And up is OFF, down is ON (unlike

USA house light switches). The chrome shaft matches turn signal shaft and is matched in length, (TR4A and onward use plastic black covering on shaft and a longer shaft length as well as a plastic column plinth to accommodate 4A-6's relocated head light switch). I believe the relay is located on interior firewall left of heater box. (I haven't installed mine yet so that's all I can tell you). The wiring harnesses should help you locate correct location - might even be a screw hole already. The correct OD column switch (chrome stalk and short length) are real hard to find, many times a later longer switch installed/ or sold. Good luck,

-Carl

Subject: TR4 OD wiring
Date: Mon, 14 May 2007
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

There is a clarification needed. TR4A was a chrome handle version of what then became the TR250 and TR 6 switch. The plastic covering came on the 250's and 6's. A chrome TR4A OD switch is as hard to find as a TR 4 OD switch. They just can't be found. The 4A's replacements were supplied with the plastic covering.

-JVV

Subject: Early TR4 OD wiring
Date: Mon, 14 May 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I recently did this. based on some TR4s I looked at... the switch does go on the right side of the nacelle. I made a (sorta) D-shaped hole to accept it. You will probably find the switch provided has a flat spot on one side of the threaded portion, hence the shape of the hole. The switch typically provided is not the correct one for a TR4 -- it has a black (rather than chrome) stalk and is somewhat angled. I found that mounting it with 'up is off' orientation causes it to angle back from the wheel and thus reduces the possibility of accidently flicking it in a turn. I believe the relay is mounted above the tunnel, along the lower edge of the battery box. There were exact measurements of the location in one of the manuals (probably Bentley/factory) for dealers adding OD aftermarket.

-Geo

Subject: TR4 OD wiring
Date: Mon, 14 May 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I've been told you can peel that black plastic covering off and you will reveal a shiny steel stalk that can be polished up a bit. Anyone done this?

-Geo

Subject: TR4 OD wiring
Date: Mon, 14 May 2007
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

I did just that, it's not too shiny however, more like an aluminum finish, it may well be aluminum too as it's never rusted. My chrome plated turn signal switch does show some minor pitting after 41 years, 38 with me as of June 11th. I've really enjoyed the car but most of all I've enjoyed the friends I've made having owned it.

-JVV

Subject: Early TR4 OD wiring

Date: Sun, 20 May 2007
From: "Allen Hess" <allenhess@mgcarclub.com>

The OD switch on the TR4 and the 4A are in different locations. So info about a 4A is not what I needed. Having looked at a friend's TR4A, the turn signal and OD switch are on the left side of the column. The Moss catalog shows the two switch bezel. The main light switch and dimmer are on the right side of the column. The TR4 light switch is on the dash and dimmer on the floor. I also found holes which fit the relay in the location you described and that is where I put it.

-Allen

Solenoid/Overdrive/Electrical/Solenoid

Subject: How I repaired the Solenoid (Long)
Date: Thu, 8 Apr 2004
From: "Ronnie Babbitt" <rbtr3a@cox.net>

I was able to repair the solenoid, for those of you who are familiar with the construction you might be able to follow the repair as I try to explain. First, the solenoids are basically two coils one high current that draws the plunger in and the second a low current that holds the plunger once in place. If you remove the protective boot covering over the solenoid there is a plastic cap held in place by two small screws. Once the screws are removed the cap can be lifted, under the cap are the soldered connections that connect the coils to the breaker contacts. It is similar to the points inside your distributor. During normal operation when the high or pulling coil energizes it pulls the plunger in to the solenoids bore, when the plunger bottoms out it strikes a nylon pin located in the center of the bore. Upon striking the nylon pin it pushed it backwards or to the rear of the unit. This backward movement then pushes against the contact breaker causing it to open the breaker gap. This is the switching mechanism that allows the pulling coil to switch to the holding circuit. I hope this all makes sense for it is my best explanation to how the solenoid works.. Buy measuring the different contacts you can measure the individual coils to determine the health of the solenoid. You should have readings on one coil of .44 ohms and 11 ohms on the other coil. My measurements were as indicated.

Now to the repair; First of all I polished the plunger to remove burs and potential drag. I then polished the bore of the solenoid. After removing the plastic cap and exposing the contacts I noticed that the nylon pin had become over heated and had melted. This melting diminishes the ability of the pin to open the breaker gap once the plunger is engaged. I carefully lifted the breaker contact using tweezers and removed the nylon pin. Once removed my first thought was to make a new pin by turning one on the lathe. However the pin is so thin it would flex while turning. So I decide the only thing to do was to modify the original pin. I was able to chuck the pin in the lathe exposing only the end of the pin; I drilled the center and tapped the pin. I found a 6-32 nylon screw and threaded it into place. This provided the additional length I needed to allow the plunger to open the breaker gap once engaged. I reinserted the pin, I re-bent the contact back into the correct shape and correct location. I then re-flowed all the solder connections and measured the coils resistance. Reassembled the solenoid and tested it using a 12v power supply. Electrical circuitry is not one of my fortes so I enlisted the help of one of our engineers. He assisted me with all the necessary testing to insure the unit was working correctly. Prior to installing the solenoid back to the overdrive I applied a small amount of lithium grease to the plunger and the solenoid bore.

The other mod; if you have ever replaced one of these you know that access to the bottom screw is nearly impossible. The first time I tried I spent two hours on my back under the car using a very long screwdriver and flash light. Not this time, I located a scrape piece of octagon rod about five inches long I turned down about a half inch and threaded it to a 8-32 screw. I could then insert the rod into the bottom hole of the solenoid and turned it into place using a < in socket.

Once the solenoid was installed I adjusted it according to the shop manual making sure to have the correct gap between the adjusting nut and the adjustable stop.

I connected the wiring and applied power to the unit, I repeated the switching several time and it never failed. After engaging the unit many more times decided a test drive was in order, so far so good.. I hopefully prolonged the life of this solenoid for a while however I will obtain a spare for the shelf.

-Ronnie

Solenoid/Overdrive/Electrical/Solenoid

Subject: OD Solenoid Amp draw
Date: Sun, 29 Feb 2004
From: "Randall Young" <Ryoung@navcomtech.com>

> If you can't measure current, you could check coil resistance with the solenoid disconnected and manually
> moved. Unfortunately I've never seen any specs for current draw or resistance of the coils.

The pull-in coil draws 15-20 amps, so its resistance is around 0.7 ohms.

Holding coil draws about 1 amp, so its resistance is around 12 ohms.

Even with only the holding coil energized, the solenoid will grow quite warm to the touch after some time. The pull-in coil will overheat in a matter of minutes if continuously powered.

In normal operation, the solenoid plunger moves only a small distance (about 5/32"), and it's somewhat cushioned by the linkage to the operating valve. I'm not certain, but I have a suspicion that over-enthusiastic bench testing of the solenoid may lead to shortened life ... on the newer solenoids it's only a bit of nylon that the plunger hits to move the contacts and being slammed into may well deform the nylon.

-Randall

Solenoid/Overdrive/Electrical/Solenoid

Subject: Overdrive chatters
Date: Thu, 14 Dec 2006
From: "Randall" <tr3driver@ca.rr.com>

> I'm moving and need to get the TR overdrive working pronto. When the overdrive lever is thrown, the
> overdrive seems to alternate between engaged and disengaged at a fairly high clip, I'd say 10 Hz. It happens in
> 2nd, 3rd, or 4th so it's probably not the tranny switches. The only item left is the solenoid. My manual is
> already packed. What setup is required on the solenoid?

That's usually a symptom that the solenoid is bad.

There are two coils inside the solenoid, a pull-in coil and a holding coil. The pull-in coil actually moves the plunger, but once the plunger has moved, a contact opens and leaves only the holding coil to hold the plunger up.

It sounds like your holding coil has a broken wire, so once the pull-in coil disengages, the plunger falls back down and the pull-in coil activates again.

There is some chance you can repair it, by removing it from the car and carefully separating the cover on the end. If the broken wire is visible, solder a jumper between the two broken ends and wrap it with electrical tape. But it's probably best to just replace the whole thing.

-Randall

Subject: Overdrive chatters
Date: Thu, 14 Dec 2006
From: <jar@aldermanroad.net>

You may need a new solenoid.

The solenoid is constructed with two circuits: the activation (primary) and the holding (secondary) circuits. When the solenoid is activated, both the primary and secondary windings are activated. This primary winding is heavy gauge wire, and carries a high amperage, about 10 amps as I recollect, but don't hold me to that. This high current is the reason for the use of the relay in the activation circuit. This provides a very powerful magnetic field so the operating lever is really snatched. This is the very strong "snap" that is heard.

When the solenoid reaches the top of its bore, it pushes a little plunger at the top that pushes a bronze finger that carries the current to the primary. This finger is shoved such that the circuit to the primary is broken so that only the secondary (holding) circuit remains activated. The magnetic field is strong enough to keep the lever lifted, but the current is much smaller. Thus the total current through the solenoid is now about 1 amp. (don't hold me to that number.)

What is likely going on is that the primary circuit is functioning, but the secondary is not. This results in the whole thing operating like a door bell: it breaks the primary circuit so the lever drops back to the off position, which allows the primary circuit to be activated, which lifts the plunger, which breaks the primary...you get the idea. No secondary circuit to hold it in the on position.

This may be from nothing but the secondary wire is loose at the top of the unit, or it may have burnt inside the unit. If at the top, you can use a needle point solder gun to fix it. If inside, the whole unit is toast.

-Cheers

Subject: Overdrive chatters
Date: Fri, 15 Dec 2006
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

David, I had a similar problem and it turned out to be an intermittent ground in the wiring system and not the solenoid itself. The vibration of the drive line made it act as you are describing.

Once apart jiggle the wires some and see if that causes the same issue. Of course if you are stationary and the solenoid is alternating it's not likely a grounding issue.

It's just another place to check before you spring for a new solenoid.

-JVV

Solenoid/Overdrive/Electrical/Solenoid

Subject: Overdrive solenoid
Date: Tue, 28 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

> What did I do wrong? My guess is this thing was drawing the 15 amps all the time, instead of the brief
> moment for it to actuate.

There are several things that can happen. One of the most commonly overlooked is the "drop" when the solenoid is de-activated. It only has a limited range, and if the plunger drops too far, the solenoid won't pick it back up again. As you know, there is a contact in the top of the solenoid that opens when the plunger reaches the upper end of its travel, and reduces the current from 15-20 amps down to 1 amp. Some solenoid mounts have an adjustment for 'drop' (which may be missing or misadjusted). Others had only a rubber stop, which may have fallen out or distorted until it lets the solenoid drop too far. If you have the latter type, I suggest you modify it to be adjustable.

Another possibility (since the TR lacks a cover over the lever arm) is that grit or a small rock got into the solenoid and blocked the plunger from opening the pull-in contacts.

Or, your solenoid may have simply been defective. There's a little plastic button that pushes against the contacts, and it seems that some of them are made of thermoplastic that gets soft and distorts when it gets hot. Or maybe they just aren't hard enough to withstand the repeated pounding from the plunger, I don't know. But I've taken one out of a burned solenoid that was simply too short to open the contacts. My suggestion is to add a fuse to the OD solenoid circuit, sized so that it will blow if the cutout contacts don't open quickly. That won't fix the problem obviously, but at least it will only cost you a 50 cent fuse instead of a \$150 solenoid to learn you have a problem. I used a MDL 8 fuse (which is an 8 amp slow-blow), just because I had a case of them on hand; but I believe even a 5 amp (American) standard blow would work. I also added a diode across the relay contacts, which seems to make them last longer.

-Randall

Subject: Overdrive solenoid
Date: Wed, 29 Aug 2007
From: <CarlSereda@aol.com>

That's something I could do Randall, can you tell me what diode and which contacts to connect?

I also added a diode across the relay contacts, which seems to make them last longer.-Carl

Solenoid/Overdrive/Electrical/Solenoid

Subject: TR3A Intermittent overdrive
Date: Tue, 7 Aug 2007
From: "David Brister" <david.brister@wanadoo.fr>

> I was going to try adjusting the arm the solenoid acts on it slightly up or down but as it's such a pain to do I
> was hoping for something that would increase my odds from 50/50 on weather I should adjust up or down?
> Any votes?

A few days ago Randall suggested the answer could be found in
<<http://www.vintagetriumphregister.org/maintain/TransRebuild/OverDriveA02.pdf>>

As usual Randall is absolutely right. I adjusted the lever using the Haynes recommendation with the 3/16" lock piece and as it said in the VTR write up my O/D didn't work. So on to plan B in the write up. However, it occurred to me that not everyone will have a dial gauge (including me) to measure the "up" movement of the ball. So I used a drill bit of the diameter to fit the top plug hole with marker pen ink and marked the "down" position of the ball on the drill. Then on energizing the solenoid and playing with the pinch bolt I was able to get the .030" to .040" lift and confirm it by marking the "up" position of the ball. You can measure the distance between the two marks with feelers. And praise be my O/D works again!

-David Brister

Subject: TR3A Intermittent overdrive
Date: Mon, 30 Jul 2007
From: <amcewen2@cogeco.ca>

I broke the solenoid bracket putting the engine/gearbox back in the car, I replaced it without too much difficulty (would have been a lot easier if it was above or below the floor not spanning it #&\$), now the overdrive comes on easily when engaged but if I'm running for a while with it and have to disengage due to traffic etc.. then it likely won't re-engage until the car sits for a few minutes (fluid cools?), running without the for a while O/D doesn't seem to have the same effect. The fluid level is good and little lever on the other side of the case seems to line up with that little hole in the O/D case so I'm at a loss as to the cause.

I was going to try adjusting the arm the solenoid acts on it slightly up or down but as it's such a pain to do I was hoping for something that would increase my odds from 50/50 on weather I should adjust up or down? Any votes? Thanks

-Art McEwen

Subject: TR3A Intermittent overdrive
Date: Mon, 30 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

Art McEwen wrote:

> I was going to try adjusting the arm the solenoid acts on it slightly up or down but as its such a pain to do I ...

Have you checked how far the solenoid drops when not engaged? If it drops too far, it could cause the symptom you describe. Some brackets had an adjustment for drop, but others just have a rubber block that can rot and fall out. Several people have suggested adding a bolt and nut to the later bracket, so the stop can be adjusted. Laycock specified a drop of 1/4", but some people have suggested using less, to be sure the solenoid can pull in every time.

It's also common on older units for the "adjustment lever" on the side to not give the right adjustment. It's better, IMO, to measure the movement of the operating valve ball directly with a dial indicator.

Both items are discussed in detail, with photos & diagrams, at:

<<http://www.vintage triumpher register.org/maintain/TransRebuild/OverDriveA02.pdf>>

-Randall

Subject: TR3A Intermittent overdrive
Date: Mon, 30 Jul 2007
From: <amcewen2@cogeco.ca>

Randall wrote:

> Have you checked how far the solenoid drops when not engaged? If it drops too far, it could cause the
> symptom you describe.

Not as such, no. I've checked that it moves smoothly every time, moving too far wasn't on my radar.

> Some brackets had an adjustment for drop, but others just have a rubber block that can rot and fall out.

There's a stop in the new one that was certainly in better shape than the old one.

> It's better, IMO, to measure the movement of the operating valve ball directly with a dial indicator.

But that would mean pulling the cover again, sigh.... Thanks. I'll read the pdf, if nothing else it will give me an idea of what I'm doing ;)

-Art McEwen

Subject: TR3A Intermittent overdrive
Date: Mon, 30 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

Art McEwen wrote:

> But that would mean pulling the cover again, sigh....

FWIW, there's really no reason you can't go for a test ride with the tunnel out. I've done it lots of times, no worse than riding a motorcycle. Be a little careful about where you put your right hand, though.

If you can duplicate the problem that way, then you can see an important piece of information: when the OD fails to engage, is the plunger up or down? If it's down, then most likely the problem is electrical in nature; possibly the contact points inside the solenoid itself.

-Randall

Subject: TR3A Intermittent overdrive
Date: Mon, 30 Jul 2007
From: "Ed Woods" <fogbro1@comcast.net>

Art,
Sounds like lower pressure when hot to me. Time has come to measure it. Guage is 50 bucks on E-bay or make one yourself.

If the o/d's in good shape, straight 30wt, non detergent oil will work fine as per John Esposito of Quantumechanics. If it's worn, something heavier might help; for a while anyway.

-Ed Woods

Subject: TR3A Intermittent overdrive
Date: Tue, 31 Jul 2007
From: <amcewen2@cogeco.ca>

Ed Woods wrote:

- > Art,
- > Sounds like lower pressure when hot to me. Time has come to measure it. Guage is \$50 on E-bay or make one
- > yourself.

Yeah, it's just frustrating when it's all been recently buttoned up and it's likely only a small adjustment it needs, Somehow, if it was a major job it would seem more worthwhile ;)

- > If the o/d's in good shape, straight 30wt, non detergent oil will work fine as per John Esposito of
- > Quantumechanics. If it's worn, something heavier might help; for a while anyway.

I'm running Hypoid gear oil now.

-Art McEwen

Subject: TR3A Intermittent overdrive
Date: Tue, 31 Jul 2007
From: Jay Holekamp <jholekamp@sbcglobal.net>

Greetings Art,

If you decide you need an overdrive pressure gauge set up, I can supply. Knowing what pressure the hydraulic system is making will help a lot in diagnosing your problem. Details: <<http://tinyurl.com/505s>>

-Jay

Gearbox/Overdrive/Electrical/Top Cover Switches

Subject: Early OD...again
Date: Mon, 27 Oct 2003
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

----- Original Message -----

Subject: early OD...again
Sent: Monday, October 27, 2003
From: "Dave Massey" <105671.471@compuserve.com>

> Drill and tap the new one. I did that when I converted my transmission. Trying to reweld something that was
> precision machined will be near impossible. Hint: The switches have a metric thread.
> -Dave

According to my TR4 Workshop manual it is a 16mm x 2mm pitch thread. Size the drill accordingly, 14mm I think is the right one for a 16mm tap. I have one of those taps around somewhere that I'll use for a back up light switch when I overhaul the transmission over the winter.

-JVV

Gearbox/Overdrive/Electrical/Top Cover Switches

Subject: Switch connections for OD
Date: Sat, 20 May 2006
From: "David Brister" <david.brister@wanadoo.fr>

As a temporary solution I once wired a motorcycle horn to the reversing switch via the output from the o/d solenoid. When you selected reverse with the o/d solenoid energized the horn blew, frightening you out of your wits, but it worked.

-David Brister

Gearbox/Overdrive/Electrical/Top Cover Switches

Subject: Overdrive Woes
Date: Fri, 29 Aug 2008
From: Jay Holekamp <jholekamp@sbcglobal.net>

Since when you have intermittent overdrive there is no electrical power to the solenoid, my guess is you have a lockout switch (Moss part # 140-470) on the transmission that sometimes doesn't close and sometimes does close. Try jumping this switch and if the overdrive is always on when the dash (or steering column) switch is on, it's the lockout switch. But very careful not to use reverse while you have the lockout switch jumpered and overdrive engaged, or you'll damage the overdrive.

-Jay

Subject: Overdrive Woes
Date: Fri, 29 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

> my guess is you have a lockout switch (Moss part # 140-470) on the transmission that sometimes doesn't
> close and sometimes does close.

I agree with Jay. However, a safer (and possibly easier, if it's hard to duplicate the problem) way of testing would be to temporarily add a test light across the lockout switch, and bring it out to where the driver can see it.

I setup a length of lamp cord, with connectors at one end that my meter (or test lamp) leads would plug into, and quick connects on the other end. Then I have various terminations, including alligator clips, and quick connect jumpers, that can attach to the quick connects on the lamp cord. It's easy to make, and a valuable tool for troubleshooting intermittent electrical problems. After just one use, I was glad I took the time to make it.

-Randall

Subject: Overdrive Woes - new question
Date: Fri, 29 Aug 2008
From: <kinderlehrer@comcast.net >

On a related issue (sort of) - is there an overdrive lockout switch that works opposite of normal? Specifically, normally "ON"? A friend has a TR4 with an OD but the top plate only has the reverse light switch location drilled out. He would like to use that location for a switch that would lock out the overdrive in Reverse. Or perhaps there is a solenoid that would produce the desired effects?

Did we have this discussion before? I can't find it in the archives.

-Bob

Subject: Overdrive Woes - new question
Date: Fri, 29 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

> On a related issue (sort of) - is there an overdrive lockout switch that works opposite of normal? Specifically,
> normally "ON"?

I'm not aware of one that fits the predrilled holes.

> A friend has a TR4 with an OD but the top plate only has the reverse light switch location drilled out.

Of course, the proper solution is to drill and tap the other two holes; or trade top covers for one that is already drilled and tapped.

> He would like to use that location for a switch that would lock out the overdrive in Reverse.

Although the damage isn't nearly as severe as reverse, operating a standard A-type in 1st gear is also pretty hard on the unit. Since the OD has to handle the multiplied torque from the engine, it 'sees' much more torque in 1st gear, but the relatively low shaft speed means the pump output is very low. The result is very likely to be slippage under some common conditions, like pulling away from a stop sign, which will lead to rapid clutch wear.

> Or perhaps there is a solenoid that would produce the desired effects?

Sure, all you need is a relay with a "normally closed" contact. Most general purpose automotive relays have a NC contact.

> Did we have this discussion before? I can't find it in the archives.

Beats me. Did we?

-Randall

Subject: Overdrive Woes - new
Date: Fri, 29 Aug 2008
From: "Geo Hahn" <ahwahnee18@gmail.com>

<kinderlehrer@comcast.net> wrote:

> On a related issue (sort of) - is there an overdrive lockout switch that works opposite of normal? Specifically,
> normally "ON"?...

The danger there, I think, is that any failure such as a loose or broken wire could result in the OD being operable in reverse.

With the original lock-out design most faults would render the OD inoperable.

-Geo

Gearbox/Overdrive/Mechanical

Subject: A-type OD planet gear carrier
Date: Wed, 5 Apr 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

Very slowly working through a TR4A overdrive rebuilding, and I'm advised there should be little to no lateral play of the planet gears in their carrier. In my case there is lots of play, so I suppose the bearings in the middle need replacing. Therefore I need to get out the pins, which should just be a press-out as I understand it. Now I realize there are "Mills pins" that should be removed first, and how I missed that I don't know, but, I managed to move the pins anyway: I am now at the point where I can get two of the pins about 2/3 of the way out using a hammer and drift - and they will go out either way - but then no further. In fact one of them will go back and forth some of the way by hand now (I have not tried the third; I wanted to leave it be for now to be a reference for reassembly).

What is the hang-up? I am guessing with the significant wear in the bearings, there could be ridges on the pins, but I have tried all kinds of things and they seem to reach a very hard stop.

Any BTDT advice?

-Jim

Gearbox/Overdrive/Mechanical

Subject: OD Speedometer Cable Routing
Date: Fri, 6 Jun 2008
From: C E White <Chux.Stuff@GMail.Com>

I've just completed installing an A-type overdrive into my 1965 TR4A and am trying to route the new, longer speedometer cable. Can anyone tell me the proper routing of this thing? Every attempt so far has resulted in a lot of cable left over! Yes, I have the correct cable (96").

-Chuck White

Subject: OD Speedometer Cable Routing
Date: Fri, 6 Jun 2008
From: "Randall" <tr3driver@ca.rr.com>

> Yes, I have the correct cable (96").

Chuck, I'm going to go out on a limb and say I disagree with you. According to memory and the info I have handy, the OD 4A used a shorter cable combined with an angle drive.

The earlier models used the 96" cable, with no angle drive. The lack of angle drive forced the cable to make a big, wide loop under the RH floorpan to match the drive on the OD without crimping the cable, hence the long length. But the redesigned tunnel for the 4A no longer allowed that approach, hence the introduction of the angle drive.

-Randall

Subject: OD Speedometer Cable Routing
Date: Fri, 6 Jun 2008
From: "C E White" <BN_Knight@Ameritech.Net>

Thanks, Randall. I have the right angle drive and the old cable so I'll give that a try. Is there any special routing to get it from the speedo (LHD) to the angle drive on the right side of the OD?

-Chuck

Subject: OD Speedometer Cable Routing
Date: Fri, 6 Jun 2008
From: <DLyilis@aol.com>

What is the correct cable for the angle drive? I have installed a J type and have the angle drive and have not yet come to thinking about the cable.

Subject: OD Speedometer Cable Routing
Date: Fri, 6 Jun 2008
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

When I installed an A-Type OD with an angle drive I used the same cable that I had been using for the non-OD box.

-Geo

Subject: OD Speedometer Cable Routing
Date: Fri, 6 Jun 2008
From: "Randall" <tr3driver@ca.rr.com>

> Is there any special routing to get it from the speedo (LHD) to the angle drive on the right side of the OD? Sorry, that I don't know. Hopefully someone else does?

-Randall

Subject: OD Speedometer Cable Routing
Date: Sat, 07 Jun 2008
From: <spamiam@comcast.net>

The secret is the 90 degree angle drive which attaches to the output of the OD. It is on the passenger side of the OD, as you know. The angle drive will interfere a little on the transmission cover. Ideally you cut a hole and fabricate a little "bump" that clears the angle drive and seals well to the cover. Preferably removable in case you need to service the angle drive or cable.

The LONG cable specified for the OD in the TR4a is not correct. Try using the original speedo cable and see how it fits. I think I needed an extra few inches, but not nearly as much as the cable specified. Once you have an idea of what length you need, then look at the various cables available and pick the best one.

-Tony

Subject: OD Speedometer Cable Routing
Date: Sat, 7 Jun 2008
From: "C E White" <BN_Knight@Ameritech.Net>

Thanks for all the help and information Tony, Randall, and others. I've re-installed my original (66"?) speedo cable and it fit perfectly. The routing I used was from the back of the speedo out the grommet in the firewall, across in front of the battery box, down the passenger's side of the firewall, under the car but inside the tranny tunnel to the right angle drive adaptor. I used zip ties to keep the cable away from the back of the head, the exhaust pipes and the passenger's side muffler (my '4A is fitted with the dual exhaust system).

-Chuck

Gearbox/Overdrive/Mechanical

Subject: Speedometer cable for overdrive
Date: Fri, 14 Mar 2003
From: Chris Kantarjiev <cak@dimebank.com>

> Only the TR2-4 use the longer cable and have a notch in the floor pan and a special rubber boot to
> accommodate it. The TR4A introduced the use of the gearbox and the floor pan on longer included the
> cut-out for the cable to angle straight out of the gearbox.

Well ... I won't speak for the TR6, since I'm not entirely certain (well, I wasn't, but do read on), but the 4A definitely uses a longer speedo cable for overdrive than for non-overdrive. Since the TR6 gearbox is the same unit (at least the early, A-type O/Ds are) and the speedometer is in the same place, I'd guess that they do, too.

The non-OD gearbox has the speedo drive on the left side of the tail shaft. The OD gearbox has the speedo drive on the right side, the solenoid is on the left side. The cable is routed across the top of the gearbox, fastened with some Adel-style clamps to the top cover bolts.

The OD cable p/n is 504948 (/I for inner, /O for outer). Ah, that's for the 4A; for the 6, I see that the p/n is 516545. And yes, you need a right angle box, p/n 120694. (Why a different part? Did they switch the speedo/tach location *again*?)

I don't have accurate length information for LHD cars. But I note that the Moss UK catalog specs a 69" cable for "all cars with O/D" (not true) as well as the LHD standard gearbox, and a 78" for a RHD standard gearbox. Since the cable in a RHD standard car must cross in much the same way as in an OD box in a LHD car, might be a good guess - though the RHD standard setup doesn't seem to use a right angle drive!

TRF should be able to supply you the right cable, or at the very least, the required length. Call their tech support line.

-Chris

Subject: Speedometer cable for overdrive
Date: Sat, 15 Mar 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> Well ... I won't speak for the TR6, since I'm not entirely certain (well, I wasn't, but do read on), but the 4A
> definitely uses a longer speedo cable for overdrive than for non-overdrive. ... The OD cable p/n is 504948 (/I
> for inner, /O for outer). Ah, that's for the 4A;

Chris, my TR4A SPC also lists 504948 /I & /O for the LHS non-OD application. Does yours list something different?

> For the 6, I see that the p/n is 516545.

And again, my TR6 SPC lists 516545 for the LHS non-OD application.

Here's some guesswork on lengths:

504948 supercedes to GSD114, which Rimmer's says is 66"

516545 -> GSD169 -> 69"

504607 -> GSD141 -> (can't find this one)

504613 -> GSD109 -> 63"

504609 -> Moss USA 731-000 -> 96"

-Randall

Gearbox/Overdrive/Mechanical

Subject: TR3 Gearbox versus TR4
Date: Thu, 27 Nov 2003
From: Geo Hahn <ahwahnee@cybertrails.com>

Wayne wrote:

> I have a TR4 OD tranny in my 1958 TR3 (NO - you can't have it!) It's leaking like a sieve right now and I'll
> get it fixed here soon once I get time to figure out where the leak is coming from. I have a TR3 Bentley's
> book for reference right now and have a question about oil quantity and type. I know we had an oil type
> thread recently but can anyone tell me the quantity of oil to fill it back up if we assume that it has been
> "drained and re-filled?". Or perhaps I just fill it to the brim?

The Haynes says 3.25 pints is the capacity for TR4 gearbox plus OD and a drain & refill is 2.75 pints. I do not have an OD so I do not have direct experience here, but I recall the non-OD capacity of 1.5 pints was referring to Imperial Pints (about 1.8 US). So be sure whatever reference you use you know whose pints are being mentioned.

I had previously asked if anyone used a tube & funnel to fill the gearbox from the engine compartment but all responses mention using pumps. Nevertheless I tried filling from above and found it to be quite convenient. I used a 30" length of clear vinyl tubing (1/2" OD, 3/8" ID) putting the funnel just above the fuel pump (if you look just right and have a light under the car you can see the drain plug from the engine compartment).
-Geo Hahn

Gearbox/Overdrive/Mechanical

Subject: TR4 tranny -> o/d mateup
Date: Thu, 21 Sep 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

After much frustration and great support from the members of this list, I now have my TR4 transmission together with nothing binding, the gear shifts all working, etc. Many thanks go to all who responded and especially Larry Young and Sam Clark for writing such a great article on the topic.

So.....on attempting to mate it to the overdrive unit, even though I had specifically taken care to align the splines within it, they are now misaligned and I can't put them together.

Is there another way to line them up? When I reach in with a long screwdriver they seem very unwilling to move at all.

It would be excellent if someone made a tool like you use for lining up your clutch friction disc. I guess there isn't too much demand though. TIA,

-Jim Wallace

Subject: TR4 tranny -> o/d mateup
Date: Thu, 21 Sep 2006
From: Mike Kitchener <mikek@9online.fr>

Jim,
ISTR that you have to engage overdrive with a lever under the bridge pieces and then turn the output shaft until the two sets of splines are aligned. Once aligned you let go of the levers and tap the bridge pieces to lock everything together. Good luck,
-Mike

Subject: TR4 tranny -> o/d mateup
Date: Thu, 21 Sep 2006
From: <Dave1massey@cs.com>

grandfatherjim@gmail.com writes:

> So.....on attempting to mate it to the overdrive unit, even ...

It's called "an old main shaft." The problem I encountered when mating an OD to a transmission is the tendency is to set the transmission on end (bell housing down) and lower the OD onto the mainshaft. The problem with this is when the OD is inverted gravity will cause the moving portion of the OD clutch to slide forward and the helical cut of the gears will cause the sun gear to turn and now it no longer aligns with the sprag clutch splines.

Then you turn it over to realign it and now the clutch disk is in contact with the ring gear and it won't turn.

The solution I've used (once the sun gear and sprag clutch splines are realigned) is to bolt the OD output flange to a big board and with it facing up (flange down) and lower the transmission onto the OD. The weight of the transmission will help compress the springs, too.

-Dave

Subject: TR4 trans/od spline align (TR4 tranny -> o/d mateup)
Date: Thu, 28 Sep 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

I had been having trouble getting my transmission mated to the overdrive, and received much valuable advice from list members, for which I am most grateful. Thanks all of you.

So, now they are together, and it turned out that getting the two splined parts within the overdrive aligned (to receive the main shaft from the tranny) was easy. You read that right, easy! Mike Kitchener provided the vital tip (as did others, but for some reason his registered in my brain). With the overdrive standing on its back end, I lifted the two bridge pieces with a long screwdriver. (They stay up on their own). Then I rotated the entire overdrive while observing the two splined sections with a flashlight. They moved relative to each other, and so when they were lined up just right, I tapped down on the bridge pieces which locked them in place. I then did a trial fit of the transmission (main shaft pointing down into the o/d), without the 8 springs. It slid right in, so back out it came, the 8 springs were set in place, and all went together as smoothly as can be.

It could be that I was lucky - but I prefer to think that this success was a result of all the great input from all of you. (Next step, transmission onto engine....this is feeling good) Thanks again,
-Jim Wallace

Gearbox/Overdrive/Mechanical

Subject: Transmission and OD id
Date: Fri, 16 Mar 2007
From: don spence <dkspence@telus.net>

Can someone confirm the source and type of the following?

The transmission is serial # TS23378 and the overdrive tag shows serial # 22/1374/005147.

Thanks

Subject: Transmission and OD id
Date: Fri, 16 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

That should be a 3-synchro box from a very early (1957) TR3A (meaning a short starter bulge and a dipstick), and it's A-type OD. If memory serves, that OD is very similar to the one used on TR4, but has cast iron rings on the operating pistons, hex flats on the drain plug, and a separate bolt to hold the filter screen in place. It might have had the adjustable OD solenoid stop, but I think not. Later A-types (TR4A onwards) were modified to give a softer engagement (smaller accumulator piston), to avoid tearing up the IRS.

-Randall

Subject: Transmission and OD id
Date: Sun, 18 Mar 2007
From: <TRDOCTOR@aol.com>

Randall In addition to Randall's description, the 22 in the serial number would indicate a 22% overdrive ratio.

-Sam and Carol Clark

Gearbox/Overdrive/Mechanical/Accumulator Valve

Gearbox/Overdrive/Mechanical/Clutch + Sun Gears

Gearbox/Overdrive/Mechanical/Mountings

Gearbox/Overdrive/Mechanical/Operating Lever + Solenoid

Written by: <ebk@buffnet.net>

Hi Tom!

I'm introducing myself to you, because you don't know me from a hole in a cave. I was told by Richard Mandziak [as I understand, you're both in the same British Car Club] to E-mail you because you have a TR4 or a TR4/A, [I forgot which you have.] with an A-Type OD. I'm having problems in adjusting mine & burned out the solenoid, but then I got it working again to the point that it would turn on when cool & say on until I turned it off, then when I went to turn it on again [within a short period of time, like stopping to pay a toll], it wouldn't go on, until it cooled down. I that went to a garage mechanic & he tried to adjust it & it never worked again. I put a pressure gauge on it to find that when the engine runs the OD pressure is 300#. When I push the right side manual lever ALL the way down to engage the OD, the pressure jumps to about 310# :-(. When I release the lever, the OD disengages & the pressure drops to 290# 7 then rises up to 300# within a matter of seconds. I don't want to install a new solenoid until I know for sure what the problem is. I really don't want to pull the engine/tranny OR just the tranny, now because it's to close to the season starting. I read Nelson R.'s article on OD drives lightly & recall the pressure should be about 450psi when engaged. So what do you think?

-Cosmo Kramer

----- Original Message -----

Subject: Hi Tom!
To: Thomas Kendall
Sent: Thursday, April 01, 2004
From: <ebk@buffnet.net>

Thomas Kendall wrote:

Hi Cosmo,

Generally the lower oil pressure is due to the back flow valve not seating properly (items 35, 36 and 37 in the Moss parts catalog for the TR3/4 overdrive section).

> Thanks for giving me a reference point when explaining things to me. It's less confusing for me.

There may be dirt in the ball seat, a damaged ball or a weak spring. I really don't recommend making the longer plunger as it can sometimes be a solid jam when you tighten the valve plug.

> OK I gather you are speaking of the Ball (35) having dirt or damage. Therefore, replace it & clean the
> area well before installing, right? But I'm not clear on what you mean by 'making the longer plunger'?
> Please explain or rephrase it to be clearer to this old man.

O.K. I had assumed (bad idea) that you had read the OD problem solving that Del Border had written on A-type OD used in Healeys that has been floating around for a while. The delay in responding is because I have been trying to find it on the web again to send you as an attachment or the web site address for your info. I CAN'T find the thing now. In his article, he made a new plunger (36) with a thicker shoulder. I believe it was increased to about .230" thick. Other sites recommend getting a slightly stronger spring for a higher pressure on the ball, not to exceed 7 lbs. I don't know how they measured this, so I can't comment on a given spring. Moss lists both ball and spring in their catalogue (35 and 37).

A thinner sealing washer would probably be better.

> So this thinner washer (38) could just be ordered & sanded down with 1000 grit on top of glass
> [smooth, flat surface], right? About how much should I remove, .002", .004"?

I can't give you an amount as I don't know how thick the one you have is. If it is about .062", then .032" would probably work. You might be able to get this at a good hardware store.

Reseating the ball using a brass drift and light tapping might also be required.

- > I have a problem with is operational step. Reason: I'll be doing this step while the OD is in the car. The
- > insertion of the ball is horizontal. Therefore, how do I know the ball is in its proper place to start with,
- > before using a brass drift? Also, using a brass drift means that I can't magnetize the ball to the drift for
- > it to stay in place for the 'light tape' to seat it ball (35)?

Using a wheel bearing grease that has no graphite or moly will hold the ball in place. You will probably have to use a mirror to check the ball seat for foreign debris and to install the ball. You can use a vacuum pump or a shop vac to supply suction through a short rigid tube to hold onto the ball while you locate it. Then tap lightly to reseat the ball.

Too hard can damage the pump body. I believe this can all be done by raising the rear of the transmission and some contortions. If this doesn't cure the pressure problems then it is possible the pump is starting to go or there is a big problem with the accumulator piston rings and/or spring(s).

- > These Accumulator piston rings that you mention are Moss/USA part # 43, right? Which are not a
- > valuable from Moss, now & haven't been for quite some time. Will the other Accumulator set up work?

Yes, the other accumulator will work, but Moss doesn't have all the parts listed. Victoria British does list all the parts. I wouldn't do this except as a last resort . Way too expensive and I have not seen an OD with broken rings. If after all simple (read cheaper) ways don't cure the problem and the accumulator can't hold pressure for awhile after shut down it might be required to replace this assembly and/or the operating pistons (items 23) and/or rings (item 24). Like wise if the pressure never comes up to specs the pump could also be bad or the spring (6) may have failed. Pump BAD, spring cheap but replacement is difficult but doesn't require the gearbox to be removed.

Adjusting the operating rod is easy if the setting arm is not loose or there is no wear internally.

- > Ok, How do I know if the 'setting arm' (#59 or #33?) is considered 'to lose'? or 'wear' is there? I've
- > never come across anything that states what the wear limits are, & wear on what part #'s are you
- > talking about?

I don't have an item 33 in my out of date catalogue but it is the brass arm on the passenger side that lines up the hole in the case. With the actuating lever (59) clamped to the shaft and holding it firmly by hand the setting arm should not be able to move. If it does, and on one of my OD it does, then you have to use an alternate method to set the actuating lever. There is no specification of wear limits on the operating shaft and cam. This is the shaft that the actuating lever and the setting arm are on. You can check the operation of the operating valve ball (item 30) using a dial indicator or by putting a short rod on top of the ball and the move the setting arm to its alignment hole and feeling for the ball to lift (approx. .030). The rod for setting the arm location is a 3/16" diameter drill shaft. If the setting arm is loose on the shaft or the ball does not lift when the setting arm is located using the rod then you have to move the setting arm to the proper location and hold it while you actuate the solenoid and while pressing down on the actuating lever (33) tighten the clamp bolt. Before doing this, it would be a good idea to check the operating ball and seat to insure the ball is sealing. The same method of reseating the ball can also be used here (no grease needed though). You might have noticed that to accomplish the alternate method that you would need three to four arms and at least three eyeballs on extensible stalks. Fortunately for me this is easy after that nuclear power plant problem and the mutation started. Most people have a friend (victim?) help them with this problem.

You just do it like the repair manual states. If there is a problem, then you need to loosen the clamp bolt (on #95's arm?) on the solenoid arm and using a smaller rod

- > What part # is this smaller rod? I'm lost on where you are in the OD.

See above. No part number for setting rod but any drill diameter that locates the setting arm fairly rigidly with

pressure applied in the down ward motion will work.

So as to not over adjust the operating lever (#59), engage the solenoid, push down lightly on the adjusting arm (#33?) and then tighten the lever clamp bolt. An alternate method is to remove the operating valve plug and spring and measure the lift of the ball.

> I tried this with another person using a dial gauge, but I couldn't get an accurate reading. Any specific
> suggestions on how this can be accomplished?

See long winded paragraph above.

About 1/32", if I remember correctly, then tighten the lever clamp bolt. If the solenoid does not engage when power is applied then there is an electrical problem. The solenoid must move to its full motion otherwise the pull in circuit stays engaged and fries the solenoid internally. Check to make sure the solenoid piston is not jamming or is sticking.

>How do you suggest I do this? Push the solenoid plunger up & watch it drop? Won't the actuating lever
> #59 restrict the drop?

With the actuating lever (59) loose, push up and then pull down. There should be no sticking in the solenoid. The spring in the operating valve (28) helps return the lever when it is clamped to the shaft under operating conditions.

Dirt often gets into the insides since you can't get the dust seals any more.

> That brings me to another question: I find my dust seal gets in the way of adjusting the arm #59. How
> do I get around this?

If you have a pair of ignition wrenches the right size, they are very thin and short so they are easy to work with. If you mean that the dust seal doesn't allow the operating lever to move to the limit of the solenoid when set properly and the solenoid energized, then that is a problem. My dust seal is dried up and cracked but doesn't interfere with the motion.

I never asked if you have a TR4 workshop manual. The factory manual shows the pump valve and operating valve systems very clearly in figure 10 and 9 respectively. If you don't have one it would be a good investment as it shows very clearly and simply how to do things. (IF you have the proper, unattainable in many cases, tools. I have been making my own tools to remove main shaft circle clips and rear end bearing races lately.).

I hope I haven't insulted you by being long winded or too basic.

> NO you haven't as you can tell. I'm confused with you not being 'basic' enough.

I certainly don't mean to insult your intelligence or abilities. I have had several discussions with other people who curse their Laycock OD because they don't work and have usually found the problem to be very simple to cure as it usually involves the check valve.

> OK, I'm lost again. What #'s are included in the 'Check Valve'? So I know where you are in the OD.

Items 35, 36 and 37.

I don't recommend enlarging the hole from the pump as most articles state.

> OK, which Pump? PLEASE give #'s! I've never hear of increasing any hole size.

Only one pump in the OD, items 5, 6 and 7.

The pump is a positive displacement pump and opening the hole means the pump must supply more pressure to lift the return ball and the spring must supply more force to reseal it. I have driven my TR4 for over 600,000 miles and never had a problem with the OD except for a solenoid failure about 20 years ago. I have been using 85W/90 GL-4 oil from Sta-lube mixed with about a pint of Marvel Mystery Oil added with excellent results.

Good luck and let me know if you cure the problem,

-Tom Kendall

Cosmo writes:

> Hi Tom!

> 'Cure the problem', I'm not going to touch the OD until I thoroughly understand were & what you're
> speaking about. I tried using just GL-4, then straight 50 wt. ND motor oil, & now using straight 30 wt
> ND motor oil. Thanks for the suggestion, but you didn't mention what the ratio of 50 wt. to Marvel
> Mystery oil. PLEASE, do NOT take me the wrong way. I DO appreciate all that you have written, but
> you can see that I NEED EVERYTHING numbered & explained in detail. I'm running out of time [&
> it's MY Fault, NOT yours]. So if I can't understand something, then I'll leave it until next year & focus
> harder on the problem. I DO like it that you use the Moss/USA catalog as a reference, But please
> follow through as if one would be reading a manual. REASON: I will save this info in my 'E-mail
> TR4\TR4/A Repair Manual' that I'm working on. Thanks again for all your time in writing to me.

> -Cosmo Kramer

> BTW- Do NOT take anything for granted when writing info. to me. :-[

About a pint of Marvel to the refill of the gear box.

I tried motor oil also but didn't get good clutch grab as almost all oils have friction modifiers that hamper synchro operation and clutch grab. Many Healy drivers are supposedly using Valvoline 20-50 oil but they don't have 2nd, 3rd and 4th gear operation, usually only top and seldom 3rd. The GL-4 85w/90 oil is the recommended oil in the factory service manuals.

-Tom Kendall

Gearbox/Overdrive/Mechanical/Operating Valve

Subject: A-type OD
Date: Mon, 09 Apr 2007
From: Kevin Thompson kthompson@whoi.edu

Hi folks,

Would anyone know what the thread size is for the operating valve plug on the A-type overdrive units? I'm in the process of trying to fit a pressure gauge to check the operation. And, would an older 1200 RPM 1/2" electric drill give me enough umph to shift it into overdrive? So far, I'm having no luck getting it to work. This is a "boxes-o-parts" resto, so I've no idea of the history of said unit.... I removed the operating valve and cleaned the tiny hole in the stem, and cleaned the screen at the bottom of the unit, topped it with 30 wt oil, etc. Any ideas, or what the top plug threads are so I can get a pressure reading?? TIA

-Kevin T

Subject: A-type OD
Date: Mon, 9 Apr 2007
From: "Randall" tr3driver@ca.rr.com

Would anyone know what the thread size is for the operating valve plug on the A-type overdrive units?

All I remember offhand is that it's not a standard SAE thread. To get a good pressure reading, the fitting also needs to accommodate the spring, plunger and ball. The ball may not stay on the end of the stem otherwise. There's usually someone selling a gauge, hose & fitting on eBay for about \$50.

-Randall

Subject: A-type OD
Date: Mon, 09 Apr 2007
From: "J.C. Hassall" jhassall@blacksburg.net

Can't help with the thread info, but I can tell you the 1/2" drill won't do the trick. I tried the same approach. The problem is your "1200" RPM is no-load speed; it'll slow down considerably when under load. You can kludge a washing machine (etc) motor and belt drive. That'll require some fixturing, to make sure all the bits stay in their proper location when you power the electric motor. For a picture of a test fixture, go to www.archive.org, have it return the archives for www.buckeyetriumphs.org and look at the Technical articles for Jun 03, 2003. Read the A-type OD article, Part IV.

-Jim

Subject: A-type OD
Date: Tue, 10 Apr 2007
From: [<TRDOCTOR@aol.com>](mailto:TRDOCTOR@aol.com)

You can also go to the VTR website (VTR.org) and look at the article that Larry Young and I wrote about working on A-type overdrive units. I believe that there is a picture of the mock up that Larry made to spin up a transmission to check the overdrive for pressure.

-Sam and Carol Clark

Gearbox/Overdrive/Mechanical/Operating Valve

Subject: OD Operating Valve Shaft Oil Leak
Date: Fri, 27 Jun 2003
From: "Randall Young" <ryoung@navcomtech.com>

> The OD on my TR3A leaks oil at the Operating Valve Shaft at the end opposite the solenoid. The service
> books and catalogs do not show any seal or o-ring. My question is, how is the oil supposed to be sealed in
> and how do you repair it when it does leak?

I don't have a parts manual handy, but I'm fairly certain there is supposed to be an O-ring on that side. If you look at the Moss catalog for item #866-030 "O-ring, operating shaft", it shows 2 required.

To replace it, you'll have to drive out the pin that locates the "adjusting" lever on the shaft. Check that the new ring protrudes slightly from the groove in the case, as sometimes the groove is too deep. If so, you'll need to find some sort of packing to fill it up a little, I think McMaster Carr sells Teflon "packing rings" for this purpose or Herman van den Akker will turn one up in brass. It's probably best to have already removed the valve plunger, as otherwise the operating shaft is apt to slip sideways and let the plunger fall off of it.

When you reinstall the operating lever (after repining the adjusting lever), push it and the adjusting lever closer together while you tighten the clamp, to put some pressure on the O-rings. This is mentioned in the OD service manual, which I believe is still available from TRF. However, don't use the book method for adjusting the valve, instead see Nelson Riedel's write-up on how to measure the ball lift directly and set it there.

<<http://www.buckeyetriumphs.org/technical/AOD/AOD4/AOD4.htm>>

(scroll down past the photo of his girlfriend <g>)

-Randall

Gearbox/Overdrive/Mechanical/Pump + Valve

Subject: TR3 overdrive- no oil pressure
Date: Mon, 16 Aug 2004
From: "Randall" <tr3driver@comcast.net>

> Any suggestions for a condition of seemingly no oil pressure in an A-Type overdrive?

Just to state the obvious ... are you sure you reinstalled the pump cam the right way around? If you can spin the unit with the valve plug removed and not get oil flow out the top, then I would suspect the cam is missing, or the pump foot is not riding on it.

Flow but no pressure might be a broken/missing spring or ball in the anti-return valve.

The pump runs under oil, there should be no need to prime it.

-Randall

Gearbox/Standard

Subject: Anti-rattle spring, '63 Triumph TR4
Date: Fri, 16 Mar 2007
From: Brian Jones <brianjone5@mac.com>

Hi there,

I am trying to find out what is involved in installing the anti-rattle spring in the gearbox of my TR4. I was ordering some items and added the spring and plunger as they were so small & cheap.

I get a loud rattle when accelerating at around 3k revs. I am hoping these tiny things may cure it, though with the volume of noise and the size of these items, it seems improbable.

Is this to replace a worn part, or install an after-market part?

Could anyone kindly give me an outline of what is involved?

-Brian

Subject: Anti-rattle spring, '63 Triumph TR4
Date: Fri, 16 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi Brian!

Well, once you remove the old parts, you then install the new ones. Starting with the spring, followed by the 'plunger' [small metal piece].

Now the tricky part: Press down the plunger below the surface. Then take a cold chisel & ping a small nick on the inside edge of the hole. Enough to have the metal over hang the plunger so as to hold everything in place.

Caution: Be-careful not to have the spring set the plunger flying when installing to removing the cold chisel. Just in case you didn't ping the chunk of metal over enough to stop the plunger from flying out.

BTW- It's to REPLACE a worn [broken spring] or missing part.

-Cosmo Kramer

Subject: Anti-rattle spring, '63 Triumph TR4
Date: Fri, 16 Mar 2007
From: Bob Labuz <yellowtr@adelphia.net>

The anti rattle spring is standard equipment from the 3 through the 4A and maybe 250 and 6. The spring and the plunger fit in a small hole at the end of the lever. First you insert the spring followed by the plunger. Use heavy grease to hold them in place and then install the lever into the center shaft selector. This is not easy on a new spring, so be patient and be careful you don't lose the plunger or spring. Once installed, the spring/plunger combination should reduce the rattle.

-Bob

Subject: Anti-rattle spring, '63 Triumph TR4
Date: Fri, 16 Mar 2007
From: <Dave1massey@cs.com>

That spring and plunger goes in the bottom end of the shift lever. All that is involved is removing the lever which can be done without removing the transmission cover. You will have to remove the boot. You will see a stamped steel cap that holds the lever in place. Refer to your manual but I think there are just two or three bolts that hold it in place and you only need loosen them and then rotate the cap and it will lift off. Odds are the spring and plunger is missing. If someone has been in there previously they may have lost them and thought

them to be unnecessary. The tricky part is to reinstall the lever without losing the parts. A dab of grease will help.

-Dave

Subject: Anti-rattle spring, '63 Triumph TR4
Date: Fri, 16 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

The factory fought with that problem a lot ... AFAIK it was never totally solved until they switched to 6 cylinders. Other "fixes" include the strap from the shift extension down to the motor mount, which is frequently missing; and the "counterweight" mounted to the rear of the OD (which I've only seen on one car).

-Randall

Subject: Anti-rattle shifter items
Date: Sun, 18 Mar 2007
From: <CarlSereda@aol.com>

Hi Brian, In attempts to reduce the shifter rattle problem on TRs I recall reading on TR Factory Service Bulletins something like:

- 1) The spring weight on the shifter was increased (the coil spring above the ball on chrome shaft) to a stronger spring and
- 2) An inch of rubber hose can be slid down the chrome shaft to the base ins such a way as to interfere with the chrome shaft hitting directly against the coil spring cover.

On my car I don't know if the coil spring above the shift lever ball is the later 'heavier style' so leaving that 'as is' for now. I will be attempting to slip the rubber/plastic hose on chrome shifter shaft base to insulate it from vibrating against spring cover in the near future (two years). My car is all apart so this can't be tested for quite some time. Regards and glad to be back online!

-Carl

Gearbox/Standard

Subject: Rebuilding Angle Drive
From: Roger Elliot

Cosmo,

I forgot I got some instructions on rebuilding the angle drive that seem pretty clear - probably more so if I had an angle drive in my hand.

-Roger Elliott

The usual cause of failure of the speedo angle drive is breakage of the short piece of speedo inner cable that inserts into the pinion in the gearbox. You can replace it, presuming that you have a piece of speedo cable with a squared end on it. To disassemble the box carefully drive the shaft which takes the section of cable inward to pop off the welsh plug that holds it in. Use a pin punch to drive the broken piece of cable out of the center of the gear and install the new piece of cable.

Sometimes a little difficult to get the welsh plug back in but once it is in position a couple of light taps on the center of it will usually secure it in position. If the piece of speedo cable that you are using to replace the original is a little loose it can be soldered into position. BTW the easiest way to cut speedo cable is with a grinding wheel.

Gearbox/Standard

Subject: Shifter knob thread
Date: Sun, 30 Dec 2007
From: "Randall" <TR3driver@ca.rr.com>

> Having measured the threaded shaft, I find it to be approx. 7/16x32. This is a size I never heard of but I will
> need to find a tap to make the knob insert.

Likely there are cheaper sources; but McMaster-Carr carries 7/16-32 taps.

<<http://www.mcmaster.com/nav/enter.asp?pagenum=2345>> (near the bottom, under "special thread taps")
-Randall

Gearbox/Standard

Subject: TR4 popping out of second gear
Date: Tue, 21 Mar 2006
From: <TR250Driver@aol.com>

<markvaden@gmail.com> writes:

> Hi,
> My TR4 pops out of second gear when the engine brakes. I suspect that the likely cause is worn out dog teeth,
> but someone awhile ago mentioned to me that it could be a worn out shift fork. Has anyone else experienced a
> worn out shift for causing a gearbox to pop out of second gear? From looking at the manual, I can change the
> shifter fork by just removing the top cover from the gearbox - which seems a whole lot easier than changing a
> gear/synchro internal to the gearbox. Thanks in advance for your help.
> -Mark

Mark,

The TR250 was popping out of 3rd gear right after a rebuild. I tightened up the screws on the selector shaft just a bit and it has run OK that way for several years now. As I recall there are 3 of them right on the top cover and an easy procedure to adjust as outlined in the manuals. Probably this is masking another problem like worn dog teeth but it worked for me. BTW the forks were new in my box.

-Darrell

Gearbox/Standard

Subject: TR4 Transmission Detent Spring Required
Date: Fri, 1 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

I'm sure everyone is aware of this, but just in case:

There are two different detent springs, used in different locations on different transmissions. The part number I quoted matches Malcolm's specs, and is used with a "bullet" shaped nose piece and a spacer under the retaining screw. Later transmissions used this both for 3/4 and reverse rails, while earlier ones used it only for the reverse rail.

The other spring is larger diameter (about .360") and longer, used with only a ball bearing to bear on the shaft. The earlier transmissions used this for 1/2 and 3/4, while later ones only used it on 1/2. P/N 101236

I'm not sure when the changeover was, perhaps at the introduction of synchromesh on first gear.
-Randall

> Brian Sanborn wrote:

> > ===== Original Message

> > > From: Randall Young <ryoung@NAVCOMTECH.COM> =====

> > > Malcolm:

> > > I don't have any that are worth the price of shipping. They do get old and tired. However, new ones are
> > > only \$.70(US) @ TRF, P/N 106489.

> > > Don't know if they're in stock at the moment.

> I have purchased these twice from Moss and found them to be weaker than the old, tired ones in gearboxes. If
> someone like Quantum Mechanics has good ones, by all means get them there.
> -uncle jack

Gearbox/Standard

Subject: TR4A transmystery
Date: Fri, 8 Sep 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

Keen to install my tranny onto its overdrive, with the goal being to mount then to the engine and install the works in the car this weekend; I consulted the ever unreliable Haynes for advice on the rebuild. Thinking I had done what it told me, I nonetheless concluded the gears-into-box sequence with the following results:

- a) In first, second, and third gears, the input shaft would only turn a few degrees and then come to a hard stop
- b) In fourth gear, the output shaft turns at the same rate as the input shaft
- c) In neutral, the output shaft turns at the same rate as the input shaft
- d) The gears on the layshaft appear to be turning freely
- e) No gears appear to be stuck
- f) In reverse, same result as in a)
- g) There was considerable slop somewhere on the main shaft, but I forget where ones. Between second and third I think.

(All this was without the overdrive having been installed.)

OK, so then I disassembled all but the front cluster on the main shaft, because I seriously don't want to deal with that circlip ever again. Then I saw where a thrust washer between second gear and its synchro cup seems to be preventing the two cone-surfaces from making contact - yet it is definitely shown that way in Haynes....could this be right? Isn't the point of the cone shaped surfaces to make contact?

Now it's 2 am and I can't think anymore. Hopefully tomorrow, well actually it is already tomorrow, I'll be able to spot something obvious, say aha! and all will be well. But in the likely event that won't happen, if anyone could give some words of advice, or even encouragement, I could use them, as I still REALLY want to get the engine in the car this weekend (with the tranny hanging off it). Anyone btdt? Grrrr. Signed,
-Confused near Ottawa

Subject: TR4a transmystery
Date: Fri, 08 Sep 2006
From: <spamiam@comcast.net>

From the sound of it, when you are in "neutral" 4th gear is still selected.

Did you try resisting the turning on one shaft while turning the other? Slight friction may make both turn simultaneously when really in neutral.

If the input and output actually turn 1:1 then the 4th gear MUST be engaged.

When you then engage any other gear too, it will lock up.

Check out the front synchro hub. There is a front and back. On one side the "neck" adjacent to the interlocking lugs on the output shaft is taller than the other side. I fail to recall which way it goes, but it is NOT obvious. At least it was not to me. I do not know what effect reversing the hub has, but I bet this might be the culprit.

-Tony

Subject: TR4a transmystery
Date: Fri, 8 Sep 2006
From: "Randall" tr3driver@comcast.net

- > a) In first, second, and third gears, the input shaft would only turn a few degrees and then come to a hard stop
> b) In fourth gear, the output shaft turns at the same rate as the input shaft

> c) In neutral, the output shaft turns at the same rate as the input shaft

Somehow, the output shaft is locked to the input shaft. Can you confirm visually that 4th gear is not engaged? If not 4th gear, then my next guess would be that there is something wrong with the bearing between the two shafts. Possibly one of the shafts is not properly seated into its other bearing. Or the bearing not properly located in the case; forcing the shafts too close together and locking the center bearing.

> OK, so then I disassembled all but the front cluster on the main shaft, because I seriously don't want to deal
> with that circlip ever again. Then I saw where a thrust washer between second gear and its synchro cup seems
> to be preventing the two cone-surfaces from making contact - yet it is definitely shown that way in Haynes.
> Could this be right?

No, not right. That thrust washer should be much smaller than the synchro cup, the cup doesn't touch the washer at all. The shift hub should be able to press the synchro cup into firm contact with the cone on the gear, well before contacting the washer. The thrust washer fits well down inside 2nd gear. Kinda sounds like you either have it assembled wrong, or your "top hat bushing" (aka 2nd gear bushing) is broken.

Note that there were several different revisions of all the 4-synchro parts over the years (through TR6 and Stag). Some of them will interchange, but many more just look similar and won't interchange. Is there any chance you have mis-matched parts? You wouldn't be the first! I've even heard stories of professional rebuilders trying to use mismatched parts.

> Isn't the point of the cone shaped surfaces to make contact?

Yes. When you start to shift into a gear, the first thing that happens is the center of the shift hub forces the synchro cup into contact with the cone. Then the force from the shift fork overcomes the springs in the hub, and the outer ring of the hub slides over the dog teeth on the cup & gear to complete the shift.

-Randall

Subject: TR4a transmystery continues
Date: Sun, 10 Sep 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

Had it back apart, replaced a gear, getting good at undoing that awful circlip, etc. Back together, being careful, and voila! It works through all the gears, and reverse. Time for celebration? - well, not quite... As we start to slowly lower it onto the overdrive, there comes a point where something binds, so back off it comes to be examined, and now it has the same symptoms as last night:

- -neutral and fourth seem to work like fourth i.e. the output turns at the same rate as the input, and any in other gear it just locks up (almost; there is a little play)
- -first motion shaft and main shaft are not binding
- -no synchro cups are stuck

Stumped, and frustrated. Any ideas? Remember, it was working well, and now something has changed...and I did not take anything apart between working and not TIA

-Jim W

Subject: TR4a transmystery continues
Date: Sat, 9 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Any ideas? Remember, it was working well, and now something has changed...and I did not take anything
> apart between working and not

Sounds like either the main shaft or the input shaft has been pushed into the case, until it's jammed into the other shaft.

Both front and rear bearings should have circlips on the outside, to prevent them from being pushed into the case. Both shafts should have distance pieces on them, and circlips, to prevent them from being pushed through the bearing. One of those components must be missing or not seated into its groove. Or possibly you need thicker distance piece(s).

-Randall

Subject: TR4a transmystery continues
Date: Sun, 10 Sep 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

Getting closer now.... On removing the front cover and pushing the input shaft forward slightly, everything works. It was the fourth gear and the synchro cup being stuck (forced) together. A thicker washer behind the circlip on the input shaft looks like it would solve it, however I am pretty sure I have the original one on there. I have my original TR3 box as well so am using it for comparison, albeit many parts are not the same. The washer in question on the TR3 box is the same thickness as the one I am using on the TR4 box, which is about 0.068", so I think it's the right one. I have two that are about 0.092", one that is about 0.118", and another, presently behind the difficult circlip, that I believe is also 0.118". Now I am questioning which washer goes where all the way along the input shaft and main shaft, wondering if I have mixed them up. Looking at the Moss Europe catalog gives me the part numbers but not their dimensions. Can someone with the parts catalog identify these for me? Part numbers are 060078, 116496, 059443, 058949. Looking at the diagram, I really can't figure out why I have two that are 0.092"..... TAI,

-Jim

Subject: Transmission rebuild article (TR3-6)
Date: Mon, 11 Sep 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

In case anyone else is pondering this I have found a great article that provides the necessary information, on the VTR website: <<http://www.vintagetrionphregister.org/maintain/TransRebuild/>>

The sizes of all the washers are there....back to the rebuild tonight....

-Jim

Subject: TR4 transmission rebuild question (hopefully the last)
Date: Thu, 14 Sep 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

When reassembling the gears on the main shaft, the article at:

<<http://www.vintagetrionphregister.org/maintain/TransRebuild/TRTrans02.pdf>>

It says on page 6 to install the front synchro hub with "the large boss forward". On looking at the hub, one side has a boss that sticks out farther, but is of a smaller diameter, and the other side has a boss that is of a larger diameter but not as deep.

So, one could take the "large boss" as being either side, depending on whether "large" refers to depth or girth.

Could someone please advise which way this hub goes? TIA,

-Jim Wallace

Subject: TR4 transmission rebuild question (hopefully the last)
Date: Thu, 14 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Could someone please advise which way this hub goes?

The longer boss (sticks out further) goes towards the input shaft.

-Randall

Gearbox/Standard

Subject: TR6 tranny alignment - use of dowels
Date: Tue, 15 Jan 2008
From: "Lanoway, Brian" <Brian_Lanoway@standardaero.com>

Alan Salvatore wrote:

"It's time to replace the clutch on the TR6; I almost got run over trying to accelerate onto I-85 today. It's probably got about 2 weeks left in it before it totally quits.

The Luk kit came a few days ago. Now I am waiting on a Speedie Sleeve to put on the rear crank. Any tips on pulling the tranny. How difficult is it to lift out? I remember some talk about using some dowels to line it up on the install."

Al,

I posted a response on the List a while back on how to use shoulder bolts as dowels to properly line up a tranny with the engine plate.

Here's that post again:

I had put a new TOB in two years ago and was more than dismayed when I recently started to get a squeal when I first engaged the clutch. Hours spent on the web brought up all kinds of stories on faulty new throw out bearings followed by all kinds of advice on possible cures.

One of the articles on the web talked about the need to locate the gearbox center relative to the flywheel center with two 3/8 dowel or shoulder bolts. That article mentioned that most owners are unaware of the need to do this and only use 5/16 bolts in all the holes of the bell housing. This would cause an eccentric alignment between the two centers and all kinds of clutch problems.

I then pulled out my gearbox and found that the 2-year-old TOB was perfectly fine, but I had used only 5/16 mounting bolts. I also found a badly worn (actually, badly machined) flywheel bushing. I replaced the flywheel bushing, used two shoulder bolts with 3/8 ground shoulders and 5/16 threads from Fastenal in the locating holes, reassembled everything and the squeal is gone.

Lesson learned: Everyone, make sure you use 3/8 shoulder bolts to properly align the centers of your gearbox and flywheel. If you only use 5/16 bolts to mount your gearbox, you will get all kinds of clutch/TOB/bushing problems because of their eccentric motion.'

-Brian Lanoway

Subject: TR6 tranny alignment - use of dowels
Date: Tue, 15 Jan 2008
From: <MMoore8425@aol.com>

I agree with the dowel pin issue. It's very important that either the original dowel pins be installed or shoulder bolts.

Here's something else I do which has been a big help:

1. Buy several cheap (Gr 2 or 3) 5/16-24 (?) bolts 3 inches long or so.
2. Hacksaw the heads off, and using the same hacksaw, make a slot in the end where the head was for a screwdriver.
3. I install several of them in the engine to use as a guide and to slide the tranny in on to protect as much as possible the input shaft of the tranny.

4. Once the tranny is in, replace them one at a time with long bolts which you can now use as an aid to align and inert the transmission. It is very important that you know the clutch spline has been properly engaged by the input shaft before much torque is put on these bolts.

-Mike Moore

Gearbox/Standard

Subject: Transmission shipping
Date: Wed, 26 Apr 2006
From: <Dave1massey@cs.com>

<lee.k.janssen@lmco.com> writes:

> Any suggestions on the best method of shipping a TR4-6 transmission?

Take a tip from Henry Ford and construct a wooden box where the top and bottom can be used as floor boards in your car.

Seriously, the first thing to do is to remove the shift lever. This will make the unit less tall and protect the lever from breakage.

The best way is to construct a wooden crate with internal mounting features for attaching the transmission at the bell housing and rear mount. Construct it so that minor intrusions will not contact the transmission.

An alternative method is to get a cardboard box and foam it in place.

DON'T FORGET TO WRAP THE TRANSMISSION WITH PLASTIC BEFORE FOAMING! The aerosol foam insulation available at the hardware store will work fine but take care so as not to use too much. Also, foam in halves.

Here's how I would do it:

1) Spray a layer of foam in the bottom of the box sufficient to space the transmission from the bottom of the box (depends on how much bigger the box is compared to the transmission). Let cure.

2) Wrap the transmission loosely in plastic film (a trashbag will be fine but cut it open so that it is a flat sheet). Set the transmission on the foamed bottom and spray in some more foam on either side to fill up half way and let cure.

3) Open the plastic wrap and dress it along the parting line (fill line to this point). Dress another piece of plastic sheet across the top of the transmission, parting line and up the sides of the box. Foam the remaining space and fold the sheet across the top and close the box temporarily until the foam cures. This will make a removable foam insert to protect the transmission front he top. This shipping carton is now reusable

The foam is easily carvable and a recess can be made for the loose shift lever. And a bottle of whisky.

-Dave

Gearbox/Toyota Conversion

Subject: Toyota transmission conversion
Date: Sat, 23 Aug 2008
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Frank wrote:

- > Hi Guys
- > Is there a way to tell one Toyota W transmission from another?
- > I of course want the W-58 with the 0.783 fifth gear. I realize I can paint a dot on the input and output shaft,
- > put the trans in 5th and turn the input one revolution. But if there is a marking somewhere on the casing, it's a
- > lot easier to get the junk yard to check it over the phone and save myself running all over California. Also, I
- > understand there are some differences in bell housing to gear shift dimension? Yes /no?
- > If so how is that dimension difference achieved?
- > -Frank Fisher

Frank,

Here's the gear ratios <<http://tr6.danielsonfamily.org/5speedRatio.htm>>. Mine was out of an '83 Celica and has the 0.783 5th gear but I never could find any markings on the tranny case itself. Further down that page you can see how I determined the ratio.

There are lots of W58 tranny's out there but only the ones listed in gear ratio table will fit without any modifications. Having said that.....Dane Wilson is using a W58 from a '92 Supra but it required changing out the Shift Lever Housing to the same one on the tranny's that Herman recommends. It's Toyota part number 33502-14100 and costs about \$130. Expensive part but it opens up more W58 trannys that will work with the kit.

Here's some good links:

A good link resource on how to take apart the transmission in case you need to change or modify the part:
<<http://www.celicasupra.com/w58teardown/csw58.html>>

Other references:

<chnical/ma61/gearboxes.html" <http://users.tpg.com.au/users/loats/technical/ma61/gearboxes.html>>

<<http://alldrivelineparts.com/transmissions/tw56cp.html>>

Complete Toyota W58 transmission service manual:

<<http://www.cygnusx1.net/Supra/Library/TSRM/MK3/manual.aspx?S=MT&P=1>>

Complete Toyota Electronic Parts Catalog for W58 (MkIII Supra)

<<http://www.cygnusx1.net/Supra/Library/EPC/291210/chassis.aspx>>

<http://en.wikipedia.org/wiki/Toyota_W_Transmission#W58>

-Bob Danielson

Gearbox/Trouble Shooting

Subject: Overdrive HELP!!
Date: Mon, 17 Jun 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> However the weight of opinion seems to be on the side of using 20W50 racing motor oil in the overdrive
> units. Ask Randall Young for some details, he seems to have made a study of the subject.

I've actually been more reporting what others have said, collected over many years of A-type ownership. Laycock, the makers of the OD unit, specifically warned against using 'hypoid' oils and recommended motor oil. Ken Gillanders of BFE reported that Standard-Triumph changed the recommendation to gear oil around 1960, based on some problems they had with short gearbox life; and the 20W50 racing oil recommendation came from him.

Now to the real stuff:

> Here is the big goof. With operating valve still loose to bleed air, I push forward on adjusting lever to
> engage OD. Lever springs forward past something internal approx. 90 degrees and won't come back to
> original position no matter how much I plead. Someone please tell me that I won't have to disassemble
> trans/OD to reset adjusting lever.

Ok, you don't have to disassemble to reset the lever. Remove the plug for the operating valve completely. Make sure you find and fish out, the spring, plunger and ball that should be under it. If you look in where the ball seats, you should see a fairly small hole in the center. Take a length of stiff wire (coat hanger or 'baling' wire), and put a double kink in it, such that it will start into the hole and then bind as the kink goes in. When you pull back on the wire, the operating valve should come out with it. See:

<<http://www.buckeyetriumphs.org/technical/AOD/AOD4/AOD4.htm>> (about 1/4 way down) for a photo of this operation. Inspect the valve to be sure it wasn't bent or damaged when you tried to move the lever before. If it's bent, probably best to replace it. Now move the adjusting lever back home and drop the operating valve back into place.

While you've got it apart, turn the output shaft a few turns, and check that you have oil flooding into the valve area. See: <<http://www.buckeyetriumphs.org/technical/AOD/AOD5/AOD5.htm>> for more suggestions on trouble shooting.

After you drop the ball back into place, adjust the solenoid by measuring how much the ball rises rather than looking at the 'adjustment' lever. Again, details at:

<<http://www.buckeyetriumphs.org/technical/AOD/AOD4/AOD4.htm>> near the bottom. BTW, if you want to engage the solenoid with the plug out, either hold your thumb over the hole, or push the lever into the engage position by hand first. Otherwise, the ball will get launched !

-Randall

Gearbox/Trouble Shooting

Subject: TR3 Overdrive problem
Date: Fri, 30 May 2008
From: "Randall" <tr3driver@ca.rr.com>

> Sometimes it "sticks" and prevents shifting into reverse, while all the forward gears will work.

Just for clarity, Corey, having the OD stuck on won't prevent shifting into reverse. It just won't let the car move in reverse. (And as everyone knows, forcing it to move under those conditions will destroy the OD.)

First thing I would check is electrical, just because it's easier to get to. When the problem happens, try pulling the solenoid wire off the relay (under the dash, forward of the heater, on the back of the battery box). If you're not sure which is which, just pull off both the wires that run into the tunnel (but try to remember which one goes to which terminal so you can reconnect them later). If that releases the OD, then the problem is electrical, possibly a short at the relay.

Since that's not likely to be the problem, next step is to pull the tunnel off and remove the stem from the operating valve. IMO, best to let it cool overnight first. Flip the OD on & off a few times (key on, engine off, 4th gear) to try to release the pressure. Undo the hex plug on the RH top of the OD (which may burp out some oil under pressure, but only a little bit) and collect the copper washer, spring, distance piece and ball under the plug. (Items 20,18,17,16 in the diagram at <<http://tinyurl.com/6ye5cu>>) Then use a bent paperclip or similar pushed down the hole in the center to withdraw the stem (Item 15). There is a tiny hole in the side of the stem that drains oil from the center of the stem. If that hole is blocked, it can cause the OD to not disengage (or even engage without the solenoid being activated). While you're in there, inspect the ball to be sure it's perfect and that it's seat in the OD casting is in good shape.

Also with the tunnel off, you can verify that the solenoid is releasing and the operating lever dropping. If not, there may be grit inside the solenoid causing it to bind. You can also double-check the adjustment (tho I doubt that's the problem).

If all that fails, the problem is likely inside the unit, meaning it has to come out of the car.

More info at:

<<http://www.buckeyetriumphs.org/technical/AOD/AOD5/AOD5.htm>>

-Randall

Gearbox/Trouble Shooting

Subject: TR4 Overdrive -click-click
Date: Fri, 17 May 2002
From: "Robert Erickson" <oldenglish@searchbug.com>

Steven:

The symptoms you describe mimic a diagnostic test I discovered many years ago. Accelerate to 35 or 40 mph. This will bring the oil pressure up in the overdrive to operating level. While still in 3rd gear, release your foot from the gas pedal, (engine braking) and engage the OD switch. Wait two seconds, then release the OD switch. You may or may not notice a slowing in revolutions when you engage the OD, but when you release the OD you should definitely notice a more unrestricted, free-wheeling deceleration. This test works only with deceleration.

Now, what it means is a previous owner has broken a circle clip in the OD that secures the cone clutch to the thrust ring assembly. It's a two-bit part replacement that requires a complete tear down of the OD unit. The good news is that other than this circle clip, your OD is probably in wonderful shape. I have repaired many overdrives with this problem. Usually the circle clip breaks into two pieces, but I've seen three pieces on occasion.

The next step is yours. I recommend asking assistance from your club transmission guru if you plan on confronting this adventure on your own. From your description of the symptoms, I'd bet big money that a broken cone clutch circle clip is the correct diagnosis. Contact me off-list if you wish.

-Bob Erickson

Ignition/Coil

Subject: Coil Polarity
Date: Tue, 28 Oct 2008
From: <ZoboHerald@aol.com>

<kimbrelltr4@yahoo.com> writes:

> I have looked at the wiring diagram for my [positive ground] 1962 TR4 to determine the correct polarity for
> the coil wiring. It does not show a terminal number, or positive/negative marking on the diagram at the coil,
> only the wiring colors. I have not switched the coil connections to know if it will run if wired the other way.
> Please advise !

==AM==

Do you want to keep the car set up for positive ground? If so, then that wiring diagram likely shows coil terminals as CB (contact breaker, i.e., the points in the distributor), and that would be the + side and so marked on a more modern coil) and SW (switch, or - on a more modern coil). Does that help?

-Andy Mace

Subject: Coil Polarity
Date: Tue, 28 Oct 2008
From: "Randall" <tr3driver@ca.rr.com>

<kimbrelltr4@yahoo.com> wrote:

> I have looked at the wiring diagram for my [positive ground] 1962 Tr4 to determine the correct polarity for
> the coil wiring. It does not show a terminal number, or positive/negative marking on the diagram at the coil,
> only the wiring colors. I have not switched the coil connections to know if it will run if wired the other way.
> Please advise !

It will run, most likely just fine, with the coil wired the other way. There is a small difference in how easily the generated spark can light the fuel/air mixture, but normally there is plenty of margin so it will run either way. You might notice that it's a little harder to start with the coil polarity backwards, but I could never tell the difference.

And as Andy notes, the original coils were marked "CB" at the positive terminal, and "SW" at the negative terminal. If your car retains the original positive ground, then "CB" gets the wire from the distributor, and "SW" gets the white wire from the harness.

Replacement coils are usually marked "+" and "-", which for a positive ground car would be the distributor and harness wire respectively.

If the car has been converted to negative ground, then swap the two connections to the coil.

-Randall

Ignition/Coil

Subject: Coil Wires
Date: Sat, 11 Dec 1999
From: Jerry Oliver <slantws@home.com>

Jim. I'm not sure from your description, but I think you are confusing the location of the wiring harness that terminates at the coil. If you look at the top of the coil, on the rearward side you will see a "+" mark. This is the end of the wiring harness. Attach the white wire to coil at either of the tab connections. They are both the same. On the forward side of the coil there is a short white/black wire that goes from either of the coil tab connectors on the front ("-") and then to the back side of the distributor. The other wires in that particular section of the harness go to : Green, to the thermostat temp sensor on the water inlet housing. Purple (or purple and white on the reproduction harness) to the horn, and BLACK to the horn. You need to buy the shop manual, so can follow the wiring diagram in it. The radiator shroud is secured at the front with screws, and the back fold presses against the metal frame of the radiator. Those folds create enough tension to hold it place (sort of). Hope this helps.

-Jerry Oliver

Ignition/Coil

Subject: Coil wiring
Date: Mon, 28 May 2007
From: <ray@raysmg.com>

I have removed a home grown adaptation of a small Holley fuel injection unit from my TR3 and returned it to stock SU carburetion as God intended; I also replaced the fuel pump with one of the appropriate rating for the carbs.

The wiring to the fuel injection was 'creative' and certain magic occurred in a black box. I have removed all unnecessary wiring and with it, one necessary wire which leads to the '-' lug on the coil. The other wire attached to the same '-' post connects to the low tension lead on the distributor.

My question is this: to what should the missing wire be attached? Is it simply a ground at the '-' would indicate?

I will be heading out of town for a couple days beginning tomorrow and would appreciate your response; it may be a few days before I can reply back with a successful outcome.

-Ray McCaleb

Subject: Coil wiring
Date: Mon, 28 May 2007
From: "Randall" <tr3driver@ca.rr.com>

Ray,
I don't understand the question. Since the car was undoubtedly converted to negative ground, the "-" terminal of the (aftermarket) coil should go to the points, and only to the points if the remainder of the car is stock. I'm guessing the ECU (black box) from the injection was using the points signal to determine engine rpm (and possibly even injector timing, though that's probably not a good idea since the timing from the points is not constant). Or, some fuel injection units (notably early Bosch systems) used the points signal to enable the fuel pump. If the engine stopped turning, the pump quit getting power (so it wouldn't feed a fire after a wreck).

Certainly the '-' post of the coil should not be grounded, except through the points when they are closed.

-Randall

Ignition/Coil

Subject: Help with TR3 Lucas sport coil swap
Date: Mon, 25 Sep 2000
From: <Herald948@aol.com>

<dwillner@icontech.com> writes:

> I'm swapping out the original "Sandard" coil (finally) with a new Sports coil and have
> noticed a slight difference in markings near the posts. The original had the BAT and the
> DIST marking while the Sport coil has a positive and a negative symbol. Can someone
> tell me what leads go where, I couldn't find any other info.

Dave, I don't think I've ever seen a Lucas coil with BAT and DIST markings. When you refer to "Standard" I assume you're referring to the Standard Ignition Products company and not Standard-Triumph?

Anyway, the old Lucas coils original to a TR3 usually had SW and CB markings on the terminals, for Switch and Contact Breaker, respectively. Your new Sport coil's "+" terminal would connect to the switch (battery) side of the circuit, and the "-" to the ground (distributor) side, unless you're still running a positive ground system.

Geesh, I hope I have that right; it's been a long day.... ;-)

-Andy

Subject: Help with TR3 Lucas sport coil swap
Date: Mon, 25 Sep 2000
From: Randall Young <ryoung@NAVCOMTECH.COM>

Dave :

The answer depends on whether your car has been converted to negative ground or not (which IMO is why Lucas changed the markings). If your car is still positive ground, then the "+" terminal goes to the distributor and the "-" terminal gets the white wire from the harness. If your car is negative ground, then the "-" terminal goes to the distributor, and the "+" terminal gets the white wire from the harness.

-Randall

Ignition/Coil

Subject: What's that crazy ballast resistor for?
Date: Mon, 08 May 2000
From: Barry Schwartz <bschwartz@pacbell.net>

For those interested -

To make the visualization a little simpler I'll try to explain, in layman terms as I understand things, why some ignition systems were designed with some type of ballast resistance.

When you initially crank the engine over to start it, the battery voltage drops to around 6-7 volts because of the rather large amperage drain caused by the starter. The ignition switch in such circuits with a ballast resistance have an additional circuit in the "start" position that bypasses (effectively shorts) the resistance, so now the 6 volt coil sees the battery voltage (which is around 6 volts). In this way you receive full spark that the coil was designed to operate at, instead of the wimpy spark that a 12 volt coil would deliver at this cranking voltage, and at a time when you need it most. When you let go the start position to the run position the ignition switch, via a spring, returns to the run position which now incorporates the resistance element (in series with the coil) to effectively drop the 12-13 volts NOW at the battery to the nominal 6-7 volts at the coil, which is what it was designed to run at. This the reason it's not a good idea to run a coil designed for a ballast resistance (6 Volt) in a vehicle that was designed without a ballast resistance circuit. In this case the coil, designed for 6 volts would see the full 12-13 volt during normal operation, and would soon expire from overheating.

-Barry Schwartz

Ignition/Coil

Subject: Xmas ignition?
Date: Tue, 25 Dec 2007
From: Jeff Scarbrough <fishplate@charter.net>

Paul Dorsey wrote:

> Isn't setting the points and setting the timing both doing the exact same thing? IOW, if one offsets the points
> this can be counteracted by the timing being offset (in the opposite direction)?

Yes, but...

The points need a particular dwell time to optimally charge the coil. The magnetic field must be sufficiently strong to produce a spark of proper size. Too little dwell causes insufficient spark. Too much dwell doesn't leave enough time for field collapse, also making an insufficient spark - it may contribute to coil overheating, too,

-Jeff Scarbrough

Subject: Xmas ignition
Date: Wed, 26 Dec 2007
From: Bill Beecher <wbeech@flash.net>

Yes, Setting the points does affect the timing, this is why you set the points first, then set the timing.
Bill B.

Subject: Xmas ignition
Date: Wed, 26 Dec 2007
From: tom white <tswhitez123@hotmail.com>

Setting the points determines how long a plug fires. Setting the timing determines when the plug will fire.

-Tom

Subject: Xmas ignition, determining timing?
Date: Wed, 26 Dec 2007
From: "Paul Dorsey" <dorpaul@negia.net>

I see- thanks!

You set yours for 4 deg. BTDC. Templeton uses an 8 deg. setting, why the diff.? I know octane is a big reason, and a question of performance vs. fuel economy is also a big reason, altitude??? What else?

-Paul

Subject: Xmas ignition, determining timing?
Date: Wed, 26 Dec 2007
From: "Jim Muller" <jimmuller@rcn.com>

Tom White wrote:

> Setting the points determines how long a plug fires.

Not be a nitpicking scrub, but this just slightly misses the point (no pun intended :-). Plugs start to fire the moment the points open and, yes the firing does require a small time interval. But the important issue is the time spent closed, not the time spent open.

The time spent closed is the critical period for coil current to build up for the next firing. During the firing portion, as long as there is enough time at all, once the plug has fired any extra time they spend open is of no consequence. After that the points need to be closed only long enough to build up the perfect current; any longer

simply heats up the coil. At high RPM's you could run out of time between firings, and the most likely problem is running out of current-build-up time, not actual firing time. The point being, you aren't really adjusting the time for firing, you're adjusting the time for getting ready for the next firing.

Consider: At 6000rpm a 4-cylinder has 12,000 firings per minute, for 5msec per firing. Suppose the dwell duty cycle (i.e. the percentage of time spent closed) is 50%. This means 2.5msec open, 2.5msec closed. By comparison, 2000rpm allows 15msec between firings. But if 2.5msec is long enough for 6000rpm, it should be long enough for 2000

When "setting the points", one typically sets dwell by adjusting the maximum gap to which the points open. If the cam lobes are symmetric (and the points don't bounce too much), both the opening time on one side of the lobe and the closing time on the other side are affected, both moving either closer to or further from the max-open point. That's why you have to set the timing last. You have to restore the proper opening time which got changed when you adjusted the point gap & RPM, too. So at 2000rpm the dizzy could be open for 12.5msec, and closed for 2.5msec. In theory this would keep the coil cooler. (I've never had a coil go bad [** knock on wood dashboard] but some of you folks apparently have.) Of course, dizzies don't work that way. If it was set to 50% then the closed and open times would both be 7.5msec.

-Jim Muller

Ignition/Distributor

Subject: Dist. Advance
Sent: June 15, 2005
From: <CarlSereda@aol.com>

- > TRF sells rebuilt TR distributor units (they say from England) for ~\$US250. Holden (an impressive UK firm)
- > sells their rebuilt units for ~\$US150.00. < www.holden.co.uk>
- >
- > BPNW sells rebuilt units but make sure correct numbers are stamped on body/vacuum/etc.
- >
- > Moss sells distributor spares including: the advance springs in a '5-assortment pak' for \$12.00 or 'specific
- > pairs' for about \$8.00.
- > Junk yard cores can be had for \$10-30.00.
- >
- > At this late date - 40 years later, options seem to be:
- > 1) Buy a Mallory.. their Unilite version looks great w/ vacuum and mechanical advance capability - a bit
- > pricey.
- > 2) Exchange for a professionally rebuilt unit with CORRECT SPECS for good chunk of cash.
- > 3) Get your's professionally rebuilt - the US firm Fred Thomas mentioned looks very competent:
- > <www.buffalomachineworks.com>
- > 4) Rebuild your own unit or another better condition unit yourself to your car's specs*.
- > * Then have your distributor put on a SUN machine and have it proven to factory specs.

- > As I mentioned in the past, I bought an excellent used MGB distributor (they're more plentiful) for \$10.00 for
- > my TR4, I put in:
- > a new pair of Moss's TR4A springs for \$8.00.
- > Installed an nos TR4A (2-6-3) vacuum unit for \$15.00 (otherwise I would have had my leaking 2-6-3 rebuilt
- > for \$45).
- > New points/rotor/condenser/cap etc. for another \$25 and I am set to almost brand new TR4-A specs for
- > about \$60.00. (I also altered the MGB id number stamped into the distributor housing to reflect TR4A's.
- > (application - changed only 2 numbers). I'm going to have the distributor run up on a SUN machine to verify
- > it's getting TR4-A specs. Ideally your car would be put on rolling road dynamometer and a pro would set
- > curve to perfectly manage your particular motor. (your conservative and extra safe 40 year old factory curve
- > specs CAN be improved to optimize your particular motor for today).
- > ps; Marcel says even brand new distributor manufacturers like Mallory, etc. can only 'guesstimate' what your
- > car's curve should be, let alone pick the optimum curve for your specific motor build. Good luck,
- > -Carl

-
- > To the list:
 - > Does anyone know of a source for the Lucas parts referenced in the second article? TIA,
 - > -Ken Gano
 - >
 - >> IGNITION ADVANCE CURVE REQUIREMENTS (shows factors involved, and recommends the best
 - >> way to get your curve absolutely right) by Marcel Chichak < www.jcna.com/library/tech/tech0013.html>
 - >>
 - >>
 - >> TUNING THE LUCAS DISTRIBUTOR (if you've never gutted a dizzy and not sure what to look for - a
 - >> great place to start) by Marcel Chichak < www.jcna.com/library/tech/tech0015.html>
 - >>
 - >> LUCAS DISTRIBUTOR DATA (a table of all Lucas distributor body #s and vehicle applications) by
 - >> Marcel Chichak <www.telusplanet.net/~chichm/tech/lucas.pdf>

Subject: Distributor Pro
From: "THOMAS FANSHER" <tfansher@comcast.net>

Date: Tue, 20 Feb 2007

----- Original Message -----

Subject: Distributor Pro
From: <CarlSereda@aol.com>
Sent: Friday, July 22, 2005

> Hi Listers,
> This fellow Bob, at: <lucasdistributors@yahoo.com> restores Lucas distributors, and sent some
> interesting info. (below)..
> Seems like a good guy to know if you need your TR distributor rebuilt to original specs. Regards,
> -Carl
> -----
> Hi Carl,
>
> Regarding the 40735/40795, they both have the same advance curves. The only difference is that the 40795
> was also used on the Morgan. This is very similar to the 41385 and 41558 used on the TR6.
> The 558 has the same advance curve and was used from 73 on but is not listed in any of the workshop
> manuals.
>
> Regarding bushing stock, much of what Lucas used was a steel based Oil-lite type composite. It is really no
> better than a bronze based Oil-Lite composite. I use both and have seen no difference in wear rates. It is
> critical however to continuously lubricate the bushing. The 40795 does have an oil feed hole.
> Usually, when I rebuild a 40795, I replace the single bushing with 2 (upper and lower). This provides an oil
> well around the shaft and actually helps lubricate the upper bushing.
>
> I would be happy to contribute to the distributor dialog on the TR List and will answer any questions that I
> can. One thought to keep in mind is that no two Lucas distributors operate alike. I find that the performance
> curve often needs to be tweaked to the particular engine. The OEM performance curve is usually the starting
> point if you really want smooth performance. I have three well calibrated distributor testers/scopes that I use
> and love to keep these cars (Particularly Triumphs including mine) on the road. Hope to talk with you soon.
> -Bob
> -----
> Hello Carl,
> I'm in the Cincinnati, Ohio area. I generally charge \$25 for a complete performance and vacuum advance
> curve. I plot out all of the data so that you have complete documentation. Since you replaced the springs
> which should be a matched set, you don't have to worry about a primary and secondary performance curve. So
> assuming you have the correct springs, you're probably OK. The one thing to watch out for on a 40795
> however, is wear on the lobe shaft stop and spring stud. Because the 40795 uses rather light springs, every
> time you hit the accelerator, the stop hits the stud with a bang. I usually see 1 to 2 degrees of unwanted extra
> advance due to wear. If you would like, you could mail your unit to me. I can turn it around in an evening.
>
> Also, I assume that you replaced your bushings with Oil light stock. They should be impregnated with 30
> weight oil (~160F for at least 2 hours) before installation. Best regards,
> -Bob <lucasdistributors@yahoo.com >

Subject: Distributor/4th parade results
Sent: Tuesday, July 05, 2005
From: "fred thomas" <frede.thomas2@verizon.net>

> Well a few weeks back I made a comment about the incorrect distributor being used in our T/R 2/4 and the
> available parts from the suppliers being incorrect, last week I solved my problem, herewith are the results, I
> have 87.2 MM pistons, slightly milled/alterd head giving about 9.5 compression ratio, stock cam and ignitor
> ignition, Ken Gilanders 6 blade impellar water pump, I installed new Bosch plugs, adjusted the valves (1st

> time in 5 years), set the timing to 8 degrees BTDC, the dist. is a D25 #40795, lower control plate is a
> #54412154 or 10 degrees which gives 20 degrees max. advance, the vacuum advance unit is 54413565
> (2-6-3), springs # 54411614 and weights #54413073, my car has never been peppier, not fast do to stock cam,
> but very quick and responsive, I have a skirted Smith's 156 thermostat, yesterday in our local July 4th parade
> the temp gauge moved just above the first mark (125) but well below the 185 for about 1 hour of idling
> along the route, am I pleased, you bet I am, I also averaged 28.4 MPG for a nice little lunch trip (170 miles
> R/T). Folks if you are driving a T/R 2 to 4A and looking for a big overall improvement in your little 4
> cylinder then check the distributor part number as well as the vac. advance number, the results will really
> surprise you.
> Running the correct distributor for your engine configuration/needs. The distributor being sold for our cars is
> for a MG and everyone knows how damn slow they are compared to a "Triumph" :) :) :)
> -"FT"

Ignition/Distributor

Subject: TR4 - Dwell vs Points Gap
Date: Sun, 1 Jun 2008
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I believe the dwell for a correct TR4 distributor is usually quoted as 60* or else as a range centered on that such as 57* - 63*. Points gap is either .015 or a range of .014 - .016 depending on where one looks.

