

**Danger of poisoning!**

Ingesting oil or absorbing through the skin may cause poisoning!

Possible symptoms are:

- Headaches
- Dizziness
- Stomach aches
- Vomiting
- Diarrhoea
- Cramps/fits
- Unconsciousness

**Protective measures/rules of conduct:**

- Pour oil only into appropriately marked containers
- Do not pour oil into drinking vessels (drinks bottles, glasses, cups or mugs)
- Observe country-specific safety regulations

**First aid measures:**

- Do not induce vomiting.

If the person affected is still conscious, he/she must rinse out their mouth with water, drink plenty of water and consult a doctor immediately.

If the person affected is unconscious, do not administer anything by mouth, place the person in the recovery position and seek immediate medical attention.

**Note:**

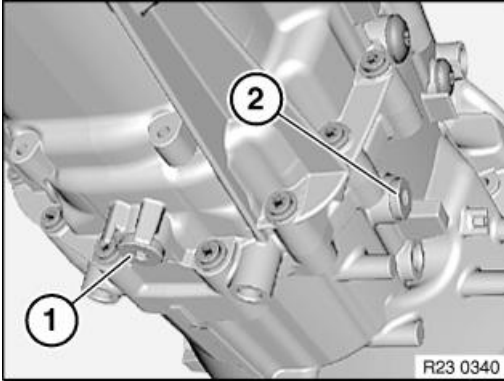
Transmission must be at operating temperature.

Transmission oil:

- refer to BMW Service [Operating Fluids](#).

Filling capacities:

- Refer to [Technical Data](#).



Draining transmission oil:

- Release oil drain plug (1) and filler plug (2).
- Clean oil drain plug (1) and screw in.

Tightening torque [23 00 4AZ](#).

Fill transmission with transmission oil.

- Pour in gear oil until overflowing.
- Screw in oil filler plug (2).

Tightening torque: [23 00 4AZ](#).

**Important!**

After completion of work, check [gearbox oil level](#).

[Use only the approved transmission oil.](#)

Failure to comply with this instruction will result in serious damage to the transmission.

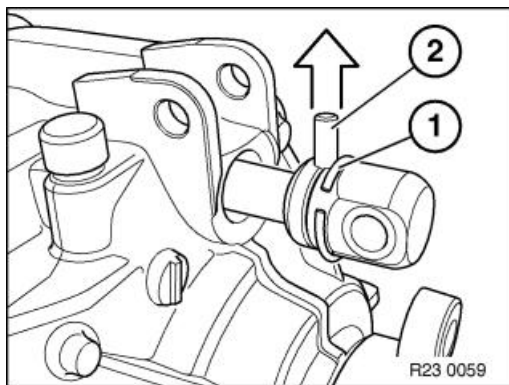
**Recycling:**

Catch and dispose of escaping transmission oil.

Observe country-specific waste disposal regulations

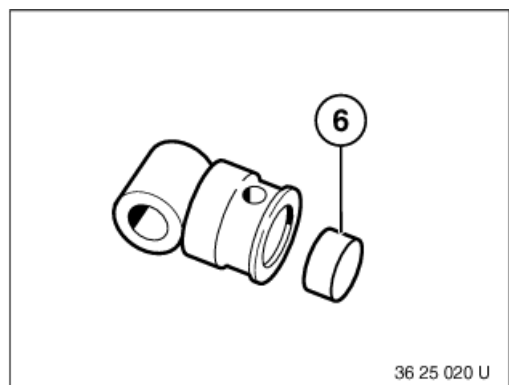
**Necessary preliminary tasks:**

- Drain transmission oil at oil drain plug. Tightening torque: [23 00 4AZ](#)
- [Remove transmission](#)



Convert gearshift rod joint.

Push back circlip (1) and drive out cylindrical pin (2).

**Note:**

Check damping disc (6) for damage and replace if necessary.



Convert following components from previous transmission to new transmission.

- [Release bearing and release lever](#)
- Ball pin and wire spring clip
- Stud bolts for clutch slave cylinder
- Reversing light switch, tightening torque: [23 11 1AZ](#).
- If applicable, re-insert zero-gear sensor, screws with Loctite.  
Tightening torque [23 14 2AZ](#).



Reassemble the vehicle.

Check oil level.

*Installation note:*

Observe [greasing specification](#).

**Important!**

After completion of work, check [gearbox oil level](#).

Use only the [approved transmission oil](#).

Failure to comply with this instruction will result in serious damage to the transmission.

**Recycling:**

Catch and dispose of escaping transmission oil.

Observe country-specific waste disposal regulations

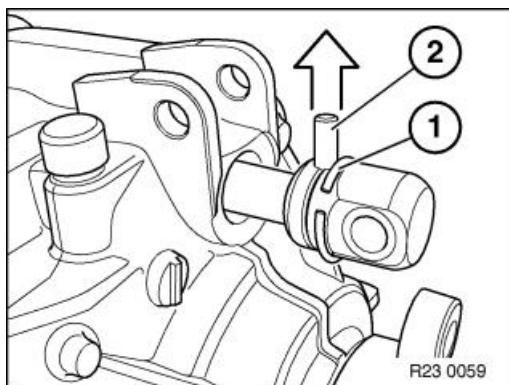
**Necessary preliminary work:**

- Drain [gear oil](#) at oil drain plug.  
Tightening torque: [23 00 4AZ](#).
- [Remove transmission](#).
- Remove [transfer box](#).



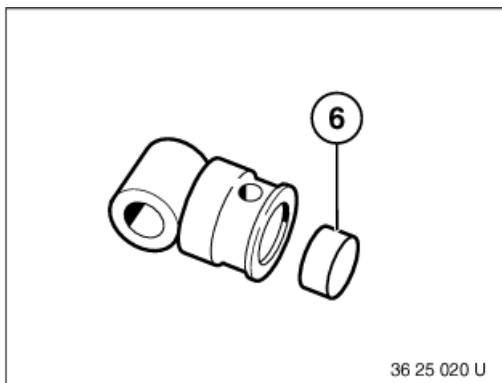
Convert following components from previous transmission to new transmission.

- [Release bearing and release lever](#).
- Ball pin and spring wire clamp.
- Studs for clutch slave cylinder.
- Reversing light switch, tightening torque: [23 11 1AZ](#).



Transfer gearshift rod joint.

Slide back retaining ring (1) and drive out cylinder pin (2).



*Note:*

Check damping disc (6) for damage and replace if necessary.



Reassemble the vehicle.

Check oil level.

*Installation note:*

Observe [greasing specification](#).



## Important!

After completion of repair work, check [transmission oil level](#).

Use only [approved transmission oil](#).

Failure to comply with this instruction will result in serious damage to the transmission.



## Recycling:

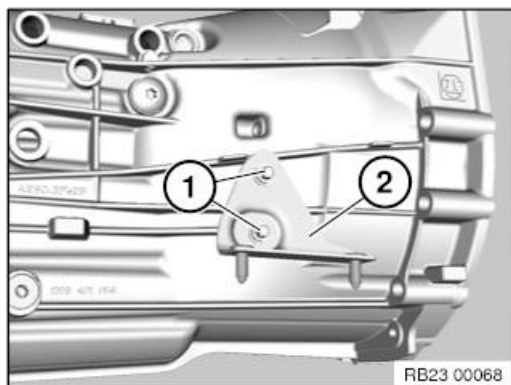
Catch and dispose of escaping transmission oil.

Observe country-specific waste disposal regulations



## Necessary preliminary tasks:

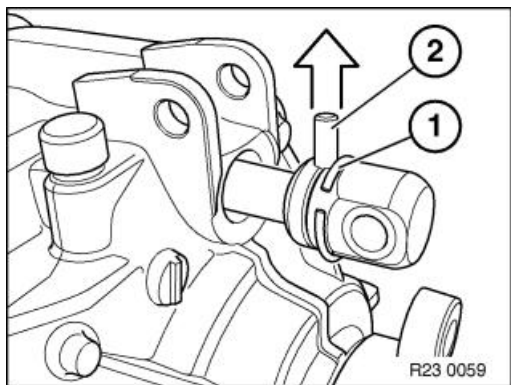
- Drain transmission oil at oil drain plug.  
Tightening torque [23 00 4AZ](#).
- [Remove transmission](#)
- Remove [transfer box](#)



Release screws (1).

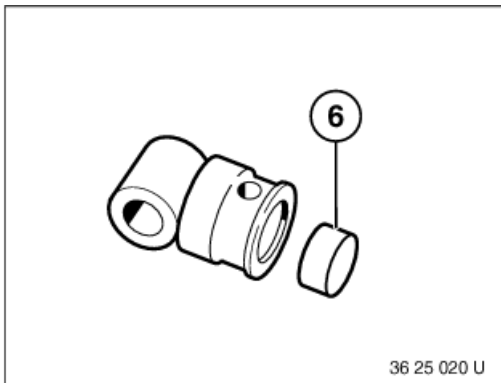
Tightening torque [23 00 3AZ](#).

Modify holder (2).



Transfer gearshift rod joint.

Slide back retaining ring (1) and drive out cylinder pin (2).



*Note:*

Check damping disc (6) for damage and replace if necessary.



Modify following parts to new transmission:

- [Release bearing and release lever.](#)
- Ball pin and spring wire clamp.
- Studs for clutch slave cylinder.
- If necessary zero-gear sensor  
Tightening torque: [23 14 2AZ](#).  
Replace screws.
- Reversing light switch  
Tightening torque: [23 14 1AZ](#).



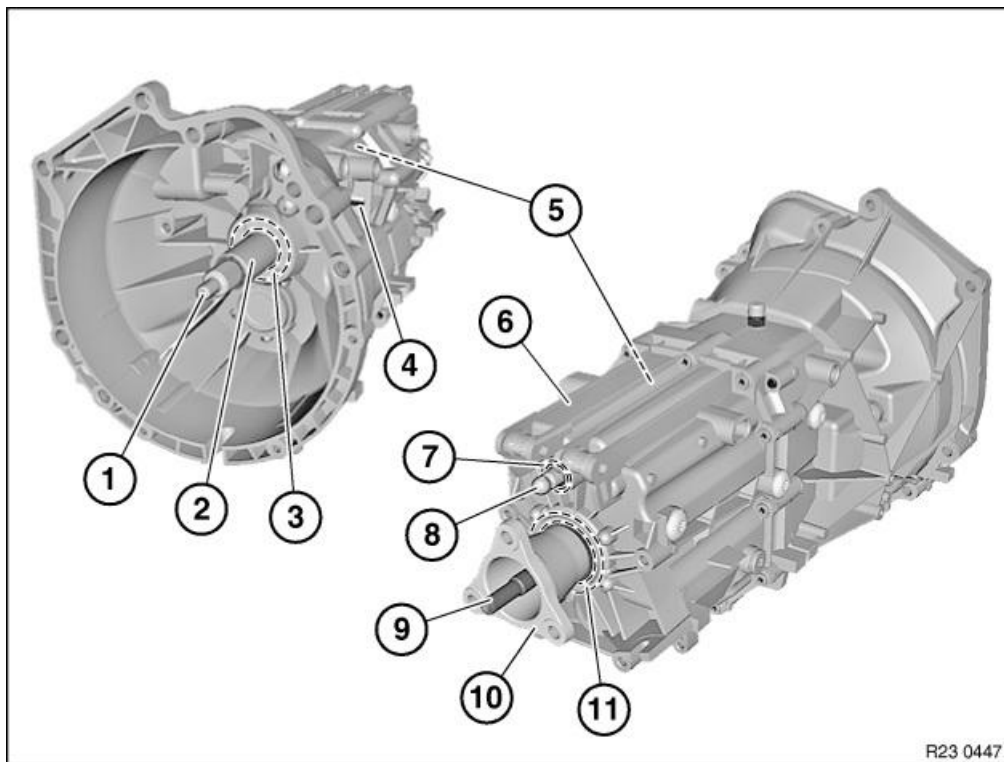
Reassemble the vehicle.

Check oil level.

*Installation note:*

Observe [greasing specification](#).

## 23 00 ... Overview of gearbox housing (GS6-17BG)



Complete transmission, oil change, transmission designations

0 [General information](#)

1 Drive shaft

2 [Guide tube](#)

For transmission input shaft

3 [Radial shaft seal](#)

4 Transmission housing, front section

5 Internal components

shafts, gear wheels, gearshift components

6 Transmission housing, rear section

For gearshift shaft

7 [Radial shaft seal](#)

8 Gearshift shaft

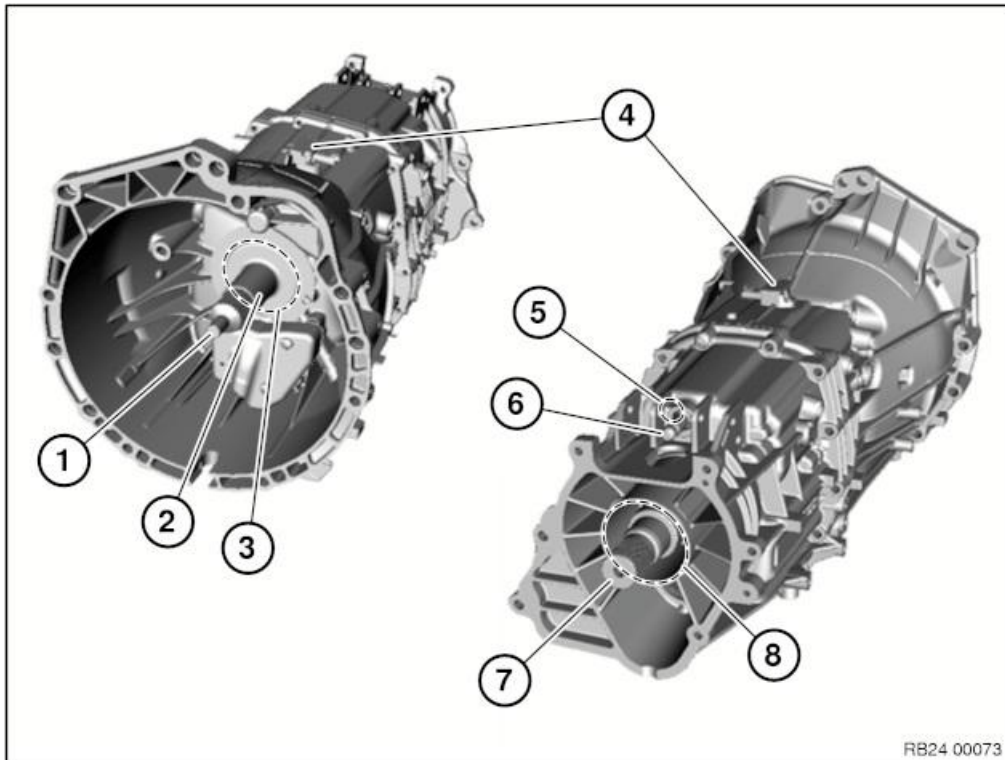
9 Output shaft

10      Output flange

For output flange

11      [Radial seal](#)

