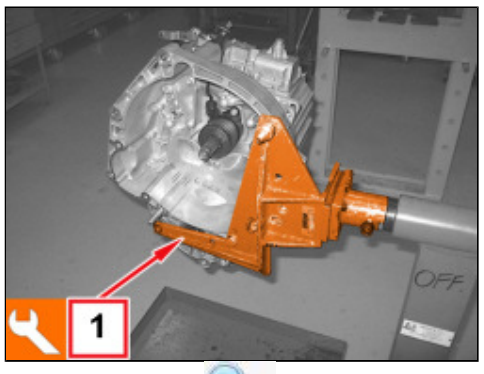
Removing ( Refitting )

During removal/refitting of gears at the press, observe the following in order not to damage the teeth:

- the gear/plate bearing surface must be as large as possible;

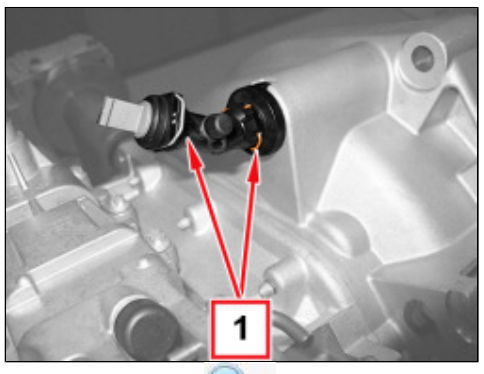
- insert an aluminium sheet of suitable thickness between the gear and the plate.

1. Fit the gearbox on the overhaul stand using the tool.

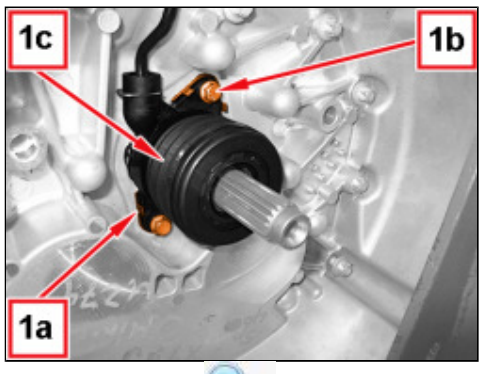



| Tool | Description | Function | Validity |
|---|---|---|---|
| 1871001014 | Mount | Gearbox support for overhaul stand | 2.0 JTDM |

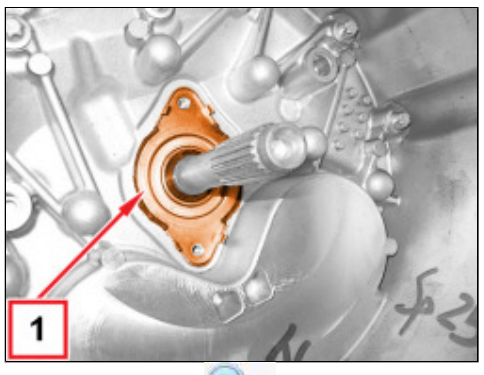
1. Raise the retaining clip and remove the three-way connector.




1. Open the retaining tabs (1a), undo the screws (1b) and remove the clutch control coaxial actuator (1c).

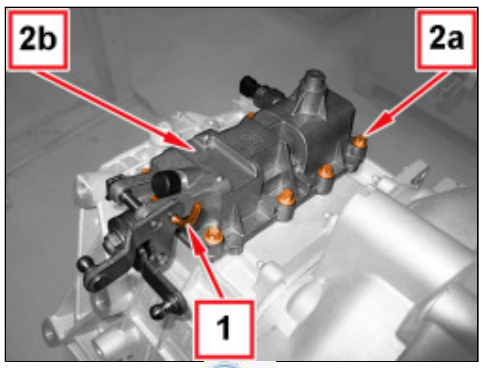


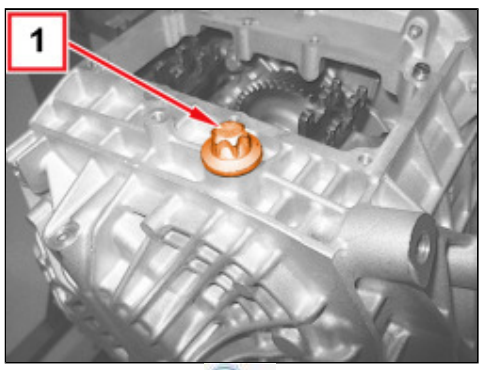

1. Cut the sealant and remove the main shaft inlet cover with oil seal.




1. Fit the locking pin for the gear selection/engagement selector.

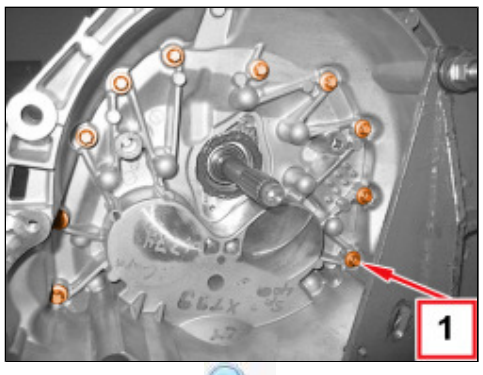
2. Undo the screws (2a) and remove the gear selection/engagement unit (2b).



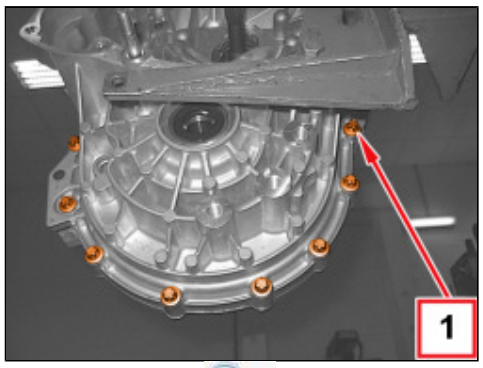




1. Undo the reverse gear mounting retaining screw.

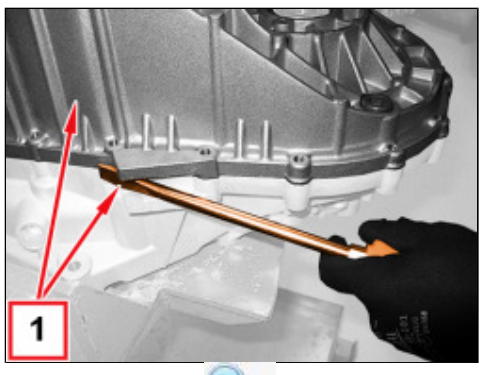
The screw is pre-treated and must be replaced at every removal.




1. Undo the inner screws fixing the gearbox casing.

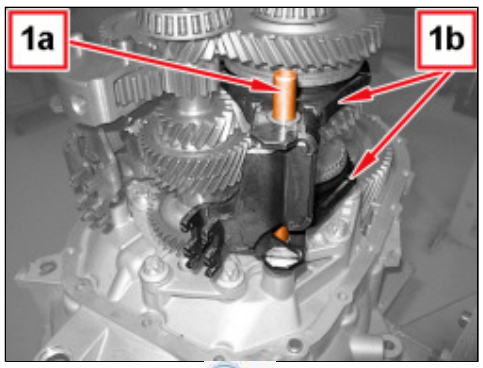



1. Undo the outer screws, differential side, fixing the gearbox casing.

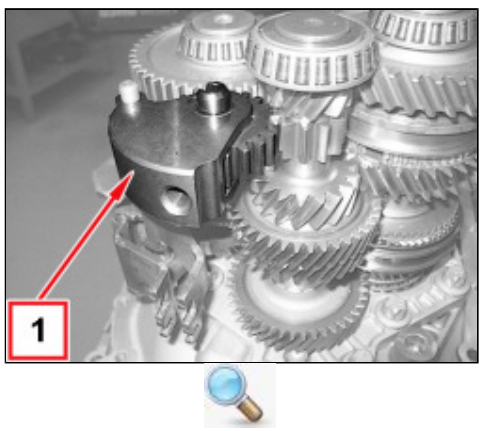



1. Work in the point shown in the picture and remove the gearbox casing.

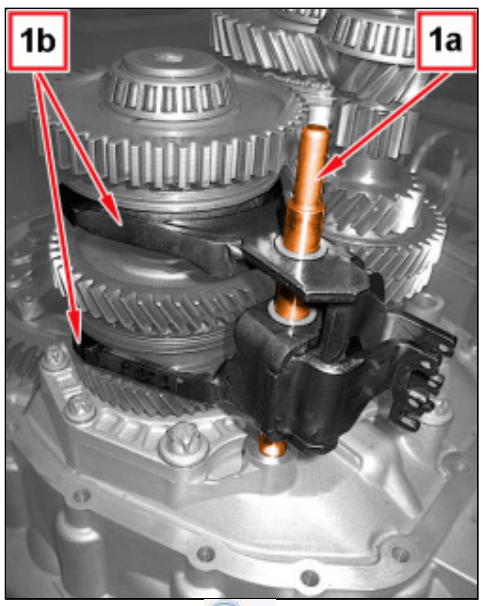
1. Remove the rod (1a) and the 1st-2nd and 5th-6th speed control forks (1b) from the lower layshaft.



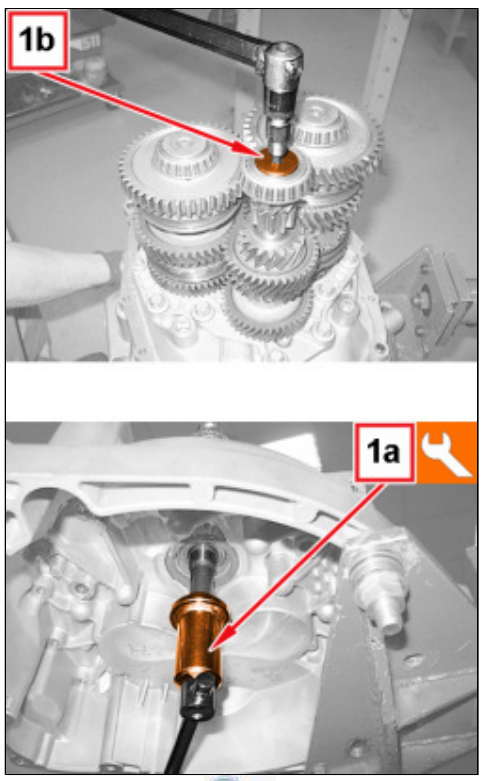

1. Remove the mounting complete with reverse gear.




1. Remove the rod (1a) and the 3rd-4th speed and reverse control forks (1b) from the upper layshaft.



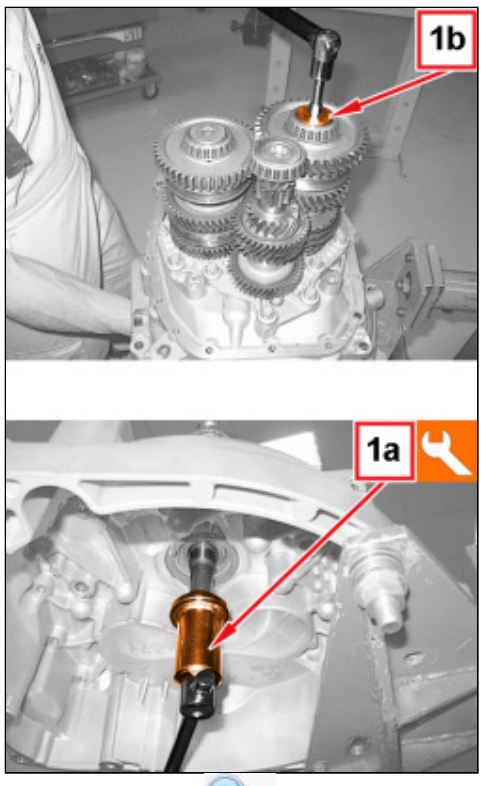

1. Position the tool (1a) and undo the ring nut (1b) fixing the rear main shaft bearing.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870853000 | Lever | Main shaft rotation | 2.0 JTDM |

- Engage the 1st and 6th speed.

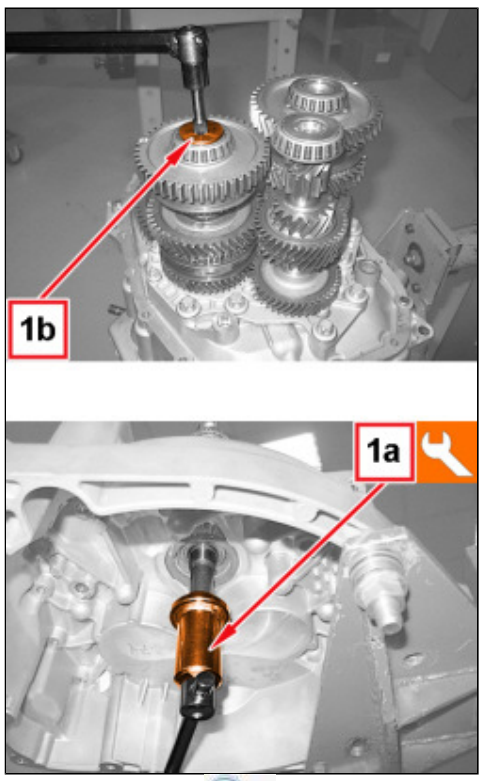
1. Position the tool (1a) and undo the left ring nut (1b) fixing the rear lower layshaft bearing.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870853000 | Lever | Main shaft rotation | 2.0 JTDM |

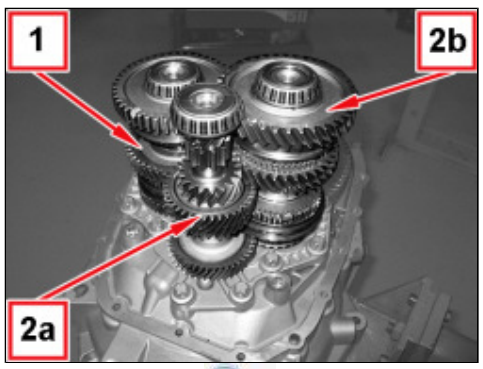
- Engage the 4th speed and reverse.

