

## Sealing the Rear Main Seal

Every so often we run into a situation where one of the "lip-type" rear main seal conversions on the 4-cylinder TR engine will develop an instant leak, for which I have not always had an instant answer. However, with the help of one very determined Morgan mechanic we have learned a great deal more.

The English installation instructions were minimal at best and non-existent at worst. At this time there are two different seal kits available: one from Moss Motors and one from Racetorations in England. The blueprints from the Racetorations kit were right on. Unfortunately, the same could not be said for the kit from Moss. We know Moss doesn't make these units, but buy them from a manufacturer in the UK.

Our poor Morgan mechanic had a Moss unit and with real pluck, stayed with it until it did not leak at all. These are the things he found and what he did about them:

1. There was a very sharp edge at the back of the block and a radius on the corresponding portion of the oil seal carrier. With the sharp edge cutting into the alloy radius, the mounting plates would not fit properly, but would rock back and forth. Answer: round the sharp edge on the block with a die grinder, and when filling the seal holders prior to assembly he applied two narrow beads of Loctite anaerobic red cement, one line on each side of the bolt holes.
2. The inside diameter of the seal cavity was .020" too large. Answer: a double pass around the bottom of the shells with Permatex No. 3. For the other unit, a light pass at the very bottom of the cavity works well.
3. This one is easy to do. It's a test to check the oil-tightness of the seal where it comes together. Before anything is assembled to the engine, connect the two ends of the spring and insert the spring into the cavity of the seal. It will require a little force. Then place the seal into the cavities of the two halves of the alloy housing and hold the assembled unit up to a strong light source. If you see a triangle of light where the seal comes together, you will need to caulk it with some Loctite anaerobic red cement. The best way to do this is, while you are assembling the unit, use the spring inside the seal to pull it open and daub in the cement. Be sure to wipe off any excess as it will adhere to the crankshaft.
4. Be sure the alloy housing halves fit together properly. With the crankshaft removed from the block fit the two halves up to the block and install the rear main bolts. You are trying to determine if the two pieces mate up without holding the cap off the block. If they don't fit perfectly, the edges of the housing pieces can be dressed down with #600 sandpaper on a piece of glass. When the fit of the housing halves is correct you should mark the upper half to indicate the location of the split in the seal (after having determined its position with prior fitting of the seal inside the housing). It is very important that the break in the seal be straight up after the unit is assembled.

I prefer to use the following assembly method: I first assemble the seal on the crankshaft. With the block inverted on an engine stand, first put in the upper main bearings and thrust washers, lubricate them, then lay the crankshaft in, first rotating it so that the #2 and #3 throws are facing upward. Have a helper start the bolts on the rear main seal housing, with your indicator mark pointing

straight down (remember, engine is inverted).

When it comes to sealing the rear main cap, we are hampered by the fact that the Payen gasket kits available to us these days contain less of the felt sealing wick than ever before. To get a good seal you really need about 3" more of this stuff than they supply. You can get more of this felt from most parts suppliers. We have found that the best sealing compound for this is either Permatex #3 Aviation Cement or Indian Head Gasket Shellac (the latter well known and loved by old timers!). Push the cement-coated felt into the groove in the rear main bearing cap and force it in with a punch. Make sure the cement is forced out of the gap between block and cap all the way to the top, both inside and outside, and wipe off the surplus.

One last thing: place a small bead of Loctite red cement between the edges of the alloy seal housing halves where they join. Our experiments show no harm in doing this and it may actually help sealing.

Our Morgan mechanic did all this with the engine still in the Morgan, with gearbox, clutch, flywheel and oil pan removed. Will wonders never cease?!