I have always set the gap and thus ignored the dwell but recently I looked at both.

I find that I cannot adjust to both specs. A .015 gap yields a dwell of 48*--- a 60* dwell can only be achieved with a .008 gap.

Either way, once I re-adjust the timing, the engine runs fine. Maybe not exactly as well each way but any difference is beyond my notice.

Soooo... which way do I set it? Or do I split the difference? Since the relationship between gap and dwell would seem to be purely mechanical based on the shape of that little cam in the dizzy it doesn't suggest to me that anything is really wrong.

For now, I went with the 60* dwell and skinnier gap. My thinking is that dwell is the thing that is relevant to spark and gap is just a simple way to set the dwell w/o an instrument. My only concern with that is that the .008 gap leaves a much smaller margin for the gap to close up as the piece of the points set that rides on the cam wears down or as the points loosen over time.

No I don't want a Pertronix, having so much fun with this set-up.
-Geo

Subject: TR4 - Dwell v Points Gap
Date: Sun, 1 Jun 2008
From: "Randall" <tr3driver.ca.rr.com>

> I find that I cannot adjust to both specs. A .015 gap yields a dwell of 48*--- a 60* dwell can only be achieved
> with a .008 gap.

Although it's possible that the point cam is that badly worn, my suggestion would be that there is something wrong with the dwell measurement. Can you see wear marks in the face of the point cam (ie a difference in height between where the rubbing block rubs, and where it doesn't)?

> Soooo... which way do I set it?

Personally, I'd set the gap per the book and let the dwell fall where it may. Might borrow a buddy's dwell meter too ...
-Randall

Subject: TR4 - Dwell v Points Gap
Date: Sun, 01 Jun 2008
From: Jeff Scarbrough <fishplate@charter.net>

Geo & Kathleen Hahn wrote:

> I believe the dwell for a correct TR4 distributor is usually quoted as 60* or else as a range centered on that
> such as 57* - 63*. Points gap is either .015 or a range of .014 - .016 depending on where one looks.
> 60 degrees sounds like a lot of dwell...are you sure about that? I would guess 45 to 50 degrees would be more

- > likely...
- > I have always set the gap and thus ignored the dwell but recently I looked at both.
- >
- > I find that I cannot adjust to both specs. A .015 gap yields a dwell of 48*--- a 60* dwell can only be achieved
- > with a .008 gap.

I always set the gap, then fine-tune with a dwell meter.

- > Either way, once I re-adjust the timing, the engine runs fine. Maybe not exactly as well each way but any
- > difference is beyond my notice.
- >
- > Soooo... which way do I set it? Or do I split the difference? Since the relationship between gap and dwell
- > would seem to be purely mechanical based on the shape of that little cam in the dizzy it doesn't suggest to me
- > that anything is really wrong.

The relation is purely mechanical as you suggest, but... there are many things that can affect the measurement...

Make sure the points are smooth - no pits, depositions, or wear of one contact into the other. Any of these could affect the ability to get a feeler blade between them without changing the effective dwell. Make sure the lobes on the distributor are smooth and unworn. Are the points uncontaminated with the grease you put behind the rubbing block?

Make sure your dwell meter is operating correctly, possibly by testing it on another car.

- > No I don't want a Pertronix, having so much fun with this set-up.

As long as you're having fun... <g>

-Jeff Scarbrough

Subject: TR4 - Dwell v Points Gap
Date: Mon, 02 Jun 2008
From: <spamiam@comcast.net>

Geo & Kathleen Hahn wrote:

- > I find that I cannot adjust to both specs. A .015 gap >yields a dwell of 48*--- a 60* dwell can only be
- > achieved with a .008 gap.
- > -Geo,

I have found it a little hard to be absolutely positive about the point's gap. The spring action is reasonably light, and any position of the feeler away from perfectly parallel with the points electroded will result is a "tight" feeling.

I consider the dwell to be a more accurate measure than feel, as long as your dwell meter is accurate. I would set the dwell to the suggested setting +/- 1 degree, I might prefer a dwell on the lower side of ideal rather than the high side because as the rubbing block wears, the dwell will tend to increase (at least I think it does). Since the TR4 distributor is pretty easy to access, it is not that much of a PITA to adjust and readjust and readjust... until you hit the right dwell.

I found that a distributor cap for a 1970 MGB (push-in wires) with magnecore wires made a much bigger difference than the Pertronix Ignitor module for my ignition. Plus the Pertronix magnet wheel (hub?) did not fit as securely as I would have liked on the distributor shaft, and the rotor does not seem to fit as securely with the Pertronix magnet wheel.

-Tony

Subject: TR4 - Dwell v Points Gap
Date: Mon, 2 Jun 2008
From: <Chip19474@aol.com>

Geo,

Set the gap for a snug (as opposed to sloppy) .016" and you'll be fine....this setting allows you to get more good running from the engine because it allows the point gap to remain within spec (.014" to .016") as the rubbing block on the point set gradually wears down (and decreases the point gap). I've seen these cars run (barely) with as little as .005" gap. These were largely neglected cars - not the recommended condition for points!

As for the dwell angle dilemma - not sure why you're not getting a spec dwell angle reading but if you set the points correctly and the timing is good and the motor runs great - you are there:)

-Chip Krout

Subject: TR4 - Dwell v Points Gap
Date: Mon, 2 Jun 2008
From: Greg Perry <rgperry@earthlink.net>

Geo,

As others have stated about not getting the correct dwell on the meter, I found myself using the wrong scale for a 6 cylinder engine while reading the 8 cylinder scale. If I remember correctly the 4 cylinder scale is double the 8 cylinder scale reading. Just a thought,

-Greg Perry

Subject: TR4 - Dwell v Points Gap
Date: Mon, 02 Jun 2008
From: "Jim Muller" <jimmuller@rcn.com>

Greg Perry wrote:

> If I remember correctly the 4 cylinder scale is double the 8 cylinder scale reading.

Good point but it actually depends on how the dwell meter works. If the meter measures the ratio (or the difference) between the on-time and the off-time then dwell would be independent of both rpm and the number of cylinders. If it just measures on-time or off-time and normalizes that against a firing interval then it would depend on how it "knew" the firing interval.

An obvious way for the meter to know the firing interval is just to measure it is. Of course, this is the same thing as measuring on-time and off-time, and still means the result is independent of number of cylinders. But if the meter's operating instructions are for the user to adjust the engine to a particular rpm using the meter's tach display, then the #-of-cylinders setting for the tach will affect the rpm display,. So a wrong setting will mean the user is actually measuring dwell at the wrong rpm, thus producing a wrong dwell answer too.

-Jim Muller

Subject: TR4 - Dwell v Points Gap
Date: Mon, 2 Jun 2008
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

----- Original Message -----

> somebody wrote:

> The dwell angle is the amount of distributor rotation ~per cylinder~ where the points are closed. Typically,
> that number should be half of the total rotation per cylinder. Bentley said for TR6, dwell is 35*, open angle is
> 25* for a total of 60*. $60 \times 6 = 360$. For the Spitfire, dwell is 51*, open angle is 39* for a total of 90* $90 \times 4 =$
> 360.

This is almost making my head hurt. Seems like I could check the accuracy of the meter (yes I'm looking at the 4-cyl scale) by simply connecting my test bulb and using my protractor to see how many degrees the rotor moves while the points are closed (bulb lit). Crude but perhaps effective.

If the gauge is accurate (I suspect it is) I will likely opt for a compromise setting of a gap slightly less than .015 and a dwell less than 60*.

Thanks for all the fish... I mean advice.

-Geo

Subject: TR4 - Dwell v Points Gap
Date: Mon, 02 Jun 2008
From: Jeff Scarbrough <fishplate@charter.net>

Geo & Kathleen Hahn wrote:

> This is almost making my head hurt. Seems like I could check the accuracy of the meter (yes I'm looking at
> the 4-cyl scale) by simply connecting my test bulb and using my protractor to see how many degrees the rotor
> moves while the points are closed (bulb lit). Crude but perhaps effective.

That's one way.

>If the gauge is accurate (I suspect it is) I will likely opt for a compromise setting of a gap slightly less than
> .015" and a dwell less than 60*.

That's what I'd do... <g>

>Thanks for all the fish... I mean advice.

I read a suggestion today: Use a dial indicator to check the lift of the points. Place the stem right behind the contact and rotate to max lift...just one more trick to make it all as complicated as humanly possible.

-Jeff Scarbrough

Ignition/Distributor

Subject: TR4 Distributors
Date: Thu, 12 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> As things slowly chug along on my TR4 restoration, I find myself with 2 distributors to pick from. I have a
> DM2 and 25D. I plan on going to negative ground & using a Pertronix, but it looks like Pertronix has a
> different kit for each distributor. I am wondering if there are any inherent differences between the 2
> distributors, or if one is any better than the other.

John,

IMO the 25D design is slightly better. It's simpler, with fewer pivot points to wear, and possibly easier to get parts for. But keep in mind that there are many different variations within each model number, with different advance curves to suit different engines. Also, while the Pertronix will compensate to some extent for wear in the main bushing, it cannot compensate for wear in the advance mechanisms.

So, assuming you are comparing a 40735 DM2 to a 40795 25D (which are both for TR4 engines and have the same advance curves); I would choose the one in the better condition.

-Randall

Subject: TR4 Distributors
Date: Thu, 12 Jul 2007
From: <spamiam@comcast.net>

John,

First, do a vacuum check on the vacuum capsule of each distributor. If one leaks, then it is probably not eligible for use. It is possible to get them serviced or (in some cases) new ones. Also check each one for wear on the shaft and proper motion of the mechanical advance and vacuum advance mechanisms.

I have seen on E-Bay, some new distributors, but they appear to be a "one size fits all" approach.

There IS a difference between the DM2 and 25D4. Functionally, the difference is the advance curves. How much mechanical advance, and how much vacuum advance. I forget the specifics on these distributors, but as I recall the 25D was set up for more advance.

More advance means more power (within limits) as long as the octane of the fuel and compression of engine can tolerate it. The 25D4 is the later distributor, and that one would be the one I would pick if all else is equal regarding wear in the units.

Mechanically, there are differences between the DM2 and 25D4 units. This means that the Pertronix magnet sleeve that is correct (size/orientation) for one is not right for the other. Even then there was variability in production tolerances. The Pertronix for my 25D4 did NOT have a snug fit on the shaft and wiggled probably 3 degrees in either direction. Tech Service told me how to improve that, but it was definitely a Rube Goldberg fix.

Ignition/Distributor/Bushing & Body

Subject: Which distributor?
Date: Mon, 29 May 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

I believe the TR3A and TR4A distributors are different. This being the case, & since I have one of each, which should I use on my TR3a engine which now has 87.2 mm pistons?

I have the stock TR3 cam in place, and still have the H6 carbs, though I could change to the HS6, as I have a set of those too. I guess my question is, what do the distributor specs primarily deal with - is it the cam lift/duration, compression ratio, or something else? I bet the answer is really "everything", but I am curious as to what is the most dominant issue.

-Jim Wallace

Subject: Which distributor?
Date: Tue, 30 May 2006
From: "Randall" <tr3driver@comcast.net>

> I believe the TR3A and TR4A distributors are different. This being the case, & since I have one of each,
> which should I use on my TR3A engine which now has 87.2 mm pistons?

I don't know, but I do know that, as old and worn as these distributors are now, and as sloppy as they were new, which one works best now has almost nothing to do with the original specifications. So my advice is to try them both and see which one works best for you.

> I guess my question is, what do the distributor specs primarily deal with - is it the cam lift/duration,
> compression ratio, or something else? I bet the answer is really "everything",

This article might help ... or not.

<<http://www.jcna.com/library/tech/tech0013.html>>

Once you've digested that, the same author has another good article at:

<<http://www.telusplanet.net/~chichm/tech/lucastuning.pdf>>

He's also written an interesting article on using a Hitachi dizzy from the junkyard for an electronic conversion, but the link I have doesn't seem to work.

-Randall

Subject: Which distributor?
Date: Tue, 30 May 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

Jim, I believe that it is a DM2 on all the dizzies up to/including (I think) TR4. The TR4A had a 25D4.

-Tony

Subject: Which distributor?
Date: Tue, 30 May 2006
From: "Randall" <tr3driver@comcast.net>

> Jim, I believe that it is a DM2 on all the dizzies up to/including (I think) TR4. The TR4A had a 25D4.

The information I have handy seems to indicate that some early TR4s used DM2, and some late TR3B used 25D4. Also, there was a "factory approved" 25D4 replacement for the earlier engines, so many of them have 25D4 as well.

But the dizzy model number doesn't tell you the important part, the advance curve. Lucas made literally hundreds of different distributors all bearing the "DM2" and "25D4" models, the difference was the part number and the advance curves. There were several different DM2s used on TRs, with different advance curves, and likewise several different 25D4s used, with different advance curves.

I show 40403, 40480, 40698, 40734, 40735 as the DM2 models used, and 40795, 40798, 40842, and 40850 as the 25D4 models used, all on TR2-4A.

-Randall

Ignition/Distributor/Bushing & Body

Subject: TR4 dizzy
Date: Thu, 18 Mar 2004
From: "Randall Young" <ryoung@navcomtech.com>

> Does anyone know of a source for the breaker plates in the Lucas 25D dizzy (the plate the points and
> condenser attach to). Mine has developed so much slop in the center pivot that my Crane XR700 is faltering.
> At least I think that is my problem. Moss lists them as N/A. Anyone BTDT?

I got my spare from a MG Midget in the local "Pull your own" junkyard. Junk dizzys are fairly common on E-Bay too.

However, I doubt seriously that's your problem, the XR700 should be able to tolerate a good deal of variation and the pivot plate isn't likely to get that loose. Are you sure it's not slop in the shaft instead?

-Randall

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: Blue Streak Points?
Date: Tue, 28 Feb 2006
From: "Randy&Val DeRuiter" <deruiterville@hotmail.com>

Thanks to all who replied on and offline on my quest for Blue Streak Points for a TR4. For anyone who needs this later, I believe the following is correct:

Blue Streak points are still made by Standard Motor Products. The PN for the points is: LU1617XP

Note there is also a similar set of points with PN LU1617P, but I believe this one lacks the lubricating wick. My further guess is that this may be manufactured by Intermotor, as they were bought out by Standard in the mid 90s.

Note also if you go to Standards website you may have a difficult time finding the points - I did anyway. They have a webpage describing applications for LU1617XP/LU1617P, but the picture is likely for 1617P without the wick.

So hopefully I have this straight, the part is available via internet as seen in previous posts and I'm sure local suppliers - and hopefully will turn out to be what I was interested in.

-Randy.

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: Can you tell a rotor?
Date: Fri, 3 Aug 2007
From: <CarlSereda@aol.com>

Hi Listers,

Bought two TR distributor ROTORS from 2 suppliers recently. These two rotors look identical except one came in a green Lucas box and one came in a blue OEM box 'Original Engine Management' was in the fine print.. not 'Original Equipment Manufacturer'!

They look fine and I'd say identical, except one has the rivet about .020" deeper into the plastic. This wouldn't bother me unless I had heard mention of some mysterious rotor failures blamed on too deep of riveting shorting out to the distributor cam. Any more info on this?

Was the real rotor problem, or manufacturer ever identified? Regards,

-Carl

Subject: Can you tell a rotor?
Date: Sat, 04 Aug 2007
From: <emanteno@comcast.net>

<CarlSereda@aol.com> wrote:

> Was the real rotor problem, or manufacturer ever identified?

The problem rotors were genuine Lucas. The cure was the OEM rotors, white box with blue printing, made in Italy. I got mine from World Wide Imports of Madison (WI).

-Irv Korey

Subject: Can you tell a rotor?
Date: Sat, 4 Aug 2007
From: <CarlSereda@aol.com>

Thanks Irv,

I got the Lucas rotor from Moss, the OEM from World Wide Imports like you did.. interesting that the OEM rotor has a deeper rivet. Thanks again,

-Carl

Subject: Can you tell a rotor?
Date: Sat, 4 Aug 2007
From: <Btmfdchn@aol.com>

"Irv Korey" <emanteno@comcast.net> wrote:

> The problem rotors were genuine Lucas. The cure was the OEM rotors, white box with blue printing, made in

> Italy. I got mine from World Wide Imports of Madison (WI).

I agreed. I got mine from AutoZone.

-TJ

Subject: Can you tell a rotor?
Date: Sat, 4 Aug 2007
From: Bob Labuz <yellowtr@adelphia.net>

Greetings,

Maybe someone can set me straight!! Over the years I have acquired a number of OEM rotors as they seem to appear out of nowhere when one gets a parts car or project.

They all look the same to me and when it comes time to get a new engine started, I just pick one, clean it up and away we go.

I currently own 2 TRs, and have had two others and have never had a problem with the rotors. Problems with internal distributor wires, points, and caps, but never a problem with a rotor or even a coil.

Have I been lucky?

With my current project, a 63 TR4, I just picked a rotor out of the bunch and the engine runs just wonderful.

What causes a rotor to go bad? Is it related to wear between the rotor contact and the cap contacts?

-Bob

Subject: Can you tell a rotor?
Date: Sun, 05 Aug 2007
From: <emanteno@comcast.net>

You probably have old stock Lucas. They were fine. The stuff that has been sold over the last 3-5 years is the problem stuff. My last Lucas rotor started going bad after less than 1000 miles. I've heard some of them crack and arc, leading to misfires or no starting/running.

-Irv Korey

Subject: Can you tell a rotor?
Date: Sat, 4 Aug 2007
From: <tr3driver@ca.rr.com>

“Irv Korey” <emanteno@comcast.net> wrote:

> I've heard some of them crack and arc, leading to misfires or no starting/running.

I wonder though, how many times those incidents include other upgrades to the ignition system, like Lucas Sports coils. The rotor has to withstand any increase in voltage, and the path from the contact arm to the distributor post isn't very long at all.

Caravanning home from VTR 2000, a local club member had a new rotor <[installed @ VTR](#)> fail on his TR4A. Failure itself was invisible, a carbon track through the interior of the rotor, grounding the spark to the dizzy shaft. He had a Lucas Sports coil, and, as it turned out, a bad spark plug connector that evidently allowed the coil to develop more voltage.

-Randall

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: Contact Points
Date: Wed, 25 Jul 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

<terryrs@comcast.net> wrote:

> All right. I don't get this. My TR3A daily driver had noticeably less power at low RPM's, but at lifted RPM's
> accelerated nicely. At idle, though, it dropped to about 8, rumbled for about half a minute, then decreased
> under 5 and wanted to stall. When I got home, I popped the distributor cap, rotated the engine to max point
> gap, ...and the points were still closed! (to the naked eye, anyway)
> How in the heck did this thing keep running???? (Adjusted the gap, and will check out the difference in
> performance tomorrow. Enough to make me shift to electronic ignition.)
> -Terry Smith

I guess they were opening just a little. Two things that can cause you to lose the setting are wear on the part that rides the cam (good idea to lube the cam a bit) and the adjusting screw not being tight enough. Of course a decreasing gap will also retard the timing.

As the Brits say... Mind the Gap.

-Geo

Subject: Contact Points
Date: Wed, 25 Jul 2007
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

Terry, a common problem; you need to put a small dab of white grease on the distributor cam to lubricate the points rubbing block. They can wear out fast otherwise.

-JVV

Subject: Contact Points
Date: Thu, 26 Jul 2007
From: "Jack W. Drews" <vintr4@geneseo.net>

Vintage racers and some long distance drivers have found that the points available from the Big Three have rubbing blocks that wear very quickly. Some of us have gone through a set of points in a half a racing weekend. I had a set in my TR6 wear completely off on a trip of less than 100 miles.

Same goes for rotors - what could possibly go wrong with a new rotor? Well, the ones from at least two of the Big Three sometimes crack and fall off, and sometimes they quit working, with no apparent visual reason.

The solution to the points problem is to buy rotors from Peter Caldwell at <<http://www.nosimport.com>>. I think he sells Bosch, I don't think they are on his website, but he charges practically nothing for them. For points, if you can find a local parts store that gets points from the Standard company, those points are excellent and even have the little lubricant pad. I got mine at Carquest in a Carquest box, but the guys behind the counter knew who the manufacturer was. They were even listed in their desk catalog. If you want some of these and can't find them locally, I'll buy them from you and ship them to you at cost (NFI) but please send car model and your mailing address in your first email.

-uncle jack

Subject: Contact Points
Date: Thu, 26 Jul 2007
From: Mitch <ms6453@optonline.net>

Hi All,

I have been using Standard Ignition products for over 30 years. The common TR point set is LU1617XP. These have always worked & worn flawlessly. They are even supplied with a lubricating pad. Find a local parts shop & try them.

http://www.smpcorp.com/web_app/catalog/smp_bgbulk.aspx

-Mitch Seff

Subject: Contact Points
Date: Thu, 26 Jul 2007
From: <Chip19474@aol.com>

<terryrs@comcast.net> writes:

> ... the points were still closed! (to the naked eye, anyway) How in the heck did this thing keep running????
> -Terry,

From years of changing points it's amazing to me to see these cars running on what appears to be "no point gap". The key to your observation that the points were closed is "to the naked eye" since they must have been opening or you wouldn't be collapsing the magnetic field in the coil and causing a spark.

As many responses have noted, get a good quality point set with condenser and get a good quality rotor. Use a small dab of dist shaft lube so the rubbing block won't wear down quickly. The range of point gap is .014" to .016" for proper dwell angle. I like to set new points to .016" - that way you've got a tolerance of .002" to allow for the rubbing block to eventually wear down.

-Chip Krout

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: TR3 Contact points set screw
Date: Tue, 5 Oct 2010
From: "Trevor" <tbeatson@shaw.ca>

"Anybody know, offhand, what the proper size is for the set screws to fasten points onto the plate?"

Terry, the screw that holds the points to the base is 2BA, and the one which holds the base to the dizzy body is 4BA.

-Trevor

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: Do Rotors Really Fail?
Date: Fri, 14 Jul 2006
From: <MMoore8425@aol.com>

Rotors don't wear out and need replacing nearly as often as parts manufacturers would have you believe. While I've had rotors fail mechanically, that is actually quite rare.

You get a couple of things going on under the distributor cap that cause the rotor, and cap, to wear out.

The rotor spins against the carbon button in the center of the cap. This produces carbon dust that coats everything. That promotes arcing to ground and not the plugs. Once this starts, usually called carbon tracking, it's remarkably difficult to stop it. The carbon tracks get embedded into the plastic and wiping doesn't remove them.

As the spark jumps across the small gap between the rotor and the cap lug it produces an arc and blasts a little bit of the metal off. Make it a soft metal like many cheap caps use, and you can really wear things away after a few million arcings. Now you've got a great big gap instead of a small gap. Which promotes misfiring. The metal blasted off by the arc is usually vaporized and gets to redeposit itself inside the cap just like the above carbon does. Again, promoting arcing to ground and such.

While it would sound like you could clean up the rotor and just replace the cap, that will generally wear out the carbon contact button in the center of the cap in short order. The rotor gets worn from the previous carbon button, and doesn't match up well with the new one, and grinds it down. Sort of like putting new brake shoes on nasty brake drums, the shoes wear out quickly as a result.

Wipe down the inside of the rotor and cap to prevent carbon arcing from every occurring. Dress the contact points on the rotor and the cap. Do that and you can add many years to the life of the components.

The Jaguar group has had a lot of failures of newly manufactured rotors. There seems to be a manufacturing problem. I think it has to do with arcing through the plastic to the distributor shaft. Best,
-Mike Moore

Subject: Do Rotors Really Fail?
Date: Fri, 14 Jul 2006
From: <"rgt2">

I have also had a rotor, not in a TR, fail. It would run great with no load, but as soon as a load was placed on the engine it would run just terrible. Once the rotor was replaced all was well. On inspecting the rotor under a magnifying glass you could just make out a track that ran to the outside edge of the rotor so that under load the engine was putting spark to the plug just in front of the one that it should have.

-Rod Trunnell

Subject: Do Rotors Really Fail?
Date: Sat, 15 Jul 2006
From: "Rarebits"

> -----Original Message-----

> The Jaguar group has had a lot of failures of newly manufactured rotors. ...

The quality of currently available rotor arms is certainly questionable. Before anyone suggests buying those from a specific manufacturer, they all come from the same source, irrespective of what label is on the package. Lucas no longer makes rotor arms for "our" cars, they buy and repackage the same product as everyone else. If you can find original quality Lucas, with the brand name moulded into the plastic, then do so as they are the

best you will find. Having said that, I have never had one fail in any of my cars. I have kept my ignition systems standard and in good order. Damaged leads can cause rotor failure, high power coils and electronic ignition also stress an already weak component, Cheers,
-Bill.

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: Good-bad Condenser

Date: Tue, 04 Sep 2007

From: "tom white" <tswhitez123@hotmail.com>

If your condenser is burned out and you run points you can check the color of the spark at the points for diagnosis. If the condenser is bad the spark at the points will be yellow when they open. If it is good the spark will be blue. Best regards,

-Tom

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: Help needed in Norway - again
Date: Wed, 4 Aug 2004
From: <TERJE_KOLBEINSEN@bluezone.no>

Sorry List, but yesterday's starting effort only proved me without sparking :-((

Today I was fiddling around with a multi meter and I measured between + on coil and first - on coil, then all the way to the fixed part on the breaker points - always reading approx 12.5V. Opening/closing the points does no difference, so obviously something is wrong. Any ideas..

-Terje Kolbeinsen

Subject: Primary coil resistance?
Date: Wed, 4 Aug 2004
From: "Kinderlehrer" <kinderlehrer@comcast.net>

Not necessarily so! If the magnets in the collar come unglued, they can move around, fall over, and otherwise become disoriented. The car may still start, but it won't run very well. Put a set of points in and see if the problem goes away.

Been There Done That, I have a new collar to prove it (still waiting for the T-shirt),
-Bob

> I called Pertronix and while helpful they seem convinced that it's not the unit itself since it didn't completely
> die (as it would in a failure).

Subject: Help needed in Norway - again
Date: Wed, 04 Aug 2004
From: "Mark J. Bradakis" <mjb@autox.team.net>

You may have the points installed such that the frame is not grounded. With the points closed, check with your multimeter to see if there is zero resistance between the points and the distributor body.
-mjb.

Subject: Help needed in Norway - again
Date: Wed, 4 Aug 2004
From: Dave Massey <105671.471@compuserve.com>

INTERNET: <TERJE_KOLBEINSEN@bluezone.no> wrote:

>Today I was fiddling around with a multimeter and I measured between + on coil and first - on coil, then all
> the way to the fixed part on the breaker points - always reading approx 12.5V. Opening/closing the points
> does no difference, so obviously something is wrong. Any ideas?

The most common cause of this is an error in assembling the points, etc. There is a wire from the terminal (to the distributor) and a wire from the confessor that get attached to the points under the nut. There is also a shoulder washer (a little plastic piece with a stepped diameter) that is intended to insulate the point spring and these two wires from the breaker plate. With this the only path to ground is through the points. Quite frequently the two wires are assembled on top of the washer in direct contact with the nut which will provide a full time path to ground for the coil.

The two wires should be underneath the shoulder washer and in contact with the spring for the points.
-Dave Massey

Subject: Help needed in Norway - again
Date: Thu, 5 Aug 2004
From: <TERJE_KOLBEINSEN@bluezone.no>

Thanks a lot all of You :-) Great help as always, and this time you were right on the spot Dave. I just rushed out to the garage at 01:00 AM to check it out, and it proved to be a misplaced plastic washer. A stupid mistake by myself....

Have not tested it fully, but at least it gave a spark as the point opened, so I'll have a try after work later today
-Terje

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: Points
Date: Sun, 11 Aug 2002
From: "Peter Arakelian" <PeterAra@msn.com>

> I've got the condenser lead and terminal lead from the coil attached to the contact point post on top of the
> nylon washer as I believe they should be.

If I interpret you correctly, you have assembled the wires incorrectly. These wires should be insulated from the post by the nylon washer. They should only touch the sprung steel that goes to the contact points themselves. First put on the lower nylon washer, then the steel strap that goes to the contacts with the round portion over the lower nylon washer's bushing, then the two wires, then the upper nylon washer making sure that the bushing portion of the washer goes into the holes on the terminal ends of the wires thus insulating everything from the post, then the nut.

-Peter Arakelian

Ignition/Distributor/Cap/Condenser-Points-Rotor

Subject: TR with Cracked Rotor?
Date: Tue, 29 Jan 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> I don't remember who showed me this trick, years ago, but after breaking the electronic pickup on my Chev ½
> ton while trying to take off its rusted in place rotor I remembered this trick.

Chevy's are famous for rusting under the rotor, I don't know why. However, it shouldn't be a problem on a TR, since you're supposed to pull the rotor every 7000 miles or so (basically every tune up) and put a few drops of oil under it. The oil seeps down to lubricate where the point cam rides on the shaft, and the centrifugal advance pivots.

Of course, everyone does this, right?

-Randall

Ignition/Distributor/Cap/Wires

Subject: Screw Terminal on Coil
Date: Sat, 28 Jun 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I have secured from Moss the screw and metal washer shown as appropriate for the screw-in coil application,
> and I now have a new set of Magnecor wires to install. What are the next steps to properly connect this to
> the coil?

Strip about 1/4" of the insulation from the end of the wire, then slip the nut over the wire and then the metal washer. Fold the wire down against the washer, and solder it in place. (Let us know if the Magnecor uses a solder able alloy.) Trim away any wire that hangs over the edge of the washer.
-Randall

Ignition/Distributor/Cap/Wires

Subject: TR Distributor Cap (Cross Ref.)
Date: Thu, 9 May 2002
From: "Mike Rose" <lytspeed@hotmail.com>

Regarding the thread about plug wires, I have found that the distributor cap from my old '69 MGB is a perfect fit on my '59 TR3A and I can now use "real" plug wires with no fear of losing contact between the little pointed screw and the wire core. I don't know about other years of MGB's, but I had one left over from a car that I sold years ago and tried it and it works perfectly. So, if your car is a "driver" and you aren't too concerned about authenticity, try a cap and high performance wires from an MGB.

-Mike Rose

Ignition/Distributor/Timing Key & Pin/Electronic

Subject: TR3/4 Coil Orientation
Date: Sat, 05 Jan 2002
From: Randall <ryoung@navcomtech.com>

Geo Hahn wrote:

- > I knew this, but then I thought about it and got confused all over again...
- > On a positive ground car, which way is the coil connected, i.e. does the SW (ignition switch) connect to the +
- > or - post?

Negative (-) post. The + post goes to the points, which connect it to ground (which is positive).

- > Also, is there a test to determine if a coil is standard or ballast type?

Measure the primary resistance (across the '+' and '-' terminals, or 'SW' and 'CB' if so marked). I forget the numbers offhand, but they're on the VTR web site 'maintenance' pages.

-Randall

Ignition/Distributor/Timing Key & Pin/Electronic

Subject: Dead TR4 - Need Help!
Date: Wed, 1 May 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> I also checked the resistance across the coil (I couldn't remember what it should be), but I get no resistance
> (short) across the coil. Is this right?

Depends a bit on your ohmmeter. 'Normal' is around 3-4 ohms, which is pretty low on the scale for most meters. If it's an analog meter (has a needle) then you will need to set the zero for ohms to get an accurate reading. Digital meters don't usually have an external adjustment, but if it's a cheap one and hasn't been calibrated in recent memory, it could be off by that much.

Try putting back in the condenser you removed at your last tune-up (you did save it, right?) and see if that makes a difference. Try checking for spark directly at the coil output. Double check that with the points closed and the key on, you get 12v from the 'white wire' side of the coil to ground, and 0v from the other side to ground. Then turn the engine so the points open, and check that there is 12v on both terminals.

If none of that produces any fruit, then change the coil.
-Randall

Ignition/Distributor/Vacuum Advance

Subject: Checking Distributor Vacuum Advance
Date: Wed, 3 Dec 2003
From: "Randall Young" <ryoung@navcomtech.com>

> What's the best/easiest way to verify operation of the vacuum advance on a TR3A distributor?

Probably the best way is to disconnect the line, hook up a timing light, start the engine, then watch the timing mark as you apply vacuum to the advance module. I use a MityVac.

However if you don't have a ready source of vacuum, you can just suck on the port. If it doesn't leak, it's probably OK.

> Can the diaphragms be replaced or repaired?

Takes special equipment to do it, but I was able to have my local independent parts supply house send the module out to be rebuilt. ISTR the price was about \$30 (although that was a few years ago), and it took 3 days. Even came back with the right compression fitting, even though they replaced the part with the fitting on it.

> And what's that giant sucking sound I hear each time I tromp on the accelerator? NAFTA?

Either that or the air rushing into the carbs. A set of K&N's with some good velocity stacks will cut down on it

...

-Randall

Subject: Checking Distributor Vacuum Advance
Date: Wed, 3 Dec 2003
From: "Lumia, John" <jlumia@ball.com>

Bill, while I don't own a 3, the situation should be generic. If you have a vacuum gauge, disconnect the fitting at the advance unit and hook up the gauge to verify you have vacuum getting to the valve. You should probably see between 10 - 15 lbs of vacuum at idle. If you don't have a gauge, you will probably feel some suction if you put your finger over the open end of vacuum line. If you are getting vacuum, reconnect the vacuum line and hook up a timing light and point it at the timing marks. You should see the timing mark move toward retard as you increase the throttle, then toward advance when you let off the throttle. Or if you have a vacuum pump, you can use it to pull a vacuum on it and see if it holds vacuum. If you use the pump while the engine is idling, you should see a change in engine speed as you pull a vacuum on the advance unit. If not, the advance unit is kaput.

-John Lumia

Subject: Checking Distributor Vacuum Advance
Date: Wed, 3 Dec 2003
From: "Randall Young" <ryoung@navcomtech.com>

> You should probably see between 10 - 15 lbs of vacuum at idle.

Sorry, that's not right. The vacuum advance port is 'timed', meaning it gets no vacuum at idle. Every car I've ever wrenched on is this way, including all TR2-4A. Only the vacuum retard port on later cars, or a manifold vacuum port like for a brake booster or carbon canister, has vacuum present at idle.

> You should see the timing mark move toward retard as you increase the throttle, then toward advance when you let off the throttle.

On a TR2-4, the vacuum advance moves fairly slowly, while the centrifugal advance is working quite rapidly in the opposite direction. It's really tough to separate the two motions, especially since the engine will rapidly rev up with the throttle open enough to activate the vacuum advance.

> If you use the pump while the engine is idling, you should see a change in engine speed as you pull a vacuum
> on the advance unit.

Since the most common problem is a leaking diaphragm, also check to see how long it holds vacuum.

-Randall (E-mailed to Cosmo Kramer)

Ignition/Distributor/Vacuum Advance

Subject: Lubing the vacuum advance mechanism

Date: Fri, 20 Apr 2007

From: <spamiam@comcast.net>

As I have been working on my ignition issues on my TR4A, I recently installed the Pertronix Ignitor. That alone did not seem to make a huge difference. Cold starts are noticeably easier and the timing mark does not jitter around at all when checking the timing with a timing light. I also installed the "performance" distributor cap (press-in terminals) and the Cobalt brand ignition wires. They seem fine, and maybe it runs marginally better. But as I checked and set the timing and was revving the engine, I saw that the vacuum advance seems to be sticking. The advance jumps around, rather than moving smoothly. Also, the advance does not appear to drop back to "zero" every time. It would appear that I need to lubricate the advance mechanism. What is the simplest manner to do so? I want to dismantle as few parts as possible, even squirting in some lithium grease would be OK by me.

-Tony

Subject: Lubing the vacuum advance mechanism

Date: Fri, 20 Apr 2007

From: <spamiam@comcast.net>

As a follow-up, I thought a little about the jerky advance I am seeing. Probably it is the advance mechanism itself, not the vacuum part of it alone. I will try putting some oil down the center of the cam and see if that helps a little.

-Tony

Ignition/Distributor/Vacuum Advance

Subject: The effects of ignition timing
Date: Sun, 30 Nov 2003
From: "Peter Arakelian" <PeterAra@MSN.COM>

> I'm still trying to settle on the optimal ignition timing for the GT6

The accepted seat of the pants method for setting timing, which is also listed in some shop manuals, is pretty straightforward. Advance the timing until you can still accelerate from 30 mph to 50 mph at full throttle in high gear on a level road without any pinging. I add an additional test:

Take it out on the highway and get going at the speed limit and press full throttle, if it pings, retard the timing a little.

And, yes, it will affect the sound of the exhaust.

-Peter Arakelian

Ignition/Distributor/Vacuum Advance

Subject: TR3 diz to carb vaccuum
Date: Tue, 3 Apr 2007
From: "Joe Laurito" <trglory@comcast.net>

I just finished rebuilding a set of SU H6s for my TR3A and I am putting them on the car now. Everything went great until the final step; attaching the vacuum line from the distributor. I just wouldn't fit, so I removed the front carb to take a look. It seems that the hole is tapped for what appears to be 1/4x28 whereas the fitting looks to be about 5/16x28. I dug my old carb out of the box and sure enough the fitting fits that carb. I could drill and tap the rebuilt carb, but the problem is that I never heard of 5/16x28. What do I have here and how do I fix it?

-Joe Laurito

Subject: TR3 diz to carb vaccuum
Date: Tue, 3 Apr 2007
From: "Randall" <tr3driver@ca.rr.com>

> It seems that the hole is tapped for what appears to be 1/4x28

My memory is that hole has considerably coarser threads than 28 tpi. And of course they are not SAE threads at all, the SU H6 carbs use only British standard fasteners.

> whereas the fitting looks to be about 5/16x28. I dug my old carb out the box and sure enough the fitting fits
> that carb. I could drill and tap the rebuilt carb, but the problem is that I never heard of 5/16x28. What do I
> have here and how do I fix it?

I'm guessing that someone has "fixed" your old carbs, by tapping them out to 1/16" NPT (which is 27 tpi and about 5/16" diameter). Fittings for that thread are readily available at the hardware store, while the original fitting was NLA for a long time (and wouldn't have solved stripped threads in the body anyway). Since it seems a crime to modify the carbs, I would suggest sourcing the proper fitting. I see both Moss and TRF have them listed. Or you might be able to beg one from a fellow club member.

-Randall

Ignition/Distributor/Vacuum Advance

Subject: TR3 engine timing
Date: Wed, 10 Sep 2008
From: Bob <yellowtr@adelphia.net>

<L1J1S@aol.com> wrote:

> Hello, what is the best way to time a tr3 & 4 engine? Should one use a timing light or use a test light (static
> timing)? I know it has to be 3/8" before TDC. any suggestions welcomed.
> -LARRY SCHWARTZ

My method is to set the crank at TDC using the indicator on the crank pulley and then set the distributor so the points are just opening using a 12v light bulb (one of those dash bulbs), By attaching a bulb to the points and then ground you can then move the distributor back and forth until you get to the approximation. I made a little harness with a spare bulb socket and wire clips.

Once that is done, set the distributor advance to 4 degrees advanced and you are at a good starting point.

Remember to tighten down the distributor and start the engine.

Now I adjust the timing by "ear" with the engine running by using the micrometer adjustment on the distributor advance. When it sounds ok, I take it for a spin to insure no knock and good power, acceleration.

This method has always worked for me, both the 3 and 4 run just great.

I think this method is described in the manual somewhere.

-Bob

Subject: TR3 engine timing
Date: Thu, 11 Sep 2008
From: "Geo Hahn" <ahwahnee18@gmail.com>

My method is similar to what Bob has described though I try to get the initial set-up at about 4* then use the vernier from there.

Probably obvious but I'll mention that you want to set the points gap before you set the timing.

My full (simple) sequence is: points gap, timing, carb sync, mixture adjustment & idle adjustment. The engine only needs to be hot for the last 2. This assumes you start with good clean components (plugs wires, etc.).

Subject: TR3 engine timing
Date: Thu, 11 Sep 2008
From: "John & Pat Donnelly" <pdonnell1@san.rr.com>

I just installed a Pertronix in my TR4A. So, is the timing process any different for an electronic ignition?
Johnnie

Subject: TR3 engine timing
Date: Fri, 12 Sep 2008
From: "Brian Induni" <308gtsi@roadrunner.com>

Johnnie,

I installed Pertronix in my 4A last year, and have had no problems with it. Timing it was very easy - follow the

book method for lining up the rotor with #1 tube, then fine tune. I find using a strobe is worthless since the advance weights start providing advance at a very low RPM, so I get it close then adjust by ear. Starts first time every time, idles beautifully, and pulls great right thru 5000 RPM.

Make sure the PCV valve is in place and the oil filler cap is on tight. These really affect idle RPM.

-Brian

Ignition/Distributor/Vacuum Advance

Subject: Vac Advance
Date: Mon, 11 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> Greetings... Might someone share the vacuum advance specs for a TR4A? I believe the distributor number is
> 40795A.

The data I have for a 40795A is that it should have a 54413565 vacuum unit, with specs of 2-6-3 (normally marked on the unit). Meaning that advance starts at 2 inches of mercury, and ends at 6 inches of mercury with a total of 3 cam degrees (6 crankshaft degrees) advance.

-Randall

Subject: Vac Advance
Date: Mon, 11 Sep 2006
From: "fred thomas" <frede.thomas2@verizon.net>

> Greetings... Might someone share the vacuum advance specs for a TR4A? I believe the distributor number is
> 40795A.
> -TJ

The Moss U/K part # is 510890 and YES it is available from the U/K, the Lucas # 54413565, the engine operating # 2-6-3

-"FT"

Subject: Vac Advance
Date: Mon, 11 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

Vacuum Advance dist. 40795:

Inches Hg	Degree Crank advance
2.0	0
3.0	1
4.0	1.75
5.0	2.5
6.0	2.75

Centrifugal Advance:

RPM	Degrees Crankshaft advance
500	0
700	0-2
1200	5-7
1600	9-11

-Greg Perry

Subject: Vac Advance
Date: Mon, 11 Sep 2006
From: "Randall" <tr3driver@comcast.net>

Interesting numbers, Greg. Where did they come from? In particular, why do you believe those to be crank degrees instead of camshaft degrees?

-Randall

Subject: Vac Advance Update
Date: Mon, 11 Sep 2006
From: Greg Perry <rgperry@earthlink.net>

FT,

There are also differences in vacuum advances. The 83mm engine distributor (40850) is all centrifugal advance without a vacuum advance. I was comparing Randall's numbers for the 40795 distributor to those in the chart from my repair manual. The difference in Randall's advance numbers were 2 times the chart crankshaft advance numbers. I realize that there are some considerable differences between distributors. I do not know if the early distributors for TR4's were measured in camshaft degrees or crankshaft degrees in the distributor specifications. But my repair manual chart is in crankshaft degrees.

-Greg Perry

-----Original Message-----

>Subject: Vac Advance Update
>Sent: Sep 11, 2006
>From: fred thomas <frede.thomas2@verizon.net>

>> Randall,

>> After looking at the other vacuum advance numbers in the chart, the advance is lower for the distributors for
>> Lucas number 40735 and 40795. If one doubles the degree advance numbers for these distributors, one gets
>> advance numbers in line with the rest of the distributors in the chart for the same vacuum. I bet that the
>> original specs for these distributors were originally in camshaft degrees from what your earlier post stated.

>> -Greg Perry

> -----

>When you start referring to other dist and vac. advance, let's not forget the weights and springs are quite a bit
> different for each model, also piston size makes a g difference, that has been the problem with replacement
> dist. Over the years, installing the original factory dist with 83 mm pistons and now you have 92 mm pistons,
> just will not work for the best performance for your engine, many variations to even a T/R 3 & 4, piston size
> is the most vital to know.

> -"FT"

Subject: Vac Advance Update
Date: Mon, 11 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> The 83mm engine distributor (40850) is all centrifugal advance without a vacuum advance.

Strange ... my Lucas catalog says it should have a 54411462 vacuum advance. I don't have specs for that unit handy, but I'm pretty sure it's a vacuum advance unit.

-Randall

Subject: Vac Advance
Date: Tue, 12 Sep 2006
From: <btmfdchn@aol.com>

Greetings all and thanks very much for the specs and all the cogitating. I had specs of 2-6-3 but those numbers are so far off from everything else on my sheet I was suspicious of them. I've been looking at the Pertronix distributor (did you know Pertronix made a complete replacement distributor for the 45d BMC applications?) and the very adjustable 123 but both of them seem to offer much more vacuum advance. Not sure this would do well in our TRactor engines. Anybody got specs for the Mallory units?

-TJ

Subject: Vac advance (part 1.)
Date: Sat, 16 Sep 2006

From: <CarlSereda@aol.com>

Hi listers,

I sent this out last week, but it doesn't seem to have made it (too long?) - So sending in 2 parts now.

Hi all,

I believe this to be the last word from Leyland Triumph on TR4A and Spitfire MK.3 distributor specs; (I'm guesstimating it was published in 1968)

WORKSHOP MANUAL SUPPLEMENT for Spitfire MK.3 and TR4A, 1st Edition: Incorporating Emission Control Equipment

Engine Modifications - TR4A

The specification for the TR4A remains unaltered except for the following details:

1 CARBURETOR

- a) Needle - New needle fitted to provide a weaker mixture
- b) Main Jet - A new main jet is fitted to suit the revised needle
- c) Piston Damper - The piston damper is modified to restrict movement of the barrel. This provides a more immediate effect on the piston to give maximum acceleration with the weaker needles and jet settings
- d) Throttle Disc Poppet Valve - This is a small spring loaded poppet valve set in the carburetor throttle disc. At high manifold depression, that is during overrun with throttle closed, the valve opens to supplement the volume of fuel/air mixture which, together with a retarded ignition setting, maintains correct combustion.

2. IGNITION DISTRIBUTOR

The system includes a special distributor which has an extended operating range to permit a retarded static setting whilst maintaining the normal advance characteristics at higher engine speeds.

TIMING MARKS

TR4A Idle Speed RPM = 850/900, Ignition Static (Crankshaft Degrees) = T.D.C., Ignition at Idle = T.D.C.

Ignition Distributor Data:

Centrifugal advance (check at decelerating speeds)

Distributor RPM	Degs. distributor advance	crank rpm	degs. cranshaft advance		
below	min	max	below	min	max
400	no advance to occur		800		
500	0	3.5	1000	0	7
700	7	10.5	1400	14	21
900	11	13.0	1800	22	26
2500	11	13.0	5000	22	26

Subject: Vac advance (part 2.)
Date: Sat, 16 Sep 2006
From: <CarlSereda@aol.com>

VACUUM ADVANCE

Ins. of mercury vacuum	degs distributor advance	degs. crankshaft advance
min	min	max
<2	no advance to occur	
3	0	1.0 2.0
4	0	2.7 5.4
6	2.5	5.5 11.0
8	4.8	7.8 15.6
10	6.5	8.9 17.8
11	7.0	8.9 17.8
20	7.0	8.9 17.8

Whilst I find the above information intriguing, for my own TR4 ('63 open breather but with 4A in & out manifolding) I am sticking with the Lucas 40795 with vacuum unit 2-6-3 and carb needles spec'd just prior to final smog driven choices.

-Carl

PS- Randall regarding Greg's numbers shown below his 'degree crank advance' should read 'degree distributor advance' according to my official factory workshop manual.

> Inches Hg	Degree Crank advance
> 2.0	0
> 3.0	1
> 4.0	1.75
> 5.0	2.5
> 6.0	2.75

>

> The data I have for a 40795A is that it should have a 54413565 vacuum unit, with specs of 2-6-3 (normally marked on the unit). Meaning that advance starts at 2 inches of mercury, and ends at 6 inches of mercury with a total of 3 cam degrees (6 crankshaft degrees) advance.

> YMMV ... if anyone knows different, please let me know.

> -Randall

Ignition/Distributor/Weights & springs

Subject: Distributer springs
Date: Wed, 13 Jun 2007
From: <btmfdchn@aol.com>

<KingR44916@aol.com> wrote:

> Does anyone know who sells the springs that go in the distributors for a TR6?

Greetings...

I recently had 2 distributors rebuilt by <www.advanceddistributors.com> Jeff's work was excellent. He has the parts and can re-curve to your specs. I would check with him.

-TJ

Ignition/Distributor/Weights & springs

Subject: Distributor springs
Date: Fri, 9 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> I'd like to measure the distance between the spring posts, as outlined in the article, but I 'm not sure how to
> remove that assy. for access with calipers. Any suggestions welcome.

I've not worked on the 6-cyl version, but I believe it should be the same as any Lucas distributor. You'll need to remove the rotor & point plate, then drive out the pin that holds the drive dog to the shaft. Look carefully at the pin first, some of them are tapered and only come out one way. Probably yours is just a roll pin, though, so it can come out either way. Also mark the relative position of the dog & shaft before you remove it.

Then you can tap the shaft through the dog, remove the dog & collect any washers between the dog & body. Examine the shaft for any burrs and file them off. Then pull the shaft the rest of the way out, with the point cam & springs still attached.

However, it sounds like you may be going about this the hard way. If you just want to know if your setup is right, it's better IMO to check the advance on the car. Make some more timing marks if you need to, or mount a degree wheel; then rev the engine up with a timing light attached and watch what happens to the timing. The book, or Marcel's database, should have the information about what your particular distributor should do.

Once you know it's wrong, then disassemble to try and fix it.
-Randall

Ignition/Electronic

Subject: DIY Electronic Ignition
Date: Sun, 22 Dec 2002
From: "ptegler@cablespeed" <ptegler@cablespeed.com>

----- Original Message -----

Subject: DIY electronic ignition
Sent: Sunday, December 22, 2002
From: "Randall Young" <ryoung@navcomtech.com>

> Hi all:
> Came across this link on USENET, thought someone here might possibly be interested.
>
> This is a fairly simple circuit that acts as a "points amplifier", it uses the original points but routes the coil
> current through a transistor. It won't help with dizzy shaft wobble, but should make the points last a long
> time. I ran something similar on my TR3A, and didn't change points for over 10 years!
>
> <<http://www.cs.berkeley.edu/~wkahan/TransIgn.pdf>>
> -Randall

Replace the germanium transistor with a MOSET transistor.... (maybe shift the capacitor value a bit) and use a hall effect sensor and magnets as the 'points' ...and you have the very common Pertronix' module of today.

Paul Tegler

Subject: DIY electronic ignition
Date: Mon, 23 Dec 2002
From: "Randall Young" <ryoung@navcomtech.com>

Chris Byard wrote :

> I guess the Germanium power transistor used in the given circuit would probably deliver the wetting current
> as its gain is probably fairly low. However finding one now would probably be a bit difficult- my usual
> Google entry of HEP235 data turned up nothing so it's probably obsolete, along with the zener diodes quoted
> too. The circuit was probably a junk box special back in 1969 when the originator used it.....

My apologies for not checking on device availability before posting the link.

An NTE-127 is listed as a replacement for the HEP 235, I found several places on-line that appear to carry it. Likewise, NTE-5158A replaces the HEP-Z2547. However, at the price I found listed for a NTE-127 (US \$32), IMO this circuit is not worth pursuing. Sorry for the wasted bandwidth.

-Randall

Ignition/Electronic

Subject: Pertinox Wiring and General Comment
Date: Sun, 31 Oct 2010
From: terryrs@comcast.net

TR3A TS 58667 has been running less than optimal. Still had pick up, but less than it ought. Ran rough at idle. Also seemed like the top end faltered at 4k RPM. Re-installed the Pertonix. Combed List archives here yesterday; finally found how the red and black wires hooked up to the coil: red to positive, black to negative for a negative ground car.

But the thing that took forever to find in Archives was that for the Pertonix, the wire in the harness coming from the key goes to the positive coil terminal for a negative ground car. This must be reversed to the negative terminal when running points. So, for the record, here it is in one place.

I also found I didn't know how to spell Pertonix. That, alas, is another, sad, story.

Then I installed the MGB distributor with metal core wires left over from an old plow truck. I'm keeping the old TR distributor with wire screws as a spare in the car. Power differential feels considerable. I'll never go back.

Lastly, I happened to notice that one of the carb damper screws had come loose and was hanging on the lip of the reservoir. What exactly would be the symptoms for that?

-Terry Smith

Subject: Pertinox Wiring and General Comment
Date: Mon, 1 Nov 2010
From: "Randall" <tr3driver@ca.rr.com>

> I discovered that the poles on my (Lucas) coil are not labeled + and -, they are labeled BAT and DIST. Wot
> now,

Interesting. Are you sure it wasn't "CB" and "SW"?

There is an old-time test for coil polarity: With the engine running, hold the plug wire a bit away from the plug terminal (or any ground) and the tip of a (sharpened) ordinary "lead" pencil in the gap. If you look closely, you should be able to see that the spark is brighter to one side of the pencil tip. If that side is towards the plug/ground, the spark polarity is correct.

There is a better write-up (and another method) at (Warning MG content <G>)
< <http://mgaguru.com/mgtech/ignition/ig104.htm> >

- Randall

Ignition/Electronic

Subject: Pertronix
Date: Mon, 6 Aug 2007
From: Chris Buckley <chris.buckley51@yahoo.co.uk>

Hi Listers,

If one is fitting Pertronix electronic ignition is it necessary to upgrade the coil? TIA,
-Chris

Subject: Pertronix
Date: Mon, 6 Aug 2007
From: "Ed Oot" <eoot@citlink.net>

Nope, not necessary.

Subject: Pertronix
Date: Mon, 6 Aug 2007
From: <Btmfdchn@aol.com>

Chris Buckley <chris.buckley51@yahoo.co.uk> writes:

> Hi Listers,
> If one is fitting Pertronix electronic ignition is it necessary to upgrade the coil? TIA
> -Chris

Greetings... You must make certain the coil resistance in 3 ohms across the + and - terminals. Many "high performance" coils are lower and will shorten the life of the Pertronix.

-TJ

Subject: Pertronix
Date: Mon, 6 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

> If one is fitting Pertronix electronic ignition is it necessary to upgrade the coil?

No, the stock coil should work just fine.

-Randall

Subject: Pertronix
Date: Mon, 6 Aug 2007
From: <aldwyn@sylvancircle.org>

>> If one is fitting Pertronix electronic ignition is it necessary to upgrade the coil?

>

> No, the stock coil should work just fine.

> -Randall

So is there a benefit to using the Flame Thrower coil with the Pertronix ignition? Or is the Lucas coil just the same?

Subject: Pertronix
Date: Mon, 6 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

> So is there a benefit to using the Flame Thrower coil with the Pertronix ignition? Or is the Lucas coil just the
> same?

Might be some small benefit; but I've not found it. I suspect the main benefit is from less weight to accelerate
(in your wallet).

Plus, I believe it makes other components (like the rotor) more apt to fail.

-Randall

Ignition/Electronic

Subject: Pertronix ignitor ignition
Date: Wed, 21 Jul 2004
From: "Kai M. Radicke" <kradicke@wishboneclassics.com>

> So, maybe we should avoid the pertronix units?
> -Tony

Yes, they're junk. Here is my annual diatribe about Pertronix ignitors (copied from my post a few months ago to the 6-PACK list):

The benefits of the Pertronix Ignitor are more theoretical than measurable in the real world. In fact, I have had so many quality and technical issues with the Pertronix over the years that I refuse to sell them even when requested.

Before starting my own parts business, I worked for a much larger East Coast British car shop that sold the Pertronix units when they first became available for British cars between late 1997 and 1999. The units had a 30%+ return rate and overall at least half of those that purchased the units had major issues that needed replacement parts from Pertronix ... the other 30% just got fed up and returned them.

The basic issues of the Pertronix are these:

- 1) Horrible quality control in production. The magnetic collars are the weakest point, often suffering from tops which are improperly glued into place and come loose during operation. Missing magnets or incorrectly polarized magnets.
- 2) They are very voltage sensitive. If your car, for whatever reason, is getting less than 11.5V to your Pertronix unit, it will work intermittently if at all.
- 3) Even when all supporting systems are functioning perfectly and the Pertronix unit displays no quality issues, there is often a stumble or a miss in the power band around 3000RPM. This particularly applies to the TR6, as I remember fielding a few technical support calls specifically from TR6 owners and this problem.
- 4) Pertronix reduced their warrantee from 36 months to 30. A dead giveaway that they would rather cut their losses on warrantee issues than to build and provide a proper product.

I even ran a Pertronix unit in my 1974 TR6 during the summer of 1999. The first problem I encountered was that the magnets were not polarized correctly in the collar, two of the six were incorrect. A new collar from Pertronix solved that issue. Then I had the mystery miss in the power band, which was pretty annoying but I could deal with it. Then I had an alternator fail, but I still had to make it home, a task which would have worked fine if I had points that were still installed.

So at the end of the summer, points when back in, I feel the idle quality and power band smoothness that properly adjusted points provide is equal or better to a 100% properly functioning Pertronix unit. The sole benefit of the Pertronix is that people do not have to "worry about points"... but instead you have to worry about the Pertronix.

Moss will admit they had lots of problems during the same period of time with the Pertronix, they also claim Pertronix has fixed all the issues. I doubt it, nothing I saw on new units made me change my mind about the quality. You won't know if the magnetic collar is a problem until you install it. I prefer points, check and adjust them twice a year, replace them every 18 to 24 months and you should have no problem.

-Kai M. Radicke

Ignition/Electronic

Subject: Problem fitting Pertronix
Date: Tue, 03 Apr 2007
From: <spamiam@comcast.net>

I have a TR4A that has a mild miss which is most noticeable at idle. I decided to try a Pertronix Ignitor. The correct model for the 25D4 distributor on this car is the LU-142A. I ordered it and was very anxious to try it out.

It is easy to install these units. It took only a few minutes to get the ignition module installed. Then I went to push on the magnet collar. It is supposed to go onto the shaft with a bit of resistance. But, it did not fit snugly at all on mine! I was able to get the collar to drop fully down with no effort at all. It does not fit securely, and I can twist it on the shaft by 5 degrees or so.

I doubt that it is supposed to fit that way. I tried to push it down harder, but it is clearly all the way down. I looked for a support contact # or email but I found no clear answer. I will try their (non-toll-free) sales number tomorrow and see what answers they have.

Has anyone fitted the Pertronix to their 25D4 distributor (negative ground)? If so, was it the LU-142A model? Did the collar fit securely?

-Tony

Subject: Follow-up on loosely fitting Pretronix collar: idle miss persists
Date: Wed, 04 Apr 2007
From: <spamiam@comcast.net>

I did not see any suggestions on the list for a fix for my loosely fitting Pretronix ignition magnet collar. I had found it to fit excessively loosely on the distributor shaft. It would rotate a 3-5+ degrees in either direction! I called Pertronix. No specific "technical" phone number is listed. No toll-free number is listed. But my call was answered IMMEDIATELY and I had an answer for a fix immediately. It even sounded reasonable!

They suggested I use a soldering iron to create a furrow on the flat faces on the inside of the collar where the collar grips the flat faces of the shaft. They recommended one furrow in the center of each face. This sounded plausible, but I thought I would get better rotational control with 2 furrows on each face closer to the corners. By making the furrows you are also rasing a lip of plastic at the edges of the furrow. This heaped up plastic takes up the play in the fit.

They recommended doing 2 opposite faces only at first, but since my fit was VERY loose, I decided to do all 4 faces right away.

It worked well. The collar has no play.

The only other thing I can see as an issue is a basic design "problem". The collar has a lip to set to depth that the collar drops down on the shaft. This lip is about 60 thou thick. This RAISES the rotor's position on the shaft, and the fit of the rotor does not feel to be as secure as when it gets fully settled down.

When running the engine, it runs with precisely the same dwell as I had with points, just about 60 degrees. When using a timing light, the firing seems to be more precise. The timing mark on the engine does not wiggle around at all, not that it did much of that before. I had to adjust the timing of the distributor a few degrees to get it back to where it had been with points. On cold start, maybe it starts more easily, but I am not positive about that one. When the car has been run within a day or two, it starts pretty easily even when cold using points. It seems to idle more happily at 800 rpm than it used to with points.

I had made the change in the ignition to try to eliminate a fairly frequent, but random, miss that was most

noticeable at idle (only at idle?). Since it seems to idle more happily at 800 than with points, I think the Pertronix has helped somewhat, but I still have a miss.

I suspect that my valve guides are pretty leaky (slight oil smell to the exhaust at idle, and a slight blue puff out the tailpipe when lifting the accelerator, or re-starting a hot engine). At high vacuum, they might leak a noticeable amount of oily air into the intake ports. Maybe this contributes to the miss at idle. My compression is fine and within 10% in all cylinders, so I think the valves and rings are OK. I may have to pull the head and get new valves, hardened seats, and new guides.

-Tony

Subject: Follow-up on loosely fitting Pretronix collar: idle miss persists
Date: Wed, 4 Apr 2007
From: <jimmuller@rcn.com>

<smapien> wrote:

> When running the engine, it runs with precisely the same dwell as I had with points, just about 60 degrees.

Pardon me for jumping into a subject about which I know very little but this statement got my curiosity going. Is not the Pertronix a magnetic-pickup electronic ignition? So what is the meaning of dwell on such a beast? Or more to the point, what is the meaning of a dwell measurement on such a beast? Is there a setting one can adjust? I wouldn't have thought so.

- Jim Muller

Subject: Follow-up on loosely fitting Pretronix collar: idle miss persists
Date: Wed, 4 Apr 2007
From: <Dave1massey@cs.com>

<jimmuller@rcn.com> writes:

> <smapien> wrote:

> >When running the engine, it runs with precisely the same dwell as I had with points, just about 60 degrees.
> Pardon me for jumping into a subject about which I know very little but this statement got my curiosity going.
> Is not the Pertronix a magnetic-pickup electronic ignition? So what is the meaning of dwell on such a beast?
> Or more to the point, what is the meaning of a dwell measurement on such a beast? Is there a setting one can
> adjust? I wouldn't have thought so.

The Pertronix (and the Crane XR700 for that matter) is a point replacement module. Inside the electronics is a transistor switch that serves the function of the points. The on time / off time characteristics mimic the points with a 60 degree dwell.

I don't know how Pertronix does the dwell but it may be that the magnetic pickup senses the presence of the magnet for the correct period of time to accomplish the 60 degree dwell.

The Crane uses an optical pickup and the slot in the interrupter wheel is what gives the 60 degree dwell. If you want less dwell you can open up the slot a bit.

-Dave

Subject: Follow-up on loosely fitting Pretronix collar: idle miss persists
Date: Wed, 4 Apr 2007
From: "Randall" <tr3driver@ca.rr.com>

> I suspect that my valve guides are pretty leaky (slight oil smell to the exhaust at idle, and a slight blue puff out
> the tailpipe when lifting the accelerator, or re-starting a hot engine). At high vacuum, they might leak a
> noticeable amount of oily air into the intake ports. Maybe this contributes to the miss at idle. My compression
> is fine and within 10% in all cylinders, so I think the valves and rings are OK. I may have to pull the head and
> get new valves, hardened seats, and new guides.

Before doing all that, Tony, I would check the lift on each valve. Wouldn't hurt to have a peek inside the timing chest too, to check that the tensioner isn't broken.

-Randall

Subject: Follow-up on loosely fitting Pertronix collar: idle miss persists
Date: Wed, 4 Apr 2007
From: "Anthony Rhodes" <spamiam@comcast.net>

Randall, good suggestions. I did check the valve lift last summer. I bought a dial gauge to measure the motion. It could work but it was rather cumbersome. The magnetic base had no good place to fit securely. The motion of the rocker is difficult to track on either end. I gave up on that technique and just measured the full up and full down travel. They seemed fine then. I can do it again. Do get to the tensioner, I have to remove the fan and then the front cover, right? That might be a pretty big pain in the neck. Can I even GET the fan and pedestal off without removing the radiator? (TR4A) If the timing light shows that the TDC hole does not jitter back and forth, just tracks smoothly based on the mechanical advance (vacuum line removed), then wouldn't this suggest that the cam chain is not "too loose" and the tensioner must be reasonably OK?

-Tony

Ignition/Electronic

Subject: TR4 Electronic Ignition Question
Date: Mon, 30 Jul 2007
From: "Daehler, William F" <william.f.daehler@delphi.com>

So I was looking at the alternative upgrades for my ignition system, which is currently just points. Looks like I could buy a Pertronix kit which replaces the points with a shutter and an optical trigger.

But if I open my wallet even farther, I could get a Crane Cams Fireball XR700 which has an optical trigger as well as an ignition module.

What should I do? What are the pro and cons? Makes me really want to know what's inside that ignition module.

-Will

Subject: TR4 Electronic Ignition Question
Date: Mon, 30 Jul 2007
From: <pethier@comcast.net>

"Daehler, William F" <william.f.daehler@delphi.com> wrote:

> So I was looking at the alternative upgrades for my ignition system, which is currently just points. Looks like
> I could buy a Pertronix kit which replaces the points with a shutter and an optical trigger.

You sure they are selling you an optical system? The positive-ground Pertronix I have on my TR4 is a hall-effect unit. It installed quite easily and did not even change the timing. I have had no trouble so far, but I keep the points and wiring instructions in a small plastic container in the glove box just in case.

-Phil Ethier

Subject: TR4 Electronic Ignition Question
Date: Mon, 30 Jul 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Better yet, there's this one <<http://www.123ignition.nl/id/22.html>> It's a drop in replacement distributor. Only problem is you'd have to have your tach converted to electronic.

-Bob Danielson

Subject: TR4 Electronic Ignition Question
Date: Mon, 30 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

"Daehler, William F" <william.f.daehler@delphi.com> wrote:

> So I was looking at the alternative upgrades for my ignition system, which is currently just points. Looks ...

The Pertronix uses magnets and a Hall Effect transistor, rather than shutter and optical trigger.

> But if I open my wallet even farther, I could get a Crane cams Fireball XR700 which has an optical trigger ...

The XR700, like the Pertronix, is a simple "points replacement" device. It should be equivalent in terms of performance, since the spark energy is still determined by the coil rather than the module.

Hard to say which is better, IMO. The Crane unit is slightly more sophisticated, with things like automatic shutdown when the engine is not turning (to prevent overheating the coil & module), and a LED on the side to help with troubleshooting. But the Pertronix is simpler to install, and lacks that big module to hide somewhere.

I was disappointed and frustrated with the Crane XR3000 I bought for my TR3A (which is like the XR700 but has a capacitive-discharge circuit in the module); but I've heard from lots of other people that had trouble with the Pertronix.

So if money is a concern, I'd go with the cheaper one. And carry the parts to convert back to points if it goes sour on the road. One nice thing about points, they almost always give you lots of warning when they go bad. Electronics are more apt to just stop working, IMO, plus can sometimes cause really weird problems.

Eg the MSD unit I put on my Chevy, which would sometimes just stop working for just a minute or two on cold mornings; then work absolutely fine the rest of the day. Always worked fine when I started the engine, just long enough to get out in traffic, then it would die at idle, waiting for a light. Usually just long enough for me to get out and open the hood (much to the disgust of the other drivers behind me). After months of hunting for the bad connection; I finally replaced the MSD module and the problem disappeared.

-Randall

Subject: TR4 Electronic Ignition Question
Date: Tue, 31 Jul 2007
From: "Frenken, Eric" <efrenken@lctax.de>

Hi Will,

For another (bulletproof) alternative look here:

<http://brits-n-pieces.com/shop/product_info.php/info/p6783?language=en>

-Eric

Subject: TR4 Electronic Ignition Question
Date: Tue, 31 Jul 2007
From: "Frenken, Eric" <efrenken@lctax.de>

Good recommendation, Bob, but there's no need to convert the tach on a TR4 (contrary to a TR6) when installing the 123ignition. It's plug'n'play in case your car is negative ground! Best regards

-Eric

Subject: TR4 Electronic Ignition Question
Date: Tue, 31 Jul 2007
From: <Btmfdchn@aol.com>

Greetings... I recently faced the dilemma of what to do about the tired distributors in my TR engines (61 and 66) A friend had mentioned:

Advanced Distributors in Minnesota <www.advanceddistributors.com>

<<http://www.advanceddistributors.com>>

I communicated with Jeff and then sent him the 66 unit. He seems to have the parts for a rebuild including the big bushing (\$30 installed). He can also convert the units to Pertronix which I did on the 66. He recurved it for what is now sold as "gasoline" here in California.

End result, the cars starts and runs much better and actually idles nicely-and I haven't touched the carbs. I sent him the distributor for the 61 and stayed with points. Likewise a transformation. He was able to rebuild the vacuum advance as well. (\$50) NFI, just a very happy customer.

-TJ

Subject: TR4 Electronic Ignition Question
Date: Tue, 31 Jul 2007
From: <spamiam@comcast.net>

"Bob Danielson" <75TR6@tr6.danielsonfamily.org> wrote:

> Better yet, there's this one <<http://www.123ignition.nl/id/22.html>> It's a drop in replacement distributor. Only
> problem is you'd have to have your tach converted to electronic.
> -Bob Danielson

Are you sure about that? I have looked at these a little. It looks as if they are a LITERAL drop-in replacement. Admittedly, I was looking at one that would fit the TR4A, however.

It looks as if they will fit in the original distributor pedestal, which on the TR2-4A (at least) engines has the tach drive in the pedestal.

It looks as if the original tach drive would still work on my car. Not so, on the TR6?

Other than offering variable amounts of total advance, and being NEW not worn out, it does not seem to be all that much better than a more standard style distributor with an aftermarket electronic ignition.

The installation instructions are not very thorough. The description of the vacuum advance functions is sketchy. The manual does not clearly chart the advance curve. Neither the vacuum advance curve, nor the "mechanical advance" curve of the electronic advance unit. I would be more comfortable with more info.

-Tony

Subject: TR4 Electronic Ignition Question
Date: Tue, 31 Jul 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Their site says "Triumph-owners should check if they need a connection for a mechanical rev. counter, as a 123\GB does not offer this." which to me says that there's no mechanical tach connection. I also saw a few guys with these at VTR and they had converted to an electronic tach. But everyone I've talked to who has one loves them. I was considering one before going the TBI route and my distributor is now the stock pedestal, a custom mounting plate, Chrysler electronics and a Jeep cap! Not very original at all....LOL

-Bob Danielson

Ignition/Electronic

Subject: Coil Resistance & Pertronics
Date: Sun, 17 Apr 2011
From: <spamiam@comcast.net>

-----Original Message-----

Subject: Coil Resistance
Date: Fri, 15 Apr 2011
From: cofrog@q.com

I'm confused (again). What coil resistance do I use with a Pertronix LU142A Ignition? I have two different cars and two different setups. A street TR4 which has the 1.5 ohm internal ballasted coil and a TR4A racer with an external ballast and a 3 ohm coil. Both are negative ground. Some folks on the web say use only a 3 ohm coil (unballasted) with the Pertronix. It appears my coil shot craps on the street car and took out the Ignitor. So I'm double checking what resistance coil is proper.

I want to give kudos to Marvin at Pertronix who replaced the toasted LU142A even though it was out of warranty by a few weeks.

-Dan

Dan,

The 1.5 ohm coil needs external ballast to bring the overall resistance to about 3 ohms. In other words, the 1.5 ohm coil runs on 6V. The purpose of that is to allow the ignition switch to sent power which bypasses the ballast when starting the car. When the starter is sucking lots of amps, the battery voltage sags to well below 12V. This will make a standard 12V coil put out a weak spark, and start hard, especially if flooded. Bypassing the ballast runs the coil at the equivalent of about 16V while cranking the engine. That short duration of over current will not harm the coil, but will assist in starting.

Conversely, the 3 ohm coil should not use a ballast resistor. If it does have a ballast resistor, it will be effectively running on something like 8 Volts, when it is designed for 12v. You will get a weak spark in that situation.

If you run the 1.5 ohm coil continuously without a ballast resistor, you will burn it out and you will probably damage the pertronix that is trying to switch the coil. In my humble opinion, the pertronix is JUST able to handle the switching current from a 3 ohm coil. Doubling that current is probably going to be bad.

I have never used a pertronix in a ballasted system. But here is what I THINK you need to do if you do use it in a ballasted system: The pertronix unit needs 12V, so it can't tap that from the + side of the coil the way it does when you have an unballasted system. You need a separate 12V supply. All the other pertronix connections are the same. When cranking the engine, you will probably be switching higher current thru the coil than usual, but for limited durations, this is probably not going to be a problem.

-Tony

Ignition/Electronic

Subject: Pertronix Bench Test
Sent: Tuesday, August 16, 2011
From: Marvin Grebow <marving@pertronix.com>

Please see attached sheets for testing the Ignitor:

Marvin Grebow Jr.
PerTronix Inc.
Technical Department
909-273-6006

marving@pertronix.com

Attached Sheets 1&2:

6 & 12 VOLT NEGATIVE GROUND TESTS

DO NOT LEAVE IGNITION SWITCH ON WITH ENGINE OFF
(IGNITOR WILL OVERHEAT AND FAIL)

Socorro Alcocer 8/16/2010

Grounds:

- Ignitor "MUST" be grounded properly.
- Make sure that your breaker plate is grounded to the distributor housing.
- Distributor Housing needs to be grounded to engine or intake.
- Check contact surface area of distributor "Hold Down Bracket" for proper ground.

OTHER CHECKS

- Check sticker on the backside of module "Ignitor by PerTronix" If the Sticker is shriveled up, wrinkled, cracked, or if you see any burn marks on that side of module the unit over heated and failed for various reasons.
- If you're using Part #1281 or 91281 (only), make sure that module and magnet sleeve are level with each other on top.

VOLTAGE TESTS

	6 Volt System	12 Volt System		
Minimum	Maximum	Minimum	Maximum	
Ignition Switch "ON"	5.2	N/A	8.0	N/A
Cranking	5.2	N/A	8.0	N/A
Engine Running	N/A	9.0	N/A	16.0

Note: Low voltage can be caused by poor connections, poor contacts in the ignition switch, and or a resistor wire in the wiring harness (Factory Installed)

1. Do not disconnect wires from ignition coil.
2. Use jumper wire (With alligator clips on both ends)
3. Connect jumper wire from negative (-) side of coil to a good engine ground.
4. Connect volt meter red lead to positive (+) side of coil and black lead to engine ground.
5. See chart below for specifications.

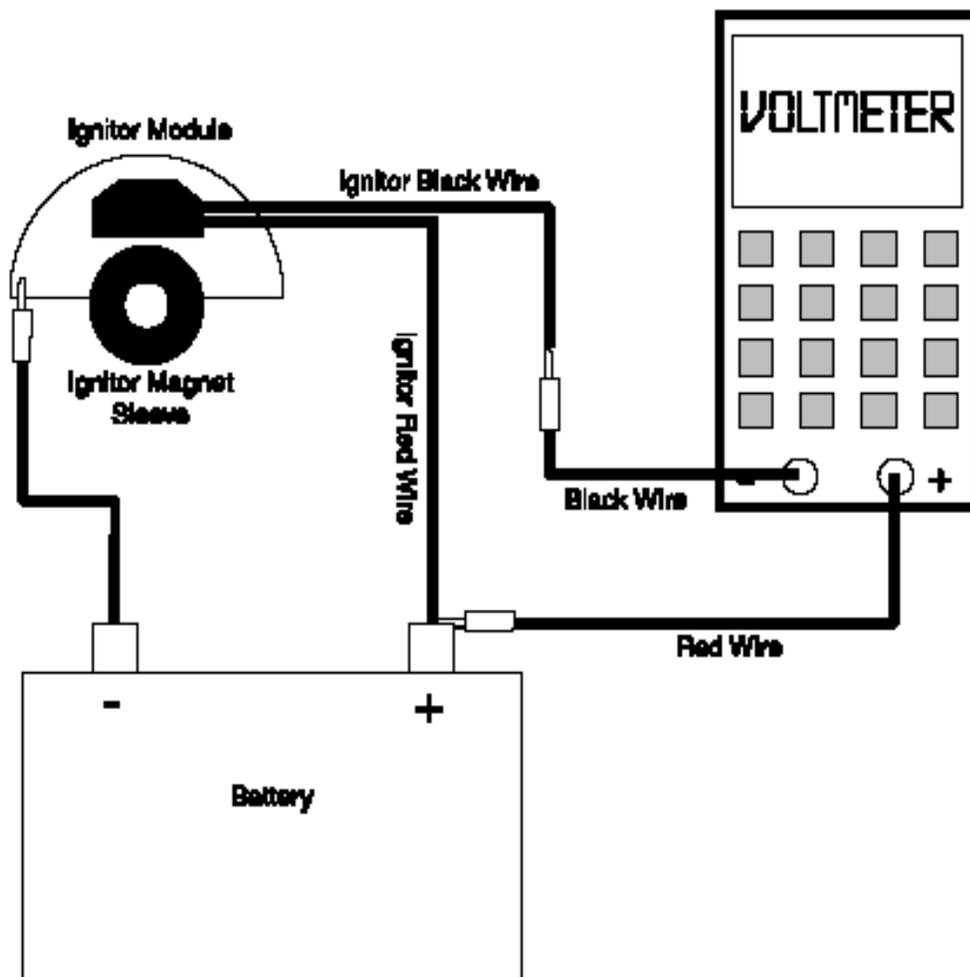
IGNITION COIL TEST & SPECIFICATIONS

	6 Volt System	12 Volt System		
Minimum	Maximum	Minimum	Maximum	
1, 2 & 3 CYL	1.5 ohms	3.0 ohms	3.0 ohms	4.5 ohms
4 & 6 CYL	1.5 ohms	3.0 ohms	3.0 ohms	4.5 ohms
8 & 12 CYL	0.6 ohms	3.0 ohms	1.5 ohms	4.5 ohms

Note: Do Not Remove Ballast Resistor or Resistor Wire when using a coil that does not meet our minimum ohm specifications (permanent damage to Ignitor will occur).

1. Remove all electrical wiring from ignition coil (coil must be tested by itself).
2. Connect the red ohm meter lead to the positive (+) side of the coil.
3. Connect the black ohm meter lead to the negative side of the coil.
4. Check ohm meter for proper coil resistance and make sure that that it meets our minimum specifications or an external resistor must be added.

Module Test:



12 & 6-volt Negative Ground Module Test

1. Connect the Ignitor plate to the battery negative terminal.
2. Connect the red Ignitor wire to the battery positive terminal.
3. Attach the black lead from the voltmeter to the Ignitor black wire.
4. Attach the red lead from the voltmeter to the Ignitor red wire.
5. Rotate the magnet sleeve in front of the module; the meter should fluctuate between battery voltage and 0 volts.
6. A constant measurement indicates that the power transistor or hall cell may have failed.

Ignition/Spark Plugs

Subject: One Black Plug
Date: Wed, 29 May 2002
From: "Randall Young" <ryoung@navcomtech.com>

> Here's another curious note. The manuals describe multiple plugs (all Lodge #'s) depending on the condition
> of the engine (stock, race modified, etc.). Are the Bosch, Champion, NGK plugs we've been discussing here
> covering these conditions (or heat ranges?), or is there an equivalent for each of the Lodge #'s?

At one time, there were conventional construction Champions available that would fit, in different heat ranges. However, to the best of my knowledge they have been discontinued.

> Or, let me ask a different way. Is there a cross reference chart showing hotter/colder plugs, possibly by brand?
> Spending \$10 or so trying to find a better plug may be worth the money, but I need to know what model
> numbers to go after.

Thing is, if only one plug is black, the plugs are not the problem!

Plug heat range is a fairly confusing topic, at least to me. For Bosch plugs, the number determines the heat range (IOW if only the number is different, the plug will physically fit), and the higher the number the hotter the plug. So, if you could find them, a W8BP would be a hotter plug (the 'R' means resistor and my chart doesn't list a WR8BP), and a W6BP would be a colder plug. However, I've been told that all but a few non-resistor plugs have been discontinued.

For NGK plugs, it's still the number, but they run in opposite order, so a BP5HS is hotter than a BP6HS (and is listed as the equivalent to the W8BP). However, I don't find a BP7HS listed, BP6HS is given as the equivalent to both WR7BP and W6BP. Of course, manufacturers take a lot of liberty with equivalence charts !

> One last note. When running the Lucas Sport coil, the spark should be hotter (more voltage, meaning bigger
> spark). Does that mean you can could spread the plug gap wider (maybe to .030) to obtain a bigger (better?)
> spark? It seems like there needs to be a balance between the coil and the plugs (and wires) based on the
> condition and tuning of your engine. Bigger (or hotter) may not be better.

Some people have reported a small improvement from opening the gap to perhaps .027". .030" is too large IMO, you'll start having rotor failures and whatnot. Personally, I couldn't tell any difference whatsoever, so I'm still running .025".

The temperature of the spark does not go up, neither does the diameter of it. What does go up when you lengthen the gap is the length of the spark. If you think about this in terms of lighting a candle with two matches instead of one, you can see why it doesn't make a big difference.

-Randall

Subject: One Black Plug
Date: Thu, 30 May 2002
From: "Craig B. Foch" <cbfoch@earthlink.net>

Plug heat range measures how well the plug sheds heat to the cylinder head, and this depends on the size and shape of the ceramic insulator. Hot plugs shed heat slowly, because the contact between insulator and cylinder head is relatively small and far from the center electrode. You run hot plugs in a cool-running engine (e.g., many short trips). Because the plug retains heat, the electrode is less likely to foul. Conversely, cold plugs shed heat quickly, because the contact between insulator and cylinder head is relatively large and close to the center electrode. You run cold plugs in a hot-running engine (e.g., race engine). Because the plug sheds heat, its electrode is less likely to burn away.

So if all your plugs are fouling, switch to a hotter plug. If they are all burning their center electrodes, switch to a colder plug. If only one plug is fouling, and you have tried swapping plugs between cylinders, then the problem is elsewhere.

-Craig Foch

Ignition/Spark Plugs

Subject: Plug Heat Range
Date: Fri, 12 May 2006
From: "Randall" <tr3driver@comcast.net>

> Does anyone have a "chart" showing TR6 spark plugs over a heat range from cold to hot. I'm running the
> stock Champion N9Y and want to try some that are a range or two hotter. Brand doesn't really matter.

For almost any given brand of plug, the letters determine all the plug physical dimensions, while the number is the heat range. Unfortunately they differ between brands as to whether a higher number is hotter or colder. For Champion, higher numbers are hotter. The Champion chart I have lists the following plugs, in order from hottest to coolest :

RN16YC5
RN14YC
R/N12YC
R/N11YC
R/N9YC
R/N7YC
R/N6YC
RN4YC

The trailing 'C' indicates Champions "Copper Plus" line of plugs, which replaced the 'standard' N9Y. The leading 'R' indicates an internal resistor, for EMI suppression (and where I've written R/N it means the plug is available both ways).

The other thing you could try (if you want) is one of the newer plug designs that have wider heat ranges.

Interesting to note that the plug specified in my TR6 owner's manual is a UN12Y. Not only a much hotter plug than you are using, but the leading 'U' indicates an "auxiliary gap", which I assume is to improve starting with fouled plugs. Seems like Triumph must've had trouble keeping the plugs clean, too.

-Randall

Subject: Plug Heat Range Part 2
Date: Fri, 12 May 2006
From: "Randall" <tr3driver@comcast.net>

> So what are the benefits of running a hotter plug anyway? Cleaner running? Improved fuel economy? Or is it
> just a matter of what works best in your car?

Just a matter of what works right. Too cold a plug won't burn off deposits, and eventually foul. Too hot a plug is subject to glazing, and overheating (can cause pinging), and won't last as long as it should.

<www.ngksparkplugs.com/techinfo/spark_plugs/techtips.asp>

IMO if you had to change the mixture to match the plugs, the new plugs are wrong. I'm guessing they were partially fouled, and misfired with a lean mixture. FWIW, this is one of those cases where an electronic ignition might help.

According to the cross-reference I found, the BP6ES covers N8Y through N10Y.

-Randall

Ignition/Spark Plugs

Subject: TR6: plugs - hot, cold or regular
Date: Fri, 15 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> Is there any indicator that says it is better to use a cold plug versus a hot one?

The "best" heat range for your engine is the one that lets the plug tip get hot enough to burn off deposits; while not overheating; for the kind of driving you do.

> How about after rebuilding the engine? After installing electronic ignition?

At least in theory, neither of those things should make a difference. Assuming of course you didn't go to a hotter plug when the engine was worn out, in an attempt to burn off the oil deposits quicker.

That said, I found that when running conventional plugs on my TR3A, with a MSD6 and mostly freeway driving, I needed to go one range colder. But the problem went away when I switched to a "platinum" plug with a different nose design.

-Randall

Subject: TR6: plugs -- hot, cold or regular
Date: Sat, 16 Jun 2007
From: <Chip19474@aol.com>

<jeffn@msystech.com> writes:

> Is there any indicator that says it is better to use a cold plug versus a hot one? How about after rebuilding the
> engine? After installing electronic ignition?

Jeff,

My suggestion for your 6 is to try good old Champion N9Y, N9YC or RN9YC (if you want resistor plugs). N12Y (and its variants) plugs are hotter - better for ailing, lower compression motors not rebuilds. My TR6 has had extensive performance mods and I'm very satisfied with the N9Y's.

-Chip Krout

Ignition/Spark Plugs

Subject: Spark Plugs...Ignition Upgrade
Date: Thu, 20 Nov 2003
From: "Lou Metelko" <lmtr4a@ctlnet.com>

----- Original Message -----

Subject: Spark Plugs...Ignition Upgrade
Sent: Thursday, November 20, 2003
From: "Jeffrey J. Barteet" <barteet@barteet.com>

- > Hey, Everyone,
- > Believe it or not, I've had the same spark plugs in my TR4 since I replaced them when I got the car in '98.
- > They still look okay, but ...
- >
- > What other species of sparkplug, work well in these tractor motors?
- >
- > Anybody use regular (non-platinum) Bosch plugs? Have a part #?

Jeff:

Current spark plugs favored by the TR2 through the 4As are:

Bosch WR7BP - platinum tip that seem to be very foul registrant - kind of hard to find but worth the search
Champion L87YC - the old stand by that can be found virtually anywhere, even the various Mart stores. Good price but I seem to have to replace yearly because of fouling. L87YC's are possibly better known nowadays as: **Champion #312**. Why they changed the numbering system is beyond me, but they're still out there and usually can be found under either part number.
NGK BP6HS - heard good things about the NGK line but have not tried them.

What's this about Capacitive Discharge System - man, I can't even pronounce it, let alone know what it is. Is it set at .015?

-Lou Metelko

Ignition/Spark Plugs

Subject: Types of Sparking Plugs
Date: Tue, 26 Feb 2002
From: "Fred Thomas" <vafred@erols.com>

Ken Gilanders recent article in VTR still says **Bosch Platinum # WR7BP** for our cars, and this is all I have ever run in my car. "FT"

Subject: Sparking Plugs
Date: Tue, 26 Feb 2002
From: "Brad Eells" <bradlnss@lightspeed.net>

Sparking Plugs??? Why..Lodge HNY, of course! [;-]
-Brad

Ignition/Trouble Shooting

Subject: Car won't start?
Date: Mon, 27 Jan 2003
From: Randall Young <ryoung@navcomtech.com>

> Still nothing. I added heat and waited a day and tried today, turns over, but no ignition. I also used my new
> 500w (9.95 at sears, what a bargain!) halogen tripod lamp, which gets really hot, near the carbs to warm them
> up, nothing. Now in new to the whole car deal, so what should I check next? What do I look for in the points,
> condenser, etc.?

Justin, the details depend greatly on your particular car (which I've forgotten if you posted it before), but when I'm stumped, I always look at the basics: fuel, air, compression, spark (not necessarily in that order). With those 4 items (at the proper time and in the proper proportions), it has to run!

Start with a quick ignition/plug test: pull one of the plugs and inspect it for problems. If it's all gummed up with deposits, or wet with fuel, or the gap is significantly larger than spec (.025" for most Triumphs); invest in a new set of plugs before continuing. Put the plug wire back onto the plug, and lay it on a grounded surface (like the rocker cover stud/bolt), then have a helper crank the engine while you watch for spark at the plug. If necessary, you can hold the plug in place, being careful to only touch the metal shell and to hold it firmly against a ground (otherwise you may get shocked, which is unpleasant but rarely dangerous). I have an old plug with a wire and clip soldered to the shell, that I use for such problems. If you lack a helper, some Triumphs have an under hood starter button (be sure the ignition is on); or you can buy (or build) a remote starter switch.

(Currently on sale for \$3.50 at HF, and a good tool to own):

<<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=35448>>

The spark should be strong and regular, blue or perhaps orange. If it's yellow, the coil may be wired backwards.

If the plug was wet with fuel, try cranking for a while with the ignition on, choke off and the accelerator floored. Check the plugs again, if they're wet again then the engine is somehow getting too much fuel (or not enough air).