1. Position the tool (1a) and undo the left ring nut (1b) fixing the rear upper layshaft bearing.



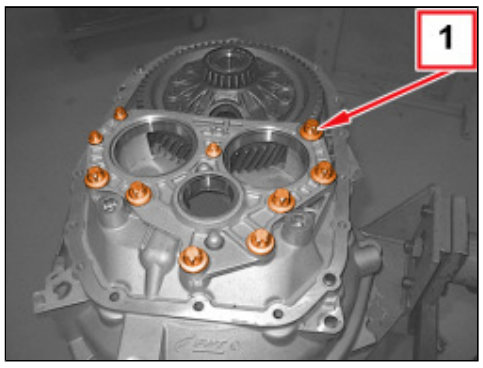

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870853000 | Lever | Main shaft rotation | 2.0 JTDM |

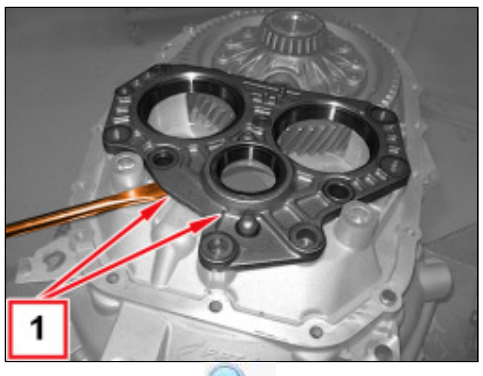
1. Remove the upper layshaft.



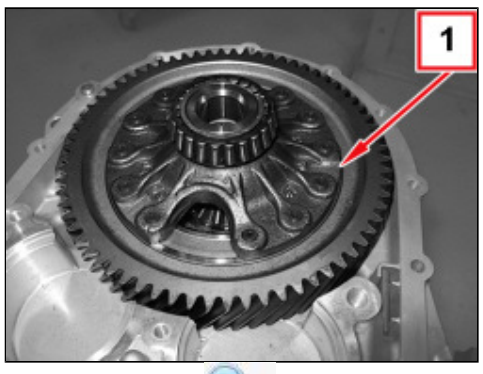

2. Remove the main shaft (2a) and the lower layshaft (2b).

1. Undo the screws fixing the main shaft and layshaft front bearing outer race mounting plate.





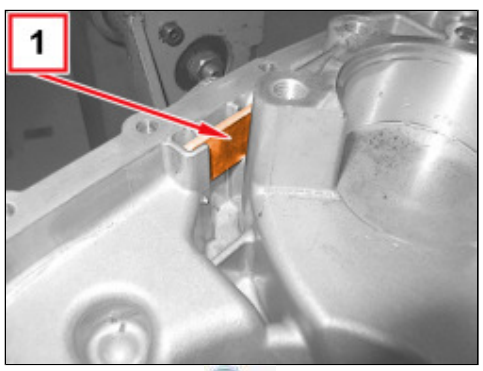

1. Work in the point shown in the picture to remove the main shaft and layshaft front bearing outer race mounting plate.



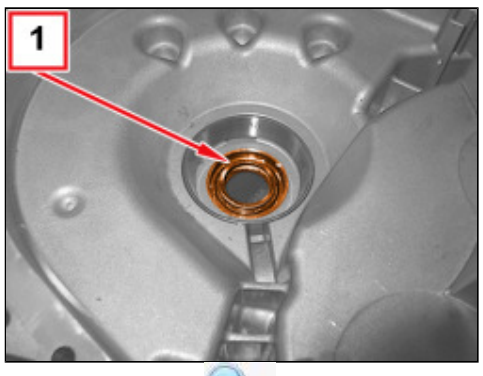

1. Remove the differential casing.

- To disassemble the differential casing refer to

Op. 2110D20 DIFFERENTIAL INTERNAL CASING, REMOVED - DISMANTLING AND REASSEMBLY, CHECK PLANET AND SATELLITE GEARS



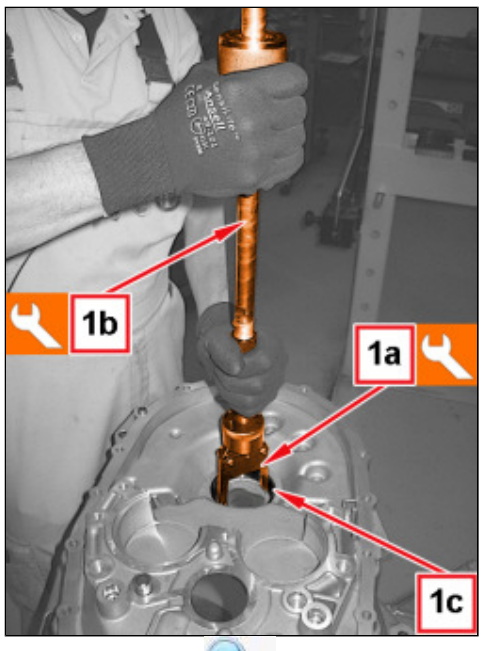

1. Remove the magnet.




1. Remove the differential right driveshaft oil seal.

1. Use tools (1a) and (1b) to remove the outer race (1c) of the right differential casing bearing.

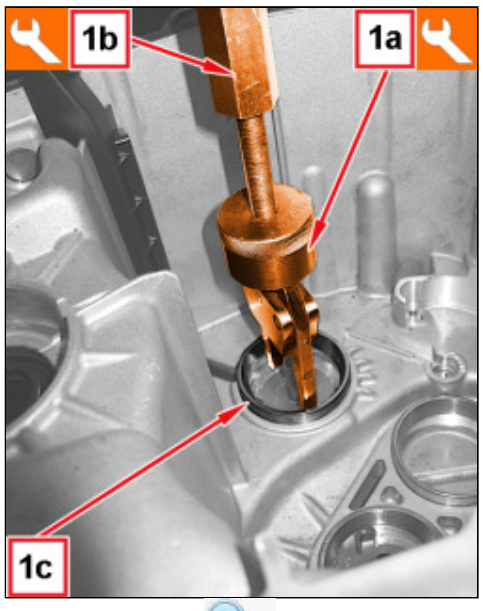
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870655000 | Extractor/fitting tool | Bearing race removal | 2.0 JTDM |
| Tool | Description | Function | Validity |
| | | | |




| | | | |
|---|---|---|---|
| 1840206001 | Mallet | - | 2.0 JTDM |

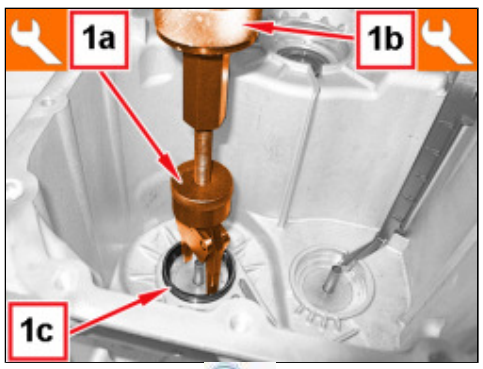
**DISASSEMBLE THE GEARBOX CASING AS DESCRIBED BELOW**

1. With the tools (1a), (1b), remove the outer race (1c) and the upper layshaft rear bearing scraper ring.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870655000 | Extractor/fitting tool | Bearing race removal | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1847017001 | Mallet | Extracting bearings | 2.0 JTDM |

1. With the tools (1a), (1b) remove the outer race (1c) and the lower layshaft rear bearing scraper ring.



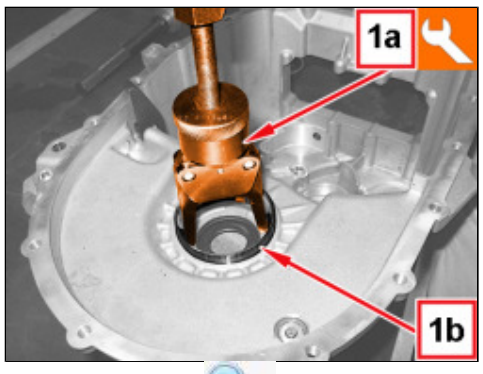

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870655000 | Extractor/fitting tool | Bearing race removal | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1847017001 | Mallet | Extracting bearings | 2.0 JTDM |

1. With the tools (1a), remove the outer race (1b) and the main shaft rear bearing scraper ring.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870655000 | Extractor/fitting tool | Bearing race removal | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1847017001 | Mallet | Extracting bearings | 2.0 JTDM |

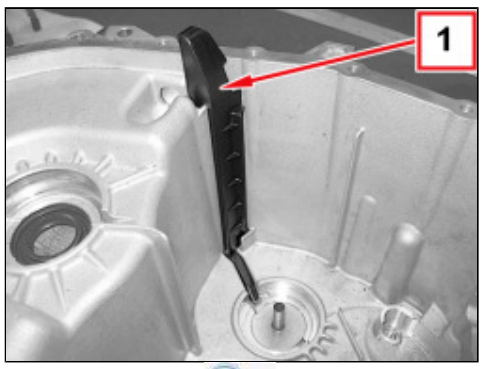
1. With the tools (1a), remove the outer race (1b) and the differential casing left bearing scraper ring.

| Tool | Description | Function | Validity |
|---|---|---|---|

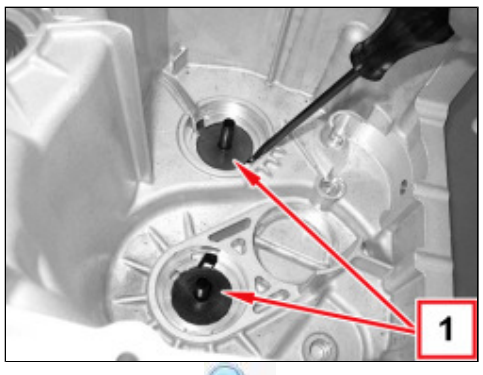



| | | | |
|---|---|---|---|
| 1870655000 | Extractor/fitting tool | Bearing race removal | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1847017001 | Mallet | Extracting bearings | 2.0 JTDM |

1. Remove the lubricating oil duct.



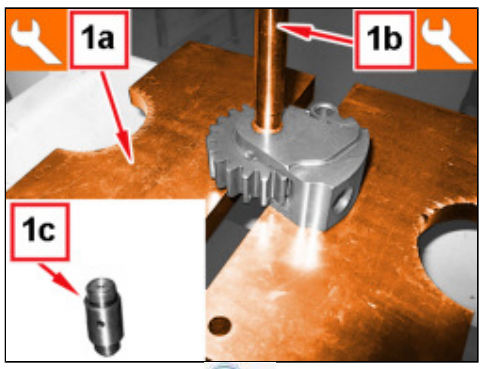

1. With a suitable screwdriver, remove the layshaft lubricating ducts.




- Remove the left differential shaft oil seal from the gearbox casing.

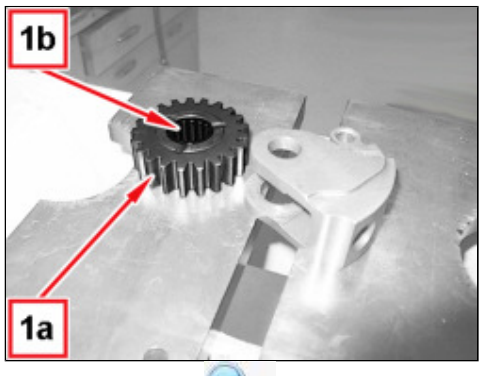
**DISASSEMBLE THE REVERSE GEAR MOUNTING AS DESCRIBED BELOW**

1. At the hydraulic press, with the tools (1a) and (1b), remove the pin (1c) fixing the reverse gear to the mounting.



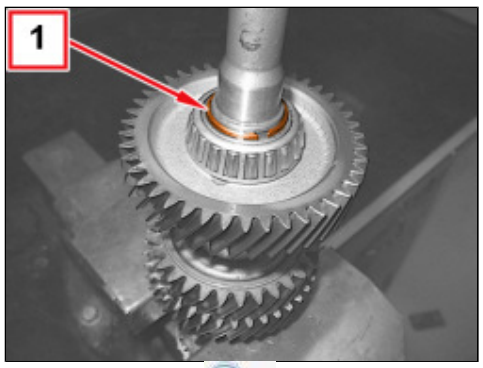

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 2000028700 | Extractor/fitting tool | Removal/refitting of reverse gear shaft | 2.0 JTDM |

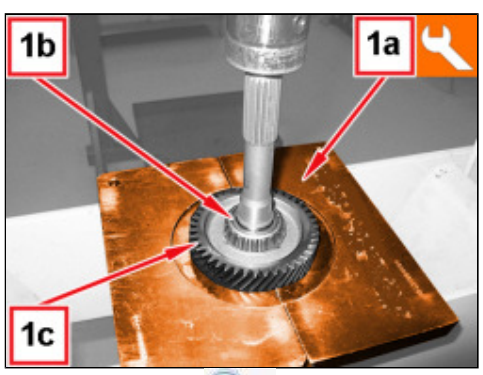
1. Release the reverse gear (1a) complete with needle bearing (1b) from the mounting.




**DISASSEMBLE THE MAIN SHAFT AS DESCRIBED BELOW**

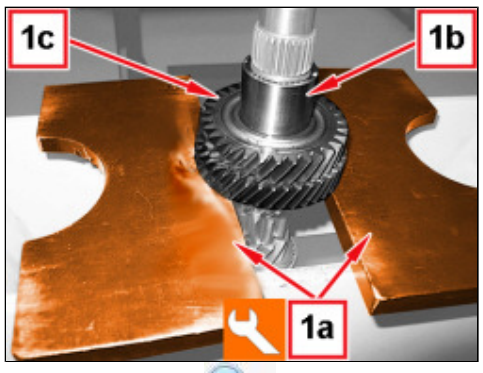
1. Position the main shaft in a vice fitted with protective jaws and remove the front bearing retaining ring.



