

## Replacing the clutch ...

Words & photos: John Waldock

**Last year my NB SE began to make quite pronounced throw bearing noises on gear changes.**

Being industrious and keen to try most things once, I asked around the Chapter to see if anyone was brave, mad keen or foolish enough to help me through the process of replacing the bearing and clutch.

Several members ran for the hills, but my good friends Rob Tanner and Allan Pryer offered to do the job. Rob is quite experienced mechanically and so drove the process, with Allan and myself acting as apprentices and sounding boards.

We began by jacking up the car and putting it on car stands. It's really important to do this carefully and use the jacking points, as these points are reinforced and can take the load.



*Mid-chassis brace*

Once the car was up, we took off all the wheels to get easier access under the car. To access the gear box, there are a number of things that have to be removed from the car. Under the car, there are a number of chassis braces and other components which are in the way. There is a mid-chassis brace, a bar in front of the brace, a brace near the differential and a bar in front of the rear brace. These are all held with large bolts, fairly easily removed but a slow process. They will have some road muck on them no doubt, and small deposits of oil too. We removed these, cleaned with

turpentine and then washed them with water. They came up pretty well.

You will also need to remove the gear knob, then the centre console, take off the gear stick and the rubber boots. This is all fairly easy, we found both the chassis boot and gear box boot had perished and needed replacing. They are about \$40 each so expect to have to pay this when you do the job.

The exhaust needs to be removed; there are three bolts that connect it to the exhaust manifold, and they can be tricky to remove so buy some lubricant spray such as CRC or WD40. There is also a bracket with two bolts that needs to be removed.

Once these items are all clear, it's time to remove the PPF ... that's the power performance frame, though we had

lots of other names for this beast, none of them printable. Firstly, you will need to unplug the speedometer wire and reversing light connection. You will see these at the back of the gearbox. You will also need to loosen the attachments for the cable that runs along the PPF. This is all fairly straight forward to do; just be careful not to break the plastic clips.

The PPF is held to the gear box by two long bolts;

when these are removed the PPF is loose at the gear box end. You would be wise to support the back of the gear box with a jack to take its weight.

At the other end of the PPF is the diff. There are two large bolts here also, harder

to remove as there are sleeves at this end of the PPF. It appears to be a pretty complicated process, and we ended up loosening the bolts, but not removing them. *You may wish to mark the bolt positions as they are important for the handling of the car.*

Since we didn't fully remove the PPF, we pulled it sideways and held it away with wire. Not ideal, but it did work and saved us some headaches with the rear bolts. You will need to remove the tailshaft; it's held on with four bolts, which allow it to be lowered and pulled away from the back of the gearbox.

Next we needed to remove the bolts around the bell housing and starter motor to remove the gear box. These bolts are not easy to access and we used a number of long socket extensions to get up in there. We went slowly and carefully as we didn't want any damage to the bolts. The gearbox should have a jack underneath it to take the weight of the gearbox as you release the bellhousing nuts.

As the bolts come away, the gearbox should now be loose and balanced on the jack. Be careful, as it could easily fall off (and damage itself, other components or you!) *and that's not good.* Lower the jack, pulling it backwards. *Ensure you have the car high up on stands,* so the gear box can be lowered and pulled backwards and out. Put the gear box to the side, but check the condition of the boot which surrounds the throw out arm. Mine was damaged and needed replacing (\$15).

You will need to remove the pressure plate to get at the clutch. It is held on with a number of bolts (eight if I recall correctly). Store them carefully as you will need them again. The pressure plate will come off, exposing the clutch and behind it the flywheel. The flywheel will also need to come off to be machined, which can be done by any good automotive engineering business. Mine cost \$62 to be machined, and it's best to have the flywheel machined so it has a new smooth surface for the clutch to bed into.

We replaced not only the clutch, but also the throw bearing and the pressure plate itself, as the old one was damaged when the throw bearing failed. You should also look at the rear engine seal, as this can leak oil and its easy and cheap to replace while you're there.



*Braces, exhaust and tail shaft removed*

# ... or clutching at straws!



*A very chewed-up pressure plate*



*What a mess!*

Now we can install the new clutch. The flywheel needs to be bolted back on. You will need a tension wrench as these bolts need to be tensioned to factory specs. We also used a little *loctite* on the bolt threads so they can't come loose during the life of the clutch. *Make sure you have at least one, if not two or three MX-5 workshop manuals on hand as they give really good tips on how to avoid the pitfalls. They also should have the bolt tensions numbers in them.*

The flywheel goes on with six bolts. Add the bolts in pairs and tighten them in pairs too.

The next stage is to use the clutch alignment tool to slide the clutch and pressure plate into place. We found a really useful clutch tool from the UK which holds the clutch and pressure plate together as you slide them into place. As these are centred, they need to be aligned *carefully* or excessive vibration can occur. Bolt the pressure plate back



*New clutch and bellhousing, with clutch alignment tool*

into place. Reattach the bolts, again using a tension wrench.

The next step is to put the gear box back in. You will need to clean the clutch fork arm and put it back in place with the rubber boot. *Do this before you put the gearbox back in; you will need some room to do it.* Slide the throw bearing onto the spindle. We put some general grease on the spindle to make sure the bearing slides along nicely. Now slide on the new boot.

The gear box goes back on in the reverse way you took it off, be careful using the jack as its a heavy thing. It took a little jiggling to locate the

spindle on to the clutch, but it went in with a little work.

**Note:** there is a bracket on the driver's side associated with the starter motor, and this needs to be in place, or you will have to re do the bolts and that's a hassle (*just ask Rob T*).

Once the gear box is in place, the other components go back on in reverse order. We cleaned all the underneath and bracing so that they went back on nicely. We noted that the universal joints on the

tailshaft were a little stiff and had a small groove, but after some consulting online this appears to be normal.

As for the brand of clutch fitted, I purchased an Exedy "stage one" racing clutch, as I wanted to make sure that I had a heavy enough clutch as the SE is of course a turbo. Post-fitting, I have found the clutch to be nice and firm, but certainly not heavy. Exedy also make a heavy-duty clutch which would have served the purpose just as well. I have had the SE back on the road for two days, and there is a little bedding-in vibration on downshifts, but overall the clutch



*Throw bearing*

seems to be working very well so far.

**Some final thoughts:** You will definitely need to have a large assortment of tools. We used a lot of socket extensions to get to some of the bolts. You will also need a torsion wrench, mallet and hammer and definitely a clutch alignment tool.

A note of caution: I did let my throw bearing get pretty much chewed up before I replaced it and I definitely don't recommend that you drive your car to the point that the bearing fails. The failed bearing parts made a mess inside the clutch and bellhousing as the photos illustrate only too well. ■