Building Something Special

Ned Buck

Whilst my front axle has been away, I have been working on the engine crankcase and getting it ready for the crankshaft installation. The crankcase has had a hard life, and a lot of the bolt or screw threads have been abused. In particular the sump was held on with a motley collection of different sized bolts, so I decided I would renew them all. I used two different methods, one being thread inserts, and the other was to use brass rod, drilling and rethreading the holes, threading the brass rod to suit then drilling and
tapping the brass for the correct size bolt.

Before starting this work, I read through the excellent article written by Bob Garrett on engine rebuilds. I must have read it five times. One thing Bob suggests, as do others, is the introduction of an external full-flow oil filter, as the filter on the original engine is only a mesh screen in the sump. Bob explains very clearly how this is to be done by tapping the main oil gallery in the crankcase.

All of this essential work was very tedious and time consuming, and has meant the crankcase is ready for a rebuild with all the threaded holes being cleaned out with taps and any suspect threads replaced.
One thing I hadn't realised, until I read Bob's piece, was that there are two vertical oil galleries at the back of the engine which are sealed up with flat-head threaded screws, which were 'peened' over to hold them in place. I found it quite hard to push back the peening and resorted to a small cutter held in a Dremel to remove the metal holding the screws. As it happened the galleries, whilst dirty, were in fact clear.

This endoscope was quite inexpensive and has proved to be very useful, Note the dirty oil showing in the photo on the left, this crankcase was immaculate before I opened the galleries to clean them.

was able to insert my endoscope and check these quite easily. And after brushing with a pipe cleaner style brush, and lots of WD40, they came up very clean.

Before the crankshaft can be installed, the flywheel must be lapped onto it, something I had never done before as other engines have flywheels that are bolted on. I was quite nervous doing this, but I hope I have done it correctly, following reading many different internet blogs on how it should be done. (what did we do before the internet?). I checked the dimensions involved as the

flywheel must fit on the crankshaft tightly, but it is important that it does not actually press on the main rear bearing. I held the crankshaft in a vice, and after applying fine grinding paste to the taper proceeded to 'lap' the fly wheel, whilst being conscious of the need to maintain a small gap between the flywheel boss and the rear bearing inner race.

Photo far left: rotating the flywheel back and forth on the crankshaft through 180° , whilst held in the vice.
Other photo shows the finish achieved after just a few rotations with fine paste applied to the taper. Obviously this had to be cleaned off very thoroughly (no one wants grinding paste on their crankshaft!

The 'shrunk' front axle arrived next, and I wasted no time getting it back on the chassis. I now have very nice tight king-pin holes, ready to take the stub axles. I had ordered new bushes for the original semi-Girling stub axles, and have fitted them. However, they will need reaming with a ½ " reamer.

Before I can get the basic engine back together I need to work on the camshaft. I wanted to have a slightly sporty cam, and I was put in touch with Paul Bonewell who is apparently a very skilled motor engineer. He was certainly able to give me a lot of good advice. He also pointed out that the cam I sent him had a tooth missing from the oil-pump drive pinion so was effectively scrap!! Asking through the club, and also via the suppliers, I was able to obtain not one but two cams, one already slightly tweaked from Bob Garrett, and one that I picked up from Tony Betts at the Beaulieu autojumble. Paul managed to get the cam back to me very quickly, and one of my next jobs is to lap the cam pinion on to the reworked cam. (More fine grinding paste needed).

Now I needed to fit the crankshaft – which I confess I had been putting off as I had bought a new 1$5/16$" crankshaft with shell bearings, new conrods and pistons from Tony Betts.

The first job was to fit the rear main bearing, which involved pressing the outer race into the rear bearing housing. I put the bearing in my freezer overnight and it just slipped into place. I then removed it (making use of the half round slots I had cut- Thanks Bob) as I hadn't lined up the oil hole. Fortunately, I realised my mistake before the bearing warmed up, as this would have been a

Far left is the rear bearing housing showing half round slots filed into the rim to aid future removal. Left is the side view showing the oil feed hole to the bearing, very important to line this up with the hole in the crankcase.

major issue. I also drilled the hole out in the bearing housing, but I'm afraid I shied off doing the crankcase.

Fitting the crankshaft came next, and warming up the crankcase with a heat gun really helped with fitting the bearing housing into the crankcase. I then fed the crankshaft into the case and stood the case vertical with a block of wood holding the crankshaft. After I had warmed up the inner race with a heat gun I was able to press and knock this onto the end of the crankshaft until it was firmly in place. The crank was then supported, and I pushed the crank with the inner race into the outer race.
The installation of the front bearings is better covered in Bob's description, suffice to say I managed to get the two matched bearings firmly in place (one at a time) using the heat gun.
I am pleased to say the crankshaft rotated very smoothly on the bearings – having used liberal amounts of assembly lube on both bearings.

To be continued……