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LuK Repair Solution for Wet Double Clutches

Removal and Installation
Special Tools

Audi, SEAT, Škoda, Volkswagen
6-speed-transmission 02E (DQ 250)
7-speed-transmission 0BH, 0DE, 0BT, 0DW (DQ 380/81, DQ 500)

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Our products are based on a comprehensive systems approach. Innovation, technical expertise, and the highest material and manufacturing quality make us not only one of the leading development partners for vehicle manufacturers, but also a pioneering provider of value-retaining spare parts and complete repair solutions for clutches and clutch release systems, engine and transmission applications, and chassis applications in original-equipment quality – right up to the appropriate special tools.

For over 50 years, we have offered everything needed for transmission repair under the LuK brand. Besides the LuK RepSet family and products for the entire hydraulic release system for professional clutch repair, the portfolio also includes the dual mass flywheel and components for expert repair of transmissions and differentials. It also includes professional solutions for transmission repair of commercial vehicles and tractors.

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1 Damage Diagnostics for the Double Clutch System

1.1 General Instructions for Testing the System

Before repairing the double clutch, some fundamental questions must be clarified with the customer in order to narrow down the error pattern as precisely as possible.

If the vehicle is still drivable, we recommend carrying out a test drive. The customer should be the driver in order to demonstrate any possible malfunctions.

DOUBLE CLUTCH, ENGINE SIDE

DOUBLE CLUTCH, GEARBOX SIDE

Specific Questions for the Customer

- Exactly what is not working or what is the specific complaint?
- How long has the problem existed?
- Did the problem start suddenly or did it develop gradually (slowly)?
- When does the problem occur? Sporadically, often or always?
- What driving condition is the vehicle in when the problem occurs? For example, when starting, accelerating or decelerating, or when the engine is cold or warm?
- What is the mileage of the vehicle?
- Is the vehicle subjected to extraordinary loads? E.g., towing a trailer, high load capacity, frequent hill climbs, operated as a taxi, fleet car, rental car, driving school?
- What is the driving profile? For example, urban vehicle, short journeys, intercity, highway?
- Have repairs already been carried out on the clutch/transmission system? If so, at what mileage? What was the cause of that complaint? What repairs were carried out?

General Tests on the Vehicle

Before commencing with the repair of the vehicle, the following points should be checked:

- Defect code entries in the control unit (engine, transmission, clutch, comfort, CAN bus, etc.)
- Battery power

1.2 Wear Test

Clutch wear cannot be checked with a test drive. The transmission and clutch electronics continuously monitor the system. Malfunctions are displayed in the instrument cluster.

1.3 Visual Inspection

Prior to each repair, the area of the clutch system must be checked for leaks and damage as a matter of course. Damage caused by parts that have broken off or oil leaks due to defective seals or sealing rings must be rectified before the clutch is replaced.

1.4 Noise

For the noise rating of the area of the double clutch, it must generally be ensured during a test drive that no noise is emanating from surrounding components such as the emission system, heat guard plates, engine suspension damping blocks, auxiliary equipment, etc. The radio, air conditioning and ventilation must be switched off during the noise investigation. A stethoscope can also be used in the garage, for example, to locate the source of the noise.

1.5 Diagnostics

You can diagnose the transmission electronics and clutch electronics. Prior to each repair, the contents of the error memory must be read using a suitable diagnostic tool and, if possible, retained as a print-out. The error memory report provides an initial overview of the system errors and forms the basis for further repair measures. The report provides the data required to assess the error pattern (important when contacting the Service Center or in case of a warranty claim). Finally, once all work has been completed on the double clutch, a basic adjustment of the clutch system must be performed using a suitable diagnostic device.

2 Description and Scope of Delivery for the LuK RepSet 2CT

The LuK RepSet 2CT (Double Clutch Technology) includes all the components required to replace the double clutch transmission, as this system must always be replaced as a whole.

A combination of used parts and new parts from the LuK RepSet 2CT is not permitted. Otherwise malfunctions and defects cannot be ruled out.

1 Wet double clutch
2 Snap ring for cover
3 Washers
4 Clutch end cap
5 Snap ring for clutch
6 Pilot bearing

3 Description and Scope of Delivery for the LuK Special Tool

The LuK special tool (part no.: 400 0540 10) is an essential piece of equipment to enable the correct removal/installation of the wet double clutches in 6-speed and 7-speed transmissions.

Due to the restricted mounting space, the double clutch cannot be removed from the bell housing and re-inserted again by hand. Therefore, the set contains two special installation tools for this purpose.

A retaining pin is required to enable the professional installation of the new double clutch. Unlike comparable tools, this is designed in such a way that additional mechanics are not required for the installation process. After installation, the axial clearance of the double clutch has to be adjusted using washers (included in the LuK RepSet). The necessary measuring tools as well as their mounts on the transmission housing are also included in the tool kit.

