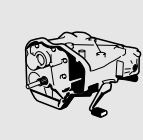
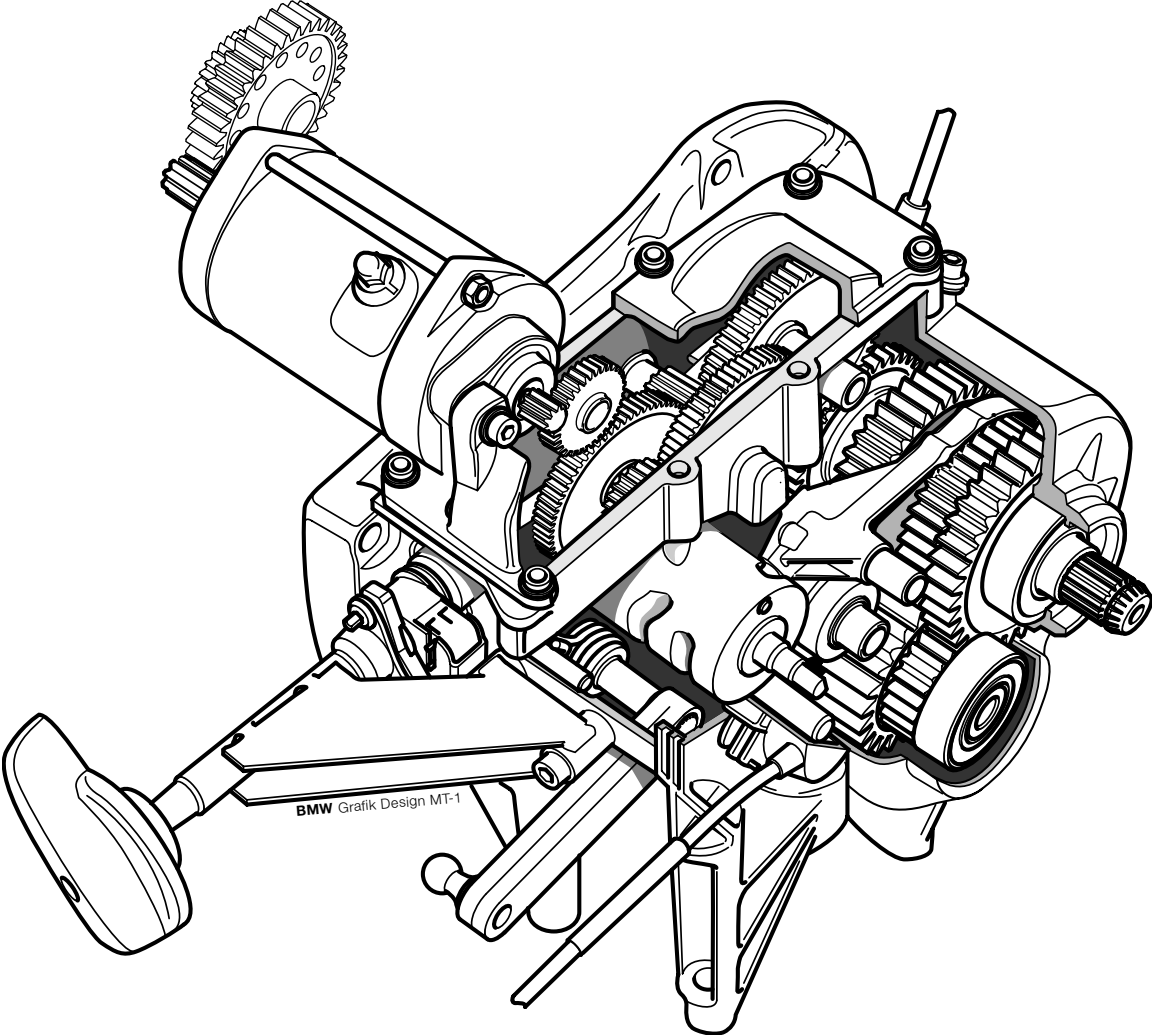