## 23 00 ... Overview of gearbox housing (GS6-45BZ) All-wheel drive



Complete transmission, oil change, transmission designations

### 0 [General information](#)

1 Gearbox input shaft

### 2 [Guide tube](#)

For transmission input shaft

### 3 [Radial shaft seal](#)

### 4 [Zero-gear sensor](#)

For gearshift shaft

### 5 [Radial shaft seal](#)

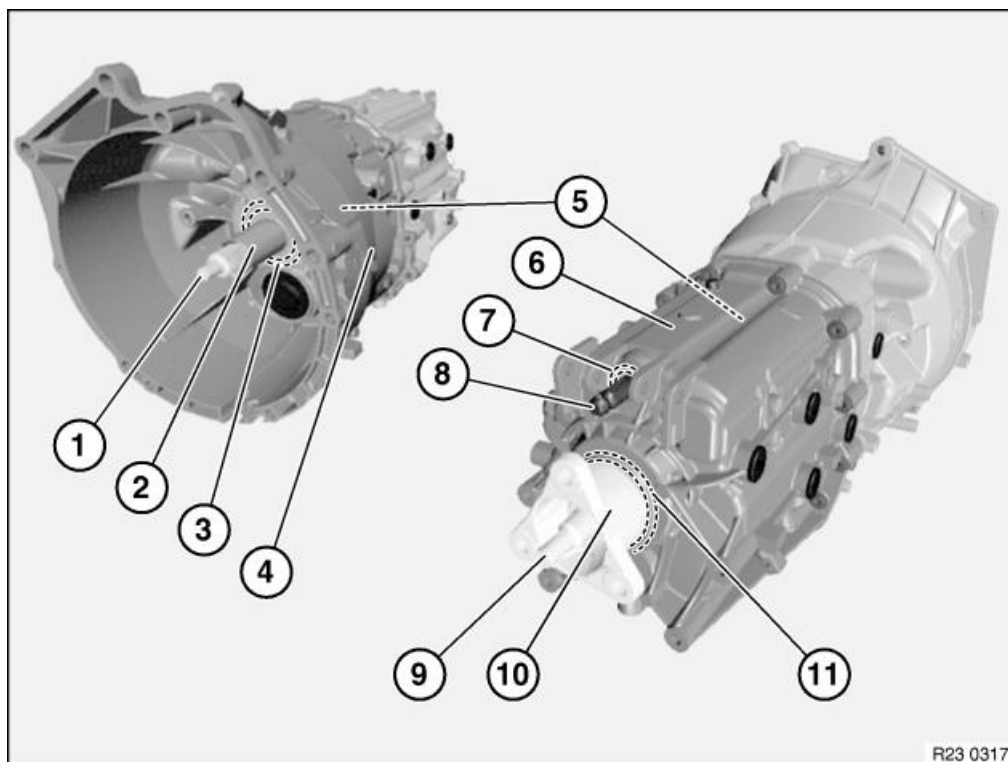
6 Gearshift shaft

7 Output shaft

For output shaft

### 8 [Radial shaft seal](#)

## 23 00 ... Overview of transmission housing (GS6-37BZ/DZ) H transmission



Complete transmission, oil change, transmission designations

0 [General information](#)

1 Drive shaft

2 [Guide tube](#)

For transmission input shaft

3 [Radial shaft seal](#)

4 Transmission housing, front section

5 Internal components

shafts, gear wheels, gearshift components

6 Transmission housing, rear section

For gearshift shaft

7 [Radial shaft seal](#)

8 Gearshift shaft

9 Output shaft

10     [Output flange](#)

For output flange

11     [Radial shaft seal](#)

# 23 00 017 Remove and install transmission

## PRELIMINARY WORK

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### 1 – Remove heat shields

- Remove the heat shields around the propeller shaft.

## MAIN WORK

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## POSTPROCESSES

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### 2 – Install the heat shields

- Install the heat shields around the propeller shaft.

## Additional Information

## Overview of Tightening Torques

## Overview of Special Tools

## Links

### General repair instructions

Used in step

[12 00 ... Notes for disconnecting and connecting battery](#)

[61 00 ... Safety information for handling vehicle battery](#)

[61 12 ... Notes on intelligent battery sensor \(IBS\)](#)

### Operating materials

Used in step

[3.0 ATE brake cylinder paste, grease in clutch area](#)

# 23 00 019 Remove and install transmission

## PRELIMINARY WORK

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### 1 – Remove heat shields

- Remove the heat shields around the propeller shaft.

## MAIN WORK

---

## POSTPROCESSES

---

### 2 – Install the heat shields

- Install the heat shields around the propeller shaft.

## Additional Information

## Overview of Tightening Torques

## Overview of Special Tools

## Links

### General repair instructions

Used in step

[12 00 ... Notes for disconnecting and connecting battery](#)

[61 00 ... Safety information for handling vehicle battery](#)

[61 12 ... Notes on intelligent battery sensor \(IBS\)](#)

### Operating materials

Used in step

[3.0 ATE brake cylinder paste, grease in clutch area](#)

**Special tools required:**

- [00 2 030](#)
- [21 2 220](#)
- [23 4 050](#)

**Important!**

To prevent heavy damage to the engine block, the protruding thread of the transmission bolts absolutely must be checked for damage and corrosion **before removal**.

If there are signs of corrosion, the rust must be removed and the threads must be cleaned **before removal**.

Replace rusted, damaged screws.

Failure to comply with this instruction will result in serious damage to the engine block and transmission.

**Important!**

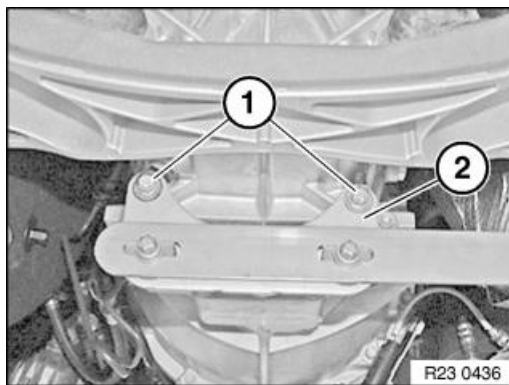
After completion of work, check transmission fluid level.

Use only the [approved transmission oil](#).

Failure to comply with this requirement will result in serious damage to the manual gearbox.

**Necessary preliminary tasks:**

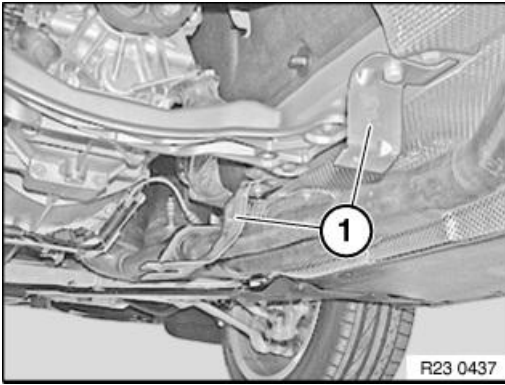
- Remove [front underbody protection](#)
- Remove [rear underbody protection](#)
- Remove complete [exhaust system](#)
- Remove heat shields with side brackets
- Support engine with jack when removing gearbox



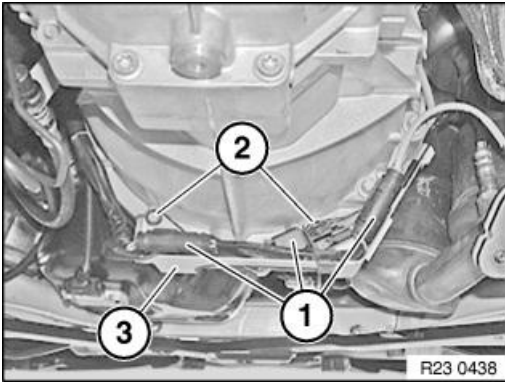
Release screws (1).

Remove exhaust bracket (2).

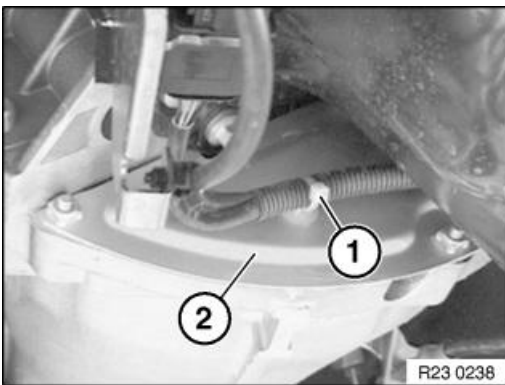
Tightening torque: [23 00 1AZ](#).



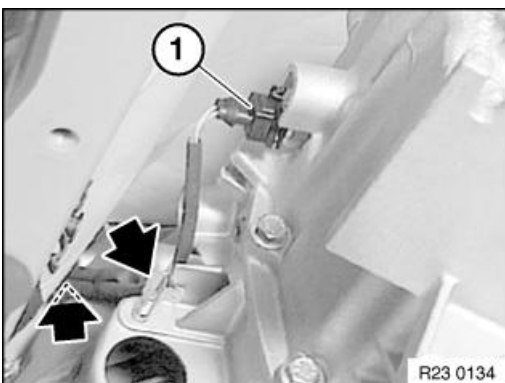
Remove holder (1).



Disconnect connector (1).  
Release cable from holder.  
Unfasten screws (2).  
Remove bracket (3).  
Tightening torque [23 00 1AZ](#).



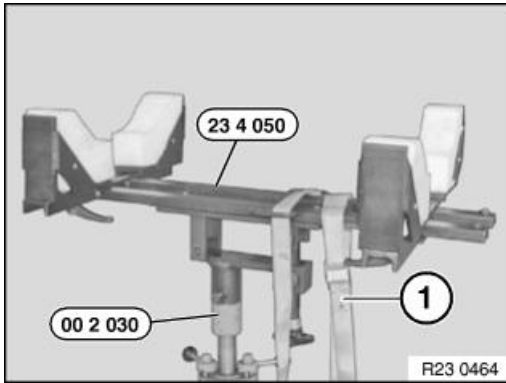
Cut through cable strap (1). (120i and 320i only)  
Remove cover plate (2).



Detach connector (1) from reverse gear switch.  
Detach cables from brackets on transmission.



- [Remove](#) propeller shaft from transmission.
- Release centre mount.
- **Note:**
  - Bending the propeller shaft by an excessive angle can cause premature damage to the joint/propeller shaft!
  - Tie up propeller shaft to underbody.
  - Support engine with lifter when removing transmission.



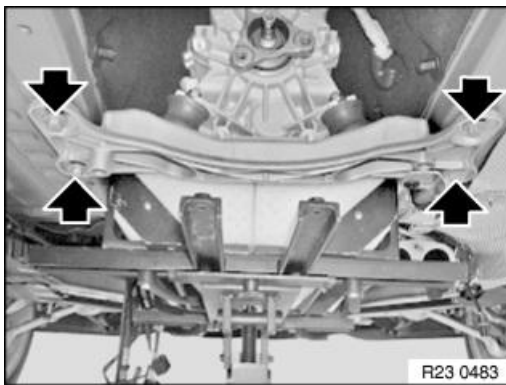
#### Supporting transmission:

Support transmission with special tools [23 4 050](#) , [00 2 030](#) .

Secure transmission to mounting with tensioning strap (1).

Tasks are described in [Transmission bracket](#).

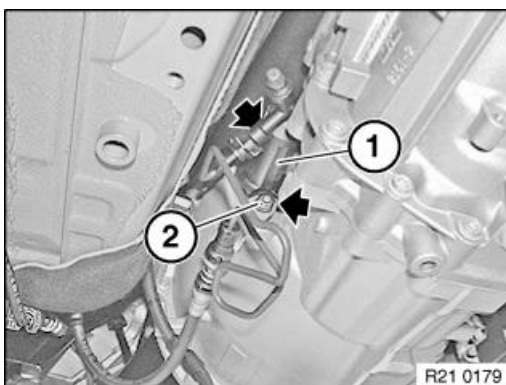
After completion of work, check transmission fluid level.



Remove screws and nuts.

Remove cross member (1)

Tightening torque: [23 71 1AZ / 2AZ](#).



*Note:*

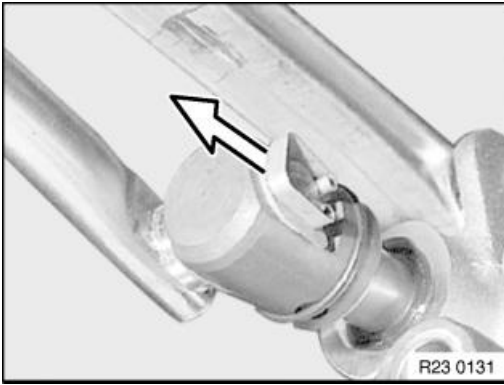
Pressure line of clutch slave cylinder remains connected.

#### Important!

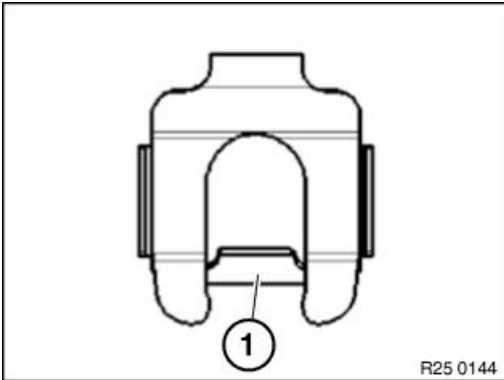
Relieve tension on clutch slave cylinder slowly; otherwise air will be drawn in through sealing cup.

Release nuts (2) and remove clutch slave cylinder (1).

Tightening torque: [21 52 5AZ](#).



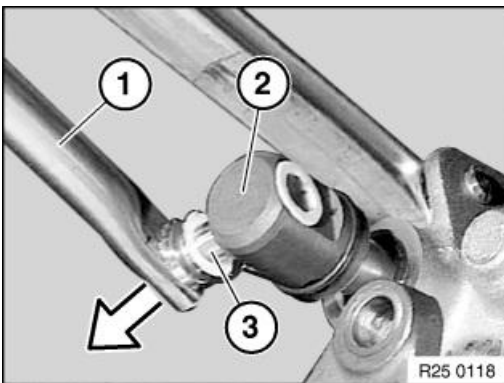
Detach retaining clip.



**Important!**

New retaining clips fitted as from 04.08.