1 Slide hammer
2 Dial gage with stand
3 Holder
4 2 plugs
5 2 mounting hooks
6 Retaining pin for DQ 250
7 Retaining pin for DQ 380/81 and DQ 500
8 Mounting sleeve for DQ 250
9 Collet
10 Mounting sleeve for DQ 380/81 and DQ 500


REPXPERT
MENU
ARBEITEN
LERNEN
INFORMIEREN
PRODUKTKATALOG
TRAINING
AKTUELLES
FEEDBACK
SERVICE TIMES
EVENTS
LESEZEICHEN
SUPPORT
LuK
FAG
INA
RUVILLE

4 Removal and Installation the Double Clutch

4.1 Repair Instructions

Valid for:
- DQ 250 6-speed transmission, e.g. 02E, etc.
- DQ 380/81 7-speed transmission, e.g. 0DW, 0DE, etc.
- DQ 500 7-speed transmission, e.g. 0BH, etc.

With a wet double clutch in Audi, SEAT, Škoda and Volkswagen.

In combination with:
LuK RepSet 2CT

Using the LuK special tool:
Part no.: 400 0540 10

Important instructions for proper repair:

- Repairs may only be carried out by specialist staff and using suitable garage equipment
- Due to on-going technical developments in the series by the vehicle manufacturer, the repair process and the special tools required are subject to change e.g. gage dimensions
- A repair must always be carried out using the latest repair instructions and the appropriate special tools

The latest data and information can be found at: www.repxpert.com

- When replacing the clutch, we recommend that you check the dual mass flywheel (DMF) and replace it if necessary. If the DMF is to be re-used, the tooth profile on the connection to the clutch must not be worn
- As is the case when repairing a standard clutch, when replacing the double clutch, the pilot bearing must also be replaced (in the LuK RepSet 2CT)
- Before mounting the double clutch, the transmission input shafts must be cleaned thoroughly and checked for damage
- Before installing the transmission, the gearing on the DMF or on the input hub must be greased. The choice of lubricant is determined primarily by the information provided by the vehicle manufacturer. In the absence of any specification, temperature-resistant and age-resistant high-performance grease can be used
- Check that the shim is positioned correctly on the engine and replace it if damaged (if available)
- Damaged or missing fitting sleeves must be replaced
- Always use a suitable lifting device to remove and install the transmission. Guide the engine and transmission together manually until the full surfaces of the housing are touching before screwing together
- After installing the clutch and transmission, the basic system settings must be made using a suitable diagnostic device
- Each LuK RepSet 2CT must be installed in full. A combination of used parts and new parts from the LuK RepSet is not permitted
- Oily and/or dirty transmission parts must be cleaned before using new components. Cleanliness must be ensured throughout the entire repair process

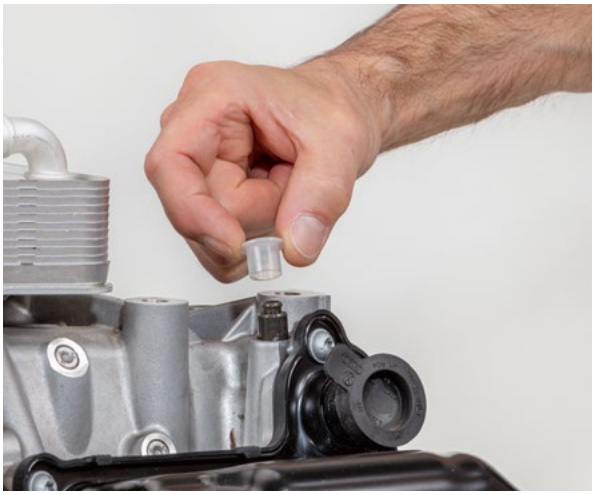
Important:
Double clutches or dual mass flywheels that have been dropped must not be re-fitted.

4.2 Removing the Double Clutch

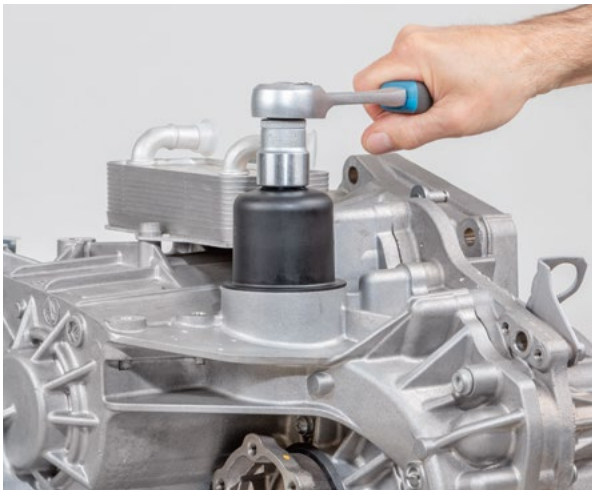
- Drain the transmission oil
- Remove the transmission in accordance with the vehicle manufacturer's specifications