My favorite way of diagnosing "no fuel - no start" is to squirt some "starting ether" down both carbs. You'll need to either lift the pistons, or better yet use a long nozzle to get under them. Then try cranking. If the engine now fires (even if it doesn't stay running), you've got a fuel delivery problem.

Quick & dirty compression/timing check: remove a plug and hold your finger over the hole. Crank the engine in short bursts, until you feel air pressure forcing your finger off the opening. Now pull the dizzy cap and make sure the rotor is pointing towards the cylinder you pulled the plug from. Sounds silly, but I sure wish I'd done this to my first TR3A, instead of spending two days standing ankle-deep in snow, trying to get it started; and then riding in it for over an hour while being towed home.

Of course, all of these can be followed up with more detailed, accurate tests, but for me, these usually either find the problem, or get the engine running.

Oh, one last comment, Heet will not help to start a car that already has liquid water (or worse yet ice) in the fuel lines. It's a preventative measure, not a curative one.

-Randall

Subject: Car won't start
Date: Tue, 28 Jan 2003
From: <lstein6@earthlink.net>

I just got to reading the list (been sick). Perhaps all these things have been mentioned and if so I apologize. here's my list:

1. Put a timing light on any spark plug wire (a timing light with battery and inductive pickup is excellent investment). Crank the engine in neutral of course and just see if you get nice flashing light. If you do, you know you at least have spark.

2. My choke still isn't working on my tr7 (!@#\$ fasd). So I keep a can of starting spray in the car. I don't even have to pull off the air cleaner, just 1 long second spray into air intake of air cleaner and vroooooom, it starts right up. That would tell you if you have fuel problem. If it stalls in 2 or 3 seconds it's definitely fuel problem.

3. Pull fuel line off before it goes to carbs. Get good metal or thick plastic cup, disconnect coil wire and crank engine for a few seconds, you should see 'blurb, blurb, blurb' of gas as engine cranks. If nothing, you have fuel starvation.

These three items can be done in a matter of a couple minutes without any real work. Next, pull plugs and look at them. Are they white (as in no gas)? Are they black and or wet (as in flooded)? With plugs out you can do compression check (just a great thing to have as a reference). Balance is most important as in the numbers should be within 10 lbs for best. Can be as low as 100 lbs and be okay (I think, but the experts here know better than me). Next you can do a static test on the timing, with plugs out, turn engine with fan till #1 piston at top (flashlight), balance wheel is pointing at (whatever is right 0 degrees to +12 degrees?) and rotor is pointing at #1 plug wire, hook up simple 12v light bulb or voltmeter and turn distributor to get it to just turn on. I hope this helps, let us all know what it was.

-Larry

Subject: Car won't start
Date: Thu, 30 Jan 2003
From: "Kinderlehrer" <kinderlehrer@mindspring.com>

----- Original Message -----

Subject: Car won't start
Sent: Thursday, January 30, 2003
From: <JutH1685@aol.com>

> Success this afternoon! But only for 5 seconds! I PROPERLY applied the starting fluid into the carbs and
> cranked the engine. It fired, raved, then stalled, so i think maybe there is a problem with fuel delivery? I'm
> leaving it in the sun this afternoon, but its only 16? degrees, so we will wait and see. If that doesn't work, any
> suggestions?
> -Justin

Suggestion #1:

Go inside, get a big fire going in the fireplace, and make yourself a nice hot toddy. Stay there until spring.

Suggestion #2:

Ok, so if you are really determined to get this thing running;

a) put dry gas in the tank. Give it a chance to work.

b) disconnect the fuel line at the carbs, put the end of the fuel line into a jar, and crank the engine. If the jar fills up, the problem is in the carbs.

c) if there is no gas there, then work backwards. Start with the easy, replace any gas filters. Then disconnect the line before the fuel pump, if gas flows (assuming you are not on a steep hill)- you probably need a fuel pump, if not keep work in back until you find the blockage - could be ice in the tank. BTW, are you sure there is gas in the tank?

d) You got fuel into the jar, therefore everything should be ok up to the carbs. Check the floats - are the bowls full? Then the valves may be stuck or dirty (or frozen). At this point it would be helpful to know what kind of

carbs you have.
Hope that helps.
-Bob

Ignition/Trouble Shooting

Subject: I'm stumped!
Date: Sun, 24 Jun 2007
From: "Kurtis J." <tr4driver@gmail.com>

After a spring and early summer of uneventful TR4 driving, I pulled out of my garage a couple of weeks ago, and my TR4 died at the end of the driveway and wouldn't start. I finally managed to re-start it, but it was obviously not running on all four cylinders. I pulled it back into the garage and left it there for a few days.

A few days later, after replacing the distributor cap, the spark plugs, the plug wires, the condenser, the points and the rotor, I was confident enough to drive it roughly 120 miles to my wife's high school reunion. I had some problems starting it after a stop for lunch, but otherwise it ran great. The next morning, it wouldn't start, and I ended up having to advance the distributor to get it to start. I kept fiddling with the timing and had it running fairly well for the first 40-50 miles, but then it started missing again, and kept getting worse. I kept fiddling with the timing, but could never get it sorted out. I managed to limp home, and replaced the plug wires and distributor cap again. Checked the points gap, the valve clearances, etc. Thought I had it licked, and tried to drive it to work a few days ago. It still had a high rpm miss, that got worse and worse. I barely made it home.

Today I replaced the coil and the entire distributor with a spare (with different points and condenser). I double checked all connections. I still cannot time the thing so that it doesn't miss. I checked the plug wires with a timing light (before it quit working!), and the miss was occurring on all four cylinders.

Does anyone have any ideas? Again, the thing was running great up until a couple of weeks ago. I've always timed it by ear, and have never had any problems getting it running great. This situation has me baffled.

-Kurtis

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: <mrV8q@aim.com>

> After a spring and early summer of uneventful TR4 driving, I pulled out of my garage a couple of weeks ago,
> and my TR4 died at the end of the driveway and wouldn't start. I finally managed to re-start it, but it was
> obviously not running on all four cylinders. I pulled it back into the garage and left it there for a few days. ...

Seems you've sorted out the ignition side....

Have you checked for good fuel flow.... clogged filters(s), sediment from the gas tank, dying fuel pump?

-Kevin Browne

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Frank & Sandy Crowe" <thecrowes@hotmail.com>

Other than replacing the distributor, I didn't see the rotor mentioned. The only time my TR3 has ever left me stranded (while showing off to my father-in-law no less) was due to a resistance through the rotor to ground. I had about 70Kohm resistance from the center metal contact to the little clip that holds it to the distributor drive shaft, thereby sucking all the spark from the plugs to ground! When it happened, it started missing on one cylinder, then two, then just died.

-Frank

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "John Macartney" <standardtriumph@btinternet.com>

It's a long shot on this one, but how long since the engine was rebuilt? In extremis, it might be worth removing the timing chain cover to check if the chain tensioner is still tensioning. Could just possibly be that if the chain is loose, it may have jumped one or more teeth on the sprocket and that'll play hell with things. Personally, I'd go for something simpler like another defective dizzy cap or a pattern type rotor arm that's either a whisker too long or short. I've had dizzy/rotor arms on both my cars and the timing chain problem on my Fergie tractor with the Vanguard engine.

-Jonmac

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: <MMoore8425@aol.com>

<thecrowes@hotmail.com> writes:

> Other than replacing the distributor, I didn't see the rotor mentioned. The only time my TR3 has ever left ...

There have been a rash of rotor failures as the new ones are poorly made. The Distributor Doc (UK) sells quality ones. My Jaguar quit because the fairly new rotor was arcing though. The bad ones have a rivet which arcs through the plastic internally to the shaft,

-Mike Moore

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Kurtis J." <tr4driver@gmail.com>

<mrv8q@aim.com> wrote:

> Seems you've sorted out the ignition side.... Have you checked for good fuel flow.... clogged filters(s),
> sediment from the gas tank, dying fuel pump?

I seem to be getting good fuel flow. I disconnected the fuel line past the filter and cranked it a few times and had a healthy flow of fuel.

-Kurtis

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Kurtis J." <tr4driver@gmail.com>

<thecrowes@hotmail.com> wrote:

> Other than replacing the distributor, I didn't see the rotor mentioned. The only time my TR3 has ever left ...

So far I've tried three different rotors, three different distributor caps, three different sets of plug wires, three different sets of points, two different sets of spark plugs, two different coils, three different condensers, two different distributors.

-Kurtis

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: <Mmoore8425@aol.com>

<standardtriumph@btinternet.com> writes:

> Personally, I'd go for something simpler like another defective dizzy cap or a pattern type rotor arm that's
> either a whisker too long or short. I've had dizzy/rotor arms on both my cars and the timing chain problem ...

Here is the only source I know of for good rotor arms.

<<http://www.distributordoctor.com/>_ <<http://www.distributordoctor.com/>>

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Kurtis J." <tr4driver@gmail.com>

John Macartney <standardtriumph@btinternet.com> wrote:

> It's a long shot on this one, but how long since the engine was rebuilt? In extremis, it might be worth ...

The engine was rebuilt about 3 or 4 years ago.

-Kurtis

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: TeriAnn Wakeman <twakeman@razzolink.com>

Kurtis J. wrote:

> So far I've tried three different rotors, three different distributor caps, three different sets of plug wires, three
> different sets of points, two different sets of spark plugs, two different coils, three different condensers, two
> different distributors.

Don't get too hung up focusing in on just one cause. Electrical and fuel related problems do share many symptoms.

Recently my TR3 started losing power, coughing up a storm and occasionally backfiring. About a quarter mile from the filling station where I just filled a nearly empty fuel tank.

I siphoned the tank & added 5 gal from a different source, replaced the fuel pump, the fuel filter blew out fuel lines, checked float valves, check jet passages and popped in a new set of plugs. All because my condenser failed right after I filled the fuel tank. My Mallory condenser that had less than 5000 miles on it from new.

Over the years I can not count the number of times I've chased a fuel or electrical system problem only to have the real problem be in the other system.

Going back to your electric, did you try swapping out the low voltage wire between the coil & distributor? It sees a lot of vibration and I've had two go bad on me over the years. The vibration can fatigue and break the wires at the edge of the connector crimp. The insulation holds the wire & connector in contact but vibration makes & breaks the electrical connection with predictable results.

Any chance you might have sticky flat valves? Never focus on just one system

-TeriAnn

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Geo Hahn" <ahwahnee@cybertrails.com>

My guess (since we're guessing) is a stuck float jet. I had a Gross jet that would stick closed. Remarkable how well these engine run on 2 cylinders (actually I suppose the other 2 were getting some fuel via the balance tube).

Anyway, only takes a second to open a bowl and peek inside (if you have Su's, can't recall the change point).

-Geo

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: <jimmuller@rcn.com>

Geo Hanh wrote:

> My guess (since we're guessing) is a stuck float jet. ...

I am struck by how diverse the answers have been. (I've never seen a float valve stuck closed, but then, I've never used Grosse Jets.) Each of the answers could offer the real solution (except that some have already been tried). Bad dizzy parts, bad coil, air leak, jumped timing chain, split vacuum advance diaphragm (not mentioned yet), split carb diaphragm? (not mentioned yet), blown head gasket, a radiator water stream, clogged gas tank vent, burned-out candle on the Lucas altar, the MG badge in your spare-trim-parts box, etc.

You just never know until you check.

-Jim Muller

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: <Dave1massey@cs.com>

<jimmuller@rcn.com> writes:

> I am struck by how diverse the answers have been. (I've never seen a float valve stuck closed,

My TR8 suffered from that on occasion. And I don't use Grosse Jets. In fact, I doubt Grosse Jets will stick whereas the rubber tipped ones will. Grosse Jets have other issues, however.

-Dave

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> I am struck by how diverse the answers have been. (I've never seen a float valve stuck closed, ...

It seems to me to be much more common in the last few years than it used to be. Given all the other things I know they've done to our gasoline; I wonder if it isn't also "stickier" than before. The residue left behind when it evaporates certainly seems a lot harder than the 'varnish' we used to get.

> but then, I've never used Grosse Jets.)

I have now seen both Grose Jets and stock float valves stick closed. Since I couldn't get the Grose Jet apart to clean it, I threw it in the cornfield (which IMO is where they belong anyway). Even after cleaning, the stock valve apparently stuck again a few days later (although I didn't go back to verify that myself).

> split vacuum advance diaphragm (not mentioned yet)

Not likely to be the problem, IMO. I've driven a TR3A that way, and it just makes the engine kind of sluggish with poor fuel mileage.

> burned-out candle on the Lucas altar

Sounds most likely to me!

-Randall

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Kurtis J." <tr4driver@gmail.com>

<twakeman@razzolink.com> wrote:

> Don't get too hung up focusing in on just one cause. Electrical and fuel related problems do share many ...

Thanks for the tips/suggestions TeriAnn. I checked the items you suggested (among other things this evening).

-Kurtis

Subject: I'm stumped!
Date: Mon, 25 Jun 2007
From: "Kurtis J." <tr4driver@gmail.com>

> > burned-out candle on the Lucas altar
> Sounds most likely to me!

Who would have guessed? <grin>

Around 10:00 PM this evening, I decided to start tinkering with it again. When I turned the key, it initially started right up (which encouraged me), but immediately began to miss and stutter (and would not take throttle well).

So... I shut it down and checked the float bowls. Everything looked fine. I made sure the choke linkage was working properly and that the jets were returning. Then I tightened the mixture adjustment nuts all the way lean and backed them off about 10 flats a piece (I didn't count them going in, so I can't say where they were before, but last time I had set the mixture I did it with a Colortune kit). Then I re-checked all of the spark plug, distributor, coil connections, and replaced the rotor again (with an older one I had).

When I started it, it sounded good enough to take it for a test drive, which I did (in the rain without a top at 10:20 PM). It ran much better... no high rpm miss at all... just a little hesitation (perhaps it's a little lean?).

I'll take it for an extended test drive hopefully tomorrow evening. Thanks everyone for your responses!
-Kurtis

Ignition/Trouble Shooting

Subject: Missing at high revs TR4A
Date: Tue, 17 Jul 2007
From: Chris Buckley <chris.buckley51@yahoo.co.uk>

Hi List,

I know this kind of problem has been discussed at length before but as it wasn't one of mine I never took much notice. The engine seems to be fine up to around 3000 rpm after which I can feel the hesitation which remains or maybe gets worse the higher the revs.

I don't think it is shortage of fuel as it is too predictable so I assume it is connected with timing or an electrical problem. Does anyone on the list have some kind of check list to go through otherwise any ideas would be greatly appreciated? Thanks,

-Chris Buckley

Subject: Missing at high revs TR4A
Date: Tue, 17 Jul 2007
From: Cliff Hansen <cliff_hansen@earthlink.net>

Check the low tension wire from the coil to the distributor (tends to break at the push-on connectors), the wiring internal to the distributor (from this connector to the condenser), and replace the condenser.

-Cliff

Subject: Missing at high revs TR4A
Date: Tue, 17 Jul 2007
From: Don Spence <dkspence@telus.net>

Check the resistance on your high tension leads. Also the condenser.

Subject: Missing at high revs TR4A
Date: Sun, 22 Jul 2007
From: Chris Buckley <chris.buckley51@yahoo.co.uk>

Hi again listers,

Thanks for the feedback. I have checked the HT leads resistance and changed the condenser but still the 'misfire' seemingly now through the whole range of revs. When I got home I removed HT leads in turn and found that removing the lead from number 3 cylinder made the least difference to the idle. I then checked all plugs and found No 3 to be 'sooty' while all the others were clean burnt light grey colour.

Any ideas for further checks? TIA

-Chris Buckley

Subject: Missing at high revs TR4A
Date: Sun, 22 Jul 2007
From: Chris Kantarjiev <cak@dimebank.com>

> I then checked all plugs and found No 3 to be 'sooty' while all the others were clean burnt light grey colour.

Are you using the stock manifold with PCV valve intact? If so, then the #3 is where the oil blow by will be deposited, causing soot and eventually wet fouling.

You can, for a while, help the problem by running a hotter plug in #3, but you should be planning and saving up for rings.

-Chris

Subject: Missing at high revs TR4A
Date: Mon, 23 Jul 2007
From: Chris Buckley <chris.buckley51@yahoo.co.uk>

Chris Kantarjiev <cak@dimebank.com> wrote:

> I then checked all plugs and found No 3 to be 'sooty' while all the others were clean burnt light grey colour. ...

Hi List,

I am using stock manifold with PCV valve. The engine is not yet fully run in. I HOPE it doesn't need new rings already. If a new plug doesn't solve the problem, I will do a compression test.

-Chris Buckley

Subject: Missing at high revs TR4A
Date: Sat, 28 Jul 2007
From: Chris Buckley <chris.buckley51@yahoo.co.uk>

Hi Listers,

I have now changed the sooty plug and going for a test drive tomorrow. It was definitely sooty rather than oily. Regarding the PCV valve, I have installed a rocker feed kit as sold by Moss and was wondering if that could be the cause of a lot of oil being pushed through the valve and being dumped into cylinder no 3 causing it to make the plug sooty. All advice greatly appreciated, Thanks,

-Chris

> When I got home I removed HT leads in turn and found that removing the lead from number 3 cylinder made
> the least difference to the idle. I then checked all plugs and found No 3 to be 'sooty' while all the others were
> clean burnt light grey colour.

I would also check the soot on the plug--does it feel dry and fluffy, or oily? If the latter, it's time to do a compression check. If the former, the plug could be firing intermittently, or, there might be a slight vacuum leak at the manifold at that cylinder.

Subject: Missing at high revs TR4A
Date: Mon, 6 Aug 2007
From: Chris Buckley <chris.buckley51@yahoo.co.uk>

Hi Listers,

Still not much progress I am afraid. I have now checked the compression which is 100%. Now I am finding it seems to miss worse than before but improves greatly when I pull out the choke so seems it could be fuel after all. I disconnected the fuel line before the carbs and turned over the engine to find a strong flow from the fuel pump.

What next? TIA,

-Chris

Subject: Missing at high revs TR4A
Date: Mon, 6 Aug 2007
From: "Randall" <tr3driver@ca.rr.com>

> Now I am finding it seems to miss worse than before but improves greatly when I pull out the choke so ...

I would take that as an indication that it's time to disassemble and clean the carbs.

However, it might be worth hooking up a gauge to check fuel pressure at the carbs, when the problem occurs; as sometimes there can be intermittent problems with fuel delivery. Most vacuum test gauges will also read fuel

pressure, so just 'tee' the gauge into the line at the rear carb, lead the line out from under the bonnet, and trap the gauge under a wiper blade where you can see it while driving. If you can still see a minimum of 1 psi (2 is the spec as I recall), then fuel delivery is not the issue.

-Randall

Subject: Missing at high revs TR4A
From: "Lee&John Howard" <leejohn7@gmail.com>

Randall <tr3driver@ca.rr.com> wrote:

> I would take that as an indication that it's time to disassemble and clean the carbs.

>

> However, it might be worth hooking up a gauge to check fuel pressure at the carbs, when the problem ...

> -Randall

I'm sure you've done this, but my identical problem was finally corrected with a new fuel filter! This after months of doing everything else you can imagine.

-John Howard

Ignition/Trouble Shooting

Subject: Spark
Date: Sun, 28 Jan 2007
From: <MGruber921@aol.com>

I agree with Randall about just swapping out parts. From my own experience, when I say change the points, my normal troubleshooting starts with removing the distributor cap, turn ignition switch on, use a common screwdriver with 6" blade, stick it between the points and wiggle back and forth. If there is spark from the sides of the points, I isolate the screw driver to touch only one side of the points and see if spark does jump across. If not, clean or change points.

Kind of going to the heart of the problem first.

-Marv

Ignition/Trouble Shooting

Subject: TR-4A: The car won't start
Date: Thu, 18 Apr 2002
From: john donnelly <pdonnell@san.rr.com>

Hello John,

John wrote:

- > My 1966 TR-4A won't start. The car is in the midst of a rolling restoration and doesn't get much use. (a couple of hundred miles in four years.)
- > Any suggestions on how to approach this problem?

The best approach is to start at the beginning, and work from there. Remember that you need three things to make the engine go bang; spark, compression and fuel. Check in that order.

1. Check points. Probably best to replace if they got oily. Otherwise use brake cleaner to clean, then file contacts flat. If they got oily, then they're probably pitted. Set at .015".
2. Check wiring internal to distributor and to coil. Replace or tighten as needed.
3. Check condenser and wiring. Replace if any doubts.
4. What color are plugs? Should be tan/sand colored. Check gap. Should be .025-.027".
5. While you have the plugs out check the valve/rocker gap. (It's easier to turn the engine by hand with the plugs out). Should be .010" cold. Inspect for broken springs.
6. Meter the sparkplug wiring. Should be zero for solid core, or a few ohms for resistive.
7. Check the timing. Set at static zero to begin with, then advance using the distributor adjustment screw one mark.
8. Disconnect the white wire going to the "+" side of the coil, and check the compression. Should be within 10-20 lbs of each other. Any wild readings need to be rechecked. Squirting a teaspoon of motor oil into a cylinder will affect a reading if there is a ring problem, not valves.
9. Reconnect the white wire, and connect a timing light to #1, and try to start. Repeat on all cylinders. Light should flash on all cylinders. Flashing means you're getting spark. That's good.
10. Pull the tops of the carb reservoirs, check for fuel and "stuff" in the bowls. If you have a fuel pump with the lever pump a few times to see if there's flow. You can do the same by pressing the solenoid button. Make sure the ignition is off.
11. Check float height. Should be 3/32". Use a drill bit to measure.
12. Based on the plug color you might want to adjust the carbs leaner/richer (probably leaner) a few flats at a time. Or, if unsure, set the jets to the initial setting of "two turns" and try to start.
13. Open the choke wide open and try to start. This would indicate an air leak. Once you get it running use carb cleaner around carb throttle shafts and manifold to locate.

Hopefully you found the problem in one of the above steps.

-John

Subject: TR-4A: The car won't start

Date: Thru, 18 Apr 2002
From: "Bob Westerdale" <Bob.Westerdale@ametek.com>

John-

Pull out a plug, re-connect the plug's HV lead, lay the plug on the valve cover (or make a ground connection to the plug's body in other way), and have someone crank the engine, If you do not see a spark, it's probably your points.... Pop off the dizzy cap, observe the points- rotate the engine till they're closed. Pull off the coil's HT lead, stuff a short piece of wire (any type will do) into the HT socket, and bend the wire so it comes to within about 1/4" from the side of the head or valve cover. Using an insulated poker, flick the points "open" and observe the spark jumping from the temporary wire to the motor. No Spark? See if the coil has power on the + (Low Voltage) side, then see if there is the same voltage on the other side of the coil, with the points still closed. If it reads the same on both sides of the coil, either your points are fried or the little flexi-wire that connects the points to the dizzy's feed thru is broken. If you have spark in all the right places, but still none at the plug's gap, they may have broken down internally (Especially common in Champions) and you'll need a new set of NGK's or Bosch plugs.

-Bob Westerdale

Ignition/Trouble Shooting

Subject: TR4 cut out under power
Date: Wed, 30 Apr 2008
From: "Lee&John Howard" <leejohn7@gmail.com>

I was having a nice drive along a good curvey road last evening when the engine cut out. I was very fortunate to be able to coast into a pull-off. Tried what I could on spot, and then was AAA'd home. Put on a new rotor. This is negative ground car, so battery lead should tie to neg post on the coil, right? Coil is OK, judging by ohm test. I installed a new condenser, & checked the gap. No spark. What have I missed? It's most embarrassing. Your help greatly appreciated.

-John Howard

Subject: TR4 cut out under power
Date: Wed, 30 Apr 2008
From: "Randall" <tr3driver@ca.rr.com>

> This is negative ground car, so battery lead should tie to neg post on the coil, right?

Nope, the neg coil post should be grounded by the points on a negative ground car. But having it backwards won't keep the engine from running, just perhaps make it a little more difficult to start on cold mornings.

> Coil is OK, judging by ohm test. I installed new condenser, & checked the gap. No spark. What have I
> missed?

I would start by checking for spark directly at the coil, bypassing the ignition wires and cap. If you have someone to help, this can be done with a pair of screwdrivers, one to stick down inside the coil tower and the other to reach over towards the rocker cover.

If no spark at the coil, roll the engine until the points are closed, then check for 12v across the coil primary terminals. Then open the points and check for 0v.

If the points appear to be always open, check the flexible lead from the dizzy side terminal to the points, as it can sometimes break internally and not conduct even though it looks OK.

If the points appear to be shorted, then possibly you've pulled my old trick, of fixing the original problem and introducing a new one by installing the insulator wrong. The wires go on the post first, then the insulator goes on top.

There's also the chance that your 'new' condenser is actually bad.

-Randall

Subject: TR4 cut out under power
Date: Wed, 30 Apr 2008
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

"Randall" <tr3driver@ca.rr.com> wrote:

> If the points appear to be always open, check the flexible lead from the dizzy side terminal to the points, as it
> can sometimes break internally and not conduct even though it looks OK.

In addition to all that Randall mentioned, I would check the little lead from the coil to the dizzy... white w/ a black stripe if the wiring is original/correct. That wire leads a hard life and can fail at either connector. Without it you have a 2000 lbs semi-portable radio.

-Geo

Subject: TR4 cut out under power
Date: Wed, 30 Apr 2008
From: "Lee&John Howard" <leejohn7@gmail.com>

<ahwahnee@cybertrails.com> wrote:

> In addition to all that Randall mentioned, I would check the little lead from the coil to the dizzy... white w/ a
> black stripe if the wiring is original/correct. That wire leads a hard life and can fail at either connector.
> Without it you have a 2000 lbs semi-portable radio.

>-Geo

>

> ----- Original Message -----

> From: "Randall" <tr3driver@ca.rr.com>

>> If the points appear to be always open, check the flexible lead from the dizzy side terminal to the points, as
>> it can sometimes break internally and not conduct even though it looks OK.

Thank you all. I'll get back on it tomorrow and let you know. So far I don't think I've done or misdono any of your collective moves.

-John

Subject: TR4 cut out under power
Date: Thu, 1 May 2008
From: "Lee&John Howard" <leejohn7@gmail.com>

Well, it turns out the coil WAS bad, as well as, I think, the low tension terminal wire. It had lost insulation so must have been shorting out to the case. I wrapped it in tape and we got spark. So I don't know what came first, the coil or the wire, but I imagine I messed up the wire when screwing around under the dist cap. This is almost enough to send me to electronic ignition! At least I will add an spare points assembly in my boot bag.

Again, thanks for all your help. Keep your AAA paid up!

-John

Ignition/Trouble Shooting

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: "Ed Purcell" <epurcell05@comcast.net>

Hi Listers,

I have a late TR4 with a fairly new Pertronix distributor. It ran fine for a while after installation. I attempted to adjust the ZS 175's due to a rough idle with poor results. I then resealed the jets and backed off three turns per the manual. The car now revs fine in neutral. On the road it cuts out. The higher the gear, the lower RPM the miss begins. Hence the greater the load, then poorer the performance. All ideas appreciated. Thanks,

-Ed Purcell

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: Peter C <peter@nosimport.com>

Ed, that is a typical sign of a high tension ignition breakdown. Suspect ignition rotor cracked, cap has cracks, coil wire loose.

-Peter C

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: Bob Labuz <yellowtr@adelphia.net>

Ed,
I agree with Peter.

In addition to the coil, take a look at that little wire inside the distributor that goes from the coil to the points.

Mine failed on the 3 a few years back. When under load the advance kicks in and was stretching the wire out of its connector.

Replaced the wire and no more cut out under load.

-Bob

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: "Ed Purcell" <epurcell05@comcast.net>

----- Original Message -----

Subject: TR4 Cutting Out Under Load
Sent: Wednesday, June 13, 2007
From: "Peter C" <peter@nosimport.com>

> Ed, that is a typical sign of a high tension ignition breakdown. Suspect ignition rotor cracked, cap has cracks,
> coil wire loose.
> -Peter C

Thanks Peter and Bob, and for anyone else pondering this, I just put the old points distributor back in and the symptoms did not change. They say the carbs are usually not the problem, but it sure looks like mine are messed up. To reiterate, I have excellent idle and operation at low RPM. Cutting out starts @ about 2K under load. I can nurse it up to about 3K max. Also cuts out worse up hill. Thanks again.

-Ed Purcell

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: <jimmuller@rcn.com>

Ed Purcell wrote:

> They say the carbs are usually not the problem, but it sure looks like mine are messed up. To reiterate, I
> have excellent idle and operation at low RPM. Cutting out starts @ about 2K under load. I can nurse it up to
> about 3K max. Also cuts out worse up hill. Thanks again.

Sorry, I don't recall the details of the original post.

Did you not recently install an electronic dizzy? One way that might screw up your carbs is if a vacuum line got neglected and is now sucking air. Perhaps you richened them at idle to make it run okay? At speed that air leak would become less significant so that it would be too rich.

Here's another idea. Your tale sounds vaguely similar to my experience with the SUs a PO put on my GT6.

I could dial in the idle mixture okay, but at speed it had two features. When cruising it would miss, especially after it had warmed up, seeming to be too lean; under full throttle it ran like a racehorse.

Playing with the idle mixture didn't really help. Eventually I figured out that both the springs and the needles were wrong. The PO had used late-model MGB carbs. The needles were too thick so it was too lean for cruising. At full throttle the pistons would hit maximum excursion too soon, resulting in a venturi that couldn't open any further, which richens the mixture at higher flow rates.

If your carbs haven't been touched then this isn't your problem. But perhaps you've had a piston spring break? Or a diaphragm split?

-Jim Muller

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: "Ed Purcell" <epurcell05@comcast.net>

Jim,
There are similarities. I recently installed a Pertronix distributor. It ran well for a couple hundred miles. I attempted to adjust the mixture due to rough idle. Things went from bad to worse, so I then readjusted idle, sync, and mixture back to three turns below bottom of piston. I now have the symptoms listed in my last post. I put the old distributor (with wires) back in with no change. I do not use vacuum advance. I will try the coil next and then I suppose a full rebuild on the carbs. Can't do it for a while tho. Too many balls in the air. If I ever find the gremlin I will advise the list.

-Ed Purcell

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> To reintegrate, I have excellent idle and operation at low RPM. Cutting out starts @ about 2K under load. I
> can nurse it up to about 3K max. Also cuts out worse up hill.

If it won't do more than 3K rpm even with no load, but will do 2K under load; then I'd say the problem almost has to be ignition. Takes a lot more fuel to pull a load than just rev the engine up; but ignition requirements go up quickly with just rpm (and also with load).

Might be worth swapping out the ignition coil, just to see what happens. Your local auto parts store should have

a general purpose coil & ballast resistor that will do for a test (or permanently if you're not worried about appearance).

-Randall

Subject: TR4 Cutting Out Under Load
Date: Wed, 13 Jun 2007
From: "Skip Gurnee" <skip47@powernet.net>

I agree with Randall. Ignition is more likely the culprit from the symptoms described, and the coil is a possible offender. Coils don't like heat or vibration, and so Triumph put them right where they'd get as much as possible, on the engine itself (maybe the tractor heritage). If you aren't concerned about pure originality, relocate it to the inner fender well.

I did that with all my TR's, and never had a coil failure since. Best,
-Skip Gurnee

Ignition/Trouble Shooting

Subject: TR4 distributor problem
Date: Thu, 15 Jun 2006
From: Steven Newell <steven@newellboys.com>

I've been chasing a missing/stuttering problem in my TR4 that was getting worse over a couple weeks. I suspected the Pertronix Ignitor and on removing it to reinstall points I found the distributor innards looked a bit rusty -- as if I hadn't oiled it anytime recently. Thinking it would be a clever shortcut, I switched the entire distributor with the one in my running project car. Now I can't get my driver to fire with the replacement distributor.

I think I must have a wire in the wrong place. I'm not especially clever about electrical things, but I can use a digital camera so here's a photo of the distributor now in the car. Anyone spot something wrong?

<<http://newellboys.com/parts/dist-small.jpg>>

A CLUE? The ammeter reads slight discharge with I turn the key to 'run.' When I turn the key to 'start' the engine cranks quickly AND the ammeter swings to full discharge the back to with every engine rotation. And no firing at all. The post on the points where the condensor wire connects becomes very hot. Idea?

-Steven Newell

Subject: TR4 distributor problem
Date: Thu, 15 Jun 2006
From: "Randy&Val DeRuiter" <deruiterville@hotmail.com>

Steven-

Did you by chance install the points on the replacement distributor? You may have a problem with the installation. There is a small plastic piece that isolates the points from permanently grounding. I had this trouble briefly before, and its been discussed here before as well - here is a snippet from 2001:

>Your problem sounds like the points aren't working properly for some reason. You can check by manually
> opening the points and looking for spark. Remove the cap and rotate the engine until the points are definitely
> closed. Remove the coil wire from the distributor and locate it about 1/4 inch from a grounded surface. Turn
> on the ignition, then manually open the points with a screwdriver. You should see a spark if everything is
> working ok (then your problem could be the cap or rotor or wires). If not, and some voltage is present on the
> primary side of the coil, look for the possibility that the points are permanently grounded. The coil side of the
> points should be isolated from ground - there should be a plastic grommet right underneath the wire lug where
> the wire attaches to the points. If you have an ohmmeter, you can test the points operation by disconnecting the
> wire from the points at the coil and attaching one side of the ohmmeter to this wire and the other side to ground.
> As you open and close the points, you will see the ohmmeter go from zero resistance to infinity.
> -John Lumia - 76 TR6

Not an expert either, just a "btdt" guess.

-Randy

Subject: TR4 distributor problem
Date: Thu, 15 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I think I must have a wire in the wrong place. I'm not especially clever about electrical things, but I can use a
> digital camera so here's a photo of the distributor now in the car. Anyone spot something wrong?

> <<http://newellboys.com/parts/dist-small.jpg>>

I think you've got the point post assembled wrong ... there should be an insulator on top of the wire terminals, and not between the terminals and the points spring. The terminals have to contact the spring, but not the post/nut.

It also looks like you have the distributor connected to the same terminal of the coil as the wire from the ignition switch ... they should be on opposite terminals. Although not entirely in the photo, it looks like a wire has been added from one coil post to ground, this is simply wrong and should be removed/discarded.

Last, in the photo it looks like the point rubbing block is near the peak of the cam, but I don't see any gap between the points. Might just be the angle, but I would double-check the point gap once you've fixed the other things.

Of course, all of this should have shown up when you checked the static timing ... Might be worth doing this time, eh?

Don't forget the rotor when you put it back together.

-Randall

Subject: TR4 distributor problem (solved)
Date: Fri, 16 Jun 2006
From: Steven Newell <steven@newellboys.com>

Kurtis wrote:

> Yeah, the rotor's missing! :) Seriously... did you remember to replace the rotor? BTDT. You had the project
> car running fine with this distributor, didn't you?

What kind of idiot would forget to... oh, sorry. ;>)

Nah, it was my failure to check *any* reference for the correct wiring of the distributor with points that got me. I lazily guessed the wiring with points would be like the wiring with the Ignitor, so I reconnected the ground wire and connected the low tension lead and the ignition wire to the other post. Sometime after I sent my note to the list, I thought to look at a photo of a TR4 engine where I could see how the wires actually connect. About the same time, several folks on the list (Randall, Randy, Mark) noticed the wiring gaff and even suggested improvements to the points install.

The car started right up and ran smoothly without stalling. I then set the timing using the static method -- which I'd been unable to do while I had the Ignitor installed.

-Steven Newell

Subject: TR4 missing problem (Ignitor followup)
Date: Fri, 16 Jun 2006
From: Steven Newell <steven@newellboys.com>

I'd been having trouble with random missing and power loss over the last few weeks. The problem progressed from a stumble once or twice on every trip to the grocery until the car was staggering over the hill to the neighborhood swimming pool.

I checked the fuel system, battery, and several wires/connectors and confirmed the problem was still there. Then I looked into the distributor. I pulled the distributor AND the Pertronix Ignitor together. I replaced it with a points-equipped distributor from my TR4 project car -- it won't be needing it for a while. After listerati helped sort my wiring, it started quickly and ran happily.

So the stumbling and power problem was either the distributor or the Ignitor -- sorry I can't say which. It looks like I'd been remiss in oiling the distributor as it had some light rust in the guts, but the failure was also consistent with the Ignitor failures others have experienced. I should emphasize that the Ignitor was reliable and maintenance free for 45,000 miles and six years, so I'm not bashing the unit's performance.

-Steven Newell

Ignition/Trouble Shooting

Subject: TR6 starts but won't run
Date: Sun, 1 Jul 2007
From: "jim hearn" <jimhearn1@comcast.net>

I just picked up a '74 TR6. I got a good deal but was unable to learn anything about what I had especially motor wise (got it from the son of the owner). It has 125 to 130 lbs in all six cylinders. The points look good and are gapped correctly. It starts up (not real easily), sounds good, but it won't continue running more than a second or two. I have a see through fuel filter and can see plenty of gas ready to go into the carbs. I am almost sure it is spark that it is losing.

If I want to run a jumper from the battery directly to the coil to rule out the key switch and wiring, does it go to the positive side of the coil I do suspect the coil so it will probably get changed if the key switch test shows nothing. Any ideas are greatly appreciated.

- Jim

Subject: TR6 starts but won't run
Date: Sun, 1 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> I have a see through fuel filter and can see plenty of gas ready to go into the carbs.

Doesn't necessarily follow, Jim. Even a full filter doesn't mean there is pressure to the carbs.

> If I want to run a jumper from the battery directly to the coil to rule out the key switch and wiring, does it go
> to the positive side of the coil

Yes. Keep in mind you are also shorting out the ballast resistor, so don't run it too long that way.
-Randall

Subject: TR6 starts but won't run
Date: Mon, 2 Jul 2007
From: <Dave1massey@cs.com>

Almost sounds like the ballast wire in the harness (the one that powers the coil when the engine is running) is broken. The easy way to check that is with a volt meter. With the key in the RUN position there should be either 6 volts or 12 volts (depending on whether the points are open or closed). If it is zero the wire is likely broken.

The reason it starts is because of the ballast bypass that is engaged during starting. When the starter is energized 12 volts is applied to the coil allowing the engine to start but as soon as the starter is switched off the power to the coil is via the ballast wire. If this wire is broken the car will start and immediately die when the key is released.

Another possibility is the wrong starter or a mis-wiring of the starter. The ballast bypass wire connection at the starter must go to a special contact on the starter. If it is connected to the W/R wire the solenoid coil will effectively shunt the coil power to ground and you will have the same symptoms even though the ballast wire is in fact intact.

-Dave

Subject: TR6 starts but won't run
Date: Mon, 2 Jul 2007
From: <Chip19474@aol.com>

<jimhearn1@comcast.net> writes:

> but it won't continue running more than a second or two.

> -Jim,

After it quits, pull the first plug wire, crank the engine and check for spark.....it'll probably be there but it's a quick check to rule out ignition problems. Despite the full fuel filter, the filter may actually be clogged and restricting flow. They are cheap and you should replace it anyway given the inactivity of the car. If that doesn't help, drop the carb bowls and check the carb float valves to be sure they are working okay.....the valves may be gummed up and not opening far enough or quickly enough to feed fuel after the car starts.

-Chip Krout

Instruments/Amp Gauge

Subject: Ammeters and Voltmeters
Date: Sat, 08 Nov 2008
From: "Tom Note" <tom628@verizon.net>

In view of all the recent discussions on these meters, I was wondering if it's difficult, or requires a lot of electrical expertise to convert from a voltmeter (as in a TR6) to an ammeter?

-Tom

Subject: Ammeters and Voltmeters
Date: Fri, 7 Nov 2008
From: "Randall" <tr3driver@ca.rr.com>

> In view of all the recent discussions on these meters, I was wondering if it's difficult, or requires a lot of
> Electrical expertise to convert from a voltmeter (as in a TR6) to an ammeter?

It's not trivial, but not terribly difficult either. Basically you have to divide the electrical system into the battery and starter on one side (plus perhaps the horns and the sense wire to the alternator), and everything else on the other side; then connect the ammeter between them.

Assuming this is a 73 or later TR6 (earlier cars had ammeters), you can just remove 3 of the 4 brown wires that go to the tie point in the battery cable; join them together somehow, perhaps with one of these:

<<http://www.madelectrical.com/catalog/cn-1.shtml>>

& then run a pair of heavy wires (10 AWG will do, but I'd use 8) from the old tie point and the new tie point to the ammeter.

-Randall

Subject: Ammeters and Voltmeters
Date: Sat, 08 Nov 2008
From: "Tom Note" <tom628@verizon.net>

Thanks Randall, for the tutorial and the connector web site.

-Tom

Subject: Ammeters and Voltmeters
Date: Sat, 8 Nov 2008 08:08:47 -0500
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Mad Electrical <<http://www.madelectrical.com>> that Randall links to is a "must have" bookmark for all automotive things electrical e.g. on their site is a tab called Electrical Tech. Behind it you'll find a great tutorial on the various Delco alternators that we use as an upgrade as well as things like: Brighter Headlights, 1-wire vs 3-wire alternators etc. Dan Masters turned me on to this site many years ago.

-Bob Danielson

Instruments/Amp Gauge

Subject: Dash wiring Amp gauge
Date: Sat, 10 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> Guess I'll take my best shot, and figure it out if things go hay wire.

Wiring the ammeter backwards just causes it to read backwards. No big deal, and easy to fix. Or, you could do a quick test with a flashlight battery. Momentarily connect the battery across the ammeter, noting which terminal is positive, and which way the needle deflects. If the needle reads charge, then the terminal corresponding to the ground polarity gets the brown wire.

> What's hay got to do with wire anyway?

Long ago, hay bales were bound with low grade steel wire. When cut to release the hay, the wires fly all around and curl up into a mess. I'm not sure that's the origin of the word/phrase "haywire", but it seems likely to me.

The use of wire declined after machines that could automatically tie twine were invented, and it was discovered that the cows were eating bits of wire that injured them.

-Randall

Instruments/Amp Gauge

Subject: I give up
Date: Fri, 7 Nov 2008
From: <jimmuller@rcn.com>

David Lylis wrote:

> With nothing left to lose, I took the gauge apart and sprayed the inside with carb cleaner and blew it dry. It is
> working again.

An ammeter is a strange sort of beast. In fact, there is only one kind of meter, a galvanometer, and it responds to current. It is usually built to have as low a resistance as possible, and to expect very low current. A voltmeter is made by putting a known high resistance in series with the galvanometer, and calibrating the markings such that a given voltage produces some particular small current that produces a given deflection on the meter. End of story, more or less. The resistance is chosen to be high so that very little current is carried, thus not burning out the meter and also so that it draws no significant extra current on the circuit it is measuring.

An ammeter is a step more complicated. It must carry all the current of the circuit being measured, but it must do so without adding significant resistance so as not to cause a voltage drop. But it can't be just a pure conductor because that would mean there is nothing for a galvanometer to detect. So it needs a voltage drop, but a very tiny one. To that end, it places a known, very low but non-zero resistance wire in series with the circuit. All current going into one side of the meter must pass through that wire to get out the other side. The resistance of that wire produces a small voltage drop from one end of the wire to the other. A voltmeter, i.e. a galvanometer in series with a large resistor, is placed in parallel with that low-resistance wire so as to measure that voltage drop.

The point of all this description is that an ammeter could fail in two ways. If one of the terminals was broken or making a poor connection, or if the low-resistance wire was broken, it would look like an open circuit and pass no current at all. With this failure mode nothing in that part of the wiring would work at all because no current would get through.

The other failure mode is that it carries current just fine but doesn't seem to measure anything. This could be because something, perhaps water, is providing a short between the main terminals. It wouldn't do much for the overall conductivity of the meter (which must be as high as possible, but still have some known small resistance), but it might be enough to make the internal galvanometer have no voltage drop to detect. However the same failure mode could be caused by a broken wire within the voltmeter section, i.e. within the galvanometer or its associated series resistor. Or instead of a broken wire it could just be a poor connection in the voltmeter section. Just the act of taking it apart and re-assembling it could fix a problem like this.

-Jim Muller

Subject: I give up
Date: Fri, 7 Nov 2008
From: "Randall" <tr3driver@ca.rr.com>

> But it can't be just a pure conductor because that would mean there is nothing for a galvanometer to detect.

Sorry, Jim, but I disagree.

Current flowing through a wire always generates a (weak) magnetic field around the wire. The ammeter used on TR2-early TR6 is not a galvanometer at all, but instead a "moving vane" movement that responds to that magnetic field directly. Hence it requires no voltage drop and in fact would still work even if the segment of wire inside the instrument could be made a superconductor with no voltage drop.

And it will still indicate (some) with a direct short between the terminals. In fact, that is exactly what I have on my TR3A, so that the 60 amp alternator does not peg the 30 amp ammeter. By choosing the short (3 strands of wire stretched terminal to terminal), it acts as a current divider with the section of wire inside the meter,

resulting in only approximately 1/2 the current flowing through it. Thus it reads 30 when the actual system current is 60.

-Randall

Subject: I give up
Date: Fri, 7 Nov 2008
From: <jimmuller@rcn.com>

Randall wrote:
> Sorry, Jim, but I disagree.

Excellent! (I figured that would happen. :-)

Well, in truth I thought about that sort of meter, but wasn't sure if Smiths had made them that way or not. I've never had occasion to take an automotive ammeter apart. So I took a leap and described how a traditional current-detection circuit would be designed. I would think that sort of meter less consistent across manufacturing samples, but maybe that's the whole point, it doesn't have to be all that accurate. And of course, AC is different too.

-Jim M

Subject: I give up
Date: Fri, 7 Nov 2008
From: <DLylis@aol.com>

My ammeter has an oval loop of (maybe) 10 gauge solid wire connected to two posts that then go to spade connectors in the back. Above that is a little "butterfly" of very thin steel that rotates on a pin to which is attached the indicator needle. Quite obviously by some process that is beyond my knowledge, as current flows through the heavy wire a magnetic field is set up that varies based upon the load being greater or less than the supply. Therefore the little butterfly wings are attracted (or repelled?) by one end of the oval loop or the other making the needle indicate + or - on the gauge. How am I doing?

I think that there was probably a film of crap on the oval loop and the butterfly that interrupted the working of the gauge. The last time I "fixed" it, it then worked for a day. As I said before, stay tuned.

-David Lylis

Subject: I give up
Date: Fri, 7 Nov 2008
From: <DLylis@aol.com>

For get about it! It isn't working again. I am going to NAPA and buy one so I have a temporary until I can find another Lucas.

-David Lylis

Subject: I give up
Date: Fri, 7 Nov 2008
From: "Randall" <tr3driver@ca.rr.com>

> I would think that sort of meter less consistent across manufacturing samples, but maybe that's the whole
> point, it doesn't have to be all that accurate.

Exactly, it's hard to notice even a 10% error (3 amps out of 30).

But now that I think about it, they could be calibrated by bending the wire loop a bit closer or farther away from the vane movement. Seems unlikely they would bother, but maybe ...

-Randall

Subject: I give up
Date: Fri, 7 Nov 2008
From: Denman Mike <mikedenman@sbcglobal.net>

Couldn't the wire be nothing more than a shunt. A shunt, for those not familiar with the term as used electrically, is used to reduce the amperage through the gage. For example, I have a 65 amp alternator on my Marcos and a 30 amp ammeter gage. By using a shunt, I am still able to use the 30 amp ammeter. The gage needle (with the shunt installed) moves less, of course, with a given change in discharge/charge.

-Mike Denman

Subject: I give up
Date: Sat, 08 Nov 2008
From: "Jim Muller" <jimmuller@rcn.com>

Denman Mike wrote:

> Couldn't the wire be nothing more than a shunt? A shunt, for those not familiar with the term as used
> Electrically, it's used to reduce the amperage through the gage.

Well, yes. That's exactly what I described the first time, a large wire that carries most of the current, with a much lower current bypassing the shunt and going through whatever sort of gauge is desired. Another term would be voltage divider, an array of resistors to pre-determine how much current goes through which path and thus what voltage each will see. The difference as you describe it is that the shunt would be to reduce a current or voltage by some moderate fraction, in your case 1/2, which is to say to split current across two different paths by 50/50. With a conventional current-detect circuit it might be to divide currents by 99% and 1%.

-Jim Muller

Instruments/Amp Gauge

Subject: Parts I used for Alternator conversion on my TR4 (shunt)
Date: Sat, 06 Feb 2010
From: Gary O'Hagan <goh62agan@verizon.net>

Randall wrote:

> Since I didn't like having the ammeter hit the peg on cold starts, I added a shunt across the back of it to take
> roughly 1/2 the current (so it read +30 when the real current was +60). This setup was still working quite
> well for me when the car got wrecked in 2005.
-Randall

OK, Randall's mentioned this a couple of times.

- 1) What gauge wire for the shunt?
 - 2) Just put single female /double male adapter on the terminals and add the shunt?
- Gary O

Subject: Parts I used for Alternator conversion on my TR4
Date: Sat, 6 Feb 2010
From: "Randall" <tr3driver@ca.rr.com>

> OK, Randall's mentioned this a couple of times.
> 1) What is the gauge wire for the shunt?

16 AWG seemed to work fine for me. But you missed the more important question.

> How long should it be?

The answer varies by ammeter, on my early TR3A, I found that 3.5 inches was about right. Brian Kemp measured a TR6 ammeter and found that it would need 8 inches of 16 AWG.

The point is that every ammeter has some internal resistance (although it is too low to measure with most ohmmeters), and the shunt needs to have nearly the same resistance (for a 50% shunt of course). My TR3A ammeter was about 1.2 milliohms, Brian's TR6 was 2.7 milliohms. 16 AWG is about 4 milliohms per foot.

One way to determine this is to use the headlights as a fixed load, and adjust the length of the shunt until the ammeter reads 1/2 what it does without the shunt.

> 2) Just put single female /double male adapter on the terminals and add the shunt?

It should be adequate, although I might be tempted to do something a bit more permanent. Here's a shot of mine, taken as I was disassembling TS39781LO:
<<http://tinyurl.com/ybvtl48>>

> 3) Easy as pie?

Came out a whole lot better than the last pie I tried to bake!
-Randall

Instruments\Amp Gauge

Subject: Smiths voltmeter lessons learned (long, condensed version)
Date: Mon, 22 Jan 2007
From: "Randall" <tr3driver@ca.rr.com>

Testing has revealed that the voltmeter in my 'new' 71 Stag reads almost a full volt high, while the spare voltmeter from E-Bay reads over a full volt low. Probably the voltmeter in my other Stag reads low as well, but I didn't test it (yet).

When I tried to calibrate the original voltmeter, I discovered that just touching the adjustment would make radical changes in the reading ... subsequent disassembly confirmed that there was no friction left to hold the adjustment in place (which is very likely why it was so badly off to begin with).

However, after reassembling [Note that I do NOT recommend dis/assembling the unit, as some damage is inevitable], I found that a dab of clear fingernail polish would hold the adjustment; and I was able to properly calibrate the unit while the polish was still soft. A screwdriver in the slot is a very unsatisfactory tool ... I wound up turning a tool to suit. But, if you started with a flat screwdriver that will just fit into the round window, and grind away the last 1/16" or so leaving a nub on one side (to engage the slot), that would probably work OK.

Apply 11 volts to the gauge, and wait a minute for it to settle. Then tweak the slot behind the "11", so the needle covers the mark. The slots move more or less side to side, they don't really turn (which is why a plain screwdriver works so poorly).

Then apply 15 volts, wait again for it to settle, and adjust the other slot until the needle is right over the 15 mark. The adjustments do interact to some extent, so repeat as necessary (but mine was close enough after one round). I used more fingernail polish to hold each adjustment in place.

If you do disassemble the unit (again, I'm not recommending this, just reporting what I found), the order on the posts in back is: Thin nylon washer with a single notch, which locates over a nub in the case. Thick phenolic washer with 4 notches, one of which locates over the same nub in the case. Brass terminal, with a nub located into the phenolic washer so the terminal points upward. Split lock washer. Slotted nut.

One other item: prices vary widely on clear fingernail polish at the local supermarket. First bottle I found was \$6 ... eventually I found one way down on the bottom for only \$2.50. (Tedious but unavoidable disclaimer follows)

-Randall

Instruments/Amp Gauge

Subject: TR3A ammeter
Date: Wed, 29 Oct 2008
From: "Randall" <tr3driver@ca.rr.com>

<DLylis@aol.com> wrote:

> My ammeter is not working. After installing the interior I could not bring myself to crawl back under the dash
> for a few more days. I tagged all wires as it came out and am reasonably certain that all is connected as it
> should be. Is there a ground I have missed? The gauge is grounded to the dash, is it not?

No. The ammeter does not need a ground. I've also never seen one fail, so I would suggest you have a mistake somewhere else that is routing current around the ammeter. A test here would be to disconnect the ammeter and see if the headlights (or anything but the horns) still work. If so, there is a wiring error.

> BTW my fuel gauge is not working either. See earlier post about running out of gas.

The fuel gauge (on a TR3) does require a ground. Have you tried making sure it's adequately grounded?
-Randall

Subject: TR3A ammeter
Date: Wed, 29 Oct 2008
From: "Randall" <tr3driver@ca.rr.com>

> After installing the interior I could not bring myself to crawl back under the dash for a few more days.

BTW, David, it's not that difficult to feel behind the dash and undo the nut that holds the ammeter in place.

Disconnect the battery first, then undo and remove the nut, lock washer and bracket. Then you can pull the ammeter forward with the wires still attached. If you are brave, you can even leave it hanging on the wires (making absolutely certain the terminals cannot touch the metal of the panel), while you reconnect the battery and make whatever tests you need. Some tape on the edge of the hole might be a good idea.

Much easier IMO than trying to lie underneath and see what's going on, especially with the heater installed.

Re-installation is a bit trickier, but still possible. But don't forget to disconnect the battery ground strap while you do it.
-Randall

Instruments/Amp Gauge

Subject: Voltage vs. Amp metering
Date: Fri, 20 Oct 2006
From: TeriAnn Wakeman <twakeman@razzolink.com>

Randall wrote:

>> All kidding aside and someone please correct me if I am wrong, but isn't the volt gauge designed to measure
>> the condition of the battery?
>
> Nope. Depending on the failure mode, the voltmeter will look just fine when the battery is junk.

I agree completely. The volt meter tells you if your charging system is producing enough voltage to run the electrics and keep the battery topped off, not if the battery itself is dead or dying. Both gauges have their strengths but if I only have a hole for a single gauge to monitor the electrical system, my personal preference is for one that tells me if the charging system is functioning correctly and producing enough voltage to keep up with the load. Randall seems to prefer monitoring the battery. It's a matter of individual preferences.

>> Whereas, the ammeter will indicate charging capability of the charging system, shorts, major power drains
>> from a particular electrical sources (on our cars like when activating aux lights, air horns, electrical brakes
>> from the 24' double wide you are towing, etc.), and the capacity to maintain adequate battery charging.

A volt meter will tell you these things as well. IF the load is larger than the charging system can handle, the voltage will decrease. So any decrease or fluctuation indicates a load that exceeds the charging system capabilities to handle. A volt meter reading 14V or slightly higher indicates that the charging system is working fine and is capable of handling the load plus keep the battery fully charged. If the voltage goes up there is a problem with the voltage regulating system. If the voltage goes down then you are drawing more current than your charging system can handle. An ammeter at zero tells you that the charging circuit is handling the electrical load but it doesn't tell you if it is maxed out and can not generate enough voltage to keep the battery fully topped up. You need a charging system that produces a higher voltage than your battery produces to fully top up a battery and to get maximum service life out of it.

It is hard to see a one or two amp discharge in a 30 amp meter. It is quite possible to be drawing just a tad more than your charging system can handle and slowly discharge your battery over a long drive. Most people don't run head lamps, heater and wiper motors at the same time on a long drive in their TRs so don't over tax their generator long enough to drain the battery. I had that happen in the Land Rover once. I drove all day in a cold storm with everything on. The ammeter said everything was fine but there was not enough juice left to start the Land Rover the next morning. A volt meter would have alerted me that the charging system was not keeping up with the load by indicating a lower voltage level.

> It will also tell you when you've left the lights on, whether the brake lights work, ...

A volt meter will not show that. Also the ammeter reacts to changes much faster than a car volt meter does (Lucas & Smiths volt meters have very slow movements). An amp meter will catch a momentary short if your eyes are on the meter at that instant. A car voltmeter can not react that quickly.

> and when the engine idle rpm is too low to keep up with the electrical load.

A volt meter is very good doing the same, plus if the load is too much for the charging circuit to handle and produce the 14.X volts needed to keep a battery fully charged.

> BTW, that car had a voltmeter, that said everything was hunky-dory. But I could tell the engine was cranking
> slower than normal, even after driving 1/2 hour with the voltmeter reading 14.4.

A volt meter will not measure the battery's condition, just the condition of the charging system and warn you if the electrical load is exceeding the capabilities of the charging system. Once the engine is running you could unplug the battery and the volt meter would not notice unless the charging system did.

Different people prefer to monitor different things. I prefer to monitor the charging system and load on the charging circuit. Randall seems to prefer to monitor the battery and the load on the battery, and as a bonus he can glance at his ammeter as a reminder to turn the headlamps off.

-TeriAnn

Instruments/Dash

Subject: Dash Replacement
Date: Mon, 14 Jul 2003
From: Dave Massey <105671.471@compuserve.com>

"Richard Crabbe" wrote:

>Thanks for the spelling lesson all - now for the original question - Does anyone have some CONSTRUCTIVE
> ideas about the dash?

Sure. Most wires are long enough to reach out through the hole for the corresponding gauge. Run the wires and feed the appropriate wires through the opening for each gauge and then make your connections and mount the gauge in turn. For those that don't reach, you can make the wiring connections from underneath the dash (if the radio is out you can reach the dimmer and the two lower gauges more easily. If the glove box is out you can reach the Ammeter and the other gauge on the far right more easily.

Make the oil pressure gauge connection via the ash tray opening. Connect the left hand (center cluster) gauges before installing the tach.

-Dave Massey

Subject: Dash replacement
Date: Tue, 15 Jul 2003
From: Bob Bownes <bownes@seiri.com>

Lumia, John wrote:

> Richard, I did this, 3 years ago and I think that the 4 small gauges attach to the wooden dash first along with
> the dimmer and idiot lights, then you hook them up. Then you offer up the dash to the car. Finally you put the
> speedo and tach gauges, wiper switch and light switch in last.
> - John

As stated, I put in the small gauges then placed the dash roughly in place (having a 2nd set of hands to hold up the passenger side helps, as does having removed the center console support) Then connect up the small gauges, and proceed as described OR do what I did, and reach in behind the dash through the openings for the larger gauges and up from underneath.

One additional trick is to leave the ash tray out to be able to get in behind that...

-Bob

Instruments/Dash

Subject: TR2-6 Gauge gaskets Instruments: Dash Gauges
Date: Wed, 9 Jan 2002
From: "Patrick Bitton" <pbitton@axess.com>

-----Original Message-----

Subject: TR2->6 Gauge gaskets
From: <owner-triumphs@autox.team.net>
Sent: January 9, 2002

I know we've been through this but where can I get both the gauge to dash and glass to gauge gaskets for my 73 TR. I'm about to replace the front harness and I figure this is as good a time as any to take care of the details. Thank you.
-Deano

Dean,

I went to Home Depot and bought O-Rings that fit like a glove. Much cheaper than the big 3 and they work like a charm. Bring your gauge to check if it fits. For the bigger gauges you can use aquarium filter O-Rings.

-Patrick

Subject: Gauge repair
Date: Sat, 29 Mar 2003
From: Scott Suhring <suhringtr36@comcast.net>

Here is a tech tip that I recently wrote for our club newsletter (when you're the editor, you tend to write a lot of articles) on this exact subject:

Anyone who has disassembled their dash gauges can appreciate the frustration of first trying to remove the chrome ring that holds the glass secure to the gauge and then finding the dried up remains of the rubber gasket (if that is what this material ever was). Well, certainly one of the parts distributors must have these, but when you look in their catalog or check the parts manual, low and behold they are not listed. The reason for this is that the gaskets came as part of the gauge, which was produced by Smiths/Jaeger. So what do you do?

I have tried various materials and have talked to others that have used everything from windshield glazing to using the gaskets that are available to seal the gauge to the dash, none of which provide the proper seal for the chrome rings. The solution I have devised is to make my own gaskets. To do this, you will need the following materials:

1. Permatex "The Right Stuff" gasket maker (part #29208)
2. Universal Pump Dispenser (this is a plastic syringe found in the glue section of your local hardware store)
3. An Exacto knife or any arts and crafts sharp cutting blade
4. Q-Tips
5. Pam cooking spray
6. Small screwdriver or dental pick

The Permatex gasket maker is a silicon-based material that cures to a flexible rubbery composition that is easy to work with and makes a great gasket. Here is what you do to make your gasket:

1. Clean out the inside of the gauge cover ring of any of the remains of the old gasket.

2. Cut off the tip of the syringe to the size opening that allows enough material to by, pushed out to the thickness of the gasket you need to make.
3. Depending on the number of gasket you will be making, fill the syringe with the Permatex.
4. Spray the tip of the Q-tip with the Pam and wipe this on the inside of the ring, but do not saturate the surface.
5. Take the syringe and evenly apply the Permatex in the grove for the gasket to the height just below the inner lip of the ring. You will get some "waves" in the material and uneven application, but this is okay. Just be sure that it is a continuous bead of material that fills in the grove.
6. Let the Permatex cure for 24 hours.
7. Using the small screwdriver or the dental pick, work this under the gasket and pry up the gasket until it is released from the ring. There will be some spots that the Permatex will remain stuck in small bits and these can be removed by just scraping them off to clean up the surface.
8. Using the Exacto blade, trim the gasket of any uneven areas or bulges. Don't be shy since the material is very pliable and cuts easily.

You will not have a perfect looking gasket, but this will absolutely provide you with a good seal and one that will remain flexible for the next time you need to disassemble the gauge.

Hope this helps. BTW, for those who are aware of my extended restoration of the '59 TR3, I am proud to announce that I fired up the engine today for the first time since I rebuild the head and had the lower end done. Had a real tough time adjusting the timing, but once we got that figured out (don't forget the notion of being "off a tooth"), it fired up and ran great. Some minor adjustment with the carbs and all was fine. One problem was the fuel shut off tap leaked, so I just bypassed this and will deal with it later. Anyway, I'm certainly excited!

-Scott Suhring

Subject: Gauge repair
Date: Sat, 29 Mar 2003
From: <ptegler@cablespeed.com>

Scott, (and everyone)

Rather than just Permatex Gasket maker, Permatex also makes a 'flowable silicone'. It will 'ooze' out into a very smooth layer all on its own. No trimming required to get it flat. The label itself says... Flowable Silicone.

I've also had good luck simply looking through the o-ring box at my local Pep Boys auto store and finding the right size o-ring to simply lay in the ring. (right cross section as well as right diameter)

-Paul Tegler

Instruments/Dash

Subject: Lettering Knobs
Date: Wed, 8 May 2002
From: "ian.viles" <ian.viles@ntlworld.com>

> Has anybody got a hint for re-lettering the dash switches for a TR6?

Mark,

I have recently done this successfully as follows on choke, heater knobs etc:

1. Remove knobs & clean with T Cut polish
2. Carefully ink in details with a white 'Gel Pen' - borrowed from my 11 year old daughter. The Gel Pen brand is 'Crayola PRO' and can be bought individually although the white one came out of a set.
3. Gel Pen is not hard wearing, so I then clear acrylic lacquered the knobs.

-Ian Viles

Instruments/Dash

Subject: TR3A under dash sequence
Date: Fri, 2 Jun 2006
From: "Terry Smith" <terryrs@adelphia.net>

> I am soon going to be installing the wiper motor with cable and boxes, defrost ducts, heater, and wiring
> harness under the dash of my TR3 (which has virtually nothing else installed on its body). Oh yes and the
> steering column. Could someone recommend the proper sequence? I can just see myself installing and
> uninstalling....
> -Jim Wallace

Hi, Jim

Having just done this (and redid some of it):

- 1) Prepare and paint floors, firewall, whatever as necessary
- 2) Lay in your accelerator pedal assembly
- 3) Install your brake/clutch assembly
- 4) Install your dimmer switch assembly
- 5) Create a ground junction in the firewall to attach the collective ground wire for your gauges (which is also the ground for your battery) if you're opting for this. (It means connecting all gauges with a string of wire connectors.)
- 6) If you've installed a new battery box, check the back to ensure that it has the two small ledges welded on for your dash braces. If not (my repro didn't), weld or rivet new ones in. (Doug and Alex Monzo sent some great pictures, and Mike Lang sent a detailed narrative,. If you need I've saved them and can pass them on. [...thanks again, you guys!])
- 7) Run the wiper assembly, tighten down and test the action.
- 8) Install the heater, hoses, and firewall pipes. The heater will only be hanging from the bulkhead bolt, so string the other two supports from the cowling.
- 9) Assemble most of the steering column assembly, including the dash bracket, but without the steering wheel, controller, etc.
- 10) On the lefthand side, place the steering column bracket on the defroster vent studs, and loosely place the defroster vent on also, get the nuts started, but don't tighten anything. On the right hand side, simply hang the defroster vent, but don't tighten the nuts.
- 11) Attach the two brackets on the left and right side to the battery box ledges (described above). Attach to the heater bracket and the steering column bracket to this bracket.
- 12) Install the dash with all gauges attached. The slots at the top of the dash are the first thing against the cowling, while the steering bracket comes next, and the defroster vents last. But because you've already started these, you're simply squeezing the dash into the gap you left by keeping these loose on the bolts.

After that, it's pretty intuitive, wiring harness, steering wheel assembly, etc. Hope I haven't forgotten anything. Have fun!

-Terry Smith

Subject: 3A under dash sequence

Date: Fri, 2 Jun 2006

From: "Randall" <tr3driver@comcast.net>

> 5) Create a ground junction in the firewall to attach the collective ground wire for your gauges (which is also
> the ground for your battery), if you're opting for this. (It means connecting all gauges with a string of wire as
> connectors.)

Just a side comment, the fuel gauge is the only small gauge on a TR3/A that needs a ground. And the factory grounded it to the tie point on the back of the instrument panel (which has to be grounded for the panel lights to work).

The speedo and tach need grounds, but only for illumination and the high beam indicator. For the TR4, none of the small gauges require grounds.

-Randall

Instruments/Dash

Subject: TR4 Air control
Date: Sun, 10 Sep 2006
From: Bob Labuz <yellowtr@adelphia.net>

Good Afternoon,

I need to know which side of the air control unit the rubber seal goes. Does it go against the outside (on the end where the air control valve goes to the dash proper) or the end where it attaches to the body?

I am guessing the felt seal goes against the dash end and the rubber seal goes against the body.

Also the felt pads on the air control valve. I thought 1 went on the inside and one on the outside. Which is which? There are 2 different felt pads, one almost rectangular and one with a slight curve (oval). The oval goes on the bottom, the rectangle on the top, but inside or outside? Thanks,

Bob

Subject: TR4 Air control
Date: Sun, 10 Sep 2006
From: "J.C. Hassall" <jhassall@blacksburg.net>

>Good Afternoon,

>I need to know which side of the air control unit the rubber seal goes. Does it go against the outside (on the
> end where the air control valve goes to the dash proper) or the end where it attaches to the body?

Hi Bob,

If I understand your question, the rubber seal goes around the air control "neck" which presses against the hole in the tub (under the dash). IOW, if you hold the air control assembly in your hand, the rubber seal should be attached to the rear of the assembly, so it forms a "snug" fit against the hole in the tub.

>I am guessing the felt seal goes against the dash end and the rubber seal goes against the body.

>Also the felt pads on the air control valve. I thought 1 went on the inside and one on the outside. Which is
> which? There are 2 different felt pads, one almost rectangular and one with a slight curve (oval). The oval
> goes on the bottom, the rectangle on the top, but inside or outside?

Thanks for asking this question. I just realized I rebuilt mine backwards. The felt *should* be mounted so that it helps form the seal when the air valve is closed. You'll notice there's a slight lip inside the "throat" of the housing. The felt should seal against that when the flapper is closed. Mine currently works the other way. Damn! Now I get to redo *another* assembly.

-Jim

Subject: TR4 Air control
Date: Sun, 5 Nov 2006
From: "Bob Labuz" <yellowtr@adelphia.net>

Cosmo Kramer wrote:

> Hi Bob!

> A couple of quick questions:

> 1- What car were you talking when asking this question?

> 2- Are these 'seals' the ones found in the Moss catalog # 23 & 27, under the heading of 'TR4A Dash'?

> -Cosmo Kramer

Cosmo,

The car is a TR4, & yes those are the part #s. It looks the same for a 4 as 4A.

-Bob

Instruments/Dash

Subject: TR4 question
Date: Sun, 23 May 2004
From: "Kurtis" <kurtisj@cox-internet.com>

- > Hi,
- > Installing TR4 temp and amp gauges. Where do the wires go?? From the "rear" of the gauges...
- > Amp: Which wire goes on the left, Brown with white or Brown?
- > Temp: Which wire goes on the left, Green/Black or Green/Blue?
- > There are no markings on the gauges to indicate how to hook them up.
- >
- > Amp: Brown/white on the left, Brown on the right
- >
- > Temp: Green/Black on the left, Green/Blue on the right
- > -Bob Labuz.

Bob,
Here's how mine are connected:
Temperature gauge- green/black (left) / green/blue (right)

Ammeter- brown/white (right) / brown (left)

Note: My car has been changed to negative ground. Reverse if your car is positive ground.

All directions are from the perspective of sitting in the car and looking at the gauges in the dash face on.

I don't know about the temperature gauge, but if you hook the ammeter up backwards, it will simply reverse in operation (show a + current when you actually have a discharge condition). I hope this helps.

-Kurtis J.

Instruments/Dash/Wood

Subject: TR4 panel lamp rheostat
Date: Tue, 7 Oct 2008
From: "Karl Vacek" <kvacek@ameritech.net>

My TR4 is a late commission number, and came with the wood dash, which should be correct. The PO removed the panel lamp rheostat and turned a wooden plug to fill the hole, and then covered the whole dash with wood-grain fabric-backed vinyl wall covering. Really.

After removing the lovely wall covering and discovering his customization, I ordered the Lucas rheostat from TRF. It's real Lucas, and the number matches that sold for TR4 thru TR6. Problem is, the threaded portion is at least 1/16" too short to extend through the thickness of the dash and leave threads for the bezel, even without the rear locknut and washer. It also appears that the wood dash stands off the metal panel behind by a little over 1/16" too. Before forcing and possibly bending the metal, maybe someone else has seen this? Shouldn't the wood and metal panels be flush against one another, which would probably allow this thing to fit?

-Karl Vacek

Subject: TR4 panel lamp rheostat CORRECTION
Date: Tue, 7 Oct 2008
From: "Karl Vacek" <kvacek@ameritech.net>

Upon further review, the gap was mostly an illusion, probably only 1/32" and readily pushed together.

The threads on the switch are about 13/32" long, and the total construction of the steel and wood dashes is about 7/16" thick, leaving the threads 1/32" recessed, rather than standing out 1/16" or so to allow the bezel to thread on. The factory parts book shows a flat bezel like I have, but a "top-hat" style that goes through the dash a bit would work. What's going on??

-Karl Vacek

Subject: TR4 panel lamp rheostat
Date: Tue, 7 Oct 2008
From: <CarlSereda@aol.com>

Karl,

My own 'factory optional' wooden TR4 dash over the years has warped a bit and not a perfect flush fit everywhere against the original white steel dash. I don't think you'll be able to rectify easily. I guess you could oversize the steel dash hole and undercut the wood from behind to move the switch closer to wood surface. But what you might consider is putting a simple Lucas pull-switch there to operate a reverse light - the rheostat is pretty useless - the dash lights are not even bright enough in its highest position! You can hide the rheostat (still wired in) up behind the dash board and put something useful in its place like a back-up light switch - but you would need to find a deep enough pull/flip switch too - but might be easier and more useful.

-Carl

Subject: TR4 panel lamp rheostat
Date: Wed, 8 Oct 2008
From: "Karl Vacek" <kvacek@ameritech.net>

After more consultation with TRF, it appears likely that the earlier part had longer threads - the current rheostat superseded another one that superseded the original, all many years ago. On metal-dash TR4's it was no problem anyway. On TR4A's, TR5/250's, and TR6's, the rheostat was moved to the center panel below the dash, where it's only thin metal.

Only the wood-dash TR4's appear to have a conflict. Wood dashes on TR4's had originally been a factory option, but were apparently made standard at the end of TR4 production. Mine appears to be from the factory,

it's in the right commission number range to have had a wood dash, and the metal behind it is indeed the metal that goes with a wood dash, as opposed to a metal dash that someone put wood over. They're obviously different, and the difference is simple to spot when the glovebox is open.

And the DPO didn't want a rheostat - in fact he wired around all the original switches, using a toggle-switch panel below the dash. Glad he didn't throw anything else away (except the ash tray, which got the same wood plug treatment).

Anyway, I've got to either find a good original rheostat, or make up an extension thread for the new rheostat I have. Geez I wish the old TV repair parts store was still here. If I can't find something standard to screw together (maybe a lamp parts supplier?), I'll probably be spending some quality time with the lathe.
-Karl

Instruments/Fuel/Gauge

Subject: TR3 gauge questions
Date: Fri, 22 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

I believe MoMa would do these. This site has full details on the gauge (MGA site but same gauge):
<http://mgaguru.com/mgtech/electric/fg_01.htm>

Meanwhile, a yardstick makes a handy dipstick for checking fuel level. **Approximately 1" = 1 gal.**
-Geo

Subject: TR3 gauge questions
Date: Fri, 22 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> I'm going to buy a cheap substitute for my fuel gauge (the resistance won't be exactly right, but will give me
> some indication anyway)

Be warned that it may indicate backwards, or give you no indication at all; or possibly even damage the sender
in the tank.

> Boy though, the needle is soooo fragile and it looks so touchy and delicate, I'd rather have an experienced
> hand do it.

Although I don't see one at the moment, it's not unusual to see "working" TR3 fuel gauges on eBay for not
much (like under \$20). **Be sure you don't get a TR4 gauge though, since even though the early TR4 gauges
look identical, they take very different senders (& a voltage stabilizer).**

-Randall

Instruments/Fuel/Gauge

Subject: Fuel Gauge
Date: Tue, 29 Aug 2006
From: "Terry Smith" <terryrs@adelphia.net>

I had a problem with the TR4 fuel and electric temp gauges installed in my TR3A. Both pegged when I applied power from the voltage stabilizer. I changed the voltage stabilizer, fussed around with the temp gauge, and voila! I'm running at about 185 degrees, and darn glad to finally know it on my newly rebuilt engine!

The fuel gauge continued to peg. I swapped wires at the back of the gauge, and got about three quarters of a tank. Oddly, as I ran the car and used gas, the gauge wound up pegged with about 5 gallons in the tank. Tonight I filled the tank, and darned if the gauge didn't settle in at between half a tank and empty. When I got home, I swapped out the wires at the sending unit, putting the ground wire I'd fabricated on the insulated post, and the green/black wire on the narrow, non-insulated post, which caused the gauge to peg again, as it actually should because now the gas tank is full.

I'll run it through the end of the week to see if at least the needle moves toward empty this time, and not toward full.

Any ideas?

-Terry Smith

Subject: Fuel Gauge
Date: Wed, 30 Aug 2006
From: <Dave1massey@cs.com>

<terryrs@adelphia.net> writes:

> The fuel gauge continued to peg. I swapped wires at the back of the gauge, ...

I think you will find that the more you drive it the fuller the tank gets. These cars were renowned for their fuel economy.

Seriously, if you plan on using a TR4 fuel gauge you will have to use a TR4 fuel sending unit. The TR3 gauges and sending units work in the opposite manner from the later TR4-6 units.

-Dave

Subject: Fuel Gauge
Date: Wed, 30 Aug 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

FWIW -- you can easily 'work' the sending unit with a length of copper wire about 18" long with the end bent into an 'ell'. Inserted thru the gas cap, it can be used to press down on the arm of the sender to simulate a nearly empty tank or hooked under the arm of the sender to lift it and simulate a nearly full tank.

That said, sounds like you'll be replacing the sender. Yes, it can be done w/o removing or moving the tank, just have to remove the seat back for the occasional seat or whatever you have back there.

-Geo H

Instruments/Fuel/Sending Unit

Subject: Resistance for the fuel sending gauge?
Date: Thu, 6 Jul 2006
From: <Chip19474@aol.com>

<lstein6@gmail.com> writes:

> 30, 60 or 90 ohms?

> Thanks,

> -Larry

Larry,

I just repaired a fuel sending unit from a Lotus Europa....looks a lot like a Spitfire unit (don't tell the Lotus people!)...the resistance after cleaning and testing was roughly 28 ohms to 100 ohms - full swing so, without a lot of research, I'm guessing that's a fairly typical range.

-Chip Krout

Instruments/Fuel/Sending Unit

Subject: TR6 & TR4A fuel level sender... Same?
Date: Wed, 4 Jul 2007
From: Don Spence <dkspence@telus.net>

Anyone know if a TR4A fuel level (tank) sender can be used to replace the one in a 72 TR6?

Likewise the resistance range across the sweep for the TR6?? TIA
-Don

Subject: TR6 & TR4A fuel level sender... Same?
Date: July 6, 2007
From: "GJ Pooley" <pooleyj@ns.sympatico.ca>

Hi Don;
I got this off a TR6 discussion list awhile ago and had saved a copy.

A NOS TR6 fuel level sender:

Empty= 270 OHMS.

Full= 17 OHMS

Good luck

-Jay

Subject: TR6 & TR4A fuel level sender... Same?
Date: July 6,2007
From: "Randall" <tr3driver@ca.rr.com>

Yes, they're basically the same.
-Randall

Instruments/Oil/Gauge

Subject: Oil pressure gizmo
Date: Sat, 23 Aug 2008
From: Doug Mathews <mathews@uga.edu>

Paul,
Here is one example.

<<http://store.summitracing.com/partdetail.asp?autofilter=1&part=SUM-G1438&N=700+-151266+115&autoview=sku>>

and PFD instructions (which I can't decipher) at:

<<http://static.summitracing.com/global/images/instructions/sum-g1438.pdf>>

Paul Dorsey wrote:

- > By now, engines probably come with such a device. But is there a gizmo that shuts the engine off (or blinks a red light) if a motor's oil pressure drops significantly?
- > Anything like this for a TRactor Motor?
- > -Paul

Subject: Oil pressure gizmo
Date: Sat, 23 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

- > By now, engines probably come with such a device. But is there a gizmo that shuts the engine off

There are such things, but they are rarely (if ever) found on cars. Usually found on "stationary" engines that run without human supervision, like air compressors and such.

- > (or blinks a red light)

Practically all modern cars have a red light for no oil pressure (generally instead of a gauge).

- > Anything like this for a TRactor Motor?

I don't know of anyone selling a kit specifically for the TR2-4, but you could add one yourself, if you like. Easiest, IMO, would be to drill and tap the oil filter head in a strategic spot for a standard oil pressure light sender (as found, for example, on TR250 and early TR6). 1/8" NPT IIRC. Then mount and wire up a suitable red light, with power from the ignition switch and grounded through the switch.

-Randall

Subject: Oil pressure gizmo
Date: Sun, 24 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

- > How would one hook up a Summit \$16 oil pressure switch like the one Doug Mathews found at:

>
<<http://store.summitracing.com/partdetail.asp?autofilter=1&part=SUM%2DG1438&N=700+4294816030+115&autoview=sku>>

- >
- > and PFD instructions (which I can't decipher) at:
- > <<http://static.summitracing.com/global/images/instructions/sumg1438.pdf>>

Well, what do you want it to do? If you just want it to kill the ignition when there is no oil pressure, you should be able to just run a wire from terminal B to the point side of the coil; leaving the other two terminals open. Of

course, that also means you could use a much less expensive switch (eg GPS107, available from TRF for \$8). But, that will also make your engine seem harder to start, since the ignition will be disabled until the starter turns the engine enough to build oil pressure. You can solve that problem by adding either a pushbutton switch or a relay, to enable the ignition while cranking.

Unless you are also converting to an electric pump, the other contacts aren't much use to you.
-Randall

Instruments/Oil/Sending Unit

Subject: Catastrophic oil line failure for oil pressure gauge
Date: Tue, 7 Oct 2008
From: "Karl Vacek" <kvacek@ameritech.net>

New lines or not, the one thing that will definitely limit the damage if it ever breaks again is to put a restrictor at the place where it attaches to the engine. A plug inside the fitting with a very small drill hole through it will still allow pressure to be measured just fine, and if the line breaks you'll get a small stream but not a gusher. Aircraft do this - it's particularly important in flight because you can't just pull over onto a cloud if a leak occurs, and stains aside, you don't want to lose all your oil.

-Karl

Subject: Catastrophic oil line failure for oil pressure gauge
Date: Tue, 7 Oct 2008
From: "levilevi" <levilevi@comcast.net>

If you don't have a plug with a drilled hole a rolled pin (from any good hardware store) works too.
-Bud Rolofson

Instruments/Speed & Tach /Cable

Subject: Overdrive speedo cable
Date: Mon, 27 Nov 2006
From: "Jim Wallace" <grandfatherjim@gmail.com>

On the right-angle drive for the speedo cable, is the knurled part on the angle drive supposed to rotate freely? On mine it doesn't and I don't want to force it but so far the only way I can see to install the thing is to rotate the entire assembly, and have it end up in an unfavorable position.

How does one free it up? I want to go gently since it appears to be of soft metal, brass or bronze I guess. (TR3A with TR4A-OD)

-Jim

Subject: Overdrive speedo cable
Date: Mon, 27 Nov 2006
From: "Randall" <tr3driver@ca.rr.com>

> On the right-angle drive for the speedo cable, is the knurled part on ...

Yah, knurled ring should turn. I have no idea how to free it up, except the usual, add some lubricant and work it back and forth.

But why not just forget the angle drive & install a long cable as Triumph intended on the 3? One less thing to go wrong ...

-Randall

Subject: Overdrive speedo cable
Date: Mon, 27 Nov 2006
From: <Dave1massey@cs.com>

<grandfatherjim@gmail.com> writes:

> On the right-angle drive for the speedo cable, is the knurled part on ...

Yes. You should be able to tighten it down while holding the angle drive body stationary at the desired angle. If the nut doesn't turn it is either gunked up or deformed. If the cause is gunk you can clean it up with brake cleaner. If it is deformed it is probably from some heavy handed use of channel locks at some point.

If you can't fix it you can always resort to the longer cable that was supplied with the OD equipped models that don't need the drive. There are provisions in the frame and floorboard for a cable to route direct into the drive attachment on the transmission.

-Dave Massey

Instruments/Speed & Tach/Cable

Subject: Speedometer cable for overdrive
Date: Fri, 14 Mar 2003
From: Chris Kantarjiev <cak@dimebank.com>

> Only the TR2-4 uses the longer cable and have a notch in the floorpan and a special rubber boot to
> accommodate it. The TR4A introduced the use of the gearbox and the floorpan on longer included the
> cut-out for the cable to angle straight out of the gearbox.

Well ... I won't speak for the TR6, since I'm not entirely certain (well, I wasn't, but do read on), but the 4A definitely uses a longer speedo cable for overdrive than for non-overdrive. Since the TR6 gearbox is the same unit (at least the early, A-type O/Ds are) and the speedometer is in the same place, I'd guess that they do, too.

The non-OD gearbox has the speedo drive on the left side of the tail shaft. The OD gearbox has the speedo drive on the right side, the solenoid is on the left side. The cable is routed across the top of the gearbox, fastened with some Adel-style clamps to the top cover bolts.

The OD cable p/n is 504948 (/I for inner, /O for outer). Ah, that's for the 4A; for the 6, I see that the p/n is 516545. And yes, you need a right angle box, p/n 120694. (Why a different part? Did they switch the speedo/tach location *again*?)

I don't have accurate length information for LHD cars. But I note that the Moss UK catalog specs a 69" cable for "all cars with O/D" (not true) as well as the LHD standard gearbox, and a 78" for a RHD standard gearbox. Since the cable in a RHD standard car must cross in much the same way as in an OD box in a LHD car, that might be a good guess - though the RHD standard setup doesn't seem to use a right angle drive! Curious.

TRF should be able to supply you the right cable, or at the very least, the required length. Call their tech support line.

-Chris

Subject: Speedometer cable for overdrive
Date: Sat, 15 Mar 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> Well ... I won't speak for the TR6, since I'm not entirely certain (well, I wasn't, but do read on), but the 4A
> definitely uses a longer speedo cable for overdrive than for non-overdrive. <snip>
> The OD cable p/n is 504948 (/I for inner, /O for outer). Ah, that's for the 4A;

Chris, my TR4A SPC also lists 504948 /I & /O for the LHS non-OD application. Does yours list something different?

> for the 6, I see that the p/n is 516545.

And again, my TR6 SPC lists 516545 for the LHS non-OD application.

Here's some guesswork on lengths:

504948 supercedes to GSD114, which Rimmer's says is 66"

516545 -> GSD169 -> 69"

504607 -> GSD141 -> (can't find this one)

504613 -> GSD109 -> 63"

504609 -> Moss USA 731-000 -> 96"

-Randall

Subject: OD speedo cable routing

Date: Wed, 7 Jun 2006
From: "Terry Smith" <terryrs@adelphia.net>

> I need the wisdom of the list to keep me from breaking speedo cables in my 60 TR3A. The cable is a mile and
> a half long and where I've routed it could be the problem. I lubed the cable....wrong lube??? I routed it across
> the firewall with hold down clips then down the inner fender then through the frame up to the tranny.
> If you have a better lube or routing could you let me know....I'm really at a loss with this

Hi, Bob. I think the routing you describe is accurate. I saved the following posting from Randall last month or so, since I was nearing that point myself:

>> The factory routing had the cable crossing over on the little shelf in front of the battery (little clip in the
>> middle), then going down the bulkhead/firewall on the right side and back along the inside of the RH frame
>> rail. ISTR there's a clip on the frame rail somewhere. Big, sweeping curve towards the transmission, then
>> up through the floorboard hole for the handbrake lever and through the channel in the handbrake boot, the
>> hole in the trans tunnel and onto the OD. Mine chafed where it went through the floorboard, so I slit a
>> length of rubber hose and slid over it as a buffer.

>>>The TR2-3B LHS OD speedo cable is a LOT longer than the non-OD, something like 96" versus 63" as I
>> recall.

In terms of the lube, I believe the favored lube is graphite. Grease has a tendency to despoil the gauge.
-Terry Smith

Instruments/Speed & Tach/Cable

Subject: Speedometer Right Angle Drive
Date: Wed, 26 Jun 2002
From: Brian Sanborn <sanborn@net1plus.com>

>===== Original Message From: <Lbc61tr4@aol.com> =====

> Ok, so now I'm really confused. If the TR4 does not use the right angle adapter, then what should be the
> maximum angle on the turn at the gearbox? Even using the boot and hole next to the handbrake, the angle of
> the turn is still almost 90 degrees. How is the extra long TR3 overdrive cable routed?
> -Paul

Paul,
I used the 96" TR3 OD cable part from TRF on my '62 TR4. The cable exits the OD case and through the boot. It then makes a 90 degree turn along the frame and through a hole in the frame where the brake line goes through. I then routed it along the side of the frame members to the starter and up and over the bell housing and then a turn into the firewall and to the speedo. The speedo runs rock solid at all speeds.

I could not get the "TR4 OD cable" to work because it was just a bit short if you wanted to go through that brake routing hole. The TR4 cable will only make it if you route it so it runs under the frame and then across the gearbox top and exit out on the left side of the engine/bell housing space. This worked but the underside was a jury-rig.

You have to cut and remove the rubber grommet on the brake hole in the frame to pass the OD end of the cable through the hole. If you cut with an exacto knife on an angle it will come out and go back without a problem. If it is dry and brittle it will need a new rubber grommet. Put the cable through the hole BEFORE routing back to the OD connector.

-Brian Sanborn

Instruments/Speed & Tach/Cable

Subject: Tach problem
Date: Wed, 12 Mar
From: "Randall Young" <Ryoung@navcomtech.com>

> Last fall I was having problems with my tach. I tested it with an external tach and a drill hooked up to the
> cable and it was way off, reading too high. Does anyone know why this is happening and/or where the tach
> can be repaired?

Typically, it means the bushing that carries the magnets is worn, and letting the magnets get too close to the cup. There have also been reports of the inner cable being too long, and applying pressure to the mechanism.

Mo-Ma and N. Hollywood Speedometer are two good places to have it repaired; but it isn't cheap. Probably \$100 + S&H, at least. But I've heard they come back looking and working like new.

MO-MA

1321 2nd St NW

Albuquerque, NM 87102

(505) 766-6661

For some reason, I don't have N. Hollywood's info handy, but I'm sure you can find it in the Monster List
<<http://www.team.net/sol/britpart.html>>

You may be able to solve the problem yourself, check out
<<http://mywebpages.comcast.net/rhodes/speedo.html>>

It's written for speedos, but the tach is just like the speedo, without the odometer and tripmeter.
-Randall

Instruments/Speed & Tach/Cable

Subject: Ticky Tach Problem Resolved
Date: Wed, 29 Mar 2006
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

A while back I posted a message about my tach making a ticking sound. Well I finally got around to pulling the tach and the tach cable. Unbeknownst to me the cable has a tach only end and a distributor only end to it...at least the one I got from TRF does. On the tach end there's a small metal fitting crimped onto the inner spinning cable. This fitting will seat firmly in the tach housing, but won't fit at all at the distributor. However, I didn't have the two ends reversed, dumb luck, but on close inspection, the piece didn't seat properly at the tach end due to the inner cable being about 1/16th" too long. As a result the fitting rode just on the edge of the tach housing and as the cable spun it ticked against the tach. I trimmed the inner cable, everything dropped properly into place and the ticking is now gone.

-Bob Danielson

Subject: Speedo cable route
Date: Mon, 19 Mar 2007
From: "Terry R Smith" <terryrs@adelphia.net>

> I've heard allegations that replacement speedo and rev outer cables are not the same length as original factory
> units.

>> Another common problem is that the inner cable protrudes too far from the outer cable. This can put
>> pressure on the works inside the instrument and cause incorrect readings or even failure of the instrument.

Roger that. Margaret at Mo-Ma's has made it clear that the square end of the speedometer and tachometer cables should be cut to no longer than 1/4 inch. Otherwise they damage the instrument.

-Terry Smith

Subject: Speedo cable route - now length
Date: Mon, 19 Mar 2007
From: don spence <dkspence@telus.net>

I had a similar problem which was solved by taking the old and new cables to a shop (TachMan) that works on truck tachs etc. They trimmed the cable to length and reformed the square end in a jig.

