



VERDRIVE

The Newsletter of the Ottawa Valley Triumph Club

August, 1994

A Show-Stopper!



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- *Canadian Classic Memories*
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Cover: This month we feature the TR3A of Mike Stapleton, as it 'vogues' for the crowd at this year's Richmond show.

Editor's Note: (Julio) -

By the time you receive your newsletter, the month of September will soon be upon us. The days are getting shorter and the evenings are cooling down, but we'll still have good driving weather for some time yet. We still have two important car events occurring in the fall, as well: the British Invasion in Stowe, Vermont and the British Car Day at Bronte Creek, west of Toronto. Which one to choose?

Jane & I have decided to do the Bronte Creek show. Rumour has it they expect over 600 cars to attend! Hope the weather is good!

Editor's Note: (John) -

Here we are at the mid-point of the motoring season: some events past, some still to come. At this point in the season I'm taking the opportunity to pull my transmission to get at that infamous slipping clutch! I've recently bought a TR6 for parts, including an overdrive transmission, so I'll kill two birds with one spanner and install the o/d transmission from the parts car after the clutch is redone. You don't want to remove a TR6 transmission more times than you have to!

OVTC Executive Elections:

On to important matters. Coming up soon is the election of the 1995 Executives. Your attendance is especially requested for the October and November meetings for this reason. The October meeting will have the nominations, while the voting will take place at the November meeting. Be sure to come out if you are interested in the exciting world of an OVTC exec. (better

than being an Ottawa or Regional councilor). And who knows? - you could even find yourself as the editor of this newsletter (*this way you get 'dibs' on all cars & parts offered for sale! John*).

July 25 Meeting:

The July meeting was (as always) well attended, with around 20-25 in attendance. After a goodly round of tire-kicking outside (also as always), we moved inside for coffee and the evening's events.

First on the agenda was the introduction of our latest new members: Judy Kingsford and John Tierney. Judy is a former TR3 owner who says she regrets selling her car (she still has the second set of keys to remember it by!), but wants to belong to the club at any rate to be near to the cars (good show!). Judy says she'd love to take part in club events, even if it means helping to sell tickets, etc. Boy, could we have used Judy at Richmond, eh?! John, on the other hand, is the owner of a fine TR8. How fine? - read on!

Pat Mills mentioned that the club was sending flowers to Joan Stapleton, as Joan was just admitted to hospital for her knee operation a few days before. As well, everyone present signed a card for Joan. (I'm pleased to report that Joan is now home from hospital, and is doing quite well. She's beginning physiotherapy, too.)

The main entertainment for the evening was a tape of the 1993 Roadster Factory Picnic in Pennsylvania, courtesy of Dave Huddleson. After watching the tape, many of us were beginning to imagine partaking in the 1995 picnic, as this year's event was in just a couple of weeks from the meeting. The Picnic is not just your typical car show, by any means, and it just reinforces my

opinion that Charles Runyan is living out my dream career!

Membership Renewals:

Attention, members! (at least those of you who are due for renewal). The OVTC is counting on you to continue to belong and keep us strong as a club. While we have a strong turnout at meetings (~50%), a real good, hardworking executive, and some really keen new members this year, all members can play a significant role in the success of the club. If anyone has ideas or suggestions for improving the club, they can at any time raise them at meetings or by contacting one of the executive (including Julio or myself as editors).

By the same token, membership is voluntary, so if people feel they've had enough of the club, that's fine, and we understand. Family, career and other outside activities also have important places in our lives. We just hope that the OVTC can remain a useful interest for all members in an otherwise stressful world! I know it is for Lori and myself!

Regalia:

In addition to all the golf shirts, sweaters and hats available from Pat Mills, the club is now able to offer aluminum grille badges with the OVTC crest. A sample badge was available for viewing at the meeting, but for anyone who wasn't there last month, you can see one on a number of fellow member's cars (Julio, Clive, Joe, etc.)

Fun Run to Hart Brewery:

As I mentioned in the last newsletter, the original date I'd set with Hart Brewery for a Sunday tour conflicted with the Morgan event that same weekend. Sufficient objection was raised at the meeting to reschedule the tour, so I've arranged that

September 11 will be the new tour date. We'll have it as a usual fun run, but people can join along in whatever car they like.

Ninth Canadian Classic - Belleville:

The Classic this year seemed to be a victim of recessionary times, for despite a great central location in Belleville and senSAtional weather (it only rained early Saturday morning!), the total number of registrants was roughly 70 cars. I had thought for SURE that more Toronto & area cars, as well as American TRs (on account of the favourable exchange) would have been out, but sadly I was wrong. A shame, too, for despite my bias coming from my being a native Bellevillian, I thought people would've been out in greater numbers.

Unfortunately, I was unable to take part in most of the events, due to my car's impeccable timing at choosing when to act up! I spent the better part of the week in Belleville trying to get my car running better, and cursing my clutch! I must at this time thank Stuart Beatty for supplying me with a set of points from the trunk of his TR6, despite the fact that he himself has converted to electronic ignition! Now THAT's planning for a rainy day, Stu! After replacing the points, rotor & condenser, as well as patching a hole in one carb's diaphragm (the main culprit), the brown beast finally started to settle down.