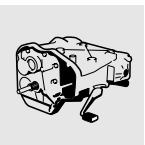
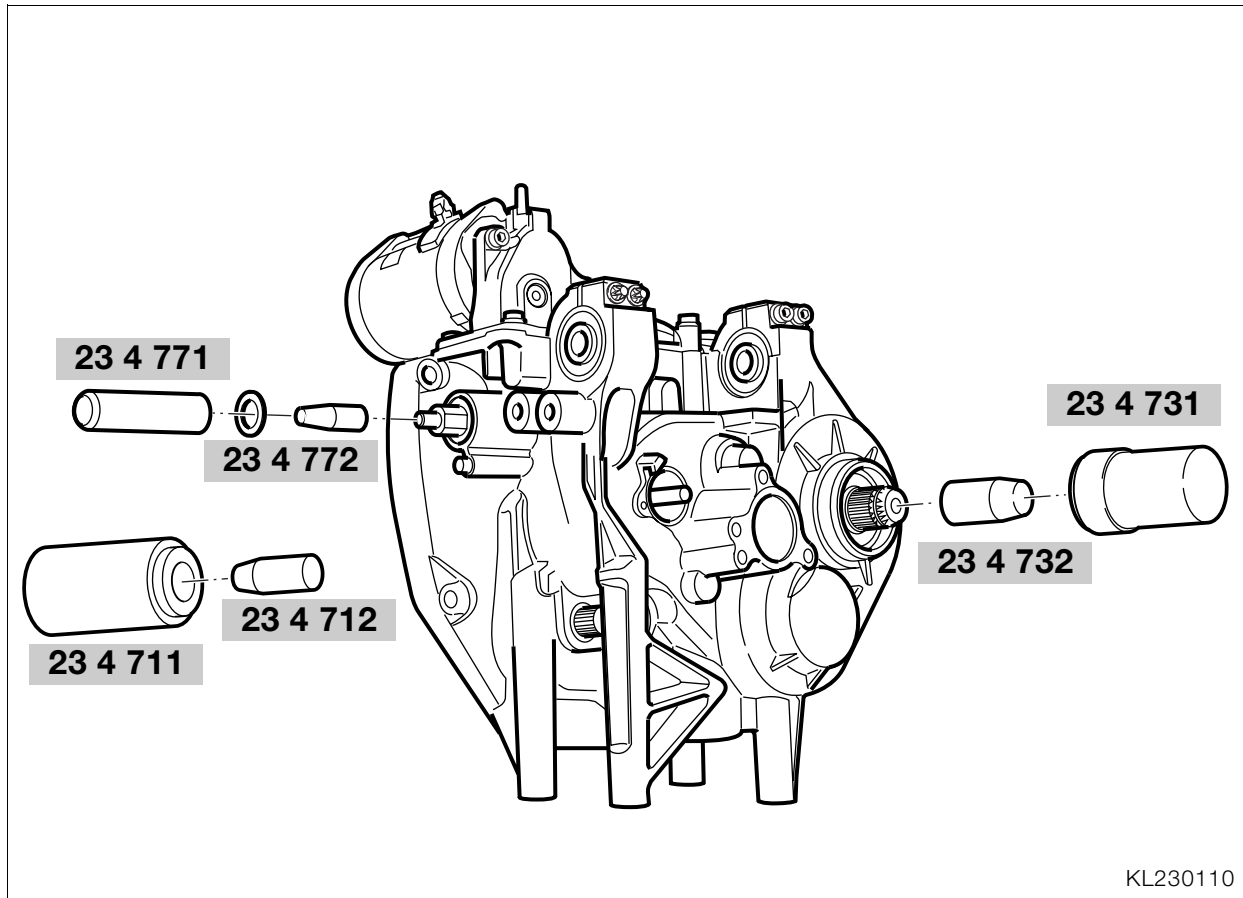