-Don

Subject: Speedo cable route - now length
Date: Tue, 20 Mar 2007
From: <TR250Driver@aol.com>

That's interesting. I have a broken 81 TR7 speedo cable. It's the one from the service counter to the speedo. It looks like the speedo end is rounded off. The only thing I could find as a replacement is 3" too long with the outer cable in black instead of gray as original. I was going to try to shorten it myself and just use the old outer cable but I was concerned about getting the end right. TachMan? Not sure we have those guys here in NE Ohio. Anyone know where I could send it out to? Thanks,

-Darrell

Subject: Speedo cable route - now length
Date: Tue, 20 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

> Not sure we have those guys here in NE Ohio. Al's Road Service in Cleveland says they do speedometer calibration and repair.

Most likely they can work on your cable. (216) 631-1111 Another thought might be one of those "speedo cable repair kits" they sell in auto parts stores. Generally they come with a piece that you crimp onto the end of the inner cable after cutting it to length. Might be that piece would fit your TR7 speedo head; and you could either put it on your old inner cable, or on the supplied replacement inner cable. Of course, the first thing to do is get the head repaired. Sounds like it must bind under some conditions, to have rounded the cable like that.

-Randall

Subject: Speedo cable route - now length
Date: Tue, 20 Mar 2007
From: <TR250Driver@aol.com>

<tr3driver@ca.rr.com> writes:

> Of course, the first thing to do is get the head repaired. Sounds like it must bind under some conditions, to
> have rounded the cable like that.

Thanks Randall, I have come across a NOS Speedo for the TR7 (7 parts are cheap) so if I can get the cable right I am going to just replace everything. I also have heard that one can take some gears out of the service counter and then use the Rest of the World real long cable which is available from all the regular sources by running it straight thru the counter whilst still using the original outer cable casings. That would be plan B. Cheers,
-Darrell

Instruments/Speed & Tach/Cable

Subject: TR3A speedo
Date: Sun, 14 Dec 2008
From: "Rick" <chandler.rick@comcast.net>

David,

You need to rotate the needle clockwise a bit to fix your average speed under-report of 20 mph. Hold the main disk with your fingers and slowly rotate the needle to advance the reading by 20 mph; these are simple cars. Concerning the instability, I am sad to report that I have recently gone through 3 Moss speedo cables before realizing that ALL of them are more that 10 thou oversize at the square cross-section end (key) at the transmission junction. This fit must be smooth, with the key completely entering the female part (I feel like Larry Flint writing this). The oversized keys only enter part way, and when the collar is screwed down, the cable buckles and twists in compression and results in erratic rotation, and eventually failure in the speedo bushings. The key dimension is supposed to be 0.125 inch on a side, and must be ground down on ALL sides to fit. Go carefully here, as the key is just a press-formed portion of the inner spiral cable, and has little excess metal to remove. Moss Motors is a friend to us enthusiasts, and I am grateful that they support our cars. In this particular case, Moss should insist on spec cables from their vendors, as the consequences of bad cables are often expensive.

-Rick Chandler

Instruments/Speed & Tach/Cable

Subject: TR4 OD- routing of speedo cable?
Date: Mon, 04 Jun 2007
From: "J.C. Hassall" <jhassall@blacksburg.net>

How is the 96" speedo cable supposed to be routed on a TR4 with OD (right angle cable drive, too)? It seems like the cable is long enough to route up to the headlights and back, or at least across the front of the engine. I routed it along the gearbox right side, across the top front of the bell housing and up to the master cylinders. I still had enough to loop around once before going thru the firewall, probably about 2 feet too much.

OTOH, will the standard cable fit? The right angle drive on the A-type OD is only a little bit further to the rear than the non-OD speedo drive. Or is there another cable which will work better? TIA

-Jim

Subject: TR4 OD- routing of speedo cable?
Date: Mon, 4 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

The 96" cable is used without the angle drive. Not sure if the TR4 is the same, but on a TR3 the cable crosses the engine compartment in front of the battery, then curves down and back along the RH frame rail. Then it makes a big, gradual curve under the passenger's floor to come up through the handbrake boot and mate to the OD.

-Randall

Subject: TR4 OD- routing of speedo cable?
Date: Mon, 4 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

The OD I added to my TR4 came with an angle drive and I was able to use the original cable.

-Geo

Instruments/Speed & Tach/Gauges

Subject: TR3 Speedometer & Tach
Date: Tue, 08 Jan 2002
From: Greg Gelhar <gmark@gosignup.com>

<pmmacy@att.net> wrote:

> Listers:
> Anyone know what bolt size and thread is used on the speedometer and tach mounting screws/bolts and
> knurled nuts?

If they are the same size as the ones used to hold in the fuel gauge and such, they are the uncommon size of 8-36.

-Greg Gelhar

Subject: TR3 Speedometer & Tach
Date: Wed, 9 Jan 2002
From: David Massey <105671.471@compuserve.com>

Randall wrote:

> I just double-checked a TR3 ammeter, and a flat-glass TR4 oil gauge, they are definitely not quite 36 tpi. I
> still believe they are 3 BA (which my chart gives as .1614" major diameter, 34.8 tpi).

Which works out to be .729 mm pitch.

-Dave

Subject: TR3 Speedometer & Tach
Date: Wed, 9 Jan 2002
From: "Mike Kitchener" <mikek@wanadoo.fr>

Listers ,

I'm curious.....Does anyone know the logic in the BA thread system??

Example : 25 BA major dia. .0098" 363 tpi

-Mike

Instruments/Speed & Tach/Gauges/Speedometer

Subject: MoMa experience
Date: Sun, 31 Jan 2010
From: "Bob Danielson" <75tr6@tr6.danielsonfamily.org>

I can tell you that many of the 6-Pack guys are turning to West Valley Instruments for having their gauges rebuilt. Morris only works on British car instruments, quotes a firm price, a quick turn around time and sticks to both. He'll typically get your gauges back within 10 days.

One of the things I learned from Morris is the importance of a "correct" inner cable and what the specs for one should be. You can find that info here:

<<http://tr6.danielsonfamily.org/SpeedometerCalibration.htm>>

And if you doubt it, here's the service bulletin about the problem:

<<http://www.74tr6.com/images/SpeedoCableLength.pdf>>

An out of spec cable can ruin a rebuilt speedo or tach very quickly.

Paul Rego has a great write up showing everything that Morris does when calibrating a full set of gauges.

<<http://www.74tr6.com/gauges1.htm>>

-Bob Danielson

Instruments/Speed & Tach/Gauges/Speedometer

Subject: TR4 Trip meter reset knob
Date: Fri, 17 Nov 2006
From: <banc8004@comcast.net>

Sometime in its past life, the knob that should be found below the speedometer to reset the trip meter to zero has been snapped off, level with the speedo's case. I can see something in there - the stump of the reset knob, I guess.

How is the knob connected into the trip-meter mechanism? Does it push-on, screw on, or other?

-Brian

Subject: TR4 Trip meter reset knob
Date: Fri, 17 Nov 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

<banc8004@comcast.net> wrote:

>How is the knob connected into the trip-meter mechanism? Does it push-on, screw on, or other?

There should be a small set-screw that can be undone w/ a jeweler's screwdriver. About the size of a screw from the earpiece of a pair of glasses, in fact I think that is what I used as a replacement screw on mine.

You will need to turn the shaft and (if possible) pull the stub of the shaft out a bit to get at it. If the stub is very short you may be able to get the case off of the speedo and then you will have easy access (normally you have to remove the shaft before separating the speedo head from the case).

-Geo

Subject: TR4 Trip meter reset knob
Date: Fri, 17 Nov 2006
From: "Tim OBrien" <obrienboys@gmail.com>

Brian,

The trip meter is connected with a tiny holding pin going through both it and the rod in the speedometer.

You may be able to wire it or perhaps engineer a paper clip solution, but as I recall, the trick is keeping things thin. As you press up the knob to re-set the mileage, there is interference in the body of the speedometer itself.

-Tim

Subject: TR4 Trip meter reset knob
Date: Fri, 17 Nov 2006
From: "Tim OBrien" <obrienboys@gmail.com>

On second thought... Geo is correct, it's a tiny little screw.

Go to the local drug store and buy a glasses repair kit. You'll get a screw that works.

-Tim

Subject: TR4 Trip meter reset knob
Date: Fri, 17 Nov 2006
From: "Randall" <tr3driver@ca.rr.com>

> On second thought... Geo is correct it's a tiny little screw.

Both types were used at different times. I'm not sure when the changeover was, but the earlier TR3A heads were as Tim originally described. Perhaps it changed at the same time as the glass?

-Randall

Subject: TR4 Trip meter reset knob
Date: Fri, 17 Nov 2006
From: <ScharfR@aol.com>

<owner-triumphs@autox.team.net> writes:

> Sometime in its past life, the knob that should be found below the speedometer to reset the trip meter to zero
> has been snapped off, level with the speedo's case. I can see something in there - the stump of the reset knob,
> I guess.
>
> How is the knob connected into the trip-meter mechanism? Does it push-on, screw on, or other?
> -Brian

Brian:

The short reset stem and knob attach with a tiny screw to the little stump you see protruding from the speedometer case. The screw is perpendicular to the shaft of the stem/stump. Or, said another way, the reset stem fits over the stump from the speedo like a sleeve. Then the screw goes through a hole in the reset stem into a threaded hold in the stump. If that's not clear, let me know and I'll send a picture.

As to your next likely question (Where does one find these parts?) my solution was to keep an eye on eBay and buy the cheapest junk TR4/TR4A speedometer

I could find that still had the reset stem attached. After I "harvested" my parts, I was able to send the remainder of the junk speedo to a list member in need of a few internal parts. That keeps the supply of spares moving through the food chain.

-Bob Sharp

Subject: TR4 Trip meter reset knob
Date: Fri, 17 Nov 2006
From: <CarlSereda@aol.com>

Brian,

A tripometer 'extension' slips over the end of the smaller actuating shaft (end is reduced to fit inside the extension) and a cotter pin slips through both items to hold in place. I've also seen a tiny threaded 'set screw' rather than the split pin technique. You may have to solder/weld an extension of sorts if your actuating shaft if it's broken short.

-Carl

Subject: TR4 Trip meter reset nob
Date: Fri, 17 Nov 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

<ScharfR@aol.com> wrote:

>As to your next likely question (Where does one find these parts?) my solution was to keep an eye on eBay...

From list post of 5 years ago (possibly still valid):

I just had my speedometer repaired by **Palo Alto Speedometer. I had taken my reset knob off when I sent it to them. They offered to supply me one for \$10. As a matter of fact, I just put it back in the car a few hours ago. They advertise in British Car, but you can reach them at: 415-323-0243.**

-Geo

Instruments/Speed & Tach/Gauges/Tachometer

Instruments/Steering Column Control Head

Subject: Control head wires
Date: Thu, 30 Oct 2003
From: <Shrack04@aol.com>

My TR3 has an adjustable column and I could not get the wires to slide up and down because my tube was a little rusty inside. SO, I took a wire brush for cleaning a pistol, (357) screwed it to a cleaning rod for a rifle and spun it up and down in the tube with my electric drill. It cleaned it out really well and made it shine top to bottom. I then carefully pulled my wire out straight and worked them so they laid together really well. I bought some long heat shrink tubing and heat shrunk all the wires together. I coated what now looks like an umbilical cord with Graphite lubricate (dry) and pulled them through with a string. They seem to slide ok now. Just a thought, 20 years and still not done..,

-Kent Shrack

Subject: TR3 Control Head
Date: Thu, 30 Oct 2003
From: Geo Hahn <ahwahnee@cybertrails.com>

Do you have the bullet connectors in place on the ends of the wire? If yes, you need to either remove them or at least stagger them... they cannot all fit thru their side by side.

-Geo Hahn

Subject: TR3 Control Head
Date: Thu, 30 Oct 2003
From: George Richardson <gprtech@frontiernet.net>

I put a continuous stream of silicone spray lube on the wires and down the shaft. An old trick learned while building aircraft electrical cables 30 years ago.

-George Richardson

Instruments/Steering Column Control Head

Subject: TR4 Turn Signal Lever
Date: Tue, 05 Dec 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Is the lever for a LHD TR4 turn signal supposed to be on the right or left side of the steering column/nacelle?

Mine is on the left and the Moss catalog seems to show it that way too. Also, the decal Moss supplies for a LHD nacelle only makes sense when mounted on the left... yet the TR4 owner's manual says that the overdrive switch is on the outboard side and thus pictures the turn signal lever on the right and the overdrive on the left for a LHD car.

Just as easy to put it either way... might as well try to get it right. Thanks!

-Geo

Subject: TR4 Turn Signal Lever
Date: Tue, 5 Dec 2006
From: Bob Labuz <yellowtr@adelphia.net>

George,

Mine came with the headlight switch on the left, OD switch on the right. But I am not the original owner.

-Bob

Subject: TR4 Turn Signal Lever
Date: Tue, 5 Dec 2006
From: <ZoboHerald@aol.com>

<ahwahnee@cybertrails.com> writes:

> Is the lever for a LHD TR4 turn signal supposed to be on the right or left side of the steering column/nacelle?

==AM==

I'm about 99% sure that the turn signal lever/switch is always outboard, so it would be on the left on a LHD TR4. On an early TR4 I had, it was that way, and the OD switch was in the RH nacelle (light control all on the dash or floor).

==AM==

Mine is on the left and the Moss catalog seems to show it that way too. Also, the decal Moss supplies for a LHD nacelle only makes sense when mounted on the left... yet the TR4 owner's manual says that the overdrive switch is on the outboard side and thus pictures the turn signal lever on the right and the overdrive on the left for a LHD car.

==AM==

Something's wrong there! The Workshop Manual seems to be the same way in "Section 0"; later illustrations and text in the same section, though, appear to be correct!

-Andy Mace

Subject: TR4 Turn Signal Lever
Date: Tue, 05 Dec 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

<ZoboHerald@aol.com> wrote:

> About 99% sure that the turn signal lever/switch is always outboard, so it would be on the left on a LHD TR4.

Thanks Andy, I suspected as much.

I remember my old Drivers Ed teacher having us memorize that 'up' meant 'right' by having us think of 'upright' freezers and 'upright' pianos... but that only works if the lever is on the left.

> The Workshop Manual seems to be the same way in "Section 0"; later illustrations and text in the same > section, though, appear to be correct!

This was after all early days for having the (TR) turn signal on the column rather than the control head so maybe they initially thought one way then switched to the other.

-Geo

Subject: TR4 Turn Signal Lever
Date: Tue, 5 Dec 2006
From: <CarlSereda@aol.com>

Geo,
My TR4 directional switch came on the left nacelle. I have installed a NOS TR4 OD switch on right side. Up is off and down is on with this setup. I believe that is correct and have revised my TR4 owner's manual to reflect that. Regards,

-Carl

Subject: TR4 Turn Signal Lever
Date: Tue, 5 Dec 2006
From: Jay Holekamp <jholekamp@sbcglobal.net>

The turn signal switch lever on my '64 TR4 (owned by me since '67) is on the right side of the column - the O/D switch lever is on the left side. The TR4 is left hand drive, bought in W. Germany. This has always been the layout on this car. brgds,

-Jay

Subject: TR4 Turn Signal Lever
Date: Wed, 06 Dec 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Good to know since that is I think the exact opposite of the 'manual.

To me, 'up is off' seems counter-intuitive since it is the opposite of the light switches around the house... if the switch can be mounted either way I may go with the 'up is on' position. In any case, I'm adding an OD indicator light since I have no heater and thus a series of blanked holes in the dash support.

-Geo

Subject: TR4 Turn Signal Lever
Date: Wed, 6 Dec 2006
From: <Dave1massey@cs.com>

<jholekamp@sbcglobal.net> writes:

> The turn signal switch lever on my '64 TR4 (owned by me since '67) ...

Which is typical of the two RHD TR's I drove in England a few years back. This was a cause of some confusion for someone accustomed to the opposite layout found on LHD cars.

Since the switches can be mounted either side, I suggest that be arranged as per your preference. I found that switching out of overdrive when you really intended to signal a right turn gets annoying after a while.

-Dave

Subject: TR4 Turn Signal Lever
Date: Wed, 06 Dec 2006
From: <zoboherald@aol.com>

- -----Original Message-----

From: <jholekamp@sbcglobal.net>

The turn signal switch lever on my '64 TR4 (owned by me since '67) is on the right side of the column - ...
==AM==

Interesting! But it begs the question (at least in my detail-obsessed mind): is this particular car one that was built originally for the German market? Some such TR4s and TR4As had some interesting specifications unique to that market at the time (e.g., steering column locks, different license plate lamps, etc.).

-Andy Mace

Subject: TR4 Turn Signal Lever
Date: Wed, 6 Dec 2006
From: "Chris Simonsen" <ccsimonsen@gmail.com>

My 63 is also a German market car.

Locking steering wheel column with ignition switch under the dash, cigarette lighter where the ignition switch goes, and the very convenient OD switch on the left side of the column.

I love the position of the OD on the left and thought all TR4's with OD were set up this way.

-Chris

Instruments/Temperature/Gauge

Subject: Temp gauge
Date: Tue, 26 Jun 2007
From: <Dave1massey@cs.com>

<KingR44916@aol.com> writes:

> just got another gauge and the reading goes to hot in a few minutes with the water temp still cold in the
> radiator. I replaced the sending unit and the voltage stabilizer anyone have any clues what I should do.

The water in the radiator may be cold but what about the water in the engine where the sending unit is mounted? You may have a thermostat that is not opening.

Another possibility is that you may not have the right sending unit for your gauge. The two work together and must be of the right combination. If you have a non-stock gauge it may not work right with the stock sending unit. And vice-versa.

-Dave

Subject: Temp gauge
Date: Tue, 26 Jun 2007
From: William McLeod <wbmcleod@cox.net>

Sounds like a stuck thermostat to me!

-Bill

Subject: Temp gauge
Date: Tue, 26 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> I just got another gauge and the reading goes to hot in a few minutes with the water temp still cold in the ...

My first step would be to check that the wire to the sending unit isn't shorted to ground somewhere. Turn the ignition on, pull the wire off the sending unit, and check the voltage to ground. You should be able to see it switch between full battery voltage and zero. If it stays zero, there is a short somewhere. If it stays at 12v, your voltage stabilizer isn't working (possibly not grounded, or defective).

Then I'd work on Dave's suggestions.

-Randall

Instruments/Temperature/Gauge

Subject: Temp gauge rebuild
Date: Fri, 8 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> I put in a new voltage stabilizer, a new thermostat, a new sending unit, & the gauge still goes straight to hot in
> about a min. of idle. Does anyone know how to rebuild the gauge or is it just too difficult?

I wouldn't attempt to "rebuild" it, but calibrating them isn't too terribly difficult. Not easy, but maybe only 4 wrenches on a scale of 5.

If you remove the gauge from the dash, you should be able to see two round holes on the back, one on each side, about 3/16" in diameter. The holes may appear to be filled with cork (or covered with tape); or they may be open so you can see the slots behind them.

You'll need a tool that will engage the slot and press against the side of the hole, so you can pry the slot sideways with reasonable precision. I turned the end of a 1/4" bolt in the lathe to create an off-center pip to engage the slot, but filing down the end of a (cheap) screwdriver would work just as well.

The adjustment behind the cold side of the scale affects the entire range; the adjustment behind the hot side affects mostly the hot side. But they do interact to some extent, so you'll need to work back and forth.

I've not actually done this on a temp gauge yet, but the voltmeter in my Stag is the same construction, and it came out very well. On it, I discovered that one of the adjustments was so loose that it would move just from setting the gauge down on the bench! I put a drop of fingernail polish in the hole to hold it in place.

Of course then you'll need some reference values to calibrate to. I'd start by taking the sender out and measuring it's resistance at various temperatures. Pick a pair of temperatures, say 140F and 240F, to correlate to two points on the gauge (the cold line & the red line) and note the sender's resistance at those temperatures. Then get precision resistors at those values (or set variable resistors) and a 10 volt power source.

Then you connect the gauge to the power source and the "low temp" resistor, wait for it to settle (a minute or so at least), and tweak the cold side adjustment so the needle reads where you want it. Then do the same thing with the "high temp" resistor and the hot side adjustment. Lather, rinse, repeat until both readings are spot on. Dab on some nail polish, check the readings one more time, and put the gauge back in the dash.

-Randall

Subject: Temp gauge rebuild
Date: Sat, 9 Jun 2007
From: "Anthony Rhodes" <spamiam@comcast.net>

<KingR44916@aol.com> wrote:

> put in a new voltage stabilizer a new thermostat a new sending unit the gauge still goes straight to hot in about
> a min of idle does anyone know how to rebuild the gauge or is it just too difficult

Hmmm, I wonder if it is the gauge! It sure is acting like the gauge is getting a steady 12v instead of the stabilized average of 10v.

Could it be actually reading the right temp?

Try turning the ignition on (pull the hot lead to the coil), and see what the gauge reads after about a minute then.

These gauges are rather reliable. It might misread by a few degrees, but not THAT much.

It is a pain in the neck, but can you get a voltmeter on the wire at the temp sensor? You should see it going, then dropping to zero, back and forth. An analog meter is much better at showing this.

If it just stays at some voltage above zero (like 12v) and never drops to zero, then the stabilizer is bad.

That is unless you have one of the new "semiconductor" stabilizers, then it should be supplying a steady 10v when you pull the wire off the sensor and read the voltage on the wire.

-Tony

Instruments/Temperature/Sending Unit

Subject: Electrical water temp gauge for my TR3?
Date: Wed, 22 Mar 2006
From: "Randall" <tr3driver@comcast.net>

> I have a electric Water Temp sending unit for a (?)TR4. Since my car is a 60 TR3A (I am not concerned with
> originality) I'd like to changeover from the 3A's capillary water gauge to the electric type (Which I think the
> TR4 had). The TR4's sending unit replaces theTR3A's sending unit in the thermostat housing quite nicely.
> Is this a good conversion and what else will I need?

I think it's a very worthwhile conversion. You'll need a "voltage stabilizer" from a TR4->6 and some suitable wiring. I've forgotten the markings on a factory voltage stabilizer, but the case should be grounded securely. One terminal goes to the green circuit (fused and controlled by the ignition switch). The other terminal provides power to the gauge. The second gauge terminal gets wired to the sender.

-Randall

Instruments/Temperature/Sending Unit

Subject: Radiator electric fan switch source
Date: Tue, 9 Nov 2004
From: <ZinkZ10C@aol.com>

Or you could make your own thermo switch.

Use a hot light switch from a 60's to 90's GM (1/2 or 3/8 pipe) Ford (3/8) or Chrysler (1/4 or 1/8). I use an adjusted GM switch on my pickup to give an early warning and retained the gauge for an actual reading.

To adjust a GM switch, scrape the paint away from the adjusting screw and turn clockwise for a lower temp.

A Ford and Chrysler switch is adjusted by turning the terminal.

A sender from a gauge car will not work.

-Harold

Instruments/Temperature/Sending Unit

Subject: Temp Gauge Conversion (From Manual to Electrical)
Date: Fri, 24 May 2002
From: "Randall Young" <ryoung@navcomtech.com>

> Can anyone walk me through the steps to convert the Jaeger electric gauge to replace my long dead
> mechanical one? I have both the gauge and sender, and have been told it is possible do this. I've also been told
> it's impossible! Thanks

Screw the sender into the thermostat housing where the old gage bulb went. (If it doesn't fit, you may have to source a Tstat housing from a TR4, but it looks to me like it will fit.) Run a wire from sender terminal to one of the gage terminals. Run a wire from the other gage terminal to the load terminal of the voltage stabilizer (which you'll also have to add). The load terminal is marked 'I' in my Haynes schematic but I don't know if they all are marked this way. Make sure the stabilizer is grounded, either the 'E' terminal if it has one or the case if it doesn't. Connect the other terminal (marked 'B' in the Haynes) to a source of fused, switched power (the hot terminal on the gas gage is a good place).

Does anyone know if any of the aftermarket voltage stabilizers are transistorized? I've never seen one, but that doesn't mean they don't exist. The original ones do not care about ground polarity, but a transistor replacement might.

-Randall

Subject: TR4 electrical?
Date: Fri, 24 May 2002
From: "Taffel, Sherman" <STaffel@bcps.k12.md.us>

Tim, Art, aficianados:

Usually in ANY BRITISH CAR - when both the fuel gauge and the temp gauge stop working -if not the supply fuse, the culprit is usually the voltage stabilizer, found in the upper right foot well sidewall of a TR\$, sorry TR4. Check the connections, as well as the feeder fuse. The Voltage stabilizer is a bimetallic gizmo that 'lowers' the 12V from the battery or 14v output from the generator/alternator to @ 10.0-10.5 v and then feeds the gauges.

Folks whose voltage stabilizer has 'internally shorted' - have fuel gauges and temp gauges that 'read high' - often 'scare-ing' people into thinking the engine is running hot (lots of summer emotional discomfort);or causes them to run out of gas when the gas gauge still reads almost 1/4 full.

VTR reprinted my article on voltage stabilizer syndrome in the Fall of 2001 #80, originally in Capital Triumph Register "The Standard" in March 2001. If you'd like a copy, I'll snail mail to you!

-Sherman Taffel

Instruments/Temperature/Sending Unit

Subject: TR4 temp senders
Date: Mon, 5 Feb 2007
From: <CarlSereda@aol.com>

Hi Listers,

I am having a hard time finding correct temp sender part #s for TR4. After all these years there seems to be many part numbers/brands and cross-overs. Does anyone know for sure if all or some of the numbers below are correct for a '63 TR4 temp sender?

SMITHS TT 3804/00A
Unipart GTR 111
Unipart GTR 104
Intermotor 52710
Commercial Ignition XTT11

Should I search out a NOS SMITHS temp sender or are there any reasons to not go with aftermarket items? Any crummy makes to avoid?

-Carl

Subject: TR temp senders?
Date: Mon, 5 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> I am having a hard time finding correct temp sender part #s for TR4. After all these years there seems to be
> many part numbers/brands and cross-overs.

If your definition of "correct" is something that will make your gauge read accurately, I suspect the answer is that there isn't such a thing. Those gauges were never all that accurate to begin with, and they haven't improved with age. To get any decent accuracy, you're going to have to measure whatever temp sender you wind up with, and then calibrate the gauge to match, IMO.

The information I have is that the original part number was 131602 for the early domed glass temp gauge, and 134435 for the later flat glass gauge. I don't know why the change was made, or what the difference is, but it seems very unlikely to me that these two parts were identical. However, the factory did list 134435 as a replacement for 131602 (and vice versa), so they evidently felt they were "close enough".

Revington, TRF, Rimmers and Moss UK all seem to agree that GTR104 is the replacement for both 131602 and 134435. Not conclusive, I'll agree, but that seems like your best chance.

I only found GTR111 listed for Morgans and Jaguars.

> Should I search out a NOS SMITHS temp sender?

The senders also drift with time, so even this is not guaranteed to be correct (assuming of course you figure out which Smiths number corresponds to each Stanpart number).

I recently tested several Stag voltmeters, which are the same basic construction as a TR4 temperature gauge, but of course without any uncertainty as to voltage stabilizer, correct sender and so on. There was roughly 1/4 scale variation between the units! On the unit from the car, which appeared to have never been molested (even the fabric over the adjustment windows was intact), I found the zero adjustment to be so loose that just rapping the case lightly would change it.

-Randall

Subject: Temp transmitters
Date: Mon, 5 Feb 2007
From: <CarlSereda@aol.com>

Thanks Randall,

Agree with your GTR104 being best # to go with for modern TR4 Temp Transmitters.

FYI: Searched through the Standard-Triumph Service Bulletins and found 2 interesting temp transmitter notices:

BULLETIN T-65-48
ALL TRIUMPH DEALERS - WESTERN ZONE
SERVICE DEPARTMENT
HIGH READING TEMPERATURE - TR4A
DECEMBER 16, 1965

This bulletin is issued to avoid unnecessary investigation on your behalf. Reports of overheating have been received and the following information will assist in rectification. In the event of abnormally high readings being obtained on the temperature gauge on Triumph TR-4A cars from CTC-53000, a correction can usually be made by substituting the existing temperature transmitter bulb with transmitter bulb bearing the Smiths part No. TT3802/00, Triumph part No. 131062. This transmitter, which was used on the Triumph TR-4 models, is at present identified by a red plastic insulator.

Should you come across any Triumph TR-4A cars fitted with the Smiths temperature gauge that is calibrated 30-70-100 as distinct from the current specification which is merely face marked C-H, the Smiths bellows type of thermostat should be used or a 70 degree C waxed type of Weston Thompson thermostat in the event of a high reading complaint being involved.

BULLETIN T-64-38
ALL TRIUMPH DEALERS - WESTERN ZONE
SERVICE DEPARTMENT
TRIUMPH SPITFIRE TEMPERATURE
NOVEMBER 25, 1964
GAUGE TRANSMITTER

For complaints of low or nil temperature reading on the Triumph Spitfire, the transmitter should immediately be suspected, as faults in manufacture have been found. Each transmitter is date coded in addition to the Smiths part number and codes 5/4, 6/4 and 7/4 (May, June and July 1964) are particularly suspect. Date codes before and after should be satisfactory. There is also the possibility that another range of transmitter may have been fitted in error, which will also result in a false instrument reading. In addition to part numbers, identification of the correct transmitter can also be made by the color of the plastic mould securing the Lukar clip which should be Maroon.

Parts numbers for the Spitfire and other models on the Smith Temperature Transmitter are as follows:

Model	Smith's Code	STMCI Part	No.	Volts
Spitfire (up to FC 26303)	4801/00	137386	10	
Spitfire(FC26303 onward)	4802/00	137705	10	
Triumph 1200	4800/00	121997	12	
TR4 (Concave Glass)	3802/00	131062	10	
TR4 (Flat Glass)	3804/00	134435	10	
Sports Six	4800/00	137386	10	

Subject: Temp transmitters
Date: Mon, 5 Feb 2007
From: "Randall" <tr3driver@ca.rr.com>

> FYI: Searched through the Standard-Triumph Service Bulletins and found 2 interesting temp transmitter ...

Good stuff, Carl! Thanks for pointing it out.

Does it seem odd to anyone else that the Smiths P/N for Herald 1200 & Sports 6 is the same, but the Stanpart numbers are different? I believe it's true that the 1200 had a voltage stabilizer while the Sports 6 did not ... maybe the sender was physically the same but got assigned a different number ?

-Randall

Subject: Temp transmitters
Date: Wed, 7 Feb 2007
From: <CarlSereda@aol.com>

> Does it seem odd to anyone else that the Smiths P/N for Herald 1200 & Sports 6 is the same, but the Stanpart
> numbers are different?

Yes - also see S-T # for early Spitfire temp sender and Sport Six is same but Smith No. is different!?! A typo from the factory?

-Carl

Subject: Temp transmitters
Date: Wed, 7 Feb 2007
From: <ZoboHerald@aol.com>

And just to ADD to the confusion, original Triumph Spare Parts Catalogues show:

Spitfire 4 & Mk2 134435; Mk3 137705 (red), and later 150843 (black)

TR4A 134435 to CTC62636, 131062 CTC62637 on

Herald 948 and 1200 appear to have used 121997 up to GA211xxx or so, then 137705. Similarly the Vitesse 6/Sports 6 (1600) used 121997, while the Vitesse 2L used 137705.

-Andy Mace

Subject: SMITHS (TR4 Temperature Transmitters)
Date: Tue, 13 Feb 2007
From: <CarlSereda@aol.com>

Figures..

just got a return call from that nice guy at MO-MA gauge repair.. He tells me SMITHS Temperature Transmitters for TR4s and TR4-A's should measure as follows;

SMITHS TT3802/00A = 37.4 to 47.6 ohms @ 212 F boiling point (early TR4 & late TR4A)

SMITHS TT3804/00A = 27.9 to 35.7 ohms @ 212 F boiling point (mid TR4 & early TR4A)

Now I see my old beat up 3804 behaves more like a 3802. And I need to locate a new transmitter that hits close to 33 ohms at boiling..

-Carl

Subject: SMITHS (TR4 Temperature Transmitters)
Date: Tue, 13 Feb 2007
From: "Mark" <mark@nashvilletn.org>

Carl,
Maybe a parallel resistor would bring it back in line. Here is a calculator link:
<<http://www.1728.com/resistrs.htm>>

If your sender measures 42 ohms at 212 and you want it to read 33 ohms in order to place the needle on the 212 on your gauge then a 150 ohm resistor in parallel would make it about right. At least in theory +/- something maybe.

How linear it would be is anybody's guess! You could also just listen for the hiss and watch for the embarrass...
-Mark

Subject: SMITHS (TR4 Temperature Transmitters)
Date: Tue, 13 Feb 2007
From: <CarlSereda@aol.com>

Mark wrote:

> Maybe a parallel resistor would bring it back in line. Here is a calculator link.
> <<http://www.1728.com/resistrs.htm>>
> If your sender measures 42 ohms at 212 and you want it to read 33 ohms in order to place the needle on the
> 212 on your gauge then a 150 ohm resistor in parallel would make it about right. At least in theory +/-
> something maybe. How linear it would be is anybody's guess! You could also just listen for the hiss and
> watch for the vapor....
> -Mark

Thanks Mark,
I like that resistance calculator link.. <www.1728.com/resistrs.htm>

Here's what I did this last hour ... since I had already had cut open several SMITHS temp transmitters (ie; cut crimping off, pulled terminal, removed spring, paper, rod, and wafer). The wafers are silvered both sides and ID stamped, A, B, C, D or E .. to indicate resistance. I simply cleaned the dirty contacts and tested each wafer in cleaned housing till I got one to read between 27.9 to 35.7 ohms in boiling water (only one 'C' wafer passed test).

Reassembled and sealed terminal-end with high temp silicone and dinged edges for tight fit - now I have a restored SMITHS TT3804/00A - what a way to save \$9!

I am familiar with your 'hiss and vapor' mode of determining the state of an engine but I don't want to be followed home by fire trucks again - that was embarrassing!

PS- How the heck didn't I see your awesome restored Sprite and 4A before this??
-Carl

Lamps

Subject: Bulb Equivalents
Date: Fri, 8 Jun 2007
From: "Bob Danielson" <75TR6@tr6.danielsonfamily.org>

Thanks Dave,

This works from 1968 TR4 and up. It includes headlights, parking/brake lights, turn signals, back up lights and license plate lights.

-Bob Danielson

-----Original Message-----

Subject: Bulb Equivalents
Sent: Friday, June 08, 2007
From: <forzion@maine.rr.com>

Bob;

Go to this website and follow the prompts for your year of TR6.

<<http://www.sylvania.com/ConsumerProducts/AutomotiveLighting/LampReplacementGuide/default.htm>>

Every outside lamp is listed with "modern" numbers, for headlights, taillights, side markers, turn signals, license plate etc. No instrumentation lamp numbers are listed, however.

-Dave Friedlander

----- Original Message -----

Subject: Bulb Equivalents
Date: Friday, June 8, 2007
From: Bob Danielson <75TR6@tr6.danielsonfamily.org>

> Has anyone every come up with a bulb equivalent matrix? I just had to replace my brake/tail light and after
> some searching found that the Lucas 380 bulb is the same as the Sylvania 1157 which is readily available.
> There's nothing on VTR, so I was thinking of putting a matrix together if I can find all the modern equivalent
> bulbs. I know that some of our bulbs are a little funky like the trunk light or is a bulb a bulb regardless of car
> age as long as it fits and has the required number of filaments?

> -Bob Danielson

Subject: Bulb Equivalents
Date: Fri, 8 Jun 2007
From: "Jim Bauder" <jimbpps@cox.net>

Listers,

I am struggling with this very issue with the front side marker lamps on my TR250.

The original bulb is rated at 2.2 watts I believe. The replacement from the 'big three' is rated at 5 watts. Installed and inadvertently left on for several hours will melt holes in the \$12.00 lenses!! Ask me how I know....

The lower wattage bulbs are available on the web from 'Bulbs.com' although I haven't ordered them as yet. I also need to replace the bulb sockets and bulb harness. These are only available from Victoria British for ~\$50.00 each! A very expensive screw up!

-Jim Bauder

Subject: Bulb Equivalents
Date: Fri, 8 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

Randall wrote:

> > Also important is the candlepower (brightness)

Glenn replied :

> Isn't the measure of brightness from an incandescent source called lumens these days?

As I understand it, they are different measurements, kind of like horsepower and torque. Candlepower is a measure of the total light output of the bulb; while lumens is the brightness in a particular direction.

One candela (the modern, color-corrected version of a candlepower) is one lumen per steradian.

<http://en.wikipedia.org/wiki/Candela>

<http://en.wikipedia.org/wiki/Steradian>

-Randall

Subject: Bulb Equivalents
Date: Fri, 8 Jun 2007
From: "Greg Gelhar" <ggelhar@earthlink.net>

Hi Bob,

Several months ago I began a chart like this. Lack of computer skills is the reason why I never finished the project. If anyone wants to see the Excel file I started that includes some obscure applications (about 50% finished), send me a message and I will attach it in my return email. Perhaps this can be finished with input from other listers.

-Greg Gelhar

Lamps

Subject: LEDs & Flasher
Date: Tue, 25 May 2010
From: Pat Ledford <pat.l@comcast.net>

I do not know if the 12 volt bulb works the same as a 6 volt LED, but what some have had to do on there 6 volt positive ground systems is to wire in one incandescent bulb into the turn signal circuit. They usually hide that one bulb in the trunk or behind the grill. That one bulb creates enough resistance to allow the flasher to work. I am a newbie to Triumphs, so in this case I may be talking through my hat.

-D Patrick

----- Original Message -----

Subject: LEDs & Flasher
Date: Tue, 25 May 2010
From: Randall <tr3driver@ca.rr.com>

> If you switch to LED's the elves will get confused, panic and flash too fast. They do the same thing when one
> of the turn signals burns out.

The LEDs draw much less current than even one incandescent bulb. In my limited tests, both the original flasher and the non-LED electronic types (at least the Tridon EL13 I tested) will fail to flash at all, with only LED bulbs.

The only flashers that will work in all cases are the ones that take a separate ground wire (so they can get enough power to operate without having to pull it through the LEDs).

- Randall

Lamps

Subject: Wattage of bulbs
Date: Tue, 20 Jun 2006
From: "Chris Buckley" <chris.buckley@tz.knightfrank.com>

Dear Listers,

The indicator on my TR4A operates very slowly and I was advised that this is caused by using bulbs of too high wattage. I cannot find what these ratings should be (there are the back and front indicators plus the side flasher, Total are 6 bulbs). While we are about it, what about other exterior bulbs eg park and brake lights. TIA.

-Chris Buckley

Subject: Wattage of bulbs
Date: Tue, 20 Jun 2006
From: "pethier@isd.net" <pethier@isd.net>

> The indicator on my TR4A operates very slowly and I was advised that this is caused by using bulbs of too
> high wattage.

In my experience, too "bright" a bulb, or adding more bulbs by hooking up a trailer, causes the flashing to speed up. These things use a bi-metal strip, and the strip will heat up faster with more current. When adding a trailer, a "heavy-duty" flasher is recommended. I'd consider trying a new flasher unit.

-Phil Ethier

Subject: Wattage of bulbs
Date: Tue, 20 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> The indicator on my TR4A operates very slowly and I was advised that this is caused by using bulbs of too
> high wattage.

More likely, IMO, the current is too low rather than too high. This can be caused by old bulbs, corroded wiring or contacts, weak ignition switch, etc. Try checking the voltage delivered to the bulb, with the bulb connected; I think you will be surprised at how low it is.

> I cannot find what these ratings should be (there are the back and front indicators plus the side flasher total 6
> bulbs). While we are about it, what about other exterior bulbs eg., park and brake lights.

Generally, turn signal and brake filaments are 21 watts. My TR4A owner's handbook 2nd ed lists:

Parking	4 watts	Lucas 222
Repeater flashing	21 watts	Lucas 382
Brake/Tail	21/6	Lucas 380
Plate Illumination	6 watts	Lucas 207
Panel Illumination	2.2 watts	Lucas 987
Headlamp (Home Market)	60/45	54521060

-Randall

Lamps

Subject: Wiring Source
Date: Tue, 17 Aug 1999
From: "Brian Sanborn" <sanborn@net1plus.com>

Check out the VTR website under maintenance. I have kept this list in my TR4 folder, for a while:

BROWN - Main fed from the battery. No switches or fuses

WHITE - Ignition circuit (IG), AGAIN with no switches or fuses.

GREEN - IG circuit, but WITH fuses and/or switches in the line.

BLUE - headlights

RED - Tail lights and side markers

BLACK - a straight ground

YELLOW - Generator connections wired through the IG

Now the main colour followed by the strip colour cases:

BROWN/YELLOW - GEN to voltage regulator (VR)

BROWN/BLUE - IG switch to VR

WHITE/RED - IG switch to the starter solenoid and starter switch to starter solenoid

GREEN/PURPLE - Brake lights

BLUE/WHITE - your high beams

BLUE/RED - your low beams

RED/WHITE - the dash lights

Lamps/Back-up

Subject: Mounting Lucas 661 Reverse Lights on TR4/4A
Date: Wed, 5 Nov 2003
From: "Chris Bohn" <cbohn@sidepipe.com>

I've got a pair of Lucas 661 reverse lamps, which were an option for the TR4/4A cars. You don't see many of these cars with the reverse light option. In his Original TR4-6 book, Piggott shows a TR4 with the correct mounting position of the lamps, just outside the rear bumper uprights. I managed to get my portly body down on the ground and took a look. I can't figure how these lamps would mount without some kind of special bracket. Anyone out there mounted 661s on the TR4/4A?

Second question: The wiring diagram for the TR4 shows circuit for the optional reverse lamps. Does anyone know if the wiring is present in the car (looks like a Green/Brown wire), or does new wire need to be put in?
-Chris

Subject: Mounting Lucas 661 reverse lights on TR4/4A
Date: Wed, 5 Nov 2003
From: <ZoboHerald@aol.com>

<cbohn@sidepipe.com> writes:

> I've got a pair of Lucas 661 reverse lamps, which were an option for the TR4/4A cars....I can't figure how
> these lamps would mount without some kind of special bracket..

The Spare Parts Catalogue lists the complete kit; there are also separate listings for the lamp, switch, harness, lead, tube (p.v.c.) and lens seating washer. If there was a bracket in the kit, it apparently wasn't sold separately.

> Second question: The wiring diagram for the TR4 shows circuit for the optional reverse lamps. Does anyone
> know if the wiring is present in the car (looks like a Green/Brown wire), or does new wire need to be put in?

As suggested above, one would originally either have gotten the wiring in the complete kit or bought the harness and lead separately. Back then, every pence counted on the relatively low-volume production of something like the TR4, so Triumph didn't usually have wiring for optional extras built into the main harnesses. Besides, with the various "Lucar" and "bullet" connectors they used, it was easy to add in supplementary wiring. ;-)

-Andy Mace

Subject: Mounting Lucas 661 reverse lights on TR4/4A
Date: Thu, 6 Nov 2003
From: <CarlSereda@aol.com>

Chris,

I believe when factory installed the optional TR4 'reverse lights' the tranny cover was removed, the tranny selector cover was removed, and a hole was drilled/tapped in appropriate place where a switch was screwed in so reverse lights were turned on when shifter was thrown into reverse. Many folks without this factory installed option later simply added a flip-switch to the dashboard either replacing the near-useless dash gauge 'dimmer switch' (tape dimmer switch up behind dash and reuse hole for your reverse switch) or by drilling a new hole about 4-5 inches above that. You might find another less destructive spot to your liking - maybe instead of a toggle switch, use a rocker switch attached below dash by your knees. Or if you're not using your overdrive escucheon on the steering column for an overdrive switch that's a handy place for a flip-switch. At this point all wiring is 'on your own' but it wouldn't hurt to keep to the proper colors!

PS; I don't know how reverse lights were attached to rear bumper/valance - maybe someone can send you a picture of their's?

Carl

Subject: Mounting L-661 reverse lights on TR4/4A
Date: Thu, 06 Nov 2003
From: "James R. Holekamp" <jholekamp@sbcglobal.net>

Greetings Chris,

Several years ago I installed a pair of Lucas L-661 reversing lamps on my '64 TR4. I wired the lights per the wiring diagram, using a Lucas SPB-101 piloted (white) pull on/push off switch on the dash in the radio mount area (I have no radio). There was no wiring for this existing in the wiring loom. I obtained the correct color (green/brown) wire from British Wiring (Olympia Fields, IL), along with the necessary black pvc tubing and ran the wiring to the lights, alongside the main harness route to the fuel tank area, alongside the wires to the license plate lights. I made a pair of simple mounting brackets using cereal box cardboard to make a pattern for sawing, filing, drilling, & bending, from a 12 ga 1-1/4 inch x 36 inch galv steel plate, obtained at the local hardware store. The brackets attach to the car at the lower over-rider mounting bolt. Since the L-661 lamp has a ground connection, I ran a ground wire (black) from the lamps back to a bolted ground point near the fuel tank - likely not really necessary - but then again the reverse lights are of doubtful use too - but I like the way they look. Perhaps one day I'll install a switch on the trans cover (as was done on TR 250/5/6) so I'll not need to remember to turn the reversing lights on/off.

-brgds, Jay

Lamps/Back-up

Subject: Reversing light switch
Date: Tue, 17 Jul 2007
From: "David Brister" <david.brister@wanadoo.fr>

Having just removed the gearbox and drive shaft cover for the first time in over 20 years, I thought it would be a good time to wire my reversing light to the appropriate switch. (Something I overlooked long ago. There was the remains of a reversing light under the rear bumper then but I removed it and fitted two of those beehive clear glass lights to the boot lid, controlled by an on/off switch under the dash..Non standard but at least you can see behind you.). So I assume there must have been an automatic switch on the gearbox. Now I can't find any reference in any of my books to a reversing light switch although it is shown as an optional extra on the wiring diagrams. My gearbox just has the two overdrive enabling switches on the top, all wired according to the book. Can anyone remember if there is or ever was such a switch fitted to a TR4A. If so could it be retro fitted? Thanks,
-David Brister

Subject: Reversing light switch
Date: Tue, 17 Jul 2007
From: "Dave B. Hammond" <dbh@hamengr.com>

Yes, you can retrofit. If the transmission top cover is not tapped for it, you will have to remove it and tap it. Switches are available from the usuals...same as the overdrive switches.
-David B. Hammond

Subject: Reversing light switch
Date: Tue, 17 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> Can anyone remember if there is or ever was such a switch fitted to a TR4A?

I believe it was fitted to some cars, possibly even required in certain markets (Belgium?).

> If so could it be retro fitted?

Sounds like someone has replaced your gearbox (or at least the top cover) in the past. As mentioned, you will need to either tap your top cover for the switch, or find one already tapped.

If memory serves, the reverse light switch on a TR4A would be in the top of the cover, over the reverse shift rail. Should be a boss there where the switch goes. The tap required is an odd metric thread though, not in the usual sets, so you'll also need to buy a tap for it.

Later cars had the reverse light switch on the side of the top cover, but I think they may have had a modified reverse shift rail as well (with a hole for the switch plunger to drop into).

FWIW, a TR250-6 top cover should work, if you can find one with the A-type switches on it.
-Randall

Subject: Reversing light switch
Date: Tue, 17 Jul 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

Here's a pic of a typical installation...

The reverse switch is, of course, the one closest to the bottom of the pic.

-Geo

Subject: Reversing light switch
Date: Thu, 19 Jul 2007
From: "David Brister" <david.brister@wanadoo.fr>

Grateful thanks to all who have helped with my reversing light query. It seems odd that my car was fitted with a reversing light ex factory and yet there is no switch on the gearbox. Perhaps Randall is right and someone has put a replacement lid on the box although nothing in the early history I have indicates that.

I am inclined to stick to the "if it ain't broke don't fix it" philosophy which has served my gearbox well for so many years.

This list certainly provides entertainment and information in generous measure. Best wishes to all,

-David Brister

Subject: Reversing light switch
Date: Thu, 19 Jul 2007
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

David,

Don't be so discouraged. It's an easy thing to do to your top cover. I did it to mine a few years ago. Just center the switch, which is the same as an OD Isolator switch, in the boss that's already on the top cover. Drill and tap it and you're done. Wiring needs to be installed of course but you have most of that in place. You do need to disassemble the top cover but again that's easily done. The top cover mechanisms are all in place as this same top cover was used on sedans which did have back up lights. Or go to a bone yard and get a top cover for a TR 6 which already has a system installed. It should bolt up to your transmission just like the TR4A cover.

-JVV

Subject: Reversing light switch
Date: Thu, 19 Jul 2007
From: <CarlSereda@aol.com>

When you ordered a TR4/4A reverse light from the factory they just added a switch to dashboard (above the dimmer switch in a similar void area near top), as removing the dash brace, rugs, tranny cover, swapping in a different gearbox cover, piercing cover for wiring harness, reassembling everything again to new condition, would be a bit much for something they probably charged \$15 for.. The Triumph Racing Green TR4 shown on Bill Piggott's first 'Triumph TR' book cover has a dash switch for the reverse light (I've pen-pal'd this guy in the UK and he's strictly a 'keep it original' type owner - and he bought his TR4 brand new).

PS- Since my own TR4 lives in cardboard boxes, I've installed a reverse switch on my transmission cover. I had a local Brit yard guy drill and tap (with the odd thread) my disassembled cover, then reassembled guts and installed switch with shims for activation on selector rail bumps. Can't wait to back up.. Regards,

-Carl

Lamps/Head/Dash

Lamps/Head/Front

Lamps/Head

Subject: Head light adjustment
Date: Mon, 25 Sep 2006
From: "Randall" <tr3driver@comcast.net>

- > Hi listees,
- > Is there a formula for a do-it-your-selfer to adjust the headlights on my TR3? I've tried but can't seem to get
- > it right.
- >
- > I remember reading something about 20 feet from a wall and putting "x"es with tape...

You need a flat, level surface for this. Pull up to the wall, and mark where the center of the headlights is, then back straight away. On high beam, the center of each beam should be where you marked the wall.

-Randall

Subject: Head light adjustment
Date: Tue, 26 Sep 2006
From: Chris Kantarjiev <cak@dimebank.com>

See: <<http://www.dimebank.com/tech/Light-up.html#aiming>>

Lamps/Head

Subject: Headlight Choices
Date: Mon, 9 Jun 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> The Land Rover has a set of IPF H4 headlamps and I think they are the best of what is out there. The cut off
> for the low beam is very sharp so properly set they do not blind oncoming cars even if the wattage is a teensy
> bit high. Like 145 Watts high beam and 90 watts low beam.

TeriAnn, I'm not familiar with IPF. Can you tell us a bit more, like what it stands for or more importantly, where to buy them? The "no name" H4 lamps I currently have on my TR3A have a lousy cutoff, and I frequently get blinked (and worse) by other traffic.

OTOH, no one ever blinks twice!! My high beams will even blind me, if I'm close to something reflective.
-Randall

Subject: Headlight Choices for TR3A
Date: Mon, 9 Jun 2003
From: TeriAnn Wakeman <twakeman@cruzers.com>

Randall Young wrote:
> TeriAnn, I'm not familiar with IPF. Can you tell us a bit more, like what it stands for?

IPF is a Japanese automotive lighting company well know in Japan and the Australian 4X4 world.

American 4X4 folks tend to think of them as being as good or better than Hella at half the price or less. or more
> importantly, where to buy them?

I by my IPF lighting through British Pacific:

<http://www.britishpacific.com/offroad/IPF_lighting.html>

The owner, Steve Hedke, drives a TR3 "Scrappy" in the annual great race rally. While British Pacific is a Land Rover parts house, they do have things like the IPF lighting, Lucas colour coded wire for sale by the foot, Lucas wire connectors and other electrical system parts. They are a mail order house. Call them @ 800-554-4133 and ask for Marty. Mary is a long time Triumph enthusiast and can help with Lucas electrical parts for Triumphs as well as IPF questions.

> The "no name" H4 lamps I currently have on my TR3A have a lousy cutoff, and I frequently get blinked (and
> worse) by other traffic.

With the 90 Watt low beams I see well long distances ahead and properly adjusted, no one flashes their lights at me.

When I pull up behind a car at a traffic light I can see the sharp cut off on the back of the car in front. In fact that is how I finally adjusted the headlamps. I parked about 10 feet behind a car and se the cut off line a little below the base of the rear window.

Of course with 280 watts total high beam, I dip my high beams way in advance of any oncoming traffic. The only reason I have not fitted them to the TR3 is that I like the look of my PL700's too much.

Of course you can fit any wattage bulb. It doesn't have to be the super high watt ones.
-TeriAnn J. Wakeman

Lamps/Head

Subject: Headlight recommendation
Date: Mon, 10 Apr 2006
From: John Wise <60TR3A@cox.net>

>Hi,
>I would like to replace my dim headlights on my TR4. I am looking for bright lights that I can use with my
> generator and existing wiring.(I am not ready to convert to an alternator). Does anyone have a
> recommendation? Also how important is it to add relays to the existing wiring.

I use Hella European H4 headlights with 60/55W, but ultra-white bulbs.

Victoria British sells them as do most regular parts places. The European H-\$ keeps the light on the road & out of the other driver's eyes. When I lived in FL., I used to run 110/90W bulbs in my 911. Then I switched to the normal 60/55w ultra white & got the same visual performance.

The V-B URL for the page with the light is:
<<http://www.victoriabritish.com/icatalog/tc/0020.html>>

They are in the upper left hand corner. Shop around, the Hella H4's are available in lots of places!
-John A. Wise

Lamps/Head

Subject: Proper Fog/Driving Lamp configuration for a TR3?
Date: Sun, 28 Jul 2002
From: "Jim Hill" <jrhill@chorus.net>

Graham Stretch wrote:

>> Something no-one else has mentioned, the fog light should be wired so it is available on sidelights
>> (best check local regs regarding this) and dip beam only, it should go out when main beam is
>> selected, the reason being if it is foggy main beam just bounces, if it is clear enough for main beam
>> you don't need a fog light on! These are the long standing regs for UK.

> Geoff Burns wrote:

> I have had it explained to me on more than one occasion that the real purpose of the fog lights is to
> make your vehicle more visible to others in foggy conditions. Contrary to popular belief, its primary purpose
> is not meant to help you see where you are going.

> And Graham replied:

> I realize that this is one of its prime functions, but you still have to stay within the regulations, and I was
> stating the reasoning behind the (UK) regulations as I have seen it written. The main function of the fog lamp
> is to provide a wide flat topped beam of light from a location low on the vehicle which will project below the
> fog, as fog is generally less dense the nearer to you get to the warmth of the earth.

Let's see if I've got this right now:

- 1) There are times when you want to be able to run the fog light with the headlights off but the running lights on.
- 2) There are times when you want to have the headlights on, both bright & dim, but without the fog light or the driving light.
- 3) There's not likely to be any occasion when you'd want the fog light unless either the running lights are on or the headlights are on and set to dim.
- 4) There's not likely to be any occasion when you'd want the driving light on unless the headlights are on bright.
- 5) Whenever the driving light is on, the fog light should be off, and vice-versa.

Of course you can accomplish all of this with entirely separate and independent switches for the fog and driving lights, but if you want to "automate" the process as much as possible, you'd have to:

A) Have separate on/off switches for the fog light and driving light. When those switches are off, neither the fog light nor the driving light will be illuminated regardless of the position of the headlamp switch or the dimmer switch. When either or both of the separate switches are on, the illumination of the fog and driving lights will depend on the position of the headlamp switch and the dimmer switch.

B) Wire the fog light switch so that when the switch is on:

i) The fog light will turn on when the running lights are on and the headlamps are off - regardless of the position of the dimmer switch

ii) The fog light will be on when the headlamps are on, but only when the dimmer switch is in the 'dim' position

C) Wire the driving light switch, so that when the switch is on, the driving light will be on only when the headlights are on and the dimmer switch is in the 'bright' position.

Is that close?
-Jim Hill

Lamps/Head/Dimmer Switch

Subject: Cheap TR 6 Headlight Dip/dimmer Switch
Date: Wed, 25 Oct 2006
From: KURT JOHNSON <kajohns64@yahoo.com>

I traced my non-working headlights to a faulty dimmer switch. A new switch is \$60 from the Triumph catalogs. I bought one from Advance Auto parts made for a '75 Chevy P/U. Looks very close to the original, plugs in with the original wiring connectors, and was only \$5.98. The mounting flange is a little wider requiring drilling one hole in the mounting bracket. I hope this info is helpful

-Kurt Johnson

Subject: Cheap TR 6 Headlight Dip/dimmer Switch
Date: Thu, 26 Oct 2006
From: "KURT JOHNSON" <kajohns64@yahoo.com>

Cosmo Kramer <tr4a2712@yahoo.com> wrote:

- > Hi Kurt!
- > Question: Are you talking about the switch that inserts into the steering column (Flash to pass)? OR
- > The switch that works the Headlamps from low beam to high beam & back again, that mounts on the floor
- > (actually it's on the left side bulk head)?
- > -Cosmo Kramer

It is the floor mounted high/low beam switch I'm talking about. It has the flat blade like connectors.

-Kurt Johnson

Lamps/Head/Dimmer Switch

Subject: TR3 Dimmer switch
Date: Thu, 26 Oct 2006
From: <Acey2525@aol.com>

Hi guys,

Has anyone ever had a problem with their dimmer switch? Can they short out internally? My alternator is discharging only with the lights on and after I've used the dimmer switch. Riding along at night I put the high beams on everything is OK...switch to the regular lights and they go dark and I have to play with the dimmer to get the regular lights back on. I took the dimmer off and made sure that the connections weren't touching the floor when I press the dimmer. I also wonder why it wouldn't just blow a fuse if it did short out, I ripped every wire out of the car and installed a Dan Masters harness a year ago and I know it's the electrical system is rock solid. It's not discharging all the time, it seems like it only does it after I run with the lights at night and after using the dimmer switch. Thanks for your help.

-Jack

Subject: TR3 Dimmer switch
Date: Thu, 26 Oct 2006
From: "Randall" <tr3driver@comcast.net>

> Hi guys,

> Has anyone ever had a problem with their dimmer switch? Can they short out internally?

Headlight dimmer, not dashboard dimmer, right? Although anything is possible, I think it's very unlikely. I've never seen one do that. More likely a short in the wiring on the load side, IMO.

> OK...switch to the regular lights and they go dark and I have to play with the dimmer to get the regular lights
> back on.

I assume by "regular lights", you mean the low beams? Are you sure you aren't turning the high beams back on?

> I also wonder why it wouldn't just blow a fuse if it did short out, I ripped every wire out of the car and
> installed a Dan Masters harness a year ago and I know it's the electrical system is rock solid.

That does seem odd ... did you follow Dan's schematic? If so, how do you know it's discharging (his schematic has no ammeter since Dan, like TeriAnn, doesn't believe in them)?

For maximum voltage to the headlight bulbs, Dan's harness (like the factory harness) does not use fuses in the headlight circuit. So one possible explanation is that you have a short on the load side of the low beam relay (between the relay & the headlights). But that wouldn't explain why they work after fiddling with the dimmer switch ... unless it's the high beams you see work.

-Randall

Subject: TR3 Dimmer switch
Date: Fri, 27 Oct 2006
From: TeriAnn Wakeman <twakeman@razzolink.com>

>Hi guys,

> Has anyone ever had a problem with their dimmer switch? Can they short out internally?

Normally the contacts oxidize and get dirty over time if they are not switched frequently. The oxidized contacts do not make a good contact and the other beam does not come on because of an open circuit. Working the switch will usually get it to work after a while. Once the contacts become corroded they can be problematic.

The switch is not likely to be your shorting out point. Check for debris build up around the external foot switch connections and at the headlamp sub-harness.

The bulbs are the resistive load. If there is an internal short that cuts down the filament resistance you could draw more current than you generator could produce.

-TeriAnn

Subject: TR3 Dimmer switch
Date: Fri, 27 Oct 2006
From: <zoboherald@aol.com>

- -----Original Message-----

<twakeman@razzolink.com> wrote:

> Hi guys,

> Has anyone ever had a problem with their dimmer switch? Can they short out internally?

Normally the contacts oxidize and get dirty over time if they are not switched frequently. The oxidized contacts do not make a good contact and the other beam does not come on because of an open circuit. Working the switch will usually get it to work after a while. Once the contacts become corroded they can be problematic.

==AM==

And that's exactly what I've gone through with my current Herald (which I bought from someone who had put 700 miles on it in 13 years). Occasionally, I'd find myself in "blackout mode" after using the foot dimmer switch. But more frequent night driving and use of the switch has just about eliminated that problem in the four years since I bought the car (and put about 26,000 miles on it). ;-)

-Andy Mace

Lamps/Head/Dimmer Switch

Subject: TR3A-4A Dimmer Switch
Date: Mon, 18 Dec 2000
From: <Gbouff1@aol.com>

Well,

The existing dimmer switch on my TR3A is looking better and better. I went to the local part shops and even looked thru their catalogs but found nothing that came close to the TR3 headlight dimmer switch. Went down to the basement, wire brushed the old switch, redrilled the center post and rivited the switch cap back on. Checked out the switch with a multi meter and painted it with aluminum paint. It should hold together and beats spending \$40-\$50 for a new one.

-Gary Bouffard

Lamps/Head/Dimmer Switch

Subject: TR4 high beam switch
Date: Thu, 21 Sep 2006
From: Bob Labuz <yellowtr@adelphia.net>

Ok, I need to know how to connect the dipper switch.

On the back of the switch are 3 terminals:
one with a number "1", another with a "F" (in the center) and the last with a number "2"

The wires are Blue/White, Blue/Red, and Blue
-Bob

Subject: TR4 high beam switch
Date: Thu, 21 Sep 2006
From: "Randall" <tr3driver@comcast.net>

> I need to know how to connect the dipper switch. ...

Bob, I've seen too many cases where the switch markings are misleading, missing or wrong (although not specifically on a TR4 dipper switch). So, I always like to "buzz" out the switch contacts. This also helps ensure that the switch is good, before I install it and have to wonder what I've done wrong.

Using an ohmmeter, or self-powered test lamp (either one is available from Horrible Freight for just a few dollars), put the switch into the "low beam" position (which I believe is "stalk up") and look for the pair of terminals with continuity. Make a mental note of the third terminal. Now flip the switch to the "main beam" position, and test again.

The terminal that had continuity both times gets the Blue wire (which comes from the main headlight switch). (I think it's likely this is the 'F' terminal, but like I say, it's better to test.)

The terminal that had continuity only in the "low beam" position gets the Blue/Red wire (which goes to the low beam filaments in the headlights).

The remaining terminal (with continuity only in the "main beam" position) gets the blue/white wire, which goes to the indicator in the speedo, and the main beam filaments in the headlights.

-Randall

Subject: TR4 high beam switch
Date: Fri, 22 Sep 2006
From: Bob Labuz <yellowtr@adelphia.net>

Randall wrote:

> Bob, I've seen too many cases where the switch markings are misleading, ...

Randall,

Thanks for this tip. Got the olm meter out and not only checked out the switch (which worked fine) but now have all 3 wires connected correctly. You were right; the solid blue wire went to the center terminal (F).

-Bob

Lamps/Tail

Subject: Bulb Question
Date: Fri, 29 Jun 2007
From: "Greg Gelhar" <ggelhar@earthlink.net>

- > In a 2 filament bulb (e.g. an 1157 for parking lights/turn signals) is one filament brighter than the other?
- >
- > If yes... Any easy way to know which is which other than just touching a lead to each contact and seeing
- > which looks brighter?
- > -Geo

That style bulb has an indexed (offset holding pins) double contact bayonet base. If you hold the bulb sideways by the glass portion to the right with the holding pins showing on the sides, the contact closest to you is the brighter filament. But that is hardly any easier than touching a battery power lead while holding the base to chassis ground.

-Greg Gelhar

Subject: Bulb Question
Date: Fri, 29 Jun 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

Thanks for the quick replies. They at least got me thinking about where I might find a picture on a website...

<<http://mgaguru.com/mgtech/electric/et107a.htm>>

-Geo

Lamps/Tail/Brake

Subject: Brake light bulb failure
Date: Fri, 29 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

> So wherever Toyota gets their bulbs, must be pretty good, and perhaps a source that could help defeat the
> "Prince" ... at least that is my experience

I'll agree, there seems to be a huge variation in lifetime of the combo brake/tail bulbs on the market today. I've had a "no name" bulb from a discount store fail within minutes of installing it. And my personal experience has been that Philips bulbs seem to fail much sooner than GE. (Side note: When I worked for Philips, the maintenance department insisted that Philips bulbs lasted less than half as long as GE.)

But there is also a sizeable variation in rated lifetime of different bulbs. I've recommended 2357 bulbs in the past, because they are roughly 25% brighter than "standard" 1157 bulbs; but they also have a much shorter rated lifetime (approximately 1/3 that of the 1157).

However, Craig's case sounds odd to me. My first step would be to verify that the "bad" bulbs are, in fact, burned out. Using the DMM that IMO every old car owner should carry with them.

Set the meter to "ohms X1". The display should show full scale, or infinite resistance. Touch the leads together and verify that the reading goes to (nearly) zero. Now hold one lead to the brass bulb base, and touch each contact in turn with the other lead. You should see a low resistance reading (a few ohms or less) for each contact. If not, the associated filament is burned out (or broken, etc.)

I'm also wondering what happens when the tail lights are not on. If there is a light visible without the brake pedal depressed, then there may be a wiring problem with the car.

-Randall

Lamps/Tail/Brake

Subject: Brighter brake lights
Date: Wed, 21 Apr 1999
From: Randall Young <randallyoung@earthlink.net>

Hi listers :

Jack Brooks asked about my brake lights & I didn't know the answer off-hand. Others might be interested, so here it is :

I use **2357** lamps instead of the normal 1157 lamps for my TR3A brake lights, and **2357NA** for front park/turn lights. The 2357's are exact replacements, but the bright (brake/turn) filament is 25% brighter than 1157. This is a very noticeable difference. Although the rating is the same, the tail/park filament looks a little brighter to me, too.

They only draw about 5% more power, so wiring and heat are not a concern as with the halogen bulbs.

The only downside is shorter rated life (400 hours vs 1200 hours on the brake/turn filament), but my experience has been that GE 2357's will outlast Sylvania 1157's. I don't keep my foot on the brake that much anyway !

I paid \$2.50 for two 2357, \$4.00 for two 2357NA last time I bought them. You can find them in almost any auto parts store (AutoZone, Kragen, Pep Boys all have them), although the GE brand is a bit harder to find. I suspect the wholesale price on the GE bulbs is higher, but I feel they are worth it! IMO any brand is better than Sylvania
-Randall

Lamps/Tail/Brake

Subject: TR6 electrical - Rear Tail Lamp
Date: Thu, 12 Aug 1999
From: <Bud_Rolofson@nps.gov> (Bud Rolofson)

> 2. When all lights are on, applying brake will cause all left rear lights to go off (again, new > bulbs did not help).

Check your red wire and your green/purple wire at the tail/brake light and/or in the harness if possible, to make sure they don't have a bare spot that's rubbing together and making them act like one wire or maybe something at the connections (dirt/grunge/spider web/pushed together) at the tail/brake light that is making them become one.

This sounds like an earth/ground fault on the left rear light assembly. Check all the earth connections: both that they exist and that they are clean/making good contact. If that does not work, quickly check the right assembly - stranger things have happened.

If you loaded your trunk for your trips, like I did for VTR, then something might have crunched your wiring together in the trunk.

-Bud

Lamps/Tail/Turn Signal

Subject: LED lighting on old TR's
Date: Mon, 19 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

> One of the things I would like to do, during the conversion is to put LEDs in the running, brake, & turn signal
> lights. I think it is a change that will make my little car easier to see in all conditions.

My advice is to "go slowly" on this, John ... I've been eyeing the conversion myself but it's not nearly as straightforward as many vendors would have you think. In general, the LEDs actually put out less total light than a regular tail light bulb (especially if you upgrade to the 2357 incandescent). What they do is put out a fairly narrow beam of bright light (somewhat like a headlight does), which then has to be aimed at the people you want to see it. Unfortunately, the stop & tail bulbs on a TR3A are at a funny angle to the world, so usually the stock LED replacements wind up pointing at the ground where they aren't as easily seen.

> To use LEDs as turn signals however you need an electronic flasher. I am assuming the since LEDs draw less
> current a thermal flasher will not heat up enough to cause the flash.

This is true. But one way around this is to add a resistor to act as a load on the flasher.

> I have searched Google & Amazon & found lots of electronic flashed but only a few of them explicitly
> mention use with LEDs. Has anyone converted their TR to LEDs or is there an EE out there who can point me
> in the correct direction???

I would try a Tridon EL13 electronic flasher (which should be easily available at the local parts store) and see if that works. If not, add the resistor.

-Randall

Subject: LED lighting on old TRs
Date: Mon, 19 Mar 2007
From: John Wise <60TR3A@cox.net>

>> One of the things I would like to do, during the conversion is to put LEDs in the running, brake, & turn
>> signal lights. I think it is a change that will make my little car easier to see in all conditions. My advice is to
>> "go slowly" on this, John ... I've been eyeing the

> conversion myself but it's not nearly as straightforward as many vendors would have you think. In general, the
> LEDs actually put out less total light than a regular tail light bulb (especially if you upgrade to the 2357
> incandescent). What they do is put out a fairly narrow beam of bright light (somewhat like a headlight does),
> which then has to be aimed at the people you want to see it. I recognize that limitation.

The LEDs themselves are not all that expensive, So I thought I would buy a couple & do a little comparison on a dark night LED on one side regular bulb on the other, For the turn signal, at least in the rear, I figure this is not a big deal. For the brake & rear running light I thought I would use a red LED that has LEDs on both the back & sides.

> Unfortunately, the stop & tail bulbs on a TR3A are at a funny angle to the world, so usually the stock LED
> replacements wind up pointing at the ground where they aren't as easily seen.

At least low riders would not hit me. :-)

>> To use LEDs as turn signals however you need an electronic flasher. I am assuming the since LEDs draw
>> less current a thermal flasher will not heat up enough to cause the flash. This is true. But one way around
>> this is to add a resistor to act as a load on the flasher.

Hmmmmmm, I knew there would be "Double E" out there

>> I have searched Google & Amazon & found lots of electronic flashers but only a few of them explicitly
>> mention use with LEDs. Has anyone converted their TR to LEDs or is there a EE out there who can point
>> me in the correct direction??? I would try a Tridon EL13 electronic flasher (which should be easily

>available at the local parts store) and see if that works. If not, add the resistor.

Thanks for the advice, I have seen it on Amazon & other sites.. I figure I have plenty of time to experiment before 1) I get my kit, & 2) before I get it installed. Summers in PHX are not really garage time, Dan was having a \$50 off sale so....

-John

Subject: LED lighting on old TRs
Date: Mon, 19 Mar 2007
From: John Wise <60TR3A@cox.net>

Bob Danielson wrote:

> John, I'd strongly recommend running this by Dan first. I asked him about doing the same thing about 18
> months ago and he wasn't too keen on the idea at the time. Maybe things have changed but I sure value his
> opinion and expertise in this stuff.

I actually asked when I placed my order & he replied: The flashers we supply are of the thermal/mechanical type, and most likely will not work with LEDs. However, there are replacement flashers available that will work with LEDs, and as I understand it, they plug directly into the sockets we supply for the flashers. There may be an additional ground wire that needs to be connected to make them work, but I'm not sure of this.

-John

Subject: LED flasher
Date: Wed, 21 Mar 2007
From: "Jim Wallace" <grandfatherjim@gmail.com>

John Wise <60TR3A@cox.net> wrote:

> I just ordered a Dan Master's wiring kit for my TR3A..... One of the things I would like to do, during the
> conversion is to put LEDs in the running, brake, & turn signal lights. To use LEDs as turn signals
> however you need an electronic flasher. I am assuming the since LEDs draw less current a thermal flasher
> will not heat up enough to cause the flash.....has anyone converted their TR to LEDs or is there a EE out there
> who can point me in the correct direction??? Thanks

> -John

John,

I have a D.M. kit and thought of using LEDs for the turn signals too. It turns out the socket for the flasher is very close to the panel, such that most flashers won't physically fit. As this comes before electrical considerations I have decided to go for regular bulbs, as bright as I can find. Randall, you mention some other model (2357?), will they make the flash quite a bit faster? Thanks,

-Jim

Subject: LED flasher
Date: Wed, 21 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

> Randall, you mention some other model (2357?), will they make the flash quite a bit faster?

It wasn't a problem for me. They draw only very slightly more current than 1157 bulbs (about 5%); the rest of the brightness increase comes from optimizing the filament more for brightness and less for long life. The downside is that they don't last as long; but they still lasted several years for me. There is also a 2357LL (LL for Long Life) which in theory should still be as bright but last longer. However, I haven't compared them myself. Note that these are dual-filament bulbs, suitable only for the front park/turn signals on a stock TR3A (etc.) I changed my bulb holders in the rear to use them there as well. However my chart shows a 2396 that should work in the stock rear turn signals on a 3A.

-Randall

Lamps\Tail\Turn signal

Subject: Turn Signal
Date: Fri, 12 Sep 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> The right side, front and back, work. The left side, front and back, do not work. The DPO was in the habit of
> running new lines whenever he had a problem so you know it's an electrician's nightmare and I really don't
> have a clue regarding this. The front running lights on both sides work and the bulbs are good. I listened to
> the flasher and it was making the blink-blink noise on the side that's OK and quiet when I put the left side on.
> Where do I start? I have a 12 volt test light-- that's about it.

Well, since the RH signals work, you know the wiring to the flasher, the flasher itself, and the wiring from there to the turn signal switch is good. Find the harness that runs from the steering box up to the connectors on the inner fender, and identify the 3 turn signal wires, which should be some variation of green. There are only 4 wires in that harness, the fourth one should be brown/black and a heavier gauge. Connect the ground clip for your test lamp to a good chassis ground, then with the RH flashers blinking, connect the test lamp to each of the turn signal wires in turn. Two of them should make the test lamp blink, the third won't. This third wire should be green/red, and feed the LH turn signals.

Move the lever to the LH position, key still on, and connect your test lamp to the green/red wire (other side still to ground). If it comes on, the problem is between there and the lamps (or possibly the lamps themselves and/or their ground connections). If not, the problem is the switch itself, or the wire to the switch. Check on both sides of the connector, they sometimes fail too.

> How hard is it to replace the wiring harness?

I can't comment on that, but I will say that replacing the main harness is not going to solve this problem. Since the RH lamps work, you know the main harness is good to the point the control head harness connects to it. From that point to the front lamps is only control head harness and lamp harness.

The control head harness is available from TRF, **P/N 502355**, \$29.95 in the price list I've got handy. Just replacing it can be either an afternoon project, or many days, depending on how things go. If the 3 little grub screws in the steering wheel come out easily, and you don't lose any of the tiny parts from the control head, or break anything, then likely it's an afternoon project.

-Randall

Lamps/Trouble Shooting

Subject: TR4A Signal Light Flasher - wiring
Date: Sun, 27 Aug 2000
From: "Brian Sanborn" <sanborn@net1plus.com>

-----Original Message-----

Subject: TR4A Signal Light Flasher
Sent: Sunday, August 27, 2000
From: <Gerald M. Van Vlack>

I have a problem with my signal lights on a TR 4 A. The problem is that while the front and rear lights flashed and signaled a right or left turn; the green indicator on the dash only worked occasionally and more recently did not work at all. The bulb is fine.

I assumed that the flasher was defective so I purchased a new flasher unit and installed it (#550 three terminal unit and the same as I pulled out). Now the green bulb on the dash stays on all of the time but it does flash when I signal a turn. It goes off when the turn signal bulbs flash on and on when the bulbs flash off. Once the turn is complete and cancels the turn signal lever the bulb again stays on all of the time. I tried this in the parts store lot and went back in and exchanged the original flasher unit I purchased as I thought it was defective. The second unit they gave me did the same thing. I drove home with a bright green light in my eyes wondering how late the Prince of Darkness stayed up dreaming up this little treat to be dealt with. Anybody have any ideas on how to put him to sleep. -Jerry Van Vlack

Jerry,

I am no Dan Masters by any stretch... but when I read the TR4/A circuit diagram on page 6-104 of the shop manual... the symptom appears as if the hot battery input (green - pin marked B or [1]) is swapped with the turning lamp switch side (green/brown - L or [3] pin).

If the flasher is working correctly... The middle pin on the flasher going to the dash indicator (light green/purple - pin P[2]) will reflect the same voltage as the green/brown on the L[3] pin (marked L). Figure 44 on page 6-124 shows the physical layout of the flasher socket for reference.

Hope this helps rather than causing confusion. The flasher operation could be tested at the workbench with a 12v source for the B[1] pin and a bulb for the L[3] side. The voltage on the P[2] pin could be read with a meter.
-Brian Sanborn

Subject: TR4A Signal Light Flasher
Date: Sun, 27 Aug 2000
From: Steve Reilly <Luckyone@sympatico.ca>

Gerald,

I had the same problem replacing the 3-pronged flasher unit for my hazard unit. The hazard light would stay on when the hazards were "off", and would flash when the hazards were turned on. I think the problem is with the flasher unit itself, it is wired inside differently.

I tested an old one, and the new unit, and sure enough, there was a difference. The old flasher unit connects the circuit when power is applied, and the new flasher unit disconnects the circuit when power is supplied. Since the new unit is always "on" when the hazard switch is off, the hazard light was always on. With the old unit, the hazard light is always off, because the hazard unit is off by default when the hazard switch is off.

As a temporary measure, I used extension leads and a splitter to connect a 2 pronged flasher to the 3 female connectors.

Basically, the purple wire is connected to "X" on the flasher unit, and both other wires (light green?) are connected by a splitter to the "L" terminal.

Worked for me, but I don't know if the TR4A is wired that much differently and I looked at a wiring diagram for a minute to see if it would interfere with any other electrical circuits.

-Steve

Subject: TR4A Signal Light Flasher
Date: Mon, 28 Aug 2000
From: <DANMAS@aol.com>

<jerryvv@worldnet.att.net> wrote:

Jerry,

Your problem is your 550 flasher. I have two of them in my shop, an old one and a new one. The old one works as it should for your TR4A, and the new works just as you describe. There are six ways to wire the flasher in your car (using the existing three wires), and none of them will produce the symptoms you describe, so your wiring is not the problem. BTW, the 550 flasher is NOT a turn signal flasher, it is a hazard flasher. That means it will continue to flash even if one of your bulbs is burned out, so you won't get a warning as you would with a true turn signal flasher. If you use a hazard flasher, you will need to check the condition of your bulbs regularly. Right offhand, I don't know a part number for a replacement for the 550, other than buying a Lucas replacement, but if I find one, I'll let you know.

-Dan Masters

Lamps/Trouble Shooting

Subject: TR4A wiring
Date: Mon, 30 Sep 2002
From: "Randall Young" <ryoung@navcomtech.com>

> Ok the new wiring harness is not a plug and play concept. Help, my front parking lights and rear
> running lamps as well as my instrument lights are on when I start the motor. If I operate my headlamps
> (only my low beams work) the ignition switch won't shut the motor off. I need to shut off the headlamp
> switch to shut the motor off. What am I doing wrong...

Here are some thoughts that may help:

Obviously, you've created a short between the two circuits, which interestingly are the two circuits present at the fuse block in a TR4A. I think I would start by removing both fuses and seeing what happens. Removing one of them should disable everything normally powered by the ignition switch, except the coil and 'IGN' warning lamp. The other one should disable all the marker, tail and dash lamps (but not the headlamps).

Another likely suspect IMO is the wiring around the headlight switch, as it gets both switched and unswitched power. If the feed from the ignition switch were somehow cross-connected to the feed to the fuse block (from the headlight switch), that would cause your symptoms. Or, the switch itself could be bad.

I've got a TR4A wiring diagram that Dan Masters worked up, let me know if you'd like a copy. I understand it's not found in the factory manuals ...

-Randall

Rear Suspension/Differential

Subject: Cracked TR6 diff mount - how bad does it have to be to clunk?
Date: Tue, 2 Jan 2007
From: "Lanoway, Brian" <Brian_Lanoway@standardaero.com>

I've been chasing a mysterious clunk in the rear suspension of my TR6 for several years - I've replaced virtually everything in my rear IRS in the process. The clunk came as the rear of the car rose and fell with changes in the road - it was never really obvious under acceleration or deceleration, and it disappeared when I put the car in neutral at speed. At times, the clunk was bad enough that you could feel it while in the passenger seat.

I finally removed the diff yesterday and yes, there is a barely discernable crack, just forward of the stud on the forward diff mount on the passenger side. I put a pair of vice grips on the stud and heaved it back and forth to get the crack to open. I could barely, barely see the edge of the crack change while I did this.

I do intend to weld up the crack and will install the diff mount reinforcing brackets from TRF at the same time, but my question is this: How bad does this crack have to be to produce a clunk in the rear suspension? Is a barely discernable crack enough to cause the clunk - or should I continue to look elsewhere.

I'm also going to get a shop to check out my diff while it's out of the car, but in the meantime, I sure would appreciate the wisdom of the list when it comes to cracked diff mounts.
-Brian Lanoway

PS: Does anyone have useful advice when it comes to welding in the four diff mount side reinforcing brackets from TRF? This will be done on a complete car on jack stands with only the diff removed. Getting at and welding in the outboard brackets looks like a real challenge.

Subject: Cracked TR6 diff mount - how bad does it have to be to clunk?
Date: Tue, 02 Jan 2007
From: <ghamilton99@comcast.net>

Brian:

I too discovered a crack in the lower horizontal brace that the pin goes through. The DPO had done a crappy job of trying to weld it. I am going to weld a large shock washer I have lying around to beef it up a little, but am not going to bother with the brackets.

PS. I did not have the infamous "clunk", I had the diff out for other reasons; don't ask.
-Gary J. Hamilton

Subject: Cracked TR6 diff mount - how bad does it have to be to clunk?
Date: Tue, 02 Jan 2007
From: "sherman" <cm.sherman@verizon.net>

You may also want to inspect the prop/drive shaft and the u-joints. They also may be the culprits, as well as the flanges which may be elongated, all contributing to the noise.

Regardless on the condition, you might as well perform the reinforcement if you're addressing the problem. These are a point of weakness, and an ounce of prevention will go a long ways.
-Corey Sherman

Subject: Cracked TR6 diff mount - how bad does it have to be to clunk?
Date: Tue, 2 Jan 2007
From: <Davelmassey@cs.com>

<Brian_Lanoway@standardaero.com> writes:

> I've been chasing a mysterious clunk in the rear suspension ... disappeared when I put the car in neutral at
> speed.

That sounds like the spline joints in the ½ Shaft binding. (EG: it goes away when in neutral) Have you greased these lately?

-Dave

Subject: Cracked TR6 diff mount - how bad does it have to be to clunk?
Date: Tue, 2 Jan 2007
From: <TR250Driver@aol.com>

Just for the sake of discussion. I was chasing what seemed like a clunk in the TR3B's rear. Replaced everything W/O success. About a month ago when the body was removed from the frame a broken body mount bolt was discovered driver's side in the rear, therefore the body must have been slapping the frame as the suspension rose and fell. Just something to think about,

-Darrell

Subject: Cracked TR6 diff mount - how bad does it have to be to clunk?
Date: Tue, 02 Jan 2007
From: <acekraut11@aol.com>

Brian,

Check out my car on the <triumphowners.com/108> web site. In the photos section in the third row you can find some pictures of my own fun with this type of repair as well as the solution that fellow lister Rick and I came up with.

I wouldn't necessarily trust the outcome of your vice grips test since the car will certainly apply more force than you can by hand. Once you have this problem repaired you can take it for a drive and find out if it is your problem or not. That will be the only truly accurate test of the source of your clunk. The problem may be worse than you can tell by your test. And, not to try to take any business away from TRF (I certainly send quite a bit their way) but I had a friend make up the brackets for me from a template. I suspect that any metal shop can also do it easily, probably quicker and cheaper than it would take to order and receive the parts. I have attached a copy of the template.

My experience is that the driver's side front mount will be just fine and I suspect that you really don't HAVE to weld it since it doesn't receive the majority of the stress. If you do choose to weld that side then you will only be able to get the inside bracket welded in. There isn't enough room for the outside bracket. There is enough room to weld the passenger side mount but it won't be fun, especially on your back under the car. For me, Rick was a lifesaver, having the welding equipment and having a lift in his garage at home.(Thanks again Rick) Also, depending on the exhaust in your car it may be impossible to weld in that space without removing it.

Incidentally, the driver side rear mount receives the next most stress so it would pay to check that mount very carefully also.

One other thing. After re-reading your post I am unclear as to exactly where the crack is. It is possible that the crack you reference is on the bottom of the bracket, on the flat part lowest on the car then where the stud is welded to the cross member above could be completely loose. On my car the crack on the lower portion went through from one side of the bracket to the other and the stud was completely free up above.

Let me know if you have any questions or if parts or all of this doesn't make sense.

-Aaron

Subject: Cracked TR6 diff mount - how bad does it have to be to clunk?

Date: Tue, 2 Jan 2007
From: "Randall" <tr3driver@ca.rr.com>

> Just for the sake of discussion. I was chasing what seemed like a clunk in the TR3B's rear.

Strangest clunk I ever chased turned out to be in the brakes. The rear brakes on some early TR3As didn't have hold-down springs, but rather adjustable posts for the shoes to rest against. Not sure if the posts were just badly worn, or if some DPO had miss-adjusted them, but the shoes were not parallel to the drums. When the brakes were applied, the shoes would move out away from the posts, then it'll fall back with a clunk.

As I recall, the posts were also some flavor of Whitworth threads, and ran in nuts welded to the backing plates.
-Randall

Rear Suspension/Differential

Subject: High engine rpm
Date: Fri, 20 Jul 2007
From: <acs25m@swbell.net>

I own a TR250 that I am having problems with. The car had 185/65r 15 tires on it when purchased. I knew that these were not the right size tires and it was causing my Speedo to be off. Well I recently purchased replacement

205/70r 15 tires and with my wife pacing me in another car the Speedo is now correct. My problem is that the engine is still running at a higher rpm than I think it should. At 60 mph my tack registers right at 3500 rpm. I downloaded an excel spread sheet that was talked about on line and the only way to get that rpm reading would be with 4.55 gears. I don't have an overdrive and highway driving makes the car overheat. Short of removing and disassembling the rear end is there any way to tell what rear-end gears are really in the car.

Any help would be appreciated,
-John R Maneke

Subject: High engine rpm
Date: Fri, 20 Jul 2007
From: "Terry Geiger" <tgeiger@shoalsbritishcars.org>

John R Maneke <acs25m@swbell.net> wrote:

>I own a TR250 that I am having problems with. The car had 185/65r 15 tires on it when purchased. I knew ...

John,

Check your tach against a known good tach, as the tachs can become inaccurate over time. An electric tach can be used to test with.

Your car should be running about 3000 rpm at 60 mph in top gear (assuming no overdrive). The speedo and tach were design to track with each other in top gear so 2,000 rpm should get you 40mph, 3,000 rpm 60 mph and so on.

-Terry Geiger

Subject: High engine rpm
Date: Fri, 20 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> At 60 mph my tack registers right at 3500 rpm.

Could be the tach is wrong. Should be closer to 2900 rpm (with 205/70-15 tires & 3.7 gears), and reading 600 rpm high isn't terribly uncommon for these old mechanical tachs.

> Short of removing and disassembling the rear end is there any way to tell what rear-end gears are really in the
> car.

Lots of ways. If you jack up one rear wheel (leaving the other touching the ground or otherwise blocked from turning), you can put a mark on the wheel and on the drive shaft and count how many turns the drive shaft makes for 2 full turns of the wheel. The drive shaft will turn less than 4 full turns if you have the standard 3.7 gears; more than 4 full turns if you have 4.1 or 4.55 gears.

To get a more accurate value, turn the wheel 20 full turns, giving 37 turns of the drive shaft for a 3.7, or 41 or 45.5 for the other ratios.

-Randall

Subject: High engine rpm
Sent: Friday, July 20, 2007
From: <jimmuller@rcn.com>

Terry Geiger wrote:

> The speedo and tach were design to track with each other in top gear so 2krpm should get you 40mph, 3k rpm
> = 60 mph and so on.

Through the clever use of advance technology before the development of microprocessors, Triumph engineers were able to make the engine speed and road speed track linearly with each other no matter what gear you were in! And of course, if he fixes his mal-adjusted tach so that it reports rpms correctly that will also cure his overheating on the highway.

But all seriousness aside though, when I read that original posting I was struck by the tire size issue. (Did the TR6 really come with 205/70's?) I wondered if maybe a PO had tweaked the tires and/or diff to get better torque to the wheels at the cost of higher rpms. A PO might have changed both. Of course, we are smart enough to know that tweaking the tire size is equivalent to tweaking the diff ratio as far as road speed vs. rpms is concerned, so if his new correct tires restored the accuracy of the speedometer then the diff must be correct too (unless the speedometer was wrong, except that he checked it against another vehicle). So the only possibilities are either that the gearing was changed or that the tach is inaccurate and the overheating is a different problem completely. The latter seems more likely.

-Jim Muller

Subject: High engine rpm
Date: Fri, 20 Jul 2007
From: KURT JOHNSON <kajohns64@yahoo.com>

John R Maneke <acs25m@swbell.net> wrote:

> I own a TR250 that I am having problems with. The car had 185/65r 15 tires on it when purchased. I knew ...

<<http://people.umass.edu/tcroy/articles/differential.htm>>

Subject: High engine rpm
Date: Fri, 20 Jul 2007
From: "Joe Curry" <spitlist@cox.net>

John R Maneke <acs25m@swbell.net> wrote:

> I own a TR250 that I am having problems with. The car had 185/65r 15 tires on it when purchased. I knew ...

<<http://people.umass.edu/tcroy/articles/differential.htm>>

Yes,
You can jack up the rear of the car and while preventing one rear wheel from turning, rotate the drive shaft and count the number of revolutions that the drive shaft must be rotated to cause the free wheel to turn one complete revolution. The ratio of those two elements will reveal the ratio of the diff.

In other words, if you have to turn the shaft 4.11 turns, you have a 4.11 rear end.

-Joe

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: <pethier@comcast.net>

"Joe Curry" <spitlist@cox.net> wrote:

> Yes,
> You can jack up the rear of the car and while preventing one rear wheel from turning, rotate the drive shaft ...

You are off by a factor of 2. :-)

-Phil Ethier

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: <DLylis@aol.com>

<pethier@comcast.net> writes:
You are off by a factor of 2. :-)

Please explain. I would have said the same thing.