I did discover that Belleville is a small haven for TR6s. I hadn't been in town 45 minutes on the Wednesday when a Belleville Utilities truck stops in from of my in-law's place. Turns out the driver was a TR owner who was going to be at the show on Saturday, and when he saw the car, he had to stop & check it out. We talked in the driveway for about 1½ hours! While still in the 'small world' department, I

knew that 2 doors down from Lori's aunt there sat this French Blue late-model TR6 in a garage, covered by about 6ft of fiberglass pink! One day while at Lori's aunt's, we were out back on the deck, and we were talking to the next-door neighbour as he cleaned his pool. Wouldn't you know - he owned a TR6 as well - a '75 with o/d and factory hardtop. He's had the car since new, but doesn't drive it, preferring to drive his sister's TR6 (another one altogether)! If that isn't enough - another truck stops at the in-law's on the Friday. Seems this guy has a TR6 too! - a '75 with o/d - which he'd owned since 1977, but hadn't driven since 1987 or 8! He lived just two blocks away, so I went for a look. The car was really solid, but needed a serious amount of detailing. Lo and behold, this guy gets himself a trip permit, boosts the battery, and drives the car to the concours that next day!! He wasn't even aware of a local club, so I introduced him to Stuart Beatty.

Enough of the small town gossip - back to the show! We had a rain delay for the concours Saturday morning, but we were all on the field by about 11:30 or so (an extra opportunity to do some detailing). Despite the low registration, a good cross-section of Triumphs were in attendance, including TR2, TR3 (+A), TR4A (IRS & non-IRS), TR6, and a strong contingent of TR7s & TR8s. My dad gave me of the *Belleville Community Press* from that Sunday, in which it said the TR2 (a 1955) had 227,000 original miles! Amazing!

Unfortunately, between the misbehaviour of my TR6 and various family obligations in Belleville that week, the Concours was the only major function I was able to participate in, though I wish I could've made the tour of Prince Edward County! I heard, however, that there was a minor 3-TR accident on the County tour, at a

sudden stop sign on some unfamiliar road! I understand that there were no major injuries (except of course to someone's pride, whoever was at fault).

While Lori and I did not attend the Awards Banquet (she was still in her leg cast, and we had family to see), I regret not making it. Nearly all Ottawa-area TRs won an award, it turns out. Alasdair Higginson, a former member, came first in the Concours for his GT-6 (no real surprise there, as it is one fine car). Alasdair also recorded 3rd best matched time at the track at Shannonville, proving his car both looks and drives great. Alan Manship came first in the Concours for his TR7 convertible, which is excellent considering the high numbers of 7's and 8's there. Well done!

Those cars not entered in the concours were eligible for participant's choice, voted on by all registrants. John Tierney took 3rd place honours in his TR8 - a tough category to stand out in, this year. Congratulations! What came as a shock to me was my learning that my TR6 came second in this category! Alan dropped in at my in-law's on his way home from the Banquet, saying "I've got something here for you", and producing the plaque. I was utterly shocked, considering the other fine vehicles on hand that day! I'll bet Julio would say it's the pinstriping he insisted I put on!

Well, that's all I have to say - a mixed bag of good and bad fortune for my car's inaugural show. Once I get the clutch replaced and the overdrive in, look out!

September Meeting:

This is just a reminder that our September meeting (on the 26th) will be held at the RCMP hangar near the NRC wind tunnel out at Research Road, near the international airport. Randy Hildebrandt

pulled the strings for this meeting, so be sure and attend. A map to the facility is provided on the outer fold of this issue, and a reminder will come in next month's newsletter issue (which I promise will be mailed before the meeting!)

This Month's Feature:

This month's feature article was submitted by Malcolm Brown. As you all know, Malcolm discovered that 'engine gremlins' had gotten into his TR6 over the winter, requiring him to pull down the majority of the engine. This article describes the trials and tribulations of Malcolm's re-rebuild, with Malcolm's ever-present sense of humour. Hope you enjoy reading it as much as Malcolm enjoyed living it!

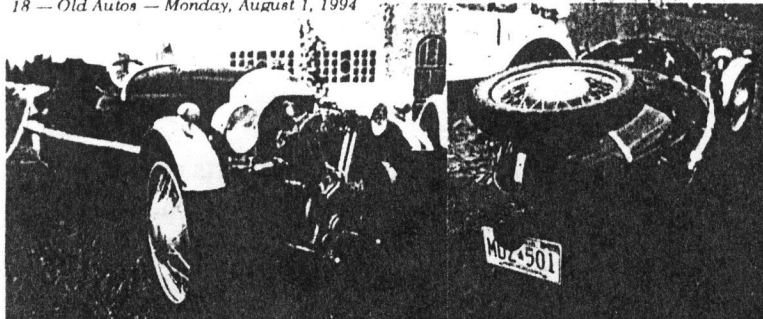
"OIL DRIPS" (by Julio)

- Well Malcolm's back on the road again after rebuilding his engine (see the article by Malcolm at the end of this newsletter). Coming back from the show in Belleville we saw his and Jeff Threader's cars outside the 'Swan' in Manotick. I guess after getting his car back together, he deserved one (or two, or..).
- Yours truly mentioned a loud front end knock on my TR3. Ear plugs didn't help, so it was dismantling time, to find the source of the problem. After taking off the timing cover (which meant the whole front end of the car) and a close inspection, the problem was found - a worn cam sprocket & tensioner. Thanks to Brian Mills' treasure chests of parts, I was able to find reasonably good replacements to put the car back on the road again. (P.S. - to Mike "I told you so" Stapleton - you were right all along on the source of the noise!)