Gearbox – sectional drawing







KL230110

Replacing the shaft sealing rings in the gearbox housing and gearbox cover



Note:

All shaft sealing rings can be replaced with the gearbox installed, apart from the input-side shaft sealing ring on the input shaft. Replace all shaft sealing rings if the gearbox is fully disassembled. Lightly oil the sealing lips before installing the shaft sealing rings.

Replacing input shaft sealing ring at input side

- Lever out the shaft sealing ring with a screwdriver.
- Drive in the new sealing ring with the sealing lips facing inwards, using slip-over sleeve, **BMW No. 23 4 712**, and drift, **BMW No. 23 4 711**.

Replacing output shaft sealing ring



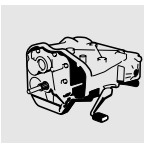
Caution:

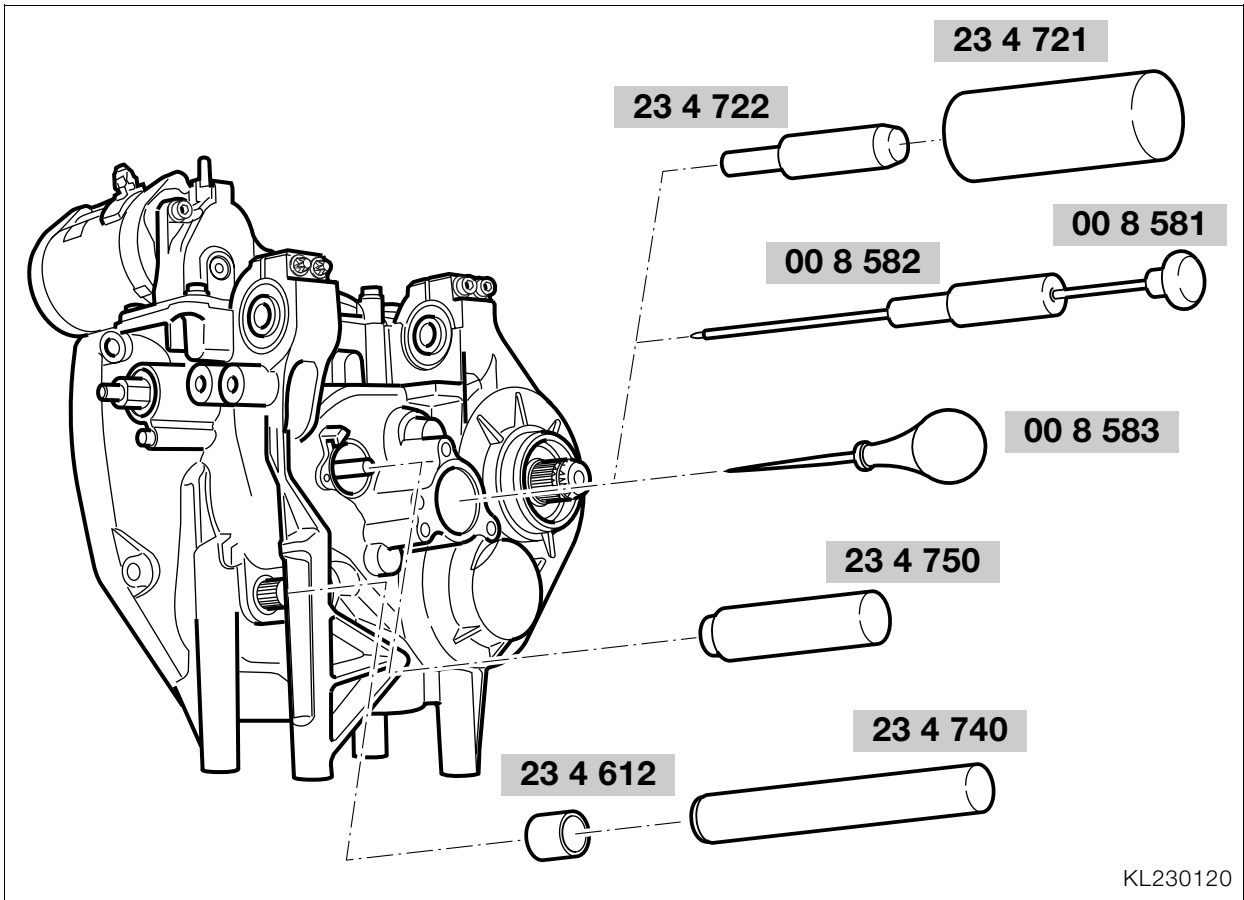
The sealing washer for the grooved ball bearing is immediately behind the shaft sealing ring: take care not to damage the sealing washer when removing the sealing ring.

- Carefully lever out the shaft sealing ring with a screwdriver.
- Install the sealing ring with the sealing lip facing inwards, using assembly sleeve, **BMW No. 23 4 732**, and drift, **BMW No. 23 4 731**.

Replacing shaft sealing ring for selector shaft of reverser

- Remove the gear-shift lever.
- Lever out the shaft sealing ring with a screwdriver.
- Drive in the new sealing ring with the sealing lips facing inwards, using slip-over sleeve, **BMW No. 23 4 772**, and drift, **BMW No. 23 4 771**.
- Reinstall the gear-shift lever





KL230120

Replacing input shaft sealing ring at output side

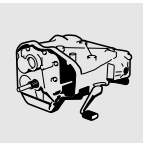
- Pierce the shaft sealing ring with awl, **BMW No. 00 8 583**.
- Screw the pull rod, **BMW No. 00 8 581**, into the hold and use impact weight, **BMW No. 00 8 582**, to remove the shaft sealing ring.
- Install the new sealing ring with the sealing lips facing inwards, using guide, **BMW No. 23 4 722**, and drift, **BMW No. 23 4 721**.