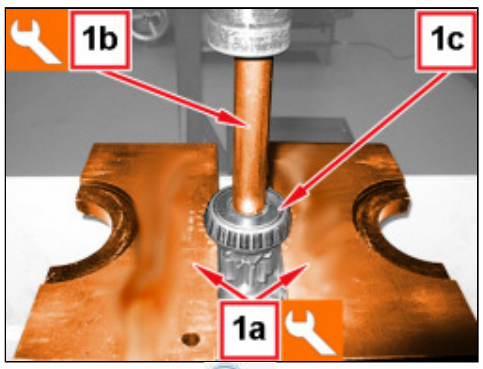

1. On the hydraulic press, using the tool (1a), remove the front bearing (1b) and the 4th-6th speed gear (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000005000 | Plate | Reaction plate in the press | 2.0 JTDM |




1. On the hydraulic press, using the tool (1a), remove the spacer (1b) and the 3rd-5th speed gear (1c).

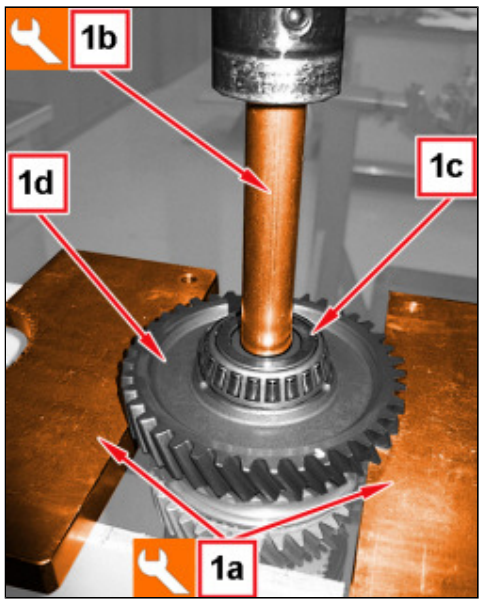
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |




1. On the hydraulic press, using tools (1a) and (1b) remove the rear bearing (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 2000004700 | Fitting tool | Removing/refitting bearings | 2.0 JTDM |

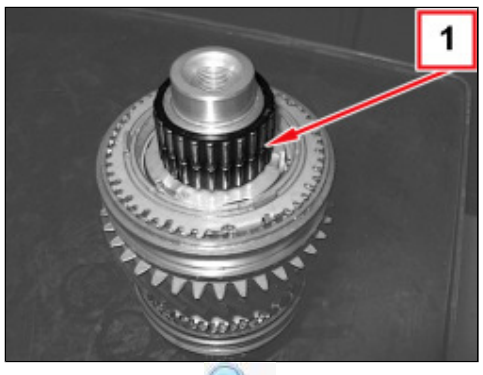
**DISASSEMBLE THE LOWER LAYSHAFT AS DESCRIBED BELOW**



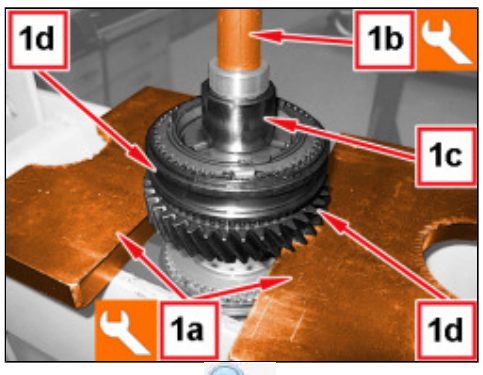

1. On the hydraulic press using the tools (1a) and (1b) remove the rear bearing (1c) and the 1st speed gear (1d).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 2000004700 | Fitting tool | Removing/refitting bearings | 2.0 JTDM |

1. Remove the needle bearing.



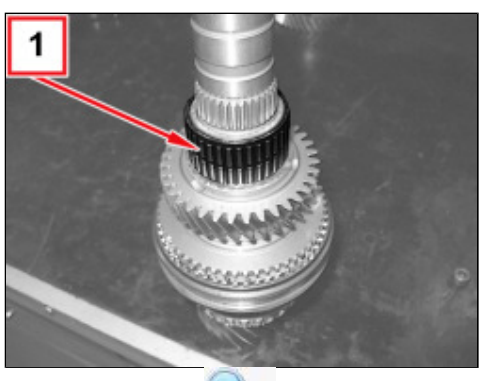

1. On the hydraulic press using the tools (1a) and (1b) remove the spacer (1c), the synchroniser (1d) and the 2nd speed gear (1e).



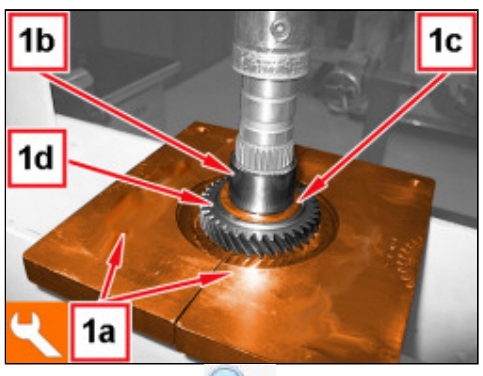

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000004700 | Fitting tool | Removing/refitting bearings | 2.0 JTDM |

1. Remove the needle bearing.

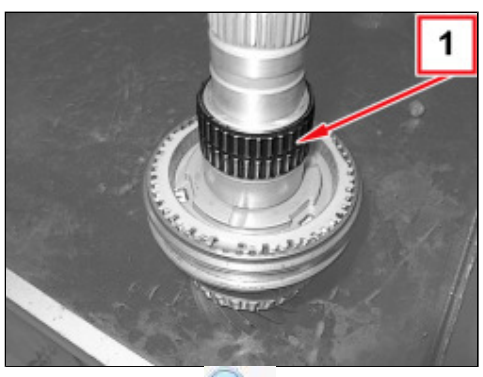


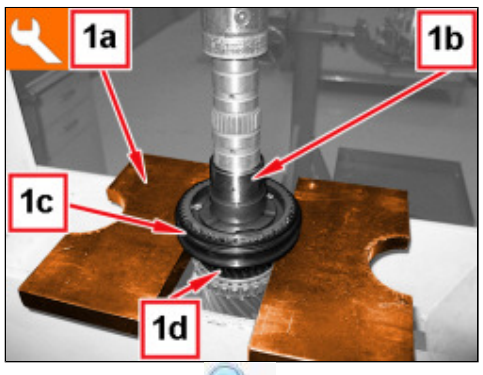

1. On the hydraulic press, using the tool (1a), remove the spacer (1b), the scraper ring (1c) and the 5th speed gear (1d).




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

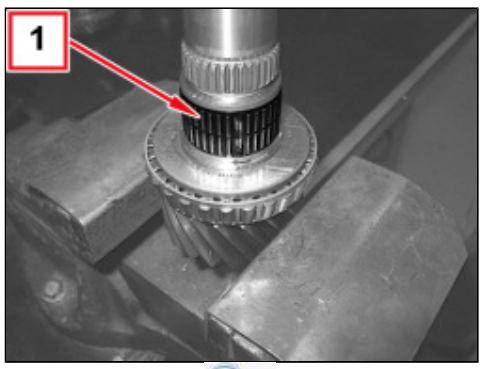
1. Remove the needle bearing.



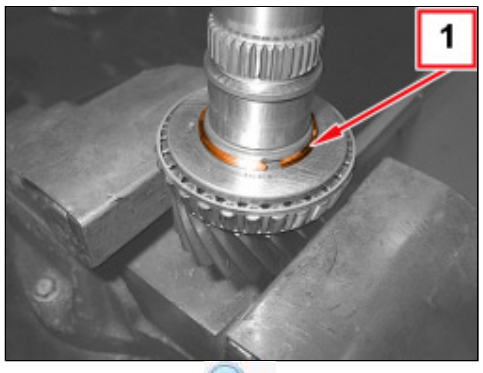



1. On the hydraulic press, using the tool (1a), remove the spacer (1b), the synchroniser (1c) and the 6th speed gear (1d).

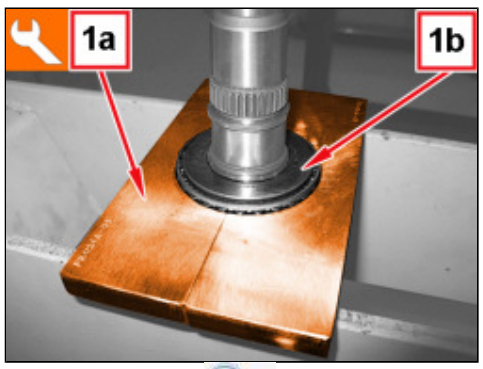
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |




1. Position the lower layshaft in a vice with protective jaws and remove the needle bearing.



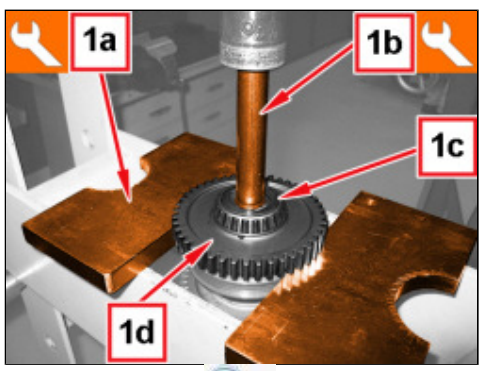

1. Remove circlip securing front bearing.




1. Working on the hydraulic press with the tool (1a), remove the front bearing (1b).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035508 | Plates | Removal of upper/lower layshaft bearing | 2.0 JTDM |

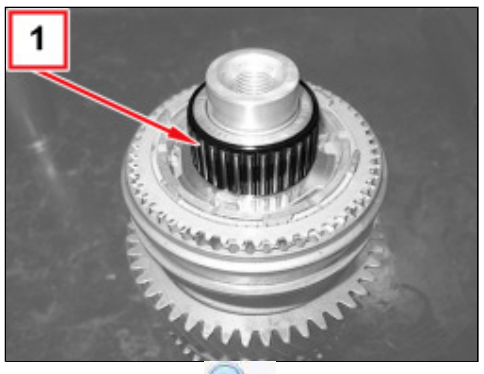
**DISASSEMBLE THE UPPER LAYSHAFT AS DESCRIBED BELOW.**

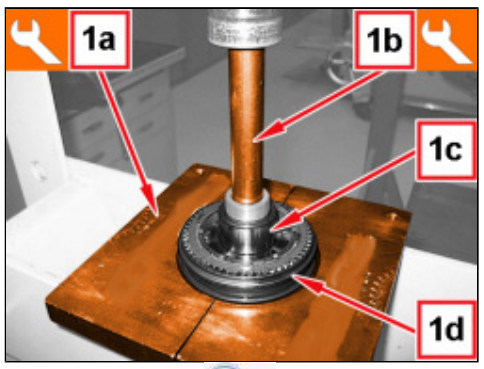



1. On the hydraulic press using the tools (1a) and (1b) remove the rear bearing (1c) and the reverse gear (1d).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 2000004700 | Fitting tool | Removing/refitting bearings | 2.0 JTDM |

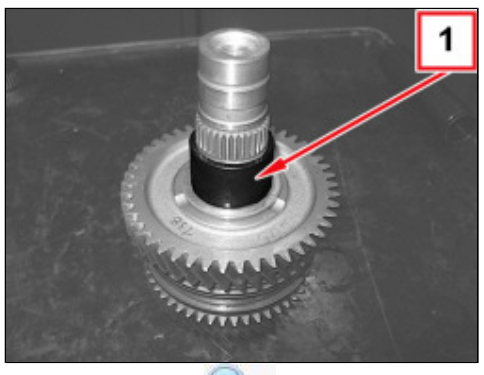
1. Remove the needle bearing.



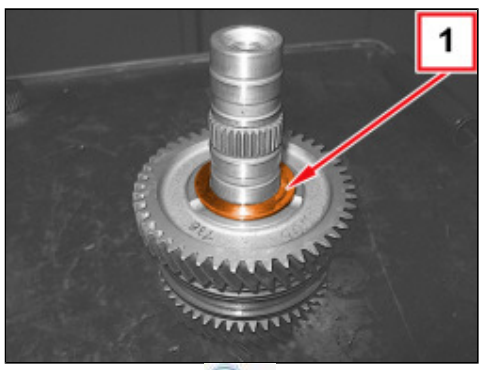




1. On the hydraulic press using the tools (1a) and (1b) remove the spacer (1c) and the synchroniser (1d).

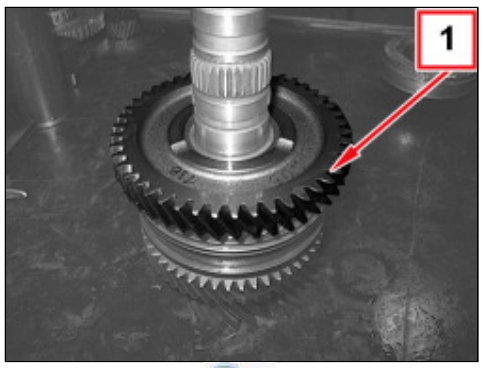
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 2000004700 | Fitting tool | Removing/refitting bearings | 2.0 JTDM |




1. Remove the spacer.

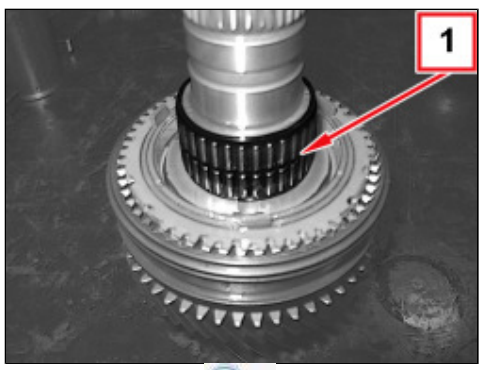


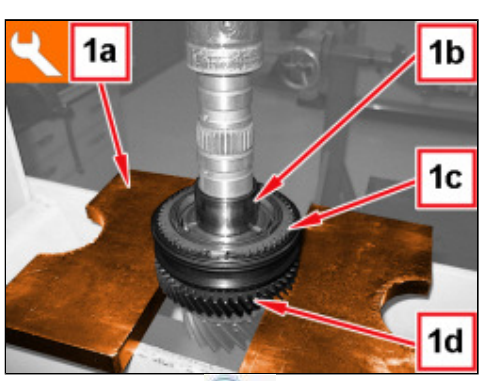

1. Remove the scraper ring.




1. Remove the 3rd speed gear.

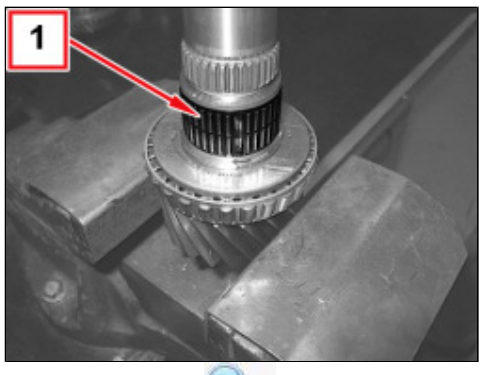
1. Remove the needle bearing.



