



Alistair Mason, Schaeffler

LuK Clutch Academy

MINI Cooper D

In this month's Schaeffler LuK Clutch Academy, REPXPERT Alistair Mason is replacing the clutch on a 2011 MINI Cooper D (R56). The vehicle was recovered to the workshop due to a non-start issue, quickly diagnosed as a clutch fault. The clutch pedal could not be pushed to the floor to activate the clutch switch for the Stop/Start system. With a book time of 6.85 hours, it makes a great repair for any independent garage.

Workshop equipment

- Vehicle lift (2 post is ideal)
- Engine support
- Transmission jack
- Clutch alignment tool

Gearbox removal

With the vehicle still sitting on the ground, slacken the front wheel/locking bolts and both the front hub/driveshaft nuts. Open the bonnet and disconnect the battery earth lead, remove the engine cover and then the air box assembly. This gives good access to the engine ECU, which is removed as one unit by disconnecting the two multiplugs and the ECU bracket retaining bolts located under the fuse box (Fig 1).



Remove the engine turbo boost pipe by first unclipping the coolant hoses from the top area and slackening the retaining clip on the rubber hose and after raising the vehicle lift and removing the engine undertray, slacken the boost pipe retaining clip on the intercooler and release the boost pipe from the rubber intercooler hose. Lower the vehicle lift and remove the turbo boost pipe, which gives good access to the top of the gearbox (Fig 2).



Disconnect the gear linkage cables, unbolt the cable retaining bracket, disconnect the reverse light switch multiplug and then remove the upper bell housing bolts. Raise the lift to waist height and remove both front wheels and hub/driveshaft nuts, then raise the ramp to gain access to the underside.



The front subframe must be detached. Remove the complete exhaust assembly, then disconnect both bottom ball joints (Fig 3), both anti-roll bar links and unbolt the power steering rack from the subframe. Ease down both plastic aero floors to access the



subframe's rear bolts (Fig 4), remove the lower pendulum engine mount (Fig 5), then support the subframe with a transmission jack,

remove the subframe bolts, ease the subframe backwards and, once free, lower on the transmission jack and stow safely.

Drain the gearbox oil and then remove both driveshafts. When removing the O/S driveshaft, the support bearing mounting must be unbolted from the engine block. Remove the clutch slave cylinder and stow away from the gearbox, disconnect the multiplug from the gear recognition switch on the front of the gearbox, unbolt the power steering pipe retaining brackets and then position the pipes away from the gearbox. Remove the lower bell housing bolts leaving one easily accessible bolt to support the gearbox. Support the engine with an engine support, unbolt the gearbox mounting from the gearbox, support the gearbox with a transmission jack and remove the final bellhousing bolt. Lower the engine and gearbox slightly to gain more clearance to aid gearbox removal and then ease the gearbox away from the engine. When the gearbox input shaft is clear of the clutch, lower the transmission jack and remove the gearbox.



Fault diagnosis

On inspection of the clutch and, more importantly the release system, the fault in this example was identified as the clutch release arm, which had cracked through (Fig 6), causing it to flex and hit the clutch pressure



plate (Fig 7) and therefore was not able to provide a full master cylinder stroke.

At this point of the repair, the customer was advised of the repair costs for a new clutch, dual mass flywheel (DMF) and a new release arm, and authorisation to carry out the repair was given.

Clutch replacement

Unbolt the clutch assembly from the DMF and then remove the DMF, inspect the back of the engine for any oil or coolant leaks that could contaminate the new clutch and DMF and rectify as required.

Check the parts for any service bulletins and obtain the correct torque settings by using the Schaeffler REPERT App, then degrease the face of the new DMF using clutch and brake dust cleaner, and replace the bolts with the new ones provided in the Schaeffler

kit, torquing them to the manufacturer's specification.

Turning to the gearbox bellhousing area, with the release arm already disconnected, remove the clutch dust using clutch and brake dust cleaner, check the release arm pivot point and release bearing guide tube for any wear and replace if required. Mount the new release bearing and arm onto the gearbox. Apply a light smear of high melting point grease to the splines on the gearbox input shaft and then mount the new clutch plate onto the input shaft, this will evenly distribute the grease and confirm the clutch plate is the correct fitment. Remove the clutch plate and wipe off any excess grease.



Degrease the face on the new clutch pressure plate with clutch and brake dust cleaner, then, using a clutch alignment tool

(Fig 8), mount the new clutch plate noting the "Gearbox Side" identification, align the clutch pressure plate onto the DMF dowels, insert, tighten, and torque the clutch bolts.

Gearbox replacement

Ensure the engine to gearbox alignment dowels are located in the engine and that pipes and wires are clear, so not to get trapped when the gearbox is installed. Using the transmission jack, ease the gearbox into position and locate onto the dowels. Insert and tighten an easily accessible bellhousing bolt, and using the transmission jack and engine support, align the gearbox with the gearbox mounting and tighten in position.

The remaining installation is in reverse order of removal, but remember to torque the required bolts to the manufacturer's specification. After the battery lead has been reconnected, reset all electrical consumers and finally, always carry out a road test to ensure a high-quality repair has been completed.

Information on Schaeffler products, fitting instructions, labour times and much more can be found on the REPERT workshop portal - www.repxpert.co.uk - the REPERT app, or by calling the Schaeffler REPERT hotline on (+44) 1432 265 265.



IT'S BETTER TO GO ALL INCLUSIVE



A LuK RepSet DMF contains every part you need to carry out a professional repair in just one box, all in genuine OE quality. It also includes a bonus points coupon that you can exchange for technical know-how, tools and clothing on REPERT, Schaeffler's website and app knowledge base for workshop technicians. All components are precision matched to work together for a fast and efficient installation, so you can save time, effort and money by getting it right first time - every time. Don't risk your reputation by using mis-matched clutch parts - for a completely professional repair fit LuK.

<https://aftermarket.schaeffler.co.uk>
www.repxpert.ie

SCHAEFFLER

Automechanika Messe Frankfurt | Forum A02 | 13-17 September 2022