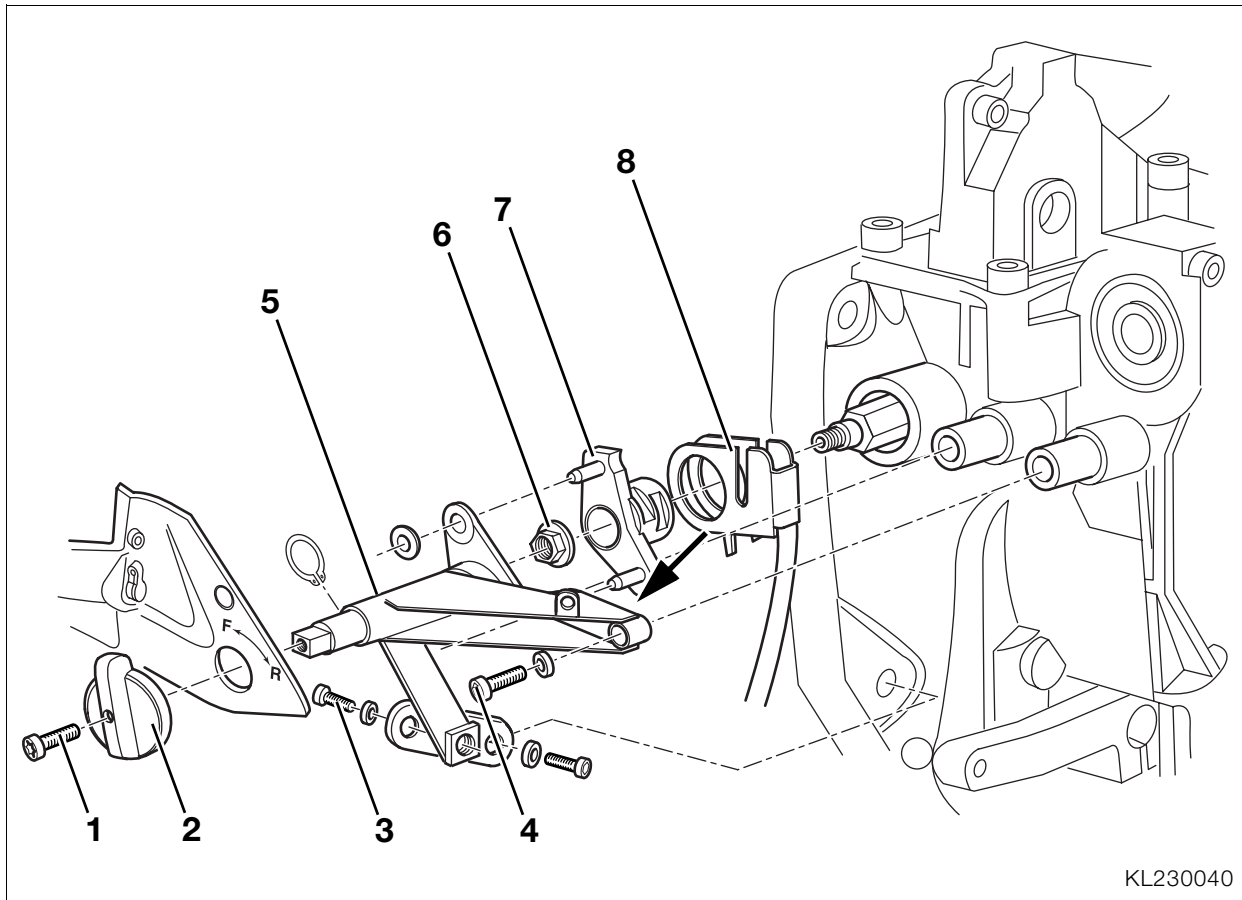
Replacing shaft sealing ring for selector drum

- Lever the shaft sealing ring out with a screwdriver.
- Install the new sealing ring with the sealing lip facing inwards, using drift, **BMW No. 23 4 750**.

Replacing shaft sealing ring for selector shaft

- Lever the shaft sealing ring out with a screwdriver.
- Install the sealing ring with the sealing lip facing inwards, using assembly sleeve, **BMW No. 23 4 612**, and drift, **BMW No. 23 4 740**.





Removing and installing actuating unit for reverser

Removing and installing actuating control for reverser

- Remove screw (1).
- Remove actuating control (2) for reverser.
- Clean threads of screw (1), coat with **Loctite 243** and install.