- John Day had his TR6 parts car picked up, so for all you members who may be looking for parts, John will be gathering his inventory together. Just remember - I get 'dibs'.
- Randy's car was at Milano's to have the fenders and bonnet painted to match his doors. I was discussing with Joe at Milano's why he (Randy) was only painting the front, as the boot is still a different hue. Who knows?
- Dave Snasdell-Taylor is also back on the road again after repairing & painting his damaged door, which he almost ripped off backing it out of his garage. What some people will do for attention!
- While at the Classic in Belleville, Joe Lashley purchased himself a beautiful new blue mohair top for his TR8 - for peanuts!! He had this grin on him like a Cheshire cat (is Cheshire anywhere near Newcastle?) as he walked across the show field with this cardboard box under his arm!

Classifieds:

- Steve Lashley's 1981 TR7 convertible is still available. Remember - this car is EFI, so no problem carburettors to sort out. Call Steve (or Joe) at 726-6724.
- John Carr's TR4A IRS is for sale, for the first firm \$8,000 (\$Cn). Call John at 692-2886 to buy or view.
- Freshly rechromed front bumper for a 1974 TR6 (holes for overriders) - \$350. Call John Day @ 723-9876. (Other parts to become available as I decide what to keep and what to sell.)



Mic Pye's three-wheeled Morgan, fore and aft. Apparently, in France in 1929, this type of vehicle was clocked at going 115 mph. It was driven by a woman — no doubt, in a great hurry.

A sporting good show

by Shannon Lee Mannion
OTTAWA, ON — As dew-kissed the bonnets of European automobiles at dawn, as right as rain and as predictable as thunder after lightning, is the sports car show held at the Richmond Fair grounds on the outskirts of Ottawa.

Formerly held at Manotick and organized by John and Evelyn Carr, publishers of the now defunct Sporting Classics magazine, this event has run for four years and it looks like it will continue in perpetuity.

There had been concern that the event would die from lack of strong leadership once the Carrs bowed out, however, with the assistance of the newly formed Association of Single Marque Car Clubs, commitment was made by the majority of area clubs to participate. Thus, the show, held the last Sunday in June, was exceptionally well-attended by participants and spectators alike.

You may be thinking, four years in a row of the same old stuff, ho hum, and this is true if you feel that Triumph 3s and 4As and three-wheeled Morgans are old stuff. Actually, does it really matter that there is a lineup of 30 garden variety MGBs or more E-Types than you can shake a stick and Aus-

tin-Healey 3000s coming out of your ears? If you are like me, you are never bored looking at the cars you hope to one day own.

A great deal of planning went into this show, starting mid-winter when the Alliance of Single Marque Car Clubs began meeting and members of the local Triumph Club agreed to take on the job as helmsmen. By the looks of this year's show, they did a remarkable job because not only was there at least one of every type of sports car listed in area clubs, but many other single marque clubs contributed two or three cars.

Therefore, you may have done a double-take when in the row with the Lotuses, the Morgans and the Triumphs was a phalanx of Land Rovers and a rather sweet 1960 Austin Cambridge that had been trallered in for the event by Joe Lightstone from the Boot 'n Bonnet Club of Kingston.

Along another row, you may have smiled to see several Volkswagen Beetles from the Capital City Volkswagen Association, or have been interested in examining the amazingly complex engine of Bill Graham's three litre 164 Alfa-Romeo, before admiring the Austin-Healeys across from it.

You may recall in an earlier article on the local Morgan club that this was the group to beat as far as the competition for best display. With their name emblazoned on the trophy for the past three years, they were hungry for another win and indeed showed the door to their nearest rivals, the Triumph club. Granted, Mike Stapleton's done-up 1959 TR3, as centrepiece of the Triumph display, certainly grabbed spectator interest.

Nonetheless, how to compete against a spectacular trio of Mogs including one, a rare 1933 Aero SS MX 4 three-wheeled vehicle. With a 990 cc Matchless over-head valve, verticle twin engine and the single rear tire chain-driven using a hand throttle, this is something not often seen anywhere, much less at a country fair ground in Richmond, Ont. Owner Mic Pye thinks there may be one or two others in the region but in my years dallying at car shows, this is the first in my experience.

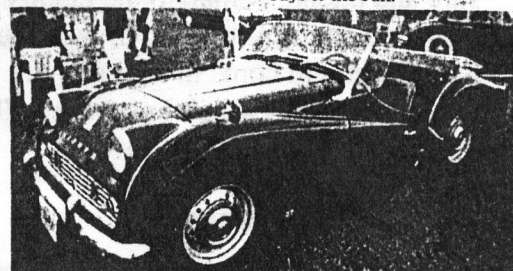
There are things in particular I like about this annual show. One is the sense of camaraderie that is present among this diverse group. I believe it is here that upcoming events such as the "Croquet Challenge" match between the Triumph club and the MG club gather momentum; it is here that the Morgan club encourages other clubs to join

them in their August 28 "Mogies on the grass" get together; and here where neophytes can talk to involved individuals about joining any one of the dozen or so clubs represented.