DQ 250 transmission:

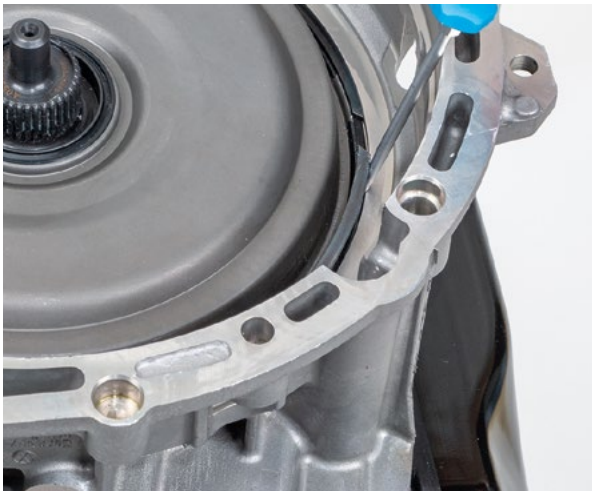
- In the mounting position, residual transmission oil can escape via the vent. To prevent this, the vent valve can be removed and the opening plugged using plug KL-0500-6071



- Replace the transmission oil filter
- Position the transmission vertically using a mounting bracket or on a flat work surface

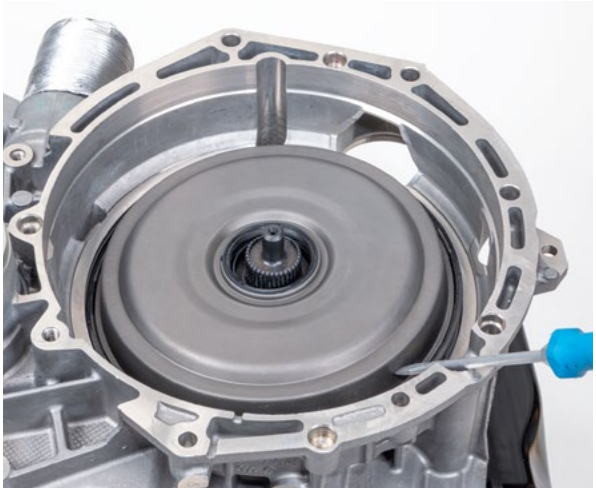


- Remove the snap ring from the clutch end cap using a flat-head screwdriver



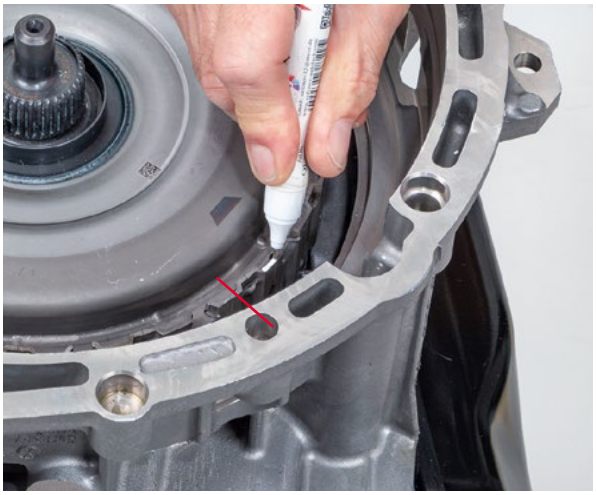
- Pry out and remove the clutch end cap using a flat-head screwdriver

Note:
Once removed, the clutch end cap and snap ring must not be re-used!

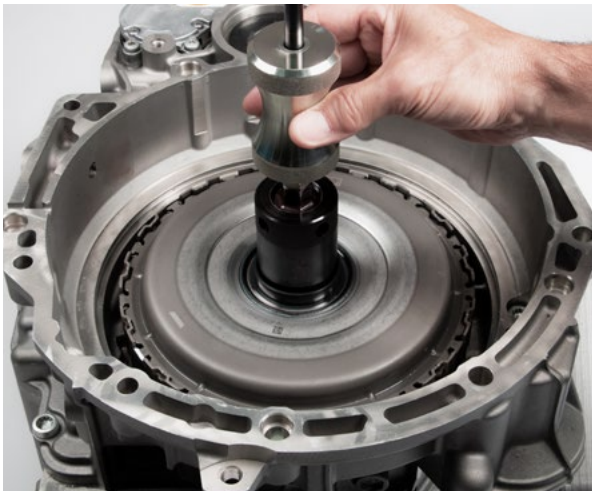


- Pry out the snap ring on the driving disk using a flat-head screwdriver

- If the double clutch is to be re-used, the driving disk and the plate carrier must be marked accordingly. If these markings are not present, they must to be applied subsequently