Removing and installing actuating unit for reverser

- Remove skirt.
- Remove left-hand section of engine spoiler.
- Remove screws (3, 4).
- Remove actuating unit for reverser (5).
- Remove nut (6).
- Remove selector lever for reverser (7) with switch unit (8).
- Remove switch, if necessary.
- Installation is the reverse of the removal procedure: pay particular attention to the following.



Note:

Mount the switch unit for the reverser with the recess engaging the lug on the gearbox.



Note:

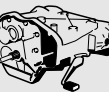
Install the actuating control (2) with the grip projection at the top.
Make sure that all cables are correctly routed and are not pinched or kinked.

- Route cables for side-stand switch, switch for reverser and gearbox switch behind the actuating unit for the reverser (arrow).
- Clean threads of screws (3), coat with **Loctite 243** and install.
- Clip the cable for the oxygen sensor into the retaining clip on the actuating unit for the reverser.

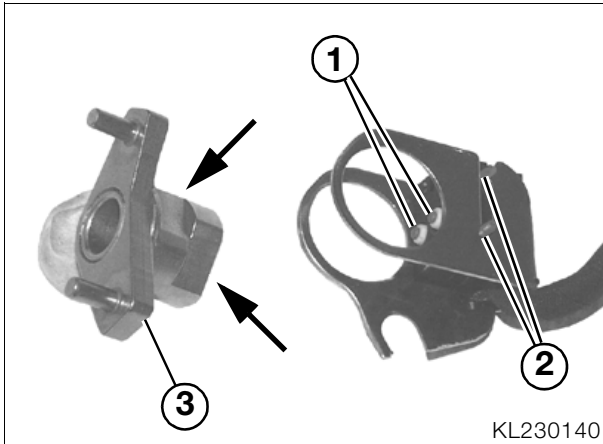


Tightening torques:

Switch unit for reverser to gearbox.....	9 Nm
Actuating control for reverser (clean thread and Loctite 243).....	6 Nm
Reverser actuator to link M8 (clean thread and Loctite 243).....	24 Nm
Link of reverser actuator to intermediate flange M8 (clean thread and Loctite 243).....	24 Nm



Disassembling/assembling double switch for reverse gear



- Turn actuating lever (3) clockwise until the flats (arrows) are toward contacts (1).
- Remove the actuating lever.

Caution:

Do not damage retainers (2) of the double switch.

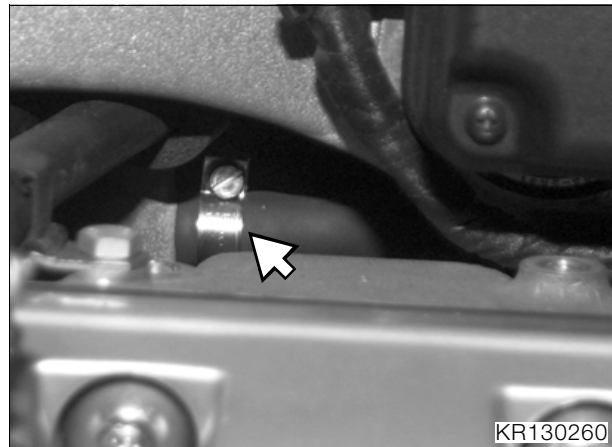
- If necessary, remove the double switch for reverse-gear indication from the actuating lever.
- Assembly is the reverse of the disassembly procedure.