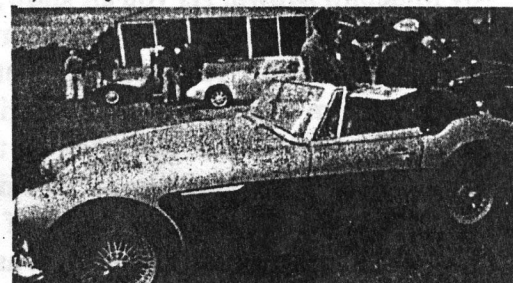
There are people whom I see only once a year at this event before they retreat and burrow into their suburban homes and hectic commuter lives. These are the wannabe sports car

owners of the fixer-uppers of a little gem they've been working on these many past years.

The Richmond show, over before supper. As the daylight gave way to dusk and the hour of evening dew approached, boots and bonnets, trunks and hoods alike, sallied from the fair grounds, drivers' faces beaming in the last slanting rays of the sun.



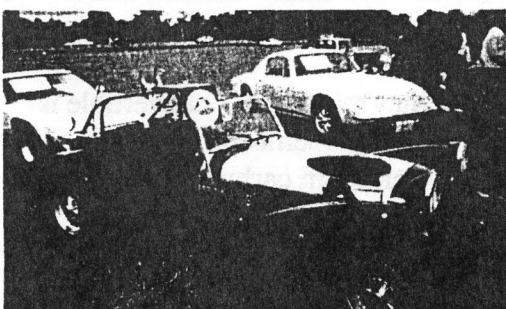
Very, very nice. Mike Stapleton's 1959 TR3 he's owned for three years.



Here, Jim Ashby holds forth on the glories of owning a 1966 Austin-Healey MK 3000.



The winning team — ecstatic members of the Morgan Owners Register of Eastern Ontario. Triumph president, Joe Lashley, grips the trophy before presenting it to Greg Kaufman, on his right, who is saying, "We won... again!"



The Lotus Club's display included Steve Meszaros' brilliant red 1963 Super 7 that was imported from Europe in 1990. He says that this is a fantastic car to drive. Lucky man!



Murray Jackson of Kanata, ON, member of the Ottawa Valley Land Rover Club, poses in front of his 1/2 ton Series 111 '88 Land Rover. Note the vanity plate that spells "LGTWGT". You have no idea how funny people sounded trying to say these consonants without the help of vowels.

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UNDERSTANDING

Exhausts

There's more to an exhaust system than meets the eye, says Geoff McAuley, after looking at the technical aspects of tuning for maximum efficiency

It would be easy to assume there's nothing complicated about exhaust systems. All you need, surely, is a pipe which runs from the engine to the back of the car? If the exhaust gases merely dribbled out of the engine at low speed, that would probably be the case.

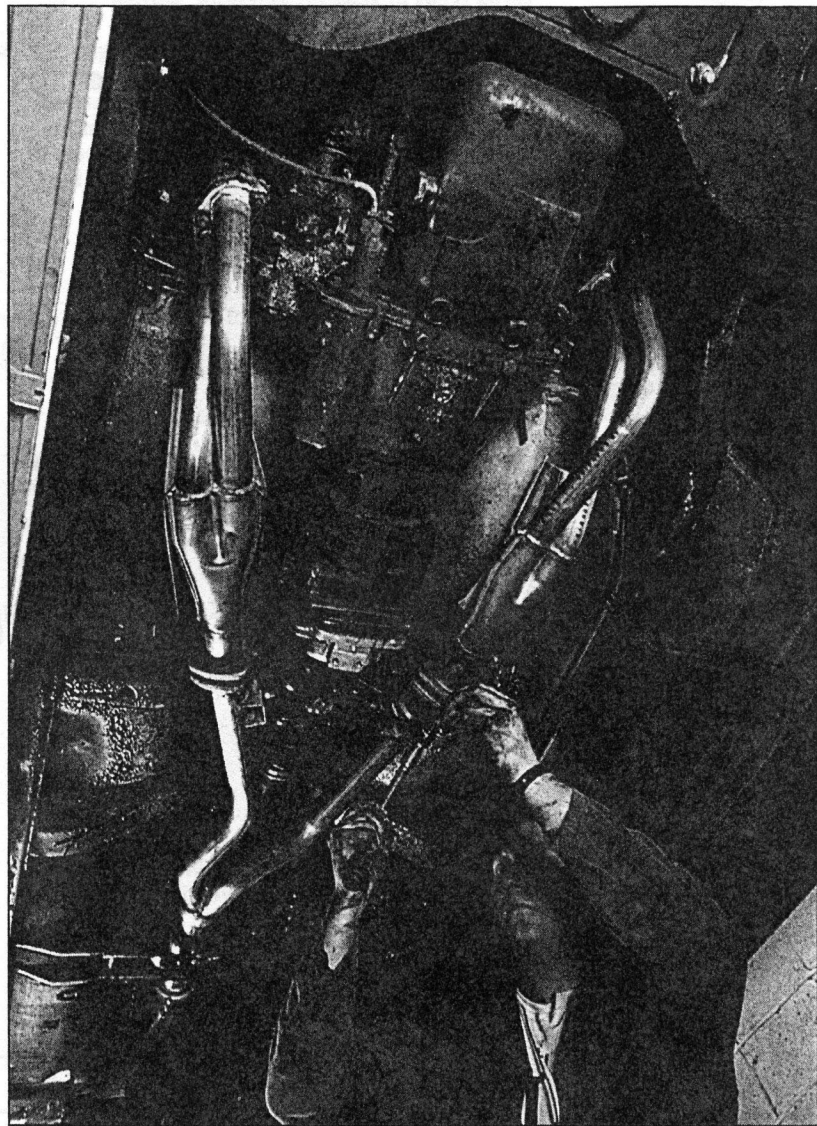
But exhaust gas velocities can reach enormous speeds, typically several hundred miles per hour, and the science of getting the best flow from a series of pipes can be extremely complex.