- Lock collet KL-0500-900 by turning the sleeve in the lower shaft notch of the driving disk gearing
- Screw slide hammer KL-0049-100 into the collet and remove the driving disk



- Remove the snap ring on the transmission input shaft

DQ 380/81 and DQ 500 transmission:

- Keep hold of the retaining ring for subsequent measurements

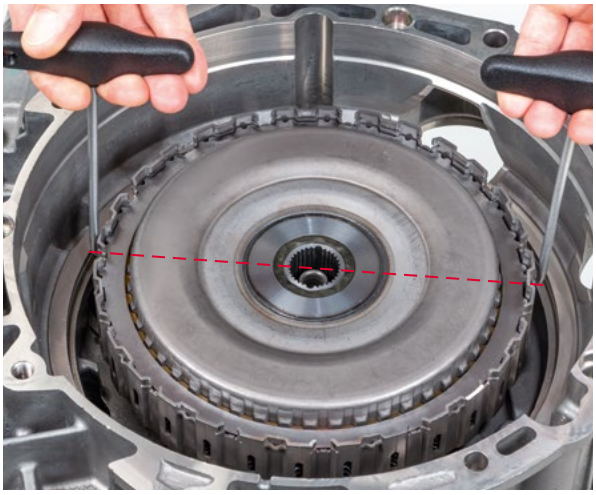
DQ 380/81 and DQ 500 transmission:

- Remove the washer

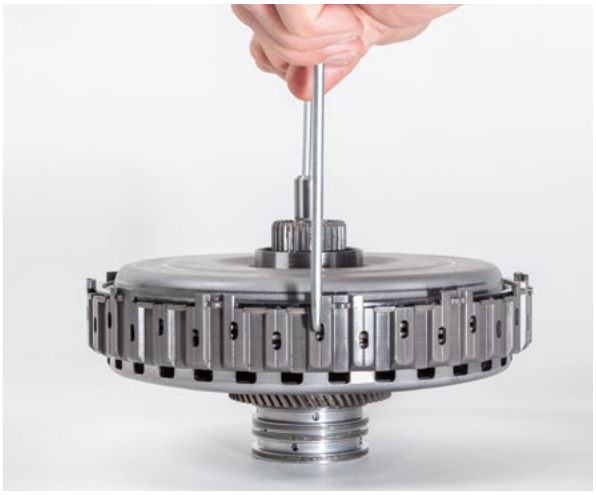
DQ 250 transmission:

- Remove the oil pump shaft from the transmission input shaft

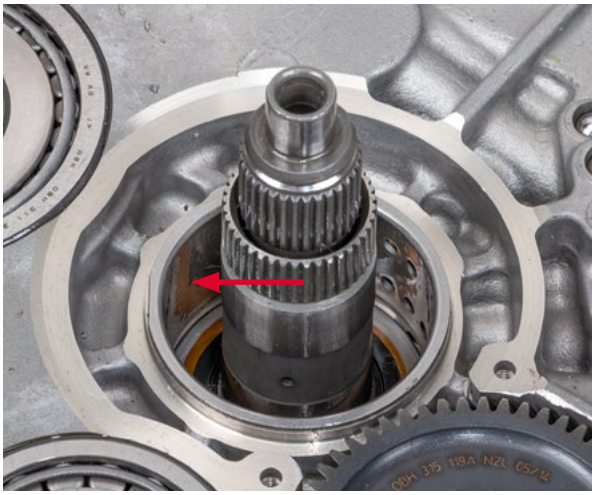
- Fit mounting hooks KL-0500-906 on both sides, aligned with the center of the double clutch
- Lift out the double clutch



- Lay the double clutch down on a clean surface



- Check the running surface of the transmission flange. It must not show any signs of grooves