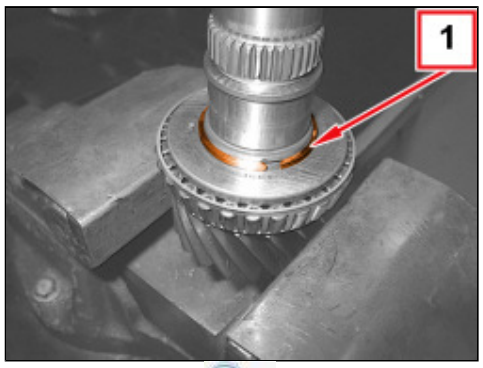




1. On the hydraulic press, using the tool (1a), remove the spacer (1b), the synchroniser (1c) and the 4th speed gear (1d).

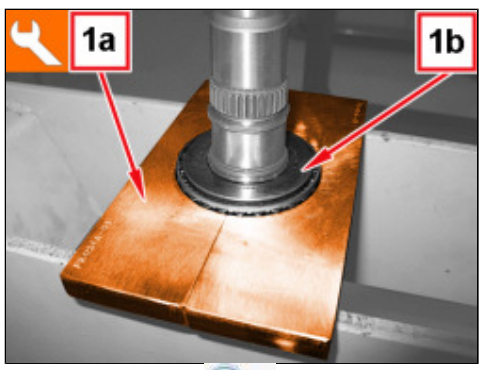
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |




1. Position the upper layshaft in a vice with protective jaws and remove the needle bearing.




1. Remove circlip securing front bearing.



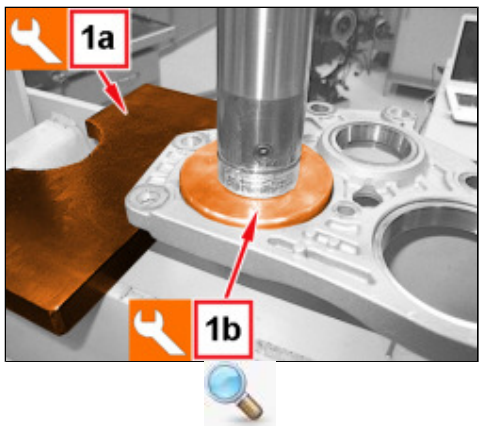

1. Working on the hydraulic press with the tool (1a), remove the front bearing (1b).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035508 | Plates | Removal of upper/lower layshaft bearing | 2.0 JTDM |

**DISASSEMBLE THE MAIN SHAFT AND LAYSHAFT MOUNTING PLATE AS DESCRIBED BELOW**

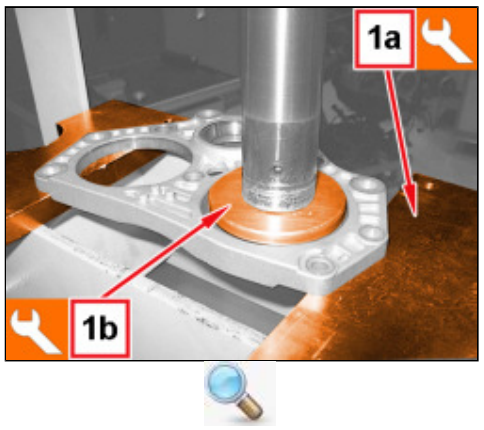
1. On the hydraulic press, using the tools (1a), (1b), remove the lower layshaft front bearing outer race.

| Tool | Description | Function | Validity |
|---|---|---|---|



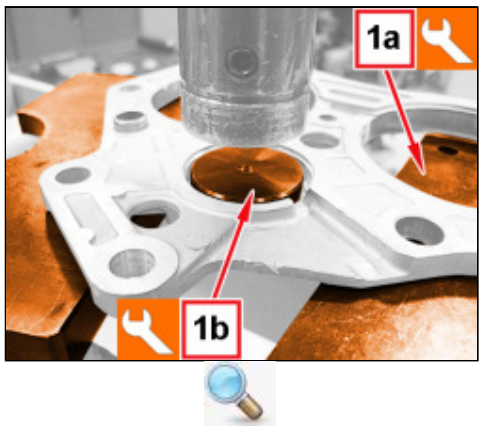

| | | | |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870434000 | Extractor/fitting tool | Removal/refitting of layshaft bearing outer race | 2.0 JTDM |

1. On the hydraulic press, using the tools (1a), (1b), remove the upper layshaft front bearing outer race.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870434000 | Extractor/fitting tool | Removal/refitting of layshaft bearing outer race | 2.0 JTDM |

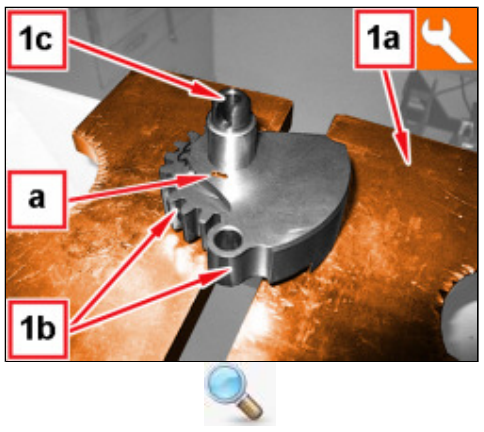
1. On the hydraulic press, using the tools (1a), (1b), remove the main shaft front bearing outer race.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870710000 | Fitting tool | Removing/refitting bearings<br><br>Differential ring gear extraction | 2.0 JTDM |

Refitting ( Removing )

**REASSEMBLE THE REVERSE GEAR MOUNTING AS DESCRIBED BELOW**



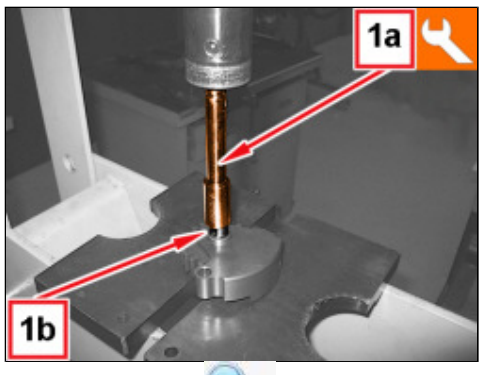

1. On the hydraulic press, with the tool (1a), position the mounting (1b) complete with reverse gear, needle bearing and fixing pin (1c).

The notch in the fixing pin must face the "a" mark as shown in the picture.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

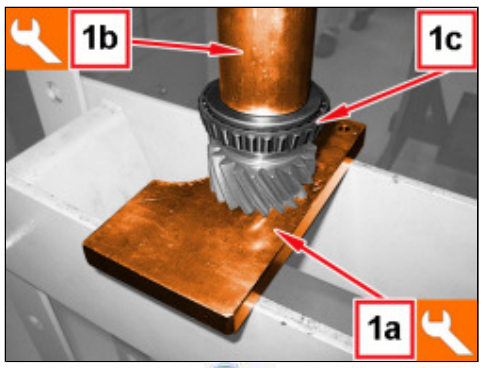
1. On the hydraulic press, with the tool (1a), definitively fit the pin (1b) fixing the reverse gear to the mounting.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000028700 | Extractor/fitting tool | Removal/refitting of reverse gear shaft | 2.0 JTDM |




**REASSEMBLE THE UPPER LAYSHAFT AS DESCRIBED BELOW**

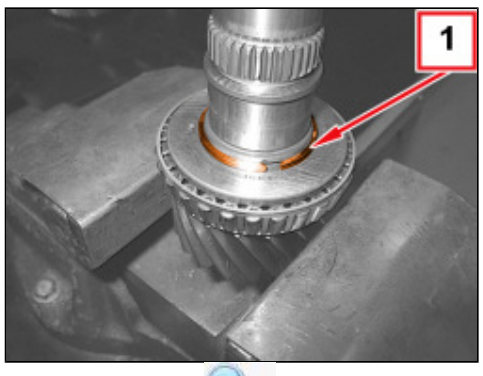
1. On the hydraulic press, using the tools (1a) and (1b) fit the front bearing (1c).



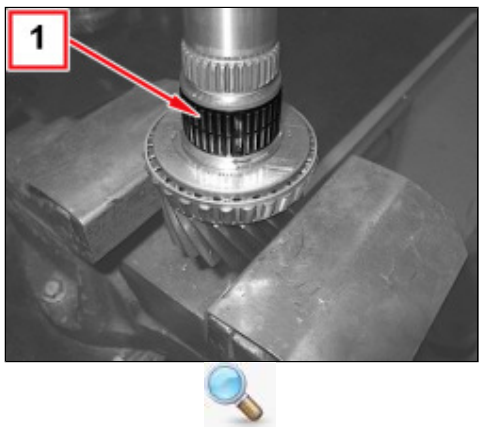

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

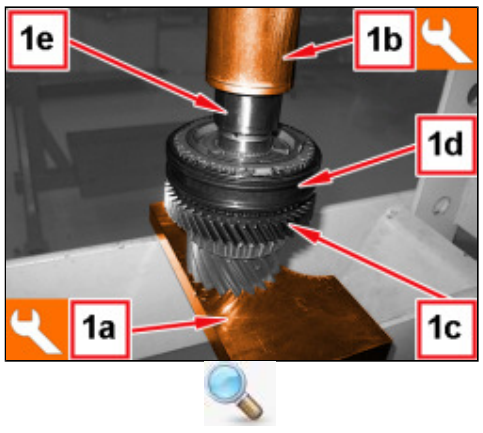
1. Position the upper layshaft in a vice fitted with protective jaws and fit the front bearing retaining ring.




1. Fit the needle bearing.



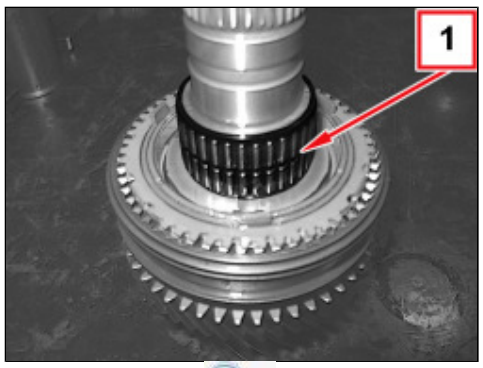

1. On the hydraulic press using the tools (1a) and (1b) fit the 4th speed gear (1c), the synchroniser (1d) and the spacer (1e).



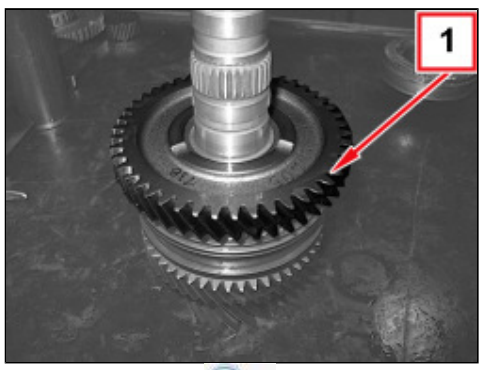

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

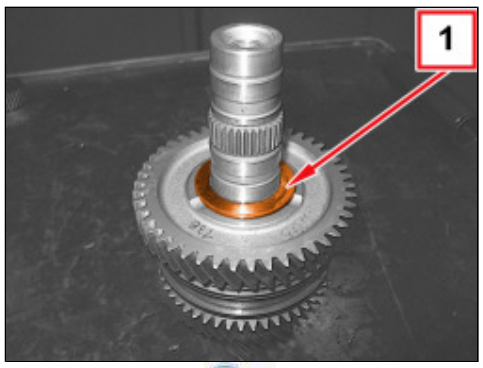
1. Fit the needle bearing.



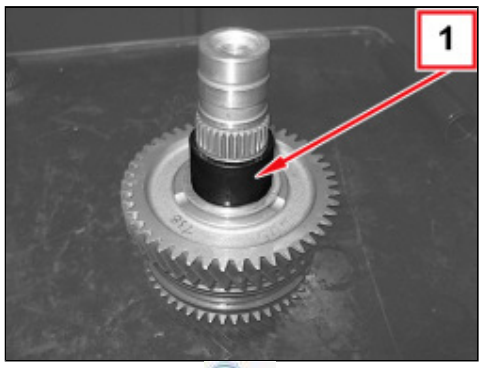

1. Fit the 3rd speed gear.



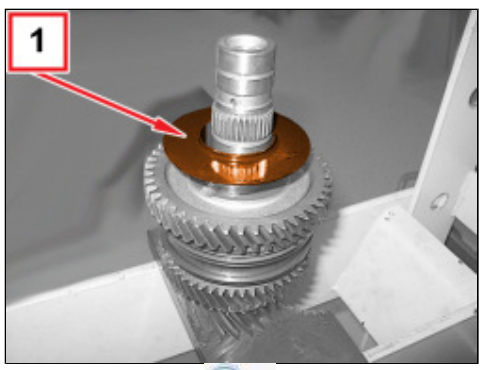

1. Fit the scraper ring.




1. Fit the spacer.

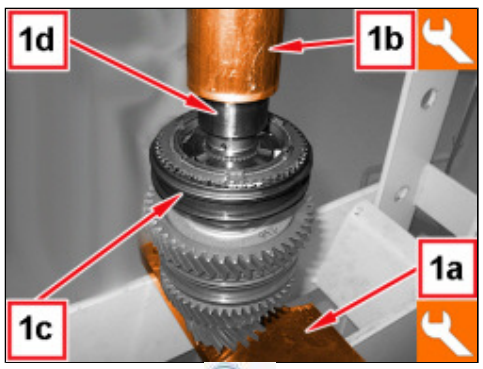



1. Fit the synchroniser mounting retaining bush.



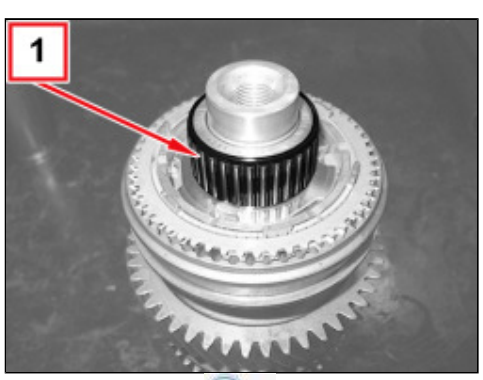

1. On the hydraulic press using the tools (1a) and (1b) fit the synchroniser (1c) and the spacer (1d).

| Tool | Description | Function | Validity |
|---|---|---|---|
| | | | |

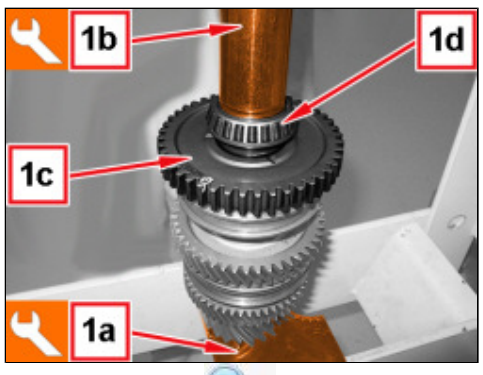



| | | | |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |




1. Fit the needle bearing.

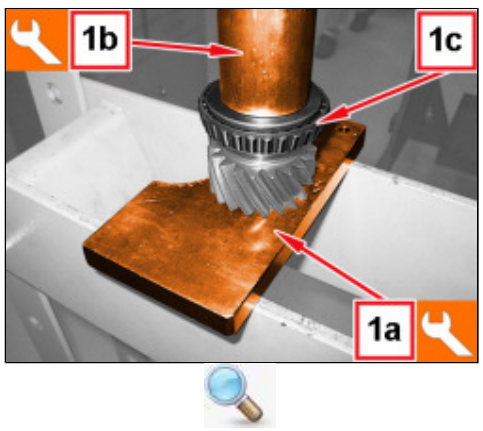



1. On the hydraulic press using the tools (1a) and (1b) fit the reverse gear (1c) and the rear bearing (1d).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870152000 | Fitting tool | Fitting spacers/bearings<br><br>Removing differential bearing | 2.0 JTDM |