It's not difficult to appreciate that it's important to avoid restrictions along the path of the gases. These are particularly likely where pipes are joined by welding, clamping or flange-bolting.

It's also important to avoid sudden changes of cross-sectional area in the pipework, as these can also cause restrictions or turbulence.

Care should be taken to achieve correct alignment between the exhaust manifold and the cylinder head (or cylinder block, in the case of a sidevalve engine). As a generalisation, it's usually the case that the closer any restrictions are to the engine, the more adverse will be the effect on performance.

Performance systems – like this one, fitted to the editorial Rover Vitesse – often merge the exhaust pipes together gradually; in this case 'eight into four into two into one'



Many exhaust systems are 'tuned' for a particular application. This process involves a phenomenon known as back pressure. As a pulse of exhaust gas leaves the tail pipe, a wave of negative pressure travels at high speed back along the pipe towards the engine. The speed at which this wave moves is affected by the diameter, length and design of the pipe, the type of silencer, and the speed at which the engine is turning.

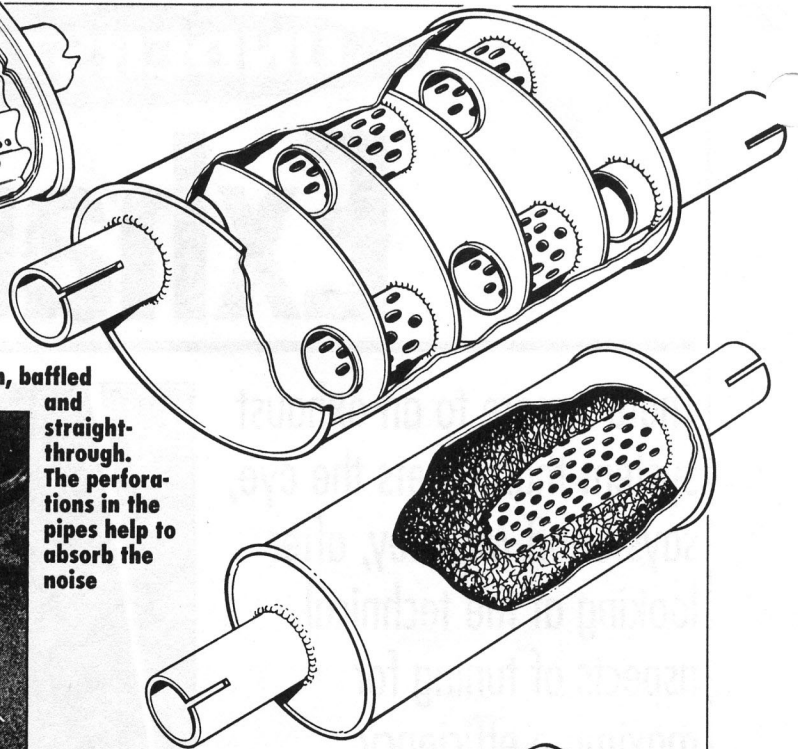
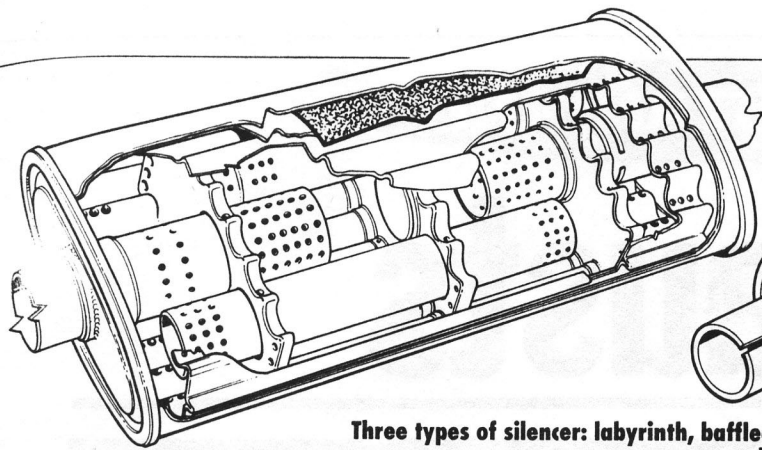
By careful design of the

exhaust system, these back pressure waves can be made to arrive at the cylinder head just as the next cylinder is exhausting, and so help to draw out the gases from that cylinder. The next back pressure wave helps the next cylinder to exhaust, and so on. The engine designer will try and arrange the maximum purging effect to occur at certain RPM, depending on the type of car.