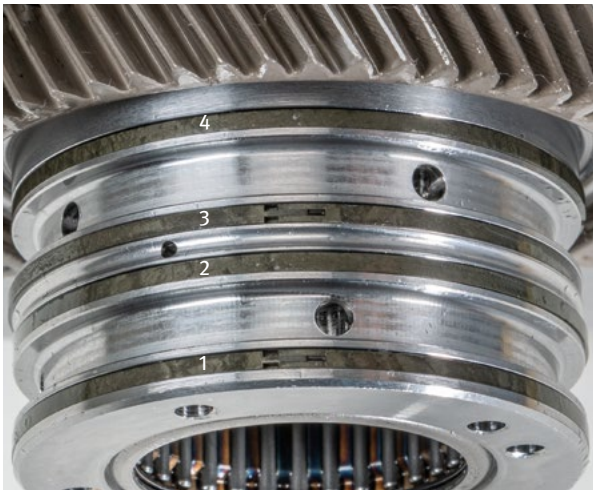


4.3 Installing the Double Clutch

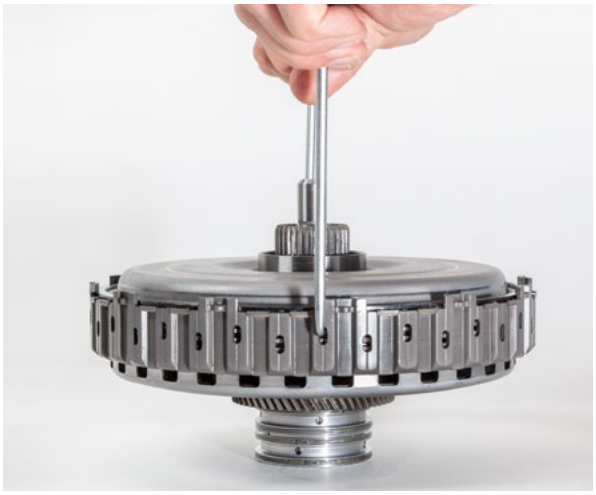
- Clean the gear bell
- Oil or dirt residues only with a remove fiber-free cloth
- Do not use compressed air or brake cleaner
- Take the new double clutch out of the packaging

Note:
The double clutch must not be dismantled, as this causes the disks inside to shift, making installation more difficult. In some cases, this can prevent the double clutch from being adjusted correctly after installation.

- Rotate the sealing rings on the double clutch by hand. They must move easily
- Align the gaps in sealing rings 1 and 3 in the same position
- Align the gaps in sealing rings 2 and 4 so that they are offset by 180° to the gaps in sealing rings 1 and 3



- Mounting hook KL0500906 as for removal in insert the holes of the outer slat support

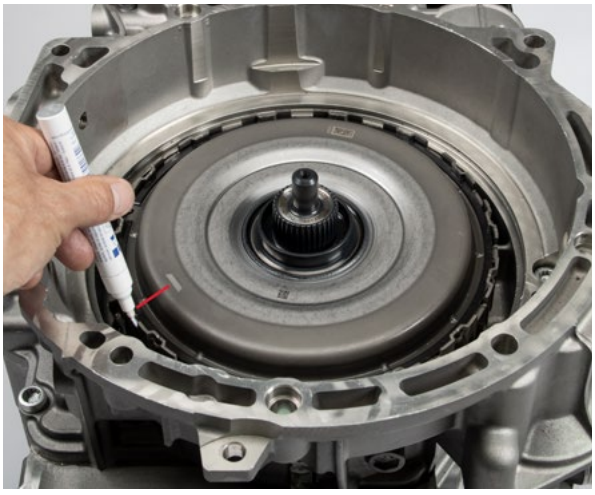


- Insert the double clutch

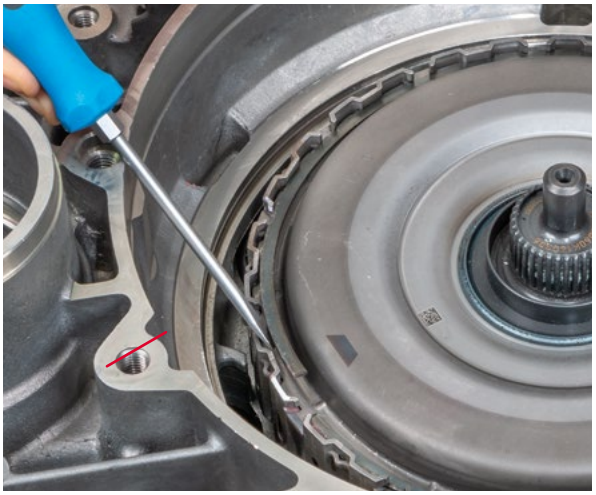
Note:
Install the double clutch carefully, do not drop it in! If the correct installation position is not achieved, lift the clutch and turn it slightly then try again.

- The double clutch is in the correct installation position when it rests on the foot of the retaining bolt without any clearance

- Check whether the marks on the driving disk and the external plate carrier are present (if the marks are missing, they must be applied prior to remove)



- Pry out the snap ring on the driving disk using a flat-head screwdriver



Note:
The snap ring is reused.