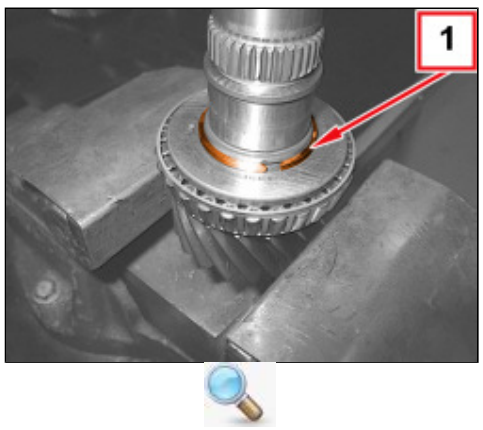
**REASSEMBLE THE LOWER LAYSHAFT AS DESCRIBED BELOW**



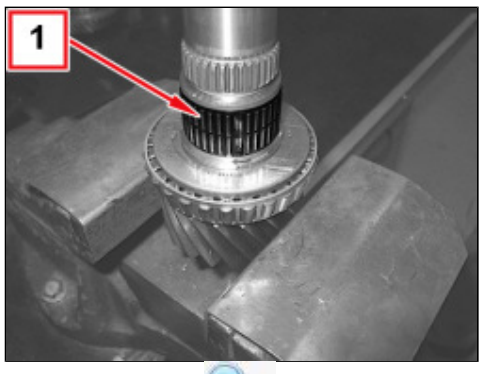

1. On the hydraulic press, using the tools (1a) and (1b) fit the front bearing (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

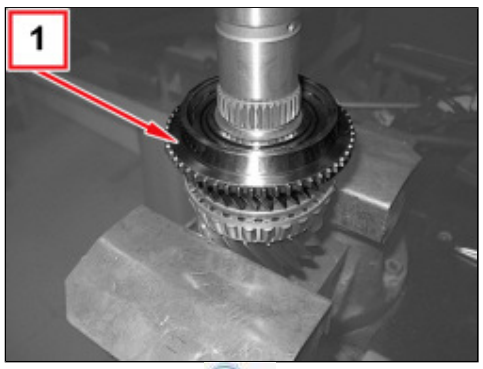
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |



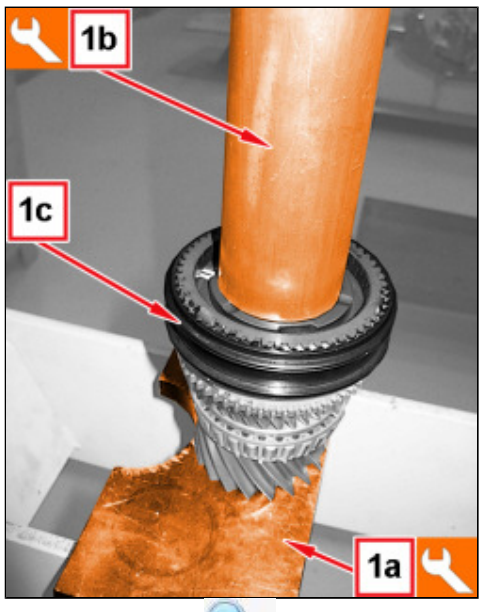

1. Position the lower layshaft in a vice fitted with protective jaws and fit the front bearing retaining ring.




1. Fit the needle bearing.



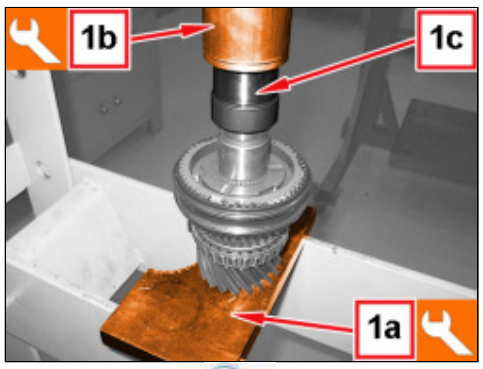

1. Fit the 6th speed gear.




1. On the hydraulic press, using the tools (1a) and (1b) fit the synchroniser (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

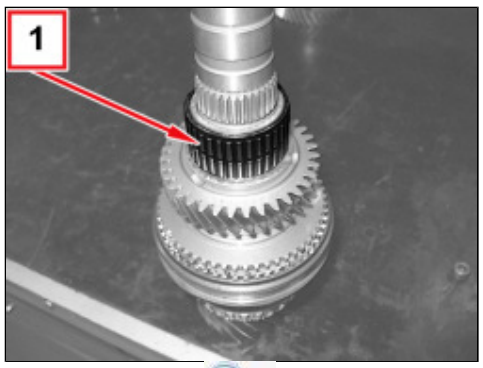



1. On the hydraulic press using the tools (1a) and (1b) fit the spacer (1c) between the 5th/6th speed gear.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

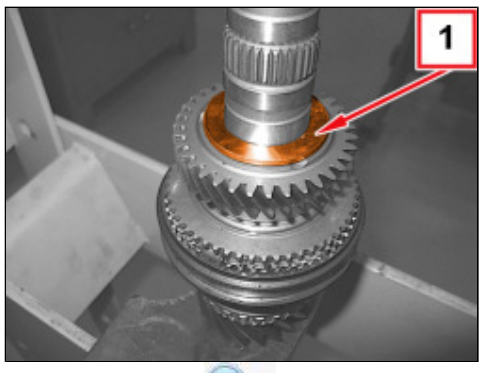
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

1. Fit the needle bearing.

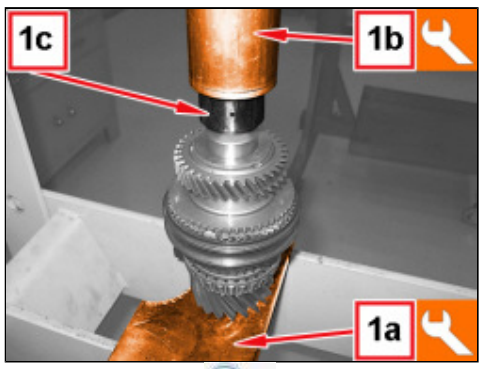



1. Fit the 5th speed gear.

1. Fit the scraper ring.



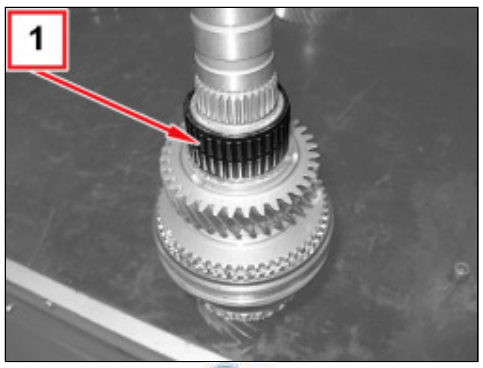

1. On the hydraulic press, using the tools (1a) and (1b) fit the spacer (1c).




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

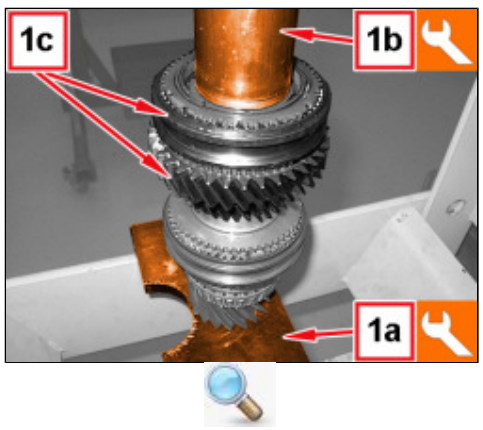
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

1. Fit the needle bearing.




1. On the hydraulic press, using the tools (1a) and (1b) fit the synchroniser complete with 2nd speed gear (1c).

| | | | |
|---|---|---|---|
| | | | |

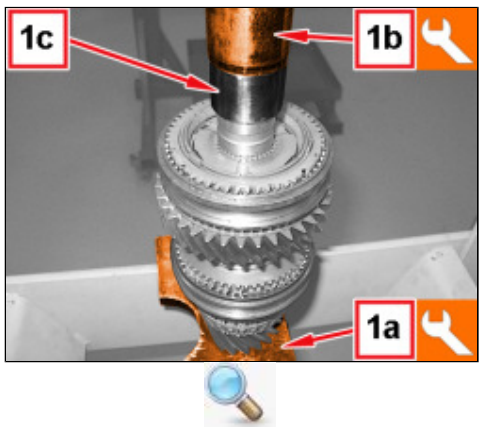



| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

Check that the 2nd speed gear rotates freely.

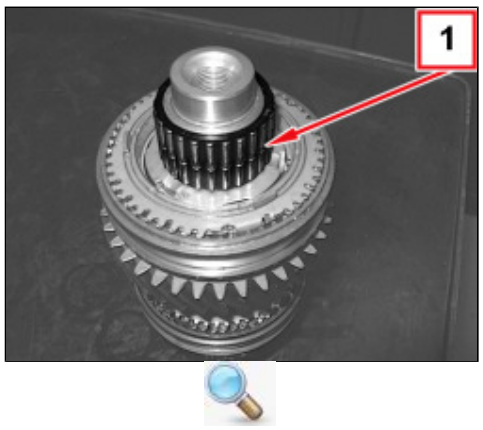
1. On the hydraulic press using the tools (1a) and (1b) fit the spacer (1c) between the 2nd/1st speed gear.



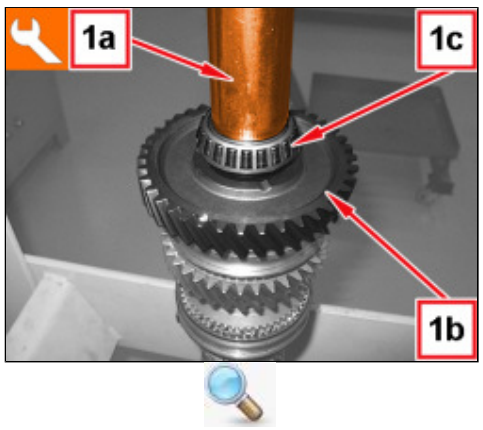

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870152000 | Fitting tool | Fitting spacers/bearings<br><br>Removing differential bearing | 2.0 JTDM |

1. Fit the needle bearing.




1. On the hydraulic press using the tools (1a) fit the 1st speed gear (1b) and the rear bearing (1c).



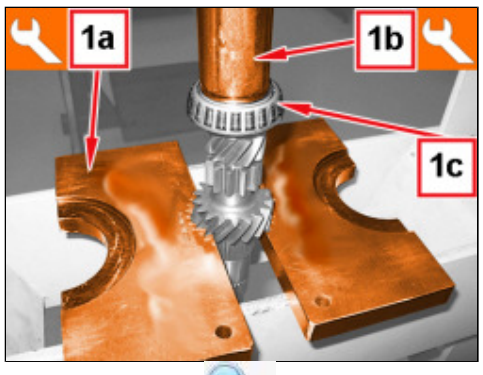

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870152000 | Fitting tool | Fitting spacers/bearings<br><br>Removing differential bearing | 2.0 JTDM |

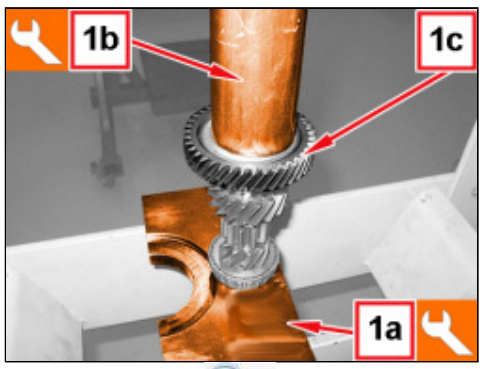
**REASSEMBLE THE MAIN SHAFT AS DESCRIBED BELOW**

1. On the hydraulic press, using tools (1a) and (1b) fit the rear bearing (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

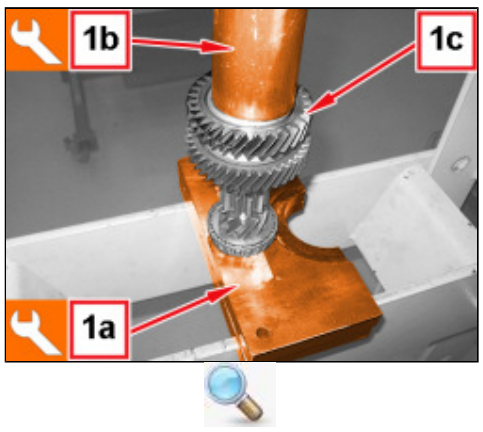



1. On the hydraulic press using the tools (1a) and (1b) fit the 5th speed gear (1c).

Before fitting, bring the 5th speed gear to a temperature of about 150°C using a suitable tool.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