So it's easy to realise how a non-standard exhaust system can undermine perfor-

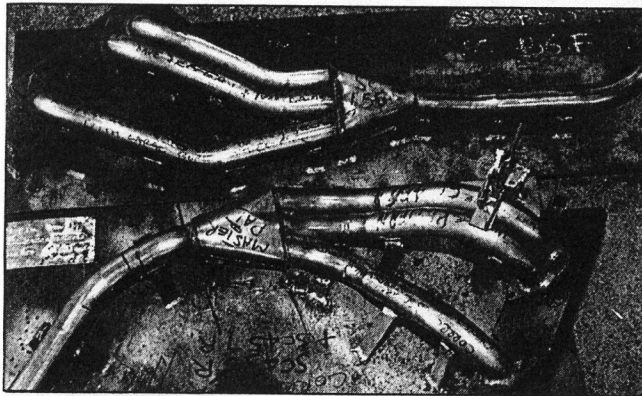
mance, but, equally, a well-designed one might enhance performance, because car manufacturers always strive for compromise between technical excellence and cost. This compromise usually means that a cast manifold of dubious efficiency is connected to a single tailpipe.

Engine performance can be enhanced considerably by providing individual pipes for each cylinder, and converging them into fewer pipes, to be eventually merged into a single one. Such systems, for



Three types of silencer: labyrinth, baffled

and straight-through. The perforations in the pipes help to absorb the noise



Tubular manifolds are tricky to design and assemble

a four-cylinder engine, are known as 'four into one', or 'four into two into one'. The length and diameter of these 'primary' and 'secondary' pipes is calculated by various formulae, which take into account camshaft timing, valve dimensions and other engine parameters.

SILENCERS

There are three types of silencer: baffled, labyrinth and straight-through.

Generally speaking, the first two provide a better reduction of exhaust noise than the third type. The labyrinth design is particularly suitable where space is at a premium. The straight-through type will usually provide a freer flow, and will often provide a slight increase in performance.

There are a few exceptions, however: for example, where the tuned characteristics of a baffled system provide better back pressure characteristics than a straight-through system.

MATERIALS

For longevity, stainless steel takes some beating. However, it can be noisier than mild steel, both at the pipe outlet and through resonance of the piping itself.

Anodised mild steel can give a reasonable life, but tends to weaken at welded joints where the protective coating might be damaged.

Flexible exhaust piping tends to be less durable than solid pipe, particularly when used in high temperature areas close to the engine.

Beware of the asbestos string-sealed flexible pipe, which might be hazardous, particularly when being sawn. Modern flexible piping no longer uses asbestos in its manufacture.

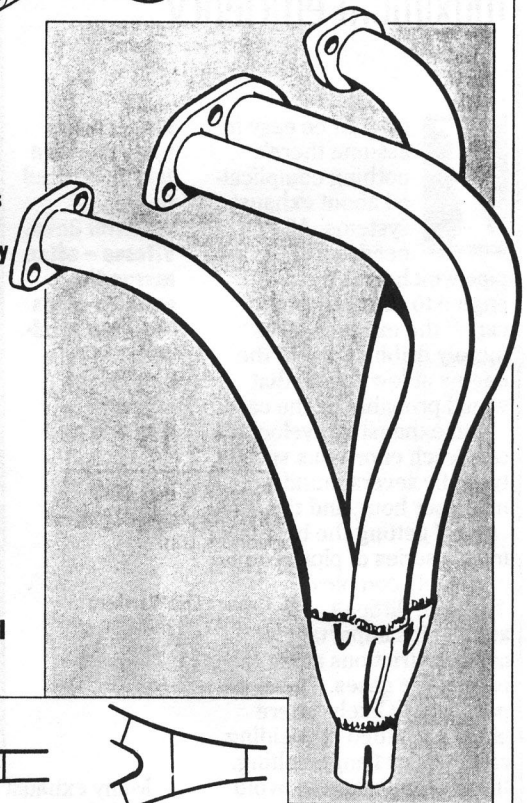
CONCLUSION

Apart from obvious areas of poor manufacture, the science of exhaust design is beyond the ken of most amateurs. So we have to rely on reputable companies to get it right.

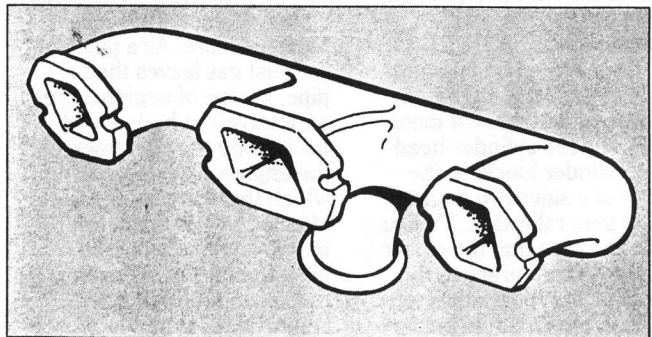
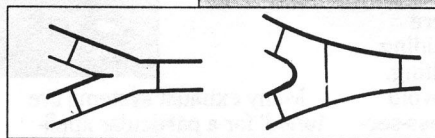
Many of our cars no longer have the benefit of original parts availability, but car club spares organisations can often ensure that subsequent manufacture is made to the correct specification.