-David Lylis

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "Joe Curry" <spitlist@cox.net>

Yes, Please explain. The ratio is what it is and therefore I don't understand what you mean by "off by a factor of 2".

-Joe

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "Mark J. Bradakis" <mark@bradakis.com>

> Yes, Please explain. The ratio is what it is and therefore I don't understand what you mean by "off by a factor > of 2".

If you had a welded diff where the axles on each side were NOT free to move independently then you'd be fine with the simple test. But since you hold one wheel steady and turn the other, you are making the "differential" part of the diff work, and you'd see that the carrier with the ring gear would move only half as much as the wheel. It is pretty easy to visualize oil you take the back cover off and watch ;-)

-mjb.

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "Joe Curry" <spitlist@cox.net>

Mark,

In your example, you would not be able to keep one wheel stationary because a locked (welded) diff would force both wheels to move together.

I tried several different methods a few years ago to see what really worked and the steps that I presented was the only method that yielded the proper results.

Basically, keeping one wheel stationary theoretically makes the free wheel spin according to the differential ratio. (Or that is certainly the way my 60 year old brain remembers it).

-Joe C.

Subject: High engine rpm
Date: Sat, 21 Jul 2007

From: <DLylis@aol.com>

OK, let's imagine for a moment that we have a car with a 3.7:1 differential and it is sitting with one wheel on dry pavement, and the other wheel is on ice. You Northern guys ought to get this! You give it some gas in gear and go nowhere. Are we saying that the ratio to the spinning wheel is not 3.7:1?

-David Lylis

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "Joe Curry" <spitlist@cox.net>

<DLylis@aol.com> wrote:

> OK, let's imagine for a moment that we have a car with a 3.7:1 differential and it is sitting with one wheel on..
> David Lylis

David,

That situation is a whole different issue. In my scenario, I have one wheel set so that it does not turn at all. In your scenario, you really can't know or control what either of the two wheels are doing.

-Joe C.

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "Mark J. Bradakis" <mark@bradakis.com>

> That situation is a whole different issue. In my scenario, I have one wheel set so that it does not turn at all.

Actually what he describes is *exactly* the same - the wheel on dry pavement does not turn at all - all the torque goes to the wheel on the ice that offers no resistance.
-mjb.

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "Joe Curry" <spitlist@cox.net>

Mark J. Bradakis wrote:

> > That situation is a whole different issue. In my scenario, I have one wheel set so that it does not turn at all.

> Actually what he describes is *exactly* the same - the wheel on dry pavement does not turn at all - all the ...
> -mjb.

Well, It would appear to be that way, but there is no way at all to know how many revolutions the drive shaft is turning and thus measure the ratio.

To be able to determine the ratio without disassembling the diff, you have to set up a controlled situation. That is what I was describing. (Apples and oranges)

-Joe

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "wbeech" <wbeech@flash.net>

Jack it up, put a chalk mark on the d/s and the wheel and turn the shaft by hand, counting revs, until the wheel goes around once. Not too tough, is it?

-Bill B

Subject: High engine rpm
Date: Sat, 21 Jul 2007
From: "Joe Curry" <spitlist@cox.net>

Bill,
That is precisely the procedure that I proposed. However, I did mention that you ought to keep one wheel from spinning so that you remove the differential effect.
-Joe

Subject: High engine rpm
Date: Sun, 22 Jul 2007
From: "Mark J. Bradakis" <mark@bradakis.com>

> I did mention that you ought to keep one wheel from spinning so that you remove the differential effect.

Sheesh.
If both axles turn together at the same rate, so there is no difference in their movement relative to each other, then there is no differential effect. If you hold one wheel stationary and turn the other, so that there is a difference in their movement, you get a differential effect.

Holding one axle stationary and moving the other axle one revolution will cause the central carrier to turn one half revolution relative to the axle that stayed put and one half revolution relative to the axle that turned.

I guess I'll have to either dig up some web video of how this works, or make one myself.
-mjb.

Subject: High engine rpm
Date: Sun, 22 Jul 2007
From: "Joe Curry" <spitlist@cox.net>

Mark,
I am pretty sure that if you do not secure one wheel, one will spin backward relative to the other with an open diff. Don't ask me to explain it but that is what I have noticed when I tried it.

I am going to have the Red Mk1 off the ground this week to adjust the rear shocks and when I have it in the air, I am going to give it a try to see if I remember it correctly or if I am actually going crazy.

I will report back to reveal if I am beaming with success or have egg on my face.
-Joe

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: Michael Porter <porterm@zianet.com>

Joe Curry wrote:
> Mark,
> I am pretty sure that if you do not secure one wheel, one will spin backward ...

Okay, I have just done what I should have done when this brouhaha began. I went out into my generally unnavigable, overstuffed garage, dragged the GT6 diff out from under the bench (the one with the cracked rear mount), which I know to be a 3.27:1, and applied vise grips to the right-hand axle flange, rotated the pinion

input until the right-hand flange was well-fixed and immobile. I took up the lash, made witness marks on input, left flange and case. One rotation of the left flange made a little less than 1.7 turns of the input flange.

Now, releasing the right flange and allowing it to turn with the same resistance as the left flange, each flange turns at the rate determined by ring and pinion ratio, which makes sense given that the spider shaft rotates at the same rate as the carrier, so the spider gears are static relative to the rate of rotation of the side gears, if the resistance to torque on both sides is equal.

Sorry, Joe. A full floating diff makes twice the revs of a locked diff. with one wheel fixed. I made the same mistake-brain fart when I advised the original poster privately. The simple fix, of course, is to jack up one side and count two revs of the wheel, or, jack up both sides and count one rev.

The reason for it becomes obvious when one figures in both rotation of the spiders and the rotation of the carrier/spider shaft assembly. With one side gear fixed, the free side gear is being turned by the spiders rotating around the fixed side gear and the spiders rotating with the spider shaft as the spider shaft rotates with the carrier, so the rate of rotation of the free side gear has to be double the rate of carrier rotation alone. Easy to visualize when one compares both wheels turning to one wheel turning. When both side gears are free to move, the spiders don't rotate--one tooth set on each side engages the side gear and the spiders, side gears, spider shaft and carrier move as one unit. Lock up one side gear and the spider begins to rotate around the fixed side gear _and_ is turning with the spider shaft and carrier.

-Michael D. Porter

Subject: High engine rpm
From: "Joe Curry" <spitlist@cox.net>

"Michael Porter" <porterm@zianet.com> wrote:

> ... Sorry, Joe. A full floating diff makes twice the revs of a locked diff. with one wheel fixed. I made the ...

Thanks Michael! I stand corrected. But I am still gonna try it for myself because I am sure that I remember the wheels spinning opposite directions when they are both free. But maybe that happens when you turn one wheel not the drive shaft. I am obviously confused and need to sort this out for myself.

Thanks again for clarifying.

-Joe

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: <pethier@comcast.net>

<Dlylis@aol.com> wrote:

> OK, let's imagine for a moment that we have a car with a 3.7:1 differential and it is sitting with one wheel on
> dry pavement, and the other wheel is on ice. You Northern guys ought to get this!

Minnesota, born and bred. Been there, done that, known people who wrecked differentials.

> You give it some gas in gear and go nowhere. Are we saying that the ratio to the spinning wheel is not 3.7:1?

Yes, we are saying that the ratio to the spinning wheel is not 3.7/1. If the left wheel is on the dry asphalt and not moving, and the right wheel is on the ice by the curb and is spinning, the ratio between the propeller shaft and the spinning wheel is 7.4/1

Let's further stipulate that the speedometer is attached to the transmission and is reading an accurate 20 MPH. The spinning wheel is turning at the same speed that it would turn if the car was going 40 MPH on drive pavement.

(Let's not do this for too long. Our hypothetical spider gears are going crazy, and we are eventually going to toast the differential.)

On your hypothetical car, whether on the straight, going round a curve, or with one wheel spinning; the AVERAGE of the ratios of each wheel to the propeller shaft must always be 3.7/1.

To get back to the original question, how do you count the turns on a car with an open diff to determine the final drive ratio? Jack up only the right wheel so the left wheel does not turn. Mark a spot on the tire. Turn the tire a hundred times, while your buddy counts the number of times one of the four prop-shaft bolts goes by. He counts 54.

54 bolts divided by 4 bolts-per-revolution is 13.5 revolutions of the prop shaft.

100 right-wheel revolutions divided by 13.5 prop-shaft revolutions is 7.407407407.

The diff ratio must always be the average of the two wheels. Left wheel is 0. Right wheel is 7.407407407. Average of these two is 3.703703704.

(Looking at another way, you could use 50 instead of 100 to calculate the ratio, since when you turned the right wheel 100 times, the average of the two wheels would be 50. $50 / 13.5 = 3.703703704$.)

You look in the factory data and see that there is a factory ratio of 3.7/1. This is most likely the diff gears you have in this car.

If the same car had a welded diff, (or a good stiff clutch-pack limited-slip) you would need to get both wheels off the ground, or you could not turn the right wheel. If you turned the wheels 100 times, your buddy would count 108 bolts, which would be 27 prop-shaft revolutions. The average of both wheels would clearly be 100, since the wheels are turning together.

$108 \text{ bolts} / 4 = 27 \text{ prop-shaft revolutions}$. $100 \text{ wheel revolutions} / 27 \text{ prop-shaft revolutions} = 3.703703704$.

I hope I have not made any typos!

-Phil Ethier

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: Ted Schumacher <tedsimx@bright.net>

<acs25m@swbell.net> wrote:

> I own a TR250 that I am having problems with. The car had 185/65r 15 tires on it when purchased. I knew ...
> -John R Maneke

John, to determine diff ratio, exception being a limited slip or welded diff., with 1 wheel held stationary, rotate the drive shaft. Mark the drive shaft and a reference point of the rear wheel. Count the number of drive shaft turns needed to get 1 wheel revolution. Multiply this by 2. Example, a 3.45 diff will take "almost 1 3/4 turns of the drive shaft to achieve 1 rear wheel revolution. 1 3/4 times 2 is 3.5. You will find it takes "slightly less" than 1 3/4 turns so you have a 3.45. A 3.7 ratio will take more than 1 3/4 turns but less than 2 turn to achieve 1 wheel revolution.

-Ted

Subject: Determining Differential ratios
Date: Mon, 23 Jul 2007
From: Doug Mathews <mathews@uga.edu>

List,

I've been reading all the messages about this subject, and I understand all of it! HA HA

Seriously, here is a url that describes the process(es) to determine what you've got. Seems to match what has been said here. <<http://people.umass.edu/tcroy/articles/differential.htm>>

-Doug

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: <acs25m@swbell.net>

First off thanks to everybody for your input, although I didn't mean to cause such a bru ha ha. I jacked the car up tightened one brake adjuster to lock the wheel and counted revolutions on the other wheel. I do indeed have a 3.70 rear-end gear ratio. I assume that means the tack is off? Is it most likely the tack or the distributor gears causing the problem? Or can something else cause it? Anybody have any experience with APT Instruments? How about converting to electronic tach from mechanical? Is it more accurate or less problematic? What are everybody's thoughts on the subject?

-John R Maneke

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> (Let's not do this for too long. Our hypothetical spider gears are going crazy, and we are eventually going to
> toast the differential.)

Many years ago I did exactly that, when my FWD Audi broke a half-shaft on a long trip. Lacking funds or inclination to repair it properly, I fixed the half-shaft so it couldn't turn and headed for home with the other shaft driving the car. Talk about horrible torque steer!

But the extra 2:1 ratio made it get fantastic gas mileage; well over 40 mpg on a car that usually got under 30. Until of course the pumpkin seized and really tore things up.

-Randall

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> But I am still gonna try it for myself because I am sure that I remember the wheels spinning opposite
> directions when they are both free. But maybe that happens when you turn one wheel not the drive shaft.

Right. With an open diff, if you turn one wheel, generally the other wheel turns backwards and the drive shaft doesn't turn. More friction in the drive shaft, because it has to turn the transmission and also turns faster (has a taller effective gear ratio from the wheel than the other wheel does).

But if you block one wheel from turning and turn the other wheel, the drive shaft will turn (assuming the transmission is out of gear <g>) at half the speed it would turn if both rear wheels were turning the same direction.

-Randall

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: "Michael Marr" <mmarr@notwires.com>

> Many years ago I did exactly that, when my FWD Audi broke a half-shaft on a long trip. Lacking funds or
> inclination to repair it properly, I fixed the half-shaft so it couldn't turn and headed for home with the other
> shaft driving the car. Talk about horrible torque steer!

MacGyver strikes again!

Subject: High engine rpm
Date: Mon, 23 Jul 2007
From: <pethier@comcast.net>

> Anybody have any experience with APT Instruments?

In Bloomington Minnesota? They did a great job putting modern innerds in the electric tach on my Lotus.
This was many years ago, but I have not heard a word against them from the locals since then.

> How about converting to electronic tach from mechanical? More accurate or less problematic?

Certainly more accurate than the Smiths electric innerds.

Subject: Determining Differential ratios
Date: Mon, 23 Jul 2007
From: <DLylis@aol.com>

<mathews@uga.edu> writes:

> Seriously, here is a url that describes the process(es) to determine what you've got. Seems to match what has
> been said here. <<http://people.umass.edu/tcroy/articles/differential.htm>>

Couldn't help but notice umass.edu. I went to UMass and, trust me, I didn't learn anything as interesting as this!
-David Lylis

Subject: Determining Differential ratios
Date: Mon, 23 Jul 2007
From: Michael Porter <porterm@zianet.com>

<DLylis@aol.com> wrote:

> Couldn't help but notice umass.edu. I went to UMass and, trust me, I didn't learn anything as interesting as
> this!

Umm, when? I flunked out of UMass-Amherst twice, in the '60s (1965-6, 1967), but did manage to get UMass-
Boston to take me back in 1972 (graduated in 1974). Cheers.

-Michael D. Porter

Rear Suspension/Differential

Subject: IRS stub axle bearings
Date: Wed, 14 May 2008
From: Michael Porter <mdporter@dfn.com>

Randall wrote:

- > I see where TRF offers 3 different grades of IRS stub axle bearings (134465), being "standard", "Japan"
- > (which I assume is NTN), and "high quality" (which appears to be SKF). With almost a 6:1 ratio in price !
- >
- > Does anyone have experiences to share with the standard or NTN bearings?
- >
- > I'm pulling the Stag's diff for other reasons, just noticed that the stub axle bearings were a bit loose ... but
- > \$115/bearing seems a bit steep?
- > SKF is Swedish, I think. They're a good quality bearing, probably as good as Timken.

You might be able to get better quality at a good price by getting the existing bearing numbers and doing a little investigation with them at a local industrial supply house's interchange books.

Here's a hint. Almost every manufacturer has more than one line of bearings. In the US, these are defined by ABEC, and the grades run from 1-7. 1 is the cheapest and is also defined as "automotive grade." Therefore, most mass manufacturers buy ABEC-1. If they last the warranty period, they've done their job.

Over twenty years ago, I worked for a start-up company building prototypes. When I got there, they had a cheap Korean mill/drill that wasn't suited for the work they were expecting it to do, and after a few months, I managed to get them buy a cheap Taiwanese Bridgeport copy. After about eight months of very, very hard work, some of it by people who really didn't care about the machinery, the spindle bearings had started to wear and were rumbling a bit. To directly replace the bearings (grease-lubricated), top and bottom, was going to cost about \$60 at the time. Since they'd worn out in less than a year, I didn't want to go through that every year, so I opted for ABEC-7 bearings, put the quill in the lathe and machined a pocket in the nose for a lip seal, and filled the quill with spindle oil. It was still working well when the company died five years later. I think the price spread for the bearings then was \$60 for ABEC-1 to \$160 for ABEC-7 from the same manufacturer.

At that job, I bought a lot of bearings which had to run in harsh environments--extreme cold, abrasive mineral dusts with positive air pressure internally, etc.--so, buying replacements for equipment that ran periodically for testing (in a company always strapped for money) was an exercise in finding the cheapest possible that would last long enough to do the testing, so I was always looking for deals. I used a lot of NTN bearings in various applications, and they didn't run any better or worse than any other. An ABEC-5 (or -7) from the cheapest manufacturer is probably going to be a better bearing than an ABEC-1 from the most expensive source.

If you want the best available in the US, look at the Timken interchange lists online, but be prepared to pay as much, or more, than SKFs.

-Michael Porter

Rear Suspension/Differential

Subject: Leaking Differential - IRS
Date: Wed, 7 Mar 2007
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

----- Original Message -----

Subject: Leaking Differential
Sent: Wednesday, March 07, 2007
From: "John Mitchell" <jmitch@snet.net>

> I had my differential rebuilt about a year ago, and now I'm getting a leak out the end (where the big nut is) of
> the left axle. What needs to be replaced and is there any point in trying to seal around that nut. Thanks for any
> advice,
> -John Mitchell

John, There is not really a leak path at the nut itself. So sealing around the nut would not really accomplish anything. I suspect it's the seal around the shaft or perhaps the flange where the retainer plate holds the assembly to the differential case. Replacing the seal is as tough as rebuilding hubs. That flange just does not want to come apart to let you get to the seal. I've tried with no success. If it's the retainer plate; that can be smeared with some sealer and replaced. I doubt however that it's leaking there. In my case I'm living with some small amount of leakage. Sorry I can't be more encouraging.

-JVV

Subject: Leaking Differential
Date: Wed, 7 Mar 2007
From: "Robert M. Lang" <lang@isis.mit.edu>

John Mitchell wrote:

> I had my differential rebuilt about a year ago, and now I'm getting a leak out the end (where the big nut is) of
> the left axle. What needs to be replaced and is there any point in trying to seal around that nut. Thanks for any
> advice, John Mitchell 76 TR6

It's leaking from the big nut on the stub axle? Are you serious? If so, you may want to check that axle stub for a fracture. There's pretty much no way for oil to get from the pumpkin to the nut unless the axle has failed. The interface between the stub axle and the flange is a tapered seat and the parts fit very tightly together. Trying to seal the nut is pointless, IMHO. But you could try to back off the nut (take the stub axle out of the car, it's a LOT easier) with an impact wrench, throw some permatex #2 under the washer and re-torque to spec. I doubt it'll help, though. The more likely seal failure is the oil seal in the mounting plate. Those seem to die with regularity. The rubber dries out and the seal just vanishes. If the case gets ANY pressure, the oil PUKES out. Usually right on the muffler causing plumes of stinky (sulphur) smoke, The trick to avoiding this is getting the stub axle and flange apart (please use appropriate tools!) without knacker the flange or the stub axle. If you succeed in separating the two, the seal replacement is easy. Sagely advice - - don't start this job without a spare axle stub. Also note that the right and left axle stubs are different. Without stating the obvious, this sort of failure can be seen when a diff. job is done "on the cheap". To save a few bucks, we check the seals on the axle stubs and if they are intact we just put them back in the diff. A year or two down the road and the seals totally fail. If you had new seals installed in your diff rebuild, find out where the seals were obtained from, as they should def. NOT fail in a couple of years. 10 years, maybe, but one or two? Yikes. Good luck!

-rml

Subject: Leaking Differential
Date: Wed, 07 Mar 2007
From: John Mitchell <jmitch@snet.net>

That's definitely where it's leaking. I saw a drop hanging from the flange, so I removed the four bolts to the half shaft and oil poured out from between, like it had pooled between the flanges. I need to get more light and a mirror and check for cracks.

-John

Subject: Leaking Differential
Date: Wed, 07 Mar 2007
From: John Mitchell <jmitch@snet.net>

Vance wrote:

- > Bummer. That would have been an easy fix. Very odd that is where the oil is leaking, unless as one of the
- > other members speculated the axle is cracked. I suppose you could get lucky and the nut could be loose so the
- > oil is leaking between the flange and the stub axle. Normally the flange cold welds itself to the stub axle, so
- > the nut could fall off completely and the flange would stay put. Interesting set of symptoms you have there....
- > Let us know what you find. This is a new one.
- > -Vance Navarrette

Thanks for everyone's help. Tonight I took the inner axle nut off to investigate further. I figured it would be a fight to get it off, but it was on very loosely. I'm thinking maybe the axle taper was never pulled fully into the housing. I couldn't see any signs of a crack, but that doesn't mean there isn't one there. but it sure looked like the oil was coming from behind the washer. I cleaned the area, and shot some of that "Right Stuff" sealer onto the back of the washer and cranked the nut on. I may replace that nut before putting it back together, although I gave the Nyloc a good whack with a BFH. I'll check it again tomorrow for leaks. I'll let you know if it worked.
John

Rear Suspension/Differential

Subject: Need some differential help please!
Date: Wed, 1 Nov 2006
From: "Graham Stretch" <technical-iwnet@onwight.net>

----- Original Message -----

Subject: Need some differential help please!
From: "OKCSpitfire"

> Hello Listers, Once again I am in need of assistance. Recently I noticed a whining coming from my
> differential. I considered buying another but had decided to rebuild it instead. But, before I tear into the
> differential I would like to make sure it does need a rebuild. It makes a whining noise when driving down the
> road. While accelerating the sound is more pronounced, when driving at a constant speed it is a low steady
> whine and when decelerating it seems to go away.
>
> The price of a pinion and ring gear is outrageous so I wanted to check here first before committing that much
> money into something that may not be needed.
> -J Stasyszen

Hi

First of all I have been made aware that most CW pinion sets around today are not pairs. That is the gears were originally lapped together as a crown wheel and pinion pair during manufacture, these days they are mainly odds and ends found laying around and put with a counterpart of the same ratio to make a pair, I was advised by the engineer that using such a pair would have a great likely hood of creating a new diff that whined and perhaps even louder than what you have. If it was mine and dependant on the volume of the whine I would replace the bearings and seals and fit new spacers behind the planetary gears to reduce the backlash, fit new oil and be happy that the diff will hold that oil and that whilst it holds the oil it may whine a bit but will last for ages. I have a 2000 saloon which has had this treatment and I drive real hard down country roads and have a lot of fun, the diff still whines though less loudly than before the treatment!

-Graham.

Rear Suspension/Differential

Subject: TR6: One Man Diff. Installation Tips?
Date: Sat, 5 Apr 2003
From: Darrell Walker <darrellw@inetarena.com>

M. Secrest wrote:

> Apparently, the diff has to go in at about a 45 degree angle.
>
> After wrestling with this for 2 hours today (to no avail), I can see it would be a whole lot easier with two
> people. But for those who have courageously installed it with only a jack and some cold beer, I'd like to
> hear about it!

I've not done it on a 6, but have on a 4A.

First, use some RTV to stick the upper halves of the mounts in place, so you don't have to fight those. I've done it with the exhaust in place, but it is worth the effort to remove them. Next, I balance the diff on my floor jack (which is a trick in itself). Situate the diff under the correct spot, but about an inch to the rear. Lift until the brackets just clear the mounting studs. Move it forward, the front mounts can then be supported on the frame rails. It helps to tip the nose up a bit, but I don't think you need anything like 45 degrees.

-Darrell Walker

Subject: TR6: 1-man differential install tips
Date: Sat, 05 Apr 2003
From: KTnKT <ktnkt@cape.com>

Hi Martin,

I just did that today. But, I had experience due to having done it 2 weeks ago, too. This time I put the pinion seal in correctly.....and replaced the axle seals and bearings.....because I don't want to do it again!! The worst part of the job was dealing with the exhaust system.

In any case:

Put some electrical tape around the 2 front mounting studs so you can put on the upper bushings without them falling back off. Have the 2 front lower bushings, 4 large washers, 4 nylock nuts, 9/16" socket, long extension, and ratchet at the ready. Put the diff on the jack directly under the mounting area and using your hands, guide it up while.....using your leg and foot to pump the jack handle. Keep guiding the diff up until the front section clears the frame, being careful not to damage the brake lines. Once the front is above the frame, guide the rear bushings onto the studs and put on one washer and nut, then the other. Don't tighten them until you get the front bushings inserted, too. If you get a mental picture of a spastic monkey squirming around under your car, then you're on your way to differential installation happiness.....Like I said, the exhaust was the biggest pain...

-Kevin Thompson

Rear Suspension/Differential

Subject: TR IRS diff mount reinforcing
Date: Mon, 8 Mar 2004
From: "Mark J. Bradakis" <mjb@autox.team.net>

Okay, here's a first draft of an article on reinforcing the mounting pins that are supposed to hold the differential to the frame on TR4A - 6 cars.

If your Internet access is web capable:

- Go to <<http://www.team.net/the-local>>
- Click on "Articles" in the menu on the upper left, which should present you with a page listing all the articles on the wiki so far. The current total is 1.
- Click on the 'Read more' link under the image of the reinforcing plate template.

There's still some stuff I need to fill in, look up, etc. but I'd like to know if something like this would be of use to folks.

-mjb

Subject: TR IRS diff mount reinforcing
Date: Tue, 9 Mar 2004
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Mark.

I would think one of the things you were going to look up is 18 swg, or 0.048 inch or 1.2MM for our metric friends, I would think this would be a suitable gauge for the reinforcement plate, somewhere near the thickness of the original frame, it could probably be done with 20 swg, one gauge thinner 1.0MM

Others who have researched this may know different!

-Graham

Rear Suspension/Differential

Subject: Differential pinion end float
Date: Tue, 5 Jun 2007
From: Greg Perry <rgperry@earthlink.net>

Hello List,

Has anyone adjusted the differential pinion end float by the method in the link below? All comments welcome?

<<http://bernardembden.com/xjs/diff/index.htm>>

-Greg Perry

Subject: Differential pinion end float
Date: Tue, 5 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> Has anyone adjusted the differential pinion end float by the method in the link below? All comments
> welcome?
> <<http://bernardembden.com/xjs/diff/index.htm>>

I haven't, but it sounds reasonable under the circumstances described. Only potential problems I see are that it assumes the pre-load was zero at the beginning, and the crush sleeve isn't already crushed too far.

-Randall

Rear Suspension/Hubs

Subject: Help! Churchill Puller
Date: Sat, 24 Jun 2006
From: "Rarebits" <bill@rarebits4classics.co.uk>

-----Original Message-----

> I have a heavy duty hub puller but the hub will not budge. I have used heat, a 2 pound hammer and
> penetrating oil while applying pressure with the hub puller, the hub still won't budge.

Hi Jerry,

Is this a proper Triumph/Churchill hub puller, or a generic heavy duty type?

> Does anyone have any tricks or trade secrets to get the hub to come off?

With a conventional puller you will be struggling for a long time. In addition to the conventional screw mechanism, the Churchill tool has sliding inner shaft. The puller needs to be tightened as far as possible, then the end of the puller is hit hard, I use a 4lb lump hammer. There is a sliding inner shaft within the tightening screw, the shock transmitted through this is what ultimately releases the hub. I have seen 10 ton presses regularly fail to move one of these hubs, 100 ton presses are usually effective but often damage the hub in the process. If you don't have a genuine Churchill tool or a correctly made copy, you are going to need a lot of luck in releasing the hub. Cheers,
-Bill.

Rear Suspension/Hubs

Subject: TR4A thru 6 Rear Hubs
Date: Fri, 9 Apr 2004
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

Lists,

I am ready to re-assemble my TR4A rear Hubs and have a question for someone who's done this before me. These are spares and were taken apart by a friend so I don't have a reference from the disassembly.

The thick bearing spacers that back up the inner bearings are the subject of my question. While the books don't show it very well I am assuming that the side of the spacer which is machined out to a depth of about 3/16 and then tapered towards the center hole when assembled to the Stub Axle faces the universal joint end of the stub axle. I think that is fairly obvious and is intended to allow clearance and adjustment for the radius between the axle and the forged joint. It's the other side that has me concerned since there is a groove machined (at least I hope it's machined) into the face of the diameter. The groove is very shallow and about 1/8 wide and seems to be well centered between the OD and ID of the Spacer.

My question is this: Am I correct in assuming that this shallow groove is supposed to be on this face? When I fit the bearing against this face it seems like it centers on the groove, maybe it's there for clearance of the bearing cage but I'd like to have confirmation from someone who has been there and done that before me. If it would help I can send digital photos of the spacer to you individually.

-JVV

Subject: TR4A thru 6 Rear Hubs
Date: Fri, 9 Apr 2004
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Gerald

Was in mine last week, or was it the week before! The groove you describe sounds to me like the bearing has spun at some time, the spacer should be plain all round with the exception of the back which is cut away to fit the dust shield, the big section disc that goes between the spacer and the adjusting nuts. Would you like a scan of the assembly or do you have a parts diagram.

-Graham

Subject: TR4A thru 6 Rear Hubs
Date: Sun, 11 Apr 2004
From: "Graham Stretch" <technical@iwnet.screaming.net>

----- Original Message -----

Subject: TR4A thru 6 Rear Hubs
From: "Gerald M Van Vlack"

> I do have a parts manual as well as a repair manual so no scan needed. Funny thing is they are the same on
> both sides so that's why I thought it was supposed to be there. Thanks for your help.

> -JVV

Hi Gerald

I just thought, this may not be detrimental to re assembling, you could possibly carefully lap this out if it is not too deep, depends if your time is cheaper than the bits! The main thing is making sure you keep the spacer parallel, otherwise it could affect the stability of the bearing and / or the adjustment. I took six to bits, had to offer some of them to a 50 ton press as the Churchill tool would not shift them, one was cross drilled and the shaft collapsed under the puller, another the wheel studs stripped, I ended up sacrificing 3 wheel flanges to the press, but then it did reach well over 25 tons, (28ish) before each of these went bang! I am told that the Churchill puller can make 10 tons, maybe 15 with a bar on the T handle! No wonder I couldn't get them apart!

Once in there, 3 of the spacers were grooved where the bearing sits and 4 had wear where the seal runs, 1 good one and one the seal wear was only slight and polished out!

-Graham

Subject: TR4A thru 6 Rear Hubs
Date: Sun, 11 Apr 2004
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

Thanks to all who responded to my question regarding the IRS Hubs. It turns out that those seemingly precise grooves that appear to be machined into the bearing spacers are in fact worn areas resulting from the bearings being too loose. One of the things I was overlooking was that this spacer is also the seal race for the inner bearing seal. Those surfaces are very worn when checked with a straight edge.

2 new spacers are on the way from TRF. Thanks again.

-Jerry Van Vlack

Subject: TR4A thru 6 Rear Hubs
Date: Sun, 11 Apr 2004
From: "Randall Young" <Ryoung@navcomtech.com>

Gerald M Van Vlack wrote :

>> I ordered new spacers, once together I don't want to do the job a second time. What do you think about
>> using anti-seize between the axle and hub in case I do need to remove in the future?

Graham Stretch replied:

> I would not use anti seize as one of the functions of the taper is to transmit the torque to the drive flange, the
> woodruff key is not capable of doing this alone. Any thoughts from the rest of you?

Somehow I missed Jerry's original query, but I absolutely agree with Graham.

Do NOT use anti-seize or any other lubricant on a locking taper! They are made as a locking taper for a definite reason and anti-seize may defeat the purpose. The reason the rear hubs get so tight is not because of rust, but rather because that big, beefy looking hub actually flexes under use and works its way tighter on the stub axle until the joint is locked solid. If the joint is slick enough that it never locks, it will continue to work and fret until something is ruined. Definitely not the sort of thing you want to have happen during a high-speed curve !

I couldn't find the passage in Kas' latest book about lapping the hubs to the axle, but I do see where he talks about having the keys shear under racing conditions. The fix I saw suggested was to make the keys out of HSS lathe bits.

-Randall

Subject: TR4A thru 6 Rear Hubs
Date: Sun, 11 Apr 2004
From: "Hugh Barber" <tr6nut@sbcglobal.net>

In the Comp Manual, Kas Kastner recommends that the hubs be "lapped to the axle and assembled with locktite on the taper". Sounds like just the opposite of anti-seize.

-Hugh Barber

Subject: TR4A thru 6 Rear Hubs
Date: Mon, 12 Apr 2004
From: "Randall Young" <Ryoung@navcomtech.com>

John Mitchell wrote:

- > How about anti-seize on the rear taper of a wire wheel? Moss recommends anti-seize on wire wheel hubs.
- > Is this a different situation?

I'm not sure if anti-seize on that taper is a good idea or not ... The factory manuals seem to be divided on the subject with some recommending grease and some saying to leave it dry. (The splines of course should definitely be lubricated.) I'm pretty certain the 'front' taper, where the nut seats against the wheel, should not be lubricated.

In any case, it's not a locking taper (angle is too steep), so my previous rant doesn't apply. I think?

-Randall

Rear Suspension/Hubs

Subject: TR6 Rear Hubs - How to determine if need rebuilding
Date: Tue, 24 Feb 2004
From: <Greg_Hutmacher@i2.com>

I currently have the rear suspension disassembled on my 76 TR6 as part of a total rebuild of the front and rear suspension and brakes (long overdue!). I have the rear axle shaft and hubs out and I am trying to determine if I did something stupid (it certainly wouldn't be the first time). When I bench tested the rear hubs by rotating them, they turned freely, quietly, and smoothly. Without using any gauges for measuring, they didn't feel like they had any excess play in them. But they were coated on the outside with many years of grease and grime so I (perhaps unwisely) liberally sprayed the outer surfaces with carb cleaner and cleaned them up with a brush. Now when I turn the shafts, I feel a slight grittiness that wasn't there before. I suspect some of the carb cleaner soaked into the inner workings where the bearings are. Now, I'm trying to decide if I need to have the hubs rebuilt as a precaution. I may have stripped some of the grease away from the bearings with the carb cleaner. I don't want to reassemble everything and then have the rear hub bearings overheat. The car has about 55K original miles on it, for what that's worth. But, I think the age of the grease inside is more of a factor than the miles. As far as I know, these hubs have never been opened up. Any thoughts on this? Should I bite the bullet and get them rebuilt?

While, we're on the subject, if I do need to have them rebuilt, is there anyone on the list that does this service well for a competitive price? Victoria British currently has rebuilt hubs on sale for \$149 each. I could go that route (anyone have any knowledge of the quality of VB's rebuilt hubs?). But, all things being equal, I would prefer to keep my original hubs since I know their history and they have relatively low miles and have never been abused to speak of.

-Greg Hutmacher

Subject: TR6 rear hubs - how to determine if need rebuild?
Date: Tue, 24 Feb 2004
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Greg

>From what you describe you have contaminated the hubs with some of that grit which would suggest that the
> seals are a bit ineffective. My advice would be at the very least strip and clean and replace the seals, but then
> for the cost of the wheel bearing kit which includes the seals and the collapsible spacer why not rebuild them
> properly. The only real problem with diy is getting the flange off to dismantle them (requires a lot of press
> force, or a hydraulic puller like the Churchill tool listed), once they are in bits they are much like front wheel
> bearings to do, drive out the old races and press in the new ones. If you do it yourself, then do yourself a favor
> and buy new lock tab washers for the two big nuts as this will make setting the end float easier, a well
> respected Triumph engineer told me to ignore the 0.002" end float and aim for no float without pre-loading
> the bearings as this would achieve the same end result after a few miles. It seems to have worked OK for me,
> as the rear wheel bearings are now on the second car with about 40,000 miles on them. The other thing I did
> was to drill right through from the flange to the cavity and fit a grease nipple, now every time I change the
> brake shoes the bearings can have a shot or two of grease to refresh them! BTW the fourth shot of grease
> pushes out the seals so only two at a time!
> -Graham

Subject: TR6 rear hubs - how to determine if need rebuild?
Date: Fri, 27 Feb 2004
From: "Graham Stretch" <technical@iwnet.screaming.net>

Hi Dennis

Here is an excerpt of a message I posted recently: A well respected Triumph engineer told me to ignore the 0.002" end float and aim for no float without pre-loading the bearings as this would achieve the same end result

after a few miles. It seems to have worked ok for me as the rear wheel bearings are now on the second car with about 40,000 miles on them.

I first did mine using a dial gauge and set the 0.002" float, after a few miles (10-20) the bearings were really loose and I then asked for help and was told to do the method described here.

The typical method of measuring the end float is to see if the wheel rocks top in bottom out / top out bottom in, there is no real correlation between this movement and end float (except experience). End float is on an axis perpendicular and central to the bearing faces! To achieve what I describe above, first tighten the flange on to the shaft, then grip the hexagonal outer housing in a vice, next tighten the adjustment nut finger tight then test for float by pulling / pushing the wheel flange along the centre line of the shaft, it should be large at this point because finger tight will not compress the spacer. Now use a wrench to tighten the nut a bit, check and if slack tighten a bit more, as you get close, turn only about 1/4 flat at a time until the end float is just gone, now bring up the lock nut and carefully lock the two together without allowing the adjuster nut to move. You will get told that the clearance is there to allow for expansion, and as you can see this method does not seem to leave any clearance. Do not worry, it will all settle back some more when you drive it and end float will appear, if you are unlucky you may need to re tighten the adjustment.

Hi Dennis!

I sent you this E-mail & have not had a reply from you. I was wondering:

1. If you had received it?
2. If you had any more information sent to you on this thread?

Thank you for your time in reading this E-mail.

-Cosmo Kramer

Subject: TR-6 Rear Hub
Date: Fri, 27 Feb 2004
From: <MD.FEED@nwh.org>

I'm in to rebuilding my own rear hubs. Before I admit defeat, I'd like to pose a few questions. Can anyone explain how rear end float is assessed according to the Bentley manual on page 390. What are they actually determining by gripping the wheel and rocking it inwards and outwards. How are they measuring end float this way?. By the way, both hubs are apart, with flanges intact with the aid of a Churchill replica I bought a few years back.

-Dennis (Massachusetts)

Hi Dennis!

I have also purchased the 'Churchill replica' through the 1st batch offered by Jim Wallace from Canada. Is this the same one you purchased? I've not used this tool yet & am wondering:

- 1- How hard was it to separate these units?
- 2- Why did you think you needed to rebuild these units?
- 3- How long have you had these units apart?
- 4- What TRIUMPH car are these units from?
- 5- I own a TR4A IRS & it has the collapsible collar. Does yours have 1st type of set up?
- 6- If so, then are you hoping to reassemble them back using the collapsible collar?
- 7- Or use shims in replacement of the collapsible collar?

TIA, for answering my questions, because I'm thinking of doing this in the future. BUT I'm not sure if mine need this, yet. I'm also worried about doing damage to the hubs in the process of using the tool, is there any chance of doing this when using the tool? Would you be so kind as to forward any private E-mailings to you in regard to this thread? Thanks again for taking the time to read this E-mail that I've sent to you.

-Cosmo Kramer

<MD.FEED@nwh.org> wrote:

Hi Cosmo,

I'll try to answer all your questions as best I can. I'm no expert, but prefer doing all the mechanicals myself, as well as getting tools made for the job. Everything can be done with the right tool.

1. I bought the Churchill replica tool. The nut on the screw end requires a 1/2" socket. I decided to use a 3/4" breaker bar type wrench. I placed the rear hub assembly in the tool, bolted it up tightly, added a pipe to the breaker bar (at this point I had about 4 feet of distance from the nut, I weigh 175 lbs, and pulled. By the way, I protected the axle threads with a brass spacer. They came apart, there is a moderately loud crack, and the hub separates about a half inch from the flange. The tool and hub I placed in a vise in order to do the pulling. Correction the nut is 1 1/2", not 1/2" as I mentioned. I'm now trying to learn about end-float, as you can see from the e-mails I've sent. The acme threads in the tool are capable of transmitting force greater than ordinary screw threads.

I have a 1975 TR-6 and am in Massachusetts. Where are you located? I'll reply to your other questions when I get a minute.

-Dennis

Hi Cosmo,

Question #2: The reason I decided to rebuild rather than accept as OK is that the car has not been run in over 20 years and I wanted to understand the rebuild process if needed again down the road.

One of the hubs had a crack in the outer bearing cage, and one of the rollers was actually broken and fell out in two pieces. I've also decided to replace the bearings in the rebuild. The bearings come off their respective shafts easily with a bearing splitter and puller assembly. I use an OTC #1124 splitter. At this point I'm buying some bearings, seals, learning about end-float, painting the hubs and flanges. The bearings are TIMKINS, I'll bet the replacements won't be. If you're interested, that inner bearing is difficult, it abuts the spacer, but I backed off the adjusting nut and lock nut, pushed them toward the universal joint, and got my bearing splitter in back of the bearing, and pulled.

-Dennis

Hi Cosmo,

The last two e-mails was specifically referring to the rear hub units, the flange is what the wheel bolts to. The smaller hub and bearing is referred to as the inner axle and bolts to the sides of the differential case. I'm past this step as you also appear to be.

The removal of the inner stub axle flange requires about 5-6 tons of press force. I made a flange support from a 6 inch circular by one inch thick piece of steel. The center hole is the diameter of the flange just below the flange. I bisected the circular steel piece, and support the flange from underneath. With the brass spacer in place, press on the end of the axle shaft, and it will come off without bending the flange. The under-lying bearing is an easy press off with any small arbor press. This is all done to replace the seal in the square piece that bolts to the differential carrier.

My one piece of wisdom is that people who use hydraulic presses, think that with sufficient force anything can be pressed off. They don't take the time to support the vulnerable components of the unit.

The above paragraph was for the TR-6 inner stub axle attached to the side of the differential. I'll finish the outer rear hub questions to you when I get some time

-Dennis

Rear Suspension/IRS

Subject: TR6 Preferred Alignment Specs
Date: Mon, 02 Jul 2007
From: <mdesenberg@comcast.net>

What is the preferred alignment specs for both the front and rear on a TR6. Bentley contradicts itself of the rear camber. I will sacrifice some tire wear for a bit better handling. I know this has been discussed many time in the past and I usually save the information, but I can't find it now.

-Mark

Subject: TR6 Alignment Specs.
Date: Wed, 04 Jul 2007
From: <mdesenberg@comcast.net>

I have an appointment tomorrow to get my 6 aligned I sent a post the other day requesting the preferred alignment specs for a 6 and still need some help. In Bentley's page 45 under general specs they list the rear camber as 1 deg, neg, +/- 1/2, (-1/2 to -1 1/2 deg). In the rear suspension section, 64.25.17, they specify the rear camber range from +1 to -1/4. If my aging memory is correct, I recall that the preferred target is 1/2 deg neg. I have installed the adjustable brackets so I should be able to get it right on. Is 1/2 neg correct for the rear camber?

Thanks for the help.

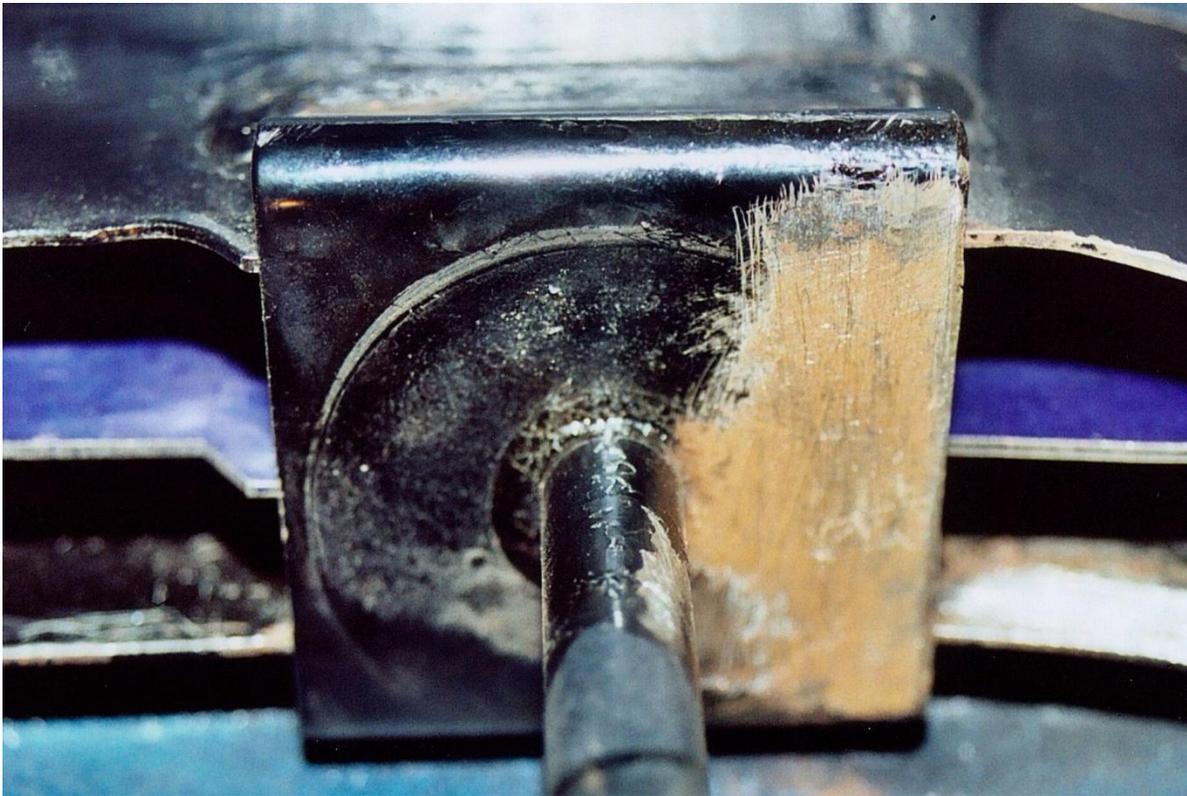
-Mark

Rear Suspension\IRS

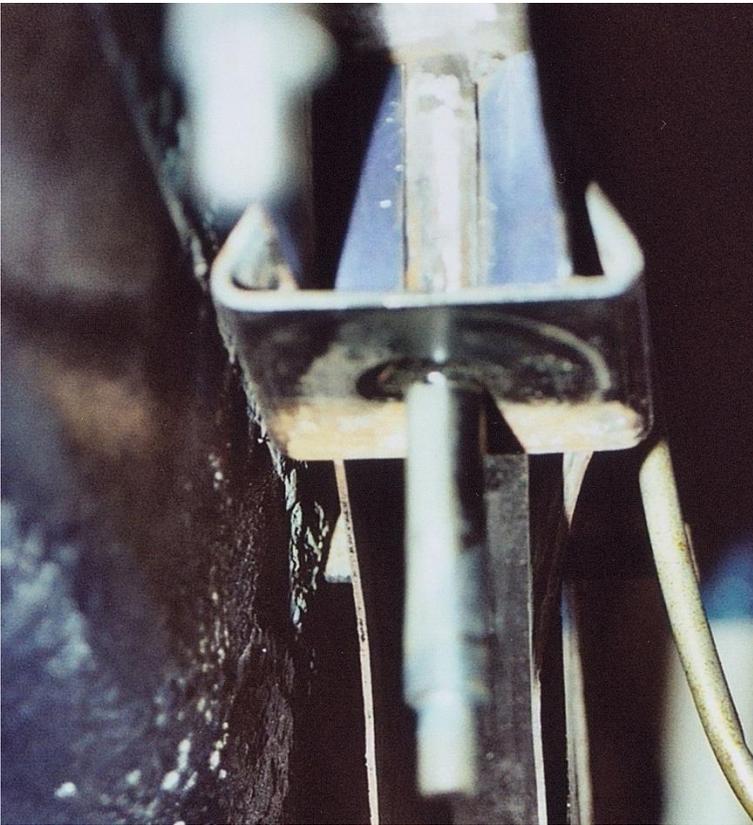
Subject: TR4A IRS gusseting the Sub-frame
Sent: Sunday, August 28, 2011
From: Cosmo Kramer <tr4a2712@yahoo.com>

wmpless@primus.ca Wrote:

> Hi Cosmo,
> I just thought I keep you up to date with my tinkering. Axles and standard Diff are back in the car, and I made
> a short test drive. ...
>
> Two things have to be done first, ... and Differential Holding Pin Brackets should be reinforced. As far as I
> could determine, the pins and brackets in good condition but I should have a least gussets added.
[See Attachment photos \(I have 13 of them\)](#)
-Cosmo Kramer



P#1- Shows the Lateral Pin Supports, that I made, in the rear sub-frame, before the welding was started.

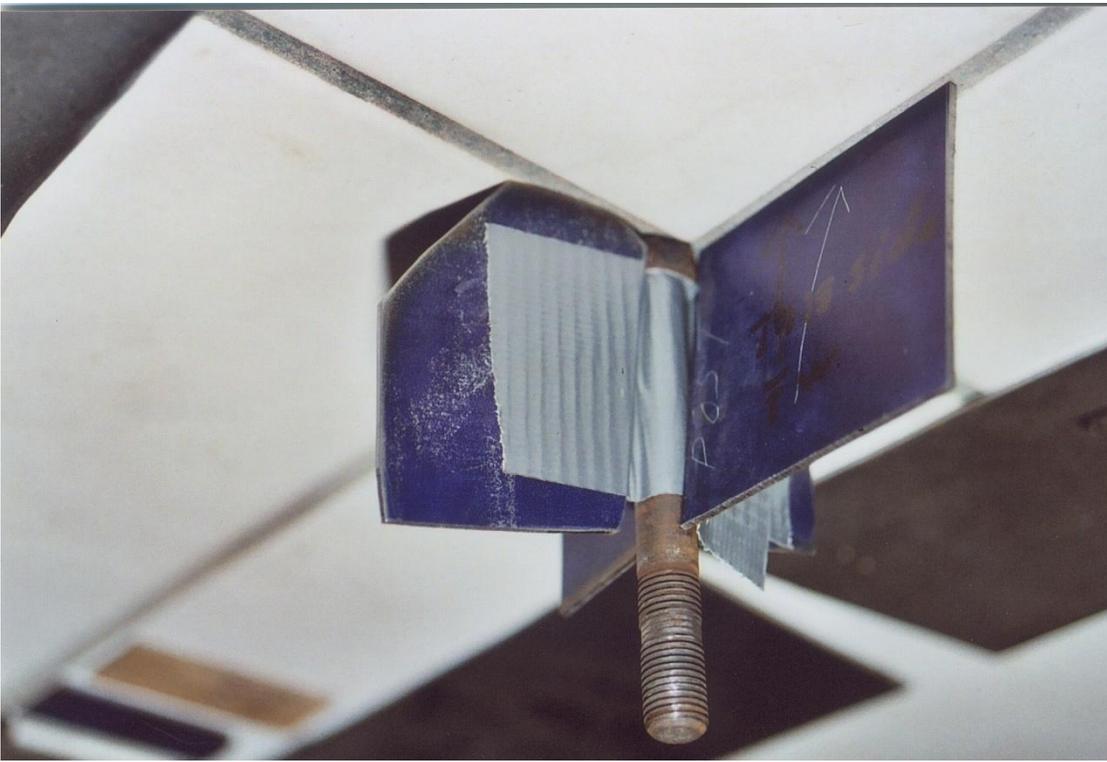


Pic#2- Shows the fore & aft Pin Support parts that I made to reinforce & strengthen the Left Rear Differential's Mounting Pin inside the IRS Rear Sub-frame, before having them welded in place. The lateral ones will be welded in next. (This was done to all 4 of the pins.)

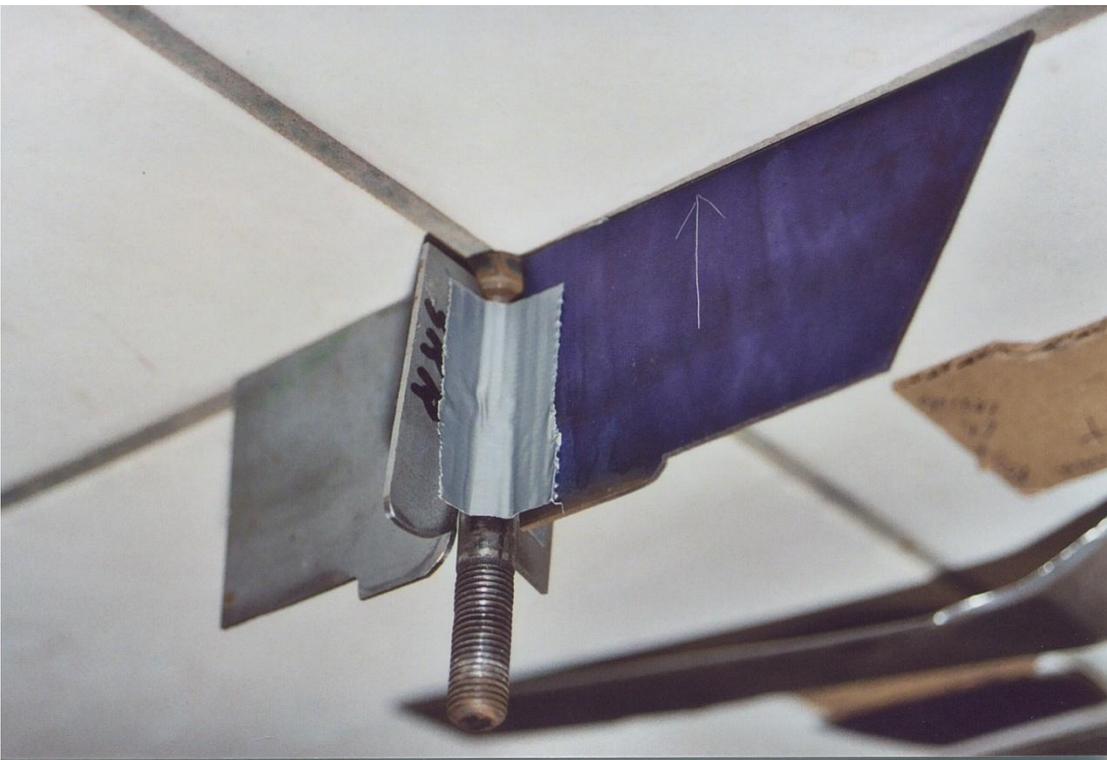
This was followed by placing the 'boxing' parts over them. All the parts that I had made, were having their edges touching on all of the sides, causing them to increase their purpose.



Pic#3- Shows the layout of the slightly oversized cardboard templates that I had made & labeled first. Then the metal pieces were made with final grinding done before being welded in place.

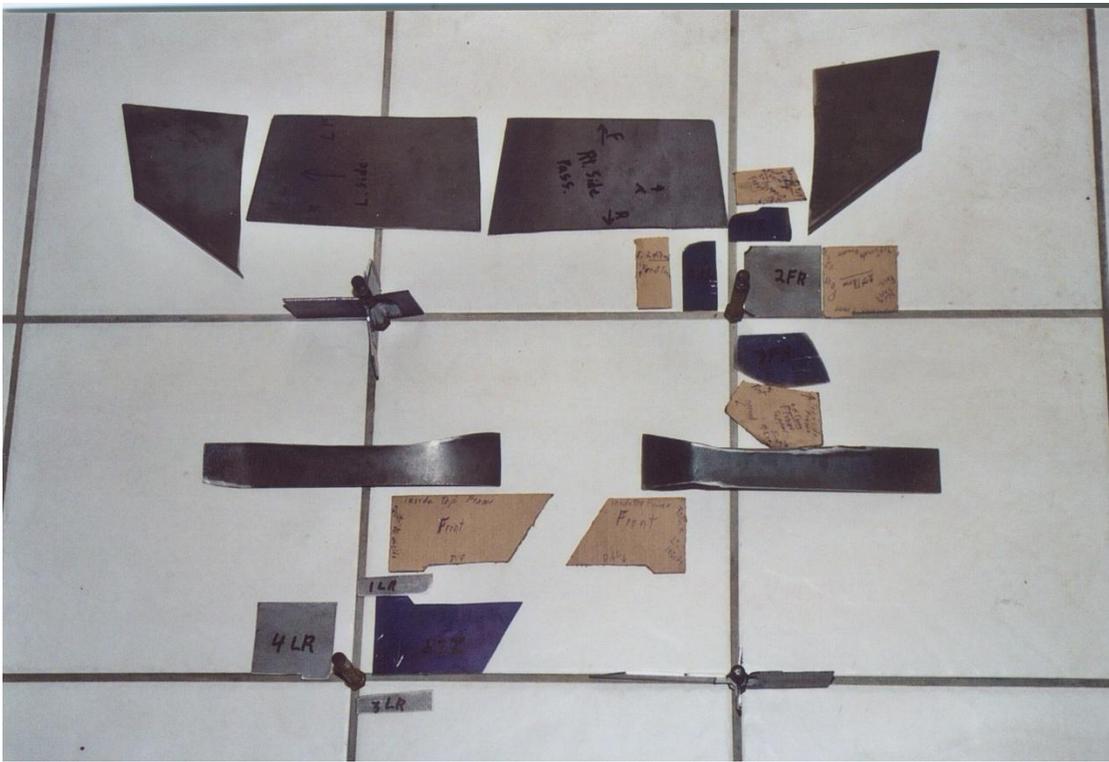


Pic #4- This shows how my home made metal pieces would look as if it were welded to one of the Diff's Mounting Pin that are inside the F&R Sub-frames. Note the arrow that I scribed on the bluing metal pieces so I would know which way is UP! Believe me, it was very confusing when making these parts from under the car & then climbing out & having the parts lying out on the work bench.



Pic#5- Shows the parts for the Left Rear Sub-frame of one pin. The cardboard, that I made, was used as a template. I then cut the metal piece to fit in the locations AROUND each pin.

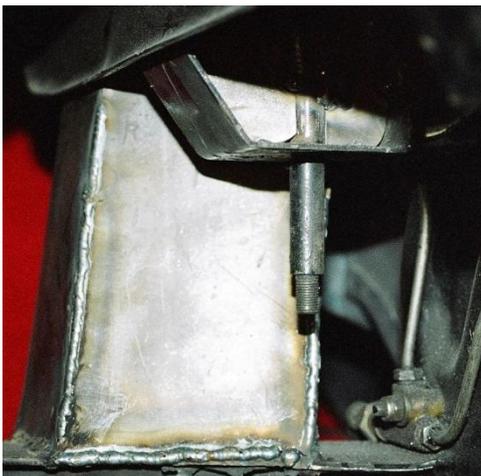
Note: This is laid out on the floor using a bolt to represent one of the pins located in the sub-frame.



Pic #6- Shows the complete layout of all the parts that I made for each of the Diff's Mounting Pins. The upper parts are for the front Diff's Sub-frame of mine & TSI's kit parts lied out. The top ends are the 'wings that are to support the Rear Spring Tower & the inside sections, at the top are the ones that 'box' the inside. The right top shows how my parts would look when welded to the Right Diff's Mounting Pin. The left side pin shows my parts lied out in position for welding to the other mounting pin.

The top 2 long pieces (of the lower 1/2 of the picture) are the inside rear sub-frame 'boxing' parts. Now this time I showed the right Diff's mounting pin with my parts looking like they were welded in place & the other pin shows my parts lied out ready to be welded in place.

NOTE: The diagonal slices of the 2 rear sub-frame inside parts are cut so they could be placed in & welded to the pin & then to each other for it to become one solid part. Thus giving greater strength to the rear pins before the 'boxing parts' were welded in place.



P#7- Shows the Inner Support Front Sub-frame metal pieces from TSI's Kit, thus 'boxing' the sub-frame



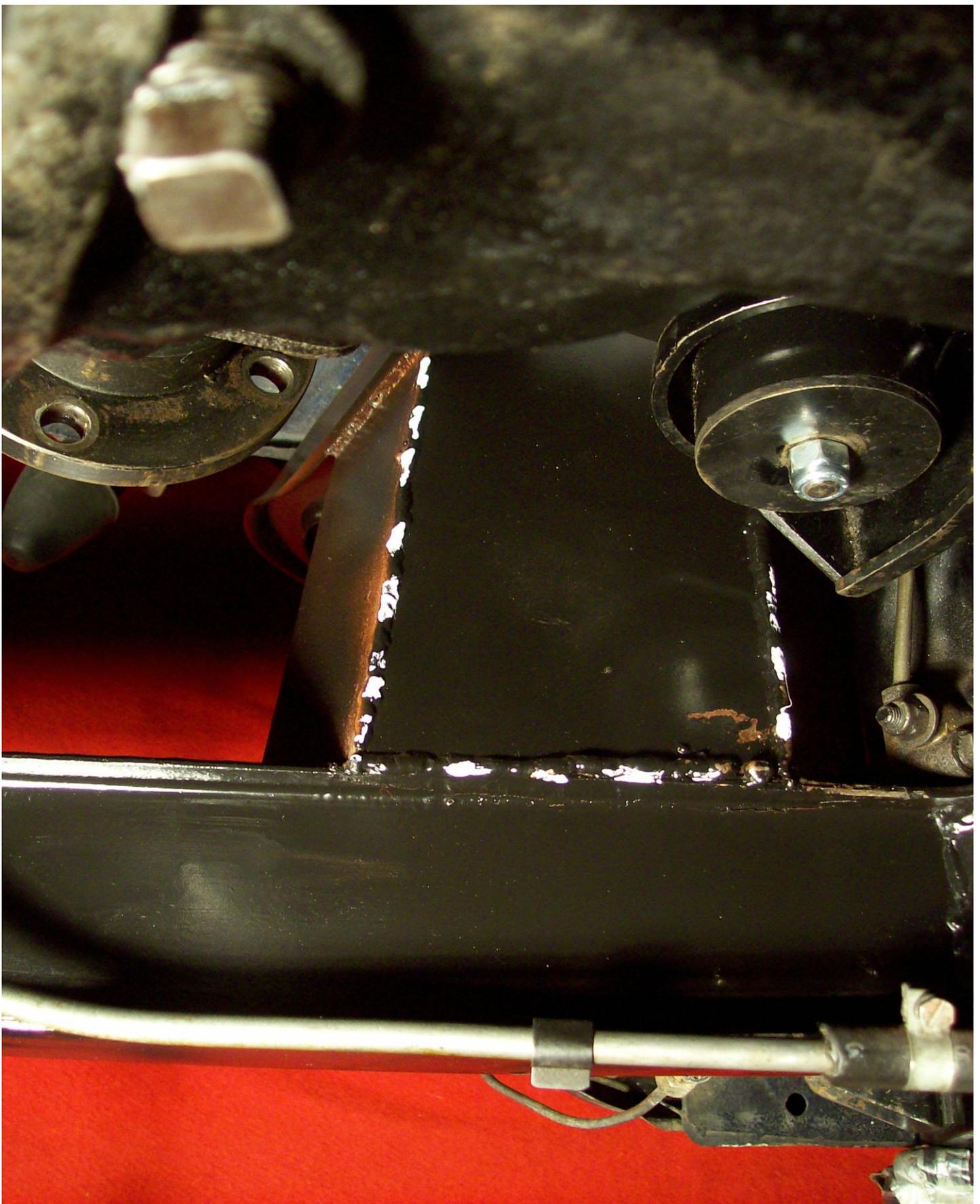
Pic #8- Shows the Rear Sub-frame that is boxed with TSI's Kit. You can't see the inserts that I made to go around each pin BEFORE TSI's Kit was then welded on.



Pic #9- Shows the welded piece of the 'boxing' parts on the Left Front inside Sub-frame, along with 2 of my home-made pieces welded inside the sub-frame. I marked the metal parts, also, to also tell the correct way the parts faced when ready to be welded in place. Because I beveled each inside edge of the boxed parts for a better & easier fit.



Pic #10- Shows the Right Outside Front Shock Tower Sub-frame with the 'Wing Support' welded in place to give it better support & rigidity. I used 'whiteout' to mark the dotted lines, for better visibility & ease of viewing from it being painted. I may even have these pieces marked out on paper with dotted lines to show where one is to bend the metal, so it will be attached to the sub-frame. The sub-frame boxing parts were purchased from TSI (Ted Schmidt Imports kit).



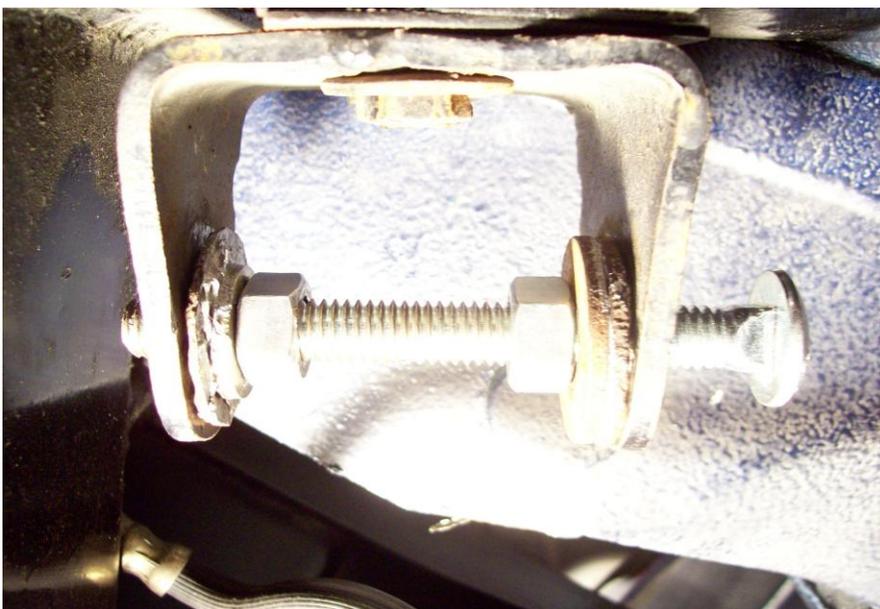
Pic #11- Shows the Inside Front Left Shock Tower boxed part welded & painted as the final look. Note: I did NOT file the finish welds for fear of weakening the welded joint. It's hard to tell this because of the black colour & the 'whiteout' dots.



Pic #12- Shows the inside of the rear sub-frame finished. Here you can view the final welds that I did NOT finish file down smooth.

I just gave a quick file & a good brushing of the weld before painting it black to match the rest of the frame.

It may not look that pretty, but it's better than filing to much of the weld to cause it to weaken. This extra filing would defeat the purpose of doing all this work for an increase of stiffness & strength.



Pic #13- This final picture shows the tool that I made to 'stretch out' the Trailing Arm Frame Support Brackets. These brackets are soft, & it was easy to bend the ends out for the urethane bushing to fit in.

By using this tool, I didn't worry about one end being bent out more than the other end. This worked GREAT because I knew that the Trailing Arm would be centered in each bracket.

Rear Suspension/IRS/Half Shafts

Subject: ½ Shaft Lateral Spline torque play
Date: Sun, 11 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi List!

I'm in the process of installing my IRS back in my TR4A. Before I start installing my ½ Shafts back in through the Trailing Arm, I wanted to check the ½ Shaft Lateral Splines for any 'torque' [rotational] play.

Question: How much, IF ANY, torque [rotational] play is acceptable, OR is 'NO PLAY!' the answer? TIA
-Cosmo Kramer

Subject: ½ Shaft Lateral Spline torque play
Date: Thu, 15 Mar 2007
From: "Allen Hess" <allenhess@mgarclub.com>

Haven't noticed a reply on the list but maybe I missed it.

> Question: How much, IF ANY, torque [rotational] play is acceptable, OR is 'NO PLAY!' the answer?

I think the correct answer is no play. The next best answer is what can you live with? If there is play it will be just like a bad u-joint or the as play in the slip joint of the drive shaft. It will clunk whenever the "load" changes - stop, accelerate, coast, brake. I have a drive shaft with some play in it but the drive shaft shop says, "It isn't that bad".

-Allen Hess

Subject: 1/2 Shaft Lateral Spline torque play
Date: Fri, 16 Mar 2007
From: "Allen Hess" <allenhess@mgarclub.com>

Cosmo,

Well I guess zero play is not correct, but compare it to U-joints where they flex easily but a new one has no rotational play.

> I had one person tell me that there shouldn't be any play at all, but I wanted to ask the list. I did check the
> spline by 'twisting the axle BEFORE each yoke of the 'U-joint' to have a slight movement. But if there is to be
> NO PLAY, then wouldn't the spline have a hard time sliding laterally?

My drivetrain clunks have been limited to my wife's MGB, but in my opinion there is a few thousandths clearance in a number of parts and they all add up by the time the tire meets the road. One other thing about the slip joint, on the driveshaft for future reference, I discovered that it had worn in the normal or mid position. When moved either way lengthwise the rotational play went away.

> I was getting the 'klunk' only when doing HARD Sudden acceleration at times. I thought that it might have
> been the IRS Sub-frame. So I dismantled EVERYTHING to reinforce it. Then I just finished reassembling
> everything last night, because I didn't receive any reply. I wanted to take it out for a test drive today but we
> got nasty weather. :>(

With fresh grease in the joints and other parts renewed I think you'll be fine.

-Allen

Rear Suspension/IRS/Half Shafts

Subject: TR-6 Drive (PROP) Shaft Suspension: Prop Shaft (Differential Shaft)-
Date: Wed, 17 Mar 2004
From: "Mark Meany" <mark@basecamp.mv.com>

"I'm into restoring my drive shaft. Thank-you all for all the great replies on my u-joint questions. In taking the splined end off in preparation for sandblasting and painting, I noticed a cork washer, pretty well deteriorated, and cracked, as well as a metal washer, split to get around the shaft, and the threaded end cap which holds both the cork and metal washer. No reference sources, has a part number for these. Any words of advice for getting replacements or making them myself."

Dennis - When I rebuilt mine last year, I was able to save the split metal washer & the threaded end cap, which is a good thing, 'cause I couldn't find 'em anywhere. The cork washer is split, intentionally, to allow it to slip over the larger diameter, splined end & get to the area where it performs its wiping action. To replace it, I used a double O-ring seal, sometimes called a Quad seal (available through McMaster Carr), that had the capability of being stretched over the splined end. Don't be tempted to get one that fits too snugly on the portion of the shaft beyond the splined end, tho'. When the threaded end cap is tightened, that seal will squash, effectively losing some of its ID. You still want it to freely slide/wipe along the shaft beyond the splined end.

-Mark Meany

Rear Suspension/IRS/Half Shafts

Subject: Finished Rear Half Shaft Rebuild
Date: Thu, 22 Jun 2006
From: "Dave Connitt" <dconnitt@fuse.net>

List,
Yesterday I received some new seal materials to try to replace the old felt washers that were used to seal the big nut that holds the two pieces of my IRS rear half shafts together. I ended up using a Buna-n o-ring. I know, I never heard of them either. McMaster-Carr sells them. It looks like a squared off o-ring. The spec. says it seals the ID, OD, top, and bottom. A cross section looks like an o-ring with an "X" superimposed over it. Anyway, it works great, just work it down the splined portion of the shaft and it rides perfect on the smooth section of the shaft. For those of you who may need to do this, here are the specs..

Material: Viton with a Durometer Shore of 70
Size: 3/16ths square thru the cross section, ID is 1.10, OD is 1.52
McMaster-Carr P/N: 90025K402
Manufacturer's P/N: AS568A-320
Cost: \$6.73 for 25 pieces

I have some pictures of the part on my website. Go to progress page and click on "seal". When installed, the shafts seem to slide with a slight "wheezing" coming out of the end as there is no grease on the splines yet. I still have to pick up a grease gun and some grease. One more thing I can check off!

<<http://home.fuse.net/davestr4a>>

-Dave Connitt

Subject: Finished Rear Half Shaft Rebuild
Date: Thu, 22 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I ended up using a Buna-n o-ring. I know, I never heard of them either. McMaster-Carr sells them. It looks
> like a squared off o-ring.

Just to be clear, "Buna-N" refers to the material the O-ring is made of. It's actually a very common material, possibly the most common O-ring material used in cars, because of its resistance to petroleum products.

The "squared off" O-rings are known as 'Double-Seal' O-rings, and they are also available in Viton material from MMC.

> Material: Viton with a Durometer Shore of 70
> Size: 3/16ths square thru the cross section, ID is 1.10, OD is 1.52
> McMaster-Carr P/N: 90025K402

Not sure what happened here ... the MMC website shows that 90025K402 is Buna-N, not Viton. They don't seem to carry Viton Double-seal rings in sizes this large.

-Randall

Rear Suspension/IRS/Half Shafts

Subject: IRS 1/2 Shaft End Cork?
Date: Sat, 9 Dec 2006
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi List!

I'm working on reinforcing my TR4A IRS Frame to get rid of that 'CLUNK' sound. Being that I have everything out from under the car. I know that the Propeller Shaft has that thick Cork Gasket in the inside end. BUT! I was wondering if this same Cork Gasket should be also in each end of the 1/2 Shaft?

Please Send replies directly to me (as well as the List), being that I reply 1st to personal mail before reading the Digest mail, & having a time limit on the library's computer use.

-Cosmo Kramer

Subject: IRS 1/2 Shaft End Cork?
Date: Sat, 9 Dec 2006
From: "Randall" <tr3driver@ca.rr.com>

> I know that the Propeller Shaft has that thick Cork Gasket in the inside end. BUT! I was wondering if this
> same Cork Gasket should be also in each end of the 1/2 Shaft?

Nope, no need for it on the half shafts. The cork is there to shield the sliding joint from dust and dirt. On the half shafts, the gaiter serves the same purpose.

The drive shaft was a 40's design that was never updated (no need, really), while the half shaft was new in the 60's. Also, the half shaft joint sees a lot more movement than the drive shaft (especially on an IRS car), so likely needs the better seal.

-Randall

Subject: IRS 1/2 Shaft End Cork?
Date: Mon, 18 Dec 2006
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Happy Holidays Randall!

Thanks for the reply. So I gather that the 1/2 shafts Do need 'SOME SORT' of seal? I haven't taken them apart from the last time that I did the restoration ('96-> '98), & I can't remember in detail, what it looked like in there. I guess I'll have to take them apart to see if there is some sort of seal & in there.

-Cosmo Kramer

Subject: IRS 1/2 Shaft End Cork?
Date: Mon, 18 Dec 2006
From: "Randall" <tr3driver@ca.rr.com>

Hi Cosmo:

You might not recognize the "seals" as such, they are rubber bellows that cover the joint. Moss 680-100 or TRF 140753.

-Randall

Subject: IRS 1/2 shafts
Date: Sat, 23 Dec 2006
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

wmpless wrote:

> Hi Cosmo,

> I understand you have removed the rear axle and if correct, I would like to learn what you found there and
> what repairs you intend to make, hear?
> - Wiard

Hi Waird!

I have removed EVERYTHING except the Trailing Arm Brackets, But I'm thinking of removing them, too. The reason is to reinforce the frame in front of the Trailing Arms. I don't think it's necessary, But I'm an 'Over Kill kind of guy'. :>O

I'm planning on reinforcing the IRS Sub-Frame with 14 ga. metal (I think that's the ga.?) While I'm at it, I'm going to install telescopic Shocks & I'm also reinforcing that portion of the frame, too.

Randall Y. was the only person to reply to me personally, besides you. He stated that the TR4A didn't come with the cork ring at the end of each 1/2 shaft, But I thought that you wrote that you had them in the TR4A & NOT in the TR6's 1/2 shafts. I was thinking that since I have everything out of the car & I have 6 of those 'Cork Rings'; That I would install one in each of the 1/2 shafts & Prop-Shaft, But I didn't recall seeing any in the 1/2 shafts when I did the restoration back in '96->'98. I really don't want to take them apart, install them & install everything back in the GQ to find out that I could or WOULD damage something, Because TRIUMPH never did have them in them in the 1st place.

-Cosmo Kramer

Subject: IRS 1/2 Shaft End Cork?
Date: Sat, 23 Dec 2006
From: <TR4A2712@yahoo.com>

Randall <tr3driver@ca.rr.com> wrote:

> Hi Cosmo:
> You might not recognize the "seals" as such, they are rubber bellows that cover the joint. Moss 680-100 or
> TRF 140753.

YES! You are correct that I never thought of the rubber bellows as 'SEALS". I do have these on my 1/2 shafts now. That's why I thought that I would ask about installing the 'Cork Ring' in them , BEFORE I removed the wire ties, install the 'cork ring' in them & into the car to find out that my 'OVER KILL" was too much & caused damage to my 1/2 shafts.

Do you think that it would do any harm if I did install the 'Cork Ring' in each of the 1/2 shafts?

Subject: TR4A 1/2 shafts
Date: Tue, 2 Jan 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi List!

As a follow-up to my question that I asked [back in Nov. when my computer was down] about installing the thick cork 'split ring' at the end of the TR4A 1/2 Shafts, like the one installed in the propeller shaft:

It is NOT necessary, because the cork is to work as a seal, & the TR4A 1/2 shaft each have a Rubber Bellow Boot to do this job.

-Cosmo Kramer

Rear Suspension/IRS/Half Shafts

Subject: IRS rear clunk - RESOLVED
Date: Sat, 15 Nov 2008
From: "Brian Induni" <308gtsi@roadrunner.com>

I wanted to follow up and let the group know of an issue I resolved. First, thanks to everyone who has provided help / feedback over the past year I've been hunting the cause of this issue.

The car is a 1967 TR4A, IRS; the issue is a rear end clunk upon take-off, shift, and bumps. Having welded in enough extra support and reinforcement to the IRS pins while the frame was bare, I was pretty certain I could cross these off the list of possible causes. I even swapped out a diff unit thinking it was a bad inner bearing (any one need a spare IRS diff??), but still had the issue. It wasn't until I had bought a second hand half shaft and was about to dismantle it to clean and check that I noticed there was absolutely *NO* play in the sliding splines! I checked the axels on the car, and sure enough, you could hear a very faint 'click' when you rotated the halves against each other. Upon further inspection of the donor axle, I found the splines to be heavily smeared with grease. Mine weren't of course because I had cleaned them up nicely and didn't give thought to really packing the grease in. After packing the grease in the spline cavity and reassembling, I had a quiet and smooth riding 4A!

Moral of the story - if it slides, rotates, or rubs, pack it full of grease!!
-Brian

Rear Suspension/IRS/Half Shafts

Subject: Rear axle removal (IRS)
Date: Wed, 30 Aug 2006
From: "Jeff Nathanson" <jeffn@msystech.com>

----- Original Message -----

Subject: Rear axle removal
Sent: Wednesday, August 30, 2006
From: "james mc arthur" <jrmcarthur@verizon.net>

> Hello to all! I am attempting to disassemble the rear end components in order to install new bushings, the tube
> shock conversion, and the new u-joints. I have removed the 6 nuts (and in some cases, the studs as well) that
> attach to the backing plate, and the 4 nuts and bolts that join the differential and axle flanges. I take it that the
> Bentley's "slide the assembly out" is an understatement. The assembly will NOT budge. Have I missed other
> attachment points? Is there a means to separate the assembly that I am unaware of? I thought that I would
> seek the collective wisdom before I make up a bracket and attempt to remove the axle assembly with a slide
> hammer. Any and all thoughts are appreciated; I can be reached at <jrmcarthur@verizon.net>. Thanks to all!!
> -Jim McArthur

Jim,
I did the same job last night following the steps outlined in Bentley's. The only problem I had was to move the upper spring for the brake to get at the nut. Once the 4 bolts are removed from the differential, the inner portion of the axle SHOULD be free and rotate around the axis of the inner u-joint. Did you remove all (4) the bolts? I'd find out where it is binding --- it's either at the differential or at the wheel housing. If the inner axle does not separate from the differential, then spray some penetrating oil there....wait....and tap gently with a rubber mallet.
-Jeff N.

Rear Suspension/IRS/Half Shafts

Subject: The "other" IRS rear end clunk
Date: Sat, 27 Sep 2008
From: "Brian Induni" <308gtsi@roadrunner.com>

Hi list,

Just wanted to give a heads up on an issue I was just able to diagnose. That is of a rear end 'clunk' in the IRS of my 4A. No, it wasn't broken diff mounts - I welded those sucker good when the frame was stripped bare and upside down. After trying solid disk wheels thinking it was bad splines, and rebuilding the diff with new bearings, etc., I finally turned my attention to the half shafts. They looked fine but had the slightest of play (they soaked for days in the parts washer) so I tried a used axle I bought this summer. I did nothing to this used axle, and it had absolutely no play in the splines. It worked - no more 'clunk' on take off! Taking it apart I found copious amounts of grease in the splines... I mean A LOT! So I slathered the original axle in grease slid it together - this was tough due to the inability for the air to be displaced - and bolted it in. Viola! No more 'clunk'! Long story short, use LOTS of grease in the splines and you will be happy you did.

-Brain

Subject: The "other" IRS rear end clunk
Date: Sat, 27 Sep 2008
From: <tr3driver@ca.rr.com>

> So I slathered the original axle in grease slid it together - this was tough due to the inability for the air to be
> displaced.

It's my belief that there is supposed to be a 'breather' hole in there somewhere. Perhaps it's clogged with dirt and old grease? Otherwise, the movement of the splines will try to force air through the splines, which could eventually dry out the grease.

-Randall

Rear Suspension/IRS/Half Shafts

Subject: TR6 rear suspension 'grunch' - Help!
Date: Tue, 13 Jun 2006
From: <Dave1massey@cs.com>

<cartr4a@ameritech.net> writes:

> My TR-4A does the same thing. I can't find anything wrong either, and I have replaced the diff mounts and
> the studs were fine. I've been trying to figure this out for about 4 years now. If while the car is on an incline
> and I give it just a little push from the back while bouncing the back end up and down, the sound disappears.
> I've never felt or heard the sound while driving. Something must bind when the car is stationary, but it seems
> ok when moving.

My TR6 does this occasionally. I witnessed a half shaft "hop" when it happened so I attributed it to the splines sticking. Old grease may be the culprit.

"Lanoway, Brian" <Brian_Lanoway@standardaero.com> wrote:

> I've replaced almost everything in the rear suspension of my 1973 TR6 (trailing arm bushings, springs and
> caps, half-shafts, U-joints, rear hubs, lever arm shocks, shock links and bushings) and I still have a strange,
> frustrating "grunch" sound coming from my rear suspension when the car is stationary and I push the rear of
> the car up and down.

Does this mean you have "NEW" half shafts? Or were they serviced? Separating the two halves, cleaning out the old grease (and accumulated crud) and repacking with fresh grease may help.

-Dave

Rear Suspension/IRS/Springs

Subject: Airlifts for TR6
Date: Wed, 20 Jun 2007
From: "Lanoway, Brian" <Brian_Lanoway@standardaero.com>

-----Original Message-----

Subject: Airlifts for TR6
Sent: 19-Jun-07
From: <AKATR5@aol.com>

Brian,

I have had Airlifts on my TR250 for over 15 years now. My brother and father have had them on their TR6s for the same amount of time. I have recommended them for years to various friends in the local Triumph club. The truth is that they work great! When you are going on a trip, and really load the car down with luggage, etc., you just inflate the airlifts a little more and it's amazing the difference they make in ride and handling.

I'll even help you out...the Airlift part # for the TR6 is: **#60784** **phone # 800-248-0892**

Installation is very simple and straight forward. Good luck! Sincerely,
-Jan Dawson

Jan Dawson, who frequents this List, provided me with the part number for the Airlift kit that fits the rear coil springs on a TR6. As you can see from Jan's email below, her family has been using them successfully on a TR250 and TR6s for many years.

After calling Airlift, I found that the part number for the kit offered by Jan has now been superceded by these part numbers:

Bags: p/n 46143; qty 2 required
Hoses: p/n 20086; qty 1 required

I'm going to order a set from my local dealer - I'm sure they're the solution to the problem of my heavily laden TR6 on road trips.

Thanks to Jan for the part numbers and recommendation.

Thanks to Randall for the original unique idea that sent me off in this direction.
-Brian Lanoway

Rear Suspension/TRS/Springs

Subject: TR4A Ride Height **Front & Rear**
Date: Thu, 15 Aug 2002
From: Ted Schumacher <tedtsimx@q1.net>

Darrell, since this seems to be a "high interest" topic we will comment, background. We supply a measurable amount of the total "uprated" TR3-6 coil springs sold in the country and have for many years. There are 2 separate issues. One is the ride height and the other is spring rate. Ride height is always based on the original factory dimension with other tires and sitting in a level, unladen position. A TR6 sits at 28 5/8" measured from the ground to the highest point of the rear wheel arch. The front dimension is about 1" less. This would hold true for the 4A and 250. Visually, ride height can fool the eye. Example - ou replace the original tires with a low profile set - say 2" shorter than the original tire. You now have an extra inch of space above the top of the tire and the wheel arch (2" taller equates to 1" above the tire). Your car is now sitting 1" closer to the ground but you have also increased the distance from the top of the tire to the wheel arch. Spring rate is the amount of weight needed to deflect the spring a given amount - normally 1". The springs we produce are 25% stiffer in the rear and 20% stiffer in the front. This equates to 475 for the rear springs and 392 for the front. There are some issues that come to play on rate. Normal spring industry standards are $\pm 5\%$ so a 500 pound spring could be 475 on one side of the car and 525 on the other - a 50# spread. Our springs are held to 2%. This is the tightest in the spring industry. The other thing that can happen is springs can "set" or sag. This normally occurs when a live coil - one that is not touching another coil in the normal ride position - contacts and other coil. This is called coil bind. When this happens, most springs will then take a set and not return to their original free length. As part of the mfg process, our springs are set solid - all coils are armed against each other. If the spring returns to the original free length after this step, they are guaranteed never to set or sag. We have springs in use that are over 25 years old and still retain all the original characteristics. Sorry for the commercial but you needed to know these points to better understand the dynamics of the spring/ride height/rate. We have seen springs made in the uk that actually sagged within a few months. What you need to do is measure your car. See what you actually have for ride height. If it is near the 28 5/8", you are in the ballpark. If not, rear ride height is adjusted by the notched trailing arm brackets. It can be raised or lowered. When you do this, you also alter the front ride height. Grab a ruler and start in.

- Ted Schumacher

Rear Suspension/IRS/Trailing Arms

Subject: Installing IRS Trailing Arms
Date: Mon, 5 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi list!

While a lot of you were sitting at the computer waiting for the TR List to come back on line, I was SOBing on getting my IRS Trailing Arms back on with NO LUCK!

History: I removed my IRS to reinforce my IRS Sub-frame. I installed my urethane bushings & differential by myself. Thanks to the list for the helpful hint of using tape to hold the Upper Diff. Mount Bushings. That only took 15 min to complete. Now I'm trying to install the Trailing Arms to find that the mounting brackets for these are too narrow for the new Urethane Bushings Metal Shaft to fit in place. It's useless to try to spread the Mounting Brackets which leaves me with the thought of 'Shorting' the hollow Metal Shaft that runs through the inside Urethane Bushings. I do recall this topic being mentioned before the list went down, but I didn't get the solution to this problem. I know that it was mentioned that this hollow Metal Shaft was to be longer than the Urethane Bushings so this hollow Metal Shaft would be able to have the bushings move freely when the bolt went through to secure the Trailing Arms.

So before I go and 'shorten' this Metal Hollow Shaft, I'm asking the list for any better suggestions that they have done to solve this problem? TIA,

-Cosmo Kramer

Subject: Installing IRS Trailing Arms
Date: Mon, 5 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Alan Salvatore <tr6parts@earthlink.net> wrote:

> Before you go any further, I would take out the poly bushings and put in the up rated rubber bushings by
> TRF.

OK, please define what you mean by: 'The Up Rated Bushings'. I had rubber bushings in & thought that Urethane Bushings would be better.

> I have found that the poly bushings elongate in the trailing arms.

Ok, please explain:

- 1- Which way?
- 2- In which directions?
- 3- How they 'Elongate'?

> 2 experiences; I will be going back to the up rated rubber ones the next time my trailing arms come out.

> -Al Salvatore

Thank you for your reply, but I'm confused on it. This is why I asked for more detailed expiation.

-Cosmo Kramer

Subject: Installing IRS Trailing Arms
Date: Mon, 5 Mar 2007
From: "Alan Salvatore" <tr6parts@earthlink.net>

TRF has regular rubber bushings and then they have some that they call 'up rated'. I assume that they are firmer than regular. I never had a problem with the up rated ones, but I decided one day to "upgrade" the car with prothane trailing arm bushings, when they distorted I tried some other poly bushing; they still don't hold

the car like the up rated rubber. I still want to go back to the "up rated rubber." They are a pain to put in vs the polys, though.

I do drive the car, about 125,000 in last 7 years.

-Al

Subject: Installing IRS Trailing Arms
Date: Mon, 5 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Alan Salvatore <tr6parts@earthlink.net> wrote:

> TRF has regular rubber bushings and then they have some that they call up rated. I assume that they are
> firmer than regular. I never had a problem with the uprated ones, but I decided one day to "upgrade" the car
> with prothane trailing arm bushings, when they distorted I tried some other poly bushing; they still don't hold
> the car like the up rated rubber. I still want to go back to the "up rated rubber." They are a pain to put in vs the
> polys, though.

>
> I do drive the car, about 125,000 in last 7 years.

> -Al

Hi Al!

Thanks for replying & giving me your input. It looks like I'll be making a phone call to TFR.

But you still haven't cleared up my questions about your phrase of 'Distortion'. Would you please explain, How this 'distortion' looked?

-Cosmo Kramer

Subject: IRS trailing arm brackets
Date: Mon, 5 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

wmpless <wmpless@iprimus.ca> wrote:

> Hi Cosmo,

> Seems nobody addressed your problem. I would not mess with the inner metal tube of the bushing. These
> bracket ears get pressed together thru the clamping action of the bolt. However, my experience is that ears of
> the bracket can be bent back fairly easily. If the brackets are on the frame I would just tap the ears with a BFH
> outwards or clamp a larger adjustable wrench on it and push outwards. Don't think ears have to move much.

> Hope, I understood your problem correctly. Cheers

> -Wiard

Hi Wiard!

Yes, you are correct in the fact that no one has truly answered my question. Thank you for doing so.

Now Al has mentioned that his Polyurethane Bushings have distorted. I've asked him to explain, how they distorted, but he has avoided that portion of my reply.

Have you noticed any distortion with your Trailing Arm urethane bushings? If so, then how does this distortion look?

-Cosmo Kramer

Subject: IRS trailing arm brackets
Date: Mon, 5 Mar 2007
From: "wmpless" <wmpless@iprimus.ca>

Hi Cosmo,

Just saw your reply and here's my unimportant opinion: I can't say that I noticed a distortion. As you have the bushings now, I would install them and I am sure they will be good for at least a couple of years. It also is not that hard to replace them, can be done without removing the arms completely. Prior to assembly I recommend that you grease well the outside of the metal tube and the hole in the bushing. Richard Good recommends to install a grease zerk into the trailing arm but his bushing (Nylatron) comes in 2 pieces and there is some space in between. The OEM rubber bushings lasted a long time and I feel for regular driving your bushings will be fine. Not sure what Al expects from his car. Cheers

-Wiard

Subject: Installing IRS Trailing Arms
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Alan Salvatore <tr6parts@earthlink.net> wrote:

> As you accelerate the sleeve inside the bushing pulls to the left or right, over time the round hole in the
> bushing becomes oval, causing slop; hence what I call distortion.

Hi Al!

Thanks for this info. I was thinking that maybe it was on the outside edge of these bushings from possibly rubbing of the Trailing Arm against the bushing. I was thinking of then installing a brass shim around the bushing that would be between the bushing & the inside hole of the Trailing Arm.