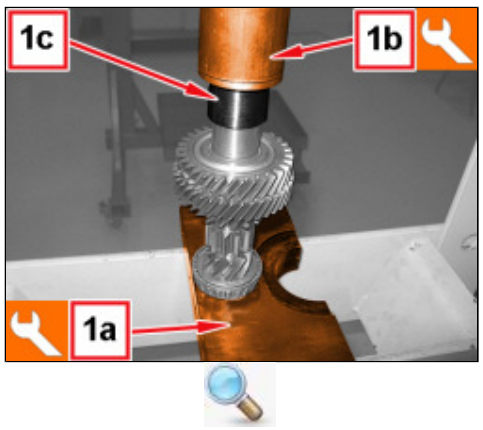
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |




1. On the hydraulic press using the tools (1a) and (1b) fit the 3rd speed gear (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

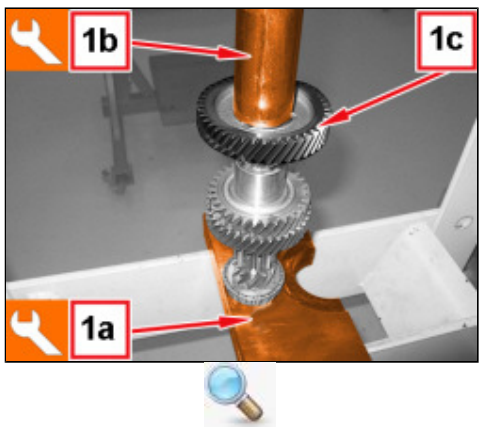
| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |




1. On the hydraulic press, using the tools (1a) and (1b) fit the spacer (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |

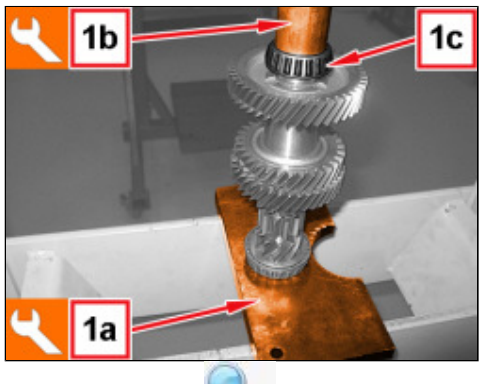



1. On the hydraulic press using the tools (1a) and (1b) fit the 4th-6th speed gear (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |

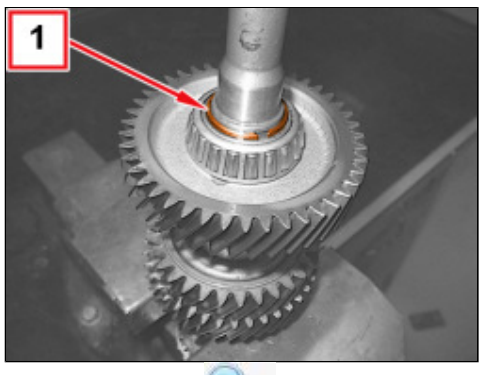
| Tool | Description | Function | Validity |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1870658000 | Extractor/fitting tool | Fitting hubs/bearings/spacers/gears | 2.0 JTDM |



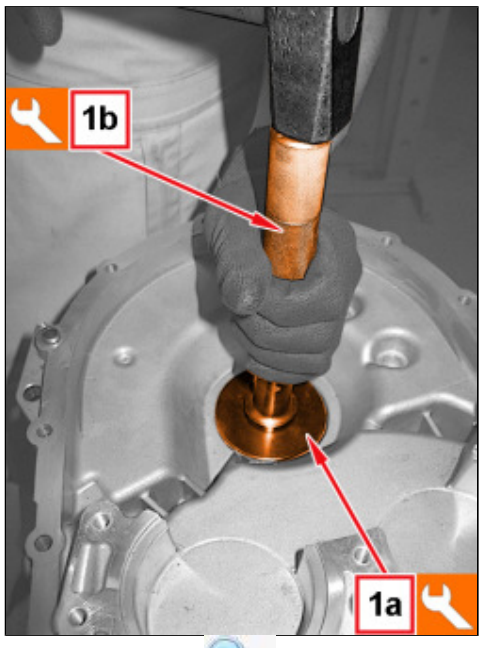

1. On the hydraulic press, using the tools (1a) and (1b) fit the front bearing (1c).

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1860837000 | Plate | Plate for support in the press | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1860945000 | Fitting tool | Fitting 4th speed drive gear bush/main shaft rear bearing/1st and 2nd speed sliding sleeve hub<br><br>Fitting bearing | 2.0 JTDM |



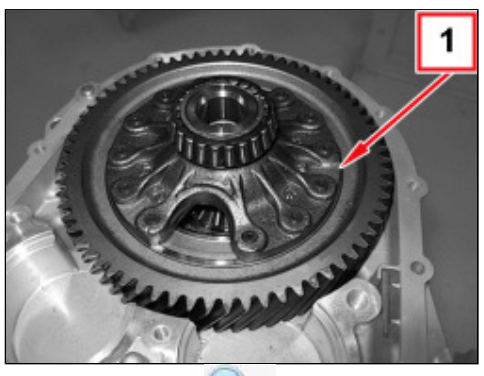

1. Position the main shaft in a vice fitted with protective jaws and fit the front bearing retaining ring.

**REASSEMBLE THE CLUTCH/GEARBOX CASING AS DESCRIBED BELOW**



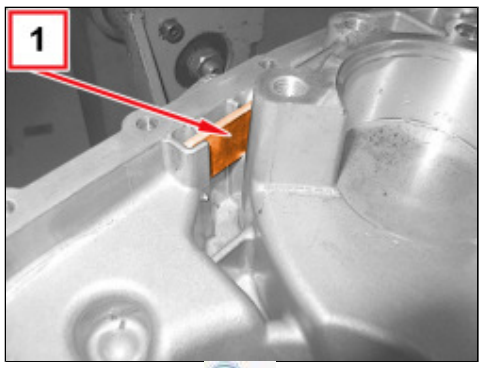

1. Use tools (1a) and (1b) to fit the outer race for the right differential bearing.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870843000 | Fitting tool | Fitting of bearing outer race | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870898400 | Grip | Fitting bearing outer races | 2.0 JTDM |

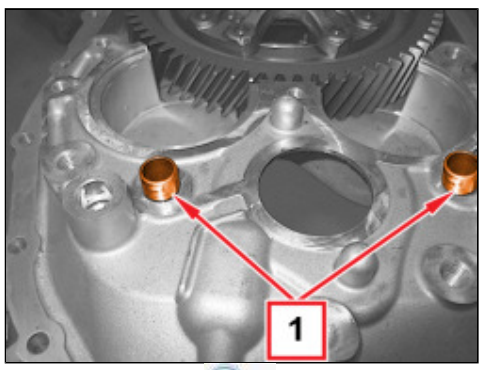



1. Refit the differential casing in its housing.

1. Place the magnet back in its housing.

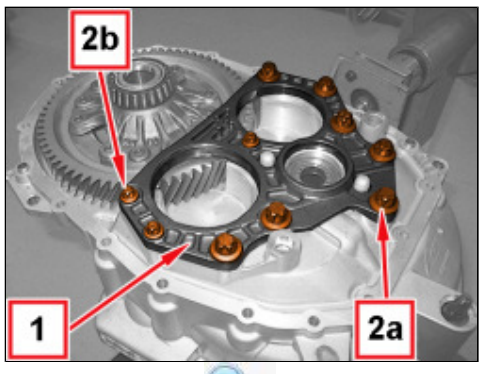


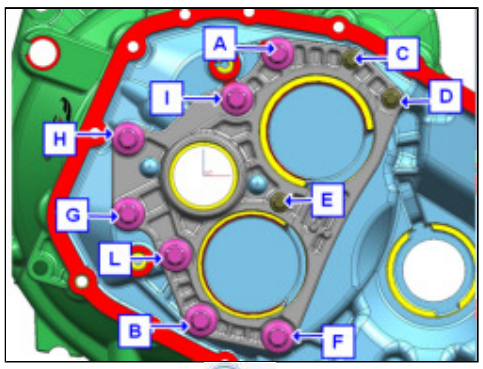

1. Check the integrity of the locating bushes for the main shaft and layshaft mounting plate.




1. Place the main shaft and layshaft mounting plate in its housing and engage the locating bushes.

2. Tighten the screws (2a) and (2b) according to the stages illustrated in the following scheme.




**STAGE 1**

- Tighten the M12 screws shown in the picture to a torque of 2.0 daNm, according to the sequence: I - L - F - H - A.

**STAGE 2**

- Tighten the M8 screws shown in the picture to the prescribed torque, according to the sequence: C - E - D.

| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Main and layshaft rear bearing retaining plate | Screw | M8 | 2.3 ÷ 2.8 | 2.0 JTDM |

**STAGE 3**

- Tighten the M12 screws shown in the picture to the prescribed torque, according to the sequence: B - G.

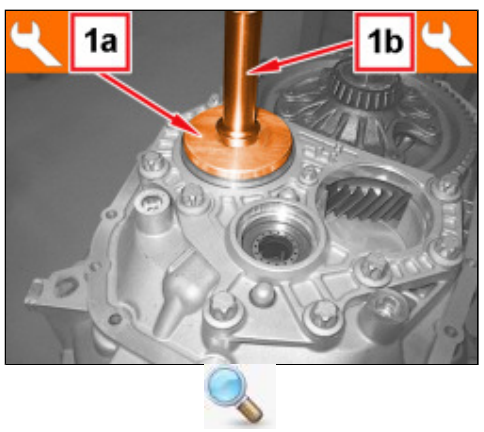
| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Main and layshaft rear bearing retaining plate | Screw | M12 | 7.2 ÷ 8.8 | 2.0 JTDM |

**STAGE 4**

- Tighten the M12 screws shown in the picture to the prescribed torque, according to the sequence: I - L - F - H - A.

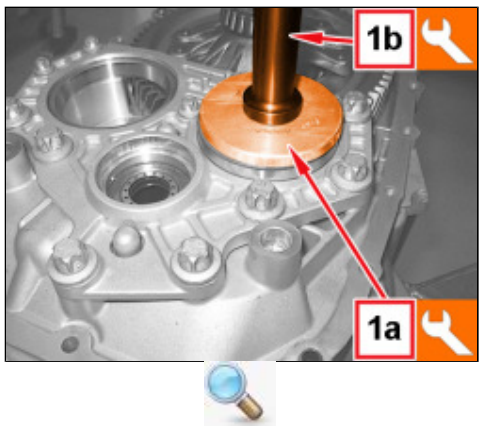
| | | | | |
|---|---|---|---|---|

| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Main and layshaft rear bearing retaining plate | Screw | M12 | 7.2 ÷ 8.8 | 2.0 JTDM |



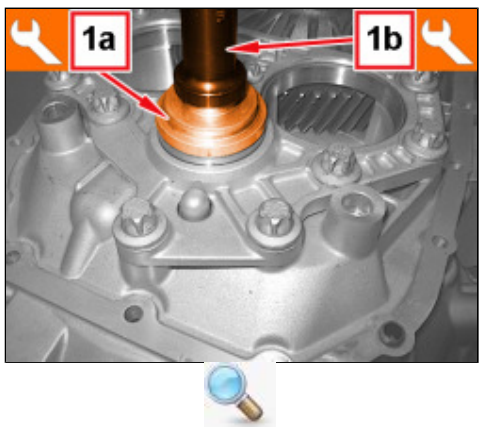

1. Using the tools (1a) and (1b), fit the upper layshaft front bearing outer race.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870434000 | Extractor/fitting tool | Removal/refitting of layshaft bearing outer race | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870898400 | Grip | Fitting bearing outer races | 2.0 JTDM |



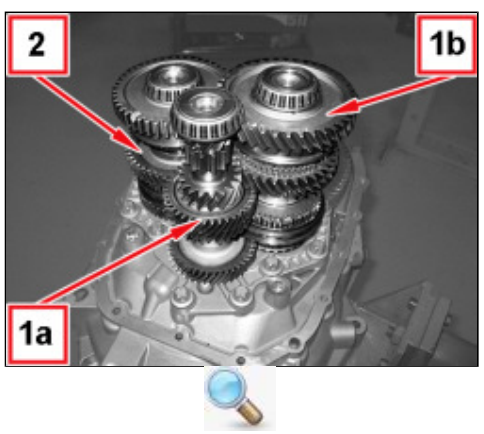

1. Using the tools (1a) and (1b), fit the lower layshaft front bearing outer race.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870434000 | Extractor/fitting tool | Removal/refitting of layshaft bearing outer race | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870898400 | Grip | Fitting bearing outer races | 2.0 JTDM |




1. Using the tools (1a) and (1b), fit the main shaft front bearing outer race.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870426000 | Fitting tool | Fitting of main shaft bearing outer race | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870898400 | Grip | Fitting bearing outer races | 2.0 JTDM |

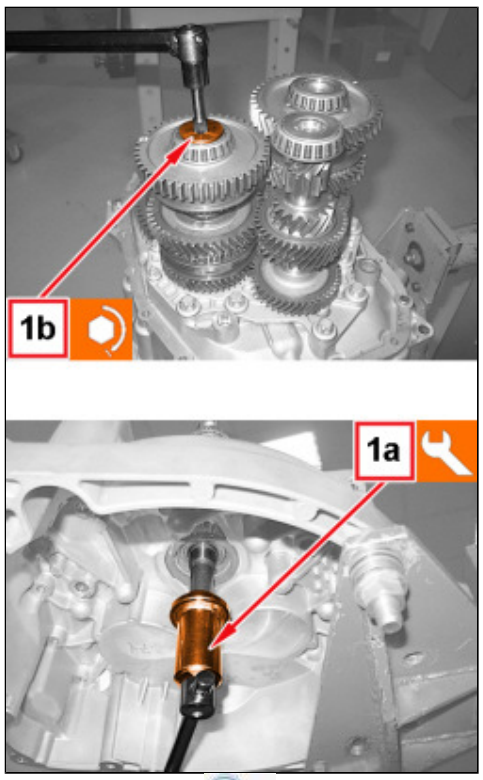



1. Place the main shaft (1a) and the lower layshaft (1b) in its housing.

2. Place the upper layshaft in its housing.

- Engage the 4th speed and reverse.