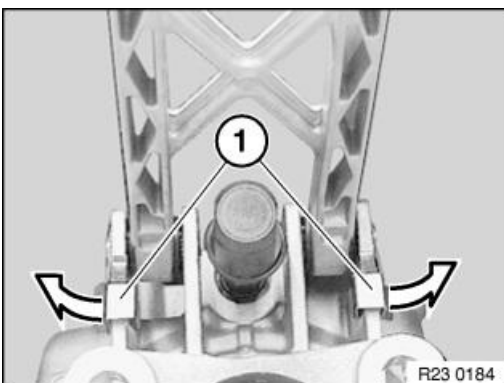
Retaining clip must interlock captively with retaining web (1) **behind** gearshift rod pin.



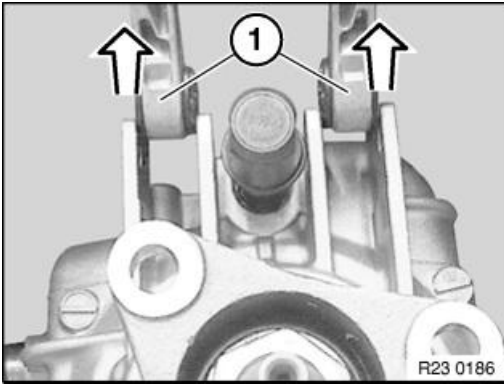
Pull gearshift rod (1) out of gearshift rod joint (2). **Installation note:**  
Grease gearshift rod pin (3).

Grease,

[Refer to BMW Service Operating Fluids.](#)



Unlock bearing journal (1) in direction of arrow and remove.

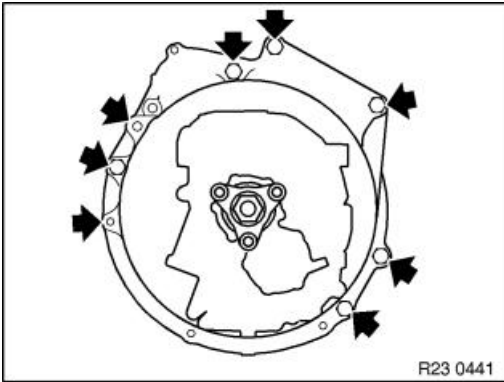


Lift out gearshift arm (1). **Installation note:**

Grease bearing journal.

Grease,

[Refer to BMW Service Operating Fluids.](#)

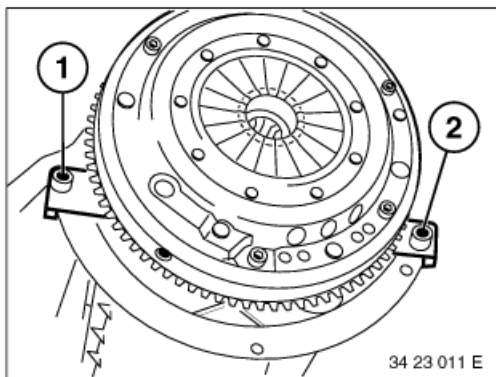


Release screws.

Tightening torque: [23 00 1AZ](#).

**Important!**

Do not suspend the transmission from the transmission drive shaft during removal and installation as this will deform the clutch disc. Pull out transmission towards rear and remove.

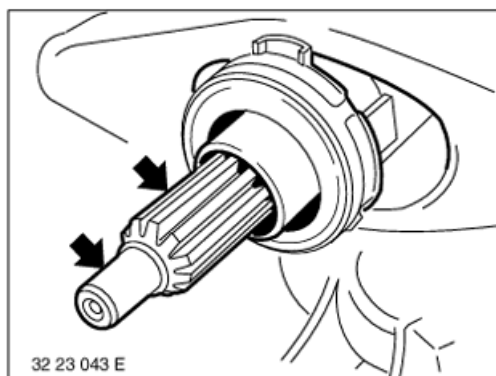


**Installation note:**

Check fitting sleeves (1 and 2) for correct fit.

Replace damaged sleeves.

Ensure correct position of cover plate.

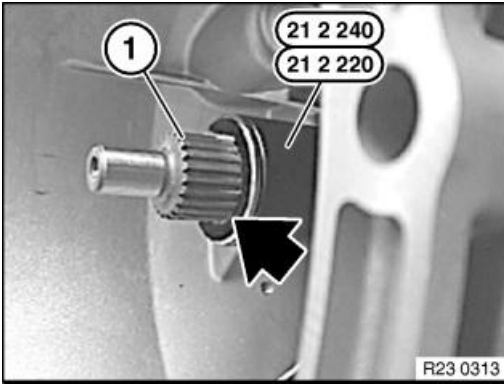


**Installation note:**

Check lubrication of transmission drive shaft for sticky consistency. If grease is sticky, clean drive shaft and [replace clutch disc](#).

Check clutch disc for friction rust in gearing and [replace if necessary](#).

Remove any grease and lining abrasion from gearing of clutch disc by mechanical means (with a cloth).



*Installation note:*

Greasing specification:

- Remove and clean release bearing and release lever (do not grease).
- Push on grease scraper ring [21 2 220](#) until limit position.
- Grease gearing (1) of input shaft with a brush.
- [Refer to BMW Service Operating Fluids](#)
- Detach grease scraper ring.

**Special tools required:**

- [00 2 030](#)
- [21 2 220](#)
- [23 4 050](#)

**Important!**

To prevent heavy damage to the engine block, the protruding thread of the transmission bolts absolutely must be checked for damage and corrosion **before removal**.

If there are signs of corrosion, the rust must be removed and the threads must be cleaned **before removal**.

Replace rusted, damaged screws.

Failure to comply with this instruction will result in serious damage to the engine block and transmission.

**Important!**

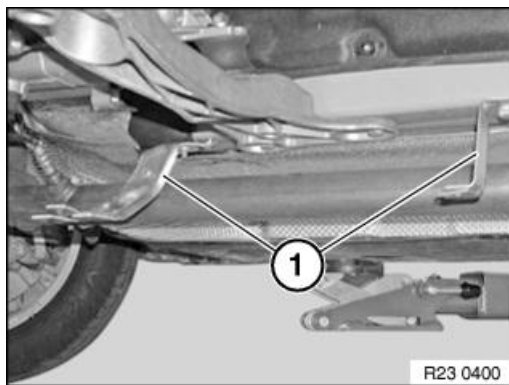
After completion of work, check [gearbox oil level](#).

Use only the approved [transmission oil](#).

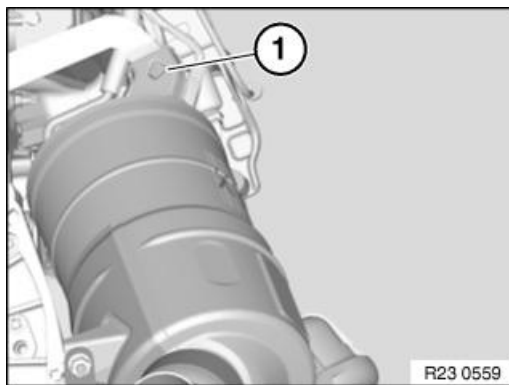
Failure to comply with this requirement will result in serious damage to the manual gearbox.

**Necessary preliminary tasks:**

- [Clamp off battery](#)
- Remove front [underbody protection](#)
- Remove rear [underbody protection](#)
- Remove [exhaust system](#) without primary catalytic converter
- Remove heat shields

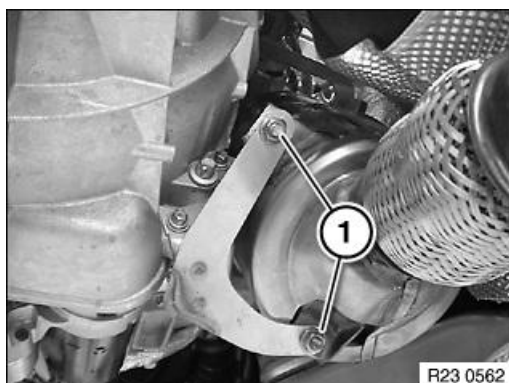


Unscrew holder (1).



Release screw (1).

Tightening torque [18 20 2AZ](#).

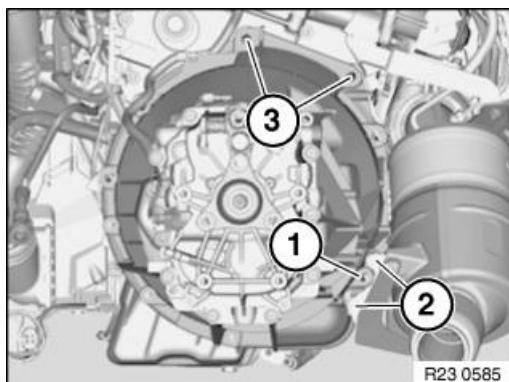


Unscrew nuts (1).

Tightening torque [18 20 1AZ](#).

Release screws from bracket on transmission.

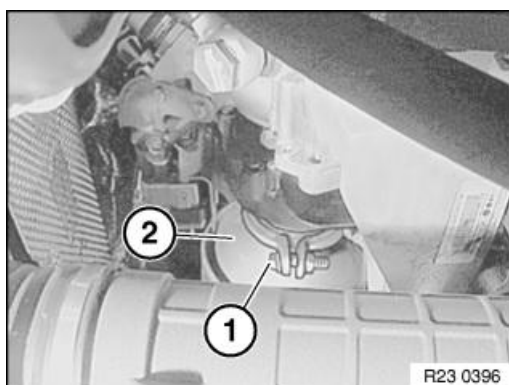
Bracket remove.



Release screws (1) and (2).

Remove holder for diesel particulate filter.

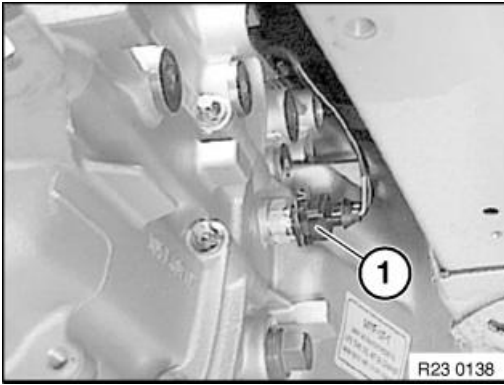
Tightening torque [23 00 1AZ](#).



Slacken bolt (1).

Turn primary catalytic converter (2) to one side.

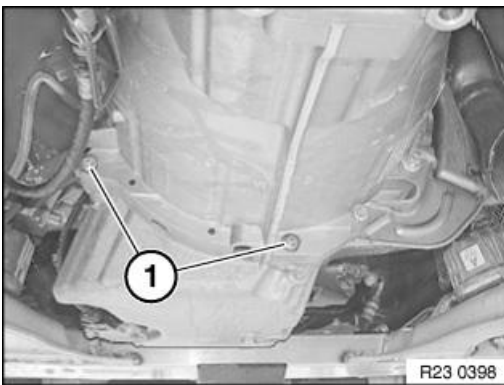
Tightening torque [18 31 1AZ](#).



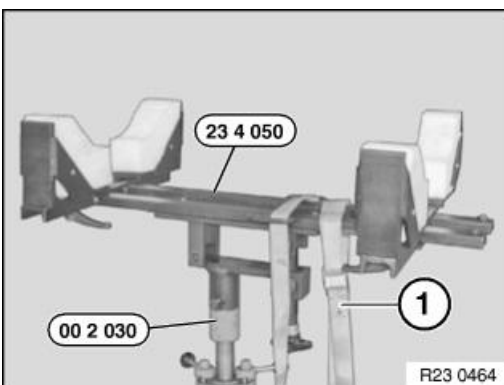
Detach connector (1) from reversing light switch.  
Release cable from brackets.



- [Remove](#) propeller shaft from transmission.
- Release centre mount.
- **Note:**
  - Bending the propeller shaft by an excessive angle can cause premature damage to the joint/propeller shaft!
  - Tie up propeller shaft to underbody.
  - Support engine with lifter when removing transmission.

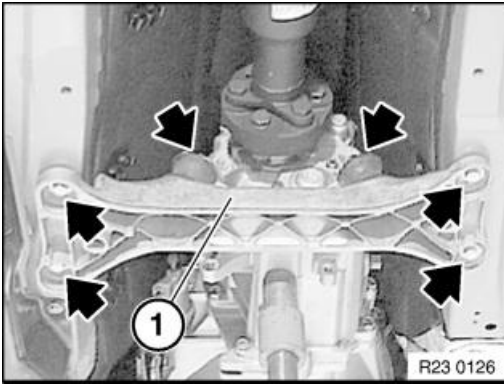


Release screws (1).  
Tightening torque [23 00 1AZ](#).  
Graphic similar

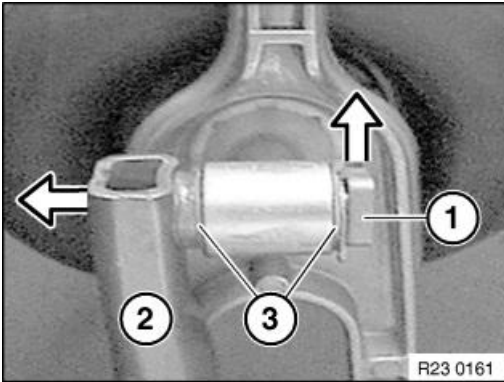


#### Supporting transmission:

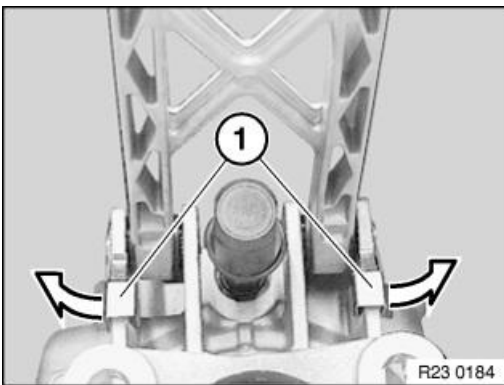
Support transmission with special tools [23 4 050](#) , [00 2 030](#) .  
Secure transmission to mounting with tensioning strap (1).  
Tasks are described in [gearbox holder](#).  
After completion of work, check transmission fluid level.