- Lock collet KL-0500-900 by turning the sleeve in the lower shaft notch of the driving disk gearing
- Screw slide hammer KL-0049-100 into the collet and remove the driving disk

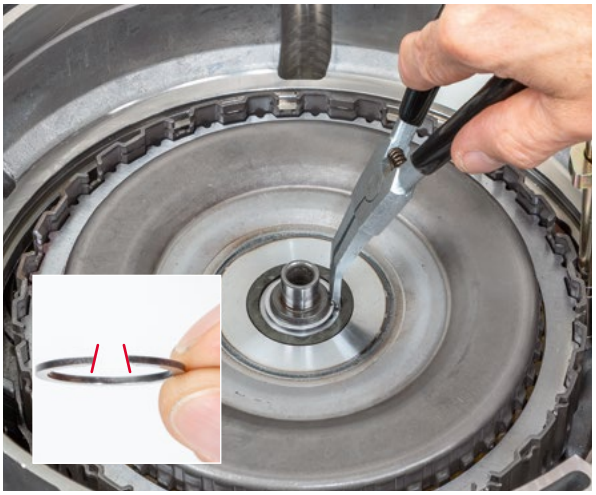
DQ 380/81 and DQ 500 transmission:

- Mount the "old" snap ring of the transmission input shaft. The smaller opening on the snap ring must face upwards

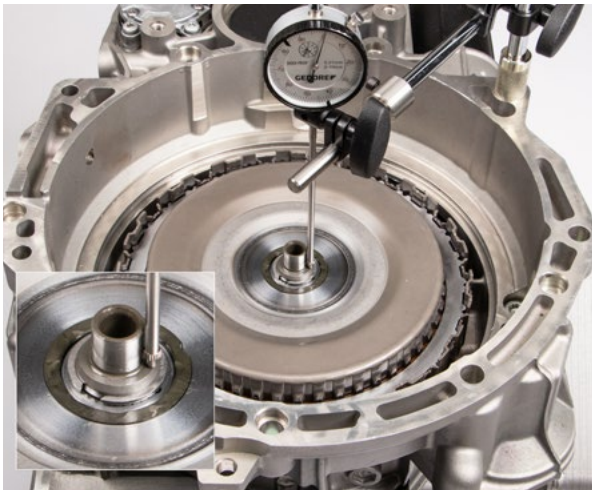
Note:
The "old" snap ring is used solely for the measurements.

DQ 250 transmission:

- Fit the snap ring with a thickness of 2 mm. The smaller opening on the snap ring must face upwards



- Three measurements (two in the case of the DQ 250 transmission) are required to determine the thickness of the washer and the snap ring



Measurement 1:

Axial clearance of the transmission input shaft

- Fit the dial gage with stand KL-0500-606 on the transmission housing
- Position the dial gage pushbutton on the transmission input shaft
- Adjust the dial gage to 0 with a little preload
- Lift the double clutch with the mounting hooks KL-0500-906 firmly upwards on the plate carrier and make a note of the measurement result

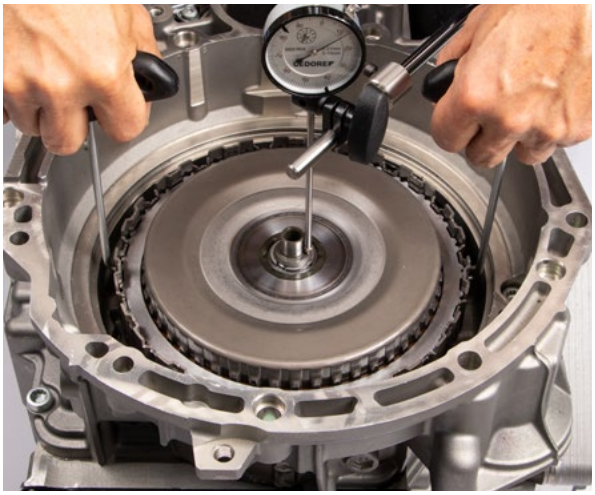
Example:
Measured value 1: 0.12 mm

Measurement 2:

Axial clearance of the double clutch on the transmission input shaft

- Position the dial gage pushbutton on the hub of the plate carrier (make sure that the measuring tip does not sit on the snap ring)
- Adjust the dial gage to 0 with a little preload
- Lift the double clutch with the mounting hooks KL-0500-906 firmly upwards on the plate carrier and make a note of the measurement result

Example:
Measured value 2: 1.40 mm



- Determine the thickness of the washer or snap ring using the following calculation:

DQ 380/81 and DQ 500 transmission:
Measured value 2 – measured value 1 – 0.11 mm = thickness of the washer

DQ 250 transmission:
Measured value 2 – measured value 1 + 1.85 mm = thickness of the snap ring

Example:

Measured value 2:	1,40 mm
Measured value 1:	– 0,12 mm
	– 0,11 mm
Measurement calculated for washer/ snap ring	1.17 mm

- Select a washer or snap ring from the range with a thickness that comes closest to the calculated value. If there is a difference, always use the next largest washer or the next largest snap ring:

Example:

Measurement calculated for washer/ snap ring	1.17 mm
Washer snap ring for installation	1.20 mm

DQ 250 gearbox:

- Remove the snap ring with a thickness of 2 mm and fit a ring with the calculated thickness
- Fit the oil pump shaft

DQ 380/81 and DQ 500 gearbox:

- Remove the "old" snap ring
- Fit the washer with the calculated thickness
- Fit the "old" snap ring

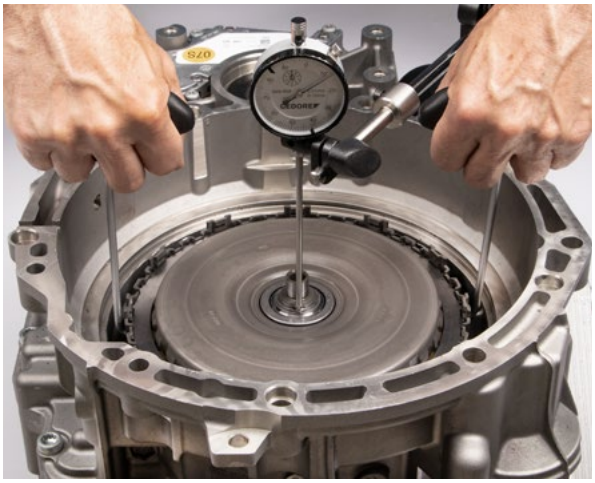
Measurement 3:
Control measurement
(for DQ 380/81 and DQ 500 gearbox only)

- Position the dial gage pushbutton in the opening of the snap ring on the washer
- Adjust the dial gage to 0 with a little preload
- Lift the double clutch with the mounting hooks KL-0500-906 firmly upwards on the external plate carrier and make a note of the measurement result

Example:
Measured value 3: 0.20 mm

DQ 380/81 and DQ 500 gearbox:
Measured values 3 and 1 are used to calculate whether the axial clearance of the double clutch is within the tolerance range.

Measured value 3 – measured value 1 = axial clearance of the double clutch



Example:
Measured value 3: 0.20 mm
Measured value 1: – 0.12 mm

Result from the
control measurement: 0.08 mm

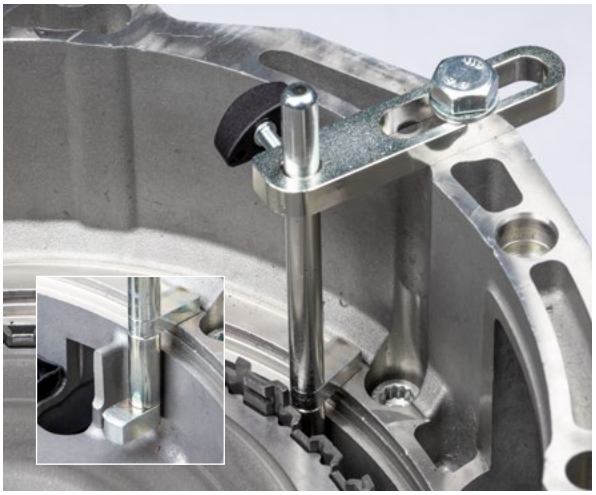
Setpoint: 0.05 mm to 0.12 mm

DQ 380/81 and DQ 500 gearbox:
- If the setpoint is not achieved, a thicker or thinner washer must be selected
- If the result of the control measurement is within the setpoints, the "old" snap ring can be replaced with the new one
- The smaller opening on the snap ring must face upwards

DQ 380/81 and DQ 500 gearboxes:
Insert holding bolt KL0500901 and fix it with holder KL0500903

DQ 250 gearbox:
Insert holding bolt KL0500902 and fix it with holder

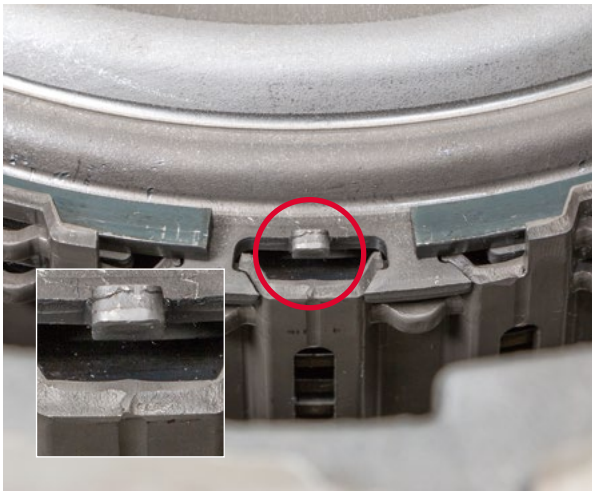
Note:
Due to the shape of the gear bell, it is not possible to mount the retaining bolt correctly at any position. Select an installation location in which the retaining bolt rests on the edge of the housing in a vertical position.