I gather that you do 'normal' driving [as in commuting] vs auto cross or Rd. Rallying. So this 'distortion' would occur over a period of time. The more miles one puts on the car, then the quicker the rate of wear.

My next question to you is: When you did install your Urethane Bushings for the 1st time; Did they just press in by hand easily? or Did you have to use tools [socket, bolt, & washers] to PRESS fit them into place?

I got the impression when reading about this on the pasted threads, that the Bushings where NOT to move. The pivoting action was to take place at the center between the cross bolt & the hollow Metal Shaft, right?

-Cosmo Kramer

Subject: Size of bushing
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Hi Wiard!

I measured my one Urethane bushing across the diameter that is to be inserted into the Trailing arm. It measured: 1.380".

-Cosmo Kramer

Subject: Installing IRS Trailing Arms & Diff. bushings
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Alan Salvatore <tr6parts@earthlink.net> wrote:

> FYI, I am using Prothane bushings everywhere else with no problem. It was just the trailing arms that it didn't
> work out in;
> -Al

Hi Al!

Thanks for this info., because I'm also concern about the Urethane Bushing for the differential being to stiff & causing more problems. I can understand if I would be getting More Vibration at the diff., because of using the

urethane vs the rubber. But I thought that the Urethane Bushing at the diff. was better in NOT causing the Diff. Mounting Stud Bolts from harming the IRS Sub-frame, right?

-Cosmo Kramer

Subject: Installing IRS Trailing Arms
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Alan Salvatore <tr6parts@earthlink.net> wrote:

> All the poly bushings come with a sleeve and the two bushing halves; the bushings just slid on the shaft. It's
> pretty easy.

I'm able to Hand Press the Urethane Bushing into the Trailing Arms & the Hollow Metal Shaft into the Urethane Bushings. This worried me that the Trailing Arm hole has 'worn' to become larger than necessary.

> The bushing doesn't move; but the sleeve moves from the torque. Eventually the shape of the hole changes. It
> happens to rubber also; but it took 15 - 20 years for the rubber vs 1 year for the ploy.

Probably because the Urethane is a stiffer material which won't 'rebound' back into shape.

> But I noticed the sway right away with the poly. The material has too much give or it doesn't retain its shape.
> But when I replaced the polys the first time you could visibly see the hole had enlarged that the sleeve passes
> through. There is a lot of torque that they have to endure in the trailing arms and I am not a racer type driver.

Thank you for making that statement. I'm just a 'seasonal driver' who doesn't put the car thru any paces, either.

-Cosmo Kramer

Subject: Trailing arm bushings
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

wmpless <wmpless@iprimus.ca> wrote:

> Hi Cosmo,
> It was nice to talk with your Master. The diameter in the center is 1.400" and diameter of the lip is 1.595".
> Hope, this helps and stay warm.
> -Wiard

Hi Wiard!

Yes, this does help. 1.400" Isn't that far off from my .380". I did take the Hollow Metal Sleeve up to the hole & would have No Problem in the 'thick' hollow Shaft going through the bolt hole. So I'm good there. Thanks for this input.

-Cosmo Kramer

Subject: Installing IRS Trailing Arms & Diff. bushings
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

Alan Salvatore <tr6parts@earthlink.net> wrote:

> Too be honest; on the Diff mounting bushings I can't remember if ...
> Prothane is in the front suspension.
> -Al

Hi Al!

Well, my Rubber Diff. Bushings are very good. They haven't shown any wear over the past 9 yr. from when I did the restoration. I figured that I would go with the urethane Bushing this time, because I had EVERYTHING out in order to do the stiffening of the IRS Sub-frame. If i don't like them, then I can always drop the diff. & reinstall the rubber. After all, It's only 16 nuts to undo to drop the diff. I installed the diff. in 15 min. by myself, so it's no big deal. I'm happy with the front suspension, now, but I want to rebuild my spare front suspension with Urethane Bushings & install that in the winter of '08. If I don't like it, then I'll drop it & reinstall the rubber suspension.

Thanks for all the time & effort you have put into returning replies to me.

-Cosmo Kramer

Subject: Trailing arm bushings
Date: Tue, 6 Mar 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

wmpless <wmpless@iprimus.ca> wrote:

> Hi Cosmo,
> 20 thou could make already a diff. when pushing it into the eye of the Trailing Arm. Also note my bushing
> firms up quite a bit when metal tube is inserted. As said before, I am sure your bushings will be alright for a
> long time.
> -Wiard

Hi Wiard!

Yes, .020" is something to be concerned about, but I also agree with you that I should be OK with them. I talked to RTF & they are going to get back to me tonight on what their bushing size is. I also spoke with Ted Schumaker owner of TSI, & he said for me to phone him back tomorrow to see what his distributor has to say. It should be interesting on what each of them say.

-Cosmo Kramer

Rear Suspension/IRS/Trailing Arms

Subject: Rear end clunk
Date: Sat, 1 Jul 2006
From: "Alan Salvatore" <6parts@charter.net>

After a long chase, I think I have finally solved my clunk in the rear. After doing the many fixes over the years, including reinforcing the differential mounts; it was during the replacement of the trailing arm bushings that I noticed that the hole in the trailing arm that the link assembly goes through had become elongated; obviously from the link assembly being loose and banging around even though the bushings were in place. I had picked up a replacement trailing arm, that I was going to swap out because one of the studs had pulled out and that had the link assembly was still in place and after removing it ; it has a much more enlarged hole. Ended up using the original trailing arm and had a new stub put in.

Anyway I tighten the link assembly as tight as it could go and so far no more clunk. I will be getting some poly bushings for the assembly the next time I place an order.

-Al Salvatore

Rear Suspension/IRS/Trailing Arms

Subject: TR6 rear Bushing replacement procedure
Date: Thu, 22 Jan 2004
From: "Alan Salvatore" <asalvato@tampabay.rr.com>

I used a 2" piece of PVC pipe, wide enough to accommodate the bushing, a board, to press against pvc pipe, a socket to press old bushing out,. Then you need a large c-clamp or a large vise to press out the old bushing. If you are using new poly bushings, they are cut in half and will just slide in place in the trailing arms. If you are using new up rated rubber bushings it's the reverse of the removal.

-Al Salvatore

----- Original Message -----

Subject: TR6 rear Bushing replacement procedure
Sent: Thursday, January 22, 2004
From: "Scott Tilton" <stilton@protoprod.com>

> I'm soliciting any helpful "Been there done that" advice, tips, tricks, etc. on the job or replacing the trailing
> arm bushings on a TR-6 (or 4A or 250) Thanks in advance.

> -Scott Tilton

Subject: TR6 rear Bushing replacement procedure
Date: Thu, 22 Jan 2004
From: "David Brister" <brister@tiscali.fr>

Threaded rod and correct nuts, plenty of washers of different sizes, washing up liquid for lubrication, piece of pipe or socket to fit over the outside diameter of the eyes in the arms. Simply shove the threaded rod through the bush to be removed, put a washer slightly less than the o/d of the bush, put a nut over the washer, lock it with another nut. Then a nut and washer on the pipe/socket end and wind away. It helps to lubricate the thread at the socket end generously. New bushes, pull them in the same way but it's important and not too difficult to get 'em in square.

-David Brister.

Subject: TR6 rear Bushing replacement procedure
Date: Thu, 22 Jan 2004
From: "Scott Suhring" <suhringtr36@comcast.net>

Scott:

I used the following method for removing and installing the rubber bushings on my '70 TR6 trailing arm and have used it on other similar jobs. As was previously mentioned, get some PVC piping that is slightly larger than the bushing opening and slightly smaller than the opening. You can cut it down so that it is a bit longer than length of the bushings. Then you want to get a length of threaded rod or a really long bolt that will reach the length of both pipes, the trailing arm bushing hole and about 2" beyond either end. What you are going to do is get a couple of large machine washers that will fit over the end of the pipe and then a number of washers that the bolt/rod will just fit through and a number (get a good dozen or so) of nuts for the threaded rod/bolt. What you will be doing is in essence running the bolt/rod through the large washer with smaller washers to keep it centered over the pipe, through the pipe, through the center of the bush out the other end and through the smaller pipe (this only needs to be the length of the trailing arm bushing hole) and finally through the other washer that sits on the end of the pipe. The end of the larger pipe will take two nuts used like jam nuts, snug up against the washer. The other end you use one nut against the washer and start turning the nut as if tightening it against the washer. In essence, you are forcing the smaller diameter pipe into the bushing and thus forcing it out of the trailing arm and into the other larger pipe. To put new bushings into the trailing arms, just do the reverse.

Email me off line if you have any questions. I have all of the piping and washers in a bag that I could measure

for correct sizes, etc. if you need this.

-Scott Suhring

Rear Suspension/IRS/Trailing Arms

Subject: TR4A Trailing Arm bushing Assembly Question
Date: Tue, 4 Jul 2006
From: "Alan Salvatore" <6parts@charter.net>

----- Original Message -----

Subject: TR4A Trailing Arm bushing Assembly Question
Sent: Tuesday, July 04, 2006
From: "Dave Connitt" <dconnitt@fuse.net>

> Happy Fourth Everybody!
> I am getting ready to install my new urethane bushes in my TR4A trailing arms and I am looking for opinions
> as to whether I should lubricate them prior to installation. They appear that they could be installed either way.
> If anybody has lubed theirs, what did you use? Thanks in advance,
> -Dave Connitt

Make sure you use an anti-seize lubricant on the bolt that goes through it. Mine had some kind of prelube on them.

-Al

Subject: TR4A Trailing Arm bushing Assembly Question
Date: Tue, 4 Jul 2006
From: Greg Perry <rgperry@earthlink.net>

-----Original Message-----

>Subject: TR4A Trailing Arm bushing Assembly Question
>From: Alan Salvatore <6parts@charter.net>

> I am thinking that the extra length of the sleeve caused excess movement and cause the first set of poly
> bushing to develop slope. I hope it doesn't happen to the 2nd set.
> Was the sleeve from TRF polys exact or was it a bit long?
> -Al

List,
I just installed a set of rear trailing arm polyurethane bushings on my TR6 that the sleeve was longer than the bushings also. I thought that it was odd that the sleeve was longer than the bushings. Are the sleeves supposed to be longer?

-Greg Perry

Subject: TR4A Trailing Arm bushing Assembly Question
Date: Tue, 4 Jul 2006
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

----- Original Message -----

Subject: TR4A Trailing Arm bushing Assembly Question
Sent: Tuesday, July 04, 2006
From: "Greg Perry" <rgperry@earthlink.net>

> List,
> I just installed a set of rear trailing arm polyurethane bushings on my TR6 that the sleeve was longer than the
> bushings also. I thought that it was odd that the sleeve was longer than the bushings. Are the sleeves
> supposed to be longer?
> -Greg Perry
>

> -----Original Message-----

>>Subject: TR4A Trailing Arm bushing Assembly Question
>>From: Alan Salvatore <6parts@charter.net>

>> I am thinking that the extra length of the sleeve caused excess movement and cause the first set of poly
>> bushing to develop a slope. I hope it doesn't happen to the 2nd set.
>> Was the sleeve from TRF polys exact or was it a bit long?
>> -Al

Yes the sleeve should be longer so that the bracket clamps the sleeve and the bearing is then the interface between the OD of the sleeve and the ID of the bushing. This is for the poly type bushings which do not flex as the original rubber ones do. For the original rubber bushings the compliance is the flex of the rubber element whereas the poly bushes create more of a bearing surface and are designed to eliminate the flexing of rubber.

I have the poly bushes in my 4A and I wish I never changed them as they are poorly made. They did not come from one of the big three. The sleeve is the same length as the bushes and I really don't know if I am getting the clamping that I should be getting. I have a new set on order from a reliable source and will change them out this winter. No I will not reveal who I bought them from but I will say that I'd always trust stuff from Richard Good.
-JVV

Subject: TR4A Trailing Arm bushing Assembly Question
Date: Tue, 4 Jul 2006
From: "Dave Connitt" <dconnitt@fuse.net>

Chris,

Thanks for the information. I was planning on adding a zerk fitting to the swing arm where the bushing sits to force lubrication in between the bushing and the arm. Sounds like that won't do much good from your description of how the urethane bushings work. I am kind of leary of using a bolt with a lubrication path drilled into it in such a critical location. You are correct in the description of my bushings. The bushing is actually two halves with a metal tube inserted in the middle. I wonder if I could drill a hole through the two bushing halves at the point where they touch in the middle which would be at right angles to the metal tube. I could then add a zerk fitting to the arm that will hopefully match up to the hole in the bushing. That would provide a grease "path" down to the metal tube at least. From there, it could hopefully travel along the tube to both ends. What do you guys think?

-Dave

Subject: TR4A Trailing Arm bushing Assembly Question
Date: Tue, 4 Jul 2006
From: "Dave Connitt" <dconnitt@fuse.net>

Alan,

My TRF sleeves were a bit long. Chris sent me an email which went to the list also that explains how the bushings work. Makes sense. I also proposed a way to add a grease fitting to the swing arms to lube the bushings

later.

-Dave

Subject: Poly bushings -- how they work
Date: Tue, 4 Jul 2006
From: "Chris Bohn" <cbohn@sidepipe.com>

Listers,

I sent the email below to Dave and Alan, and also copied the list. But it didn't show up yet on the list, so I am sending it again...

-Chris

Message:

Dave & Alan,

The urethane bushings have different mechanics compared to the original bonded rubber bushings. The latter have a rubber "outer bush" bonded to an inner "metal bush" through which the bolt passes. When you tighten the bolts, the flanges on the brackets press against the inner metal bush, thus preventing rotation of the inner metal bush. Because the rubber bush is a press fit, the outer rubber bush is held fast against the trailing arm at its outer boundary. When the suspension moves, the bush accommodates the movement by the rubber outer bush twisting against the inner metal bush to which it is bonded. This is why the trailing arm brackets must be tightened only when the approximate weight of two people is in the car. This sets the bushing at a "non-deflected" state with the car loaded, and allows for twisting of the bush for both up and down suspension movement.

The urethane bushes work in a different way. The urethane bush is not bonded to an inner metal bush -- the metal tube is simply inserted into it, and the urethane bush is free to rotate around it. As with the rubber bonded bush, the inner metal tube is crushed and held firm when the brackets are tightened. The outer boundary of the urethane bush is also tight against the trailing arm. To accommodate suspension movement, the urethane does not "twist" like the rubber bush. Instead, it rotates around the inner metal tube. Some urethane bushings don't even have the inner metal tube -- the urethane bush rotates around the bolt itself (this is often found to be the case for front wishbone bushings).

Because the urethane is rotating against the inner metal tube, there can be "stiction" if there is not sufficient lube between the urethane and metal. This can cause the infamous "squeaking" characteristic of urethane bushings. So, the metal sleeve needs to be lubed on the outside, or the urethane bush needs to be lubed on the inside, or both. There are some urethane bushing kits out there that have drilled securing bolts, with a small hole then drilled into the side. There is a corresponding hole in the inner metal bush tube, and the bolt is fitted with a zerk. This allows greasing of the urethane/metal bush interface, which is otherwise impossible.

So, in addition to using anti-seize on the bolt (to allow the whole thing to be disassembled later), make sure you put plenty of lube into the center of the urethane and also on the outside of the inner metal tube.

-Chris

Subject: TR4A Trailing Arm bushing Assembly Question
Date: Tue, 4 Jul 2006
From: "Chris Bohn" <cbohn@sidepipe.com>

----- Original Message -----

Subject: TR4A Trailing Arm bushing Assembly Question
Sent: Tuesday, July 04, 2006
From: "Dave Connitt" <dconnitt@fuse.net>

> Chris,

> Thanks for the information. I was planning on adding a zerk fitting to the swing arm where the bushing sits to
> force lubrication in between the bushing and the arm. Sounds like that won't do much good from you
> description of how the urethane bushings work. I am kind of leary of using a bolt with a lubrication path
> drilled into it in such a critical location. You are correct in the description of my bushings. The bushing is
> actually two halves with a metal tube inserted in the middle. I wonder if I could drill a hole through the two
> bushing halves at the point where they touch in the middle which would be at right angles to the metal tube. I
> could then add a zerk fitting to the arm that will hopefully match up to the hole in the bushing. That would
> provide a grease "path" down to the metal tube at least. From there, it could hopefully travel along the tube to
> both ends.

> What do you guys think?

> -Dave

Hi Dave,

I have heard of some folks doing just as you suggest: Drilling all the way through the trailing arm and urethane bushing and fitting a zerk to grease that mating surface between the urethane bush and inner sleeve. Some urethane bushings come with recesses in the inner urethane hole to act as a grease reservoir. If I were you, though, I would just really slather the lube in there and see how long it lasts. One thing to consider: From the factory, the bolts through the brackets were oriented such that the inner bolt head was closest to the center of the car. Because of the bolt length, you cannot subsequently remove the bolt, because it butts up against the frame before it clears the bush and bracket. Why the factory did that, who knows (perhaps as a safety measure, to ensure that it cannot work itself completely out), but I would fit the bolts so that the bolt heads are each pointing to the center of the trailing arm. That way, you can extract them and drop the arm to remove and regrease the bushings without having to disturb the trailing arm brackets.

-Chris

Subject: TR4A Trailing Arm bushing Assembly Question
Date: Tue, 4 Jul 2006
From: "Chris Bohn" <cbohn@sidepipe.com>

----- Original Message -----

Subject: TR4A Trailing Arm bushing Assembly Question
Sent: Tuesday, July 04, 2006
From: "Greg Perry" <rgperry@earthlink.net>

> List,

> I just installed a set of rear trailing arm polyurathane bushings on my TR6 that the sleeve was longer than the bushings also. I thought that it was odd that the sleeve was longer than the bushings. Are the sleeves supposed to be longer?

> -Greg Perry

> -----Original Message-----

>>Subject: TR4A Trailing Arm bushing Assembly Question
>>From: Alan Salvatore <6parts@charter.net>

>> I am thinking that the extra length of the sleeve caused excess movement and cause the first set of poly bushing to develop slope. I hope it doesn't happen to the 2nd set.

>> Was the sleeve from TRF polys exact or was it a bit long?

>> -Al

Greg,

The inner sleeve has to be longer than the urethane bush. The trailing arm bracket is designed to crush against the inner metal sleeve, thus prevent it from rotating. The urethane bush then rotates around the inner sleeve. This also happens with the rubber bushings, but in that case, the rubber deflects axially and does not rotate around the inner sleeve (it is bonded to it). If the inner metal sleeve is not long enough, it won't be crushed and one of two things will happen: 1) The urethane bush and the inner sleeve will together rotate around the securing bolt (not good) or 2) the bracket will crush both the inner sleeve and the urethane bush, inhibiting either from turning smoothly, in which case you will wear the both the urethane bush and the inner sleeve against the bracket (also not good).

-Chris

Rear Suspension/IRS/Trailing Arms

Subject: Trailing Arm geometry changeover TR6
Date: Sun, 11 Apr 2004
From: "GJ Pooley" <pooleyj@ns.sympatico.ca>

Hi;

In Roger Williams book "How to Restore Triumph TR5/250 & TR6", he discusses the trailing arm brackets. He says that "At commission numbers CP52867/CC61570 bracket 1555502 (3 notches) was fitted to the inside mounting and 141398 (1 notch bracket) on the outside..." "Furthermore, it is not generally appreciated that at the same time as the mounting bracket 'notches' were changed, a change occurred to the trailing arm castings, and the angles varied from the earlier castings. .. Fortunately, Triumph's casting sub-contractor was meticulous in incorporating the date of the casting on the outside of each trailing arm."

Would someone tell me, please, if a trailing arm with a date of 14/5/71 would be before or after CC61570? Is the change in the trailing arm obvious enough that I should be able to see it?

-Juanita Pooley

Rear Suspension/Live

Subject: Axle oil seal - good progress - more questions
Date: Thu, 23 Nov 2006
From: Adrian Jones <adrianjones747@earthlink.net>

Hi Folks,

Well, thanks to the list response, I have the axle out of the car. Not difficult if you remove them 6 bolts first. Ha!

Anyways, not quite finished yet:

1. The oil seal to be replaced is still in place:

<<http://i12.photobucket.com/albums/a241/AdrianJones34/Oldsealinplace.jpg>>

How to remove it - should I just lever it out with an oil seal remover tool or is there a better way.

2. I'm assuming the new one is gently tapped in with a socket with the spring side goes in first and I'm left looking at the lettering side:

<<http://i12.photobucket.com/albums/a241/AdrianJones34/Sealspringside.jpg>>

<<http://i12.photobucket.com/albums/a241/AdrianJones34/Sealletteringside.>>

3. I have the axle assembly lying on the garage floor - I can separate the bearing housing from the hub to give a gap of 1/8". Is this normal?

<<http://i12.photobucket.com/albums/a241/AdrianJones34/Gap1.jpg>>

4. Those six bolts were held in place with tab washers but they were quite loose - could that cause the oil leak.
-Adrian

Subject: Axle oil seal
Date: Thu, 23 Nov 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Adrian Jones wrote:

>1. The oil seal to be replaced ...

>3. I have the axle assembly lying on the garage floor - I can separate the bearing housing from the hub to give a gap of 1/8". Is this normal?

As I recall, that sounds normal.

>4. Those six bolts were held in place with tab washers but they were quite loose - could that cause the oil leak.

Seems unlikely. Were they really loose... or just not very tight?

Subject: Axle oil seal
Date: Thu, 23 Nov 2006
From: "Randall" <tr3driver@ca.rr.com>

> How to remove it - should I just lever it out with an oil seal remover tool or is there a better way.

The tool I had didn't seem to want to work, so I wound up using a slide hammer. But I'd try the oil seal tool first.

> 2. I'm assuming the new one is gently tapped in with a socket with the spring side goes in first and I'm left > looking at the lettering side:

Yup.

> 3. I have the axle assembly lying on the garage floor - I can separate the bearing housing from the hub to give > a gap of 1/8". Is this normal?

Yup. When installed in the housing, the two half shafts touch in the center (through a small block in the diff) and so hold each other into their respective bearings. The clearance is controlled by those shims behind the brake backing plate.

> 4. Those six bolts were held in place with tab washers but they were quite loose - could that cause the oil > leak.

Definitely! Next question is how did they get loose ... I'd be looking very carefully for distortion in the bolts, busted shims, distorted flange, etc. Those bolts take a lot of force when cornering hard and/or hitting bumps, so make sure they are in good shape. I'm not sure offhand what is special about them, but from the part number, they are not standard hardware items. So, I wouldn't replace them with hardware store bolts.

Good luck !

-Randall

Subject: Axle oil seal
Date: Fri, 24 Nov 2006
From: Adrian Jones <adrianjones747@earthlink.net>

Many thanks Randall for all that important information.

Sure enough, sometime in the past, it looks like 2 of the bolts have been replaced by regular grade 8 bolts, that are threaded all the way:

<<http://i12.photobucket.com/albums/a241/AdrianJones34/Bolts.jpg>>

The other 4 sound decidedly British (Rubery Owen R45-55).

I'll order a complete set from TRF (with the lock washers). Needless to say I'm now going to have a look at the other side of the car.

The hub looks OK and I've checked it as best I can with a straight edge.

I'll check the shims later on - I think I have to go shopping with the wife this morning.

-Adrian

Subject: Axle oil seal
Date: Fri, 24 Nov 2006
From: "Randall" <tr3driver@ca.rr.com>

> Many thanks Randall for all that important information.

It occurs to me that part of it was incorrect. There should not be oil against the joint formed by the bearing housing, backing plate and axle (the one held together by the 6 bolts). That cavity should only have grease in it (from the zerk that lubes the wheel bearing). So, if what was leaking was definitely gear oil (as opposed to oil

that separated from the grease), the inner seal is still likely bad.

-Randall

Subject: Axle oil seal - shims problem
Date: Fri, 24 Nov 2006
From: Adrian Jones <adrianjones747@earthlink.net>

Well, I've taken a look at the shims:

<<http://i12.photobucket.com/albums/a241/AdrianJones34/Shims.jpg>>

As you can see, there are 4 of them - the top two have a crease, no breakage. Should I go ahead and replace them or just sandwich them between the 2 good ones?

The combined thickness (as measured with a venire caliper) is 1/16" (Can't find the set of micrometers I had). I'm guessing, by the flexibility, that they are one each of the 4 different sizes that are sold by the Big 3 ie., 0.006. 0.008, 1/64 and 1/32.

I was just going to order up a 1/32 to go with the (good) original 1/32.

Does that sound reasonable or do I need to more concerned and get these properly measured. Needless to say I didn't measure the float (?) before I dismantled.

-Adrian

Subject: Axle oil seal - shims problem
Date: Fri, 24 Nov 2006
From: "Randall" <tr3driver@ca.rr.com>

> I was just going to order up a 1/32 to go with the (good) original 1/32.

>

> Does that sound reasonable or do I need to more concerned and get these properly measured.

>

> Needless to say I didn't measure the float (?) before I dismantled.

Given that there is something strange going on (loose bolts with intact lock tabs), I would not be happy unless I checked that the end float was within limits. I also wonder how those shims got creased ... but the crease itself doesn't seem like a problem to me. The right tool for checking end float is a dial indicator & magnetic mount. Less than \$20 from Enco.

<<http://www.use-enco.com>>

-Randall

Subject: Axle oil seal - good progress - more questions
Date: Fri, 24 Nov 2006
From: Adrian Jones <adrianjones747@earthlink.net>

Well, the leakage, to me, looked and smelled like the differential oil and not grease separating. (It wasn't leaking into the hub cap at all - just leaking down the inside of the tire onto the floor, maybe a teaspoonful.)

However, there was quite a lot of grease inside the brake drum, on the back plate and all over the shoes. Not sure what that means.

I'm thinking the oil got past the axle end oil seal and the grease got out by someone over-enthusiastic with the grease gun (not me, I didn't even know about that grease nipple, ha!)

Then again maybe all this happened when I accidentally left the hand brake on and didn't realize until I smelled the shoes roasting. Doh!

-Adrian

Subject: Rear axle oil seal - now no end float
Date: Sat, 25 Nov 2006
From: Adrian Jones <adrianjones747@earthlink.net>

Hi folks,

I put everything back together and checked the end float (per Haynes) with a dial indicator and guess what!

Zero end float at either wheel. I mean, not even 0.001. I'm really pulling and pushing but no movement. Am I doing something wrong here?

I'll order up some shims and get back to you when I have set up the float.

Just one last question. How much grease should I put in the cavity for the bearing? Normally, when using a grease gun on a nipple, the excess starts to ooze out someplace but I don't think the excess can go anywhere in this case. Or I am wrong..

-Adrian

Subject: Rear axle oil seal - now no end float
Date: Sat, 25 Nov 2006
From: "Randall" <tr3driver@ca.rr.com>

> Zero end float at either wheel. I mean, not even 0.001. I'm really pulling and pushing but no movement. Am I doing something wrong here?

Might be, but I would guess you've discovered why some DPO left those bolts loose ...

> Just one last question. How much grease should I put in the cavity for the bearing? Normally, when using a grease gun on a nipple, the excess starts to ooze out someplace but I don't think the excess can go anywhere in this case. Or I am wrong.

The manuals warn against over-greasing the rear wheel bearings for just that reason. The excess will start to ooze out inside your brakes, and you don't want that. I don't recall offhand the recommendation, but it's something like 5 strokes every 10,000 miles.

-Randall

Rear Suspension/Live

Subject: TR3 Axle shaft end float
Date: Sun, 1 Apr 2007
From: Adrian Jones <adrianjones747@earthlink.net>

Hi Folks,

I'm not sure what is going on here - maybe someone can shed some light. Basically, the end float keeps changing.

This all began when I had to renew the oil seal because differential oil had leaked through and soaked the brake pads on the passenger side. That renewal was successful. However, I measured the end float and it was zero, as measured with a dial indicator. Haynes has a nice write up, saying it is "important" to be in the spec of 6 to 8 thou.

Adjusting the float is a matter of adding or subtracting shims. These shims come in the following sizes: 6 thou, 8 thou, 1/64 inch and 1/32 inch. Let me simplify by calling them 6, 8, 16 and 31thou. Initial shims present were:

Driver: 6 + 8 + 16 Passenger 6 + 8 + 16 + 31

OK, so I added two 31 thou shims to the driver's side, giving:

Driver: 6 + 8 + 16 + 31 + 31 Passenger: 6 + 8 + 16 + 31 This gave a measured float of 46.

I took out an 8 and a 31 from the driver side, giving:

Driver: 6 + 16 + 31 Passenger: 6 + 8 + 16 + 31 This gave a measured float of 6.

However, after a week of driving I checked on the oil seal and measured again the float. It had jumped up to 14.

I took out an 8 from the passenger side, giving:

Driver: 6 + 16 + 31 Passenger: 6 + 16 + 31 This gave a measured float of 7.

After a couple of months, the float is now back at zero!

I'm being very careful measuring so I think we could rule out "operator error". Obviously, I need to put back a shim but it seems that will just start the endless loop.

-Adrian

Subject: TR3 Axle shaft end float
Date: Sun, 1 Apr 2007
From: "Randall" <tr3driver@ca.rr.com>

> I'm not sure what is going on here - maybe someone can shed some light. Basically, the end float keeps
> changing.

Only explanations I can think of (in roughly decreasing order of probability):

1. One of the axle tubes is moving in the pumpkin.
2. There is swarf in either one of the wheel bearings, or in the pumpkin. (Between the ends of the axles and the spacer block).
3. The carrier bearings in the pumpkin are so shot that the diff carrier can move around enough to change the end float reading.

-Randall

Rear Suspension/Live

Subject: TR4 Axle/differential
Date: Thu, 1 Jun 2006
From: "TAB" <boggiano@charter.net>

I have been driving my tr4 (solid axle) as my primary driver for the past 3 weeks or so, Today on the way home from work I started hearing a high pitched whine from the rear end and when the car decelerated a grinding (almost like something dragging under the car) good thing it was close to home and the garage because it really did not want to drive. When I got it home the rear end was smoking (hot), After letting it cool off I raised it up and checked the following

There is gear fluid in the differential. As I rotate the right side wheel the drive train turns the left wheel does not either direction. The left wheel turns the right turns also as does the drive train however it feels like the wheel is binding up. Does the same thing with the brake drum removed and there is a lot of play now in the wheel before the drive train moves. When I pulled the drum there is all sorts of oil like substance in the brake area, Almost grease like on the shoes.

So here I sit trying to contemplate if I have lost the differential/axle and if so where do I find another one? What should I be looking at next?

Any Ideas are welcome. Thanks

-Tom

Subject: TR4 Axle/differential
Date: Thu, 1 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> So here I sit trying to contemplate if I have lost the differential/axle and if so where do I find another one?
> What should I be looking at next?

Sounds more like a wheel bearing gone bad, to me. You'll have to have the half shaft out anyway, even if it's the diff that's bad, so I'd pull the left half shaft next.

Assuming it is the bearing, you'll want to find someone with the factory hub removal tool to get the hub off (so the bearing can be replaced). Just putting it in a press and going at it will frequently distort (ruin) the hub.

-Randall

Subject: TR4 Axle/differential follow up and more questions:
Date: Sun, 4 Jun 2006
From: "TAB" <boggiano@charter.net>

I spend the afternoon yesterday and pulled the rear axle out of the car. Came out quite easily, after I opened the rear end of the diff and took a peak inside the pinion seems to have lost a tooth which came out as mangled metal in the bottom of the case.

Thanks to all the offers I think I have a axle differential located close to me in MA.

On to other questions:

The rear dampers mounting on the frame were loose, Should they be loose or tightly fitted? They do look like they are 40 plus years old so I am going to replace while I am in there

The rear springs now that they are not loaded sag to different levels, the left side sags about 4 inches more than the right? Do leaf springs need to be replaced on a regular basis? There look like they are also 40 years old.

While I have the entire rear end of the car on the floor of the garage what else should I do there? Thanks
-Tom

Subject: TR4 Axle/differential end float
Date: Fri, 16 Jun 2006
From: "TAB" <boggiano@charter.net>

I am in the final throws of replacing the damaged differential in my TR4. I have been going through the manuals and I just don't get it. Can someone explain to me how to measure and set the axle end float on a solid axle TR4? What am I missing? Thanks

-Tom

Subject: TR4 Axle/differential end float
Date: Sat, 17 Jun 2006
From: <tr3driver@comcast.net>

"TAB" <boggiano@charter.net> wrote:

> I am in the final throws of replacing the damaged differential in my TR4. I have been going through the
> manuals and I just don't get it. Can someone explain to me how to measure and set the axle end float on a
> solid axle TR4? What am I missing?

The point the manuals may be unclear on, is that you must install both axles to measure the float. Then ideally remove both of them to adjust the shim packs, so the packs stay roughly equal.

A dial indicator should make things easier ... Enco usually has them on sale for under \$25.

-Randall

Subject: TR4 Axle/differential end float
Date: Sat, 17 Jun 2006
From: <CarlSereda@aol.com>

Tom wrote:

> I am in the final throws of replacing the damaged differential in my TR4. I have been going through the
> manuals and I just don't get it. Can someone explain to me how to measure and set the axle end float on a
> solid axle TR4? What am I missing? Thanks
> -Tom

Tom,

A very experienced TR3 race car driver (Hardy Prentice) helped me in resetting all clearances in my TR4 live axle diff last year - I might be able to advise you but your description lacking enough detail. Can you be more specific?

-Carl

Rear Suspension/Live/Springs

Subject: GT6+ Rear Spring
Date: Fri, 30 Aug 2002
From: <Windoseat@aol.com>

The formula for computing the transverse leaf spring rate is:

$$\frac{WN}{12} \times \left(\frac{1000t}{L} \right)^3$$

12 = L

I apologize for the crude depiction of the formula, but the second expression is in parentheses and raised to the third power.

W= Width of leaves in inches

N= Number of leaves

t= Thickness of one leaf in inches

L= Length of spring in inches

12= A constant for all leaf springs

That's how it's calculated. I get approximately 199.7 inch lbs.

Greg Wolf

Subject: GT6+ Rear Spring
From: <Windoseat@aol.com>

Yes, the formula works for any leaf spring, transverse or single side elliptical. The calculation would be for each spring pack. However, I still think that when you have a spring pack that consists of leaves that are progressively smaller you would have to calculate each leaf and add them together to get the total spring rate.

There is no calculation for metal fatigue. I'd assume that older springs would have to be rearched to restore the original ride height and spring rate.

Here is the formula for coil springs:

$\frac{Gd^4}{8ND^3}$ that's "d" to the fourth power

8ND³ that's "D" to the third power

G= Torsional modulus for steel= 11.25 x 10 to the sixth power or 11,250,000

d= Wire diameter in inches

N= Number of active or whole coils- don't count the partial coils at each end

D= Mean coil diameter in inches- measured looking down on the coil and center to center of the wire. Not the inside diameter of the coil or the outside diameter of the coil but the middle of the wire thickness to the middle

of the wire thickness across the diameter of the coil

$S =$ A constant for all coil springs

-Greg Wolf

Rear Suspension/Live/Springs

Subject: TR3 Rear Road Leaf Springs
Date: Wed, 15 Jan 2003
From: Randall Young <ryoung@navcomtech.com>

> During a recent conversation with several past TR3 owners, one mentioned that TR3's had two different leaf
> springs. Apparently the driver's side was stiffer to help balance the car with driver only. I can find only
> minimal reference to this and the catalogues sell only one part number for both sides. When I got my car it
> was disassembled and I remember that the springs looked different. What I am wondering is how can I tell if
> I installed them the correct way.

Jerry, on my car the springs were identical except that the passenger's side had an extra piece of leaf, only 3-4" long, effectively a spacer between the spring and axle. The center bolt might have been longer, but I don't remember it being so. Since the axle runs over the spring, the spacer has the effect of lowering the passenger's side by about 1/4", hardly enough to worry about IMO.

-Randall

Rear Suspension/Live/Springs

Subject: Solid Axle Alignment
Date: Sun, 5 May 2002
From: <WBabbitt@aol.com>

<scdennis@email.msn.com> writes:

- > I had the rear end and leafs off my TR4 for cleaning and painting. I reinstalled everything per the factory
- > workshop manual but now the rear axle sits about an inch and a half further back on the chassis. It almost hits
- > the rear of the bump strap. Can anyone give me a clue??
- > -Steve Dennis

Steve,

If everything is properly lined up on the pin in the "middle" of the spring, the only remaining possibility I can think of is that you have the spring on backwards. From the forward eye to the axle should be 18 inches. From the axle to the after most eye should be about 21 inches. Hope this helps,

-Bill Babbitt

Rear Suspension/Propeller Shaft

Subject: Drive shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: "Triumph" <triumph@yankeespitfire.com>

-----Original Message-----

Subject: Drive shaft vibrations and U joints TR250
Sent: Friday, March 19, 2004
From: <owner-triumphs@autox.team.net>

My local non-LBC mechanic told me that I can risk the chance of drive shaft vibrations if the drive shaft *flange* yokes are installed 180 out of phase with respect to their original orientation.

I understood from Bentley and threads on this lists that the yoke halves that are part of the drive shaft had to be at the same angle (the yokes of both ends of the drive shaft had to be in the same plane), but I never heard that one could not be 180 degrees off from its original orientation. I also never heard the flange end of the yokes could not be reinstalled 180 degrees off with respect to their original orientation.

Any comments?

I'm concerned that I have already removed the u-joints from the IRS axles and have lost track of the original orientation of the u-joint yokes with respect to being 180 degrees one way or the other.

Any comments? Did this make any sense?
-Don Malling

Yes, one of my manuals (spitfire 1500) mentions 'chalking' them before disassembling to facilitate reassembly. I unfortunately read that AFTER changing the u-joints... The joints made slight clicking noises for a couple of days, I wasn't thinking of what it meant when it quit making the clicking. The edges of the flanges were chipped off by then. There was also a lopsided sort of vibration on one of the axle-shafts and a heavier thumping sort of vibration on the main (prop) shaft. The vibrations went away once I read about having to ensure the correct alignment and reassembled them correctly.

-Jon

Subject: Drive shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: David Brady <dmb993@earthlink.net>

Hi Don,

I just had my drive shaft dynamically spun balanced. If you rotate the yokes 180deg, you may need to re-balance the drive shaft - this was confirmed by my driveshaft shop. This may be the imbalance concerns that your mechanic is referring to. Certainly, 180deg rotation will not affect the inherent non-constant velocity characteristics of a u-joint.

-Dave Brady

Subject: Drive shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: "Jim Muller" <jimmuller@pop.mail.rcn.net>

Terry Smith wrote:

> I took my drive shaft to be balanced. When I took it to the specialist shop, I had the arrows on the
> shaft and flange sides lined up like they were supposed to be. When I got the shaft back, the arrows
> were no longer lined up

I didn't follow this thread closely until I saw this note. Now, I may be wrong about this (I spend a lot of my life wrong), but I thought the point of lining up the flanges between the two ends of double-u-jointed shaft wasn't for balance. Rather, it was because a classic u-joint (i.e. the non-CV type) doesn't produce a constant rate of turn on the driven side (i.e. w.r.t. the driving side) if the angle wasn't absolutely straight. If you have any angle in the joint (which after all is the point of a u-joint in the first place), the driven side will accelerate and decelerate as the driving side rotates at a constant rate through half a revolution. But if the other end of the shaft has a u-joint with the same angle (more or less) and the two u-joints are aligned, the acceleration of the shaft caused by the angle at one end will be given up by the angle at the other, producing a more constant rotation at the far end. For a gearbox/drive shaft/diff combo, this means the diff is driven at more or less the same speed as the gearbox, even if the drive shaft itself accelerates and decelerates as it spins. If this is the real reason for aligning the flanges between the ends, that shaft won't work as well as it ought. On the other hand, perhaps this is such a small effect that it doesn't matter. I'm sure RY or JC or someone can expostulate on this matter further.

-Jim Muller

Subject: Drive shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: "Randall Young" <Ryoung@navcomtech.com>

Jim Muller wrote:

> but I thought the point of lining up the flanges between the two ends of a double-u-jointed shaft wasn't
> for balance. Rather, it was because a classic u-joint (i.e. the non-CV type) doesn't produce a constant
> rate of turn on the driven side (i.e. w.r.t. the driving side) if the angle wasn't absolutely straight.

Certainly phasing is important, for the reason you outlined, Jim. But, I don't see any reason a flange couldn't be out of balance enough to make a difference if it was turned 180 degrees, especially if you have it on a balancing machine. I tend to doubt that Triumph balanced them that accurately, but it's certainly possible.

-Randall

PART 2
Subject: Drive shaft vibrations and U joints TR250
Date: Sat, 20 Mar 2004
From: Don Malling <dmallin@attglobal.net>

Hugh Barber wrote:

> Don Malling wrote:
> I'm concerned that I have already removed the u-joints from the IRS axles and have lost track of the original
> orientation of the u-joint yokes with respect to being 180 degrees one way or the other.
>
> Don,
> Are you talking about the drive shaft or the half-shafts (axles)? The half-shafts have a "key" in the splines
> that will only let the two halves go together one way.
> -Hugh Barber

Thanks to all who have responded. But to tell the truth I am confused by some of the replies. I'll bet it is because my question was not clear.

In all cases, either drive shaft or axles, the yoke end that is attached to the shaft is in the correct orientation. In the case of the axles the spline goes together only one way, as Hugh pointed out, and in the case of the drive shaft, I have not moved the yoke ends that are attached to the drive shaft.

I am only asking about the flange yoke ends that are connected to the shafts by the U joint. I did not think it made any difference if these flanges were rotated 180 degrees when I reassembled the U joints. I'm still not sure if it does make a difference. Probably the best suggestion is just install the U joints have them balanced anyway

-- not sure what that costs.

One person responded and said that they had a vibration and solved it by unbolting the drive shaft flange and the mating differential flange and rotating the drive shaft 180 degrees. I guess I have heard that one should mark the drive shaft flanges and diff-tranny ends for later reassembly.

Brings up a question -- I'm putting in a new OD tranny. What to do then? Just bolt it up and hope for the best? There's only four different possibilities I guess, but what if the vibration is caused by a combination of both the diff end and tranny end -- 16 possibilities. Hmmm....

I don't understand how it could possibly make any difference how the balanced drive shaft gets bolted up to the diff and tranny. Is the tranny and diff out of balance and does the drive shaft compensate for this in some way?? I thought drive shaft was balanced out of the car. If it's balanced, how could it make any difference how it was bolted into the car? This makes no sense. If the drive shaft compensates for an out of balance diff and/or tranny then the drive shaft must be "balanced" out of balance in just the right way. Something doesn't compute here. Did the factory just keep unbolting and bolting them 16 different times (OK 8 times on average) until they got it right? I think I'm starting to see the blue screen....

-Don Mallin

Rear Suspension/Propeller Shaft

Subject: Help deciphering Standard Triumph hardware catalog vs. Triumph Spare Parts Catalog
Date: Sun, 31 Aug 2008
From: "Dave Connitt" <dconnitt@fuse.net>

Hi,

I hope someone can help me out here. I am finally getting to completion of my TR4A IRS chassis rebuild. That isn't my question. Anyway, I have decided to replace the bolts that connect my half shafts to the diff and also the bolts that connect the drive shaft to the end of the transmission. I can't find the bag of parts so I am going by the Spare Parts Catalog which states the bolt is a 107960 with a TN3209 Nyloc nut. Switching to my Standard Triumph Hardware catalog the nut is a 3/8 UNF nyloc nut. The screw is not in the catalog as a 107960. Looking in the hex bolt section, there is a 3/8 x 1-1/4 Hex UNF bolt that is a HB0960. I am guessing that is what I want. There are no hex bolts starting with "107". Can someone please confirm this for me? I want to send an order off to McMaster-Carr.

-Dave Connitt

Subject: Help deciphering Standard Triumph hardware catalog vs. Triumph Spare Parts Catalog
Date: Sun, 31 Aug 2008
From: "Randall" <tr3driver@ca.rr.com>

The reason they have a 'special' part number (not in the standard hardware catalog) is because they are a special fastener. The unthreaded shank is longer than usual, the threaded portion is shorter than usual. If memory serves, the shank is also larger than usual (full nominal size, rather than the usual "easy fitting" undersize).

My suggestion is to buy the proper fastener from TRF et al. More expensive, but not nearly as expensive as ruining a flange (by having threads cut into it).

-Randall

Rear Suspension/Propeller Shaft

Subject: "Out of Phase"
Date: Tue, 7 Mar 2006
From: Hoyt <hoyt@cavtel.net>

Bill & Skip Pugh wrote:

> I have often heard of the term "out of phase" regarding the positioning of drive-shaft U-joints. I don't
> understand the term ... I am not doubting the accuracy but am simply seeking enlightenment ...

Here's more info than you wanted:

Driveline Geometry 101

<<http://www.4xshaft.com/driveline101.html>>

Driveshafts and U-Joints

<http://www.custompistols.com/cars/articles/ts_ujoints.htm>

From this article:"To make matters more confusing, many repair manuals show the phasing incorrectly. Referring to the sketch above, the "fixed" yokes (A and B) must always be parallel."

The sketch:

<<http://www.custompistols.com/cars/images/ujoint2.jpg>>

-Hoyt

Rear Suspension/Propeller Shaft

Subject: TR Drive Shaft Bolt - Grade Needed
Date: Fri, 13 Aug 2004
From: Chris Kantarjiev <cak@dimebank.com>

You can get original-equivalent bolts from TRF. I prefer to use AN bolts, along with the high-temp nylocs. These are particularly useful where the exhaust passes near the half-shafts at the rear.

I believe that what you want is AN6-10A, which has a 7/16 grip, with an AN960-616 washer and the AN365-624A nyloc.

The thin AN960-616L washer and the half-height AN364-624A nut are tempting, but the nut is rated for shear loads only - even though the torque is transmitted in shear, there's a fair bit of clamping going on as well.

You can get them at Coast Fabrication (see the Monster List for contact info).

-Chris

Rear Suspension/Propeller Shaft

Subject: TR-6 Drive (PROP) Shaft
Date: Wed, 17 Mar 2004
From: "Mark Meany" <mark@basecamp.mv.com>

"I'm into restoring my drive shaft. Thank-you all for all the great replies on my u-joint questions. In taking the splined end off in preparation for sandblasting and painting, I noticed a cork washer, pretty well deteriorated, and cracked, as well as a metal washer, split to get around the shaft, and the threaded end cap which holds both the cork and metal washer. No reference sources have a part number for these. Any words of advice for getting replacements or making them myself."

Dennis - When I rebuilt mine last year, I was able to save the split metal washer & the threaded end cap, which is a good thing, 'cause I couldn't find them anywhere. The cork washer is split, intentionally, to allow it to slip over the larger diameter, splined end & get to the area where it performs its wiping action. To replace it, I used a double O-ring seal, sometimes called a Quad seal (available through McMaster Carr), that had the capability of being stretched over the splined end. Don't be tempted to get one that fits too snugly on the portion of the shaft beyond the splined end, tho'. When the threaded end cap is tightened, that seal will squash, effectively losing some of its ID. You still want it to freely slide/wipe along the shaft beyond the splined end.

-Mark Meany

Rear Suspension/Seals

Subject: Differential Pinion Seal - TR-4A IRS
Date: Thu, 10 Jan 2002
From: "Mark Meany" <mark@basecamp.mv.com>

Sorry I wasn't paying sufficient attention when this thread passed through recently.

I replaced my old leather based seal, which didn't leak, with a new synthetic material seal from TRF back a few months ago. The diff was out of the car (still is) so I figured what the heck, might as well take care of it. I had to fight a bit to get the new seal in & I wouldn't doubt if I inadvertently distorted its shape. Afterwards, I carefully stood the diff up on the pinion flange & put in probably a half a cup of 90 wt gear oil. It leaks through the new seal. Not major amounts & granted the vertical position certainly exaggerates matters. Anyway, I bought another seal from Moss on speculation & it appears to be closer in appearance to the original one removed. Making a short story long, was the consensus that the rawhide type seal was a better fit in the housing than the synthetic alternatives?

On an unrelated matter, I had to replace a couple of heater hoses (non-LBC) recently which on this vehicle required, draining the coolant. I found I could avoid this by jamming one of those disposable foam ear plugs temporarily in the line. I just had to chuckle....

-Mark Meany

Subject: Differential Pinion Seal - TR-4A IRS
Date: Fri, 11 Jan 2002
From: "Lumia, John" <jlumia@ball.com>

Mark, I had this problem with a Chicago Rawhide rubber seal in my TR6 diff. I am not sure how similar these units are to the TR4, but in my case I surmise that the OD of the seal is a hair too large. Of course I didn't think to measure the OD before I installed. The seal starts in ok, maybe a bit on the tight side, but as the outer metal case of the seal approaches the outer diff case, it gets harder to seat. In my case I stopped when I couldn't seem to press it in any further. That's when I noticed the outer face was distorted. I was afraid to go much further, but if you don't go far enough, the back side of the pinion flange may rub on the seal. Just make sure you drive the seal in using something that will contact the seal near its OD. My diff doesn't leak, although it's only been 1500 miles.

Did you check the cylindrical surface of the pinion flange shaft for wear? The seal tends to wear into the pinion a little over time. In my case it didn't look too bad the first time I changed the seal (happened to use a leather seal), but when I took out the diff a second time (due to bad leaking) the pinion flange surface it felt a little rough when I ran my fingernail across it. I cleaned it up with emery cloth and put it back in, with the rubber seal this time. In retrospect, I suspect it doesn't make too much difference if one uses leather or rubber (is this coming out right?), although I don't have enough experience to comment on how long either one will last.

-John Lumia - 1976 TR6 (possibly with an early rear diff)

Rear Suspension/Seals

- > Hi Mark!
- > Then one would 'butter-up' from the seal to the inside of the slotted nut with a 'non-hardening Gasket Sealing' compound?
- > -Cosmo Kramer

Actually, just applying the sealing compound where the slotted nut's washer sits would be fine. Put a 3/16-1/4" bead all around, making sure you're as close to the splines as possible, set the washer in place (squeezing the goop into the splines) & hand tighten the nut. Wait overnight for the sealer to cure a bit & finish tightening the nut. This will become obvious to you once you start working with the components.

-Mark Meany

Hi Mark!

Ok, I'm getting the picture, in the fact that you have the nut off the Pinion. This way the sealing compound will get in between the splines & when the nut is installed, then the compound will have less chance of working its way out.

-Cosmo Kramer

Rear Suspension/Seals

Subject: Oil Pinion Seal
Date: Wed, 6 Oct 2004
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

----- Original Message -----

Subject: TR4A Pinion Flange Seal
Sent: Wednesday, August 11, 2004
From: Gerald M Van Vlack

Hello List,

Does anyone on the list have a CR or comparative seal manufacturers Part Number for the TR4A IRS Pinion Seal? How about a Speedy Sleeve Part Number as well? Thanks in advance.

-Jerry Van Vlack

- > I was looking under the rear of my car last night and I've noticed my differential is still leaking along with
- > both my lever arms. I'm assuming from the pinion seal on the diff. About a month ago I traced it back to the
- > pinion seal area of the housing. Since then I had cleaned off the "breather pin" and hoped that would help, but
- > it doesn't seem to be.
- >
- > How difficult is this to replace myself. Also, can this be done while the differential is in the car? I'm
- > considering trying to find a shop locally that will repair the diff and strengthen the differential mounts also if
- > the differential has to be dropped.
- > -Adam

Adam, I just completed this job on my TR4A. It can not be done while in the car but TR4A up through the 6's differentials can be removed with relative ease. Depending upon the exhaust system that you have you may need to remove some or mostly all of it up to the header pipe connection. Once the diff is removed the pinion flange can be removed and the seal replaced. I bought my seal and a speedy sleeve from NAPA and the numbers are:

Speedy sleeve 15207 \$29.26

Seal 99149 \$15.92

They are Chicago Rawhide products and of good quality.

Once the diff is on the bench you need to lock up the flange somehow so that the large nut can be loosened. Mine was not too difficult to do. The cotter pin in mine was a piece of wire and was the original fitment and is even shown as such in the parts manuals. That surprised me but I can understand why since installing a new cotter pin was next to impossible because of how deep it's inside the flange. I ended up using another piece of wire. I would count the turns off of the nut and relative torque it took to remove and use the same turns on and slightly more torque when tightening the nut again.

ISTR that the later diff's have a collapsible spacer while the older ones do not. Perhaps someone else can clarify that point. Mine does not have a collapsible spacer so I wasn't too concerned with torque values.

One thing that I will caution you about is that you need to remove the front mount from the diff by removing 4 bolts that have star type lock washers under them in order to adequately clean around the seal area. The lock washers on my unit fell apart so I used regular lock washers when I put everything back together. That was a mistake as the bolts then interfered with the flange to driveshaft bolts. It made them stick out too far. Not much clearance between those bolt heads. If you remove the mount and your star washers fall apart, get new star washers and don't use regular lock washers.

As Dave said the unit is heavy and it's awkward too. If you need to have the frame mounts reinforced you may as well have someone do the diff work at the same time or give you the diff to do while they have it out repairing / strengthening the frame mounts. The seal takes about an hour to replace on the bench. More if you are really into cleaning up the diff.

-JVV

Subject: TR4A Pinion Flange Seal
Date: Thu, 12 Aug 2004
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

Thanks to all who have responded to my question regarding seals and Speedi Sleeves for TR Rear End Pinions. The seal is a CR 15207 (2.686 OD x 1.5 ID) and the Speedi Sleeve is CR 99149. I will purchase today and fix this weekend.

Jerry Van Vlack

Subject: Seal and Speedi Sleeve NAPA Part Numbers for TR Differentials
Date: Sun, 19 Nov 2006
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

This morning I was doing a little housekeeping and I came across a NAPA Invoice with part numbers that I thought the lists might like to have.

These are for the IRS rear end pinion seal and Speedi Sleeve. I will assume they are good for all of the TR series cars as I don't believe the seal ever changed. TR 2 I don't know but it may apply.

Seal is 15207 and Speedi Sleeve is 99149. These are NAPA part numbers but may interchange with other part houses numbers. Total cost was about \$38.00 bucks in 2004.

The Speedi Sleeve fits over the Flange diameter interface with the pinion seal. This simple fix cleared up a pesky leak that I had for too many years. As I recall I needed to remove the IRS Differential to do the repair.

You

should be able to do the repair on the car with solid axle cars.

-JVV

Subject: Subject: [FOT] Seal and Speedi Sleeve NAPA Part Numbers for TR Differentials
From: "Jerry Van Vlack" <jerryvv@adelphia.net>

----- Original Message -----

Subject: Seal and Speedi Sleeve NAPA Part Numbers for TR Differentials Subject
Date: Sunday, November 19, 2006
From: <Catpusher@aol.com>

> Please note: The Pinion Seal for the TR2-4 has a different OD from the TR4A-6

> -Hardy

Thanks Hardy,

I checked a few parts books and there are 2 different seals as Hardy explains. The Speedi Sleeve will still work but the part number that I gave for the seal itself is only good for the IRS Differentials. Take your old seal with you to match up the OD or if someone knows that dimension you could post it here.

-JVV

Rear Suspension/Seals

Subject: Replacing Pinion Seal in Differential
Date: Fri, 30 Jan 2004
From: "J.C. Hassall" <jhassall@blacksburg.net>

you wrote:

> My differential is covered with amazing amounts of oil and muck from what appears to be a long-leaking
> pinion seal. Given that I have removed my springs for refurbishing, I'm thinking now is the time to address
> the seal. Is it possible to replace the seal without withdrawing the axle and differential from the car? Any tips
> for how to get this job done efficiently, or things to look for? Many thanks!

A method which has worked for me is to thread a #8 or #10 self-tapping screw into either side of the seal, then carefully lever it out. Not trivial, but the method works. And sure beats pulling the diff apart.

-Jim

Subject: Replacing Pinion Seal in Differential
Date: Sat, 31 Jan 2004
From: "Glenn Coughenour" <gecoughenour@comcast.net>

A while ago, Graham Stretch gave the following instructions:

One method of removal / replacement is to center pop the nut and shaft at an adjacent point
undo (counting the turns), be very careful as you approach the end of the thread to ensure you know the
fractions of a turn involved change the seal and then replace the nut counting the fractions of turn first, then the
whole turns, to the final point once tightened so the center pops line up the preload should be correct (as prior to
removal).

I followed this method with good success. I did use a torque wrench to check the preload and found it almost
dead-on.

-Glenn

Rear Suspension/Seals

Subject: Pinion Seal
Date: Tue, 24 Sep 2002
From: "Bob Westerdale" <Bob.Westerdale@ametek.com>

Russ-

Pinion Seal? Piece of cake....

Put a pair of jack stands under the body, (not the R. Axle) so the rear hangs on the leaf springs and droops down a bit. Disconnect the Rear drive shaft U-joint, put another jack stand (a tall one) under the drive shaft to get it up out of the way. The pinion's flange has a cotter pin, remove it. I don't remember the exact size of the pinion nut, but it's around 1-1/8" or so. Set the E-Brake, and give the nut a twist. The pinion flange is not on a tapered spline, so generally heroic measures are not needed to pull it off. (It's a straight spline) Once you've cleaned up the gook, (taking care to keep it out of the bearing....) you'll see the pinion seal. It's made of fairly cheesy steel, with a felt ring (possibly rubber on a TR4??). Get a couple of your larger screwdrivers and prying devices, and have at it. Be sure not to damage the splines on the pinion shaft, and don't mangle the metal lip on the differential housing that captures the pinion seal. You'll have to use a little elbow grease and perhaps even a few expletives, but it should come out without any real agony. Clean the ID surfaces of the seal's mounting bore, and tap in the new seal, preferably using the tool of your choice that will not deform the seal. Nothing fancy. Next, carefully examine the pinion flange in the area where the seal normally rides. If it is badly grooved, it might be time for a Speedi-sleeve (basically a thin metal tube that 'replaces' the worn surface), but I've always been able to clean up the surface with some scotch brite or a bit of 400 grit wet-or-dry paper with some light oil. Reinstall the flange- it will take a light effort to push through the seal- add the pinion nut, (torque to ??ft/lbs?), the cotter pin and the drive shaft. It is a good idea to use fresh nylocs or lock washers on the drive shaft bolts, or at a minimum clean them up real well and tighten to spec. Probably a good time for fresh Diff lube, grease the U-joint and you're done. (I think....) I did this job on my 3A this spring, took about 2 hours. Biggest part of the job was scraping the Eisenhower Dirt off the underside.... It had been leaking for decades!

-Bob Westerdale

Rear Suspension/Seals

Subject: TR3/A Victories and Loses
Date: Mon, 9 Jun 2003
From: "David A. Templeton" <davidt@opentext.com>

Evening all,

On Saturday a local car club member and I changed the front oil seal on the differential of the '3. After getting it out, well the pieces any ways. We noticed it was a leather seal! I can only just imagine how long that has been there.

We then went to install the new seal and found that the clearance between the seal and the casing was so close that the seal had to go in perfectly straight. Hmm, nothing seemed to work, then had a thought, drilled a 1" in the wide side of a 2x4. This allowed the center spline to pass through and we had a nice surface to "gently" seat the new seal. This did a couple of things:

The length of the board allowed us to realize quickly then plum of the seal and could correct easily the wood surface was soft to not mar the seal once "bottomed" out the 2x4 prevented the seal from going any further cause the wood block rested against the outer casing.

All in all it's a good learning experience and fairly easy to do. We also took the opportunity to replace the oil and grease all of the nipples.

-David Templeton

Rear Suspension/Lever Shocks

Subject: Armstrong shock oil - follow up for lever shocks
Date: Thu, 24 Apr 2008
From: <PeterSchop@aol.com>

In an earlier post looking for oil for the lever shocks, some of the suggestions were to use 20W hydraulic oil, motorcycle racing shock oil and Harley Hydraulic Fork Oil Type "B." What I ended up using was Screamin' Eagle Performance Heavy Oil from my local Harley dealer for \$4.

After doing a little research, I found that the Harley type "B" is 10 wt, Screamin' Eagle Performance Fork Oil is 15wt, Screamin' Eagle Racing Fork Oil is 20wt. I also found Bel-Ray has fork oil available in 5wt, 7wt, 10wt, 15wt, 20wt and 30wt.

When I drained the oil in the Armstrong shock, I had to use a 13mm wrench to remove the plug on the top of the shock. After I poured the old oil out, I used a turkey baster as a funnel to refill. Slow job as the oil has to pass thru the valve in the shock displacing the air inside. I used less than half of the pint bottle.

-Peter Schoppelry

Rear Suspension/Shocks/Leaver

Subject: Leaf springs and dampers
Date: Wed, 06 Dec 2006
From: Jim and Andreas Vassiliadis <diggle@clear.net.nz>

I am getting my leaf spring retensioned. How do I test the lever arms?
Also the front leaf spring silent block bush seems to be stuck on the chassis bolt, I assume that I need some type of puller?
-Jim

Subject: Leaf springs and dampers
Date: Wed, 6 Dec 2006
From: <Davelmassey@cs.com>

<diggle@clear.net.nz> writes:
> I am getting my leaf spring retensioned.
> How do I test the lever arms?

The easiest thing to check is the fluid level. Remove plug on top and have a look.

> Also the front leaf spring silent block bush seems to be stuck on the chassis bolt, I assume that I need some
> type of puller?

That is normally a close clearance fit and if it is stuck it is probably due to rust. I broke mine loose by a combination of a soft face hammer (Lead) and a pipe wrench. But then maybe I got lucky.

I suggest copious amounts of antisieze upon reassembly.
-Dave

Rear Suspension/Shocks/Leaver

Subject: TR3-4 Rear Shock Mounts
Date: Fri, 19 Apr 2002
From: "Mike Kitchener" <mikek@wanadoo.fr>

Bill Brewer wrote:

> Where my lever shocks on my TR3 mount to the frame, the holes are elongated. I am mounting NOS shocks
> and want them to mount in tight holes. How have others fixed this?

Bill,
I used 10 mm X 30 mm bolts. These bolts just went through the shocks without drilling, but I had to drill out the frame mounts very slightly, which trued up the holes. The advantage of using 10 mm bolts, apart from the fact that they are slightly bigger, is that once the bolts are fitted, the heads are prevented from turning as they are locked against the shock body.

-Mike Kitchener

Subject: TR3-4 Rear Shock Mounts
Date: Fri, 19 Apr 2002
From: a Wallace <wallaces@superaje.com>

Hi Bill,
You could weld washers to the back of the mounting plates.

PS- I found some stainless steel socket-head bolts that fit there; I think they're 3/8 x 24 x 1 1/2". Because of these, it makes it possible to remove them later. Now whether SS is acceptable is debatable, but, the concept works.

-Jim

Rear Suspension/Shocks/Telescopic

Subject: Rear Shock Conversion Numbers
Date: Fri, 7 Jul 2006
From: <trparts@trparts>

Jeff

These are my appropriate rear shock #'s

Delco 520-318

Koni 80-2167

KYB KG4503 last cost was \$42 pr at Summit racing

Spax G933

Monroe LE1006

Art Lipp

Rear Suspension/Trouble Shooting

Subject: TR4A rear end twitch
Date: Fri, 30 Jul 2004
From: "jonmac" <jonmac@ndirect.co.uk>

Jerry Van Vlack wrote:

> I have what I believe has been referred to as the IRS twitch in my 1966 TR4A. Basically when about half way
> through a corner and starting to exit I feel a slight twitch coming from the rear of the car. It seems to
> correspond to the whole car seeming to settle down on the rear suspension as though under acceleration.

Jerry - It might be half-shaft splines, but what you describe sounds very like semi-trailing arm bushings that have said 'enough'. This is a pretty common problem with IRS cars and for those of us with the much heavier Big Six saloons, it's a common trait. A set of polyurethane bushes instead of rubber versions ought to sort things out and I feel sure you'll find plenty of info in the archives to find out how it's done. My technique tends to upset the purists - but its quick and I believe Bob Rochlin has used it? Bob? If you do change the bushings, remember not to fully tighten up until the car's full weight is back on the wheels, otherwise it'll always look as though it's been kicked up the a**e and the handling will be even worse.

-Jonmac

Rear Suspension/Trouble Shooting

Subject: The Clunk!
Date: Wed, 11 Apr 2007
From: "Cosmo Kramer" <tr4a2712@yahoo.com>

-----Original Message-----

> Subject: The 'Clunk'!
> Sent: Monday, April 09, 2007
> From: "Cosmo Kramer" <tr4a2712@yahoo.com>

> Hi Randall!

> I've got a problem that I've been working on all winter long, & I'm running out of options. Therefore; I'd like
> your input on where to go/look, what to do next. Ever since I purchased my Garage Queen (GQ) [TR4A IRS]
> back from Southern Calif. back in '96 & restored it & on the road in '98, I've had a 'CLUNK' in the back. I've
> taken it easy on accerlations so NOT to repeat the sound, but on occasions it does remind me that it's still
> there.

>
> I then got on the TRIUMPH Digest List to learn that this is a command problem in TRIUMPH IRS Systems. I
> thought it was the IRS Sub-frame so this year I set out to eliminate it. What I've done, so far: I've got the
> 'clunk'! I thought that it might have been my IRS Sub-frame. So I removed ALL of the IRS to reinforce the
> front & back of the IRS Sub-frame. [I boxed it, put wings to support the spring tower {TSI's Kit} I'll give you
> MORE info., if you wish it.], & placed support metal stiffeners between EACH Differentials 'Stud Bolt' & the
> inside of the U-channel of the IRS Sub-frame running North & South to the length of the GQ before boxing it.
> Installed New telescopic Shocks & Towers, Trailing Arm & diff. Urethane Bushings & tightened down the
> Trailing Arm Brackets. I had 1/2 of the Half Shafts [Diff. side to the center of the 1/2 shaft, replaced with a
> 'heavier duity' Flange, U-joint, & 1/2 shaft], also the outside U-joints by the Rear Hubs. Well, I got the 1/2
> Shafts back from Fleet tire [a drive repair shop] & installed them into the GQ. I took it out for a short Test
> Ride (TR), to STILL hear the clunk. :>(It seems to be located in the center of the IRS.

>
> I know that it can't be: 1/2 Shafts or their U-joints (on either ends), Shocks, shock towers, or mountings
> Trailing Arm Brackets or bushings. The Differential Bushing or the IRS Sub-frame. So I took out the
> Propeller Shaft & installed another one that I had around. [I have a LOT of spare parts, & all seemed to be
> tight at the U-joints & sliding splines.] There was still a clunk BUT NOT as pronounced on this Test Ride. So
> I do feel that the U- joints on the 1st propeller shaft MAY be bad. Therefore; I think I'll take that propeller
> shaft in to Fleet Tire & may be the other [meaning that I'll have to remove that freshly installed Propeller
> Shaft from the GQ] one into the shop & ask them for their input. I still have 2 NEW U=joints that can be
> installed in either one of the propeller shafts, if needed.

>
> Question: Do YOU have any suggestions on what else to look for? All I can think of now is to drop the
> Differential (Again) & check the back lash again from when I did it back in the restoration ['96-> '98].
> Remember: I've had this clunk since the 1st time I put this car on the road back in '98. TIA,
> -Cosmo Kramer

Randall <tr3driver@ca.rr.com> wrote:

> Hi Cosmo:
> ... so let me start by asking under what conditions you get the 'clunk'?

I've always had it since I restored the car, when I obtained it from Southern Calif. back in '96, without the
engine & tranny. Therefore; I've never driven the car previously.

> My first thought (given all you've written below) is whether it might be excess backlash inside the differential
>, or possibly even just normal operation.

I was thinking that of excess back lash (EBL), BUT I personally don't understand what you mean by: "possibly even just normal operation. "? I never thought that a clunk sound in the IRS was ever considered 'Normal'.

- > I don't have very much experience with the Triumph IRS; the vast majority of my experience has been with
- > solid-axle TR3s. The car that got wrecked has had what I would describe as a clunk ever since I got it; which
- > I am reasonably certain is a combination of normal operation and excessive backlash in the differential.

I always thought excessive back lash was NOT good for the Diff. What, IYO, do you consider as 'SAFE' EBS?

- > That is to say, there may normally be a small sound generated when shifting gears, as the ring & pinion go
- > from drive to overrun and back. As the differential wears, the noises get louder. On my TR3, I can move the
- > drive shaft an inch or more (measured at the surface of the shaft) with the rear wheels locked, which is clearly
- > too much backlash... yet it's gone for well over 100,000 miles that way and not given me any trouble.

I only get the clunk if I do a sudden take off in 1st gear. So that was going to be my NEXT question: Can & how does one check for EBL?

- > U-joints are usually quite obvious when they are bad enough to cause a clunk: by rotating them back and forth
- > you can see the play. Normally of course there should be no detectable play whatsoever (although on a prop
- > shaft they should move freely). However, John Kipping has written (on another list) that the halfshaft joints
- > should be fairly stiff. I'm not sure if that applies to 'big' Triumphs or not, he was talking about Herald/Vitesse
- > cars; but I don't see why they would be different in that regard.

I have done this without any noise or what I would say is play in the Propeller Shaft of the 'New 1/2 - of full Half Shafts. But I'm **NOT** an everyday mechanic. So maybe there is too much play. I'm going to have one of my friends [Everyday mechanic] check the IRS out, when he can get a chance to fit me in on his work day schedule.

This is why I wanted to ask you to comment on my problem. This way I'll have more back ground than just what I have been doing.

Subject: The 'Clunk'!
Date: Thu, 12 Apr 2007
From: "Cosmo Kramer" tr4a2712@yahoo.com

Hi Randall!

Randall wrote:

- >> I was thinking that of excess back lash (EBL), BUT I personally don't understand what you mean by:
- >> "possibly so even just normal operation. "? I never thought that a clunk sound in the IRS was ever
- >> considered 'Normal'.

- > Well, Triumphs aren't as refined as some cars (which is perfectly appropriate for a British Sports car, part of
- > the appeal, IMO). So yeah, clunks under some conditions are more-or- less normal.

I DO feel it's in the differential more NOW than before. Because: When I did the restoration in '96->'98, I removed the internal gears & left the Pinion & Crown (P&C) intact. The internal gears did show some marks on 1 or 2 teeth of the 'Side Gear'. I removed them to try & get a new one to replace it, but could NOT. I did get a new one for a '74? TR6 & later, but it didn't work. I was able to install it [with GREAT difficulty] but could NOT get them to turn. As I learned, TR4A -> '73? TR6's took the same Differential Gears, But after '73? [I think that's the cut off yr], the 4 internal gears changed. I do believe that the C&P's are all the same. Therefore, I think TRIUMPH changed the pitch on these internal gears, to explain why they are NOT interchangeable. Another person stated that if I did purchased all 4 of the 'same yr.' internal gears, then they should work in my

'67 differential, because I was able to get the one Side Gear installed, so the size & dimensions should work if All 4 were the same pitch.

>> I always thought excessive back lash was NOT good for the Diff. What, IYO, do you consider as 'SAFE'
>> excess back lash?

> I guess what I'm trying to say is, I don't feel it's worth rebuilding the diff just because it exhibits backlash. But
> normally, with no wear at all, I'd say you shouldn't be able to turn the driveshaft more than 1/8" or so (at its surface) with the rear wheels locked.

>> I only get the clunk if I do a sudden take of in 1st gear.

> In that case, I think you're looking in the wrong place. I think you should be looking for the suspension or
> differential housing contacting something it shouldn't. Or it might even be the splines in the axle shafts
> locking under extreme torque and then making a noise when they free up. I can hear that on my Stag
> sometimes.

>> So that was going to be my NEXT question: Can & how does one check for EBL?

> Lock the wheels with the handbrake, and put the transmission in neutral. Try to turn the drive shaft in both
> directions with your hand. How far it moves is the total backlash. The book talks only about the backlash
> between the pinion & ring gear (what they call the crown wheel), and gives it as .004-.006". But the spider
> gears can also twist, and the splines can move a small amount in several places, so what you see by moving
> the drive shaft will be much larger than .004-.006"

>> I'm going to have one of my friends [Everyday mechanic] check the IRS out, when he can get a chance to
>> fit, me in on his work day schedule.

> Good idea. I would suggest telling him of the clunk, and then showing it to him, so he can get a better idea of
> what is going on. As I said above, sounds to me like it's not inside the drive train itself, but something external
> hitting.

> I watched Doug Adams run his TR4A at the VTR autocross in Oregon a few years ago, and I'm pretty sure he
> was hitting the bump stops on takeoff. It's possible that what you are hearing is just the suspension reaching
> the limit of its travel ...

> -Randall

-Cosmo Kramer

Rear Suspension/Trouble Shooting

Subject: TR6 Rear Suspension Noises
Date: Wed, 1 May 2002
From: "Lumia, John" <jlumia@ball.com>

"Nick Barraclough" Wrote:

> Hi,
> My current attendance to events has been pretty poor due to not wanting to risk any (more?) damage to my
> TR6. I'm currently experiencing metallic scraping noises from the rear offside wheel area particularly under
> acceleration - it almost disappears when there is no change in the car's velocity. There appears to be no
> obvious rubbing of moving parts with the bodywork/chassis, the drums/shoes appear normal (without further
> dismantling) and there appears to be very little play in the drive shaft (apart from the obvious in the U-joint).
>
> Has anyone experienced anything similar before, know someone who has, or know anyone I could contact
> that may have an idea? Any help or suggestions would be greatly appreciated.
> -Nick

Nick,

It's hard to pinpoint exactly the problem from your description, but I would check all U-joints and I would check the rear wheel bearings. Jack up the rear grab one of the wheels at 3 o'clock and 9 o'clock and alternately push with one hand and pull with the other. Repeat at 12 o'clock and 6 o'clock positions. If you feel any major play, you've got a wheel bearing problem. If both wheels check out ok, get under the vehicle and inspect the U-joints. Try to keep one of the wheels steady while trying to rotate the half-shaft back and forth. If you observe any play at the U-joint, then it should be replaced. You can also try holding the differential flange while rotating the half-shaft. That should tell you how the inner U-joint is doing. It's up to you whether or not to replace just the affected U-joints, although I would consider at least replacing both of the U-joints on a particular shaft if I found one of them bad.

Another noise that tends to get lower with less applied load is the rear differential, but unless this thing is out of oil I'm not sure you would hear a metallic sound. But if you don't find a problem with wheel bearings or U-joints, then I'd start looking here.

-John Lumia

Rear Suspension/U Joints

Subject: Drive Shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: "Triumph" <triumph@yankeespitfire.com>

Yes, one of my manuals (spitfire 1500) mentions 'chalking' them before disassembling to facilitate reassembly. I unfortunately read that AFTER changing the u-joints... The joints made slight clicking noises for a couple of days, I wasn't thinking of what it meant when it quit making the clicking. The edges of the flanges were chipped off by then. There was also a lopsided sort of vibration on one of the axle-shafts and a heavier thumping sort of vibration on the main (prop) shaft. The vibrations went away once I read about having to ensure the correct alignment and reassembled them correctly.

-Jon

-----Original Message-----

Subject: Drive shaft vibrations and U joints TR250
Sent: Fri, March 19, 2004
From: <owner-triumphs@autox.team.net>

My local non-LBC mechanic told me that I can risk the chance of drive shaft vibrations if the drive shaft *flange* yokes are installed 180 out of phase with respect to their original orientation.

I understood from Bentley and threads on this lists that the yoke halves that are part of the drive shaft had to be at the same angle (the yokes of both ends of the drive shaft had to be in the same plane), but I never heard that one could not be 180 degrees off from its original orientation. I also never heard the flange end of the yokes could not be reinstalled 180 degrees off with respect to their original orientation.

Any comments?

I'm concerned that I have already removed the u-joints from the IRS axles and have lost track of the original orientation of the u-joint yokes with respect to being 180 degrees one way or the other.

Any comments? Did this make any sense?
-Don Malling

Subject: Drive shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: David Brady <dmb993@earthlink.net>

Hi Don,

I just had my drive shaft dynamically spun balanced. If you rotate the yokes 180deg, you may need to rebalance the drive shaft - this was confirmed by my driveshaft shop. This may be the imbalance concerns that your mechanic is referring to. Certainly, 180deg rotation will not affect the inherent non-constant velocity characteristics of a u-joint.

-Dave Brady

Subject: Drive shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: "Jim Muller" <jimmuller@pop.mail.rcn.net>

Terry Smith wrote:

> I took my drive shaft to be balanced. When I took it to the specialist shop, I had the arrows on the shaft and
> flange sides lined up like they were supposed to be. When I got the shaft back, the arrows were no longer
> lined up

I didn't follow this thread closely until I saw this note. Now, I may be wrong about this (I spend a lot of my life

wrong), but I thought the point of lining up the flanges between the two ends of double-u-jointed shaft wasn't for balance. Rather, it was because a classic u-joint (i.e. the non-CV type) doesn't produce a constant rate of turn on the driven side (i.e. w.r.t. the driving side) if the angle wasn't absolutely straight. If you have any angle in the joint (which after all is the point of a u-joint in the first place), the driven side will accelerate and decelerate as the driving side rotates at a constant rate through half a revolution. But if the other end of the shaft has a u-joint with the same angle (more or less) and the two u-joints are aligned, the acceleration of the shaft caused by the angle at one end will be given up by the angle at the other, producing a more constant rotation at the far end. For a gearbox/drive shaft/diff combo, this means the diff is driven at more or less the same speed as the gearbox, even if the drive shaft itself accelerates and decelerates as it spins. If this is the real reason for aligning the flanges between the ends, that shaft won't work as well as it ought. On the other hand, perhaps this is such a small effect that it doesn't matter. I'm sure RY or JC or someone can expostulate on this matter further.

-Jim Muller

Subject: Drive shaft vibrations and U joints TR250
Date: Fri, 19 Mar 2004
From: "Randall Young" <Ryoung@navcomtech.com>

Jim Muller wrote:

> but I thought the point of lining up the flanges between the two ends of a double-u-jointed shaft wasn't for
> balance. Rather, it was because a classic u-joint (i.e. the non-CV type) doesn't produce a constant rate of turn
> on the driven side (i.e. w.r.t. the driving side) if the angle wasn't absolutely straight.

Certainly phasing is important, for the reason you outlined, Jim. But, I don't see any reason a flange couldn't be out of balance enough to make a difference if it was turned 180 degrees, especially if you have it on a balancing machine. I tend to doubt that Triumph balanced them that accurately, but it's certainly possible.

-Randall

PART 2
Subject: Drive shaft vibrations and U joints TR250
Date: Sat, 20 Mar 2004
From: Don Malling <dmallin@attglobal.net>

Hugh Barber wrote:

> Don Malling wrote:
> I'm concerned that I have already removed the u-joints from the IRS axles and have lost track of the original
> orientation of the u-joint yokes with respect to being 180 degrees one way or the other.
>
> Don,
> Are you talking about the drive shaft or the half-shafts (axles)? The half-shafts have a "key" in the splines
> that will only let the two halves go together one way.
> Hugh Barber

Thanks to all who have responded. But to tell the truth I am confused by some of the replies. I'll bet it is because my question was not clear.

In all cases, either drive shaft or axles, the yoke end that is attached to the shaft is in the correct orientation. In the case of the axles the spline goes together only one way, as Hugh pointed out, and in the case of the drive shaft, I have not moved the yoke ends that are attached to the drive shaft.

I am only asking about the flange yoke ends that are connected to the shafts by the U joint. I did not think it made any difference if these flanges were rotated 180 degrees when I reassembled the U joints. I'm still not sure if it does make a difference. Probably the best suggestion is just install the U joints have them balanced anyway -- not sure what that costs.

One person responded and said that they had a vibration and solved it by unbolting the drive shaft flange and the mating differential flange and rotating the drive shaft 180 degrees. I guess I have heard that one should mark the drive shaft flanges and diff-tranny ends for later reassembly.

Brings up a question -- I'm putting in a new OD tranny. What to do then? Just bolt it up and hope for the best? There are only four different possibilities I guess, but what if the vibration is caused by a combination of both the diff end and tranny end -- 16 possibilities. Hmmm....

I don't understand how it could possibly make any difference how the balanced drive shaft gets bolted up to the diff and tranny. Is the tranny and diff out of balance and does the drive shaft compensate for this in some way?? I thought drive shaft was balanced out of the car. If it's balanced, how could it make any difference how it was bolted into the car? This makes no sense. If the drive shaft compensates for an out of balance diff and/or tranny then the drive shaft must be "balanced" out of balance in just the right way. Something doesn't compute here. Did the factory just keep unbolting and bolting them 16 different times (OK 8 times on average) until they got it right? I think I'm starting to see the blue screen....

-Don Malling

Rear Suspension/U Joints

Subject: Problem assembling U-Joints
Date: Fri, 9 Jun 2006
From: "Dave Connitt" <dconnitt@fuse.net>

List,
I am having a little problem installing new U-Joints to my TR4A half shafts. The first one went on OK. When I started installing the second one I got all the bearing caps installed but I can't get the last bearing cap down enough into its yoke to allow me to install the last snap ring. Has anybody had this problem?

Also, what is the consensus on U-Joint assembly techniques? The big problem for me is getting the bearing caps started straight and keeping them straight. Does anybody know of a tool to install U-Joints that makes this less of a pain? Thanks,
-Dave Connitt

Subject: Problem assembling U-Joints
Date: Fri, 9 Jun 2006
From: <Dave1massey@cs.com>

<dconnitt@fuse.net> writes:
> I am having a little problem installing new U-Joints to my TR4A half-shafts. The first one went on OK. When
> I started installing the second one I got all the bearing caps installed but I can't get the last bearing cap down
> enough into its yoke to allow me to install the last snap ring. Has anybody had this problem?

If one of the needle bearings has fallen out and is laying across the cap it will cause this problem. If you use enough force you will crack the cap. Ask me how I know.

> Also, what is the consensus on U-Joint assembly techniques? The big problem for me is getting the bearing
> caps started straight and keeping them straight. Does anybody know of a tool to install U-Joints that makes
> this less of a pain?

Yeah. Take it to a drive shaft house and have them install them. Like muffler work, I farm this work out, this is supposed to be fun. ;-)
-Dave

Subject: Problem assembling U-Joints
Date: Fri, 09 Jun 2006
From: "Peter Ryner" <pryner@verizon.net>

Ditto on the needle bearing falling. Been there done that too.

I've found the easiest way to install the caps is to use a large vice. Start with one side, move the yoke as far into the cap as possible to keep the needles in place. Once the cap is flush on that side, open the vice and repeat on the other side. Again, push the yoke as far as you can towards the cap you are installing. Once both are flush, use a small socket to push the cap home and install the clip. Repeat on the other side. Slow even pressure works best. I use the same method to take them apart. You'll have to use a large socket to give a space for the cap to be pressed into though.
-Pete

Subject: Problem assembling U-Joints
Date: Fri, 9 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I am having a little problem installing new U-Joints to my TR4A half shafts. The first one went on OK. ... Has

> anybody had this problem?

I agree with Dave, most likely a roller has turned and is caught between the cross and the cap. Might be on the other side. I've also broken them that way <g>

But with all the other defective parts being sold these days, I suppose it's possible your new U-joint is wrong.

> Also, what is the consensus on U-Joint assembly techniques? The big problem for me is getting the bearing
> caps started straight and keeping them straight. Does anybody know of a tool to install U-Joints that makes
> this less of a pain?

HF sells a big C-clamp that is supposed to make it easier ... haven't tried it myself. I find that very gently using my shop press keeps them straight. I don't even use a handle on the pump, just fingers so I can tell how much pressure is being applied.

-Randall

Subject: Problem assembling U-Joints
Date: Fri, 09 Jun 2006
From: <kinderlehrer@comcast.net>

Maybe this is obvious, but just in case, use some grease to keep the needles in place while you are installing them.

-Bob

Subject: Problem assembling U-Joints
Date: Fri, 9 Jun 2006
From: <Dave1massey@cs.com>

<tr3driver@comcast.net> writes:

> I find that very gently using my shop press keeps them straight. I don't even use a handle on the pump, just
> fingers so I can tell how much pressure is being applied.

I've used both the bench vice and the shop press. The advantage to the shop press is you can stack the parts up vertically and makes it much easier for those of us limited to only two hands. ;-)

-Dave

Subject: Problem assembling U-Joints
Date: Fri, 9 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> I'm going to differ with you on this. The UJs on the small chassis cars' half shafts are set tight, this is because
> they form the lower suspension link, there are additional forces at work. On the IRS TRs and big saloons,
> halfshaft UJs should be set the same way as the prop(drive) shaft UJs, ie relatively loose, these UJ's only need
> to deal with rotational forces.

No doubt you're right, Bill. Apologies to all for the bad advice.

That said, I've run drive shaft U-joints that were too tight to "flop" for many tens of thousands of miles and never had a problem.

-Randall

Subject: Problem assembling U-Joints
Date: Sat, 10 Jun 2006
From: <TR250Driver@aol.com>

Guys,

I suspect a poor installation of the right side half shaft u-joint may be the source of the rumble in the Rotoflex GT6+. While on jack stands I can see a hump in the rotation of the shaft. This occurs when one pair of cups is perpendicular to the ground the other pair horizontal. The hump takes the shaft up over a 1/4"! That is with the shaft unsupported. If I support the wishbone a little and take the assembly up some, the hump goes away???

Can anyone confirm this bad u-joint theory? Every part is new in the GT6 with no visible signs of any problems that would make her rumble. The suspect u-joint appears fine but I bet it was tight when first installed.

I'm stumped,

-Darrell

Rear Suspension/U Joints

Subject: TR6 Rear Suspension Noises
Date: Wed, 1 May 2002
From: "Lumia, John" <jlumia@ball.com>

Nick,

It's hard to pinpoint exactly the problem from your description, but I would check all U joints and I would check the rear wheel bearings. Jack up the rear grab one of the wheels at 3 o'clock and 9 o'clock and alternately push with one hand and pull with the other. Repeat at 12 o'clock and 6 o'clock positions. If you feel any major play, you've got a wheel bearing problem. If both wheels check out ok, get under the vehicle and inspect the u-joints. Try to keep one of the wheels steady while trying to rotate the half-shaft back and forth. If you observe any play at the u-joint, then it should be replaced. You can also try holding the differential flange while rotating the half-shaft. That should tell you how the inner u-joint is doing. It's up to you whether or not to replace just the affected U-joints, although I would consider at least replacing both of the U-joints on a particular shaft if I found one of them bad.

Another noise that tends to get lower with less applied load is the rear differential, but unless this thing is out of oil I'm not sure you would hear a metallic sound. But if you don't find a problem with wheel bearings or U-joints, then I'd start looking here.

-John Lumia

Subject: TR6 Rear suspension noises...
Sent: Tue, April 30, 2002
From: "Nick Barraclough" <neb@psychology.nottingham.ac.uk>

Hi,

My current attendance to events has been pretty poor due to not wanting to risk any (more?) damage to my TR6. I'm currently experiencing metallic scraping noises from the rear offside wheel area particularly under acceleration - it almost disappears when there is no change in the car's velocity. There appears to be no obvious rubbing of moving parts with the bodywork/chassis, the drums/shoes appear normal (without further dismantling) and there appears to be very little play in the drive shaft (apart from the obvious in the U-Joint). Has anyone experienced anything similar before, know someone who has, or know anyone I could contact that may have an idea? Any help or suggestions would be greatly appreciated.

-Nick.

Rear Suspension/U Joints

Subject: U-Joint Removal
Date: Sat, 19 Jan 2008
From: <ZoboHerald@aol.com>

<tr3driver@ca.rr.com> writes:

It does work for me after seeing John Kipping demonstrate it at VTR/SP, but I wouldn't call it "tapping" nor use a "regular" hammer. It's more like some pretty stout blows with a BFH (I used a 2.5 lb mini-sledge). All things considered, I find it easier to use the hydraulic press (now that I have one). Before I got the press, I used the vice jaws.

Or this technique should work too:
<<http://tinyurl.com/3ataeh>>

Or this:

<<http://www.rarebits4classics.co.uk/Hints%20and%20Tips/UJ%20Replacement.htm>>

-Andy Mace

Subject: U-Joint Removal
Date: Sun, 20 Jan 2008
From: <DLylis@aol.com>

Bob,
I have not looked at the links offered, but my technique is primitive, but very effective. (check the sizes as I am working from memory) You will need a 1 1/16 socket, a 3/4 socket, a cold chisel of medium to large proportions, and a 1/8 drift, and a BFH. 1 1/16 goes on the floor (or sturdy bench), 3/4 pounds the caps though until spider hits the other side. Flip it over and put the cold chisel against the spider and drive it back the other way. Drive the drift through the bearings on one side until you hit the back side of the cap, and hit until it pops out. Repeat. Nothing will be usable other than the remaining yolk, shaft, etc. but then again, its worn. I reinstall the new one with the reverse of this technique with a lighter hand and an SFH rather than a BFH and I can do the whole thing in about ten minutes.

I gotta tell you. I tried the tap the yolk thing and figured I was not going to live long enough to get it out that way. Maybe my technique needs a little more finesse.

-David Lylis

Subject: U-Joint Removal
Date: Sun, 20 Jan 2008
From: tom white <tswhitez123@hotmail.com>

Put the yoke in a vise with a socket the same diameter as the u-joint cap between the cap and the vise jaw. IF both caps are in place put another socket the diameter of the yoke housing on the other side. Then crank the vise closed and press out the cap. Sometimes you may need to use a cheater bar to crank the vise on a frozen cap.

-Tom

Subject: U-Joint Removal
Date: Mon, 21 Jan 2008
From: <pethier@comcast.net>

tom white <tswhitez123@hotmail.com> wrote:

> Put the yoke in a vise with a socket the same diameter as the u-joint cap between the cap and the vise jaw. ...
Once you get the pressure on, if the cap is resistant, tap on the side with a brass hammer. The small shock is usually enough to break loose a cap already under pressure. -Phil Ethier

Starter-Generator

This article is first draft of theory and operation of generators and Lucas voltage regulators. The generators on old English cars seem always to be marginal when driving at night with running and headlights on. Probably the best answer to this problem is exchanging the generator for a more modern (and higher output) alternator. The Vintage Triumph Register website has details about much of the nuts and bolts of an exchange. In addition, it has an article by Dan Masters about the theory and operation of alternators (www.vtr.com). I have borrowed heavily from Dan's work when writing this article. I refer you to his wonderful diagrams used in his alternator article as they apply directly here too. Anything you find useful I owe to him, and all errors are of course my own.

Generator - Theory of Operation

In order to understand the theory and mechanics of mechanical voltage regulators, you must understand how a generator makes electricity. The basic principle is that moving a wire through a magnetic field induces electrical current flow in the wire. The faster you move the wire, the greater the voltage that is induced. A generator essentially moves a loop of wire through a magnetic field around and around. Through one half of a full revolution a positive voltage is created, in the second half a negative voltage is created. Since generators were created before semiconductors were readily available, there had to be a mechanical way to avoid making the wrong polarity voltage. This was readily answered by reversing the connection on the wire loop as it entered the negative phase. The commutator inside the generator performs this function.