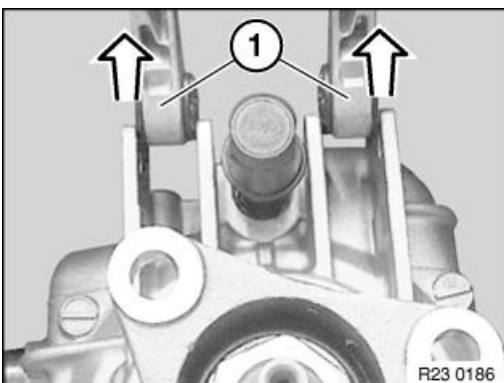
Remove screws and nuts.  
Remove cross member.  
Tightening torque [22 32 3AZ/ 4AZ](#)



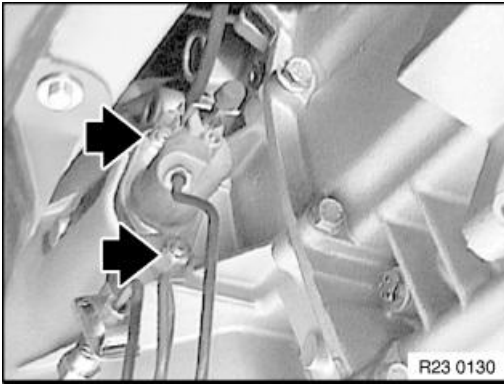
Lift off retainer (1).  
Detach gearshift rod (2).  
*Installation note:*  
Grease gearshift rod.  
Grease,  
[Refer to BMW Service Operating Fluids.](#)  
Make sure shims (3) are in correct position.



Unlock bearing journal (1) in direction of arrow and remove.



Lift out gearshift arm (1). *Installation note:*  
Grease bearing journals (1).  
Grease,  
[Refer to BMW Service Operating Fluids.](#)



*Note:*

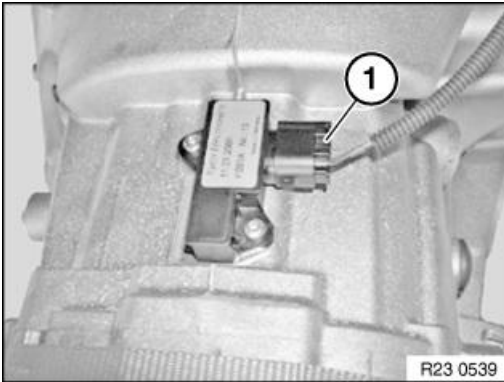
Pressure line of clutch slave cylinder remains connected.

**Important!**

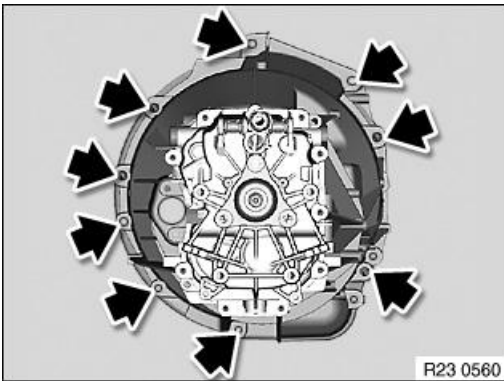
Relieve tension on clutch slave cylinder slowly; otherwise air will be drawn in through sealing cup.

Release nuts and remove clutch slave cylinder.

Tightening torque [21 52 5AZ](#).



Disconnect plug connection (1) of zero gear sensor (on transmission).

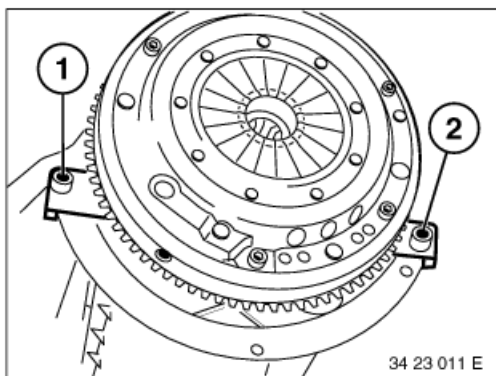


Release screws.

Tightening torque [23 00 1AZ](#).

**Important!**

Do not allow transmission to hang on transmission input shaft when removing and installing, as the clutch disc will be deformed. Pull out transmission towards rear and remove.

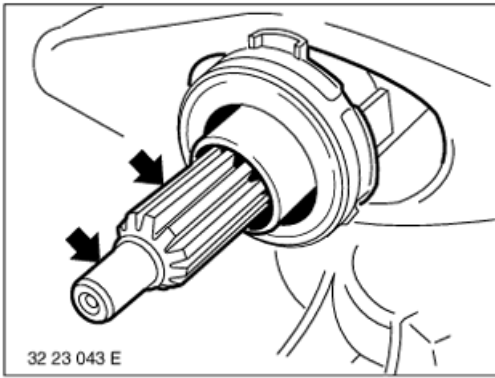


*Installation note:*

Check that fitting sleeves are correctly fitted.

Replace damaged fitting sleeves.

Ensure correct position of cover plate.

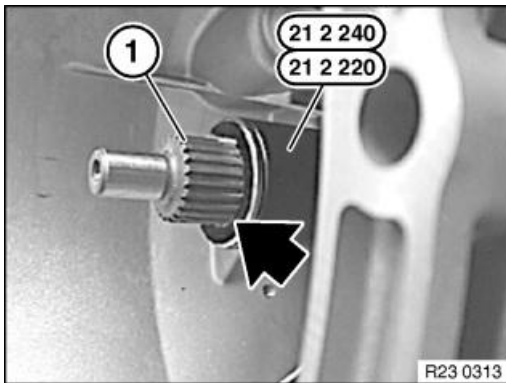


*Installation note:*

Check lubrication of transmission input shaft for sticky consistency. If grease is sticky, clean drive shaft and [replace clutch disc](#).

Check clutch disc for friction rust in splines and [replace](#) if necessary.

Mechanically remove existing grease and lining abrasion from gearings of clutch disc (with a cloth).



*Installation note:*

Greasing specification:

- Remove and clean [release bearing and release lever](#).
- Push on grease scraper ring [21 2 220](#) until limit position.
- Grease gearing (1) of input shaft. [Refer to BMW Service Operating Fluids](#).
- Detach grease scraper ring.

**Special tools required:**

- [00 2 030](#)
- [21 2 220](#)
- [23 4 050](#)

**Important!**

To prevent heavy damage to the engine block, the protruding thread of the transmission bolts absolutely must be checked for damage and corrosion **before removal**.

If there are signs of corrosion, the rust must be removed and the threads must be cleaned **before removal**.

Replace rusted, damaged screws.

Failure to comply with this instruction will result in serious damage to the engine block and transmission.

**Important!**

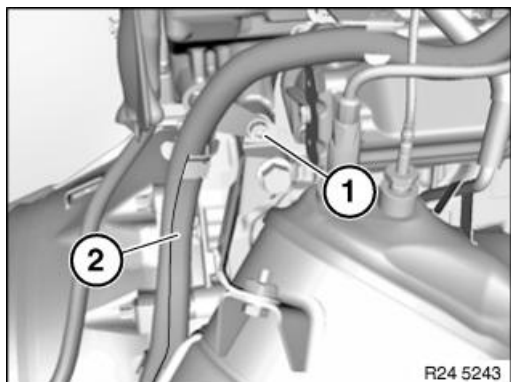
After completion of work, check [gearbox oil level](#).

Use only the approved [transmission oil](#).

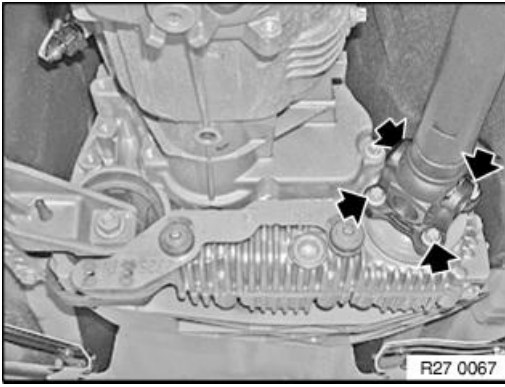
Failure to comply with this requirement will result in serious damage to the manual gearbox.

**Necessary preliminary work:**

- Clamp off [battery](#)
- Remove engine acoustic cover
- Remove [underbody guard](#), rear, with bracket
- [Remove](#) propeller shaft from transmission.
- Release centre mount.
- **Note:**
- Bending the propeller shaft by an excessive angle can cause premature damage to the joint/propeller shaft!
- Tie up propeller shaft to underbody.
- Support engine with jack when removing gearbox



Undo screw (1) from cable clip (2).



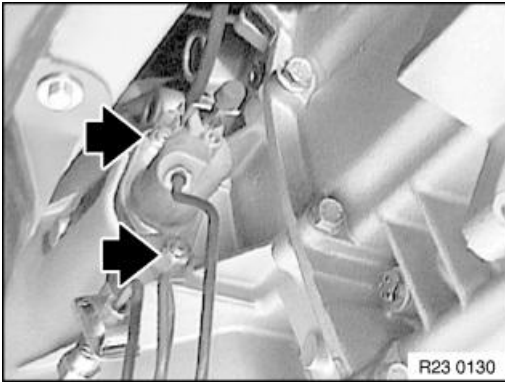
Release screws (1).

Tightening torque [26 11 9AZ](#).

Remove front propeller shaft at output flange of transfer box and tie to one side.

*Installation note:*

Replace screws.



*Note:*

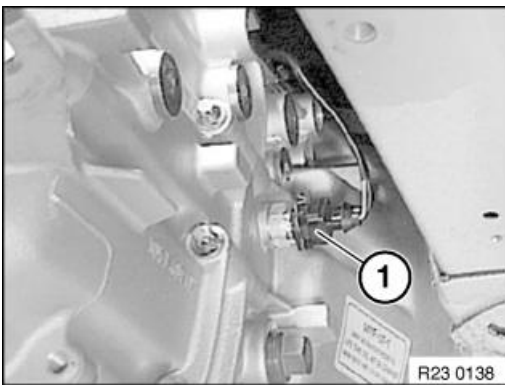
Pressure line of clutch slave cylinder remains connected.

**Important!**

Relieve tension on clutch slave cylinder slowly; otherwise air will be drawn in through sealing cup.

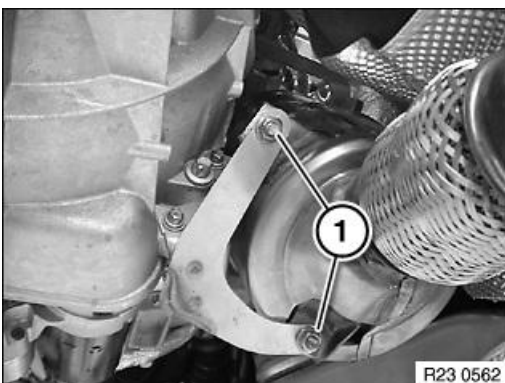
Release nuts and remove clutch slave cylinder.

Tasks are described in [Removing clutch slave cylinder](#).



Detach connector (1) from reversing light switch.

Release cable from brackets.

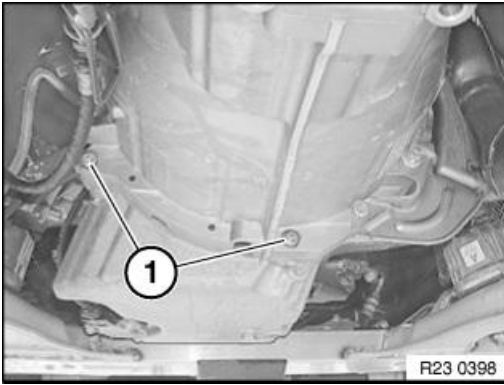


Unscrew nuts (1).

Tightening torque [18 20 1AZ](#).

Release screws from bracket on transmission.

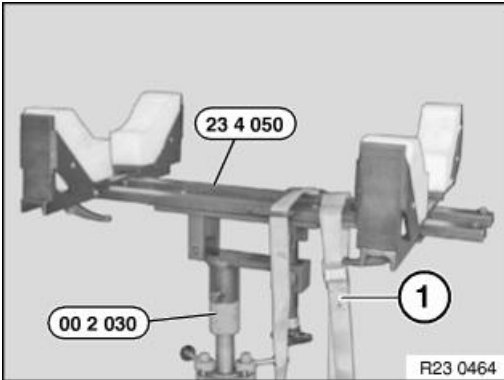
Bracket remove.



Release screws (1).

Tightening torque [23 00 1AZ](#).

Graphic similar



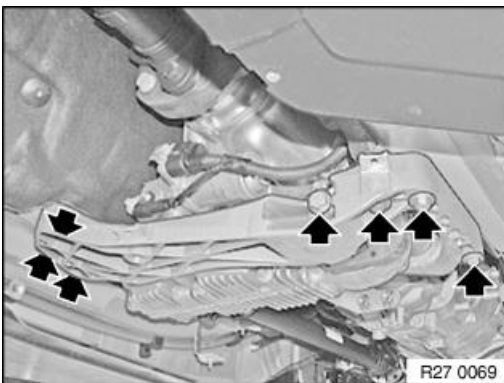
### Supporting transmission:

Support transmission with special tools [23 4 050](#) , [00 2 030](#) .

Secure transmission to mounting with tensioning strap (1).

Tasks are described in [Transmission bracket](#).

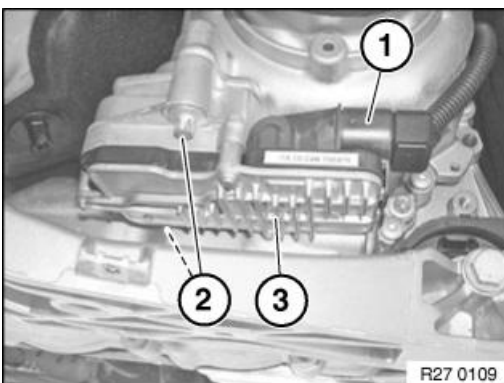
After completion of work, check transmission fluid level.



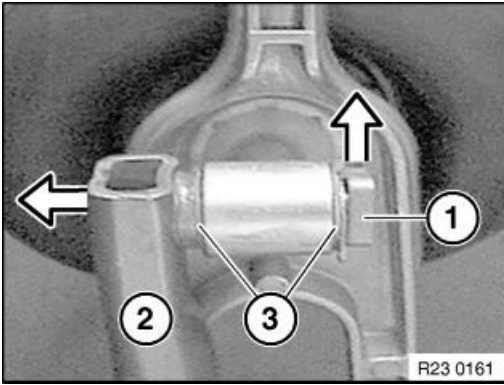
Remove screws and nuts.

Remove transmission cross member.

Tightening torque [22 31 3AZ/ 4AZ](#)



Disconnect connector (1) from transfer box control unit (longitudinal torque distribution) (3).



Lift off retainer (1).

Detach gearshift rod (2).