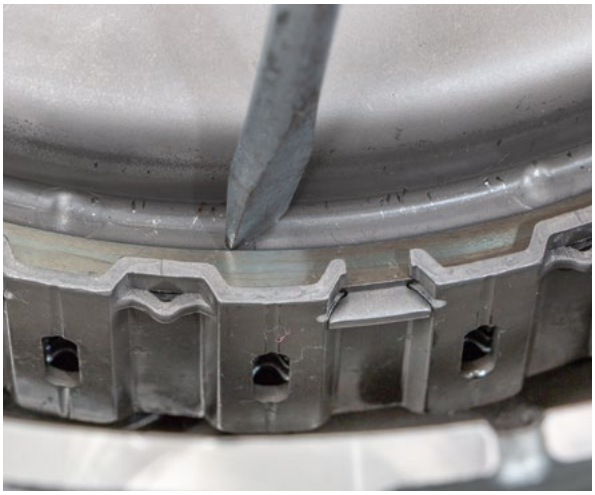
- Insert the driving disk into the double clutch. Make sure that the markings are aligned
- Hold retaining pin KL-0500-901/902 outwards under tension
- Using the collet KL-0500-900 and the slide hammer KL-0049-100, carefully drive the driving disk into position

- Insert the snap ring for the driving disk clockwise starting from the opening

Note:
Some double clutches can be equipped with a large tooth. With these versions, it is important to ensure that the gap in the snap ring sits either side of the large tooth.



- Fully engage the snap ring
- Using a flat-head screwdriver, check whether the snap ring is fully in its exact final position
- Remove retaining pin KL-0500-901/902 and holder KL-0500-903



- Check the running surface of the stub shaft of the double clutch. It must be dry and free from all residue

- Remove the clutch end cap from the packaging. Handle the cover as shown in the picture

Note:
The middle seal must not be touched, greased or come into contact with any other substances, as this will result in leaks!

DQ 380/81 and DQ 500 gearbox:

- Place mounting sleeve KL-0500-905 (gold) on a level surface

DQ 250 gearbox:

- Place mounting sleeve KL-0500-904 (black) on a level surface

Note:
The mounting sleeve must be clean and must not be scratched!

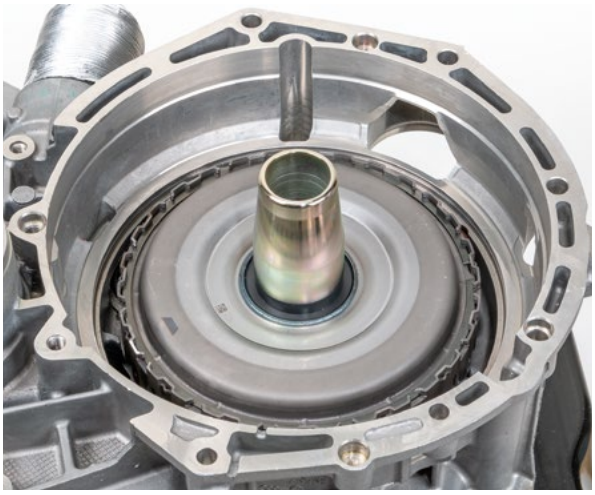
- Align the seal lip by guiding the clutch end cap downwards horizontally and evenly over the entire mounting sleeve
- Remove the mounting sleeve upwards off the cover

DQ 380/81 and DQ 500 gearbox:

- Place mounting sleeve KL-0500-905 (gold) on the stub shaft of the double clutch

DQ 250 gearbox:

- Place mounting sleeve KL-0500-904 (black) on the stub shaft of the double clutch



- Coat the outer seal of the clutch end cap with a little double clutch transmission oil

- Guide the clutch end cap horizontally over the sleeve and press it evenly into the seat of the transmission by hand

Note:
The clutch end cap must be inserted with care. Excessive force can cause the cover to deform, which will inevitably lead to leaks.

- Fit the new snap ring for the clutch cover and lever it so that it is fully inserted in the seat of the transmission all the way round

- Apply a little grease to the entire surface of the external gearing of the driving disk or the internal gearing of the DMF

Note:
The choice of lubricant is determined primarily by the information provided by the vehicle manufacturer. In the absence of any specification, temperature-resistant and age-resistant high-performance grease can be used.

- Replace the pilot bearing (included in the LuK RepSet 2CT)

- Fit the transmission
- Top up the transmission oil

Note:
The engine must not be started if there is no oil in the transmission!

- Basic adjustment with a suitable diagnostic device
- Carry out a test drive of at least 20 km
- Read the error memory using a suitable diagnostic device
- Check the transmission oil level

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