1. Position the tool (1a) and tighten the left ring nut (1b) fixing the rear upper layshaft bearing to the prescribed torque.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870853000 | Lever | Main shaft rotation | 2.0 JTDM |

| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Layshaft ring nuts | Ring nut | M18 | 9.9 ÷ 12.1 | 2.0 JTDM |

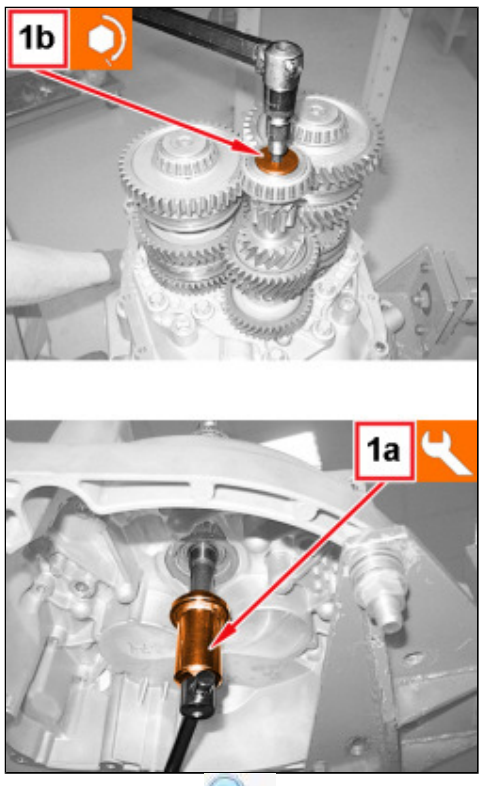
- Engage the 1st and 6th speed.

1. Position the tool (1a) and tighten the left ring nut (1b) fixing the rear lower layshaft bearing to the prescribed torque.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870853000 | Lever | Main shaft rotation | 2.0 JTDM |

| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Layshaft ring nuts | Ring nut | M18 | 9.9 ÷ 12.1 | 2.0 JTDM |

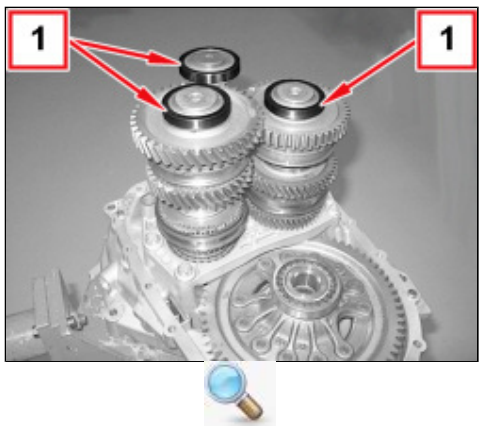
1. Position the tool (1a) and tighten the ring nut (1b) fixing the rear main shaft bearing to the prescribed torque.

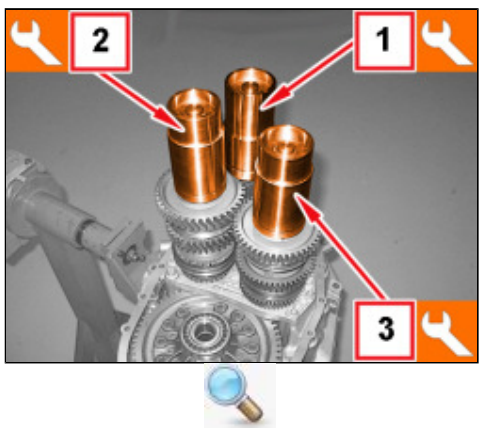



| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870853000 | Lever | Main shaft rotation | 2.0 JTDM |

| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Main shaft ring nut | Ring nut | M14 | 5.0 ÷ 6.1 | 2.0 JTDM |

1. Position the main shaft and layshaft rear bearing outer races.




1. Position the gauge on the main shaft.

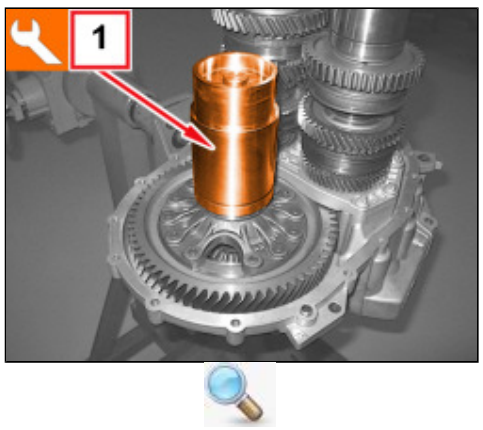
| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035504 | Gauge | Determining thickness of main shaft scraper ring | 2.0 JTDM |

2. Position the gauge on the lower layshaft.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035506 | Gauge | Determining thickness of lower layshaft scraper ring | 2.0 JTDM |

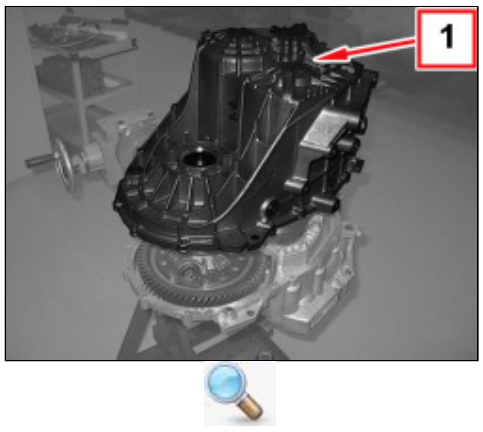
3. Position the gauge on the upper layshaft.

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035505 | Gauge | Determining thickness of upper layshaft scraper ring | 2.0 JTDM |




1. Position the gauge on the differential.

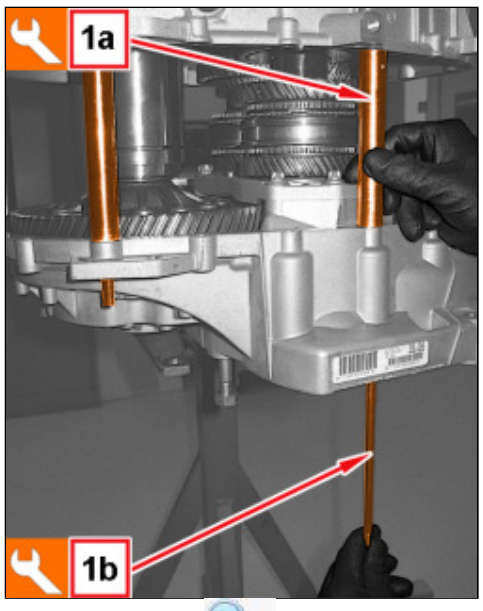
| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035507 | Gauge | Determining thickness of differential casing scraper ring | 2.0 JTDM |




1. Position the gearbox bell housing on the gauges fitted previously.

1. Position the spacers (1a) and tighten the pins (1b) to the gearbox bell housing.

| | | | |
|---|---|---|---|



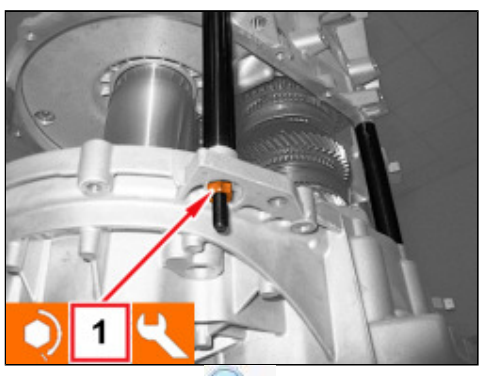

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035501 | Spacers | Determining thickness of scraper rings | 2.0 JTDM |

| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035502 | Threaded pins | Determining thickness of scraper rings | 2.0 JTDM |

Position the six spacers according to the following scheme.

Check that the gauges rotate without sticking.

1. Insert the washers and tighten the spacer fixing nuts to a torque of 1.5 daNm.

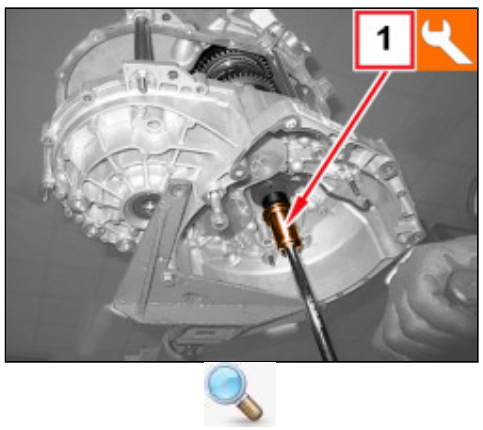



| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035503 | Nuts/washers | Determining thickness of scraper rings | 2.0 JTDM |

Tighten the nuts starting with those next to the gearbox bell housing locating bushes.

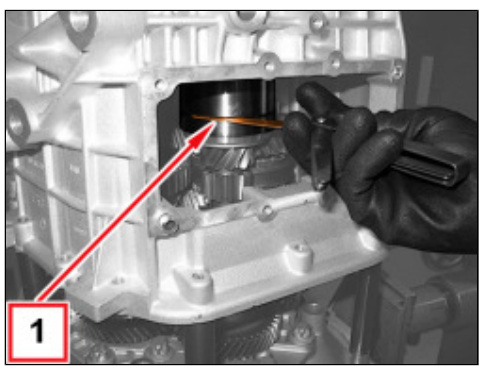
Visually check that the following components are "packed": gearbox bell housing-spacers-clutch bell housing.

1. Engage the 6th speed and use the tool to turn the main shaft 41 times (corresponding to 15 differential rotations).



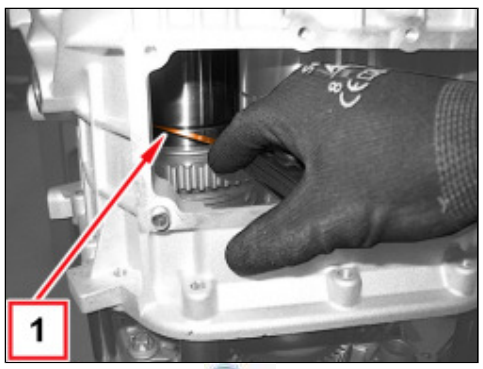

| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870853000 | Lever | Main shaft rotation | 2.0 JTDM |

1. Measure the gap between the two cylinders of the main shaft gauge using a feeler gauge.



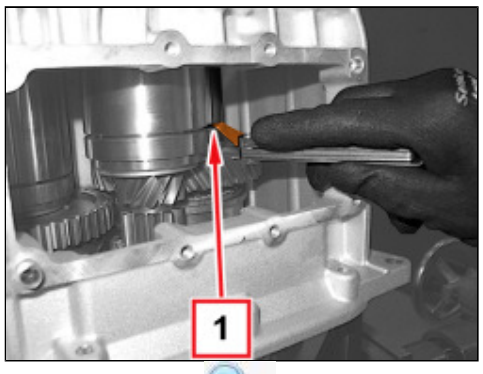
- Determine the thickness of the new scraper ring for the main shaft by subtracting the maximum permitted clearance of 0.011 mm from the reading taken previously using the feeler gauge.

1. Measure the gap between the two cylinders of the upper layshaft gauge using a feeler gauge.



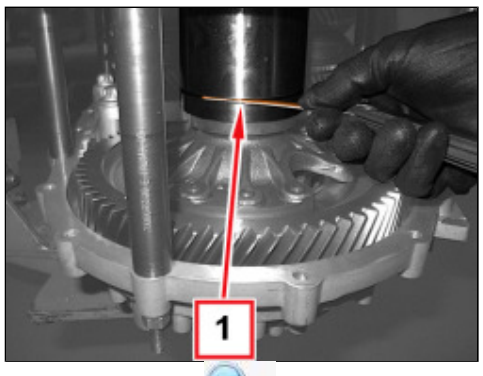

- Determine the thickness of the new scraper ring for the upper layshaft by adding the maximum pre-loading of 0.141 mm to the reading taken previously using the feeler gauge.

1. Measure the gap between the two cylinders of the lower layshaft gauge using a feeler gauge.




- Determine the thickness of the new scraper ring for the lower layshaft by adding the maximum pre-loading of 0.133 mm to the reading taken previously using the feeler gauge.

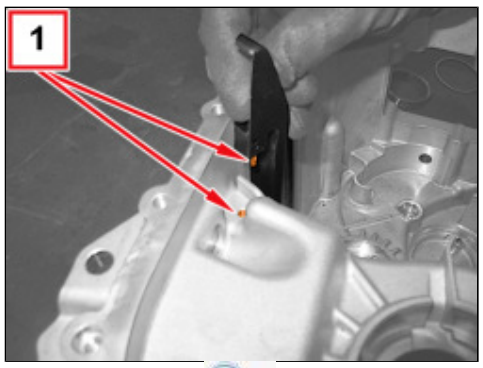
1. Measure the gap between the two cylinders of the differential gauge using a feeler gauge.



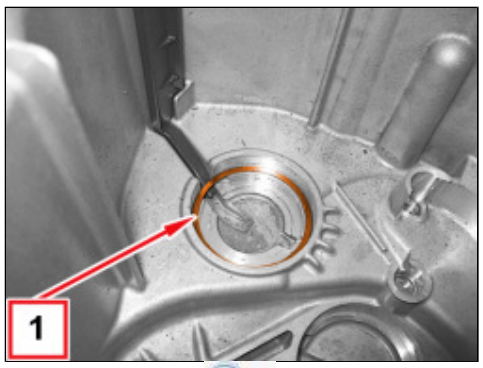

- Determine the thickness of the new scraper ring for the differential by adding the maximum permitted clearance of 0.040 mm to the reading taken previously using the feeler gauge.

- Remove the gearbox casing and all the equipment used to determine the thickness of the new scraper rings.

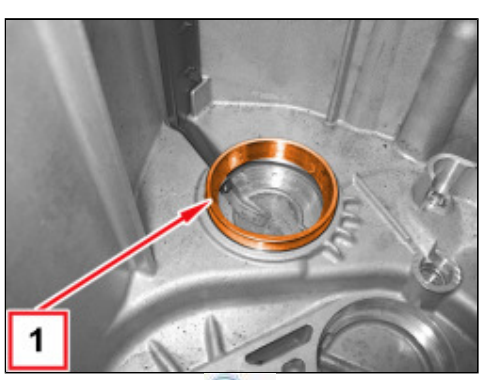
1. Place the lubricating oil duct in its housing and engage the locating pin in the hole shown in the picture.