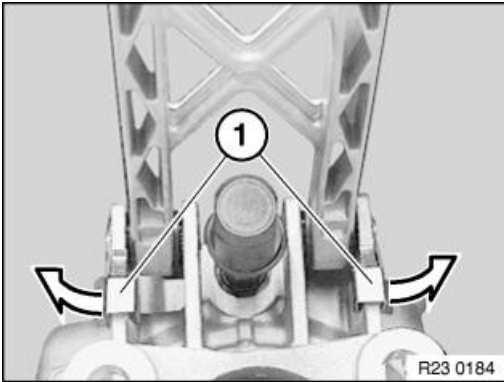
*Installation note:*

Grease gearshift rod.

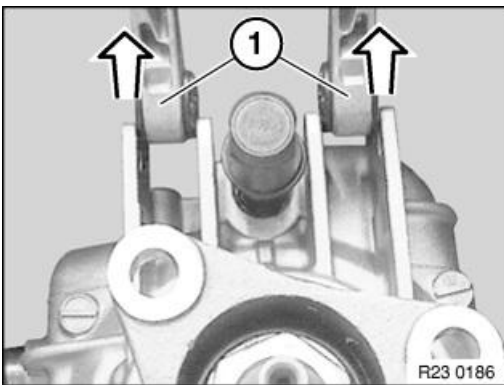
Grease,

[Refer to BMW Service Operating Fluids.](#)

Make sure shims (3) are in correct position.



Unlock bearing journal (1) in direction of arrow and remove.

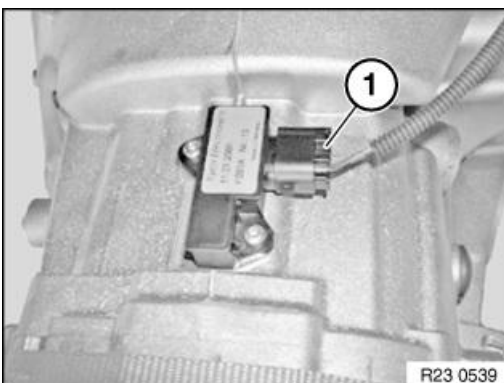


Lift out gearshift arm (1). *Installation note:*

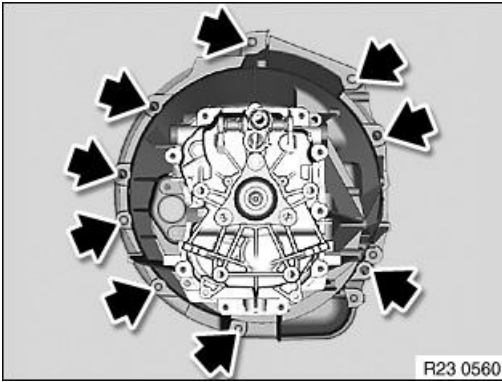
Grease bearing journals (1).

Grease,

[Refer to BMW Service Operating Fluids.](#)



For automatic Start/Stop function: Release connector (1) of zero-gear sensor (on transmission).



Loosen screws.

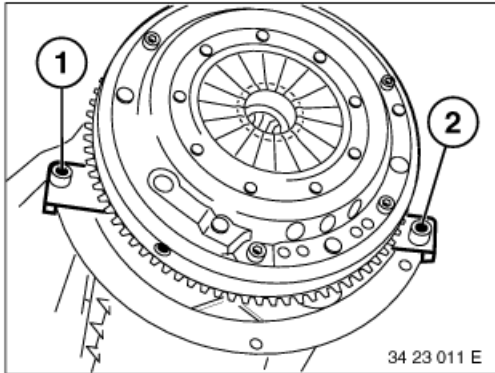
Tightening torque [23 00 1AZ](#).

**Important!**

Do not allow transmission to hang on transmission input shaft when removing and installing, as the clutch disc will be deformed. Pull transmission downwards and remove.

*Note:*

When removing and installing the transmission, support the front end of the engine at the housing with an installation aid (e.g. gearbox jack).

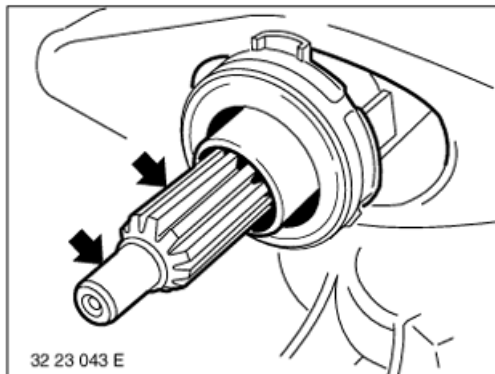


*Installation note:*

Check that fitting sleeves are correctly fitted.

Replace damaged fitting sleeves.

Ensure correct position of cover plate.

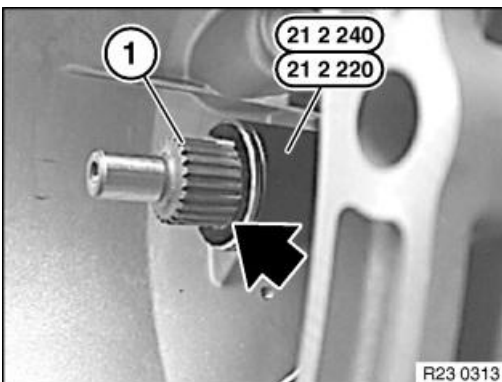


*Installation note:*

Check lubrication of transmission input shaft for sticky consistency. If grease is sticky, clean transmission input shaft and [replace clutch disc](#).

Check clutch disc for frictional corrosion in gearing and [replace](#) if necessary.

Mechanically remove existing grease and lining abrasion from gearings of clutch disc (with a cloth).



*Installation note:*

Greasing specification:

- Remove and clean [release bearing and release lever](#).
- Push on grease scraper ring [21 2 220](#) to the limit position.
- Grease the gearing (1) of the transmission input shaft. [Refer to BMW Service Operating Fluids](#).
- Detach grease scraper ring.

**Special tools required:**

- [00 2 030](#)
- [21 2 220](#)
- [23 4 050](#)
- [21 2 240](#)

**Attention!**

To prevent heavy damage to the engine block, the protruding thread of the transmission bolts absolutely must be checked for damage and corrosion **before removal**.

If there are signs of corrosion, the rust must be removed and the threads must be cleaned **before removal**.

Replace rusted, damaged screws.

Failure to comply with this instruction will result in serious damage to the engine block and transmission.

**Attention!**

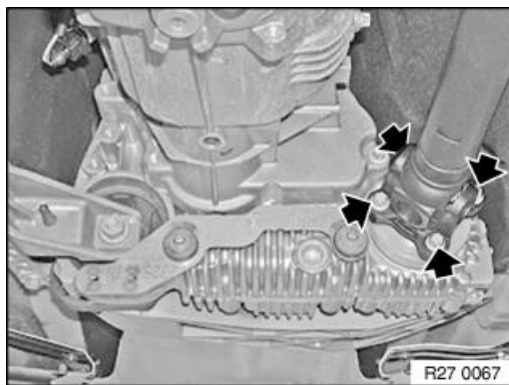
After completion of work, check [gearbox oil level](#).

Use only the approved [transmission oil](#).

Failure to comply with this requirement will result in serious damage to the manual gearbox.

**Necessary preliminary tasks:**

- Clamp off [battery](#)
- Remove [reinforcement plate](#)
- Remove front [underbody protection](#)
- Remove rear [underbody protection](#)
- Remove [exhaust system](#) without primary catalytic converter
- Remove heat shields



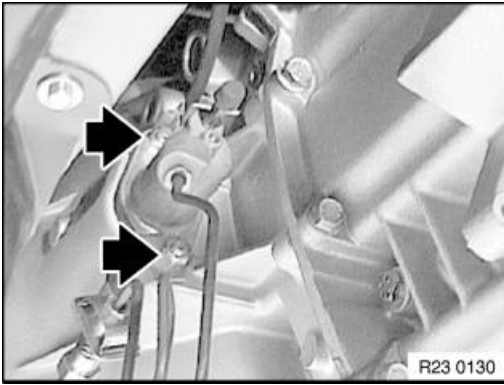
Release screws (1).

Tightening torque [26 11 9AZ](#).

Remove front propeller shaft at output flange of transfer box and tie to one side.

*Installation note:*

Renew screws.



**Note:**

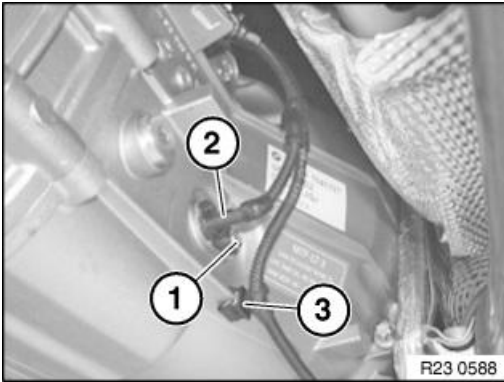
Pressure line of clutch slave cylinder remains connected.

**Attention!**

Slowly relieve tension on clutch slave cylinder otherwise air is drawn in through sealing cup.

Release nuts and remove clutch slave cylinder.

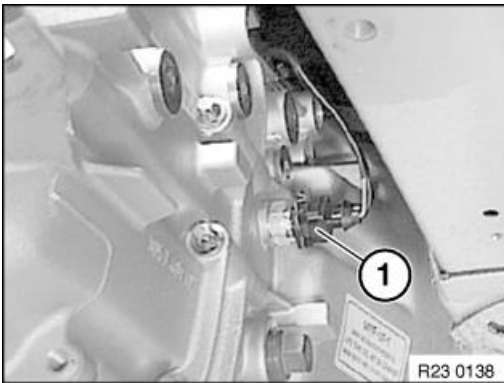
Tasks are described in [Removing clutch slave cylinder](#).



Release screw (1).

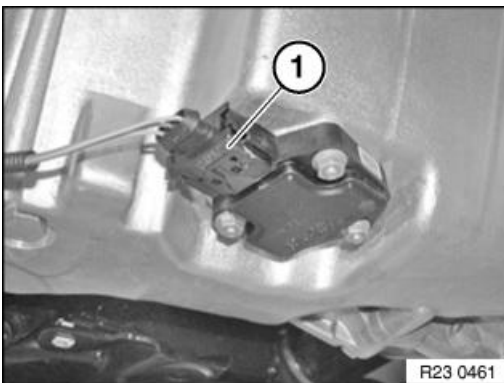
Remove Start/Stop switch (2).

Detach clamp (3) with cable from transmission.

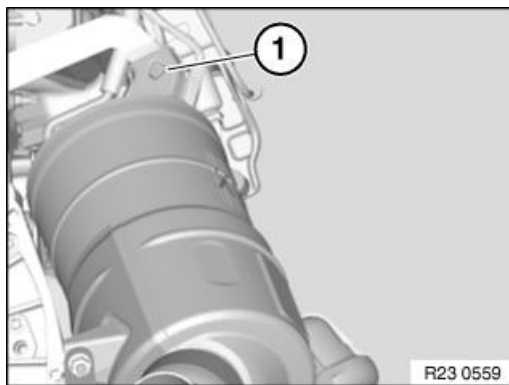


Detach connector (1) from reversing light switch.

Release cable from brackets.

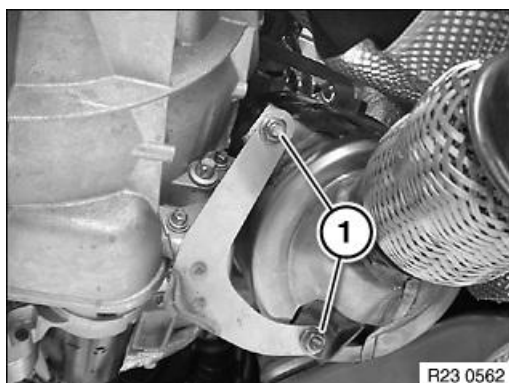


Unplug connector (1) from oil level sensor.



Release screw (1).

Tightening torque [18 20 2AZ](#).

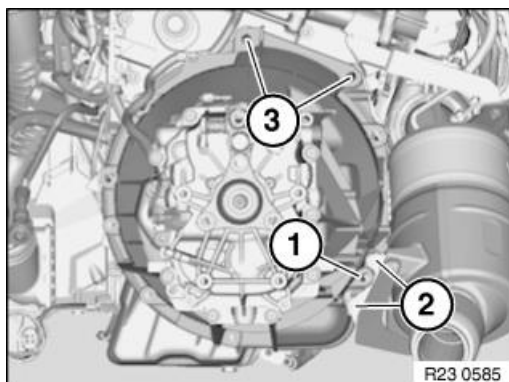


Unscrew nuts (1).

Tightening torque [18 20 1AZ](#).

Release screws from bracket on transmission.

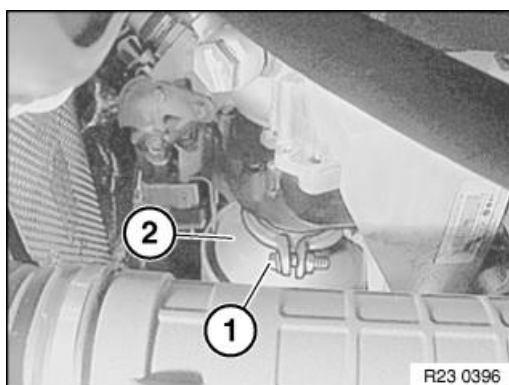
Bracket remove.



Release screws (1) and (2).

Remove holder for diesel particulate filter.

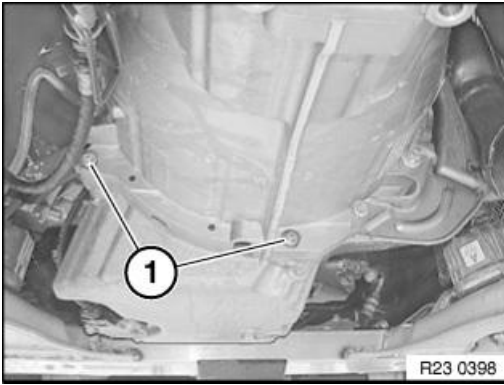
Tightening torque [23 00 1AZ](#).



Slacken bolt (1).

Turn primary catalytic converter (2) to one side.

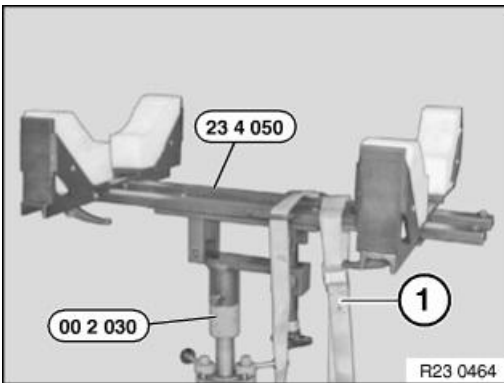
Tightening torque [18 31 1AZ](#).