There's no hard and fast rule for guaranteeing quality, and you don't necessarily get what you pay for. But there's nothing so good as personal recommendations, so ask around your fellow enthusiasts to be sure of getting the best buy.

Right, a high-performance exhaust should have primary pipes which are of approximately the same length



Below, pipes should merge as shown on the left, to avoid a large increase in cross-sectional area, right



Standard cast-iron manifolds are adequate, but inefficient

the "Chromobile" Lives....or
Dimple Up, Chamfer Up, Chin Up!?

While the title may be somewhat premature, I thought I would take the opportunity to relay my thanks to all those club members who have helped me through this most difficult time. Yes, as most of you are probably aware by now, my TR fired up this year with.....a knock! And a hard one at that (just like the school I went to). Naturally for me, this seemed difficult, if not impossible to believe, with only 12K MILES on a total rebuild! What is even more baffling, is the fact that it certainly wasn't there last season, and knocks, generally at least, don't manifest themselves spontaneously. **Interesting FACT:** This is the first winter I have not started my car up, at least every three or four weeks. Coincidence or not, I know what I am doing this winter.

At any rate, I sent out the cry for help and, shortly thereafter, was visited by big DOC and Lil' DOC Mills. They arrived of course, equipped with all of the sophisticated diagnostic instruments that befit a Triumph (e.g., stethoscope & long metal bar). I wasn't sure whether the metal bar was for "listening" to the engine, or whether it was for me, in case I wanted to bang out my frustrations. However, even with all of this fancy gear, the car refused to give up a definitive reason for the knock. Since it did rather seem like a lower end knock, as opposed to an upper valve train-type rattle (damn!), the next step was to drop the oil pan & start examining the lower end.

A few gnashed knuckles later, I had removed all of the rod bolts and caps. While the number one rod bearing did show some signs of scuffing, and one of the rod bolts from this cylinder did seem a bit loose compared to the others, there wasn't anything really obvious...only slightly suspect. The next step then, was to remove each piston and rod assembly, and examine them for any abnormal signs of wear. Of course this necessitated removing the head (and just about everything else that is attached to, bolted to, or is otherwise in the same general vicinity as the block and head).

Some Helpful HINTS:

- If, as I found, it appears that the head has been WELDED to the block, you can proceed as follows:
 - try a few whacks on the head (NO! I mean the cylinder head) with a heavy hammer and a block of wood;
 - if the head refuses to break loose, remove the studs. This can only be safely accomplished using the double nut approach (i.e., thread two nuts onto the stud and then tighten one against the other. Using the lower nut, you can now use a suitable wrench to extract each stud). With the studs removed, try a few more gentle persuasions with the hammer and block.
 - if the *^#@•§!!≤^`a*!! head still won't budge, place a pry bar (I used the rubber ended handle from my floor jack) into one of the ports and pry upwards.

Extra TIP: it's always a good idea to drain the block FIRST, before proceeding with the head removal.

This is an extra precaution since, when the head does finally come loose, all of the coolant in the water jackets goes rushing headlong into the open cylinder bores. Nothing like a bit of rust & scale in your bores to cap off a perfect day.

- If you are contemplating removal of the cam, you will need a puller to remove the vibration damper on the front of the crank:
 - a three bar puller, with at least a 7" spread, will do the job nicely. If you can't beg, borrow or steal one, the Rentalex on Carling avenue has quite a good selection of pullers @ \$16/day, as well as other automotive tools.
 - before removing the vibration damper, you will need to remove the steering rack U-bolts, and move the rack forward, just enough for the vibration damper to clear the end of the crank.
 - now that the vibration damper is off, you can remove the timing cover, timing gears & chain, cam lock plate, etc. However, (the plot thickens even more) before removing the cam, you will need to undo the LEFT side motor mount, and jack the engine up, just enough to withdraw the cam through the grill opening. This assumes of course you have already removed the grill.

With the engine now virtually gutted, but still in the car, I took the rods, pistons, etc., into the machine shop to have them checked for roundness, straightness, goodness, holiness, etc. While they were at it, I had them bead blast & de-coke the pistons. You can imagine my relief

when the machine shop called & informed me that *my rod was straight and true, and my big-end was round!*? Actually, I greeted this information with some dismay as it still begged the question, WHAT CAUSED THE KNOCK!

The next step then, was to check all of the mains...something I didn't really want to venture into, but knew I had to in order to eliminate the rest of the bottom end from the equation (as well as be able to sleep at night). With only a few more gnashed knuckles, I was able to remove each of the 4 main caps in turn. Like the pistons & rods, the main bearings checked out O.K. All of the crank bearing journals were also in excellent shape (except for one little knick on that same old number one rod position, which I was able to 'rub out' with a bit of 1200 grit emery). **Note:** don't forget to check that the thrust bearing is in its proper place behind the rear most main bearing cap, and the crank end-float is within spec.

So after all that, it appears all I have is one slightly scuffed rod bearing, a suspect bolt from the no. one cylinder, and a whole lot of aggravation. Only thing to do is replace all of the rod bearings, bolts, and gaskets, and begin reassembly. Oh yeh, and pray a lot too!

