

Slipping starter motor clutch

by Peter Charlton

There are several reasons why the clutch would slip on the starting motor:

1/. **Worn spring.** There is a powerful spring in a cassette within the clutch assembly, like all springs they eventually become weak and need to be replaced.

2/. **Oil ingress.** Oil that has migrated from the engine seal can soak the friction pads making them slip under load.

3/. **Worn friction pads.** Because of wear on the friction pads they become less effective. Also, the pads may form a glazed surface that also makes the pads less effective.

4/. **A "tight" engine.** It may be that there has never been a problem with the starting motors clutch until engine work has been completed. It could be the case that the engine is now "tight", perhaps after a re-bore. When warm, the engine has more cylinder friction increasing the energy required to turn the engine.

4/. **All, or a multiple of the above.** Two, or all of the above conditions.

The starting motor has to be removed, so that an inspection on the clutch can take place. There are several designs of starting motor and starting motor clutch, so there is more than one way to remove the starting motor. The 20/25 starting motor in this example can be removed in its fully assembled state.

Removal of starting motor.

Mark with a scraper between starting motor and engine, to ease alignment on re-assembly.

Remove electrical feed.

Lift floor boards.

Remove the three bolts attaching starting motor to engine.

Remove engine oil filler, and undertray supports.

Starting motor can now be pulled out from the engine with a bit of wiggling.

Inspection.

Place starting motor and clutch on the work bench.

Peen back the lock washer and remove the castellated nut at the end of the shaft holding on the starting dog. With the correct sized "C" spanner remove castellated nut.



The Bendix drive shell needs to be disassembled to inspect the internals of the clutch. This is done by compressing the internal pressure spring, then the externally castellated clip can be removed from the "fingers" of the Bendix drive shell. This is done using a small screw driver, carefully prizing the "castles" from the fingers one at a time until all are free. Remove clip and release the compression on the holder.

The "cap" of the holder can now be removed and the holder body pulled back to reveal the: spring, cassette, steel friction plates, fibre washer and cork friction washers.

Take a photo of the Bendix assembly to aid re-assembly.

Inspect the cork friction washers and make your own decision on what parts need to be replaced, if any. The cork friction washers can be replaced with a like product, there is a "Ferodo" type replacement product now available.



As it is very difficult to assess the effectiveness of the strong spring in the cassette, I would suggest replacing at least this component.

Replacing the spring in the cassette.

A bolt and nut can very easily do this job. Find a nut and bolt with two washers that can fit into the centre hole of the cassette. Screw the nut and bolt in this will compress the spring allowing the circlip holding the spring in place to be removed by gently prizing it out with a small screwdriver. Spring can now be removed.

Reassembly. This is the exact opposite to removal. Place the spring in cassette and then compress spring with the nut and bolt, when sur clip groove visible, fit sur clip. Untighten the nut and bolt, this will put tension back on the circlip.

Assembling the friction washer holder.

Re-assemble all the parts into the body of the holder, check your photo to make sure that no parts are missed out and in the correct order.

Place the cap over the fingers and then compress so that the slots on the fingers can be seen as the cap is being compressed.

Fit the externally castellated spring clip into the slots on the fingers.

Release the compression on the holder cap so it can rest on castellated spring clip.

Attach dog castellated nut and lock washer. Tighten nut then peen over the lock washer.



Testing

The starting motor is now ready to be fitted back to the car. There is a simple test to see if the clutch will slip once fitted. This is not a fool proof test, but will show if the clutch would defiantly slip.

Hold the fly wheel dog in a vice or use Mole grips. Using a "C" spanner on the end castellated nut, "tighten in" the clutch assembly on the spline. Increase pressure on "C" spanner, if the clutch slips, then the unit would slip when fitted to the car.



Replace starting motor to engine.

With some wiggling, fit starting motor and clutch into engine.

Line up scraper mark and then fit the three holding bolts and end cap. A good smear of grease on the roller bearing.

Fit oil filler and under tray supports.

Attach power cable to starting motor.

Test motor and clutch, by starting car.

Compressing the clutch holder can be very fiddly. Two pairs of hands can come in handy. Using the edges of the vice jaws, the holder can be compressed. A small screwdriver placed into the slots of the figures to stop holder from expanding again.

I found a solution using four bent brackets held in place with two pipe clips. Then using two pairs of mole grips the Bendix drive shell can be compressed uniformly

and externally castellated spring clip fitted by only using one pair of hands.



A "get home" solution

If your starting motor has just start to slip there are a couple of ways to get home:

- 1/. Turn on ignition and used crank handle to turn, then start car. (This can be an effort.)
- 2/. Use crank handle in conjunction with the starting motor to start car. (A two-person operation.)