The magnetic field could be created by permanent magnets within the generator, but they are expensive and bulky and heavy. Additionally, they can not be modulated to maintain a constant output voltage. It is more effective, cheaper and lighter to use some loops of wire to do the same thing. Just as it is possible to create a current in a wire by moving it through a magnetic field, it is also possible to create a magnetic field by moving a current through a wire. In order to make the field stronger you can loop the wire back on itself many times. This way a small current can create a large magnetic field. This is an electromagnet. In a generator this electromagnet is called a "field coil". It is a series of loops of wire (a coil) which creates the magnetic field.

Now we have a device that creates electrical pulses of the correct polarity. The voltage coming out is proportional to the speed of the turning of the generator, and the magnetic field strength of the field coil. As the engine RPMs increase, the voltage from the generator also rises. Unfortunately, the electrical systems in a car like a fixed voltage. If the voltage is too high the battery will overcharge and boil over, light bulbs will burn out and the coil will melt. There must be some way to control the voltage output.

Voltage Regulator - Theory of Operation

For the purpose of an automotive generator the use of a field coil makes it possible to control the voltage output. We can not easily control the speed of the generator since this is directly linked to the engine speed. We can control the current in the field coil. Increasing the electrical current in the field coil will make the magnetic field stronger. Decreasing the current will reduce the magnetic field. The voltage regulator performs this function. The voltage regulator also performs some associated functions. It cuts the generator out of the circuit when the voltage from the generator is less than the battery voltage. This prevents the battery current from running backwards through the generator, discharging the battery. There is also a mechanism to prevent too much current being drawn from the generator which might overheat or otherwise damage the generator. In some models of regulators there is one relay (called a "bobbin" in voltage regulators) for each of these functions. In the TR2-4 series, and other models as well, there are only two bobbins. One of the bobbins serves two functions in this case.

The first bobbin we will discuss is the simple "Cut-out relay". It should be more properly described as the "Cut-in" relay because it keeps the generator out of the charging circuit until it is generating sufficient voltage for the bobbin to close contacts cutting the generator into the charging circuit. It is set to cut-in at 12.7 to 13.3 volts. Once in the circuit it will stay in until the generator output actually drops well below battery voltage (11 to 8.5 volts). This may never happen even at a very low idle.

In the TR2-4 series the second bobbin provides two functions. The primary function is to regulate voltage by reducing generator output by reducing the current in the field coil. The secondary function is to prevent excessive current output from the generator, again by reducing output. There are two separate

windings on the bobbin to provide these two functions. In three bobbin regulators the voltage and current regulators are separate but functionally identical to what is described here.

When the voltage is below a certain set point there is a direct connection of the field coil to battery (actually battery plus generator) voltage. This gives the maximum magnetic field strength possible and thereby allows the generator to produce the greatest voltage possible. When the voltage exceeds a set point, the bobbin opens a contact which puts a resistor in line with the field coil and reduces the current running through the coil. This reduces the magnetic field strength, and in turn reduces the generator output. The contact is opened and closed frequently so the electrical system essentially sees the average of the duration of high and low voltages.

In the TR2-4 two bobbin system, the current regulation is performed by a separate winding on the same bobbin as the voltage regulator. This winding carries the full current output of the generator. The wire is wound so that increasing current through the wire will tend to open the contacts and lower the current in the field coil.

Regulator Adjustment

The only adjustments that you can make to the regulator are the contact gaps and the set points. I will quote the Triumph workshop manual regarding the adjustments. Their description is concise and thorough. I will add my comments in italics where additional explanations may be in order.

The control box (*regulator*) contains two units - a voltage regulator and a cut-out. Although combined structurally, the regulator and cut out are electrically separate. *The voltage regulator relay (bobbin) can be identified as the coil with just a few turns of heavy gauge wire around it. The cut-out relay has many more turns of the same heavy gauge wire.*

The regulator is set to maintain the generator terminal voltage between close limits at all speeds above the regulating point, the field strength being controlled by the automatic insertion and withdrawal of a resistor in the generator field circuit.

Cleaning Contacts

- (i) Regulator Contacts: used fine carborundum stone or silicon carbide paper (*sandpaper 400 grit or finer*).
- (ii) Cut-out Relay Contacts: used a strip of fine glasspaper, never carborundum stone or emery cloth.

Voltage Regulator-Electrical Setting

It is important that only a good quality MOVING COIL VOLTMETER (0-20 volts) is used when checking the regulator. The pulsing nature of the voltage will prevent a digital voltmeter from settling on a single reading

Remove the cover and insert a thin piece of cardboard between the armature and the core face of the cut-out (*contacts*) to prevent the contacts from closing.

Remove and join together the cables from the control box terminals A and A1. Connect the negative lead of the voltmeter to the D (*output*) post on the generator.

Start the engine and slowly increase its speed until the voltmeter needle flicks and steadies, at about 2,000 RPM. The voltage reading should be between the appropriate limits given in Table 1.

If the voltage, at which the reading becomes steady, occurs outside these limits, adjust the regulator by turning the adjusting screw 1/4 turn at a time clockwise to raise the voltage or counterclockwise to lower. *The adjusting screw can be found on the back of the regulator facing the firewall.*

Adjustment of regulator open-circuit voltage should be completed within 30 seconds otherwise heating of the shunt windings will cause false settings to be made.

Remove the cardboard.

NOTE: The voltage that you see in Table 1 is not the actual operating voltage of the generator and electrical system. It is the voltage that is only used for setting purposes.

Voltage Regulator-Mechanical Setting

A copper separator, in the form of the disk or square, is welded to the core face of the voltage regulator (*the coil with just a few heavy gauge wire windings*) and affects the gap setting

between the core-face and the underside of the armature as follows:

When a round separator is used, the core gap should be 0.015" (0.38mm).

When a Square separator is used, the inner gap should be 0.021" (0.53mm).

To adjust the air gap:

Slacken the fixed contact locking nut (*on top of the bobbin*) and unscrew the contact screw until it is well clear of the armature moving contact.

Slacken the voltage adjustment spring-loaded screw (*on the back of the regulator*) until it is well clear of the armature tension spring.

Slacken the two armature assembly securing screws.

Insert the gauge (*feeler gauge*) of sufficient width to cover the core face, and of the appropriate thickness, between the armature and copper separator.

Press the armature squarely down against the gauge and re-tighten the two armature assembly securing screws. Without removing the gauge, screw in the fixed contact adjustment screw until it just touches the armature contact. Re-tighten the locking nut.

Re-check the electrical setting of the regulator.

Cut-Out -Electrical Setting

If the regulator is correctly set but the battery is still not being charged, the cut-out may be out of adjustment. To check the voltage at which the cut-out operates, remove the control (*regulator*) box cover and connect the voltmeter between the terminals D and E (*the right-hand-most two spade terminals*). Start the engine and slowly increase its speed until the cut-out contacts are seen to close, noting the voltage at which this occurs. This should be 12.7 to 13.3 volts.

If operation of the cut-out takes place outside these limits, it will be necessary to adjust. To do this, turn the adjusting screw (*found on the firewall side of the regulator*) in a

clockwise direction to raise the voltage setting or in a counter clockwise direction to reduce the setting. Turn the screw only a fraction of the turn at a time and test after each adjustment by increasing the engine speed and noting the voltmeter readings at the instant of contact closure. Electrical settings of the cut-out, like the regulator, must be made as quickly as possible, because of temperature rise effects. Tighten the lock nut after making the adjustment. If the cut-out does not operate, there may be an open circuit in the wiring of the cut out and regulator unit in which case the unit should be removed for examination or replacement.

Cut Out - Mechanical Setting

Slacken the adjustment screw (*on the fire-wall side of the regulator*) until it is well clear of the armature tension spring.

Slacken the two armature securing screws.

Press the armature squarely down against the core face (copper sprayed in some units, fit with a square of copper in others) and re-tighten the armature securing screws. No gauge is necessary.

With the armature still pressed against the core face, adjust the gap between the armature stop arm and the armature tongue to 0.032" (0.81 mm) by bending the stop arm (*the stop arm is the metal all arm on the very top against which the moving armature contact arm (called the "fixed contact blade") rests*).

Adjust the fixed contact blade so that it is reflected 0.015" (0.38mm) by the armature moving contact when the armature is pressed against the core face.

Re-check the electrical setting of the cut-out.

Table 1. Open Circuit Settings

<u>Ambient Temperature</u>	<u>Open Circuit Voltages</u>
10C (50F)	16.1 - 16.7
20C (68F)	16.0 - 16.6
30C (86F)	15.9 - 16.5
40C (104F)	15.8 - 16.4

Starter-Generator/Alternator

Subject: Alternator conversion continued
Date: Sun, 8 Feb 2004
From: John & Patricia Donnelly <pdonnell@san.rr.com>

Hi Joe,

I had to cut off some material from the bottom mounting area of the alternator in order for it to line up with the pulleys. A good hacksaw and file work great.

I also discarded the huge mounting nut at engine bracket because of pulley alignment. Keep lots of other mounting hardware, i.e. washers, spacers, bolts and nuts, handy for ready use. The rear mounting hole of this bracket also became useless.

Using the 7127 Alternator and modified generator pulley I was able to use the stock belt (Moss 834-025), but found that I had to loop the belt around the pulley before putting in either mounting bolt. I bought the larger Gates belt (NAPA 24400) but found that it was a little too loose.

So far I've put about 10,000 miles on it with no failures. Hope this helps!

-John

Starter-Generator/Alternator

Subject: Alternator info found on VTR webpage
Date: Wed, 22 May 2002
From: "Randall Young" <ryoung@navcomtech.com>

> I just looked at <www.vtr.org> Lots of good information there on alternators and conversions. If you have
> more to add . . . I'm still listening.

For roughly the same price overall, you can get a 55 amp Bosch alternator that is a direct replacement for the TR6 unit. No bracket changes, no cable adapter (takes the same plug as the Lucas), and the same fan belt. The only downside is that it doesn't come with a pulley, you'll have to use your old pulley. (Someone wrote me that the same alternator was used in a VW application, where it comes with a pulley, but I don't know the application.)

Ask for a Bosch alternator for a 78 Ford Fiesta with A/C. (Non A/C cars used a Motorcraft alternator that mounts differently.) My local parts store stocks them (although Pep Boys probably doesn't), \$45 plus a \$10 core charge.

-Randall

Subject: Possible source for Bosch alternator...
Date: Thu, 23 May 2002
From: Skip Montanaro <skip@pobox.com>

I read with some fascination the various bits on replacing the Lucas alternator with a Bosch or GM part. Just for grins I searched Google for "Bosch alternator Ford Fiesta". From the references near the top of the results you'd think that most of these parts are now sold for use in Triumphs and MGs. But I digress...

Midway down the first page I saw a reference to a place called Alternator Starter Express:

<<http://autoexpress.safeshopper.com/404/cat404.htm?356>>

They have the Bosch alternator for \$45 (which includes a \$10 core charge) and \$5 UPS ground shipping. Remanufactured, comes with a three year warranty. I've never heard of these folks before, so have nothing good or bad to say about them... Looks like they also have remanufactured starters for many Triumphs.

-Skip Montanaro

Starter-Generator/Alternator

Subject: Belt pulleys for alternator conversion
Date: Wed, 24 Apr 2002
From: "Jeffrey J. Barteet" <barteet@barteet.com>

Here's my experience with alternator pulleys from my '62 TR4's alternator conversion:
There are several routes that can be taken regarding pulley selection with an alternator conversion.

1. Keep the stock alternator pulley and convert your crank and water pump pulleys to a thin belt.
Pros: Cheaper, more commonly available belts, and the replacement water pump pulley is aluminum with less reciprocating mass.
Cons: Expensive. Around \$300 last I checked.
2. Keep your wide belt, and take the original generator pulley and have it drilled out to the shaft diameter of the alternator.
Pros: Cheap, semi-original looking, and you keep your wide belt.
Cons: The stock generator pulley is somewhat large comparatively, and it makes the alternator a little under-driven. I found my alternator didn't 'kick-in' until I revved the motor above 1300-1500 RPM
3. Keep your wide belt, and find a replacement 3/4" belt pulley for the alternator which is smaller in diameter than the generator pulley. This is what I did AFTER trying #2 for a year or so, and I've been happy with the results. The pulley cost \$20 from an alternator shop.
Pros: Charges as sub-1000 RPM idle.
Cons: Haven't found any yet.

-Jeffrey

Subject: Belt pulleys for alternator conversion
Date: Wed, 24 Apr 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

- > **Pros:** Cheap, semi-original looking, and you keep your wide belt.
- > **Cons:** The stock generator pulley is somewhat large comparatively, and it makes the alternator a little under-driven. I found my alternator didn't 'kick-in' until I revved the motor above 1300-1500 RPM

I don't know if this would work for all alternators, but on mine I pretty much solved this problem by adding a resistor across the 'ignition' lamp on the dash. If memory serves, it was 4 ohms, 5 watts (mostly because that's what I had in the parts bin). The resistor also ensures that the alternator will continue to work even if the bulb burns out. With the resistor and an original pulley, my Ford alternator 'kicks in' as soon as the engine fires, and will put out enough at idle to keep up with either the Xenon headlamps, or the radiator fan (but not both). I've noted that my 1980 Chevy also had such a resistor built into the wiring harness.

-Randall

Subject: Belt pulleys for alternator conversion
Date: Wed, 24 Apr 2002
From: john donnelly <pdonnell@san.rr.com>

I took Randall's cue on this and it works great. I went to Radio Shack and bought a 10 ohm, 10 watt resistor (came two per package), and wired it in at the fuse box using solder and shrink tubing. The red light is a little dimmer, but who cares. When the revs drop to about 500 the light comes on, any higher it goes out and the ammeter shows it's charging.

FYI, I bought another pulley from Moss and had my machine shop drill it out. \$15 for the pulley, \$15 for labor. Remember to keep the generator, or donate it to someone who needs it.

-John

Starter-Generator/Alternator

Subject: Completed Alternator conversion on TR4 - anyone got a junk control box?
Date: Sun, 21 May 2006
From: "Chris Simonsen" <ccsimonsen@gmail.com>

Hi All,

Took about 3 and a half hours due to some un anticipated problems along the way, but the alternator conversion went well. Works good - miss the control box and may need to gut my control box to tie wires together. - I hate to kill a good control box - Anyone got a bad one out there they are willing to part with?

I did not butcher any wiring and can go back to the generator without evidence if I ever wish to. All the pieces are boxed up carefully should that day arrive (or to go with the car should I not be buried in it).

Found a pulley (of all things used for 6v tractor conversions) on the net (A203 - found several places) and the local farm store had one. The rest of the conversion went like the many postings I've read. Cut about a quarter inch off the lower boss on the alternator and it lined up fine. Was using the TRF cogged pulley already and it fits just fine.

No mods to the upper bracket. Everything lined up fine.

The wiring went without incident (thanks Dan Masters - info was available from VTR without password....nice) - I added the large wire from the alt to the solenoid as I (used to always have a dead battery) did not want to have the potential to fry wiring.

The lights are a brighter shade of yellow and the horn even works again!!!

Thanks to all that helped directly or indirectly!!
-Chris

Starter-Generator/Alternator

Subject: Generator to Alternator Pulleys
Date: Wed, 13 Aug 2003
From: "Randall" <ryoung@navcomtech.com>

> Thank you for all the help. However, (and perhaps I missed it), but one of my concerns is the belt issue. How
> hard is it to change the pulley on the water pump and the engine?

Hmmm, maybe it didn't go through. Several vendors sell kits with narrow pulleys, I know BFE and Racetorations do. However, they're fairly pricey. It may be possible to use a TR250 water pump pulley and a MGB crank pulley, but you'll need a special seal and some spacers to make the MGB pulley work. Check the Triumph Tune catalog from Moss UK, they may still have the special seal.

> Or, can you put the wider pulley on the alternator?

That's what I did, by having a machine shop bore out the original pulley to fit the larger alternator shaft. There are also commercially available pulleys that will work better (smaller diameter, which allows you to use the original belt and also turns the alternator faster for better charging at idle), but I don't know of a source offhand.
-Randall

Subject: Generator to alternator
Date: Thu, 14 Aug 2003
From: <jmaher0343@bresnan.net>

> That's what I did, by having a machine shop bore out the original pulley to fit the larger alternator shaft. There
> are also commercially available pulleys that will work better (smaller diameter, which allows you to use the
> original belt and also turns the alternator faster for better charging at idle), but I don't know of a source
> offhand.

It sounds like going with the wider pulley on the alternator is cheaper and easier. If anyone knows of where I can get a smaller pulley to put on the alternator, please let me know. Thanks,
-Joe

Starter-Generator/Alternator

Subject: GM Alternator Conversion on TR4A Need wide-belt pulley?
Date: Wed, 5 Nov 2003
From: "Chris Bohn" <cbohn@sidepipe.com>

I am pondering doing the GM 7127 alternator swap in my TR4A. I've read Dan Masters' instructions from the VTR site. The connections seem straightforward. But, I am confused about the pulley on the alternator. The TR4A has a "wide" v-belt that drives the water pump and generator. I do believe that the GM alternator comes with a "small" belt pulley. There was no mention in Dan's instructions on the need to put a different pulley on the GM alternator to accommodate the wider belt. Can anyone (applies to any TR3-4A owner) who has made the switch the GM alternator enlighten me on this?

-Chris

Subject: GM alternator conversion on TR4A\ Need wide-belt pulley?
Date: Wed, 5 Nov 2003
From: "Randall Young" <Ryoung@navcomtech.com>

> I am pondering doing the GM 7127 alternator swap in my TR4A. The TR4A has a "wide" v-belt that drives
> the water pump and generator. I do believe that the GM alternator comes with a "small" belt pulley.

You will need to either find a wide-belt pulley that fits your alternator; or else convert to a narrow belt. Many of the racer supply houses sell the narrow belt conversion (BFE, TSI, Moss UK/TriumphTune, etc.), but they aren't cheap.

When I did mine years ago, I had the original pulley bored out to fit the alternator shaft. That's not an ideal solution tho, a smaller diameter pulley would work better.

-Randall

Subject: Link to more info on alternator pulleys for TR2-4A
Date: Wed, 5 Nov 2003
From: "Chris Bohn" <cbohn@sidepipe.com>

I found this link with a little more info on pulleys solutions when converting TR2-4A to a GM alternator:

< http://athene.as.arizona.edu/~fwildi/cars/tech_talk/electricals.htm>

The relevant part is Sec. 1.3.4

-Chris

Subject: GM alternator conversion on TR4A Need wide-belt pulley?
Date: Thu, 6 Nov 2003
From: "Gerald M Van Vlack" <jerryvv@alltel.net>

List,
I've posted this option for an Alternator Pulley source at least once before but it's been a while and I don't know if this source for a wide belt pulley still exists. Call Fifth Ave Antique Auto Parts @ 785-632-3450 and order his pulley. He may also advise you to purchase his mounting and electrical diode kit. You don't need those as he has designed his system for an old Ford. Just purchase the pulley. Last literature that I have says the pulley is \$30.00 bucks. As for mounting the Alternator, you need to file or cut off about ½ inch of surface (it may be a little more) at the bottom mounting hole of the Delco Alternator to essentially make it at the same plane as the rest of the face plate. Be very careful that you maintain this surface parallel with the face plate surface as this then keeps the Alternator and pulleys in the same plane too. The alignment of the belt should be very close at that point. In my case I needed to shim with 3 very thin washers to make a final adjustment. The top Triumph generator adjustment bracket in my installation needed a very little bend to work very well and installs to the

back side of the Alternator. My installation only mounts at 2 spots but after 3 years it's working fine. If I can be of any other assistance write to me off line and I'll try and help you with your installation.

JVV

Subject: GM alternator conversion on TR4A Need wide-belt pulley?
Date: Thu, 06 Nov 2003
From: Greg Gelhar <ggelhar@gosignup.com>

Hi Chris,

I'm sorry I don't have first hand information but I remember a club member saying he went to a shop where they rebuild alternators and found a GM wide belt pulley used for a bus application. If I remember correctly it was not expensive either.

-Greg Gelhar

Subject: The ever popular GM alternator conversion discussion
Date: Sun, 9 Nov 2003
From: "Jeffrey J. Barteet" <barteet@barteet.com>

Hi Folks,

After I had removed all that cylinder head, intake & exhaust stuff, I saw there was a clear view of the GM alternator conversion I'd done a couple of years ago.

So I wiped off the larger deposits of crud and snapped a few photos. I went and dug up some notes a list member sent me who used a post I made on this a few years ago on the same subject. I put all the info. together and cobbled together a web page.

<<http://www.barteet.com/jeffrey/triumph/GM-Alt-TR>>

Hopefully a few pictures will be worth a 1000 words.

-Jeffrey

Starter-Generator/Alternator

Subject: Resistor Values for Alternator Conversion
Date: Mon, 13 Aug 2007
From: William Babbitt <wbabbitt@sbcglobal.net>

Anyone save the emails giving the specs for the resistor and where to install it so that the red alternator (generator) light won't come on during idle?

I accidentally deleted one and can't find them in the archives. Thanks,
-Bill Babbitt

Subject: Resistor Values for Alternator Conversion
Date: Tue, 14 Aug 2007
From: William Babbitt <wbabbitt@sbcglobal.net>

THOMAS FANSHER <tfansher@comcast.net> wrote:
> Is it a problem? Mine doesn't come on if I rev the engine once after starting. **10 ohm** is what Randall
> suggested.
> -Tom

Tom,
Thanks for the response. Did Randall mention how many watts the resistor needs to be good for? The light is a little bothersome since it'll typically come on whenever I go down to a slow idle. Probably the result of using the original generator pulley on the alternator instead of a smaller diameter one like the one that comes with it. It's not an issue if I leave the electric radiator fan on. I'd just like to clear it up..... Thanks,
-Bill

Starter-Generator/Alternator

Subject: TR crank pulley mods
Date: Sun, 09 Jun 2002
From: "Jack W. Drews" <vintr4@geneseo.net>

There is a recurring discussion on the lists regarding installing narrow belts for alternators, providing some sort of torsional vibration dampener, and the pro's and con's of removing the fan. I recently offered some parts for sale on E-Bay that caused a number of questions, and I thought I'd share what I know about this subject.

There are apparently two commercially available kits. One is from England (I don't know the vendor) that includes the crank and water pump pulleys. One is from British Frame and Engine (626-443-0939) and contains a water pump pulley, a crank pulley with a torsional vibration damper that was dyno-developed, a fan belt, and a new timing cover seal to fit the new pulley. Price \$380. The only tricky part in its installation is the need to mark the pulley for timing, because it comes with no marks. It is the highest quality approach I know of.

The third approach has been around for a long time and is the subject of this message. It is not quite as good because it requires a little machining, the damper is not tuned quite as well, and the Woodruff key in the crank does not engage very far into the pulley. However, it's pretty cheap. I have had one on my car for six years of racing and it has caused no problems, but for racing I will eventually switch over to the BFE kit.

This low-buck approach uses an MGB crank pulley -- I think there are two models -- but the one you want is 4-5/8" diameter. The portion that contains the seal surface is the wrong length and diameter, so the engine side of the pulley must be machined off until the pulley bore is 11/16" deep. Then you take a TR4 pulley and cut off an 11/16" piece of the engine side of that pulley, creating a spacer that goes on the crank first and provides a seal surface. So then you put on the new spacer, put on the altered MGB pulley, and secure with the heaviest washer you can find and a 5/8" fine thread bolt, 1-1/2" long or so, with red Loctite.

After doing this you can't use the fan, of course, but it doesn't do much anyway, and you must make or buy a water pump pulley suitable for a narrow belt. If you're going to run an alternator, this takes care of the narrow belt adaptation problem. If you're going to stay with the Lucas generator, you have to make a new pulley for it.

If you try this and run into problems, send me a question and I'll try to help. If these instructions are too murky, let me know and I'll sketch it up and put it on a website after the Mid Ohio race weekend.

-Uncle Jack

Starter-Generator/Alternator

Subject: TR3 Alternator Conversion
Date: Mon, 13 Oct 2003
From: "Randall Young" <ryoung@navcomtech.com>

> What alternator do I buy?

Sorry, no help there. The GM 10Si or 12Si seems to be a popular choice in the US, but IMO one of the smaller diameter foreign units (like the Mitsubishi found on my Dodge Caravan) would fit better.

> Is there someone that makes a conversion kit?

One such is Revington TR in the UK <<http://www.revingtontr.com>> A bit spendy IMO, but no doubt there are others not quite so dear.

You might check with:

Ted Schumacher at TSI <<http://www.q1.net/~tedtsimx>>
Ken Gillanders at BFE <BFEKENG@aol.com>

If they don't carry it, they'll at least know where to get it.

> If not, How does it mount on my 59 TR3?

In my case, I took out the front mount extension and ran a big bolt through my modified Ford alternator, then through the original mounts, with suitable spacers. Not the best installation in the world, but it's worked for me for many years. Had to bend the upper arm to match the alternator, too.

> Will my pulley fit or do I need to do something special?

You'll need something special, as the generator shaft is much smaller than any alternator I've seen. The stock pulley is really too big anyway.

> Is there anything special I have to do to connect it?

Start by converting to negative ground if you haven't already. The original control box will no longer be used, but you'll need to join together the two or three big brown/tracer wires that go to it. You'll also need to decide if you want your alternator output to go through the ammeter or not. If not, the output can be tied directly to the starter solenoid, but your ammeter will always read charge even if the battery isn't being charged. If so, the output can be tied to the two wires you just joined, but you'll probably want to add a small shunt across the back of the ammeter, so it doesn't peg when you start the engine.

You'll also need to extend the wire from the yellow lamp on the dash to reach the alternator. In my case, I added a resistor across the lamp, as otherwise I had to rev the engine up to 'start' the alternator. Most likely not necessary with other alternators (but GM did the same thing for the 15Si on my 80 Chevy). There'll be other details depending on which alternator you choose, but that should give you the general flavor. More at: <<http://www.vtr.org/maintain/alternator/conversions.html>>

Most people cut away the original RH steering mount (on LHS cars, of course).

> Any gotcha's come to mind?

Nope, it's really fairly easy. However, it's best to double-check that the pulleys line up (lie in the same plane) as otherwise the belt will wear out quickly.

-Randall

Starter-Generator/Alternator

Subject: TR3 Thin Belt Conversion and MGB pulleys
Date: Mon, 20 Jan 2003
From: francois wildi <fwildi@yahoo.com>

Listers,

Following a tip from Jack Drews, I started gathering the bits and pieces for a thin belt and alternator conversion of my TR3. He says that you need the early 3-main engine MGB crank pulley that is 4 5/8" in diameter. I have been hunting for one for quite some time now and I have not been able to find any. I have now been in touch with 2 different people who claim to have a 3-main MGB engine but they say the pulley is 5 1/8" (which is supposed to be the latter type).

Is anyone knowledgeable about MGB's and can she/he help me? Has anyone this pulley for sale?
-Francois

Subject: TR3 thin belt conversion (encore et toujours)
Date: Thu, 30 Jan 2003
From: francois wildi <fwildi@yahoo.com>

Well,

I spent some time yesterday with fellow lister Bill (Hi Bill!), looking at MGB crank pulleys of different vintages and even Sprite/Midget ones.

What we observed was that:

1. No matter the vintage (3-main, 5-main), the MGB pulley seems to be just over 5" diameter. This is in accordance with the facsimile of the MGB parts list from TRF, that lists only one pulley until engine GF, which encompass the 3-main and the first years of 5-main production
2. The MGB crank front end shaft seems to be the same diameter as the TR3/4, indeed
3. The spridget crank pulley of the 1275 engine has a diameter of 4 5/8" to 4 3/4". That seemed promising. However, this pulley does not have the correct center hole diameter for the TR3/4, so I doubt that anyone would adapt it for this application.

All in all, I made little progress but I am starting to believe that if it is an early MGB pulley that I need, it'll be 5 1/8". But I still wonder what's the difference between an early MGB and a late MGB pulley.

-Francois

Starter-Generator/Alternator

Subject: TR3A Alternator Conversion- 1
Date: Sat, 27 Jan 2007
From: "Terry R Smith" <terryrs@adelphia.net>

First, I've done my homework. I've spent a couple of hours researching the archives for information on the alternator conversion for a '59 TR3A. Sort of all over the place, but here's some things I've found, just to put it in one post.

I have the Dan Masters instructions. Great stuff! Still have a couple of questions.

Per Randall, I will solder in a 10 ohm, 10 watt resistor (in series) with the ignition light in order to get the alternator to kick in at lower RPM's. No problem here. I'll do this at the fuse box like John Donnelly suggested.

Also per Randall, some electronic ignition switches have a problem with feedback power from the modified ignition light that causes the engine to run on after cutting the ignition. The solution is a diode in a series with the resistor. Does anyone have the size for the diode, just to prevent a possible problem, in the event I want to convert to an electronic ignition at some point, and since I'm already in there installing the resistor?

Sourcing a pulley shouldn't be difficult. Once I source the right alternator, I can either have my local alternator/generator repair place match me up with a new wide pulley, or I can have a machine shop drill my existing one to fit.

Here's the rub: The alternator itself is a matter of some dispute. I've read Nippondenso, Delco 7127, Delco 7127-3 (if this is different from a regular 7127?), Delco 10SI, Delco 12SI, and others. I'm having a hard time getting advice on exactly which fits with the greatest ease in the TR3A, and already has the right o'clock position for mounting. (I understand that the connectors for the TR3A are supposed to be at the 3 o'clock position (Anthony Rhodes), and that the o'clock position is determined by viewing the alternator from the rear <www.madelectrical.com/electricaltech/delcoremy.shtml>. Somehow this o'clock position seems wrong, because that would put it on the engine side, not the access side, wouldn't it? Some of the recommendations I came across were for TR 4's and TR6's, and it was sometimes hard to distinguish when recommendations on 3's were from people with 4's and 6's.

I already understand the need to have bushings between the tabs on the alternator to keep them from sort of warping the body and shortening the life of it. And the need to make sure the pulley aligns with the other pulleys to again avoid shortening the life of it. An amp range in the 60's is probably plenty, even if I install a stereo and do a headlight conversion, and run them all at night with the heater and windshield wipers (right?).

Some of the conversion postings were a few years old. Any new alternators out there being used? Any good experience installing and running any of the ones listed above?

As ever, thank you, everyone. Any pictures of the conversion would be of tremendous value.
-Terry Smith

Subject: TR3A Alternator Conversion
Date: Sat, 27 Jan 2007
From: "Randall" <tr3driver@ca.rr.com>

> Per Randall, I will solder in a 10 ohm, 10 watt resistor (in series) with the ignition light in order to get the
> alternator to kick in at lower RPM's. No problem here.
Correction, the resistor should be **IN PARALLEL** with the light, not in series.

> I'll do this at the fuse box like John Donnelly suggested.

Guess I missed that one ... so you're going to run the line to the fuse box as well? Normally it only runs from the alternator to the warning light.

> Also per Randall, some electronic ignition switches have a problem with feedback power from the modified
> ignition light that causes the engine to run on after cutting the ignition. The solution is a diode in a series with
> the resistor.

MSD supplies a 100 volt, 1 amp diode. Which sounds reasonable to me. Read:
<<http://www.msdignition.com/1troub1.htm>> where it says "Engine Run-On".

> I'm having a hard time getting advice on exactly which fits with the greatest ease in the TR3A, and already
> has the right o'clock position for mounting.

Sorry, I can't help there.

> Some of the recommendations I came across were for TR 4's and TR6's,

TR4 should be basically identical, except it has more clearance for the alternator. Which brings up another point not often mentioned ... most people have cut away the mounting tab on the frame next to the alternator (which is unused on LHD cars).

> An amp range in the 60's is probably plenty, even if I install a stereo and do a headlight conversion, and run
> them all at night with the heater and windshield wipers (right?).

Sure. It'll carry that electric fan, too.

-Randall

Subject: TR3A Alternator Conversion
Date: Sun, 28 Jan 2007
From: "Mike Welch" <spitfire@freebacon.net>

I did the alternator conversion to my '69 Spit, really straight forward. I used one of the Delco. The 7127-3 means that the connectors are at the 3 o'clock position, 7127 should be with connectors at 12 o'clock, 7127-6...you should get the idea. The position of the connectors is entirely up to you, just make sure that there is enough clearance for the connector and the wires. If you were concerned about originality and the factory connector position you probably wouldn't be thinking about this conversion<g> The internal regulator is also very convenient, I was able to get the alternator at the correct fore-aft position, using the original mounting hardware, by switching the order of the mounting bolts and that big nut (don't know if the TR3 has a similar setup). My alternator came with a pulley that was slightly smaller than the one from the generator. I used that pulley (the alternator spec said that it would output 13.5 v at 800 rpm for the Chevy application I looked up, I get 13.5 at about 750 rpm). The only piece other than the alternator that I had to buy was the adjustment arm, which was an off-the-shelf item at the local parts store. I'm very happy with the conversion. 60 amp is plenty to power to run all the accessories at the same time, lights, wipers, radio, fog lights, and power inverter for charging laptop and cell phone, etc. Switching to neg ground was also uneventful.

> Here's the rub: The alternator itself is a matter of some dispute. I've read Nippondenso, Delco 7127, Delco
> 7127-3 (if this is different from a regular 7127?), Delco 10SI, Delco 12SI, and others. I'm having a hard time.
-Mike Welch

Starter-Generator/Alternator

Subject: TR4 Alternator debrief-lessons learned
Date: Sun, 31 Oct 2004
From: "Dean Mericas" <dmericas@limno.com>

I just completed the alternator conversion on the TR4, and I thought I'd share some lessons learned with the list. My goal was installing a Delco 10SI alternator in a way that would appear as original as possible.

The instructions on the VTR site were my core reference, with additional tidbits from various web sites. The VTR instructions were very helpful, but the following details were either missing or could use some clarification:

I found a suitable pulley at Quick Start Automotive Electric Products for about \$20.

Modifying the mounting boss on the Delco alternator was very straightforward. Trimming the boss down to a thickness of 1.75" gave perfect alignment with the water pump and crank pulleys without needing any shims.

The wide pulley takes up more of the alternator shaft than the narrow pulley that came with the alternator. The basic 10SI (7127) alternators are apparently all alike, but there are different fan designs. The alternator I bought had a fan that was domed in the center with a thick spacer under it, leaving very few threads for the thin attaching nut. The wide pulley covered all of the threads at the end of the shaft, making it impossible to attach the nut. I swapped the old fan and spacer from a core unit for the new fan, and solved the problem. It's difficult to describe, so just be sure to get the pulley first and make sure it will fit on the new alternator before you buy it.

I found it impossible to install the recommended 7" bolt through the front and back "ears" of the generator mounting bracket. The cross-brace is in the way in the front, and the exhaust manifold interferes in the rear. Instead, I used a 3/8" x 3" bolt through the alternator and the front generator mounting hole. BTW, the hole in the front of the generator mounting bracket is 1/2" diameter, while the mounting hole in the alternator is 3/8". I didn't want any wobble here, and installed a bushing to take up the slack and provide a very solid mounting.

The original fan belt would not fit over the pulley, so I tried longer belts, up to 40" (NAPA TR28400). The longer belts allowed the alternator to sit too close to the fender wall for my comfort. Grinding down the edge of the generator mounting plate and front engine plate where the alternator was touching them allowed the alternator to swing closer to the block and provided enough room to use the original fan belt. The alternator seems to sit just right.

I used an old control box as a terminal block, following the general instructions provided in <http://www.vtr.org/maintain/alternator/gm-tr4a1.html>. Rather than installing a fusible link, I'm planning to install a circuit breaker inside the box to protect the wiring harness against the 60+ amp surge that the alternator is capable of producing with a dead battery.

It took considerably more than 2-3 hours, but it works fine and you'd have to look pretty carefully to tell that it's not an original installation. Hope these observations are helpful to others contemplating this modification.

-Dean Mericas

Starter-Generator/Alternator

Subject: TR4 Gen to Alt convert - having problems - need help
Date: Sat, 9 Feb 2002
From: john donnelly <pdonnell@san.rr.com>

Hello List,

The generator on my TR4A is shot, so after reading lots of discussions here I thought I'd do the alternator conversion.

So I re-read all the e-mails the list put out and went with Dan Master's recommendation. Got a 7127M rebuilt alternator at NAPA. Milled down the pivot bolt boss so the pulley lines up properly. Had the pulley drilled out for the new alternator (staying with 3/4"). Tried to install the setup but found the original fan belt was too small, so I got a 40 1/2 " belt (the next larger size). Installed everything, but the adjustment bracket was too small so I got a longer one. Now the belt rubs against the cross-member support.

I took a good look at the 7127M alternator, and compared it to the original generator. The big difference is the distance between the alternator centerline and the mounting bracket centerline. On the generator it's 3 ". On the alternator it's 3 1/2 ". Hmmm. That's why the original belt was too small.

I went to back my local parts shop again and looked at a few alternators. The 7127 was the smallest. Tried the Hitachi. Tried the new Ford. Tried a Nissan version of the Hitachi. Nothing less than 3 1/2 ".

Unless I can find a belt in the 39" range, or an alternator with a smaller centerline-to-centerline distance then I'm screwed, and out about \$125 in parts. plus labor.

Another alternative would be to cut a "V" groove in the cross-member, but would prefer that as a last resort.

Any other ideas? Experiences? Thanks!
-John

Subject: TR4 Gen to Alt convert - having problems - need help
Date: Sat, 9 Feb 2002
From: "Randall Young" <ryoung@navcomtech.com>

John, I haven't tried this, so I'm not certain it will work. But, I would suggest getting the NAPA 25-24379 belt that FT told us about (Thanks Fred!), and then looking for a smaller diameter pulley for your alternator, in that belt width. For example, McMaster-Carr, <<http://www.mcmaster.com/>>, lists P/N 6204K13 as having a pitch diameter of 2.1" when used with a B-section belt, and available in bores of 1/2", 5/8" or 3/4".

This has the added advantage of turning the alternator faster, to give more charging at idle.

Need to order one of those myself, next time I order from MMC. BTW, although their prices aren't always the cheapest, they are a very nice outfit to deal with. No minimum order, very prompt shipment (I usually get the items in 2 business days), etc.

What's the diameter of your alternator housing, at the point where it touches the engine block when you try to put the belt on?
-Randall

Subject: TR4 Gen to Alt convert - one owners experiences
Date: Thu, 14 Feb 2002
From: john donnelly <pdonnell@san.rr.com>

Hello List,

First off, thanks to everyone who responded to my request for help last week on installing the alternator into my TR4A. It's in, and it works!!!

The generator on my TR4A is shot, so after reading lots of discussions here, I thought I'd do the alternator conversion. So I re-read all the e-mails the list put out and went with Dan Master's recommendation. Got a 7127M rebuilt alternator at NAPA. A special thanks to Dan Masters who sent an updated installing instruction sheet (about two years ago), and to the person who suggested that I check the mounting bracket for excessive interference. I lost your email, but your tip was spot on. Grinding down the bracket allowed the alt body to get closer to the engine and allow the alt to line up properly. Thanks!

I don't know if this is quirky or not but two observations on the conversion. The first is that there seems to be a minimum "cut-in" time for current to start moving. It takes a few moments for the red light to extinguish and the ammeter to go positive. Is this strange?

Second is that the 63 amp alternator pegs the ammeter when the engine starts. If the battery is low could any damage be caused, or should I go to the "heavy-duty" wiring that Dan suggests? I don't want my new harness fried.

The downside to the heavy-duty wiring is that the alternator output is connected directly to the battery, so you can't see the charging, only discharging. But, I've read somewhere that shunting the ammeter with a parallel resistor (a high wattage one) would effectively could make the ammeter read 1/2. I prefer this approach. Has anybody done this? And, will the wiring harness take the possible 63 amps for short periods?

Thanks again !!!
-John

Subject: TR4 Gen to Alt convert - one owners experiences
Date: Thu, 14 Feb 2002
From: Randall Young <ryoung@NAVCOMTECH.COM>

> I don't know if this is quirky or not but two observations on the conversion. The first is that there seems to be
> a minimum "cut-in" time for current to start moving. It takes a few moments for the red light to extinguish
> and the ammeter to go positive. Is this strange?

Many American alternators rely on the current passed through the 'ignition' lamp to 'start' the alternator. With my Ford unit and only the original lamp, I found I had to rev to about 3K to get the alternator going. Adding a 10 ohm, 5 watt resistor across the lamp solved the problem, now the light goes out as soon as the engine fires off. Having the resistor also means that the alternator will not be disabled if the light burns out.

> Second is that the 63 amp alternator pegs the ammeter when the engine starts. If the battery is low could any
> damage be caused, or should I go to the "heavy-duty" wiring that Dan suggests? I don't want my new harness
> fried.

IMO, no, it won't hurt anything. Although the ammeter needle may take a beating from being repeatedly slammed into the peg. The electrical 'mechanism' inside the ammeter is just a loop of fairly heavy gauge wire, it should have no trouble with 63 amps.

> The downside to the heavy-duty wiring is that the alternator output is connected directly to the battery, so you
> can't see the charging, only discharging.

Very distasteful, IMO. In fact, what you see isn't necessarily charging, so the ammeter can read substantial charge while the battery is running down! There are some alternatives, one is to run new "heavy duty" wires to/from the ammeter. Another is to switch to a voltmeter. I don't know of one that will look "at home" with the other instruments, but the original ammeter is a standard size, there are many voltmeters (including most 2" aftermarket units) that will fit in the hole. The later TR6 voltmeter will also fit.

- > But, I've read somewhere that shunting the ammeter with a parallel resistor (a high wattage one) would
- > effectively could make the ammeter read 1/2. I prefer this approach. Has anybody done this? And, will the
- > wiring harness take the possible 63 amps for short periods?

I don't know that the TR4A is the same, but on the TR2/3 the relevant brown wires are plenty large enough to handle 63 amps indefinitely. The quick connects used on later cars may be a problem, but the wires will handle it. I didn't try reusing the yellow wire that originally went to the generator, it's probably too small.

I believe I was the author of the 'shunt' idea, I've been using it on my TR3As for almost 30 years now. It works quite well. However, you don't want a 'resistor', just a short length of wire. All wire has some resistance, and the resistance required for the shunt is very low. Because the resistance is so low, it doesn't dissipate much power.

On my current daily driver, the shunt is three strands of steel "handy wire" (or baling wire if you're from the Midwest <g>), just long enough to reach from one ammeter terminal to the other. Don't recall what size offhand, probably around 20 AWG.

- > From a post I made a few years back:
- > TR3: 1.2 milliohms 3.5" 16 AWG copper makes a 50% shunt

However, it's likely there is some variation from ammeter to ammeter. Another approach (the one I used) is to pull the ammeter out of the dash, leaving it connected. Turn on the headlights briefly, and note the ammeter reading. Then add a trial shunt, and try the headlights again. About 1/2 is a good target (resulting in an ammeter that reads 60-0-60). The shorter the shunt wire, the lower the ammeter will read.

-Randall

Starter-Generator/Generator

Subject: TR4 Generator
Date: Thu, 27 Apr 2006
From: Greg Perry <rgperry@earthlink.net>

Kurt Jones wrote:

- > The generator on my TR4 started making a terrible sound today, so I pulled it, and as suspected, the drive end
- > bearing is toast. <stuff deleted>
- >
- > Is this right??? And will the bearing available from Moss work okay?
- > -Kurtis Jones

The bearing can be bought at an autoparts store or a bearing supply house locally by using the original bearing number. The bushing and bearing can also be purchased at an alternator/starter rebuild shop. Your Welcome,
-Greg Perry

Subject: TR4 Generator
Date: Thu, 27 Apr 2006
From: "Randall" <tr3driver@comcast.net>

- > The model number of my generator is 22715 (which Moss indicates actually came from a TR4A).
- > Is this right???

Seems reasonable. I know later Lucas generators had the arrangement you describe (as did the alternators), and they were frequently supplied as replacements for the earlier cars.

- > And will the bearing available from Moss work okay?

As I recall, the bearing itself is the same. The "seal" between the bearing and the frame is just a cushion to take up any slack due to manufacturing tolerances, so you can replace it with an O-ring from Home Depot if it has to be replaced.

-Randall

Starter-Generator/Starter

Subject: Flywheel-Starter Gear
Date: 4/28/02
From: <ZinkZ10C@aol.com>

<ebk@buffnet.net> writes:

> Therefore, the starter gear should also have a matching end of bevel to each tooth, right?

Yep, most drives have a chamfer as well. I do suspect some drives don't have any chamfer so your mileage may vary.

> Some of my start gear's bevel look pretty bad. At what point would it be considered being bad? [More than
> 1/3 in length being 'chewed-up'?] on either Ring Gear or starter gear?
> -Cosmo Kramer

I should also point out the 1/3 loss of tooth length applies to gears that are being flipped. Losing tooth surface on the opposite side of drive engagement isn't much of a problem. Losing tooth surface on the drive engagement side can cause more of a problem since the starter could start to spin at full speed before engagement. (this assumes a solenoid type positive engagement starter, older inertia Bendix drive starters spin at full speed and really rely on the chamfer to assist engagement so tooth loss is less of an issue.)

1/4 or less tooth loss on the engagement side of a ring gear is what I like to see. The greater number of teeth damaged, the less likely I'll reuse the gear.

I like to see minimal starter gear damage since that gear has only ~ 10 teeth vs the ~ 145 on the ring gear. With less teeth the gear wear is more rapid even though the starter gear is hardened. A bad starter gear will quickly damage a ring gear so I tend to replace starter drives early.

A lot of this stuff is a real judgment call, I've seen some pretty chewed stuff not make any noise and some lightly worn stuff grind.

-Harold

Starter-Generator/Starter

Subject: Gear reduction starter question
Date: Sun, 1 Jul 2007
From: <KingsCreekTrees@aol.com>

Hi all;

I have an early TR3A which was fitted with a bomb starter. I found the starter very unreliable, had it rebuilt twice and still had problems. For two years, I used only the starting handle.

Eventually, I decided to fit a gear-reduction starter. I've now had that fitted for two years and it failed last weekend. It just emits the usual grinding noise of incomplete engagement. Now, I'm back to using the starting handle again (and I'm very glad I kept the starting handle hole when I had the radiator recored!).

I haven't even looked at the problem yet, but would like to find out if anyone's experienced anything similar, either from bomb-type or gear-reductions starters, or if there are any general comments. With a few opinions and a bit more knowledge, I'll pull the starter and know what to look for. Has anyone gone back to the original starter?

I'm guessing I'm either unlucky with starters, or there's a ring gear problem.

-Tim Dyer

Subject: Gear reduction starter question
Date: Sun, 1 Jul 2007
From: "Kinderlehrer" <Kinderlehrer@comcast.net>

Sure sounds like a ring gear problem to me. While you are inspecting the ring gear for chipped and worn teeth, see if it is held on by bolts. If it is, it is the wrong flywheel and ring gear. If it's the right ring gear, see which way it is facing. If the campher on the teeth face rearward, it is on backward, although I'm told that shouldn't matter much with the gear reduction starter.

-Bob

Subject: Gear reduction starter question
Date: Sun, 1 Jul 2007
From: Bob Labuz <yellowtr@adelphia.net>

Tim,
I think you are in the unlucky category. I have a 58 TR3 with a 57 transmission and an original 57 bullet starter.

Back in 79 during its 1st restoration, I replaced the brushes and cleaned the computator with 600 sand paper.

I have logged over 25K miles since the 1st restoration and the starter turns the car over like new.

I have gone through a number of batteries, but the current Exide orbital seems to be the best of the lot. Very pricey though. I also have the same battery for the TR4 and it turns over just fine using an original TR4 starter.

I have never heard of a ring gear problem. They get a little chewed up in the front but for the most part they last forever.

What made your original starter unreliable?

The most common problem is with the rubber pinion sleeve.

-Bob

Subject: Gear reduction starter question

Date: Sun, 1 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> While you are inspecting the ring gear for chipped and worn teeth, see if it is held on by bolts. If it is, it is the
> wrong flywheel and ring gear.

My thought exactly. Just to amplify a bit, what Jim is talking about is the later, post-50K flywheel and ring gear (for the later starter). The later starter had a larger pinion, so the ring gear got smaller (so the mounting location could be used). An early starter with the late ring gear will just barely catch the tips of the gear teeth, and eventually wear until it slips. I saw exactly this problem on a local club member's car last year.

-Randall

Starter-Generator/Starter

Subject: Gear-reduction starter
Date: Sun, 29 Sep 2002
From: "Michael D. Porter" <mporter@zianet.com>

Alan wrote:

> > If you need a new starter, I'd recommend a gear reduction starter, I've had one for over a year now. TRF
> > has them on sale for \$169.00. A fair piece of change less than what I paid back then. Rebuilt originals are
> > available through most suppliers.
> > -al salvatore

I'm not out to diss any of the suppliers selling gear reduction starters for Triumphs, but I have to relate my experience with one (supplier not mentioned--they're all coming from the same manufacturer, anyway, I think).

The starter location on the GT6 is way down low on the right. Where I live, rain is infrequent, but when it rains, it's sudden and torrential, and the city here thinks storm drains are a myth perpetuated by people who live in big cities. Lots of local and temporary flooding. The stock starter is rather porous, and I've had lots of starter problems related to having to run in deep water. I decided that a gear reduction starter would be a good choice, since the mounting flange could be clocked so that the motor would be higher than the stock unit.

Within a couple of weeks of installing the gear-reduction unit, it started having engagement problems. Not severe, and when it wound up and didn't engage, I could let it wind down until it was almost stopped, hit the start again and it would engage. No big deal.

This got a bit worse over the year it was installed, but was still manageable. Thursday before last, it left me dead in front of our local Mexican grocery. Would spin up, but simply would not engage, no way, no how. I finally got a push to start, and put it in the driveway. Took off the starter Saturday before last and took it apart.

Discovered that it wasn't a bendix-related problem as I suspected. These units have a plunger on the end of the solenoid shuttle which positively locates the pinion gear in the flywheel before engagement. The problem is in the gear train. The motor gear (about eight-ten teeth) engages an intermediate gear of about eighteen teeth, which then engages the bendix shaft driven gear, which has about forty teeth. The only connection to the bendix drive shaft is the driven gear, through a one-way roller clutch inside the driven gear. This clutch provides over-run protection for the pinion, but it's also the only connection between the starter and the bendix.

Upon disassembly, I discovered that all of the rollers were seized in the body of the driven gear. They are made to work by inertia--they each sit in a ramped recess in the inner part of the gear, with a return spring pushing on each roller to return them to their original position--and this means they have to be free to work. The driven gear spins up, the rollers, through inertia, lag behind the rotation of the gear and slide up their ramps, binding the shaft and the gear and, in turn, turning the starter pinion.

Pretty simple--if the rollers slide. The problem with this starter is that the lubricant used isn't up to the purpose, and the assembly technique isn't the best, so there are a couple of problems which relate to binding rollers. The first is the design: there are two more or less square section bronze bushings on either side of the driven gear, on which the gear rides when it is free-wheeling. Inboard of these are the two halves of the cage containing the rollers. The land for the bushings is slightly deeper than the thickness of the bushings themselves, and if the bushings are driven full home (as they would be during manufacture) they push in slightly on the cages, pinching the rollers just a bit. And, since the grease used seems to trap wear particles, those two conditions cause the rollers to seize, and therefore not do what they're intended to do.

For anyone considering gear-reduction starters, therefore, I have some advice, based on recent experience. To avoid this aggravation of lack of engagement, I would suggest the following: upon buying a new starter, before installation, disassemble the gear train, pull the driven gear and back bearing off (there's not room to get even a small puller behind the back bearing, so use the driven gear to pull off the back bearing). Thoroughly clean out

the existing lubricant from the inside of the driven gear and repack with a good synthetic (I used Mobil 1 Synthetic Universal Grease).

Then, with a long flat punch and hammer, very lightly move the forward and rear bronze bushings in their lands so that the face of each is flush with the outside of the flange retaining them, taking care not to mess up the roller cage in the process. This gives enough clearance for cages and rollers to work properly and to ensure that grease gets all round the rollers, including all of their ends.

I also noticed that both of the bendix shaft bearings were unsealed, and the one near the pinion gear seemed to be packed with lithium grease, most of which had leaked out, as it was dry and rough, so I cleaned those, as well, and packed them with synthetic grease, then reassembled the gear train.

The result is a starter which works as intended, every time. I've had no trouble with it at all since these changes.

Certainly, some of you with this same starter, operating in cooler climes and not using your car and starter as frequently as I do (mine is a daily driver, doing runs to work, errands, etc.) won't see this problem immediately, but from private email in the last week, I know that others are having this same problem, intermittently. If you've purchased a gear reduction starter from any of a variety of sources, and find that it spins up without engaging once in a while, this is the fix.

Otherwise, I'm quite pleased with the operation of the starter, and I think it certainly has enough starting torque for those with high-compression engines.

-Michael D. Porter

Starter-Generator/Starter

Subject: More TR3 starter questions
Date: Sun, 5 Mar 2006
From: "Randall" <tr3driver@comcast.net>

> I bought the later hi-torque starter, which will fit into the bell housing, and although I haven't received it yet
> I'm wondering if I'll need to unbolt the ring gear and flip it around to match the beveled edge of the gears
> with the new starter gear.....???

Nope, no need. The bevel is needed with the original starter design, because the pinion gear is already spinning like mad when it hits the flywheel. However, the "gear-drive" starters are a "pre-engaged" design, they don't apply power to the motor until the gears are already being pushed into mesh. Even if the gears don't line up when first pushed out, they drop into place when the starter begins to turn.

This was even the Triumph factory design on the later cars with pre-engaged starters.

-Randall

Subject: More TR3 starter questions
Date: Mon, 6 Mar 2006
From: "Randall" <tr3driver@comcast.net>

> Your problem of fitting a hi-torque starter is not necessarily the direction of the ring gear - since the starter
> does not turn until the drive is fully extended - but the number of teeth on the drive. I believe the two
> different TR3 flywheel arrangements take different drive gears - either 9 or 10 teeth. Others can be more
> specific
> -Randal?

Yes indeed, the starter pinion must match the flywheel. The 9 tooth pinion goes with the early flywheel, 10 tooth with the later ones.

But the OP said he had a later flywheel and a later starter, so that part should be fine.

-Randall

Subject: TR3 starter questions
Date: Tue, 07 Mar 2006
From: Kevin Thompson <kthompson@whoi.edu>

Thanks Randall and Peter. I do have the later ring gear needing the **10 tooth pinion gear** (This is what's on a TR4A). Looks like I'll be all set with this portion of the project. Thanks again for the valuable info.

-Kevin

Starter-Generator/Starter/Solenoid

Subject: Electrics
Date: Mon, 8 Jan 2001
From: David Massey <105671.471@compuserve.com>

<INTERNET:Ct54531@aol.com> wrote:

- > Is it possible/acceptable/advisable/safe to just hook up the solenoid/starter to turn the engine over? If so, how?
- > Just connect the battery terminals and let 'er rip? Any precautions? Do I need to reconnect the whole system
- > or can I set something up where I can get power to the starter without completely reconnecting the wiring
- > throughout the car.

Do you want to start it or just turn it over. In either case, yes, all you need is a battery and the starter and the solenoid. You don't even need the solenoid if you want to use a set of jumper cables. Just hook one to the starter terminal and take the other one on and off of the engine block to start and stop the starter. If you want to start the engine you will need the solenoid so you can leave the battery connected to the block. Run another "hot" lead to the coil connection where the white wire would connect. Remove this wire to kill the engine.

- > Horns: I have one from the 64 TR4 parts car and a new one from Moss. The one from the car has two spade
- > receptors on it and the new one has four. How come?

If you look closely you will see that the four terminals are actually two pairs of two. In other words, there are two terminals that are electrically connected to each other and two more that are the same. These are used to "daisy chain" the electrical connections to two horns. You don't need to use all four but if the hire harness has separate terminals on the link wires from one horn to the other then you will need the four terminal horn in that location.

- >What's the relay (I presume that's what it is) that sits behind the passenger side horn? It has four wires going
- > into it from the harness and those weren't disconnected except briefly (and recently) to spray a little touch up
- > on it. I've reconnected to the generator and have a single spade connector left over with two wires that appear
- > to be the same color running into it. I can't tell the color but it's goldish or maybe even just dingy white. But
- > the horn on that side has two spade receptors and I only have that single connector left to connect to anything.
- > Also, on the driver's side of the engine compartment (left hand drive) I have two wires that I believe go to the
- > horn but, as I said, the new horn from Moss has four connectors on it. Does it matter which two receptors I
- > connect the wires to?

I don't know about the relay but it may be a horn relay. The two wires need to go to two of the four connectors that are not electrically connected. Visual inspection will show which are connected as the two pairs are attached by the same rivet.

-Dave

Starter-Generator/Starter/Solenoid

Subject: Ignition Question
Date: Sat, 8 Mar 2003
From: "Randall Young" <Ryoung@navcomtech.com>

Susan wrote:

> Quick question. It was finally a nice day here in Kentucky so I was going to drive my TR4. Went to start it
> and it tried to turn over two or three times, then nothing. The battery is fine. It was at half so I put the
> charger on it. The lights come on and do not dim when I turn the key. I was wondering if you guys thought it
> was my ignition coil or the distributor. The coil clicks a little when I turn the key but that is all. I checked
> the connections and they are fine.

Susan, unless I'm misunderstanding something, it can't be the ignition coil or distributor. From your description, it would have to be the solenoid (which is what clicks when you turn the key to start, the click is normal but doesn't necessary mean the solenoid is good), the cable to the starter, the starter itself, or a bad connection somewhere between those three items. Could also be a bad ground, either between the starter and the engine block or the engine block and the body. There's a ground strap between the engine front plate and the frame that is frequently overlooked when the engine has been out, it's absence can cause mysterious "no crank" problems.

If you can, connect a test light across the two big terminals on the solenoid. It should light when you connect it, and go out when you try to crank the engine. If not, the solenoid is bad (or is not getting power from the ignition switch, but the click would indicate that it is getting power). Work outwards from there until you find the problem.

-Randall

Starter-Generator/Starter/Solenoid

Subject: TR4A - Starter Solenoid Wiring
Date: Sun, 1 May 2011
From: "G.D. Huggins" <guy@genfiniti.com>

All,
I am in the process of terminating the wiring from the Masters kit on my car, and am not really sure how to terminate the wires to the starter solenoid.
My solenoid has a total of four terminals; two large, two small. The two small terminals are labeled as "S" and "I".

The diagram shows five wires terminating to only three places on the solenoid:

Place "A" Terminal

- >From the positive battery terminal - provides constant potential
- >From the "power terminal" on the "power block" - to provide constant potential to the block itself
- >From the alternator (brown wire) - methinks output to recharge the battery

Place "B" Terminal

- >From the starter - when solenoid is closed, power flows to the starter through this wire

Place "C" Terminal

- >From the starter relay - controlled by the ignition switch. Turn the switch and power hits this terminal, closing > the solenoid

I am thinking that "A" and "B" are the two large terminals on the solenoid, because a bigger load means bigger terminals. (Plus, the lines on the diagram are thick.)

I was also thinking that "C" will be the small terminal labeled "I" for ignition. This would leave the small "S" terminal with nothing on it.

Does this sound right? Anyone else have this setup and can check for me?

Any help is greatly appreciated.

-Guy D. Huggins

Subject: TR4A - Starter Solenoid Wiring
Date: Sun, 1 May 2011
From: "Randall" <TR3driver@ca.rr.com>

- > I am thinking that "A" and "B" are the two large terminals on the solenoid, because a bigger load means > bigger terminals.

That's right.

- > I was also thinking that "C" will be the small terminal labeled "I" for ignition. This would leave the small "S" > terminal with nothing on it.

I'm pretty sure it's the other way around. "S" gets the control from the switch (or in your case, the relay controlled by the switch); while "I" is used only on cars with external ballast resistors.

To verify, use your DMM (or powered test light) to check for continuity between "S" and ground. If you find continuity (or a resistance of roughly 5 ohms), it is the coil for the solenoid.

The "I" terminal I believe will show open to all other terminals until the solenoid is energized, then it will show 0 ohms to both large terminals.

- Randall

Starter-Generator/Trouble Shooting

Subject: Help - Ignition
Date: Sun, 30 Mar 2003
From: <lstein6@earthlink.net>

Tim, sounds like the ignition switch, but possibly the starter solenoid. If the gauges are moving when you turn the key, then you have positive voltage out of the switch and most probably positive voltage to the coil. On my old GT6 the starter solenoid was conveniently on the firewall next to the battery. The easy test is to jump across it (the two big nuts with heavy wires) after you turn the ignition to 'on' and of course after the car is in neutral and the e-brake is set. The starter will turn so don't jump. You can also take a set of jumper cables, just the red cable, put one end on the plus side of battery and reach down and touch the starter where the heavy wire goes to it. Oh, take a test light or meter and put it on the + coil and turn the engine by hand so that the contact points open (remove dist cap to watch). Ok:

1. Put test light on dist + with key 'on' and turn engine by hand, watch for points to open. Should get +12v. This tells you ignition switch is working to power circuits.

2. After putting distributor cap back on and everything set (choke, etc.) for start, jump across starter solenoid and see if starter cranks. If it does, check the starter solenoid, one of the smaller wires should have +12v when key is held in start position (you will need a helper for this unless you put the meter or test light on the windscreen (note I did not say windshield :)) and can see it from the driver's seat. If you never see +12v on the starter solenoid with the key held in start position, then the wiring from ignition switch to starter solenoid is bad. If you do have the +12v at solenoid, then the solenoid must be bad.

I forget what wire is the wire from ignition switch to solenoid. You need the schematic for that. On my GT6, the back of the ignition switch used to fall off, I don't know why. I ended up having to use electrical tape on it, hard (many wraps). That made everything go dead when it fell off. Good luck.

-Larry

Subject: Previous starter problem now wiring
Date: Tue, 1 Apr 2003
From: "Randall Young" <ryoung@navcomtech.com>

Hi Susan :

> ... As it turns out, the solenoid WAS dead. Just received the new one today and just now installed it. Now, the
> car starts when I push the button on the solenoid but not when I turn the key. The key does have to be on for
> it to start and when I turn the key of it shuts the motor off. My handy dandy husband would like to know how
> we can hot wire the thing so we can go from there.

If you momentarily connect a jumper wire from the small side terminal on the solenoid, to the big terminal with the cable from the battery, does the engine crank? If not, your new solenoid is not grounded or perhaps is bad (it does happen).

That small terminal should have a white/red wire on it (I think, might be wrong about the trace color), which runs to the back of the ignition switch. Try jumping from it to the brown with (white?) wire at the switch and see if that cranks the engine. If not, the wire is bad. If it does, the ignition switch is bad.

To "hot wire" it, go back to where it worked, and install a momentary (push button) switch that makes the connection that worked. In a pinch, two bare wire ends can make a switch, but be sure they can't touch accidentally.

PS- It helps if you tell us each time what car you have. Some of us can't remember yesterday ...

-Randall

Starter-Generator/Trouble Shooting

Subject: Moss Video to test Lucas generator
From: Cosmo Kramer <tr4a2712@yahoo.com>
Date: Saturday, July 31, 2010

Subject: Moss Video to test Lucas generator
Date: Saturday, July 31, 2010
From: Randall <tr3driver@ca.rr.com>

Bob wrote:

> If I remember correctly, the way I test a generator is to attach a + lead to ground on the generator from the
> battery and - to both the small and large spade connectors and if the generator spins like a motor it is good to
> go.

'Cosmo' asked:

> Is this set-up for a gen. that is normally (+) earth {Like TR4's} or (-) earth {Like TR4A's} when in the car?

It's easiest to match the test polarity to the car's polarity, since the test will also polarize the generator. But the test will work either way, and you can always repolarize the generator later to match the car.

-Randall

Hi Randall!

Thanks for the reply.

Let me know if I understanding this correctly:

For a (-) earth car, one would put the Neg (- earth) battery lead to the Gen.'s body (This is also the Field Coil, right?). The Pos (+) battery lead then attaches to BOTH little & large Spade Connectors. Therefore; this would NOT change the gen.'s polarity, right?

Now if I did the above connections to a (+) earth car, then I would have to change the polarity to the generator in order for it to be used back in the Neg. earth car, again?

-Cosmo Kramer

Starter-Generator/Trouble Shooting

Subject: TR3 Generator Problems
Date: Thu, 8 Aug 2002
From: "Randall Young" <ryoung@navcomtech.com>

> So I did a quick check to see if maybe the warning light wires were bad. I took a jumper from the generator warning light terminal and took it to the middle terminal on the regulator. No change.

Um, what warning light terminal? The warning light should already be wired to the center terminal on the regulator (which also goes to the output terminal on the generator). The warning light compares the generator output voltage to the voltage in the switched ignition circuit.

> I remembered doing a test on the generator early on (10 years ago) where we started the car and took off the battery cable and the car stayed running because the generator was generating but the warning light circuit was bad. This time, I lifted a cable and the engine died instantly.

Not a test I would recommend.

> Maybe I tweaked the backplate on the generator and shorted something out inside. Seems likely to me.

> The car was in the body shop for 2 weeks

That could also be the problem, body shop dust seems to get everywhere!

> 2. Can someone tell me another quick test to tell if it is the generator or regulator?

Remove control box cover, with engine running 1000-1500 rpm mash cutout contact closed with your thumb. 'Ignition' light should go out. If ammeter shows charge, the generator may have simply lost it's 'polarization' and all is now well. If ammeter shows discharge, connect a jumper between the D and F terminals on the control box. If still discharging, then the problem is either generator or wiring to it. If ammeter shows no deflection, problem is either the control box, or the wiring. (You should complete these tests fairly promptly, and momentarily disconnect a battery cable when you're done.)

'Standard' on-car generator test (independent of control box): Remove both wires from generator, connect a jumper between generator terminals and a voltmeter to ground. Start engine and rev slowly to 1500 rpm while watching voltmeter. If voltmeter reaches 15v, generator is probably OK. (Don't let it exceed 20v.)

> 3. Can someone tell me where I should go from here?

> 4. Is it worth it to buy a rebuilt generator or should I rebuild my own?

IMO it's certainly worth pulling the generator (after doing the tests I outlined above) and having a look inside. The fault may be obvious. If you put any force at all on that rear mounting tab, the rear plate is likely broken and will have to be replaced..

-Randall

Starter-Generator/Trouble Shooting

Subject: TR4 alternator conversion - engine just won't stop!
Date: Sun, 27 May 2007
From: <dmericas@austin.rr.com>

I converted my TR4 to a Delco alternator a couple of years ago. All has been well with it except having to rev the engine to get the alternator to kick in when it is first started. Previous posts suggested installing a 10 ohm, 10 watt resistor across the ignition lamp to get the unit to kick in at lower RPMs. Well I did that yesterday, and the lamp now goes out very quickly after start-up, but the engine continues running when I turn off the ignition switch. I can get it to die by blipping the throttle a couple of times.

What I THINK is happening is the resistor is allowing a little current from the alternator to flow back to the coil when I turn off the ignition switch, which is allowing the engine to continue to run at low RPMs. I seem to recall reading about this problem on some hot rodder sites when I was researching the swap, but I can't track down that information now.

Any suggestions on how I can resolve this? I like the earlier kick- in, but being able to turn the engine off is a higher priority ; ^)

-Dean Mericas

Subject: TR4 alternator conversion - engine just won't stop!
Date: Sun, 27 May 2007
From: "Randall" <tr3driver@ca.rr.com>

> Any suggestions on how I can resolve this? I like the earlier kick- in, but being able to turn the engine off is a
> higher priority.

Strange, a coil usually needs a lot more current than that to keep the engine running. Normally that problem only shows up when using an electronic ignition with a separate power feed (like a MSD).

Anyway, the fix is to add a diode in series with the wire to the alternator. Pretty much any power diode will work; 1 amp 50 piv (or higher on either rating). The 'arrow' of the diode symbol should point towards the alternator (meaning the diode will only conduct when the resistor/lamp is more positive than the alternator terminal).

Any Radio Shack or equivalent should have a suitable diode. RS being kind of expensive, you'll probably pay them a buck. Digikey or Mouser should have something for under \$.10. For example, a 1N5392 (100 piv, 1.5 amps) is \$.06 (qty 1) @ Mouser. <<http://www.mouser.com/catalog/630/355.pdf> >

-Randall

Steering System/Alignment

Subject: Alignment
Date: Mon, 24 May 2004
From: "john taylor" <jat1127@hotmail.com>

Hello Fellow Listers,

I have seen several notes concerning toe adjustment. One thing that really bugs me is not having the steering wheel centered while driving. I have developed a system that lets me get the toe "perfect" and the wheel centered.

My shop floor is level in one direction that is about 30 feet. I park the car in the middle and center and lock the wheel using a Hunter wheel holder. They cost about \$40. I then set up 4 jack stands and some bright colored string that makes a line down each side of the car. A parallelogram is made and I get it as long as possible to shorten any error in setup: in my case it's about 28 ft. I then very carefully using a small rule set it off the rear wheels while starting to measure at the front. Yes, I do check to make sure that they are reasonably good wheels with small amounts of run out. I try to get the box set the same distance off on each side but it really does not matter.

Now you can set the toe. I really try to get it set evenly on each side. It will affect tire wear and corner turn in if it is not.

A more accurate method would be to set up the box off the frame and it can be done but requires a lot of crawling around on ones knees etc. Working off a solid rear axle will get you really close and after a little bit of time, you do get a feel for it. TR4/A models and up get to do it the long way, until you get to the TR7/8.

-John

Subject: Do it yourself alignment question (TR3A)
Date: Mon, 24 May 2004
From: "Randall Young" <Ryoung@navcomtech.com>

> On a TR3 it may not matter, but (for what it's worth) it can make a minor difference on a Spitfire or GT6. As
> the steering lock is increased, the steering geometry becomes non-linear, which is to say that the amount of
> steering angle dialed into the road wheel per input of the steering wheel isn't constant though out the turning
> range.

It's called Ackerman steering, and the TR3 has it as well, so it does make a difference. But as I said before, it's not a large difference when the steering is nearly centered, so just visually centering before doing the toe adjustment, then correcting centering as desired after a road test, is fine. If you want to be really anal, recheck the toe after doing the centering ... but it will be OK (within the repeatability of the car anyway, which generally isn't all that good unless you've just gotten through replacing everything).

> Suppose you were to rotate the steering wheel one notch in its splines at the top of the steering column, and
> compensate by adjusting both tie rod ends to re-center the steering wheel.

At least for the TR3, the book gives a reference for where the steering box is centered, and the steering wheel should match. But that's a different topic, and not normally considered part of a front wheel alignment.

Being assembled correctly is an unspoken pre-requirement to any adjustment.

The steering only approximates the Ackerman angles ... and there's one school of design that says it shouldn't even attempt it, because at the limits of adhesion (which is where it matters the most) the tires will have different slip angles anyway. As I recall, Triumph Herald & derivatives implement "anti-Ackerman" steering ... don't know about the Spit & GT6.

-Randall

Steering System/Alignment

Subject: Camber, Caster, Toe, SAI, Included Angle....
Date: Wed, 5 Feb 2003
From: Michael Hargreave Mawson <OC@46thFoot.com>

Dear All,

I sent a detailed list of queries on the subject of wheel alignment to the Spitfires list yesterday (a copy appears at the end of this message), but no-one has yet taken up the challenge of answering them. This being the case, I thought I would consult the combined wisdom of the Triumphs list with some more-generic questions. My deductions, assumptions and half-remembered factoids are detailed below - please feel free to tear them to shreds and replace them with valid information!

OK: first principles. Each wheel can either be:

- (a) leaning in/out at the top
- (b) pointing in/out at the front
- (c) too far forward/backward
- (d) too high/low
- (e) too far out from/too far in towards the central axis of the car.

Is this right? What, if anything, have I missed?

(a) is called camber. It is a good thing for front wheels to lean out at the top, and for back wheels to lean in at the top. The amount of camber on a left wheel should be exactly equal to the amount of camber on the matching right wheel. Leaning in is called negative camber; leaning out is called positive camber.

(b) is called toe. It is a good thing for front wheels to point out at the front, and for rear wheels to point straight ahead. The amount of toe on a left wheel should be exactly equal to the amount of toe on the matching right wheel. Pointing out is called positive toe (or toe-out); pointing in is called negative toe (or toe-in).

(c) is called ??? It is a good thing for each pair of wheels to be exactly the same.

(d) is called ??? It is a good thing for each pair of wheels to be exactly the same.

(e) is called ??? It is a good thing for each pair of wheels to be exactly the same.

What are:

- (a) Caster
- (b) SAI
- (c) Included Angle (appears to be the sum of Camber and SAI)
- (d) Thrust Angle, and what do they tell us?

Any information on this most confusing subject would be greatly appreciated!

Michael Hargreave Mawson <OC@46thFoot.com> wrote:

> Dear All,

> I've just had a four-wheel alignment done on Carly, and I have to admit that I haven't really got the faintest idea what I have paid for, or what I have achieved by doing so (except that she feels much easier to drive...)

>

> If anyone could answer any of the following questions, I'd be greatly obliged:

>

> 1. **Front Camber**

> The readings fall within the "specified range" according to their computers, but the left wheel is at 2 deg 21

> min, and the right wheel is at 1 deg 58 min. Is this an acceptable variance?

>

> 2. **Caster**

> The readings are well below the "specified range" of 4-> 5 deg at 2 deg 36 min (Left) and 2 deg 53 mi

> (Right). Why might this not have been corrected, and what is the effect?

>

> 3. **Front Toe**

> It's OK, I think I understand this one!

>

> 4. **SAI**

> I don't even know what this stands for, much less its significance. Anyone? Again, my corrected readings

> fall within the specified range, but the Left wheel has half a degree more SAI than the right. Is this a problem?

>

> 5. **Included Angle**

> Both within the range, but almost a degree difference between Left and Right. Problem?

>

> 6. **Cross Camber**

> It's 24 mins. Should I be pleased?

>

> 7. **Cross Caster**

> It's minus 17 mins. Should I be pleased?

>

> 8. **Total Front Toe**

> OK, I understand this one, and I'm happy with it. [:-)]

>

> 9. **Rear Camber**

> I'm a bit concerned about this one. The specified range is -4 deg 45 mins to -2 deg 45 min. I've got +53

> - mins on the Left and +5 mins on the right. Problem?

>

> 10. **Rear Toe**

> This too. The specified range is zero to 8 mins. I have -12 mins on the left and +1 min on the right. Surely

> this means that my rear wheels are driving the car crab-wise?

>

> 11. **Total Rear Toe**

> This should apparently be somewhere between zero and +16 mins. I've obviously got -11mins overall.

>

> 12. **Rear Thrust Angle**

> No specified range for this, but they have altered it from -6 mins to -7 mins. Is this good? Bad?

> Meaningless?

>

> Having paid GBP40 plus VAT for the service, I'd like to understand what I've got, and whether they should

> have done things differently.

>

> Thanks in advance for any assistance.

> -Mike

Subject: Camber, Caster, Toe, SAI, Included Angle.... (long)

Date: Wed, 5 Feb 2003

From: Randall Young <ryoung@navcomtech.com>

> My deductions, assumptions and half-remembered factors are detailed below - please feel free to tear them to
> shreds and replace them with valid information!

All I've got are more half-remembered factors ... <g>

> OK: ... What, if anything, have I missed?

You left out the relationship of the Steering Axis (the imaginary line that the hub rotates around as you turn the steering wheel) to vertical. There are two components to this, the fore/aft component is called caster, the lateral component is called Steering Axis Inclination (aka “king pin inclination” even though our cars don't have king-pins). These angles are non-zero to make the steering self-centering, and to improve stability at speed.

There's also the Ackerman (sp?) angle, which is a measure of how much the inner wheel turns (around the Steering Axis) compared to the outer wheel. To avoid scrubbing the tires in turns, the inner wheel has to turn in further than the outer wheel. This is designed in, it's rarely even measured afterwards (except of course by those who are redesigning their steering).

> (a) is called Camber. It is a good thing for front wheels to lean out at the top, and for back wheels to lean in > at the top.

Not necessarily. IMO it's best to start with the factory specifications (which for the Spit is positive in the front and negative in the rear); but many racers modify these angles for better handling. As a gross simplification, ultimate grip is usually obtained when the tire/wheel is perpendicular to the road. Usually (not always), running negative camber in front allows the outside wheel to be more nearly perpendicular in a hard turn, because the inside suspension is extended while the outside suspension is compressed, thus putting the frame at an angle to the road. Thus, when one first starts modifying the front suspension geometry for better road handling, going to negative camber is a common first step. However, as the tire contact patch moves away from the steering axis, steering effort goes up, as does the force on the wheel bearings.

> The amount of camber on a left wheel should be exactly equal to the amount of camber on the matching right > wheel.

It's not critical that they be the same, and I believe sometimes they are set unequal on purpose. Example: To > track straight on a crowned road or for use on a circle track where all turns are in the same direction.

> Leaning in is called Negative Camber;

> leaning out is called Positive Camber.

Yes.

> (b) is called Toe. It is a good thing for front wheels to point out at the front, and for rear wheels to point > straight ahead.

Again, best to start with factory specs. I don't find a spec for the rear wheels on a Spit offhand, but the front wheels should have 0 to 1/16" Toe-in according to my factory manual. Some small toe-in is usually specified for the front of most rear-wheel drive cars; I believe on the theory that the suspension will deflect slightly at speed and that for maximum tire life and fuel mileage, the wheels should be exactly parallel under operating conditions. The rear wheels of IRS RWD cars may have a toe-out spec, for the same reason; and FWD cars may be reversed.

A notable exception was the first generation Toyota MR2 Spyder, which deliberately had the wheels not parallel, to give more rapid steering response. One of the side effects was that the tires would only last roughly 15,000 miles. With original tires at something like \$150 each (and unique to each corner), there were a lot of unhappy MR2 owners.

> The amount of toe on a left wheel should be exactly equal to the amount of toe on the matching right wheel.

Front toe is not measured separately, only the total amount with the steering centered. A differential change in toe is considered a Steering Centering Adjustment.

> Pointing out is called Positive Toe (or toe-out); pointing in is called Negative Toe (or toe-in).

That is exactly backwards to my understanding. Every manual I've seen (including the Spit factory workshop manual) give toe-in as being positive (and usually specify that it's toe-in).

> (c) is called ??? It is a good thing for each pair of wheels to be exactly the same.

I believe this is called "Set Back". It's only critical from the aspect that any significant difference is likely to indicate damage at one or more points (eg bent frame, cracked suspension link, etc.)

> (d) is called ??? It is a good thing for each pair of wheels to be exactly the same.

Ride Height. Again not critical, except to the extent that it affects the other aspects of suspension and steering geometry.

> (e) is called ??? It is a good thing for each pair of wheels to be exactly the same.

No special name that I know of, not a critical item.

> What are: (a) Caster, (b) SAI,

See above. SAI is an abbreviation for Steering Axis Inclination.

> (c) Included Angle (appears to be the sum of Camber + SAI)

Yes. Significant mostly in that it's difficult to measure SAI directly, it's easier to measure the camber and included angle, then difference them to get SAI.

> (d) **Thrust Angle**,

Thrust angle is the angle between the rear wheels and the axis of the car.

> and what do they tell us?

For most cars, most of these angles are fixed by the factory design and are not normally changed. **Toe-in is normally adjustable, camber and thrust angle adjustments are fairly common**, the others are less common. For the fixed angles, measuring them gives an indication of other problems : bent frame/body, sagging bushings, etc.

> Any information on this most confusing subject would be greatly appreciated!

Here's a web site I stumbled across :

<<http://gworobec.users.50megs.com/1110algn.html>>

There are several good books on the subject, one that was just recommended to me by Michael Porter (Hi Mike, Still working on a reply to you) :

>> I greatly recommend **Sports Car Chassis Design** (as I recall the title) by **Costin and Phipps**. Costin is >> the Cos in Cosworth, and Phipps was a Lotus chassis designer, ISTR.

>> 1. **Front Camber**

>> The readings fall within the "specified range" according to their computers, but the left wheel is at 2 deg 21

>> min, and the right wheel is at 1 deg 58 min. Is this an acceptable variance?

I believe so, yes. I don't have the book to hand at the moment, but I believe it allows something like 1/2 degree (30 min). Since you drive on the left (?), this may even be a desirable variance, since most roads are crowned (to help rain runoff).

>> 2. **Caster**

>> The readings are well below the "specified range" of 4 to 5 deg at 2 deg 36 min (Left) and 2 deg 53 min (Right). Why might this not have been corrected, and what is the effect?

I don't believe the Spit has a caster adjustment, except perhaps to replace all the suspension bushes. You might find that you have less centering force, but with roughly 2.75 degrees I don't think it will be a problem. The TR2/3 have 0 caster as I recall, TR4-6 around 3 degrees. My TR3 does have a bit of a tendency to follow the road surface rather than a straight line, but it's not a big problem.

>> 4. **SAI**

>> I don't even know what this stands for, much less its significance. Anyone? Again, my corrected readings >> fall within the specified range, but the Left wheel has half a degree more SAI than the right. Is this a >> problem?

Most likely not.

>> 9. **Rear Camber**

>> I'm a bit concerned about this one. The specified range is -4 deg 45 mins to -2 deg 45 min. I've got +53 >> mins on the Left and +5 mins on the right. Problem?

Not a serious one, IMO, but perhaps worth looking into.

First step should be independent verification, as I've seen a lot of shops that are sloppy about measuring such things. Oddly enough, this seems to be especially true with "computerized" equipment, the attitude seems to be that the computer is so smart it doesn't matter if it's sensors are improperly attached, or the other steps (proper loading in the car, suspension settled, etc.) are not followed.

Next step would be to look into ride height, as both front and rear camber change as the suspension moves through it's travel.

>> 10. **Rear Toe**

>> This too. The specified range is zero to 8 mins. I have -12 mins on the left and +1 min on the right. >> Surely this means that my rear wheels are driving the car crab-wise?

Yes, but 6 minutes (0.1 degrees) is a small angle, probably not enough to worry about. I'm surprised the factory spec is that tight; makes me wonder if perhaps someone (Mr. Haynes perhaps) read something wrong. I don't know the wheelbase of a Spit offhand, but 0.1 degrees is only 0.2 inches at 10 feet.

>>

>> 11. **Total Rear Toe**

>> This should apparently be somewhere between zero and +16 mins. I've obviously got -11mins overall. >>

>> 12. **Rear Thrust Angle**

>> No specified range for this, but they have altered it from -6 mins to -7 mins. Is this good, Bad, >> Meaningless?

I believe both of these angles are too small to worry about. Even measuring to this precision can be problematic, 6 minutes is less than .025" across a 13" wheel.

>> Having paid GBP40 plus VAT for the service, I'd like to understand what I've got, and whether they should

> > have done things differently.

A "wheel alignment" is normally limited to adjusting the adjustments provided ... while I don't know what adjustments are provided on a 1500 Spit, your description sounds reasonable to me.

-Randall

Subject: Camber, Caster, Toe, SAI, Included Angle...
Date: Wed, 05 Feb 2003
From: "Jim Muller" <jimmuller@pop.mail.rcn.net>

Michael Hargreave Mawson wrote:

> Some stuff and asked some questions. I can take a crack at some but not all.

> Each wheel can either be ...

There are other parameters, such as the tilt backwards of the steering (a.k.a. kingpin) axis; this is caster, or if you prefer, castor [:-)]. The tilt inward of the steering axis (whose main effect is to change where the steering axis intersects the contact patch). How either of these changes with suspension travel (the most significant of which is that changes in inward tilt will actually change the camber). How the position of the wheel for and aft will change with suspension travel (which is used along with caster change to produce anti-dive/anti-squat).

> (a) is called camber. It is a good thing ...

Tilt out at the top (positive camber) is not a good thing by itself. The tire tread tucks under during cornering, so you want the wheel to tilt slightly toward the turn to help keep the tread flat on the pavement. Thus you want positive camber on the inside wheel and negative camber on the outside. (Exactly how much depends on the tire's stiffness and width. The wider the tire, the more important camber is, but the stiffer the tire, the less camber you need.) Since the outside wheel takes most of the load, its camber is more important.

The complication is that during cornering the body leans outward because (on any car made after perhaps 1930) the center of mass is higher than the roll center. With any independent suspension, when the body leans, the wheels do too, which makes the wheels tilt away from the turn. In addition to camber changing, the outer wheel moves up in its suspension travel and the inner wheel drops down. So suspension engineers use this movement to correct the camber. When the upper A-arm is shorter than the lower (and they are both more or less horizontal when the car is at rest), the camber will go more negative with any movement of the suspension either up or down. Thus the inner wheel (which matters less) gets hurt by more tilt away from the turn, and the outer wheel (which takes most of the load) is helped by more tilt toward the turn.

Finally, the engineers worry about how the car behaves when something changes during a turn. For stability you may want the camber, and thus the traction, to be slightly less than ideal so that if the car is disturbed (by perhaps a bump or changes in the front/rear balance due to braking or acceleration) the grip will improve, or the car will understeer more, or whatever.

Anyway, the point of all this is that positive camber is neither good nor bad. Negative camber on the outside wheel during a turn is ideal, but what you see at rest while steering straight ahead will be whatever the designers intended it to be. These principles apply to either end of the car, though the fronts are more easily understood and more universal from marquee to marquee.

> The amount of camber on a left wheel should be exactly equal to ...

Only if you expect everything to be symmetric, especially the vertical suspension position due to loading. Perhaps you want the driver's side to have a stiffer or differently-positioned spring. If so, the at-rest and unloaded readings on an alignment machine may be different. The spring at any wheel may be fatigued; uneven rear springs will affect the car too and thus change the front readings.

> It is a good thing for front wheels to point out at the front, ...

I don't know what a TR uses, but a Spitfire uses a bit of toe-in, not toe-out. During running, any amount of drag from brakes or bearings will push the wheels backwards, deflecting the bushings and pointing the wheels further outward. So you typically (?) want to start with a bit of toe-in at rest.

You can feel the effect of poor toe-in while driving a straight, flat highway. Small changes in steering change the L/R loading momentarily. If the wheels are toed-in too much, the outside wheel will be pointing further into the turn, so when the load on that wheel increases the car will react by darting further in the direction you turned it. This makes the steering unstable and hard to drive in a straight line. If the wheels are toed-out, the outside wheel will be pointing less into the turn, so when the load on that wheel increases the car reacts by turning less. This makes it seem stable in a straight line but unwilling to turn quickly, very un-sports car-like.

Toe-in at the rear will affect how straight the car tracks down the road, especially if the wheels aren't the same. Poor toe-in at either end will increase tire wear because the wheels are always trying to go some direction other than where they are pointed. A complication is that tire wear also affects how it tracks. If you swap worn tires L to R, you may find the car seem to track differently!

> The amount of toe on a left wheel should be exactly equal to the amount of toe ...

Actually, toe-in is measured between the wheels. For the fronts anyway, steering input changes both together! The only reason their "absolute" positions matter in the front is that steering systems are non-linear as you dial in more lock. If you improperly dial in more toe-in in one wheel but the same amount of toe-out on the other, your steering wheel will be rotated a little, and the car's behavior at full lock will be not quite right, and different left to right. It isn't a big deal though; the cocked steering wheel will bother you aesthetically more than the full-lock steering.

> (c) is called ??? It is a good thing for each pair of wheels to be exactly the same.

No special name that I know of. You do expect them to be the same.

> (d) is called??? It is a good thing for each pair of wheels to be exactly the same. Don't know any special name for this either, but they aren't necessarily the same. The springs may not be the same, and they may even have been designed or "adjusted" with an expected load difference left to right.

> (e) is called ??? It is a good thing for each pair of wheels to be exactly the same.

The **Track** is the lateral distance from wheel to wheel. Adjustments are not generally made to track per se, but shimming an A-arm mount to change camber or caster will change the track. Since these changes are usually tiny, it makes little practical difference to track. Whether the L and R wheels are positioned equally to either side of the car's centerline is a moot point; the real issue is how they are positioned w.r.t. the car's weight distribution. Since the weight distribution is not well-constrained, careful L vs. R positioning would seem to be pointless. Unless the frame is bent or some suspension component (or swing axle) is the wrong piece, you just don't worry about it. You could measure the diagonals and tweak accordingly if you really want to get picky, but it still won't tell you anything if the fronts and rears are offset to either side by the same amount! In most cases, when someone wants to change the track they do so via the wheels themselves (and normally put the same strange wheel on both sides). But doing so affects the feel and steering much more than just the track. It changes where the steering axis intersects the contact patch, so the whole steering system will be different. (Taller tires have similar effects, but usually in the opposite direction as adding offset.)

> What are: ... SAI, (c) Included Angle ... (d) Thrust Angle, and what do they tell us?

I don't know the terminology SAI, Included Angle, or Thrust Angle, though they may refer to things I've mentioned above.

Caster is the tilt backwards or forwards of the steering axis. I confess I don't recall which is positive or negative! Its effect is quite complicated. With a backwards tilt at the top (the usual case), outside wheel moves up w.r.t. the chassis when you dial in steering, and the inside wheel moves down. This increases the body lean, but shifts weight to the inside front and outside rear, thus somewhat equalizing on the front the load that cornering has shifted to the outside. A second effect of such caster is that camber goes a bit more negative for both wheels (usually a good thing). A third effect is that the steering axis will intersect the contact patch in front of the patch center. This makes the road force in a turn try to re-center the wheel, thus making it self-centering in a turn.

Caster can be adjusted by shimming the front or rear of either upper or lower A-arm mount, which moves the outer end of that A-arm forward or backwards (and also changes the camber).

I have no idea about the rest of the specs you gave because I don't know the terminology it used. I'm sure someone like Nelson R. or Randall Y. or Joe C. or Dave M. or Frank T. or Phil E. or a bunch of people with more experience than mine will correct most of my errors.

-Jim Muller

Subject: Camber, Caster, Toe, SAI, Included Angle.... (long)
Date: Wed, 05 Feb 2003
From: "Jim Muller" <jimmuller@pop.mail.rcn.net>

Thank, Randall, for your note on this subject. I learned a few things!

Randall Young wrote:
>>> 9. Rear Camber ...

> Not a serious one, ...

Yeah, this is a curious reading for a Spitfire. They all start negative and then get worse as the rear spring sags. The only thing I can think of that could make the camber go positive (other than poor measurement or not letting the car settle properly) is that someone changed something. A stiffer spring perhaps, or a poorly mounted one if someone swapped a swing-spring into an older car. Or one of Kas Kastner's camber compensators! Michael, does your rear have what looks like a crossing spring mounted under the rear?

> I don't know the wheelbase of a Spit offhand, ...