Cardinal RULE: The experts say you should ALWAYS replace your rod bolts and main bearing cap bolts whenever you reassemble an engine. Even at roughly \$85 for a set of rod bolts, I think this is cheap insurance.

Unfortunately, the machine shop delivered back a 'bag-o-rings', instead of organizing them in their original sets. With two compression rings per piston, plus two chrome rings and one expander rail, making up the oil control ring (hey, even my rings are chrome), that's thirty rings! While this is not a major issue, I did have some difficulty distinguishing the upper, from the lower compression ring. Both rings had a small dimple stamped on one surface; one was slightly thicker & wider than the other; and one (the smaller of the two) was chamfered on one surface. To add to the confusion, the manual is somewhat ambiguous on this topic, and tends to mix some 4 cylinder, with six cylinder data. It is also apparent, that after-market rings are not necessarily the same as the originals. According to the original specs, both rings are the same thickness (.0615 - .0625 in.) and width (.0123 - .130 in.), and both appear to have some sort of groove or chamfer on one surface. So, after consultation with the experts, the theory for ring assembly goes roughly like this:

- the larger ring (the un-chamfered one) is the top compression ring, with the dimple facing up;
- Otherwise, an original ring will have a groove (but no dimple) and must be positioned with the groove facing down;
- the smaller ring (as in the case with my rings) is the second compression ring. It is BOTH dimpled AND chamfered (on opposite surfaces), & must be positioned dimple side UP;
- Otherwise, if both rings are the same size and, as the described in

the manual, one is inscribed with the word "TOP", then this is the second compression ring. Although no written mention is made of a chamfer, the accompanying diagramme shows the ring marked "TOP", with a chamfered side facing DOWN;

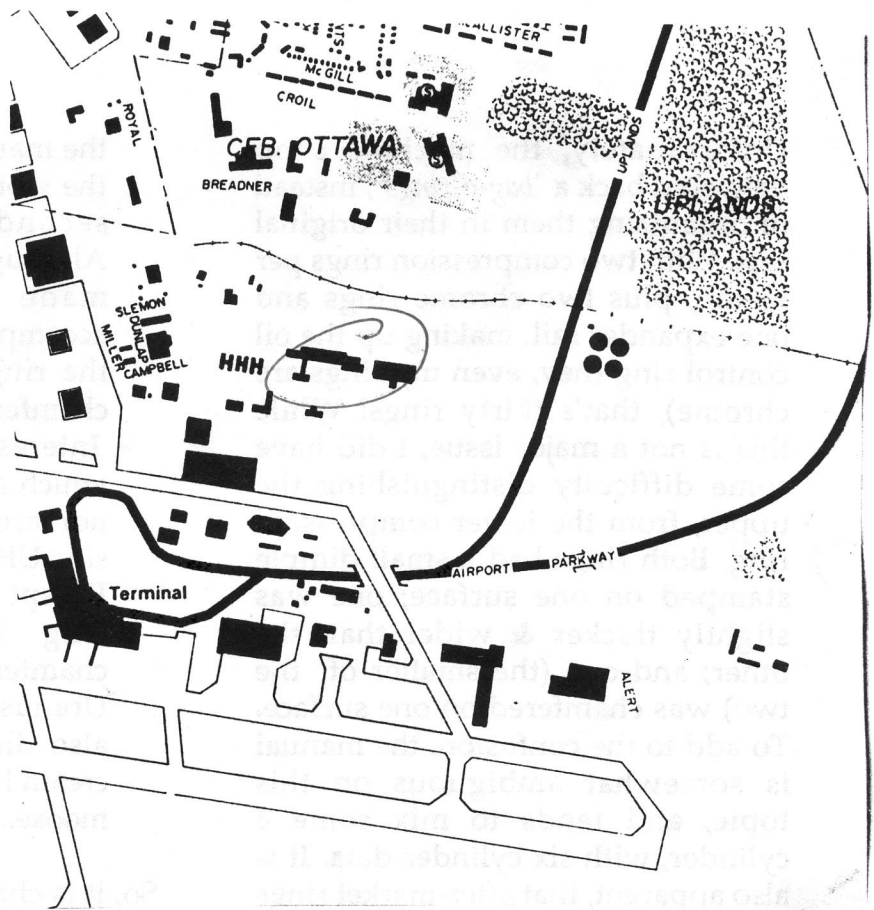
- Interestingly, for 4 cylinders, which are neither marked "TOP" nor are dimpled, it is chamfer side UP.
- Except however, if the smaller ring is dimpled but not chamfered, and the rings around Uranus are speckled, then it is also dimple side up, unless ice cream has bones then it must be a moose.....you get the picture.

So, it is chamfer side up, unless they are dimpled, then it is dimple up. Here's one for Clive. Rings marked "TOP", are always:

- a) "TOP" side UP
- b) "TOP" side DOWN
- c) aligned with Mars
- d) none of the ABOVE

At any rate, if all goes well, by the time you read this, I may be back on the road. Otherwise, I may have closed the hood for the season, while I return to my radial arm saw and wood working. Now that's fun stuff!
Cheers,
Malcolm

At right is a map of the general area of Research Road; The RCMP facility is across the road from the NRC wind tunnel, in the area indicated. See you there!



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