Removing gearbox

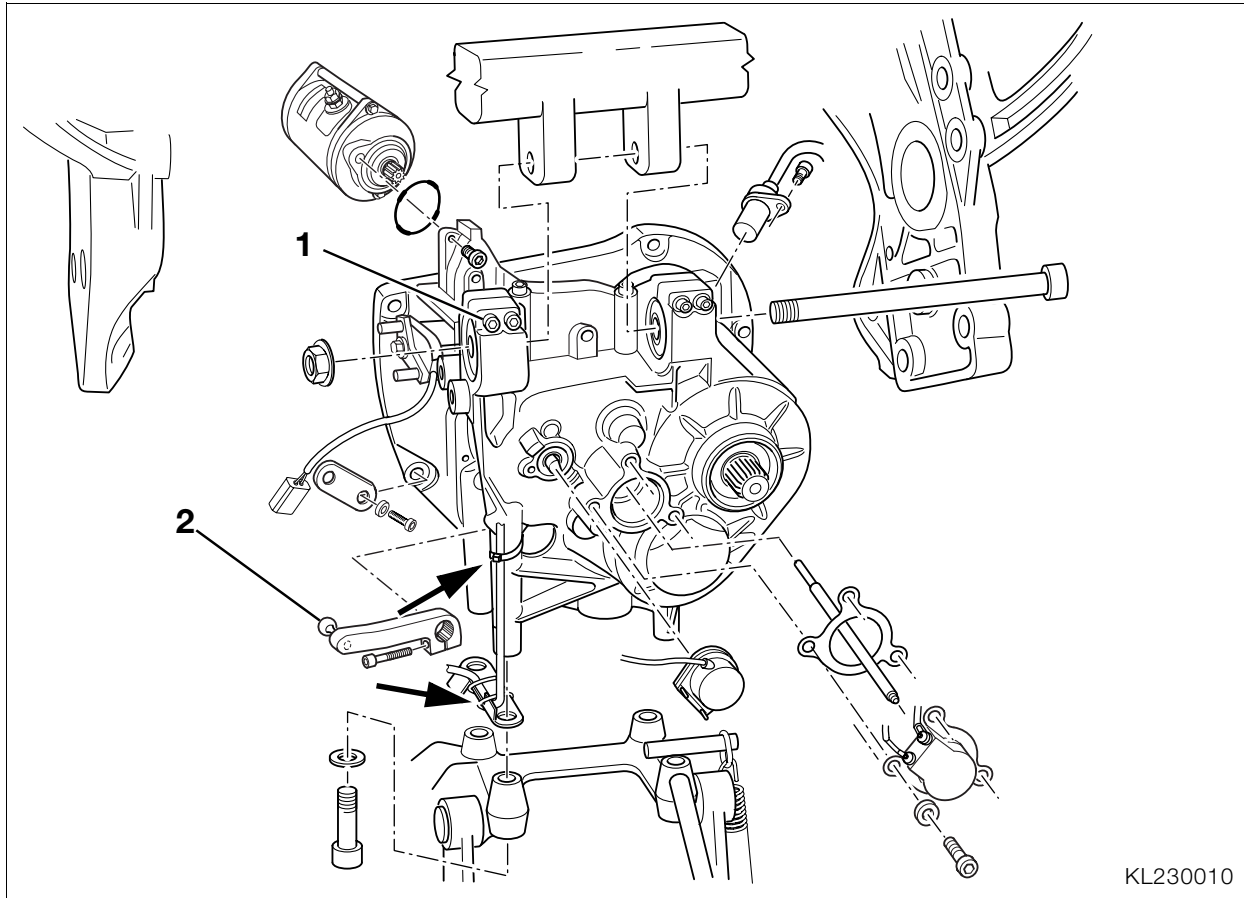
Caution:

Disconnect the negative cable from the battery first, followed by the positive cable.

- Disconnect the battery.
- Remove the left and right fairing side sections.
- Remove actuating control for reverser.
- Remove engine spoiler.
- Remove left and right skirt brackets.
- Remove tank cover with the control unit for the radio.
- Remove fuel tank.
- Remove the intake air pipe.
- Remove the left and right air outlet ducts from the radiators.
- Press left and right radiators with fans out of their holders.
- Remove fuel injection rail.
- Remove throttle-valve rail with air filter box.
- Disconnect fuel lines from engine.



- Disconnect hose (arrow) for crankcase breather.
- Remove front left footrest plate.
- Remove front right footrest plate.
- Remove left and right rear footrest plates.
- Remove left and right battery covers.
- Disconnect plugs for oxygen sensor, side-stand switch, coolant-temperature sensor and gear indicator behind left-hand battery cover.
- Disconnect primary lead from ignition coil.



- Remove exhaust system.
- Fit lifting gear, **BMW No. 00 1 510**.
- Remove rear wheel.
- Remove inductive sensor from rear wheel drive.
- Remove the rear wheel brake caliper, fasten to the rear frame with the inductive sensor using a cable tie.



Warning:
Note high release torques.

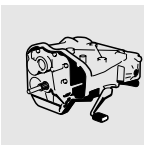
- Remove rear wheel drive unit.
- Remove swinging arm.
- Remove front drive shaft.
- Disengage gearshift linkage at ball joint (2).
- Remove transverse tube.