Release screws (1).

Tightening torque [23 00 1AZ](#).

Graphic similar



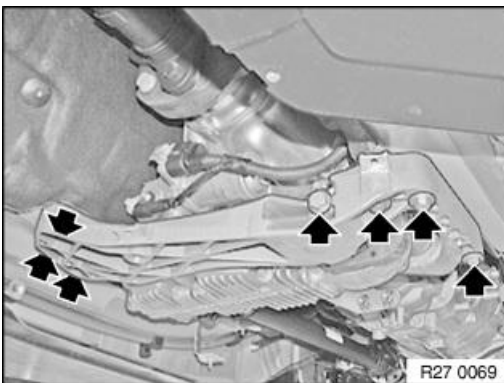
### Supporting transmission:

Support transmission with special tools [23 4 050](#) , [00 2 030](#) .

Secure transmission to mounting with tensioning strap (1).

Tasks are described in [Transmission bracket](#).

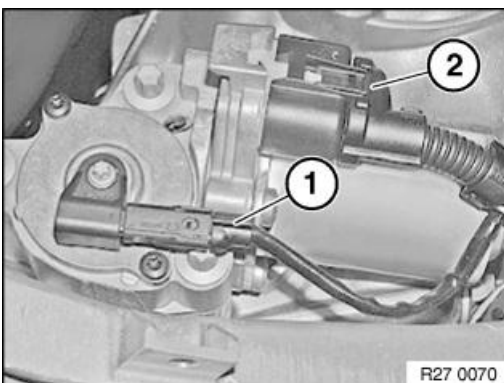
After completion of work, check transmission fluid level.



Remove screws and nuts.

Remove cross member.

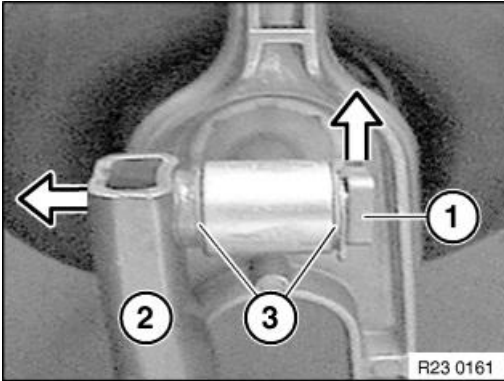
Tightening torque [22 31 3AZ/ 4AZ](#)



Disconnect plugs (1) and (2) from servomotor.



- [Remove](#) propeller shaft from transmission.
- Release centre mount.
- **Note:**
- Bending the propeller shaft by an excessive angle can cause premature damage to the joint/propeller shaft!
- Tie up propeller shaft to underbody.
- Support engine with lifter when removing transmission.



Lever out retainer (1).

Disengage gearshift rod (2).

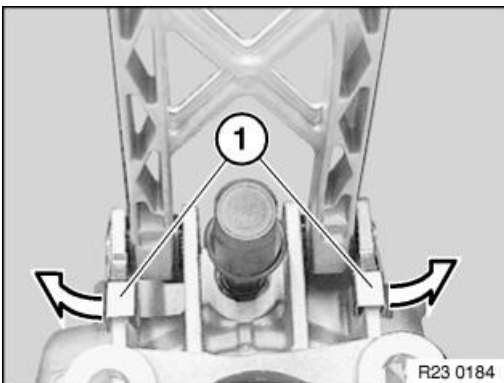
*Installation note:*

Grease gearshift rod.

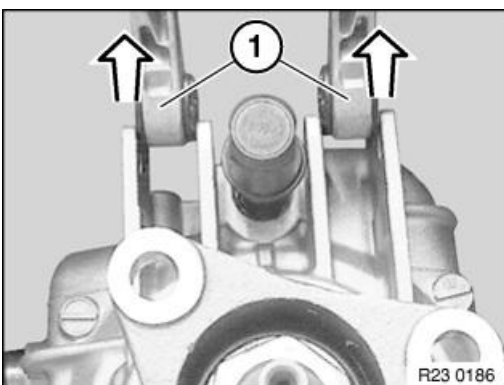
Grease,

[Refer to BMW Service Operating Fluids](#)

Make sure shims (3) are in correct position.



Release and remove bearing journals (1) in direction of arrow.

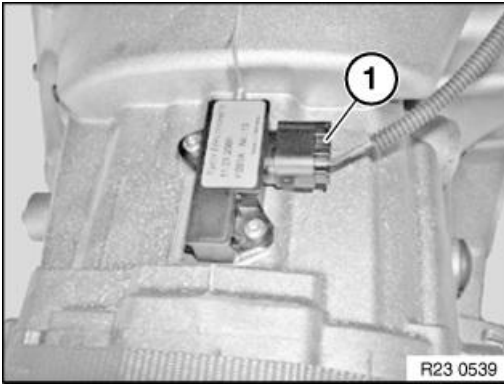


Lift out gearshift arm (1). *Installation note:*

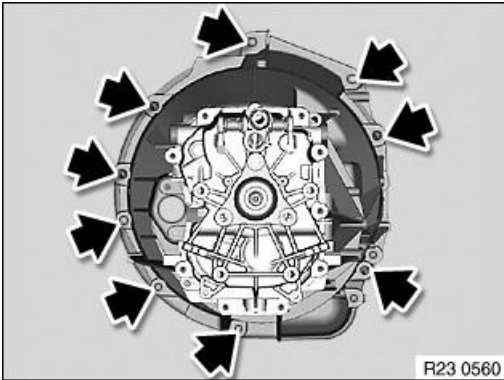
Grease bearing journals (1).

Grease,

[Refer to BMW Service Operating Fluids](#).



Unfasten connector (1) of zero-gear sensor (on transmission).

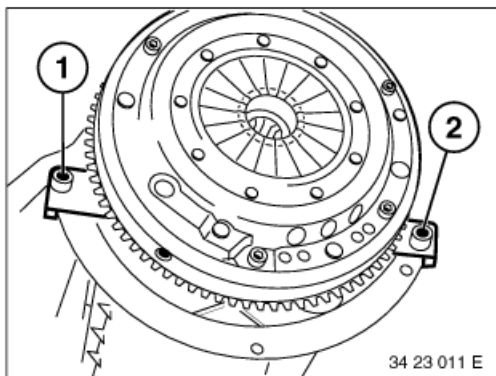


Loosen screws.

Tightening torque [23 00 1AZ](#).

**Attention!**

Do not allow the transmission to hang off from the transmission drive shaft as this will deform the clutch disc. Pull out transmission towards rear and remove.

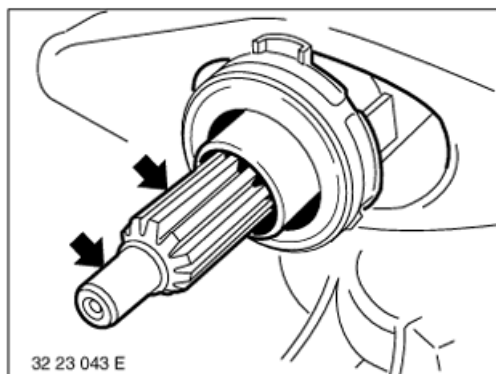


*Installation note:*

Check that fitting sleeves are correctly fitted.

Replace damaged fitting sleeves.

Ensure correct position of cover plate.

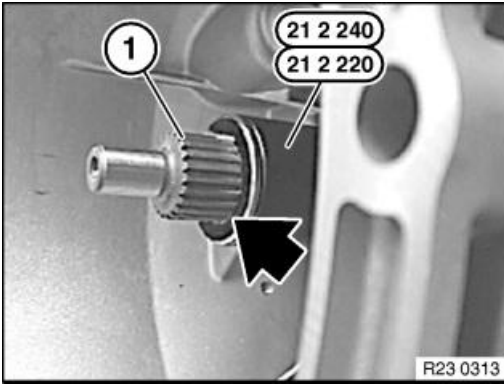


*Installation note:*

Check lubrication of transmission drive shaft for sticky consistency. If grease is sticky, clean drive shaft and [replace clutch disc](#).

Check clutch disc for friction rust in gearing and [replace](#) if necessary.

Mechanically remove existing grease and lining abrasion from gearings of clutch disc (with a cloth).



*Installation note:*

Greasing specification:

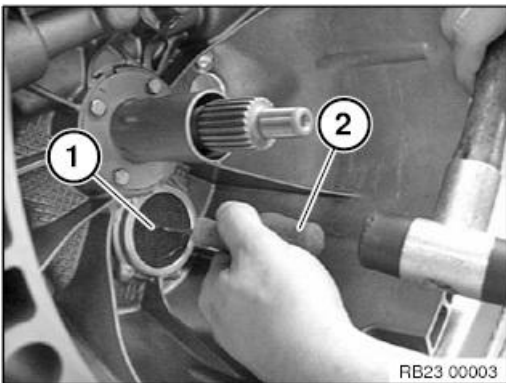
- Remove and clean [release bearing and release lever](#).
- Push on grease scraper ring [21 2 240](#) until limit position.
- Grease gearing (1) of input shaft. [refer to BMW Service Operating Fluids](#).
- Detach grease scraper ring.

**Special tools required:**

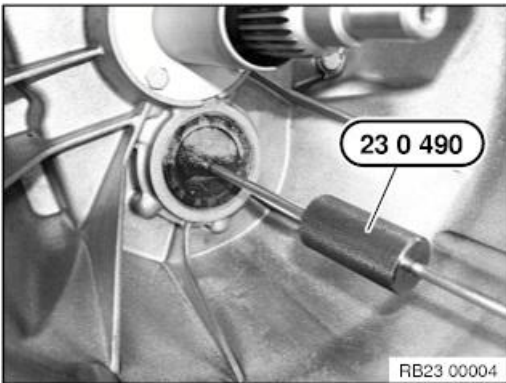
- [23 0 490](#)
- [23 0 330](#)

**Necessary preliminary tasks:**

- Remove [transmission](#).
- Remove [clutch release bearing/lever](#).

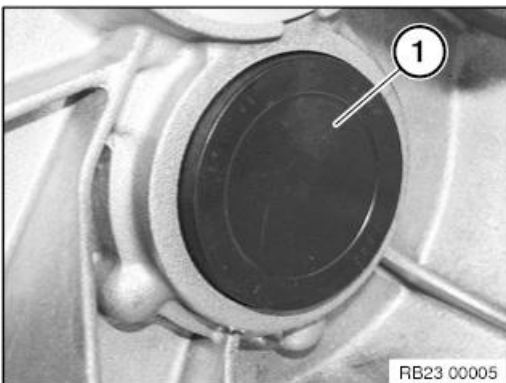


Drive a hole into the sealing cap (1) with a suitable tool (2). **Important!**  
Do not use a drill as drillings may result in transmission malfunction.

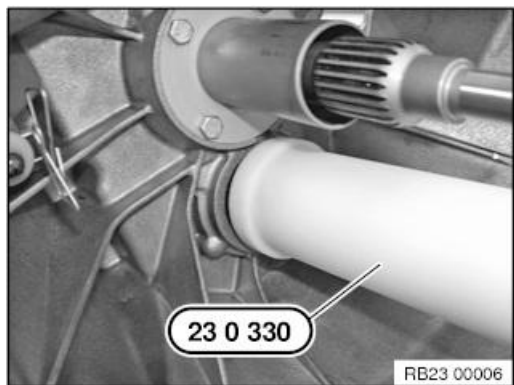


Screw special tool [23 0 490](#) into sealing cap.

Withdraw sealing cap from transmission housing with aid of impact weight.



Apply transmission oil to the sealing lip of the sealing cap (1) and insert.



Drive sealing cap firmly home with special tool [23 0 330](#) .

## 00 Risk of injury if oil comes into contact with eyes and skin



### **Danger of injury!**

Contact with eyes or skin may result in injury!

Possible symptoms are:

- Impaired sight
- Irritation of the eyes
- Reddening of the skin
- Rough and cracked skin



### **Protective measures/rules of conduct:**

- Wear protective goggles
- Wear oil-resistant protective gloves
- Observe country-specific safety regulations



### **First aid measures:**

- Eye contact: Rinse eyes immediately with plenty of water for at least 15 minutes; if available, use an eye-rinsing bottle. If irritation of the eyes persists, consult a doctor.
- Skin contact: Wash off with soap and water immediately. If irritation persists, consult a doctor.

Note: Do not use solvents/thinners.

## 00 Safety instructions for handling oil



### Warning!

[Danger of poisoning](#) if oil is ingested/absorbed through the skin!

[Risk of injury](#) if oil comes into contact with eyes and skin!



### Recycling:

Observe country-specific waste-disposal regulations.



### Measures if oil is unintentionally released:

- Personal precautionary measures: Danger of slipping! Keep non-involved persons away from the work area. Wear personal protective clothing/equipment.
- Environmental protection measures: Prevent oil from draining into drain channels, sewerage systems, pits, cellars, water and the ground.
- Limiting spread: Use oil blocks to prevent the surface spread of oil.
- Cleaning procedure: Bind and dispose of escaped oil with nonflammable absorbents.

Note: Do not flush oil away with water or aqueous cleaning agents.

