Blue Print – MINI Clutch Replacement

The BMW MINI has been available in many different powertrain variations since its launch in 1999 using various engine and transmissions from other vehicle manufacturers. This includes petrol, diesel, hybrid, and electric.

The featured vehicle, a MINI One Countryman, was fitted with the popular 1.6 petrol PSA group engine, which can be found in many Peugeot, Citroën, Opel/Vauxhall and BMW models. This example was in the workshop for an annual inspection. It was reported to the owner that the clutch was starting to slip. (Fig 1)

Figure 1

After getting the vehicle into the workshop and onto the ramp, the bonnet was opened, and the battery was disconnected. This is located in front of the bulkhead under an access panel below the windscreen. Working from the top, the coolant expansion tank was removed and was put to the side. The fuse box cover and engine ECU retainer were then removed. The air intake hose and vacuum pump plastic pipe were removed as well. With these components taken off, the gear selector cables were revealed. The cable bracket could then be unbolted, and the cables could be unclipped from the selectors. One aspect that was not and should not be forgotten is to disconnect the reverse lamp switch connector. It should also be secured so it does not get in the way. (Fig. 2)


Figure 2

The bell housing bolts located at the top of the transmission need to be loosened and removed, noting the location of each bolt. Next, the engine and transmission needed to be supported with a support beam – or a transmission jack – before the transmission mounting bolts were removed.

With the vehicle raised, both front wheels needed to be taken off, followed by the driveshaft retaining collar nuts. Then, there were a couple of options: firstly, if the complete transmission is to be removed, the front sub frame with steering rack and front suspension wishbones need to be removed. Alternatively, there is just enough room to separate the transmission from the engine in order to replace the clutch without needing to remove the transmission completely. For this MINI, this is the option that was followed.

First, the transmission oil drain plug was undone to drain the oil. Then, both front lower suspension ball joints were released from the hubs, leaving enough movement to remove both front driveshafts from the transmission using a suitable lever. Once removed, the driveshafts could be removed from the hubs.

Next, the starter motor was removed and retained securely, along with the clutch slave cylinder. This also includes the hydraulic pipe that is clipped to the top of the transmission. Before removing the last of the bellhousing bolts, the transmission neutral switch connector needs to be disconnected and the wiring loom needs to be unclipped. (Fig. 3)

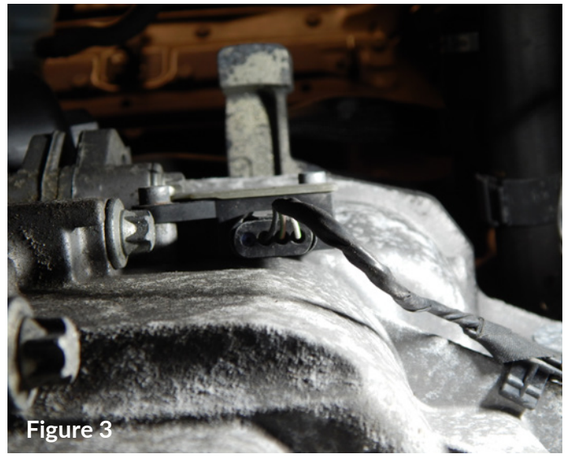
Figure 3

With the transmission supported, the transmission mounting retaining bolts were removed. Then, the rest of the bellhousing bolts were also removed. The transmission was separated from the engine, leaving enough room to access the clutch. The six pressure plate retaining bolts were undone and the clutch was removed and inspected. The clutch had endured a hard life, as there was evidence of hot spots and cracks in the mating surfaces of both the pressure plate and flywheel. Because of this, it was decided to replace both the three-piece clutch kit and the flywheel. The flywheel was taken off, leaving the reluctor ring in place (Fig. 4). This is only retained by the flywheel.


Figure 4

The release bearing was removed, and the sliding surface of the guide sleeve was inspected for wear and was lightly greased before fitting the new release bearing. The new flywheel was fitted with new bolts and tightened to the manufacturer's torque settings. This was followed by the installation of the new friction disc and pressure plate.

The transmission was aligned with the engine and bolted back into place, along with all other components that had been removed. The driveshaft seals were inspected before refitting the driveshafts, including new retaining hub nuts. Then, the transmission was filled with fresh oil through the level plug located at the rear of the transmission, close to the right-hand driveshaft.

The clutch slave cylinder was replaced as a precautionary measure and was bled to remove the air with a pressure bleeder.

The vehicle was lowered, the new hub nuts were tightened, and the wheels were refitted. All parts on top of the transmission were also refitted and the battery was reconnected.

The vehicle was road tested for smoothness of operation before being handed back to the owner.

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