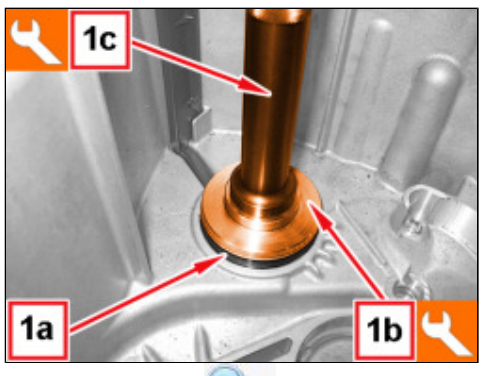

1. Place a new upper layshaft scraper ring in its housing.




1. Place the upper layshaft rear bearing outer race in its housing.




1. Fit the upper layshaft rear bearing outer race (1a) using the tools (1b) and (1c).

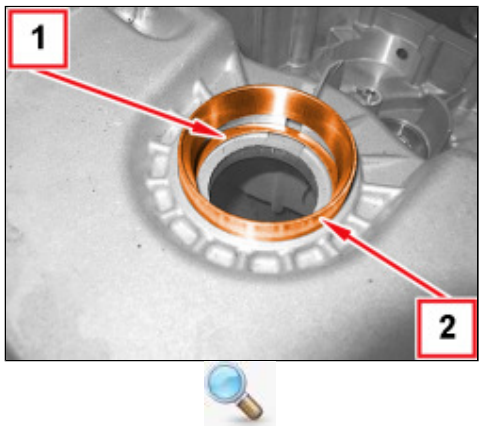



| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870381000 | Fitting tool | Fitting gearbox rear cover bearing<br><br>Fitting of shaft rear bearing outer races | 2.0 JTDM |
| Tool | Description | Function | Validity |
| 1870898400 | Grip | Fitting bearing outer races | 2.0 JTDM |

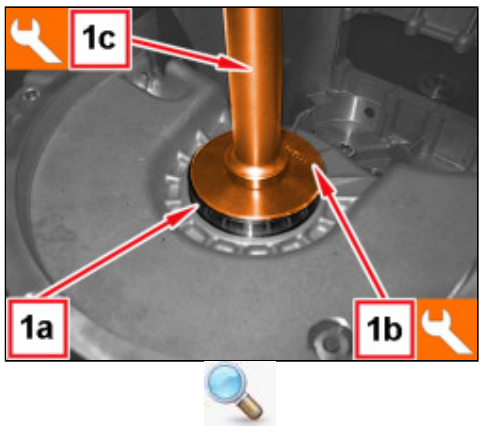
- Proceed in the same way to fit the new scraper rings and the corresponding main shaft and lower layshaft rear bearing outer races.

1. Place a new differential scraper ring in its housing.

2. Place the differential left bearing outer race in its housing.



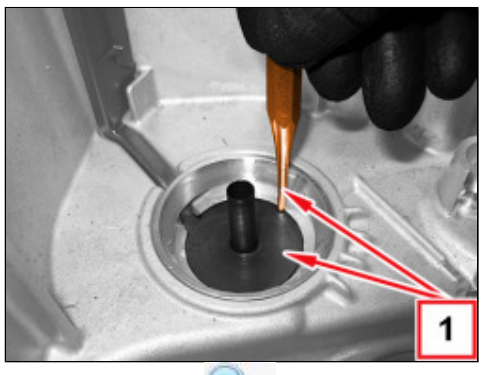

1. Fit the differential left bearing outer race (1a) using the tools (1b) and (1c).




| Tool | Description | Function | Validity |
|---|---|---|---|
| 1870843000 | Fitting tool | Fitting of bearing outer race | 2.0 JTDM |
| Tool | Description | Function | Validity |
| | | | |

| | | | |
|---|---|---|---|
| 1870898400 | Grip | Fitting bearing outer races | 2.0 JTDM |

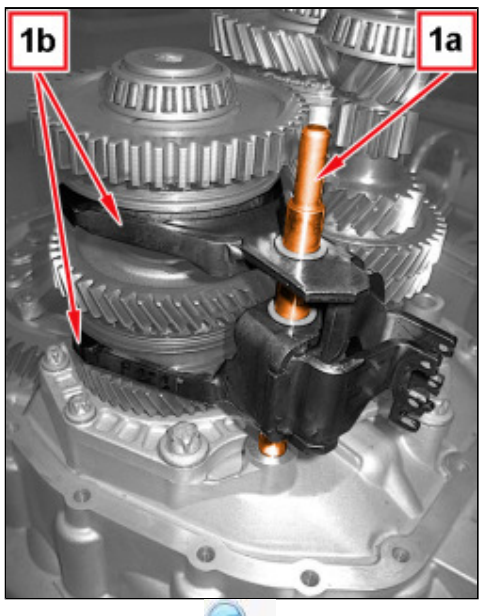
1. Fit and, with a suitable punch, caulk the upper layshaft lubricating duct to the gearbox casing.



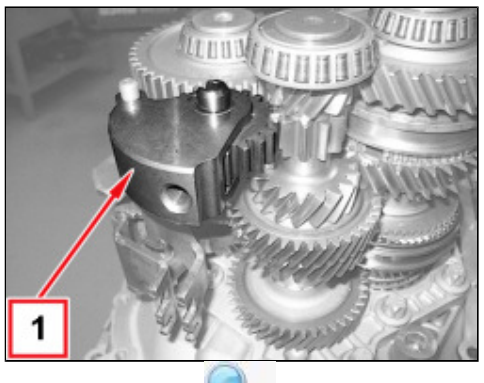

If the gearbox casing is reused, remove the burrs in the upper layshaft lubricating duct housing.

- Proceed in the same way to fit the lower layshaft lubricating ducts.

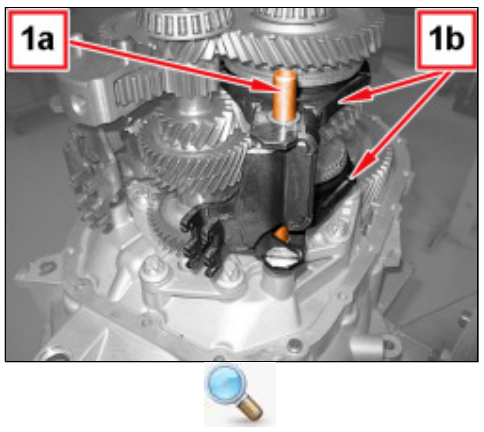
1. Fit the rod (1a) on the clutch casing complete with 3rd-4th speed and reverse control forks (1b) of the upper layshaft.




1. Place the complete reverse gear mounting in its housing.




1. Fit the rod (1a) on the clutch casing complete with 1st-2nd and 5th-6th speed control forks (1b) of the lower layshaft.

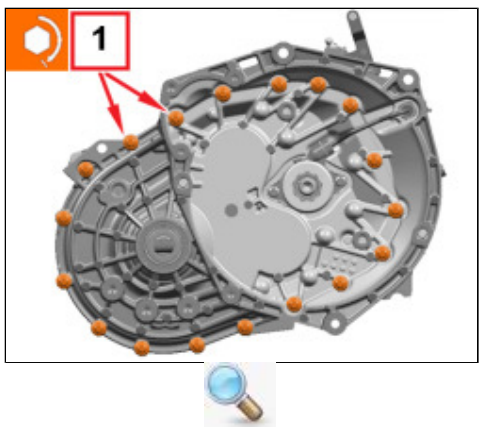



- Apply a bead of silicone sealant on the gearbox casing/clutch casing mating surface.

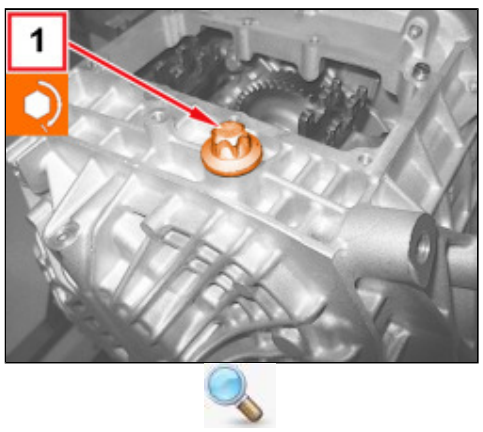
1. Place the gearbox casing in its housing, engage the locating bushes and tighten the screws shown in the picture to the prescribed torque.

The 18 gearbox casing fixing screws must be tightened according to a cross sequence.

| | | | | |
|---|---|---|---|---|
| | | | | |

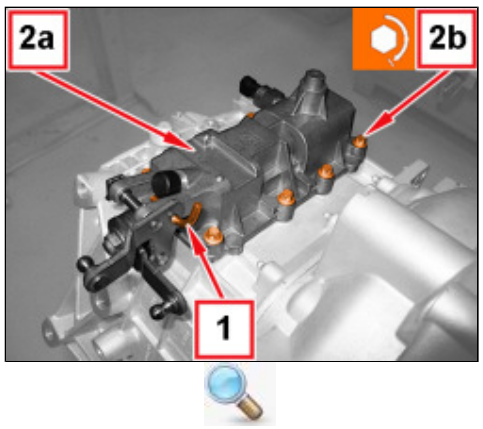



| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Gear casing | Screw | M8 | 2.3 ÷ 2.8 | 2.0 JTDM |




1. Tighten the new reverse gear mounting fixing screw to the prescribed torque.

| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Reverse gear mounting | Screw (to be replaced) | M12 | 9.0 ÷ 11.0 | 2.0 JTDM |



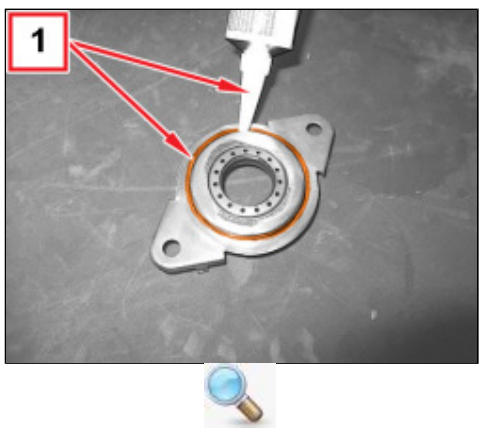

1. Check that the locking pin is inserted in the gear engagement selector as shown in the picture.

- Apply a bead of sealant to the mating surfaces for the clutch casing-gear selection/engagement unit.

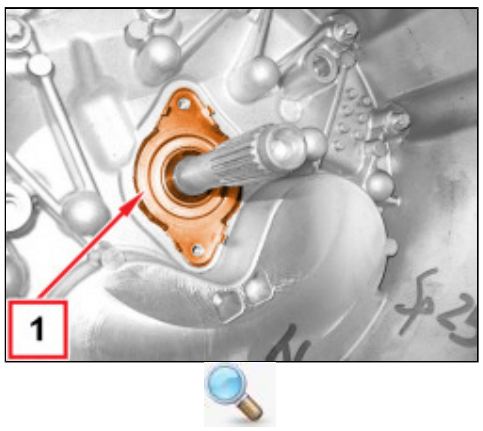
- Check that the dogs of the gear selection/engagement rods are in "neutral" position.

2. Position the gear selection/engagement unit (2a), engage the locating bushes, and tighten the screws (2b) to the prescribed torque.

| Component | Fastening | Ø | Value (daNm) | Validity |
|---|---|---|---|---|
| Gear selection and engagement assembly | Screw | M8 | 2.0 | 2.0 JTDM |

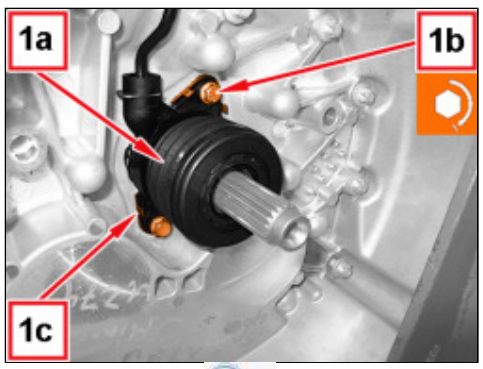


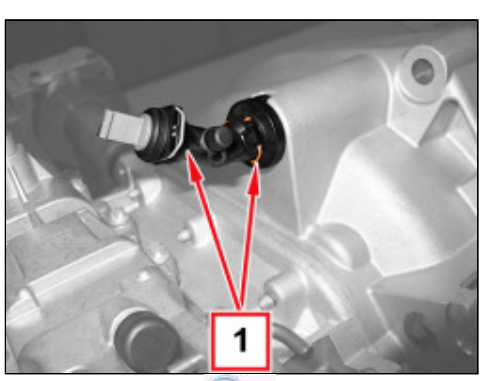

1. Apply silicone sealant to the main shaft seal ring mounting as shown in the picture.




1. Place the main shaft seal ring mounting in its housing, as shown in the picture.

1. Place the clutch control coaxial actuator (1a) in its housing, tighten the screws (1b) to the prescribed torque and engage the retaining tabs (1c).

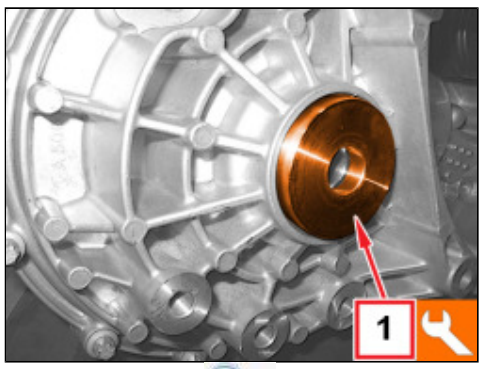



1. Using a new locating bush for the clutch control coaxial actuator pipe, place the three-way connector in its housing and engage the retaining clip.

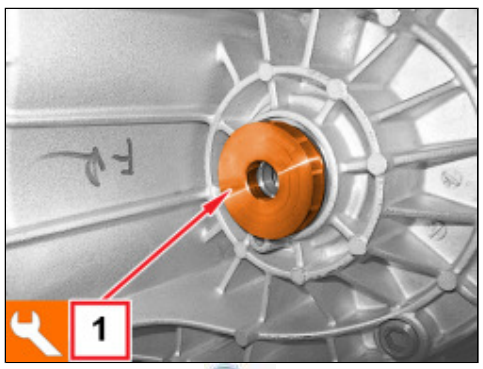
- Unscrew the fastenings, remove the gearbox from the support tool and position it on a suitable stand.

1. Fit a new right differential shaft oil seal ring using the tool.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035511 | Fitting tool | Fitting differential right shaft oil seal | 2.0 JTDM |

1. Fit a new left differential shaft oil seal ring using the tool.




| Tool | Description | Function | Validity |
|---|---|---|---|
| 2000035510 | Fitting tool | Fitting differential left shaft oil seal | 2.0 JTDM |