## 23 Transmission designations

### Breakdown of BMW designation:

| A5S 300J (former designation) |                                          |                                                                                                                                                                               |
|-------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A                             | Transmission type                        | <ul style="list-style-type: none"> <li>S = Manual gearbox</li> <li>A = Automatic transmission</li> </ul>                                                                      |
| 5                             | Number of forward gears                  |                                                                                                                                                                               |
| S                             | Type of top gear                         | <ul style="list-style-type: none"> <li>D = Direct gear</li> <li>S = Overdrive gear</li> </ul>                                                                                 |
| 300                           | Max. input torque (Nm)                   |                                                                                                                                                                               |
| J                             | Code letter of transmission manufacturer | <ul style="list-style-type: none"> <li>G = Getrag</li> <li>J = Jatco</li> <li>R = GMPT (General Motors Powertrain)</li> <li>Z = ZF (Zahnradfabrik Friedrichshafen)</li> </ul> |
| SMG                           | Notes                                    | SMG = Sequential M gearbox/transmission                                                                                                                                       |

| GS6-37BZ (new designation according to BMW Group Standard GS 90007) |                         |                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| G                                                                   | Transmission            |                                                                                                                                                                                                                                                                                                                            |
| S                                                                   | Transmission type       | <ul style="list-style-type: none"> <li>S = Manual gearbox</li> <li>A = Automatic transmission</li> </ul>                                                                                                                                                                                                                   |
| 6                                                                   | Number of forward gears |                                                                                                                                                                                                                                                                                                                            |
| -                                                                   |                         | <ul style="list-style-type: none"> <li>- = Standard with manual gearshift</li> <li>HP = Hydraulic planetary gear</li> <li>DKG= twin-clutch gearbox</li> </ul>                                                                                                                                                              |
| 37                                                                  | Transmission type       | <ul style="list-style-type: none"> <li>26 = D-transmission</li> <li>31 = C-transmission</li> <li>39 = F-transmission</li> <li>37 = H-transmission</li> <li>53 = G-transmission</li> <li>17 = I-transmission</li> <li>47= J transmission SMG -7-speed</li> <li>45 = K transmission</li> <li>36= Transmission DKG</li> </ul> |
| B                                                                   | Gear set                | <ul style="list-style-type: none"> <li>B = Petrol gear ratio</li> <li>D = Diesel gear ratio</li> <li>S= Sport gear ratio</li> </ul>                                                                                                                                                                                        |

|   |                                          |                                                                                                                                 |
|---|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Z | Code letter of transmission manufacturer | <ul style="list-style-type: none"> <li>G = Getrag</li> <li>Z = ZF (Zahnradfabrik Friedrichshafen)</li> <li>A = AISIN</li> </ul> |
|---|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|

#### Manual gearbox:

| BMW designation | Manufacturer | Manufacturer designation | Remarks                        |
|-----------------|--------------|--------------------------|--------------------------------|
|                 |              |                          |                                |
| S5D 200G        | Getrag       | B transmission (220/5)   |                                |
| S5D 200G        | Getrag       | B transmission (221/5)   | for M41 engine only            |
| S5D 250G        | Getrag       | B transmission (220/5)   | Reinforced version             |
|                 |              |                          |                                |
| S5D 260Z        | ZF           | C-transmission (S5-31 D) | for M51 engine only            |
| S5D 280Z        | ZF           | C-transmission (S5-31)   |                                |
| S5D 310Z        | ZF           | C-transmission (S5-31)   | up to 9.95                     |
| S5D 320Z        | ZF           | C-transmission (S5-31)   | from 9.95 (reinforced version) |
| GS5S31BZ (SMG)  | ZF           | C transmission           | SMG                            |
|                 |              |                          |                                |
| GS5-39DZ        | ZF           | F transmission           |                                |
| S6S 420G        | Getrag       | D-transmission (226/6)   |                                |
| S6S 420G (SMG)  | Getrag       | D transmission           | SMG                            |
| S6S 560G        | Getrag       | E-transmission (286/6)   |                                |
|                 |              |                          |                                |
|                 |              |                          |                                |
| GS6-37BZ        | ZF           | H-transmission           |                                |
| GS6S37BZ (SMG)  | ZF           | H-transmission           |                                |
| GS6-37DZ        | ZF           | H-transmission           |                                |
| GS6-37BG        | Getrag       | H-transmission           |                                |
|                 |              |                          |                                |
| GS6-53BZ        | ZF           | G-transmission           |                                |
| GS6-53DZ        | ZF           | G-transmission           |                                |
|                 |              |                          |                                |
| GS6-17BG        | Getrag       | I-transmission           |                                |
| GS6-17DG        | Getrag       | I-transmission           |                                |
|                 |              |                          |                                |
| GS7S47BG (SMG)  | Getrag       | J-transmission (247)     | SMG -7-gear                    |
|                 |              |                          |                                |
| GS7D36SG        | Getrag       | DKG (436)                | DKG -7-gear                    |
|                 |              |                          |                                |
| GS6- 45BZ       | ZF           | K transmission           |                                |
| GS6- 45DZ       | ZF           | K transmission           |                                |
|                 |              |                          |                                |
| GS6-60DA/BA     | AISIN        | BG6                      |                                |

|             |        |      |             |
|-------------|--------|------|-------------|
| 7DCT300     | Getrag | 7DCT | DKG -7-gear |
|             |        |      |             |
| GS6-58DG/BG | Getrag |      |             |
| GS6-59DG/BG | Getrag |      |             |

**Automatic transmission:**

| BMW designation | Manufacturer              | Manufacturer designation | Remarks                   |
|-----------------|---------------------------|--------------------------|---------------------------|
|                 |                           |                          |                           |
| A4S 200R        | General Motors Powertrain | GM4                      |                           |
|                 |                           |                          |                           |
| A4S 270R        | General Motors Powertrain | THM-R1w                  | Transmission wide-stepped |
| A4S 310R        | General Motors Powertrain | THM-R1                   |                           |
|                 |                           |                          |                           |
| A5S 300J        | Jatco                     | Jatco                    |                           |
|                 |                           |                          |                           |
| A5S 310Z        | ZF                        | 5HP-18                   |                           |
| A5S 325Z        | ZF                        | 5HP-19                   |                           |
| A5S 440Z        | ZF                        | 5HP-24                   |                           |
| A5S 560Z        | ZF                        | 5HP-30                   |                           |
|                 |                           |                          |                           |
| A5S 360R / 390R | GM                        | GM5                      |                           |
|                 |                           |                          |                           |
| GA6F21AW        | AISIN                     | GA6F21AW                 |                           |
| GA6HP19Z        | ZF                        | 6HP19                    |                           |
| GA6HP26Z        | ZF                        | 6HP26                    |                           |
| GA6HP32Z        | ZF                        | 6HP32                    |                           |
|                 |                           |                          |                           |
| GA6L45R         | GM                        | GM6                      |                           |
|                 |                           |                          |                           |
| GA6F21AW        | AISIN                     | GA6F21AW                 |                           |
| GA8F22AW        | AISIN                     | GA8F22AW                 |                           |
| GA8G45          | AISIN                     | 8G45                     |                           |
| GA8HP45Z        | ZF                        | 8HP45                    |                           |
| GA8HP50Z        | ZF                        | 8HP50                    |                           |
| GA8HP51Z        | ZF                        | 8HP51                    |                           |
| GA8HP70Z        | ZF                        | 8HP70                    |                           |
| GA8HP75Z        | ZF                        | 8HP75                    |                           |
| GA8HP76Z        | ZF                        | 8HP76                    |                           |
| GA8P70H         | ZF                        | 8P70                     | Hybrid                    |
| GA8P75H         | ZF                        | 8P75                     | Hybrid                    |
| GA8HP90Z        | ZF                        | 8HP90                    |                           |
| GA8HP95Z        | ZF                        | 8HP95                    |                           |
|                 |                           |                          |                           |

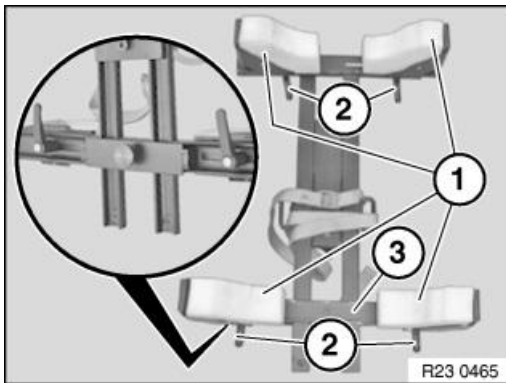
|          |         |       |        |
|----------|---------|-------|--------|
| GA7AHSCD | Daimler | AHS-C | Hybrid |
|----------|---------|-------|--------|

**Special tools required:**

- [00 2 030](#)
- [23 4 050](#)

**Note:**

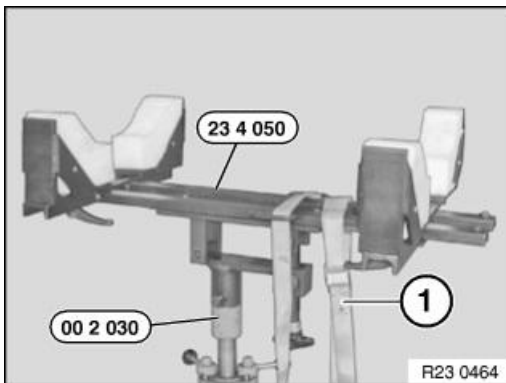
- The universal transmission bracket is introduced for the E60 AWD
- Suitable for manual and automatic transmissions

**Important!**

Front and rear supports (1) can be laterally adjusted by means of screws (2).

Carrier (3) of rear supports (1) can be longitudinally adjusted by means of screw.

Supports must be adapted in length and width to the transmission.

**Supporting transmission:**

Support transmission with special tools [23 4 050](#) , [00 2 030](#) .

**Important!**

Transmission must be secured with tensioning strap (1).

## 23 Universal transmission retaining bridge



### Special tools required:

- 0 495 187
- [24 0 200](#)



### Note:

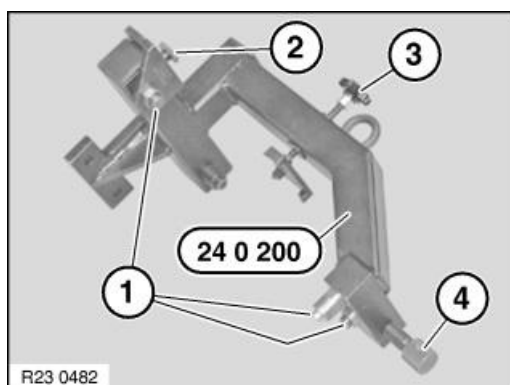
- Transmission retaining bridge [24 0 200](#) is suitable for manual and automatic transmissions



### Attention!

The adapter and shaft must be adapted to positively lock with the transmission.

**(Danger of injury)**



Adapt the adapter (1) and spindle with the thrust piece (3) on the transmission.

Adjust the length using the sliding piece (2).

Screw in spindle (4).

### Attention!

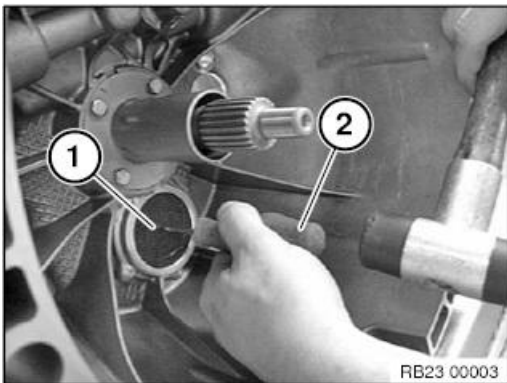
Before mounting on assembly stand 0 495 187 check retraining bridge for tight fit.

**Special tools required:**

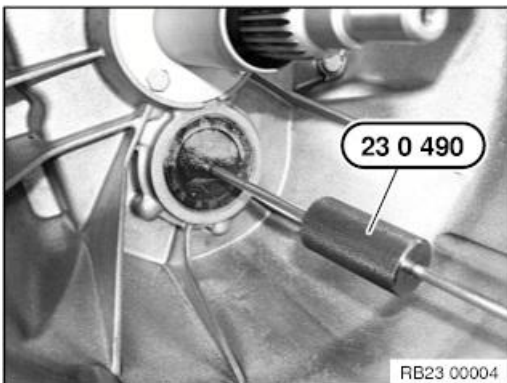
- [23 0 490](#)
- [23 0 330](#)

**Necessary preliminary tasks:**

- Remove [transmission](#).
- Remove [clutch release bearing/lever](#).

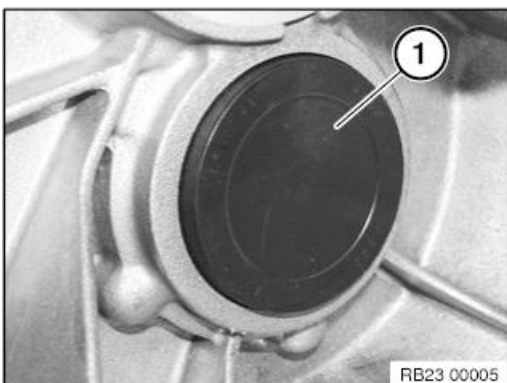


Drive a hole into the sealing cap (1) with a suitable tool (2). **Important!**  
Do not use a drill as drillings may result in transmission malfunction.

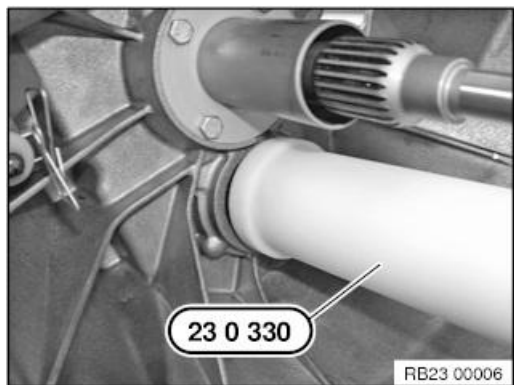


Screw special tool [23 0 490](#) into sealing cap.

Withdraw sealing cap from transmission housing with aid of impact weight.



Apply transmission oil to the sealing lip of the sealing cap (1) and insert.



Drive sealing cap firmly home with special tool [23 0 330](#) .

**Special tools required:**

- [23 4 050](#)
- [00 2 030](#)

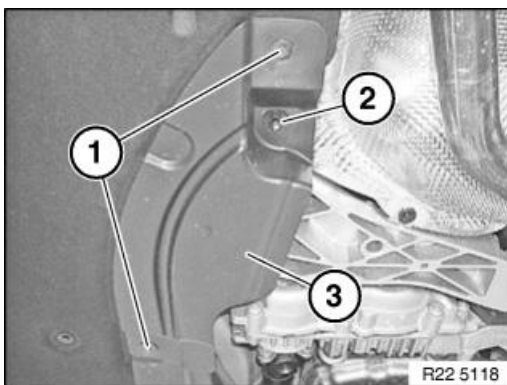
**Important!**

After installing the zero-gear sensor, it is necessary to teach in the position of the zero-gear sensor again.

Calibration is carried out using the BMW Diagnosis System "Service Function" (Learn/record zero-gear sensor).

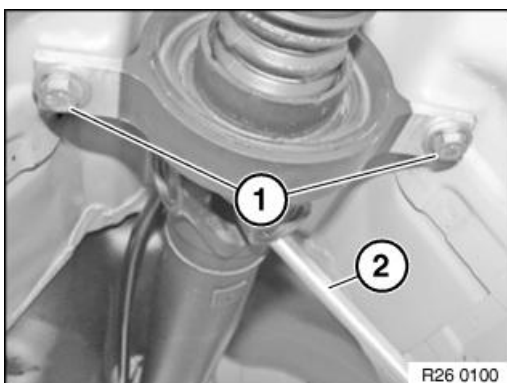
**Necessary preliminary tasks:**

- Remove rear [underbody protection](#).
- Remove [complete exhaust system](#).
- Remove middle heat shield.