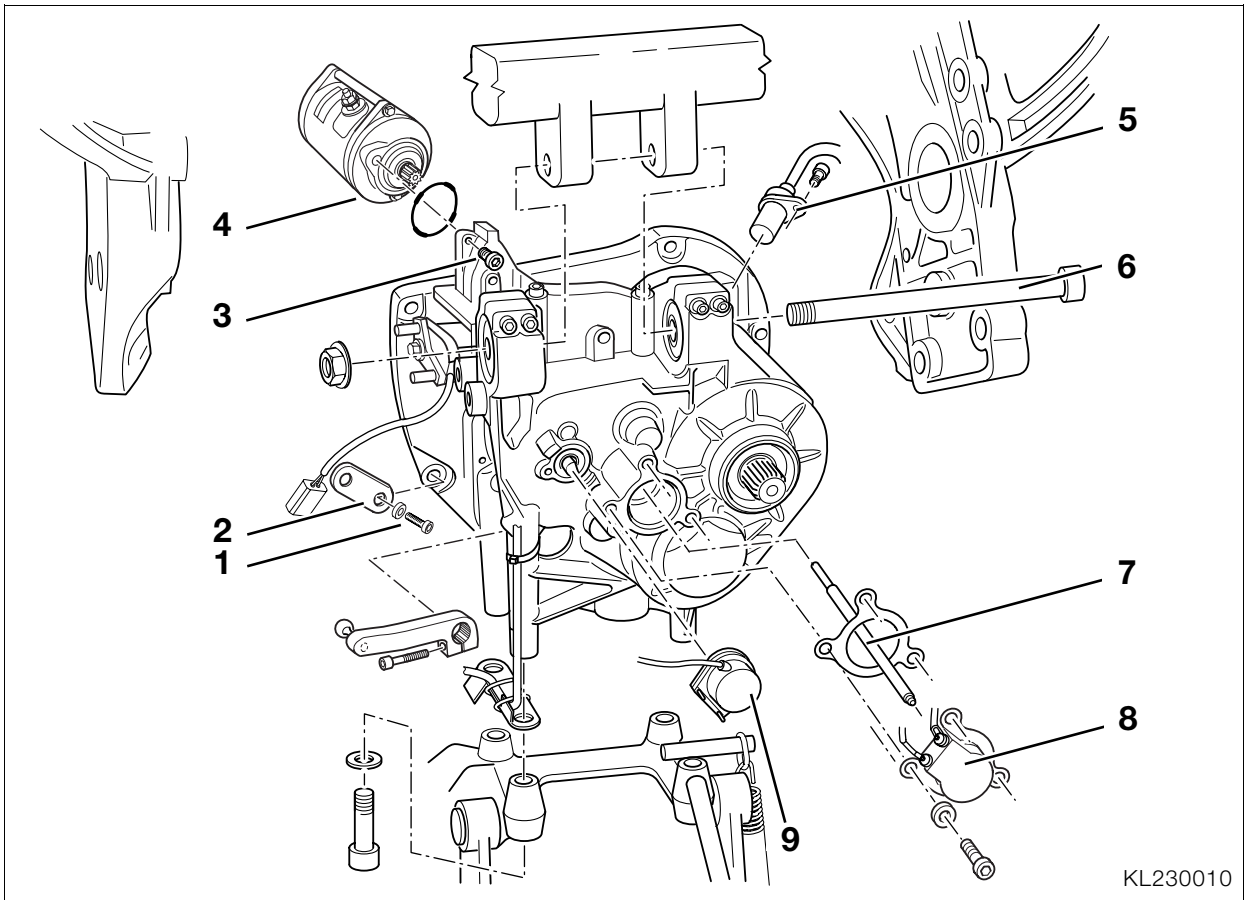
- Remove actuating unit for reverser, complete with switch unit.
- If the gearbox is to be fully disassembled, remove the main (centre) stand.
Cut through the cable strap (arrow) and remove the cable for the side-stand switch.



Caution:

The two Torx screws securing the left rubber mount (1) are each marked by a spot of paint: do not slacken these screws.





KL230010

- Disconnect plug for speed sensor (5) of reverser at right-hand skirt bracket.
- Remove nuts securing cross member to engine at left and right.
- Remove the clutch slave cylinder (8).
- Remove clutch release rod (7) from the gearbox.
- Secure front wheel in position.
- Use workshop crane, **BMW No. 46 5 640**, to raise rear of frame high enough to take weight off gearbox mounts.
- Remove gearbox mounting bolt (6).



Note:

Disconnect the power cable for the starter motor from the positive terminal on the rear frame.

- Disconnect cables for generator and starter motor (4).
- Compress spring and remove gear indicator switch (9).