83"
-Jim Muller

Subject: Camber, Caster and so on... (Shorter)
Date: Thu, 6 Feb 2003
From: Michael Hargreave Mawson <OC@46thFoot.com>

Dear All,

Thanks very much indeed to Randall, Jim, Kevin and Alex, all of whom have added immeasurably to my understanding of wheel alignment.

I have a few specific comments/questions relating to my particular car, prompted by the responses I have received from this generous team of experts:

Front Camber
^^^^^^^^^^^^^^

Positive camber increased from less than one degree on each wheel to between two and two-and-a-half degrees in the fourteen months since I last had the wheel alignment done. In that time, I replaced the front springs and shocks. Cause and effect?

From what has been said, it would appear that the 7 min reduction in left wheel camber was probably made to obviate a problem I reported with the car pulling to the left. The left wheel still has 23 mins of positive camber more than the right wheel. The car still has a slight tendency to pull to the left, so I conclude that they didn't reduce the positive camber quite far enough on this wheel. Does this make sense?

Front Caster
^^^^^^^^^^^^^^

All the front suspension bushes (and, indeed, all the front suspension components) were replaced within the last month, so it seems that I would need to shim the A-arm mount to bring the front caster in line with spec. However, the consensus appears to be that this is unnecessary. That's good. [:-)]

Front Toe
^^^^^^^^^^

Fourteen months ago, my toe was set within the specified parameters at +11 mins. When the car went in for alignment this year, it was -18 mins. What causes this? Pot-holes?

Rear Camber
^^^^^^^^^^^^^^

This car had a new rear spring (from Rimmer Bros.) fitted in April, 2001 (and it doesn't have a camber compensator). In December of that year, the Rear Camber was recorded as -44 min (L) and -1 deg 24 min (R). I have done nothing at all to affect the rear suspension since then (except that I probably altered the ride height by changing the front suspension, and I removed a whole heap of junk from the boot this time), and it is now reading +53 min (L) and +5 min (R). HOWEVER, looking at the back of the car after I've been for a drive, the wheels have visible negative camber. From what I have been told, it sounds as though the car wasn't allowed to settle before the readings were taken (on either occasion). Is that a logical deduction? In any case, if the camber is going to get more negative as the spring ages, I'm going to get closer and closer to spec over the next few years without actually doing anything! This is also good. [:-)]

Rear Toe
^^^^^^^^^^

Opinions seem divided on this one - so I deduce that the asymmetrical 11 min of toe-out is only borderline problematic. Is that a fair assessment? If I did decide that I wanted to remove a shim from the left, how easy is it for a ham-fisted mechanical ignoramus such as I to do this?

Thrust Angle
^^^^^^^^^^^^^^

It would appear that this is pretty good (but not perfect) at -7 min. If I did decide that I would like it to be zero, how would I go about achieving this?

-Mike

Subject: Camber, Caster and so on... (Shorter)
Date: Thu, 6 Feb 2003
From: Dave Massey <105671.471@compuserve.com>

Michael Hargreave Mawson wrote:

> Front Camber

> ^^^^^^^^^^^^^^^

> Positive camber increased from less than one degree on each wheel to ...

As was pointed out earlier, the camber is constantly changing as the car moves up and down due to the unequal lengths of the upper and lower A-arms. This is why it is recommended to set the suspension with the car loaded as normal. Setting the camber and then changing the springs will likely cause the car to sit at a different height and cause the camber to change. Camber differences can cause the car to pull to one side. So will caster differences (side to side)

> Front Caster

> ^^^^^^^^^^^^^^^

> All the front suspension bushes (and, indeed, all the front suspension ...

I disagree with that. If the car was re-aligned recently (before the bushing replacement) then the adjustments were made to compensate for the bushes sagging and deformation. Replacing the bushings will put the geometry back to nominal and the previous alignment is now incorrect and a realignment is recommended.

> Front Toe

> ^^^^^^^^^^^

> Fourteen months ago, my toe was set ...

Changing the suspension bushings could cause this. Or even a little settling in the bushings. Or the car setting a little higher or lower on the springs could cause that. 28 minutes is not much.

> Rear Camber

> ^^^^^^^^^^^^^^^

> This car had a new rear spring (from Rimmer Bros.) fitted in April, 2001 ...

Once again, the suspension should be checked with the normal expected load in the car. Load the driver's seat with enough weight to simulate your weight (or sit in it yourself) and be sure the tires are not bound up by rolling the car fore and aft before measurement.

They don't call this a swing axle for nothing. If the car is raised off of the ground and returned to the ground the tyres will contact the ground in a stance that is narrower than normal and the forces applied to the tyres will cause the suspension to set higher than normal. Rolling the car will allow the tyres to find their desired position.

> Rear Toe

> ^^^^^^^^^

> Opinions seem divided on this one,... how easy is it for a ham-fisted mechanical ignoramus such as I to do
> this?

Asymmetrical rear toe will cause the car to "dog track" which is to say the car will drive down the street a bit sideways. This is most common to live axle cars with leaf springs where the axle has shifted on the spring on one side. I'm not familiar with this suspension but isn't the adjustment for this done with shims inserted in the U-joint attachments to the diff?

-Dave Massey

Subject: Camber, Caster, Toe, SAI, Included Angle....
Date: Thu, 6 Feb 2003
From: Pete & Aprille Chadwell <pandachadwell@mac.com>

> What are: (a) Caster, (b) SAI, (c) Included Angle (appears to be the sum ...

> Any information on this most confusing subject would be greatly appreciated!

Caster and SAI are very, very similar. To illustrate caster, think of a bicycle's front wheel, fork and steering head. When viewed from the side, it will be immediately apparent that the axis around which the forks and

wheel rotate when steered left or right runs at an angle that is nowhere near vertical. That axis is tipped back in such a way that if you draw an imaginary line on the axis, you'll find that the line intersects the ground IN FRONT of the wheel/tire's point of contact with the ground by a considerable distance. This is referred to as a POSITIVE caster angle. NEGATIVE caster refers to a steering axis which is angled such that it intersects the ground BEHIND the wheel/tire. If you have a bicycle handy, get on it and steer the front wheel right or left and watch what happens to the CAMBER of the wheel. That is, notice that the farther you steer the wheel in one direction or another, the wheel itself leans considerably and is no longer in a vertical plane. You'll notice the same thing on a road car when the wheels are steered sharply the camber of the wheels change with steering input. How does this happen? Back to the bicycle analogy: Imagine that you designed a bicycle so that the steering axis was angled back so far that it was PARALLEL to the ground. Of course, you wouldn't be able to steer the bike at all. Turning the handlebars would only lean the wheel over.

Why have caster at all? Why not just run the steering axis vertical? Good question. Ever notice when you're steering through a corner that IF you were to let go of the steering wheel, it would snap back to center? That tendency is due to the positive caster angle. The greater the angle, the greater the self-centering force. Caster has a huge impact on the directional stability and steering effort. That is, the greater the positive caster, the lighter the steering effort (to a point, I believe) AND the greater the tendency of the car to wander. Lesser caster angles give great directional stability, but the steering effort becomes greater.

Steering axis inclination is very similar. The caster angles described above are observable when looking at the car from the side. SAI is observable when looking at the car from the front (or rear). Both angles tell us something about the steering axis. If you view a front wheel from the front of the car, the axis around which that wheel rotates when steered left or right is also slanted, almost always so that an imaginary line drawn on the axis intersects the ground near the center of the tire's contact patch. The other end of this imaginary line would (theoretically) intersect the axis of the opposite wheel's steering axis at some point in space above the car. In other words, the steering axis is inclined toward the center of the car. This inclination also has an impact on steering effort. Usually the axis is designed to intersect the ground NEAR the geometric center of the tire's contact patch. But usually it's offset so that it intersects the ground INBOARD of the geometric center of the contact patch. The distance of this offset is called 'steering offset'. The greater the offset, the more steering effort is required. SAI and steering offset are manipulated especially in front wheel drive cars to tune out 'torque steer' to some extent. I'm not sure I'm familiar with 'included angle'. Good luck!

-Pete

Subject: Castor, Camber, toe etc...long
Date: Thu, 6 Feb 2003
From: "Tim Hutchisen" <hakhutch@megalink.net>

Scions-

Not to beat a dead horse, I apologize for the length but I offer the following for clarification. Some of this has already been discussed:

Camber-The inward or outward tilt of the wheels from true vertical as viewed from the front or rear of the vehicle. The vehicle will always pull to the side with the most negative camber.

Castor- The forward or rearward tilt of the steering axis in reference to a vertical line as viewed from the side of the vehicle. Castor will also cause a pulling condition; it will always pull to the side with the least positive castor. Castor is used as a stability angle to assist the steering wheel to return to center. The more positive the angle, the more stable the vehicle will be. Negative castor will cause a wandering or unstable condition at the steering wheel. Castor does not cause premature tire wear.

Toe- The difference in distance between the front and the rear of the tires. Toe is the biggest contributor to tire wear. Any adjustment to camber or castor will affect the toe. Excessive toe-in results in an over sensitive steering wheel. Excessive toe-out will lack a sense of control or direction.

SAI (Steering axis inclination)-The angle formed between true vertical and an imaginary line drawn between the upper and lower pivot points of the spindle.

Included angle- SAI added to the camber reading at the front wheels. It is determined by the design of the steering knuckle or strut. It is not adjustable.

TOOT- (Toe Out On Turns)- When turning a corner, the inside wheel has to turn at a sharper angle than the outside wheel because the inside has a shorter distance to travel.

Thrustline- A line which bisects the rear toe, or the direction the rear wheels are pointed. If the rear wheels are pointed to the left, then the thrust line will be left. Thrustangle can be calculated by comparing the thrustline to the geometric center line of the vehicle.

Setback- The measurement of the wheelbase on each side of the vehicle after the alignment is complete.

With the TR6 IRS the rear toe and camber can be adjusted. This can result in a thrust angle change as well. I am not sure about the Spitty/Herald setup but I would guess it has the same adjustment capabilities. Camber and castor (when adjustable) usually work in conjunction with each other. IE: one affects the other. Here in Maine, due to the road crowns that we have, the camber and/or the castor are adjusted to compensate for the road crowns and this will result in a vehicle that does not pull to the ditch. Usually it will only be 1/2 degree or so from one side to the other. YMMV

-Tim Hutchisen

Subject: Camber, Caster and so on... (Shorter)
Date: Fri, 7 Feb 2003
From: Michael Hargreave Mawson <OC@46thFoot.com>

Dave Massey wrote:

> Michael Hargreave Mawson wrote:

>> Front Camber ...

> As was pointed out earlier, the camber is constantly changing as the car ...

Got it. As far as I know, the wheel alignment center I used, measures the camber without a driver in the driver's seat - and presumably makes adjustments with this in mind.

> Setting the camber and then changing the springs will likely cause ...

Splendid - that explains that, then.

> Camber differences can cause the car to pull to one side. So will caster differences (side to side)

Understood.

>> Front Caster

>> ^^^^^^^^^^^^^^^

>> All the front suspension bushes (and, indeed, all the front suspension ...

>

> I disagree with that. If the car was re-aligned recently (before the bushing replacement) then the adjustments..

Sorry, I seem to have misled you here. I had the alignment done immediately *after* I had changed all the
> suspension components. Theoretically, therefore, the wheels should now be aligned correctly.

>> Front Toe

>> ... What causes this? Pot-holes?

> Changing the suspension bushings ...

OK, thanks.

>> Rear Camber

> Once again, the suspension should be checked with the normal expected load in the car ...

Understood - thanks again.

> Asymmetrical rear toe will cause the car to "dog track" ...

It may well be. I shall get the manuals out and see if I can track down the answer.

> I hope this helps.

Very much. Thank you once again for all your help - and for your patience!

-Mike

Subject: Camber, Caster and so on... (Shorter)
Date: Fri, 7 Feb 2003
From: Michael Hargreave Mawson <OC@46thFoot.com>

<105671.471@compuserve.com> wrote:

> Michael Hargreave Mawson wrote:

>> Front Camber

>> ^^^^^^^^^^^^^^^

> <snip>

> As was pointed out earlier, the camber is constantly changing as the car moves up and down due to the
> unequal lengths of the upper and lower A-arms. This is why it is recommended to set the suspension with the
> car loaded as normal.

Got it. As far as I know, the wheel alignment centre I used measures the camber without a driver in the driver's seat - and presumably makes adjustments with this in mind.

> Setting the camber and then changing the springs will likely cause the car to sit at a different height and cause
> the camber to change.

Splendid - that explains that, then.

> Camber differences can cause the car to pull to one side. So will caster differences (side to side)

Understood.

>> Front Caster

>> ^^^^^^^^^^^^^^^

>> All the front suspension bushes (and, indeed, all the front suspension components) were replaced within the
>> last month, so it seems that I would need to shim the A-arm mount to bring the front caster in line with spec.
>> However, the consensus appears to be that this is unnecessary. That's good. [:-)]

>

> I disagree with that. If the car was re-aligned recently (before the bushing replacement) then the adjustments
> were made to compensate for the bushes sagging and deformation. Replacing the bushings will put the
> geometry back to nominal and the previous alignment is now incorrect and a realignment is recommended.

Sorry, I seem to have misled you here. I had the alignment done immediately *after* I had changed all the suspension components. Theoretically, therefore, the wheels should now be aligned correctly.

>

>> Front Toe

>> ^^^^^^^^^^^

>> Fourteen months ago, my toe was set within the specified parameters at +11 mins. When the car went in for
>> alignment this year, it was -18 mins. What causes this? Pot-holes?

>

> Changing the suspension bushings could cause this. Or even a little settling in the bushings. Or the car
> setting a little higher or lower on the springs could cause that. 28 minutes is not much.

OK, thanks.

>

>> Rear Camber

>> ^^^^^^^^^^^^^^^

<snip>

> Once again, the suspension should be checked with the normal expected load in the car. Load the driver's seat
> with enough weight to simulate your weight (or sit in it yourself) and be sure the tires are not bound up by
> rolling the car fore and aft before measurement.

>

> They don't call this a swing axle for nothing. If the car is raised off of the ground and returned to the ground
> the tyres will contact the ground in a stance that is narrower than normal and the forces applied to the tyres
> will cause the suspension to set higher than normal. Rolling the car will allow the tyres to find their desired
> position.

Understood - thanks again.

>> Rear Toe

>> ^^^^^^^^^^^

>> Opinions seem divided on this one - so I deduce that the asymmetrical 11 min of toe-out is only borderline
>> problematic. Is that a fair assessment? If I did decide that I wanted to remove a shim from the left, how
>> easy is it for a ham-fisted mechanical ignoramus such as I to do this?

- >
- > Asymmetrical rear toe will cause the car to "dog track" which is to say the car will drive down the street a bit
- > sideways. This is most common to live axle cars with leaf springs where the axle has shifted on the spring on
- > one side. I'm not familiar with this suspension but isn't the adjustment for this done with shims inserted in the
- > U-joint attachments to the diff?

It may well be. I shall get the manuals out and see if I can track down the answer.

> I hope this helps.

Very much. Thank you once again for all your help - and for your patience!

-Mike

Steering System/Alignment

Subject: Seeking opinions on homemade alignment jig
Date: Thu, 27 Apr 2006
From: "Randall" <tr3driver@comcast.net>

- > Build metal frame to bolt to wheel studs and attach a cheap laser pointer to the frame.
- >
- > Build two of them, mount them on each wheel, use a level on each wheel for consistency and mark spot on
- > garage wall where each laser hits.

Seems like a lot of work to me, just to duplicate whatever errors you had before. I made a simple tool from scrap wood to allow me to measure directly at the surface of the tires (using lines I scribe onto the tread with the wheel spinning, to pick up the true axis of rotation). With that, I can set toe to whatever value I want (and experiment with different values to see the effect on handling, etc.).

The tool is a length of 1x2, with two appx 4x12 rectangles of Masonite nailed to it. After marking the tires, I lower the car, bounce it a few times and make sure the steering is centered (toe changes as the wheels turn). Slide the tool behind the front wheels and rotate until the 1x2 is on the floor, but the edges of the Masonite are at the centerline of the wheel. Transfer the marks to the edge of the Masonite. Then move the tool in front of the wheels and measure the difference between the marks and the lines.

-Randall

Steering System/Alignment

Subject: Toe-in, the pin method
Date: Sun, 1 Sep 2002
From: "Phil Ethier" <pethier@isd.net>

I know a way to check toe-in. It requires two people, two straight pins from the sewing room, one tape measure, and the ability to roll the car a few feet.

Most of you can figure it out already. :>) This method measures directly at the spindle, provided your wheel bearings don't wobble. Bent wheel rims or crookedly-mounted tires have no effect upon its accuracy.

Measure a distance off the ground at the back side of the tire where you have a clear shot all the way across the car. For many cars, 3.5" will work, so a couple of scraps of 2x4 can come in handy. Measure from this point to an identical point at the front of the tire. Write this distance down for later. DT = direction of travel

Stick a pin in the back side tire tread at your assigned height from the floor. Have your assistant stick a pin in the back side tire tread at your assigned height from the floor on the other tire. Have your assistant hold the measuring tape on the base of the pin exactly at ten inches. Record the exact measurement at your pin. Write this down (don't bother subtracting the ten inches). LB = lateral back

Roll the car forward until the pins are exactly at your assigned height from the floor on the front side. Have your assistant hold the measuring tape on the base of the pin exactly at ten inches. Record the exact measurement at your pin. Write this down (don't bother subtracting the ten inches). LF = lateral front

A common way to express toe-in is the total measurement at the wheel diameter (I'm calling this TI). To convert your numbers to this, you need to use the ratio between your DT and the wheel size in the tow-in specs you are reading (not the wheel size you have on the car now). WD = wheel diameter.

$$(LB-LF) * WD / DT = TI$$

Obviously, a negative number for TI will be toe-out.

A little trig will give answers in degrees, which are less ambiguous than the fractional distances that are usually quoted.

Since I run my autocross Lotus at zero front toe, I get to skip out on a lot of arithmetic.

I'm sure if I have made an important typo in this, somebody will catch it right away. This tip was passed to me by autocrosser Akkana Peck. I have not heard from her for some time. I hope she is well and happy.

-Phil Ethier

Steering System/Alignment

Subject: Torturing Tie Rod End
Date: Fri, 8 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> I'm having trouble torquing the inner tie rod end on the passenger side of my TR3A.
> -Barry,

IMO that means there is something wrong with either the tie rod end, or the center link. The taper should lock; if it does not, you're likely to have trouble down the road (and dropping a tie rod is no fun at all).

IMO you should take it back apart, and find out what the problem is. Might be as simple as the boot or a bit of crud getting caught in the taper. If there is nothing apparently wrong, use some machinist's blue to find out where the tapers don't match.

-Randall

Steering System/Alignment

Subject: TR6 Wheel Alignment
Sent: Friday, January 10, 2003
From: <Chip19474@aol.com>

List,

Is there an article in the archives or perhaps on a site somewhere that steps through TR6 wheel alignment (setting toe-in) using the "steel tubing (conduit) and string method"? TIA,

-Chip Krout

Subject: TR6 Wheel Alignment
Date: Fri, 10 Jan 2003
From: "Randall Young" <ryoung@navcomtech.com>

I use what I consider to be an easier method. A length of 1x2 lumber, 8' long (the excess forms a handle), with two rectangles of 'masonite' screwed to it in strategic locations, such that with the 1x2 laying on the floor, the masonite reaches up to wheel centerline height. Jack the car up, spin the front wheels by hand and use a scribe to mark the approximate center of the tire while it's spinning. Set the car back down on the (level) floor, bounce it a few times to settle the suspension, then slide the 1x2 underneath and rotate it so the edge of the masonite is behind the front tires and at the center line. Use a pencil to transfer the scribed line from the tires to the masonite. Then move it to the front of the tires, and measure the toe-in/out directly.

I check camber with a carpenter's square and a pair of 6" rules clamped to it, so they contact the rim at the bead height (not at the lower/outermost edge). For my LBCs this is just a cross-check, I don't have adjustable camber (yet), but some of my other cars have camber adjustments.

-Randall

Subject: TR6 Wheel Alignment
Date: Sat, 11 Jan 2003
From: "Brooks Bullock" <airsmyth@adelphia.net>

Chip & list:

Good question, currently I am using two aluminum shelf extrusions, and center head drilled four aluminum gutter nails hung on some good wax thread. To keep from using the sidewall of the tire, which might give a less accurate projection, I strap the extrusions on the wheel with equal spacers between the rim and extrusion (rail), then hang the center drilled nails like four plumb bobs off the center of the rails and measure off the Floor. I am pleased with the results and am curious if other folks go to such trouble in an effort to keep others from wrenching on your beloved auto.

-Brooks

Steering System/Anti-sway Bar/Front

Subject: Advice on installing a front sway bar on TR4A
Date: Sat, 3 Jun 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

You and several others suggested the TR6 radiator shield. I like that idea. I had thought that the actual TR6 frame extended more forward and while the shield might FIT, it would still not be far enough forward.

-Tony

----- Original Message -----

Subject: Advice on installing a front sway bar on TR4A
Sent: Saturday, June 03, 2006
From: Mark

Hi Tony,

I used a TR6 Factory Bar and ordered the TR6 pan (I think they call it a radiator protector) which bolted directly to the same location as the front cross member (which I removed) off the TR4. I bought up rated mounts from a guy in Canada that have Delrin bushings. Works great and uses all TR stock parts. A friend gave me the bar and the mounts for the lower A arms, I just bought new bushings.

-Mark

----- Original Message -----

Subject: Advice on installing a front sway bar on TR4A
Sent: Saturday, June 03, 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

I want to improve the handling on my TR4A. No sway bar is available here in the US specifically for this model. Many are available for the TR6. But, the front frame is a little different on the TR6.

I saw the Goodparts 7/8" front sway bar for the TR6. It is beautiful! I corresponded with Mr. Good, and we both thought that it could fit the 4A reasonably easily. So, I ordered one.

Well, it is not quite so easy to fit. The arms that run fore-aft are, as expected, too long. But there is just not enough wiggle room to fit it properly. The front radiator shield plate has those towing loops which get in the way, but even then if they were not there, and the bar were attached to the front of the shield plate as it is in the TR6, then the vertical link is shifted too far backward on the A-arm.

So, I thought about fabricating some "extensions" to attach to the shield so that the sway bar can be mounted in the proper relationship to the A-arm. It appears that it would need to hold the center of the sway bar about 2" forward of the shield, and the total forward length of the extension would be about 3".

Has anyone come up with a better arrangement to adapt a TR6 bar to the 4A?

I assume that some place like Revington's might have a specific bar for the 4A, but I always find shipping from the UK to be prohibitively expensive and SLOOOOOW. So, within limits, I would rather adapt to a TR6 bar..

-Tony

Subject: Advice on installing a front sway bar on TR4A
Date: Sat, 3 Jun 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

With the tow loops on the front of the stock TR4A radiator shield, I wonder where the bar would fit on a 4A. When you position the bar perfectly horizontal, it wants to sit where the loops are! So, either the loops have to be cut off, or the bar is in FRONT of the loops, or it is UNDER them in some manner, and thereby reducing road clearance.

Some have said to replace the radiator shield with the TR6 unit, and then the TR6 bar fits properly. This might be the way to go. I really like the Goodparts sway bar, and its linkages. As you saw, one lister said that Richard could make a custom size bar without much trouble. That still leaves the problem of the tow loops being in the way. Do I hear a cut-off tool?

Probably I would replace the stock radiator shield with the TR6 unit before I cut up my original TR4A parts.

-Tony

----- Original Message -----

Subject: Advice on installing a front sway bar on TR4A
Sent: Saturday, June 03, 2006
From: "Randall" <tr3driver@comcast.net>

>> I want to improve the handling on my TR4A. No swaybar is available here in the US specifically for this
>> model.

>

> Huh? What's wrong with the one from Addco?

> <http://www.addco.net/Toyota-Yugo_AntiSwaybars.htm#Triumph>

>

> Although JC Whitney's website doesn't show the TR4A. I'll bet you can still buy any Addco bar through
> JCW.

> I think they consider TR4A as a sub-class of TR4.

>

>> So, I thought about fabricating some "extensions" to attach to the shield so that the sway bar can be mounted
>> in the proper relationship to the A-arm. It appears that it would need to hold the center of the sway bar
>> about 2" forward of the shield, and the total forward length of the extension would be about 3".

>>

>> Has anyone come up with a better arrangement to adapt a TR6 bar to the 4A.

>

> Talk to Richard Goode. I am reasonably sure he would be willing to take back the TR6 bar, and make one to
> your specifications for the TR4A. For a price of course, but probably pretty reasonable. I've forgotten now
> how much he wanted to bend a custom bar for my TR3A, but it wasn't much at all.

> -Randall

Subject: Advice on installing a front sway bar on TR4A
Date: Sat, 3 Jun 2006
From: Bill & Skip Pugh <anabil007@comcast.net>

I don't suppose it would be possible to "thread" the bar through the tow loops ... ??

> With the tow loops on the front of the stock TR4A radiator shield, I wonder where the bar would fit on a 4A...

-Bill Pugh

Subject: Advice on installing a front sway bar on TR4A
Date: Sat, 3 Jun 2006
From: Darrell Walker <darrellw@ipns.com>

Anthony Rhodes wrote:

> With the tow loops on the front of the stock TR4A radiator shield, I wonder where the bar would fit on a ...

I just ran mine through the loops. Had to bend them "open" a bit to get it in, but then they could go back in place.

-Darrell Walker

Subject: Advice on installing a front sway bar on TR4A

Date: Sat, 3 Jun 2006
From: "Chris Bohn" <cbohn@sidepipe.com>

I did this also. I bought the TR4 bar for my 4A from Moss years ago, and just threaded it through the loops. Fits perfect and works fine; in my case, no bending of the loops was required, perhaps because the TR4 bar is not as thick as the TR6 one.

-Chris

Subject: Advice on installing a front sway bar on TR4A
Date: Sat, 3 Jun 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

Jim, thanks for the pix! Nice looking undercarriage! The sway bar looks great installed. If the VB bar is 3/4", that probably is adequate for me. I picked 7/8" only because I had once had a car fitted with that size and I really liked it. Alternatively, I can get Goodparts to make a custom 7/8" with arms of the correct length for the 4A, then use the bending technique to feed them thru the loops.

Can you measure the length of the arms on the sway bar?

-Tony

Subject: Advice on installing a front sway bar on TR4A
Date: Sat, 3 Jun 2006
From: Jim <cartr4a@ameritech.net>

Tony,

The length of the arms is 11". I added this dimension to the second photo I posted earlier. I did not follow the bend in the arm, just from one point to the other.

<<http://www.geocities.com/britishiron2000/swaybar.html>>

-Jim

Subject: Advice on installing a front sway bar on TR4A
Date: Sun, 4 Jun 2006
From: "Anthony Rhodes" <spamiam@comcast.net>

Jim,
Well, your bar fits just beautifully. I will look into having Goodparts make a custom bar for me with 11" arm lengths.

Your photo makes it look as if the measurement is taken from the center of the bent to the tip of the arm, is that correct?

-Tony

Steering System/Anti-sway Bar/Rear

Subject: TR4A-6 Rear Sway Bar Questions
Date: Sun, 21 Dec 2003
From: "Jeff Tedder" <jtedder68@cox.net>

List,

If you've installed a rear sway bar kit (obtained from TRF or elsewhere) on a TR4A-TR6, please check my reasoning and correct me if I'm wrong. These questions are specifically focused on the attachment at the trailing arms under the spring.

I bought a rear sway bar kit from TRF some time ago. Aside from them sending me the wrong kit under the right part number (solid axle kit instead of the needed IRS kit), it appears that the parts in the kit don't match the installation instructions (what a shock!). Basically, the instructions say to simply 'place one large square washing inside each spring so it will be located over the hole in the a-arm (trailing arm) at the spring center'.

First, my kit didn't have any 'large square washers'. It did come with four large round washers that just fit inside the spring, so that's what I assume they are talking about. However..

The large round washers won't fit through the center of the spring packing pieces. As such, I am assuming that the rear springs must be removed in order to install said large round washers??? Not the end of the world, but kind of a pain nonetheless.

My further question is, on the TR6, the trailing arms conveniently have the lower spring locator tabs on them, which conveniently fit right up into the spring packing piece to make it easier to install the rear springs than on a TR4A without the tabs (they don't try to slide around when you're jacking the arm up). However, due to these tabs, it doesn't seem to me that the 'large round washer' would fit into bottom of the trailing arm (for that matter, neither would the square washers). Please offer any assistance/guidance/comments.

-Jeff Tedder

Subject: TR4A-6 Rear Sway Bar Questions
Date: Mon, 22 Dec 2003
From: "Tim Hutchisen" <hakhutch@megalink.net>

Jeff-
I have had the Addco rear sway bar on my TR6 for a few years now. Let me see if I can shed some light on your questions.....

> Basically, the instructions say to simply 'place one large square washing inside each spring so it will be located over the hole in the a-arm (trailing arm) at the spring center'.
>
> First, my kit didn't have any 'large square washers'. It did come with four large round washers that just fit inside the spring, so that's what I assume they are talking about. However..

Your assumption is correct, the four large round washers are for the following. Two of the washers are located inside the spring on top of the spring mount (raised locator tabs). They "float" on the tabs. The other two washers are for underneath the trailing arm, they also "float". As the car corners, the trailing arms move up and down. Because of the trailing arm pivot point, this causes the end of the sway bar to have to move in a horizontal as well as a vertical plane. The large washers will slide and move a few millimeters in cornering.

> The large round washers won't fit through the center of the spring packing pieces. As such, I am assuming that the rear springs must be removed in order to install said large round washers??? Not the end of the world, but kind of a pain nonetheless.

They may not have to be removed, but it is easier to construct the bushing/washer/ bolt assembly and get it started with the spring out.

> My further question is, on the TR6, the trailing arms conveniently have the lower spring locator tabs on them, which conveniently fit right up into the spring packing piece to make it easier to install the rear springs than on a TR4A without the tabs (they don't try to slide around when you're jacking the arm up). However, due to these tabs, it doesn't seem to me that the 'large round washer' would fit into bottom of the trailing arm (for that matter, neither would the square washers).

See above, the washer "floats" on top of the spring tabs. You could grind the outside diameter to fit down into the spring center, but I do not think it is worth the time or effort.

> Please offer any assistance/guidance/comments.

After installation, my advice is to tighten the nuts to 15 ft/lbs and then back them off two full turns. This is a good place to start. The rear sway bar will create an ugly oversteer condition if the bolts are too tight. Once they are tightened, add a jamb nut and lock-tight. Drive the car for a while until you can determine if it is oversteer or under steer then adjust to your liking. I have poly bushings in the entire suspension of my TR6, Koni adjustable shocks set at medium on the front, Addco sway bar on the front and rear as well as comp springs front and rear. The rear sway bar can hook the car up nicely if it is set up right. This summer, I pulled one of the rear sway bar brackets right out of the tender frame! The result was a sheared bolt (under tension)and bushings and washers everywhere on the road. I have since welded reinforcement plates to the frame where the sway bar pivots, and changed to grade 8 bolts at the end of the sway bar. The poly bushing kit for the front stock sway bar (available from the big 3) fits the rear sway bar as well if you need to replace bushings.

Be sure that you have up rated the front sway bar before mounting the rear sway bar. This creates a better balanced system and will yield better results. My TR6 now corners better than most but rides like an empty dump truck!!!

-Tim Hutchis

Steering System\Column

Subject: Installing a TR6 Steering Flex Coupler
Date: Fri, 04 Jul 2003
From: Eric Miller <ebuzz@teleport.com>

Steve wrote:

- > I'm trying to fit the rubber steering coupler to my '69 TR6 and having a bear of a time. I bought the part from
- > a reputable dealer (TRF) but it seems the bolt pattern is about 1/8" too wide.
- >
- > The original coupler had regular two bolts and two Allen headed bolts neither the all bolt or all allen screw
- > setups the catalogs list. (It's all dried out and grizzly and frankly I don't trust it).
- >
- > I'm guessing TRF couldn't get something so basic so wrong, so there must be a TRick, can anyone share it
- > with me?
- > -Steve

It has to be compressed in order to fit. I used a "C" clamp, put the two bolts in, then moved the clamp to the other side and did the other two bolts. I have heard of people using a hose clamp to compress the whole thing, but haven't tried that personally.

-Eric

Steering System\Column

Subject: Returning TR4 steering wheel
Date: Mon, 25 Sep 2006
From: <CarlSereda@aol.com>

From: Bob Labuz <yellowtr@adelphia.net>

>> <richhalpern@verizon.net> wrote:

>> All,

>> I am in the process of dismantling the TR4 in preparation of reconstructing the floors, sills, etc. One of the
>> things that I am doing is removing the dash. I have an early white metal dash covered by a PO with hard to
>> remove, wood grain, contact paper. In order to do this, I have disconnected the steering column by
>> separating the upper from the lower column, and pulled the steering wheel plus the upper column out
>> through the passenger compartment. I then loosened and removed the housing under the dash with the
>> switches and such to clear it from the dash. Is there anything cool to replace, or look at cleaning or repairing
>> (bearings, seals, etc) when I put this back together? Or should I just reverse my earlier process? Thanks,
>> -Rich

> Rich,

> Go to TRF's website and order part # RFK112. This is the upper column rebushing kit with the felts and nylon
> bushings. Since you have the column out you should replace all these parts. For 23 bucks, not a bad value.
> Also, if the rubber grommet is old and cracked, replace it also. Cheap part.
> -Bob

Be neurotic. While you have steering column apart add two more new bushes (slice off rubber nibs) and push into tube prior to normally positioned bushes (totaling 4 new bushings). The metal shaft is original size diameter where it has not been worn for 30 years and doubling up these bushings ensures more precise tolerances and it will make the whole setup tighter and last longer.

PS- Sloppy column shaft bushings cause errant horn beeping. Also a little grease is not a bad idea on your new bearing surfaces.

-Carl

Subject: TR4A Steering wheel nut and new hub install problem
Date: Thu, 28 Sep 2006
From: Michael Godley <mgodley@tiac.net>

Folks, Can anyone tell me the thread size for the steering wheel nut on the 4A....the closest I found was a standard 9/16 fine thread...which I believe is 9/16 -16 or 18...but this did not work and the thread appeared to be finer.

I went to install a LeCarra steering wheel hub and Mota Lita wheel I purchased from Moss or TRF some time ago, The stock wheel nut hits the plastic body of the horn push on the LeCarra hub, so I thought a "narrower" standard size nut might give me the clearance...Has anyone had this problem installing an aftermarket wheel hub??

-Mike Godley

Steering System\Column

Subject: Steering Linkage U-joints - Flex Coupling
Date: Sun, 13 Apr 2003
From: Darrell Walker <darrellw@inetarena.com>

One thing I did while rebuilding my suspension and installing the "quick rack" on my TR4A was to replace the stock rubber joints with the solid TR6 versions. These are almost a direct replacement. The TR6 joints are a bit shorter, but the sliding "impact" section has enough range to make it up. The splined rod also sits a little further into the joint, so I ground the ends of the linkage rods a bit so that the joint had the full range of motion. This step was probably not needed, but I didn't want to have to take it back apart if it was.

The TR6 joints offer a few advantages:

- No rubber coupling to degrade and break
- The portion that clamps over the splined end of the linkage is (thick) sheet metal, rather than cast iron.
- They use a larger bolt, so you can actually get some clamping power.
- They sit in a different place on the splines, so if your splines are worn, they will probably sit on an unworn spot

I now have no play in my steering. I've only been able to take one quick drive, so I don't really have an opinion on the quick rack. Plus I just eyeballed the toe-in. Measuring it afterward showed that I had nearly an inch (I guess my eyeballs aren't aligned!).

-Darrell Walker

Steering System\Column

Subject: STEERING WHEELS
Date: Thu, 13 Feb 2003
From: "Jeffrey J. Barteet" <barteet@barteet.com>

Hey, Folks,

I offer my recent experience with a steering wheel swap on my '62 TR4.

I stumbled across a nice Momo 'Indy' wheel for a TR-6 on eBay a couple of weeks ago. I cross referenced aftermarket steering wheels in the Moss catalog and saw that the aftermarket TR-4 and TR-6 steering wheels were interchangeable there, so I bid on the item and managed to secure it through aggressive last minute bidding at what I thought was a nice price for a good custom wheel. (About \$140 shipped)

Sorry if I bid against somebody on the list.

The wheel is stamped with a production date of 9-84. I couldn't find them new, so I'm not sure if they still make 'em.

My original TR-4 'banjo' wheel is actually in very nice condition and is a handsome wheel. It's also quite large at about 16", has a skinny rim and seems to have a little bit of flex in it despite being in near-mint condition. (I do plan to keep the banjo wheel)

The smaller Momo wheel, at just below 14" radically changes the way the car 'feels' to turn. Higher effort, more feedback, quicker turn-in and it seems to reduce the amount hand repositioning when going through turns.

Added bonuses are nicer 'grip' on the wider rim, easier egress and better vision. I never really noticed before that the stock wheel did enter into the lower portion of my field of vision. (I'm 5'8" and I have the stock seats) The wheel does not obstruct the instruments. Finally, if I had to choose between the stock wheel or the momo wheel to crash my face into, the momo would win because it doesn't have a raised center hub to dash-in your forehead.

Next to the addco swaybar and fat pirelli tires, this wheel changed the way the car feels more than any other suspension mod. (Other suspension mods include upper a-arm shortening to induce negative camber, koni dampers, and upgrading the damping rate in the rear lever shocks via tweaking the valves and adding a more viscous damper oil.)

The other day, somebody was talking about putting in shorter steering knuckles on his TR6. Since the TR-6 already has a swaybar and comparatively wider tires, I'd go with a smaller steering wheel before the shorter steering knuckles. See ya' on the road....

-Jeffrey

Steering System/Rack & Pinion

Subject: Replacing TR4A Steering Rack Bellows
Date: Fri, 7 Apr 2006
From: "John Macartney" <standardtriumph@btinternet.com>

> If I'm not mistaken (and I could be) I thought the big end of the driver's side boot was secured with wire and a
> twist... not a clamp. Rather like the wire fixing the rear axle buffers on a solid axle car. Zip ties will surely
> work but the wire is just as easy and available and may even be correct.

Or one could do it **properly** as we did in both factory owned and run Service Divisions by using jubilee type worm drive clamps. The wire, while arguably practical, had a similar effect on the steering gaiters as those wretched bent wire hose clamps that knackered hoses in no time at all.

My two pence worth
-Jonmac

Steering System/Rack + Pinion/Adjustable Length

Subject: "Quick" Ratio Steering Rack
Date: Fri, 5 Sep 2003
From: <BigOldWumper@aol.com>

I have heard that Spitfire/Herald/GT6 steering racks are a bolt in replacement for the rack on the TR4A, and gives a 'quicker steering ratio' (as well as accordingly heavier steering), and also using steering arms from an early TR4 will further 'quicken' the steering---I was wondering if anyone has tried and/or can confirm this?
-Sean

<BigOldWumper@aol.com> wrote:

K-Man,

You have a 4 and a '4A, or you were saying you have a '4A? What was meant was more precise steering, likely caused by the shorter rods if that is the case...I'm still looking into this, but one lister suggested that doing the swap would cause a lot of bump steer---but would that mean that the TR4 had a lot of bump steer? Would there be any other major difference between the steering setups between the two cars? I'm not sure of this either...Still looking into it--if you have any further info do let me know.

-Newman

Hi Newman!

I've owned only TR4/A's to drive from '71 -> now. I stripped a TR4 for \$15.00 back in '72, [thinking there was no difference or very little:-D] . Well the TR4 steering set up is that of the TR3 on wish bones & springs. The TR4/A 'beefed up there's which was carried over through the TR6. They both have the rack & pinion steering, but the TR4 has shorter rods than the TR4/A. Go to the library & get a TR4\TR4/A repair manual & see the diagrams to notice the difference.

I do NOT understand the term of 'Bump Steering'? I have a TR4 Anti sway bar [not the TR6], mounted on my TR4/A IRS. This is another reason I would like to understand these terms you use. I thought shorter rods would throw off the toe.

-Cosmo Kramer

Kramer,

I think I may have just found my answer regarding the steering arms from a '4. I went to TR Enterprises website <[TR Enterprises.com](http://TREnterprises.com)> and found that they actually sell the tie rods from early TR4's to put on later 4A's, 5/250's, and 6's, in order to give, what they call, "more direct steering." So I guess what I heard from a lister in the UK regarding this was true after all. I am, however, still trying to determine whether or not a Spitfire rack will fit the 4A and give a higher steering ratio as well, which is another thing I read (haven't confirmed it yet.) As to your question of what I meant when I said "bump steer," it is: When your steering gets thrown off whenever you go over bumpy surfaces, caused by poor steering alignment.

-Sean

Hi Sean!

So, I gather that if you take out the inner steering rods from a TR4 (Shorter length) & install them in a TR4/A, then one would get quicker steering when you turn the steering wheel, right? But I still don't understand why you wouldn't have the front wheels toe-in? Because you're going with shorter arms. :-\

Now what would cause the steering to go off when one hits a bump. I've gone over bumpy roads & the steering hasn't gone off at all.

I'm confused on this subject.

-Cosmo Kramer

<BigOldWumper@aol.com> wrote:

Cosmo,

You're not the only one confused on this subject. I'm still trying to figure this all out too, though I think I'm leaning towards buying some tie rods for an early '4 to put on my '4A. Thanks for your input.

-Costanza

Hi Sean!

OK! Now you've got me going on this trend of thought. I'll have to someday go up into the loft to see if I still have a TR4 steering rack. Please send me ALL info. & a detail description [steps used, ref. books & e-mailings, parts & #'s used, & any other helpful bits] when you have completed this project, so I could reproduce this feat. (As if I don't have enough to do on my car :-[) :-).

PLEASE, keep in contact with me, on all the happenings. I'm interested in this thread.

-Cosmo Kramer

Steering System/Rack + Pinion/Adjustable Length

Subject: TR6 - Victoria British quick ratio steering rack long (ish)
Date: Fri, 5 Dec 2003
From: "Graham Stretch" <technical@iwnet.screaming.net>

----- Original Message -----

Subject: TR6 - Victoria British quick ratio steering rack
From: <Greg_Hutmacher@i2.com>

> On a closely related topic, how does one know whether or not their existing factory steering rack is in need of
> a rebuild?
>
> Thanks for any and all opinions.
> -Greg Hutmacher

Hi Greg

I know nothing of quick racks except expect the steering to become heavier the quicker the rack ratio, less turns
= less mechanical advantage!

On the how do I know when to re-build a standard rack, a good indication is how much steering do you have to
do to drive in a straight line? Or does your car drive in a straight line if you hold the wheel still!

Something else to check is the passenger side end of the rack, it runs in a bronze bush and this bush tends to
wear and allow a bit of movement, the movement is generally in the orientation of towards the side of the tube
that the pinion is on and 180 degrees from that. This is because the rack has a flat on it in the same orientation
as the rack on the opposite end (I think this was done to "idiot proof" the loading on to the gear hobbing
machine rather than rely on an operator to orientate the bar!). Another thing that will give an overall indication
of the condition of the rack is the track rod, once the rod end is released from the vertical link, the track rod
should not flop down, original specs say a 2 lb force should be needed to make the track rod move when
rebuilding a rack, my experiences that if you can tap (with a pencil or little finger) the rod end downwards and it
either does not move or it moves and stops this rack "aint broke don't fix it!" (unless you find wear in the bush
as described above). If there is a bit of slack in the pinion and no wear to other areas then this can be reduced by
removing shims from under the large nut opposite the pinion, start with the thinnest shim (I have not found a
rack yet with all the shims the same thickness but I bet there are a few out there), re tighten and push/pull the
rack from side to side to check for tight spots, if there is still slack put the thin shim back and remove a thicker
one, repeat test, when you hit a tight spot put the thinnest shim back, under NO circumstances drive with a tight
spot in the rack, yourself centering will not work properly!

-Graham.

Steering System/Trouble Shooting

Subject: New steering is very tight and hard to turn
Date: Tue, 21 Mar 2006
From: Greg <one_second_zero@yahoo.com>

You may be on to something with the trunnions. I did buy brand new trunnions from TRF. One side (left) screwed onto the vertical link with no resistance at all, but the other side (right) did have some uneven resistance when I screwed it on. I went back and test fit the old trunnion from that side onto the vertical link just to verify that it wasn't the threads. The old trunnion screwed on easily. However, I reinstalled the new one again for reassembly figuring that once everything was back together, the resistance would not be an issue. I may go back and reinstall the old one again on that one side to see if that is part of the problem. Which brings up another question: What makes an original trunnion require replacement? Out of round hole for the lower A arm bolt? If the hole isn't out of round, is there any reason not to reuse the old one? It is probably better quality anyway. I was just in the mind set of "replace everything" which is why I bought new trunnions!

<Chip19474@aol.com> wrote:

> Greg,

> I agree with the responses you've received that suggest trying to isolate the stiffness by disconnecting the tie
> rod ends and attacking the problem a-la-carte. One other caution for you - the new trunnions should be fitted
> (turned in or tightened) so there is very smooth motion and almost no effort to turn the trunnions left-to-right
> or right-to-left as though you are turning them by the steering wheel. If the trunnions are too tight when
> installed with the suspension hanging at full drop, the steering effort will be very, very high when the wheels
> are fitted and the car is on the ground.

I think your problem is most likely with the trunnions not the rack. Tie rod ends would have to be nearly seized to give you the symptoms you have and that's not likely since they're new. But, "new" doesn't always mean "good" - many new trunnions are made overseas and not to correct standards. I've found more than a few of them to have very poorly machined threads, which cause them to bind as they are "screwed" into the vertical link. Correctly machined trunnions should screw into the vertical link with only a bit of normal resistance....hmmm, did you check to see if your vertical link threads were okay?

Good luck....you'll find the problem...fortunately, there aren't many culprits!

-Chip Krout

Subject: New steering is very tight and hard to turn
Date: Tue, 21 Mar 2006
From: "Randall" <tr3driver@comcast.net>

> I went back and test fit the old trunnion from that side onto the vertical link just to verify that it wasn't the
> threads. The old trunnion screwed on easily.

Just a side comment, that doesn't necessarily prove the trunnion was the problem. If the threads on the link are distorted, but the old trunnion is worn, it may go on easily in spite of the distortion. The new trunnion may, in fact, be correct but be binding on the distorted area of the threads.

I've not seen this with vertical links, but I have definitely seen it with other threads, TRactor motor head studs in particular.

-Randall

Steering System/Trouble Shooting

Subject: Tight Steering
Date: Wed, 30 May 2007
From: "Nolan" <foxtrapper@ispwest.com>

----- Original Message -----

Subject: Tight Steering
From: "wbeeche" <wbееch@flash.net>

> Still going through this car and I find that the entire front steering linkage, control arms, shocks and bushings
> are all new. I guess I should be real happy as this could not have been an inexpensive procedure. It looks very
> well done with all the zerks well lubricated & safety wire in place.

>
> My question is this: When I drive the steering is extremely heavy, hard to turn and does not return to center
> after a turn. There is a little play in the steering wheel, 3"-4" side-to-side but I don't think that is related to the
> stiffness. When I jack the front end up, the steering freely moves from lock-to-lock, just over two turns. Could
> something be too tight that just shows up when the weight of the car is on the wheels??
> -Bill B.

Wheels come to mind initially. If you've gone aftermarket on the wheels, and have changed the offset, you can drastically change the force required to turn the steering wheel. Otherwise, jack the car again, but put jack stands under the A-arms to get the suspension in the on-the-road positions, and then check the steering for stiffness. If it's supple, the problem is with the tires, re-the above paragraph. You can also create a stiff(er) steering with oversize tires, and very sticky tires. Generically, skinny tires made from hard rubber rotate on the pavement pretty easily. Wider tires with sticky compounds don't rotate as easily, especially the sections of the tire further out from the center of rotation.

Subject: Tight Steering
Date: Wed, 30 May 2007
From: "Skip Gurnee" <skip47@powernet.net>

Two turns lock-to-lock is pretty quick steering, which means your mechanical advantage is less than your average American car with, well, I only own one American car, a Jeep, with about 3-1/2 turns. I remember some older ones with 5 or more. You can slow down the steering by changing the steering arm at the wheel to something longer, and thus make the steering easier. Note that even F1 cars have power steering; there's a reason for it.....

-Skip Gurnee

Subject: Tight Steering
Date: Wed, 30 May 2007
From: <DLylis@aol.com>

All of the advice about the tires and the wheels is good advice. On a good day the steering is heavier than your every day car. Make certain that the adjusting screw for the steering rocker arm is not too tight. Loosen the jam nut with a 5/8 wrench and loosen the screw, then reseal it making sure that it is not too tight. If the steering box has been rebuilt, which it sounds like it has, this may not have been set properly at reassembly.

Another villain here may be the preload on the bearings in the box supporting the worm may be too tight. This can not be properly corrected without removing the box so try all other solutions first. I believe the castor on these cars is "0" so you will not find a return to center as you find on modern cars.

-D.Lylis

Subject: Tight Steering
Date: Sun, 3 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> When I drive the steering is extremely heavy, hard to turn and does not return to center after a turn. There is a
> little play in the steering wheel, 3"-4" side-to-side but I don't think that is related to the stiffness. When I jack
> the front end up, the steering freely moves from lock-to-lock, just over two turns. Could something be too
> tight that just shows up when the weight of the car is on the wheels??

As already suggested, Try supporting the car under the A-arms and see if it binds then.

Although the steering is normally heavier than most cars (even those without power steering), due to the fast steering ratio and relative inefficiency of the "cam and peg" steering; it should still return to center after a turn.

So if the steering still doesn't bind with the suspension in its normal (loaded) condition; my next suggestion would be the steering box. Unfortunately, your car is early enough that you probably have a 'solid' steering column, which AFAIK means you have to remove the front apron in order to get the steering box out to be rebuilt. This very likely explains why all the rest of the steering & front suspension has been serviced, but not the steering box.

When I finally rebuilt my steering box after many years of just doing everything else, I was amazed at the difference it made!

I also believe the lubricant in the box is important ... after the rebuild I switched to full synthetic Valvoline gear oil. The overall result was that I could change lanes with thumb & forefinger.

BTW, this was with wide, sticky tires & TR6 rims, which have more offset than TR3 rims.

-Randall

Subject: Tight Steering
Date: Mon, 4 Jun 2007
From: <DLylis@aol.com>

Randall,

As I recall in the original post on this subject, the lister said that the steering components had been rebuilt except for the steering box. I did my 3A all the way through and had similar results when finished, but not as severe as the lister seems to say. I was unhappy with that so I removed the steering box again to make certain that the worm bearing preload was correct and that the box turned with ease with a finger and thumb. (split column) I also disassembled my tie rods again (real easy second time) to check the trunnion and vertical link and that all was as it was supposed to be. I was unhappy with the idler so I replaced that and the bracket on the second go around. After reassembly I have better but similar results.

I am highly suspicious of the aftermarket silentblocs and as I recall from a previous conversation we had, that you used a silentbloc that is aftermarket with bearing surfaces rather than the rubber bonded jobs that I am using (and likely the lister). Although I am not all that enthusiastic about pulling this apart again, if I am correct as to our previous conversation, can you tell me where you got these?

-David Lylis

Subject: Tight Steering
Date: Mon, 4 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> ... I am highly suspicious of the aftermarket silentblocs and as I recall from a previous conversation we had,
> that you used a silentbloc that is aftermarket with bearing surfaces rather than the rubber bonded jobs that I
> am using (and likely the lister). Although I am not all that enthusiastic about pulling this apart again, if I am
> correct as to our previous conversation, can you tell me where you got these?

I got mine from British Frame and Engine (Ken Gillanders). Not cheap, but should last forever. I see they are

listed for \$100/pair now :

<<http://www.britishframeandengine.com/parts1.html>>

I also did a bit of fitting; as I recall I added a shim to one of them (to tighten the vertical clearance) and reamed the other one so the pin would run smoothly after the bush was pressed into the arm. Also added grease zerks.

-Randall

Subject: Tight Steering
Date: Mon, 4 Jun 2007
From: "Randall" <tr3driver@ca.rr.com>

> You said the steering did not want to return to center. That would make me wonder about the alignment,
> mainly checking the caster which job is to return the wheels to center.

TR2-3 were designed with zero castor; and there is no adjustment for it. It is possible to add castor by swapping parts with a later TR4, but that adds steering effort.

However, steering axis inclination (aka king pin inclination even though these cars don't have kingpins) also causes self-centering, and TR2-4 have SAI. Should be 7 degrees according to the factory manual, and again if it's wrong, something is bent or broken. You'll probably have to pester your alignment shop to check the SAI; I've never seen one that would do it without being specifically asked.

I mentioned once having a TR3A where the inner lower pivot had ripped out of the frame ... the shop claimed the alignment was "fine" in that condition! They obviously had only checked toe-in, as all of the other angles had to be way out of whack.

-Randall

Steering System/Trouble Shooting

Subject: TR Shake
Date: Mon, 1 Sep 2003
From: "Lou Metelko" <lmtr4a@ctlnet.com>

Stu:
My father taught me that if a vibration is in the steering wheel then it is a rolling (wheels, drums, etc) imbalance but if the shake is in the seat of the pants then it is a rotating (drive shaft, transmission, etc) imbalance.
-Lou Metelko

Wheels/Lugged

Subject: TR Discs Wheels
Date: Mon, 04 Mar 2002
From: "Power British Performance Parts, Inc." <britcars@powerbritish.com>

Alan wrote:
> Does anyone know the bolt pattern and offset for the tr6 wheel? Thanks, -al

Stock steel wheels for TR-3/TR-4 (15x4):
Bolt Pattern: 4 on 4 1/2"
Backspacing: 3 3/8"

Stock steel wheels for TR-6 (15x5 1/2):
Bolt Pattern: 4 on 4 1/2" circle
Backspacing: 3 1/2"
Good luck!
-Brian Schlorff

Subject: Wheels - TR6
Date: Mon, 4 Mar 2002
From: "Randall Young" <ryoung@navcomtech.com>

Here's a long-saved post re: wheel lug circles. The TR's (all of 'em....) use the same bolt pattern (4 on 4-1/2) as the following cars:

Acura - Legend '86-'89
Buick - Special '61-'63
Chevrolet
 Corvaire all 4-bolt
 Chevy II all 4-bolt
 Sprint '85-'87
 Nova ('61-'70)
Datsun/Nissan - most models to '89
Dodge Colt '79-'88
Dodge Colt (early)
Ford
 Mustang all '65-'68 4-bolt
 Falcon, Maverick, Granada all 4-bolt
Mazda - 626, RX7 '83-'87 ????
MGA, MGB, MGC
Olds - F-85 '61-'63
Plymouth - Arrow, Sapporo '79-'88
SAAB all ???
SAAB - 900 to '87
Toyota - most exc. MR2 and P.U. to '89

Not all of these cars ran 15" wheels.

But you have to make sure that the offset and backspace is right. I've seen some Ford rims used on TR racers, but I couldn't tell you what they came from.

-Shane Ingate

Wheels/Lugged

Subject: TR4 rear threaded lug stud removal
Date: Mon, 03 Apr 2006
From: Bill McLeod <wbmcleod@cox.net>

<richhalpern@comcast.net> wrote:

> Good morning all,
> I am trying to replace my wire wheel short studs with the longer ones for steel wheels. I double nutted the
> studs and attempted to back them out. I only get about a quarter of the way out and they become quite
> resistant to leaving the hub. I ran the one I was working on back in for now and it did tighten back up. Has
> anyone run into stubborn threaded studs, and how do you beat them into submission?
> -Rich

They are not threaded. They are a knurled fit. Beat them back with a hammer, so that they fall out, and stick in the new ones. Draw those tight with a spacer and a nut. It REALLY helps to remove the drum! Regards,
-Bill

Subject: TR4 rear threaded lug stud removal
Date: Mon, 03 Apr 2006
From: Geo & Kathleen Hahn <ahwahnee@cybertrails.com>

Bill McLeod wrote:

> They are not threaded. They are a knurled fit. Beat them back with a hammer, so that they fall out, and stick
> in the new ones. Draw those tight with a spacer and a nut. It REALLY helps to remove the drum! Regards,
> -Bill

I have never removed them but was under the impression that they are threaded in (from the wheel side) then swaged on the backside. The swaging must be ground off before they can be double-nutted and removed.

I could very well be wrong -- many LBCs are knurled press fits -- just suggesting you get a second opinion before you do some damage.

-Geo Hahn

Subject: TR4 rear threaded lug stud removal
Date: Mon, 3 Apr 2006
From: "Randall" <tr3driver@comcast.net>

> They are not threaded. They are a knurled fit.

Not so, the rear studs on TR2-4 ARE threaded. However, they are also peened into the hub from behind, so it's generally necessary to grind away the peened area before unscrewing them. Unfortunately, you need to remove the hub/halfshaft from the axle housing.

Be sure youpeen the new ones in securely. Or, as another alternative, you can supposedly buy a fully-threaded stud and thread it in from the back, removing any concerns over the stud coming out of the hub.

-Randall

Subject: Stud Removal at rear hubs
Date: Tue, 4 Apr 2006
From: N197TR4@cs.com

Grind Swaging, Back Out Stud slightly and then retighten, Grind Swaging some more ..., Repeat as Necessary.

Moroso has or did have full length threaded studs. Tighten in place. Locate wheel to fixture studs. Tack Weld Head.. They have a tendency to back out, if not secured .

I weld the front knurled ones, as well, as it is hard to get a good fit and then race on them.
-Joe (A)

Wheels/Lugged

Subject: TR4 Steel Wheel Color Wheels: Disc
Date: Thu, 10 Jan 2002
From: <ZoboHerald@aol.com>

<geohahn@theriver.com> writes:

> My Piggott books shows only TR4s with wires and all my other books have only B&W photos so I'll turn to
> the list. Would a 1964 TR4's disc wheels have been silver (like a late '3) or a sort of almond color or
> something else entirely? Thanks.

Likely the disc wheels would have been Spa White. See <<http://www.vtr.org/TR4A/TR4A-wheels.html>>, a transcription of a 1963 Service Bulletin on this very subject.

-Andy

Subject: TR4 Steel Wheel Color
Date: Fri, 11 Jan 2002
From: <ArthurK101@aol.com>

<geohahn@theriver.com> writes:

> My Piggott books shows only TR4s with wires and all my other books have only B&W photos so I'll turn to
> the list Would a 1964 TR4's disc wheels have been silver (like a late '3) or a sort of almond color or
> something else entirely?

George, the early TR4 disc wheels were the same as the TR3A. I have both Piggott books and there is a little more info in the earlier book.

The wheels were described by the factory as "silver lacquer" or "aluminum wheel paint." Piggott's earlier book ("Original Triumph TR") says, in the TR3 section, that it is not definitely known whether the two named colors were identical. Maybe someone on the list with a TR3 (or a TR4 with original discs) can identify an exact or matching color.

That said let me add that my '64 TR4 came with the optional 60 spoke wire wheels which (according to Piggott) were the same color as the discs. When I replaced the wheels in '93, I bought Dayton wheels from TRF and the color of the new wheels was a match to the originals. You might want to check with TRF (or Dayton) to see what color they use.

BUT a service bulletin (of which I have a copy) issued by the NY, NJ and Pa. Triumph distributor in '63 says that TR4 disc wheels were then changed to Spa White for all body colors. We surmise that this was because the factory changed the body color to "New White" and had a lot of "Spa White" paint leftover. So if your car is Comm number CT 18604 or earlier it would have come with silver and CT 18605 or later "Spa White."

Hope that helps. As always, if you need more info come back to me.

-Art Kelly

Subject: Spa White **Wheels: Disc**
From: Joe Curry <spitlist@qte.net>
To: ebk@buffnet.net

ebk wrote:

> Hi Joe!
> I thought you are the person that has a colour chart for PPG paints, right? If so, then would you please give
> me the paint code or paint # for "Spa White"? TIA,
>-Cosmo Kramer

Spa White 63-65 PPG/Ditzler # 8335 ICI # 3436
Cheers,
-Joe

Wheels/Lugged

Subject: TR4 wheel studs
Date: Sat, 19 Feb 2011
From: Brad Kahler <brad.kahler@141.com>

Edward Dressler <etd@psu.edu> wrote:

> Anyone have experience replacing the rear wheel studs on a TR4? The rear ones screw out of the axle
> flange but are penned in place to prevent them from coming undone. I don't want to have to remove the axles
> to do this.
> -Ed Dressler

Ed,
You will most definitely have to remove the axles. There is no other way to grind the backside of the wheel studs. The studs were screwed in at the factory and then penned over. I went through this same exercise last winter. Very frustrating and time consuming.

Once you have ground the backside that was penned then you unscrew the old ones and then screw in the new ones. The hard part is you now have to peen over the new stud so that it won't unscrew.

Pain in the royal backside to do this.

Oh yeah, you also have to pull the hub from the axle to do the work.
-Brad

Subject: TR4 wheel studs
From: Brad Kahler <brad.kahler@141.com>Ed,

You will most definitely have to remove the axles. There is no other way to grind the backside of the wheel studs. The studs were screwed in at the factory and then penned over. I went through this same exercise last winter. Very frustrating and time consuming.

Hi Brad!

Now you're talking about a TR4 & NOT a TR4A, right?

This is the 'live axle' & NOT the IRS, right?

On the TR4A IRS, Do the wheel studs also thread into the rear hub?

Once you have ground the backside that was penned then you unscrew the old ones
From the front (outside portion of the hub- as one would be in place to install the wheel onto the studs, right?)

and then screw in the new ones.

From the back side of the hub out to the front (inside ->outside of the hub), right?

The hard part is you now have to peen over the new stud so that it won't unscrew.
Could you use 'RED' Loctite & NOT bother penning the backside of the wheel stud?
Pain in the royal backside to do this.

Oh yeah, you also have to pull the hub from the axle to do the work.
By using the 'Churchill' hub puller, right?

Been there, done that.

I've been meaning to do this for a couple of years, now, but to busy with other things going on & will also rebuild the rear hubs while I have them apart.

-Cosmo Kramer

Subject: TR4 wheel studs
Date: February 23, 2011
From: Brad Kahler <brad.kahler@141.com>

Sorry, I've been extremely busy.

>> You will most definitely have to remove the axles. There is no other way to grind the backside of the **wheel studs**. The studs were screwed in at the factory and then peened over. I went through this same exercise >> last winter. Very frustrating and time consuming.

>
> Now you're talking about a TR4 & NOT a TR4A, right?
> This is the 'live axle' & NOT the IRS, right?
Correct, 1963 TR4 live axle.

> On the TR4A IRS, Do the wheel studs also thread into the rear hub?
I can't answer that as I've never had TR4A axles off. I would assume the same arrangement as the TR4.

>> Once you have ground the backside that was peened then you unscrew the old ones
>
> From the front (outside portion of the hub- as one would be in place to install the wheel onto the studs, right? The studs unscrew from the outside. The peened over part is between the hub and the brake backplate.

>> and then screw in the new ones.
>
> From the back side of the hub out to the front (inside ->outside of the hub), right?
No, outside --> in

>> The hard part is you now have to peen over the new stud so that it won't unscrew.
>
>> Pain in the royal backside to do this.
> Could you use 'RED' Loctite & NOT bother penning the backside of the wheel stud?
I seriously doubt this would be enough. I know I wouldn't trust holding my wheels on the car with just loctite.

>> Oh yeah, you also have to pull the hub from the axle to do the work.
> By using the 'Churchill' hub puller, right?

That is correct.

Wheels/Lugged

Subject: TR6 Mini Spare Tire
Date: Wed, 11 Sep 2002
From: "Randall Young" <ryoung@navcomtech.com>

> Any one know of a donut spare that might fit the 6. Looking to save weight & space.

Mitch, you could try the "compact spare" off of a 84-91 Nissan Maxima. It wouldn't quite clear the brake calipers on my TR3A, but I believe a TR6 has smaller calipers ...

If nothing else, take the T125-15 tire off and put it on a TR3 rim (which is what I did).

TR2-6 all use 4 lug bolts on a 4.5" circle. It's a fairly common pattern, here's a partial list of cars that use it :

1989-85 CHEVROLET - Sprint
1996-92 EAGLE - Summit Wagon
1993-84 Summit
1994-89 FORD - Festiva
1996-89 GEO - Metro, Sprint
2000-92 HONDA - Prelude (15")
2000-90 Accord
1999-91 HYUNDAI - Elantra, Lantra
1999-90 Accent, Excel, Pony
1999-89 Sonata
1995-90 Scoupe
1989-81 MAZDA - 323, GLC
1987-85 626, MX-6
1998-92 MITSUBISHI - Expo, Expo LRV, Vista Wagon
1999-84 Galant
1993-84 Mirage
1991-80 Tredia
1999-93 NISSAN - Altima
1995-82 Stanza
1988-84 Maxima
1990-78 B310, Pulsar
1986-82 Sentra, Sunny
1999-84 PLYMOUTH - Colt Vista
1993-84 Colt
1985-79 Arrow, Champ
1999-89 SUZUKI - Swift
1991-83 SAAB - 900
1991-80 TOYOTA - Cressida
1985-80 Celica (14")
1982-79 Tercel(4WD)
-Randall

Subject: TR6 Mini spare tire
Date: Wed, 11 Sep 2002
From: <ZinkZ10C@aol.com>

<ryoung@navcomtech.com> writes:

> TR2-6 all use 4 lug bolts on a 4.5" circle. It's a fairly common pattern, here's a partial list of cars that use it: ...

Also add:

Pinto
Mustang II 74 to 77

Ford "Fox" bodied cars
Mustang 78 to ~ 87 (4 lug only) some had a trick aluminum mini spare wheel
Small LTD
Later Granada

'90 and older Escort

Porsche 924

4 bolt wheels from a Maverick, Comet and 60's Fords **are NOT the same.**
-Harold

Wheels/Trouble Shooting

Subject: Wobbly wheels
Date: Sun, 29 Jul 2007
From: Brian Jones <brianjone5@mac.com>

I do not think 1/3" and 1/4 inch one way or the other would cause the wobble and shudder you describe, though it's certainly worth pursuing remedy for such play.

Check wheel balance. I bought the portable balance from HF (\$69 IIRC). It's surprisingly sensitive, allows you to rest a weight on the rim to achieve balance before you fit it. I could only find weights online, though they were cheap enough.

Check the run-out on your:

- a) rims
- b) tires - i.e. eccentricity while in rotation. I used a run-out dial, but any pointer held firmly will suffice.

There is a reason why the Kumhos are \$129 for a set of four at Tire Rack, and mine have noticeable run-out. There was some run-out at the rim of these 44 year-old wheels, but more at the tire, and that was with the tires correctly seated in the rim. Check your tires are correctly seated - look for the mounting line close to the rim edge - it should be a consistent distance from the rim all the way around.

Find your best pair of wheels, and put them on the front.

If all your wheels are bad, find a friend with Panasports and borrow them for a mile or two to see if they change anything.

I put my best two steel wheels, newly balanced, on the front. It cured most of the problem, and I'm only really bothered by it when the wheel eccentricity is co-ordinated. It soon passes in a mile or two, as they work their way out of co-ordination.

When I have my next windfall, I'll pick up some new wires and better tires. Good luck
-Brian

Subject: Wobbly wheels
Date: Sun, 29 Jul 2007
From: "Ed Woods" <fogbro1@comcast.net>

Dear Listers,

About a year ago, in preparation for a 2000 trek around the Great Lakes, I changed the wheels on my TR3 from 60 spoke Dayton wires to bolt on KN Minilite replicas, not because of any performance issues, but because it seemed to have become more and more difficult not only to source proper tubes, but also to find someone willing to install them.

As I recall, I had a set of 165-15 Dunlops mounted on those wire rims, probably from the early '90s restoration. Kumho Solus 185/15 are presently mounted on the new rims. And, yes, I had to revert to the longer wheel studs to make this change.

It has been the best upgrade I've ever made to the car. As an example, I had the TR3 up to 4500 rpm in 4th this afternoon in overdrive, almost fast enough to keep up with traffic, without a shimmy, shake, or white knuckles. So I gained a lot more than the ease of maintenance I was after. I gained better handling and a much more secure car at Interstate speeds.

No way would I go back to those skinny original wheels and/or tires; not if I intended to drive the car anyway. Wires are for show and steel wheels are for recycling as far as I'm concerned.

That said, I have a bunch of TR3 and TR6 wheels free for pickup and a set of Dayton wires with adapters and knock offs for sale.....

-Ed Woods

Subject: Wobbly wheels
Date: Mon, 30 Jul 2007
From: <cfisher@borgwarner.com>

Thanks to Brian & Bill etc. for the insights on wheel wobble.

I took your advice and did some wheel swapping and replace the worst dinged rim with the spare and got a dramatic improvement. There is still some wobble, so I'll probably eventually go for a new set of tires/rims, but at least now its drive able. I'll try the tip on a couple extra PSI to help out of round tires next. Cheers,
-Curt Fisher

Wheels/Tyres

Subject: 165-15 tires for TR4
Date: Mon, 12 Jul 2004
From: "Chris Bohn" <cbohn@sidepipe.com>

<ScharfR@aol.com> wrote:

- > Greetings all:
- > I'm in the same boat as Tim above (needing TR4 tires). I'm looking to buy the 165-15 size radials at a reasonable price. To me, this rules out the expensive re-makes from Coker tires, among others. In looking over the available choices, I have found a number of alternatives: Kumho, Signet, Cooper and a few others.
- > Have any list members had experience with any of these brands, in this size? As an alternative, are there other brands to consider?
- >
- > Thanks for any wisdom that's available.
- > -Bob Sharp

Bob & Tim- congratulations on sticking with the 165-15 size tire for your TR4. These are commonly referred to as a "metric" size and uses the default profile of @82%. This means that ratio of the height of the sidewall to the width of the tire is higher than most modern tires. This gives the tire a real "period look" and of course you get to experience "period handling" as well, which I believe is a good thing.

I run the Cooper Sportmaster tire, 165-15 Metric. It's all-black rubber, good tread pattern and looks great on the car (mine run on original 5" ARE Silverstone wheels). I've seen these tires on the standard disc wheels, too -- look great. I haven't seen them on wire wheels, someone else may comment on that. These tires are reasonably priced and are supposed to last a while.

-Chris

Subject: Profile of tyres for TR's
Date: Mon, 2 Aug 2004
From: "Randall" <tr3driver@comcast.net>

- > Does anyone know the specifications of the original TR2, 3, 4,4A tyres. The specific info I need is their diameter. I know that they were 165 SR 15's. The reason for the query is that I have non-standard tyres and wish to get back as close as possible to the original diameter.

If you really want to get it right (note that there were different tire options available at different times, each with its own rolling diameter) ... look for the calibration number printed on your speedometer face. It should be a 4-digit number, somewhere around 1100 to 1400. Take that number, and multiply it by 2.5, then divide by your differential ratio (which is usually 3.7). The result is the turns per mile for your original tires. Since most tire vendors give rolling diameter in turns per mile, this is exactly the number you need.

ISTR 1152 was one of the common calibrations (my TR3A is very unusual with its 1355 calibration). So, $1152 * 2.5 / 3.7 = 778$ turns per mile.

For some reason, Tire Rack doesn't list the tpm for the Kumho PowerStar 758 but the overall diameter is listed as 25.4 inches, which would be 794 tpm if the tire didn't deform under load. Since it does, it should be a very close match to the original tires.

-Randall

Wheels/Tyres

Subject: Inner Tube Note
Date: Sun, 15 Aug 2004
From: Bill & Skip Pugh <anabil@caltel.com>

I bought my inner tubes from Moss and have had no problems, fortunately I had a veteran tire dealer warn me to make sure all the stick on labels were removed from inside the tires. It seems these will wear a hole through the inner tube after a few thousand miles due to the tubes chaffing on the labels...

Looking back it almost certainly was the cause of three (3) flats earlier within one month of each other ...
- Bill Pugh

Wheels/Tyres

Subject: Large Diameter Valve Stems
Date: Mon, 17 Mar 2003
From: <ebk@buffnet.net>

ebk wrote:

>> I went today to remove the tires off the rims & found out that the local chain dealer doesn't have the same
>> replaceable tubeless tire Valve Stems. They have a larger diameter base at the rim. I want to have the rims
>> sandblasted, but If I can't get replacement valves then what should I do? There HAS to be some place to get
>> them. I have TR4/A, but the rims maybe from earlier TR cars [TR4 or 3?]. :-\ TIA,
>> - Cosmo Kramer

Randall Young wrote:

> Cosmo, they must've been just temporarily out of the smaller diameter stems. There are only two standard
> diameters, between them they cover 99% of the cars on the road today, and all Triumphs (as far as I know)
> take the smaller of the two standard diameters. I believe the smaller ones are actually much more popular,
> both my Dodge Caravan and Chevy Citation use them.
> < <http://www.genieknows.net/cb017/DIYSearch?query=1284967>>
>
> It is possible, with care, to remove and reuse the stems; but I wouldn't recommend it. They do get old and
> fail, leading to flat tires at inopportune moments. If you must, use a screwdriver to gently force the lip back
> through the hole, working your way around until it pops through.
> -Randall

Hi Randall!

Thanks for the educational lesson in: "How to remove the tyre valve for possible reuse!" I'll try it on one of the bad wheels. I was told in one reply that I would find them at Wal-Mart. My TR wheels take the larger stem, so I'll try Wal-Mart & around town to get new, but I'll need to get 5 out of the 9 wheels I have. 5 of them are good, 2 are 'iffy', one has a flat spot, & the spare doesn't hold air & when the tyre was removed, the word 'BENT' is see written in the inside of the rim :-(.
-Cosmo Kramer

Wheels/Tyres

Subject: Mounting tyres
Date: Tue, 12 Oct 2004
From: <Shrack04@aol.com>

An easy way to mount tires at home, is to lay a plastic trash bag over the rim. The antique guys use this method and the tire will slide around and on the rim with ease. Worked for me, really well.

-Kent Shrack

Wheels/Tyres

Subject: Tire age Query
Date: Tue, 31 Jul 2007
From: "Francis P. Gowash" <fpgowash@cox.net>

Hi all,

Seems that I vaguely recall a thread on tire age as determined by a code on the tire wall? Can't seem to find the key to this code. Can somebody remind me? The only thing I've found resembling codes on my tires are 25266-2 followed by DESIGN 9526.

Following that, how does one determine replacement age of tires if car is driven very little (<500 miles/year) and tires look very good externally? Thanks much

-Fran

Subject: Tire age Query
Date: Tue, 31 Jul 2007
From: <ghamilton99@comcast.net>

Fran:

Here is my recent response from Michelin, about my brand new \$175 2000 Landcruiser spare:

//////////

Gary,

While most tires will need replacement before they achieve 10 years, it is recommended that any tires in service 10 years or more from the date of manufacture, including spare tires, be replaced with new tires as a simple precaution even if such tires appear serviceable and even if they have not reached the legal wear limit.

For tires that were on an original equipment vehicle (i.e., acquired by the consumer on a new vehicle), follow the vehicle manufacturer's tire replacement recommendations, when specified (but not to exceed 10 years).

The date when a tire was manufactured is located on the sidewall of each tire. Consumers should locate the Department of Transportation or DOT code on the tire which begins with DOT and ends with the week and year of manufacture. For example, a DOT code ending with "2204" indicates a tire made in the 22nd week (May) of 2004.

If your questions have not been answered to your satisfaction, please call me at 1-800-847-3435 (toll-free) between 8:30AM and 6:00PM Eastern Time Monday through Friday. Sincerely,

-Bobby

//////////

-Gary J. Hamilton

Subject: Tire age Query
Date: Tue, 31 Jul 2007
From: "Randall" <tr3driver@ca.rr.com>

> Seems that I vaguely recall a thread on tire age as determined by a code on the tire wall? Can't seem to ...

Should be much more than that, assuming the tires were sold in the US within the last 15 years or so. Here's a couple of links that may help:

<<http://www.tirerack.com/tires/tiretech/techpage.jsp?techid=33¤tpage=11>>

<<http://www.tirerack.com/tires/tiretech/techpage.jsp?techid=11>>

> Following that, how does one determine replacement age of tires if car is driven very little (<500 miles/year)
> and tires look very good externally?

Different sources give different numbers. I believe Ford & Chrysler recommend tires be replaced after 6 years, even if they have never been used.

Tire failure is no fun at all, so I feel this is an area where it pays to be conservative, unless you only drive in parades. When I bought my Stag, the tires still had plenty of tread and I thought I could let them go until I bought new wheels. Less than 100 miles later, one of the rear tires flew apart, and the belts flayed all the paint off the fender before I could pull over.

-Randall

Wheels/Tyres

Subject: Tire Pressure
Date: Mon, 19 Aug 2002
From: "Robert M. Lang" <lang@isis.mit.edu>

Lozano's wrote:

> Hello,
> I am hoping someone can recommend tire pressures for my 6 to go autocrossing. A "can of worms".

Hi

As you may discover, tire pressures directly effect "feel". Some folks like things "soft" and some don't. (Notice that I didn't say some like things "hard" for obvious reasons.)

> After two years of trying to figure out what was causing my rubbing problem, we finally looked at the setting
> of the Koni adjustable shock. To make a long story short, it became a finger pointing situation..."I thought
> you set it?", "NO! I thought you set it".

MAKE A CHECKLIST: Then you will not have this problem. If you are racing, you can never assume anything. Check, check and re-check. Read the book, "Prepare to Win" by Carrol Smith.

Bob Tullius is reported to have used a (four page, single spaced) checklist before every race. As you can imagine, this lead to the team consistently finishing and because the cars were developed so well they consistently were leading while finishing.

> Anyway, the rubbing is finally gone and we are ready to go autocrossing. I have 215x55x16 Kumho tires,
and
> I do not know what pressures to run.
> -Jorge

Well, you didn't tell us which Kumho's you are running. But the following works for most tires.1. Check the sidewall for the highest rated pressure.

2. Chalk or shoe-polish your tire's sidewall to tread interface.

3. Fill the tires to the highest recommended pressure and make a run.

4. Did the tire "roll-over" get into the sidewall? If no, go #5, if yes, go back to #3 and add a bit of air. Use 2 PSI pound increments until you eliminate the excessive tire roll-over.

5. If you did not get roll over to the sidewall, you might have too much air! This is rare in autocross, but not outside the realm of possibilities. Try reducing the amount of air a bit. Try 1PSI pound decrements 'till' you get roll-over or near roll-over.

6. It turns out that some tires (I have no experience with Kumhos) react in a very sensitive manner to tire pressure. The Hoosier DOT radials that I used to use react to 1/2 pound pressure changes... literally "Formula One technology". But getting the gross tire pressure values can be done with chalk/shoe-polish and some iterative runs.

7. When all else fails (actually, probably before you start the iterative process), ask the tire manufacturer for some base-line tire pressures. They will tell you. After all, they don't want their tires too look like really bad performers out there.

Note: If you use your autocross tires to drive to/from the track, you should make sure that you bleed the air from the tires to below the highest recommended pressures before you drive home... we don't want to have any weird handling problems on public roads!

Side-note: Tire gauges can be a problem to eliminate their problem, buy at least one good tire pressure gauge and use it for the entire season. If you switch gauges mid-season, you will have problems unless you can calibrate the gauges equally across the entire range of pressures. I learned this one the hard way and spent half a season chasing down handling problems that were really tire pressure problems! The idea is consistency.

Final note: No tire is perfect. You can only tune so-much before the tire becomes the critical factor. If the tires that you are using are really street tires, then you will not get the ultimate performance that you might get if you are using real race rubber. Keep this in mind - even with some of the amazing street tires that are out there now.
-rml, Bob Lang

Wheels\Tyres

Subject: TR4A -TR6 Wheel Data
Date: Fri, 12 Sep 2003
From: "Darrell" <Triumph_Driver@hotmail.com>

>> Also is the diameter of the 185/15R smaller than the stock TR4A tires? I ask this because my speedometer
>> seems to run a bit high.

> My book says the stock TR4A tire was 165-15, so the 185s should be substantially taller. Your car may have
> had the gear ratios inadvertently changed, or your speedo head may simply read high. They sometimes do
> that when they get old.

When speaking of tire sizes one absolutely has to take into mind the "ratio" of the tire also. As an example, a 185-70-15 tire is much taller than a 185-50-15 tire.

So, the original tires for the TR-4/A and the TR-4 were 165-15 size. But, that was before tire ratio numbers started being used. So a 165-15 might be anything from about 23" to about 29" (about 585 to 736 mm) in diameter. I can't find anything in my TR-4 manual that specifies a tire diameter, but it does specify tire type and size. Mostly different Dunlop tire lines, the Gold Seal 5.50-15 or 5.90-15, the RSS 5.50-15 or 5.90-15, or the Duraband 6.5-15. It also list Michelin 165/15X. Before tire ratios started being used each brand would build a width, and make it as tall as they wanted, so that you had to specify tire name and size to get the right ones for your car.

I am not sure, but I think the Dunlop RSS 5.90-15 had a 25.25" (641mm) diameter.

So, how does this compare to how modern tires are measured? Modern tires use a three number system to roughly define the size of the tire. An example would be a 205/60/15, or a 185/70/15, or 165/86/15.

The first number is the width of the tread in mm. The second number is the ratio of the sidewall to the tread width in percent. The last or third number is the diameter of the intended mounting rim or wheel. By having these numbers and doing a little simple math you can find the approximate diameter of the wheel. This approximation varies in accuracy from manufacturer to manufacturer, with, in general, better makers coming closer to the number, and cheaper brands being smaller in diameter.

So, a 205/60/15 has a tread width of about 205mm. There are two sidewalls in the path when you measure a tire for diameter, so two 60%'s is 120%. You multiply this 120% (or 1.2) by the 205mm tread width to get the total sidewall height. 205mm times 1.2 = 246mm. Add this number to the wheel diameter of 15 inches (381mm) and you have the total diameter of the tire, or how tall the tire is. In this case about 627mm, or 24.7 inches. And if I go outside and measure my Kumho 205/60/15 tires on my 1962 TR-4 I find that they are 24.6 inches in diameter, but then they are not new and have worn some tread away.

Let's look at another size, 185/70/15. The sidewall ratio is 70%. So, 185mm tread width times 1.4 (double the sidewall height) = 259mm of sidewall. Plus 381mm for the 15 inch wheel size = 640 mm (or about 25.2 inches) total diameter. So here the 185 tire is taller than the 205 tire. But both are within a few percent of the original tire diameter of about 25.25 inches, so there should be little, if any, noticeable tire size induced speedometer error.

One last size to look at, the 165/86/15. I believe this is a very common size to find on TR-3 and 4's today. The width of 165 mm times double the sidewall ratio, or 1.72, yields a sidewall height of 283.8 mm. Add to that the 15 inch rim diameter of 381 mm and you get about 665 mm, or 26.2 inches of tire diameter.

So, with three tires, 205/60/15, 185/70/15, and 165/86/15; the tallest tire is the narrowest of the three, and the shortest is the widest. But all of them are right around, within a few percent, of the original TR-4 tire diameter.

But, tire diameter is not everything, those wide meats still have to fit under the fenders and not bind with anything.

On one of my web pages I go very lightly in to wheel offsets and backspacing, and there are also some pictures of my TR-4 with the 205/60/15 tires mounted on some very commonly found rims.

<http://home.mchsi.com/~token/TR4Page5.htm>

-Darrell

Wheels/Wire

Subject: Play in wire wheels
Date: Sat, 17 Jun 2006
From: John Mitchell <jmitch@snet.net>

-----Original Message-----

Subject: Play in wire wheels
Sent: Friday, June 16, 2006
From: <owner-triumphs@autox.team.net>

> I've noticed that there is some play in my wire wheels when jacked off the ground. I can wiggle the tire back
> and forth, but neither the discs on the front nor the drums on the back move with the wheel. The bearings are
> all tight and new hubs on the rears. This happens at all 4 wheels. Everything is nice and tight when I first put
> the wheel on and tighten the knock-off with the wheels in the air and nothing wobbles. I drive it a few miles,
> then re-check, and I can feel the play again. The wheels are Dayton's and the adapters and wheels have less
> than 250 miles on them. I do note some scarring on the taper area of the adapters, almost like metal
> transferred from the wheel to the adapter (maybe some of the chrome plate from the wheels), even though
> everything was coated with anti-seize. I even tried a different set of Knock-offs which didn't help. Any Ideas.
> Should I start by replacing the adapters. The car drives fine, with no shaking, even at high speed. Any help
> would be appreciated.
> -John Mitchell

I just went out and jacked the car up again and gave them a few more whacks. All seems to be tight now after a short drive. I was just afraid of over tightening. Thanks for everyone's help.

-John Mitchell

P.S. They are mounted on the correct sides.

Jim Bauder wrote:

> John,
> If the play that you see/feel is between the front wire wheel hub and the ft. disc rotor and/or between the rear
> wire wheel hub and the brake drum and/or hub assembly, you have not tightened the knock-off sufficiently! If
> they are tight before you drive but are loose when you return, perhaps you have the wire wheel hubs and
> knock-offs swapped right to left side of the car!! This would cause them to loosen as you drive. The
> knock-offs should have 'right-side', 'left-side' cast onto the outside surface of the knock-off.
>
> In either case, this is not a good nor safe situation. Wire wheels will definitely loosen enough to come off of
> the car which obviously is something to be avoided. In my experience the knock-offs have to be extremely
> tight. I always used a heavy LEAD mallet to get them tight enough and not damage the chrome finish of the
> knock-off. The original style copper mallet will work but can easily damage the knock-offs.
> -Jim Bauder

Subject: Play in wire wheels
Date: Sat, 17 Jun 2006
From: "John Herrera" <jrherrera90@hotmail.com>

> I just went out and jacked the car up again and gave them a few more whacks. All seems to be tight now after
> a short drive. I was just afraid of over tightening.

Yes, one must whack the GDFS out of them with a 4 lb. lead hammer. Then they are tight enough. I don't think it's possible to over-tighten them.

-John H.

Subject: Play in wire wheels
Date: Sat, 17 Jun 2006

From: "Peter Ryner" <pryner@verizon.net>

I'd recommend getting one of the aftermarket wrenches that fit the ears. Makes it much easier to tighten and loosen the spinner and does no damage to the ears. It is about 3 ft long so you get a lot of leverage. I did find it smart to put a rag between the metal wrench and the lug.

You might want to check the bolts on the brake drum from time to time too. I had a clunk and thought it was a loose wire wheel, but several of the nuts had come loose between the adapter and the drum. This is more of a problem on the driver's side as the nuts are not reversed as the wheel spinner is.

-Pete

Subject: Play in wire wheels
Date: Sat, 17 Jun 2006
From: "Randall" <tr3driver@comcast.net>

> The factory waffled back and forth on this issue; but I believe the final decision was to coat all contact
> surfaces with "copa-slip" or anti-sieze.
>
> I looked at the Triumph Service Bulletins just the other day, but don't recall where I got it from. Maybe
> Triumphs Only?

Here it is:

<<http://www.triumphsonly.com/pages/technical/1-f-1.htm>>

-Randall

Wheels/Wire

Subject: Wire wheel lubricant
Date: Tue, 22 May 2007
From: "Randall" tr3driver@ca.rr.com

> What is the consensus of the group to put on the new splines to protect them/make it easier to get the wheels
> off? I have read a light grease elsewhere, does anyone have anything better/more specific.

I prefer anti-sieze; but I suspect it doesn't much matter what you use, as long as you remove the wheels to clean
& recoat the splines every couple of years.

-Randall

Subject: Wire wheel lubricant
Date: Wed, 23 May 2007
From: "Glenn A. Merrell" <StagByTriumph@tscusa.org>

Seems to me I always used molybdenum wheel bearing grease, extremely sparingly in a very thin coat, and yes,
using a stiff short bristle brush.

-Glenn A. Merrell

Wheels\Wire\Adaptors

Subject: Space between Lug Holes (gauge)
Date: Wed, 30 Apr 2003
From: "T. S. White" <tswrace@pacbell.net>

Hi Robert,

There are two concerns when measuring wheels. The first is the bolt pattern and the second is the "offset" of the wheel. Both of these measurements can be done with a common measuring tape.

Bolt patterns are described as the diameter of a circle and number of holes. Thus a four hole pattern on a four inch circle. To assess this measure across the center hole of your original rim from one stud hope to another center to center. Compare this measurement to the rims you are considering. If the measurement is the same, the bolt pattern is the same.

The offset of the wheel is measured from the seating surface of the inside of the wheel to the back bead of the wheel. Measure your original wheel first. Place the wheel flat on a work surface, ex- floor. Place a straight edge across the center of the rear bead of the wheel. Then you measure from the inside surface of the wheel that seat against the hub of the car to the straight edge. This measurement is the offset for the wheel.

Both measurements should be the same as your original wheels.

-Tom

Wheels\Wire\Adaptors

Subject: TR3A wire wheel studs.....
Date: Wed, 7 Mar 2007
From: "Randall" <tr3driver@ca.rr.com>

> That said, my thoughts now drift to the proper length that the lug should protrude past the lug nut for the wire
> wheel adapter. I have the "special nuts" with the bevel on both sides, and the stud protrudes past the nut
> approximately 5/16". Is this OK?

Nope, too far. I believe 1/8" is about the maximum. You can check this yourself by smearing modeling clay (or even axle grease) on the end of the stud and installing a wheel. If the stud touches the wheel at all (evidenced by marks in the clay/grease), the stud is too long.

> If it should be shorter, would it be alright to take my pneumatic cut-off tool and simply snip off the ends of
> the stud to the correct length, taking care to not tweak the threads, of course...

The factory instructions were to use a hacksaw. An abrasive cut-off wheel works fine. But if you're talking about a pinch-type bolt cutter, I'd be worried it will distort the end of the stud and cause problems.

-Randall

Subject: TR3A wire wheel studs.....
Date: Wed, 7 Mar 2007
From: "Geo & Kathleen Hahn" <ahwahnee@cybertrails.com>

Or you could use 1/4" wheel spacers. I got mine at a local hotrod shop, ISTR Moss or one of the big 3 also sell them. Spacers let you revert to discs or alloys later or from time to time. Pictures attached for your benefit. Not all agree they are a good idea, so use your own judgement.

-Geo

Wheels\Wire\Adaptors

Subject: Wire Wheel Adaptors
Date: Tue, 4 Jun 2002
From: "Mike Rose" <lytspeed@hotmail.com>

The studs that are used to mount the wire wheel splined extensions are about 5/16" shorter than those used to mount the disc wheels. Also, the nut is thinner than the nut used for disc wheels. If you don't use shorter studs and thinner nuts, the stud and/or nut will contact the inside of the wire wheel and not allow it to seat properly on the adaptor. This is not good because the wheel will be contacting only at four points (the studs and the nuts) instead of the whole circumference of the adaptor. I have seen this on a car and it makes four fairly nasty "gouges" on the inside of the wheel hub.

-Mike Rose