Note:

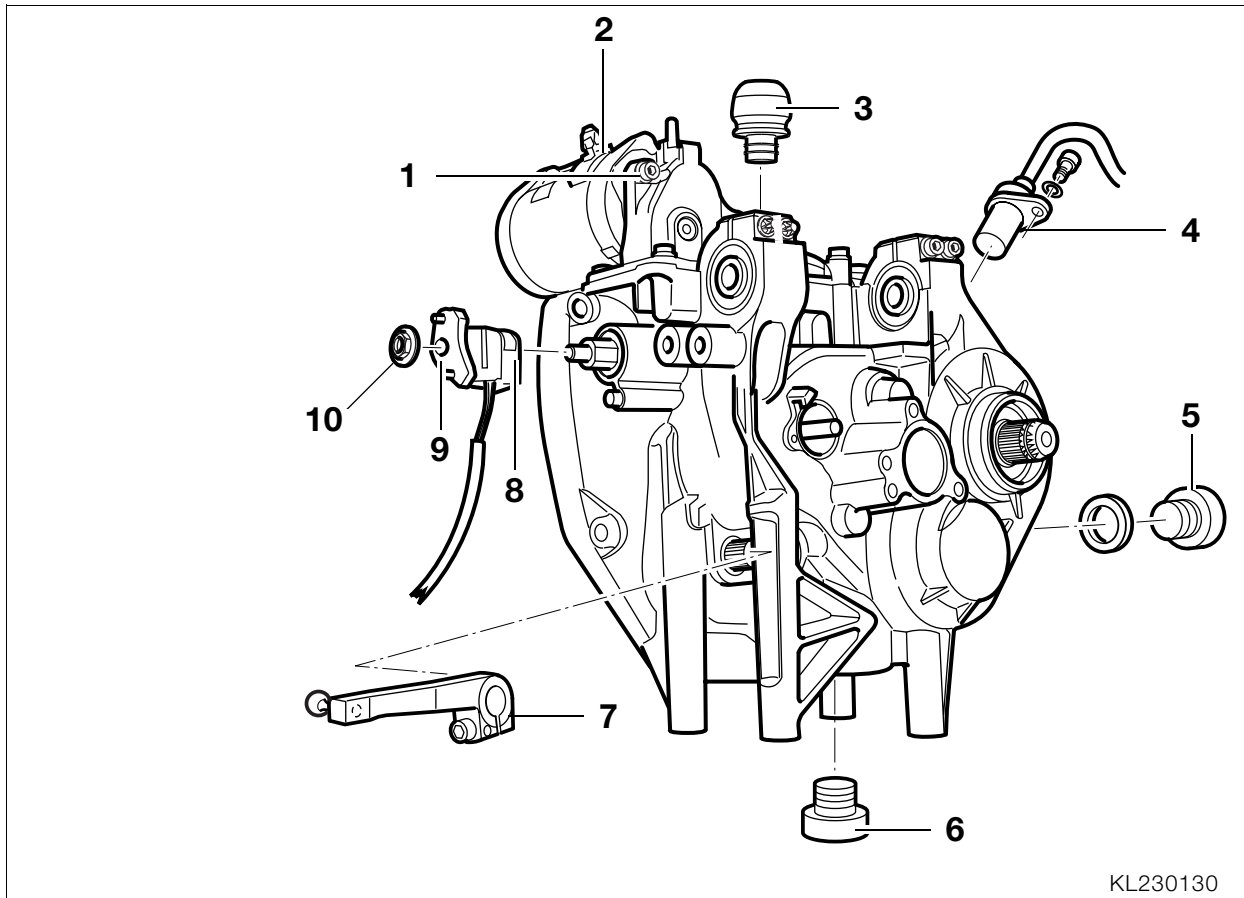
If not removed, the main (centre) stand must be retracted to permit removal of the gearbox. Screw (1) is secured with **Loctite 243**.

Caution:

When raising the frame, make sure that there is adequate clearance between the gearbox and the frame on the right and between the upper transverse tube and the generator: always take care not to scratch the surfaces.

- Use workshop crane, **BMW No. 46 5 640**, to raise frame until gearbox and starter motor are accessible.

- Remove seven screws (1) securing gearbox to intermediate flange.
- Remove link for reverser (2).
- Pull gearbox out of intermediate flange until stub of input shaft is clear and remove gearbox complete with starter motor.
- If gearbox is to be fully disassembled, remove screw (3) securing starter motor and remove starter motor.



KL230130

Disassembling gearbox

Preparatory work

- Remove screw (1) securing starter motor (2) and remove starter motor from gearbox housing.
- Remove oil filler/level check screw (5).
- Remove oil drain plug (6) and drain the oil from the gearbox into a suitable tray.
- Remove breather (3).
- Remove speed sensor for reverser (4).
- Remove selector lever (7).
- Remove nut (10) and remove actuating lever (9) with double switch (8) for reverse-gear indicator.