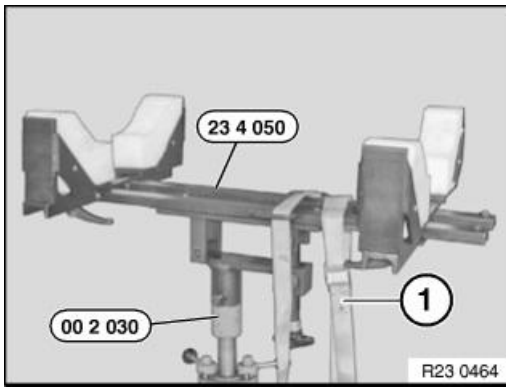
Release screws (1) and nuts (2).

Remove underbody panelling (3).

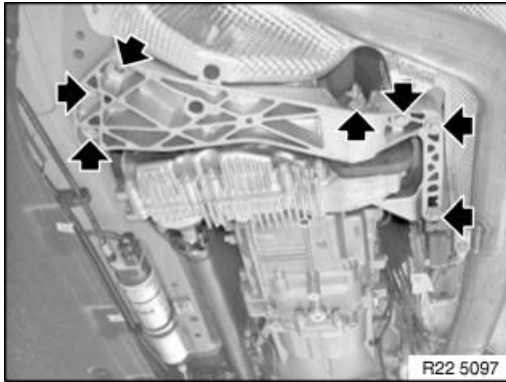


Release screws (1) on propeller shaft centre mount.

Tightening torque [26 11 6AZ](#).



Support transmission with special tools [23 4 050](#) ,[00 2 030](#) .



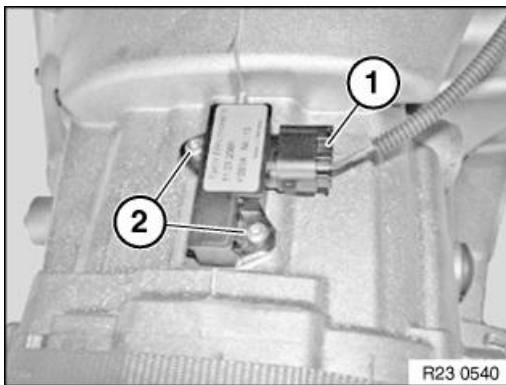
Release screws from cross member to body.

Tightening torque [22 32 3AZ](#).

*Note:*

Do **not** release screw connection on transfer box rubber mount.

Lower transmission.



Disconnect plug connection (1).

Unfasten screws (2).

*Installation note:*

Replace screws.

Tightening torque [23 14 2AZ](#).

Remove zero gear sensor.

**Important!**

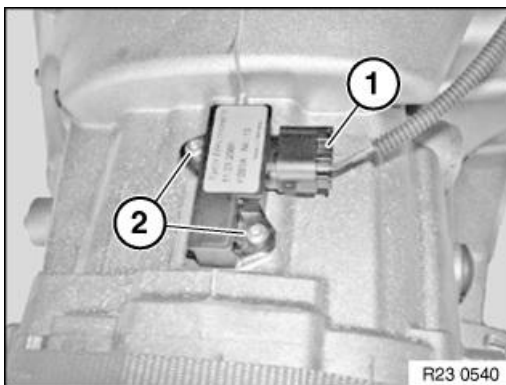
After installing the zero-gear sensor, it is necessary to teach in the position of the zero-gear sensor again.

Calibration is carried out using the BMW Diagnosis System "Service Function" (Learn/record zero-gear sensor).

**Necessary preliminary tasks:**

- Lower transmission

Tasks are described in Removing [transmission](#).



Disconnect plug connection (1) on zero gear sensor.

Unfasten screws (2).

Remove zero gear sensor.

*Installation note:*

Replace screws (2).

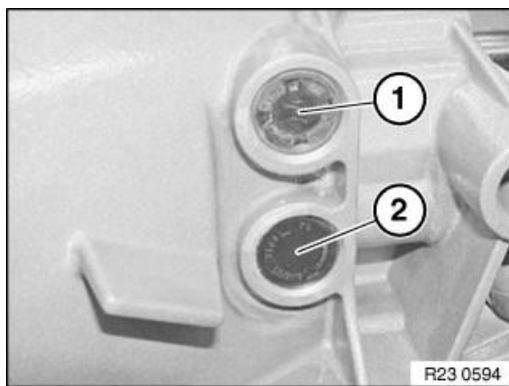
Tightening torque [23 14 2AZ](#).

## 23 31 545 Replacing both locking bolts for 6th / reverse gear (I transmission) - transmission removed



Special tools required:

- [23 4 021](#)
- [23 4 023](#)

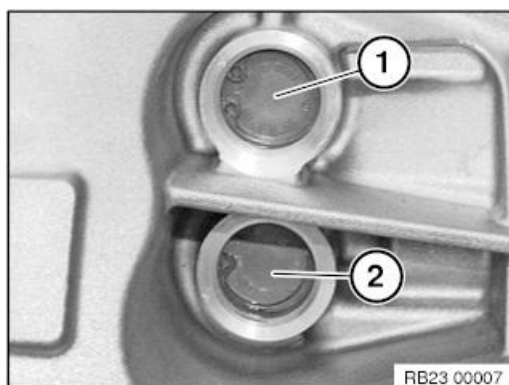


**Important!**

In petrol engines, sealing caps 1 and 2 are located **above** the circlip.

1=Locking bolt for 6th gear

2=Locking bolt for reverse gear

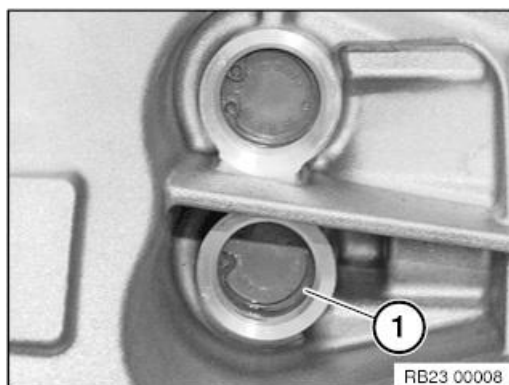


**Important!**

In diesel engines, sealing caps 1 and 2 are located **below** the circlip.

1=Locking bolt for 6th gear

2=Locking bolt for reverse gear

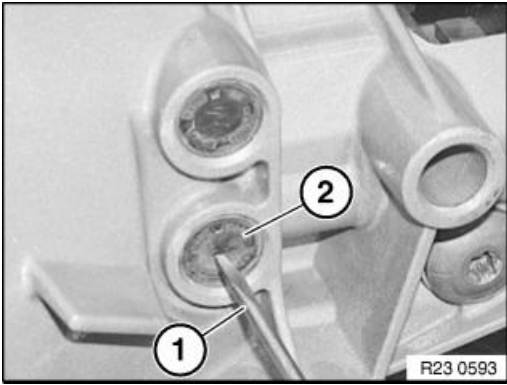


**For diesel engines:**

Lever circlip (1) out of housing with a suitable tool.

*Installation note:*

Install retaining ring (1).



Using a suitable tool (1), drive hole into sealing cap (2) and lever out of housing. **Important!**

Bore hole must not be damaged.

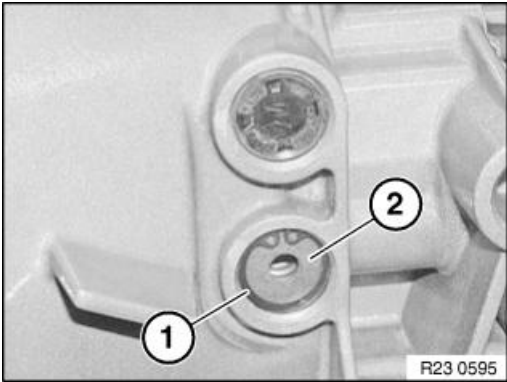
A burr or a dent can cause the sealing cap to leak.

*Installation note:*

Replacing sealing cap (2).

*Note:*

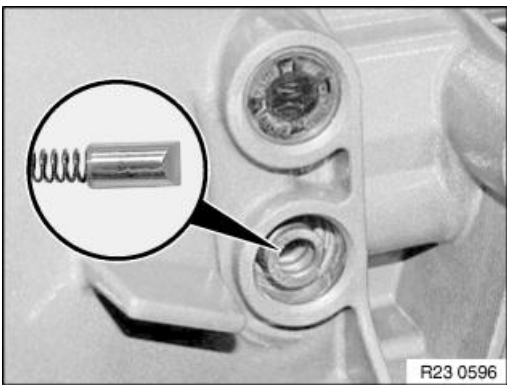
Illustration shows: Sealing cap for reverse gear



**With petrol engines:**

Remove circlip (1) and washer (2).

In diesel engines, **no** washer is fitted.



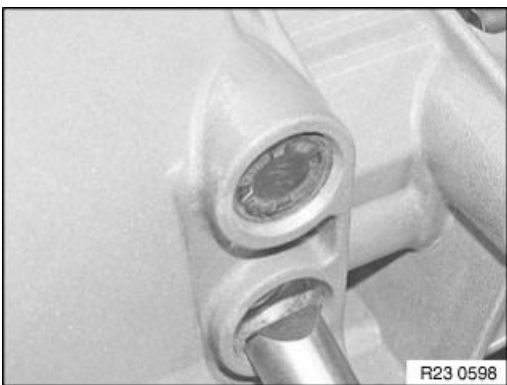
Remove compression spring and locking bolt. **Important!**

Compression springs and locking bolts for 6th gear and reverse gear must not be mixed up.

|                           |                             |
|---------------------------|-----------------------------|
| 6th gear locking bolt     | Reverse gear locking bolt   |
| Curved chamfer            | Straight chamfer            |
| Weaker compression spring | Stronger compression spring |

*Note:*

Graphic shows: Reverse gear locking bolt



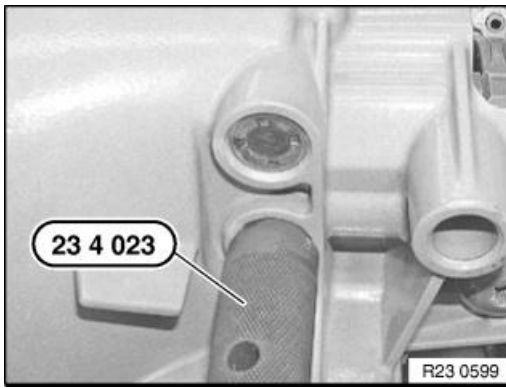
**Important!**

6th gear locking bolt:

Bevel must point in bell housing downwards to reverse gear!

Reverse gear locking bolt:

Bevel must point in bell housing upwards to 6th gear!



**With petrol engines:**

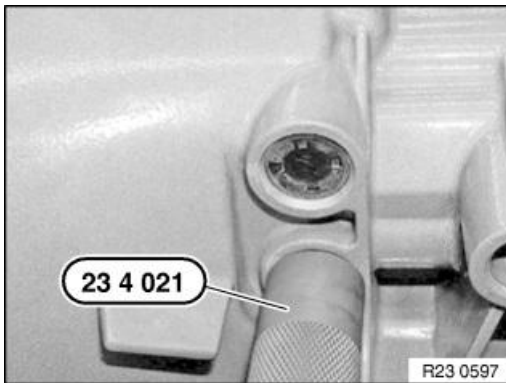
Using special tool [23 4 023](#), drive locking bolt with compression spring, washer and circlip simultaneously into housing.

**For diesel engines:**

Using special tool [23 4 023](#), drive locking bolt with compression spring, sealing cap and circlip simultaneously into housing.

**Important!**

It is essential to ensure the circlip engages completely.

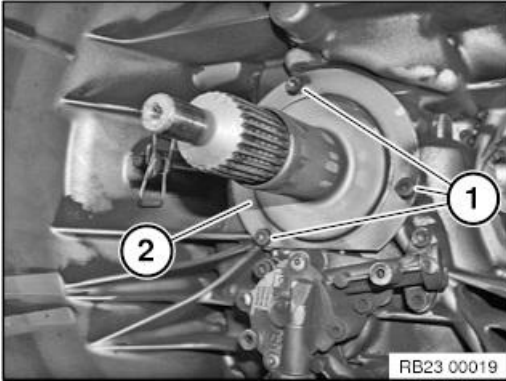


**With petrol engines:**

Drive in sealing cap (1) with special tool [23 4 021](#).

*Necessary preliminary tasks:*

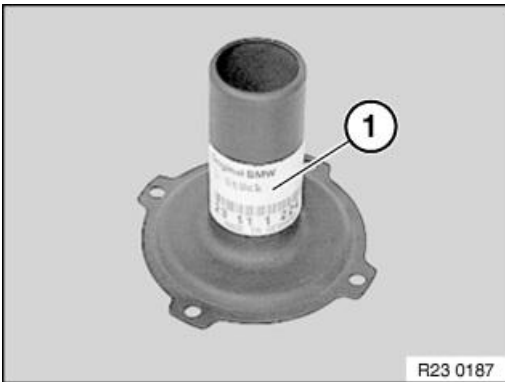
- Remove [gearbox](#)
- Remove [clutch operator](#) and release lever from guide tube.



Release screws (1).

Remove guide tube (2).

Tightening torque: [23 11 2 Tightening torque](#).

**Installation note:**

Clean thread.

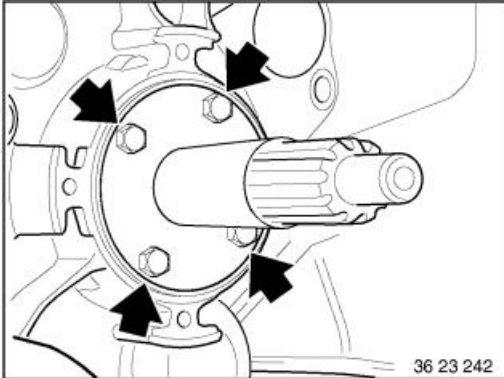
Install screws with Loctite 243.

Remove all traces of label (1) and adhesive from guide tube using suitable solvent.



*Necessary preliminary tasks:*

- [Remove transmission.](#)
- [Remove](#) clutch operator and release lever from guide tube.



Release screws.

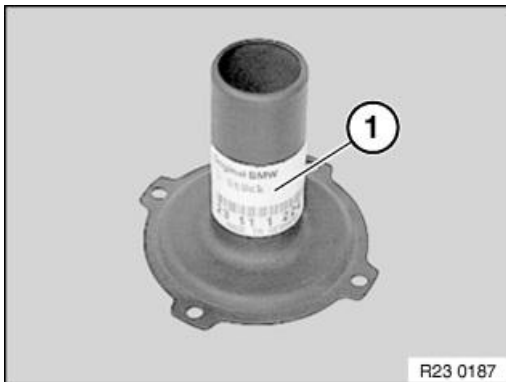
Remove guide tube.

Tightening torque: [23 11 2AZ](#).

**Installation note:**

Clean thread.

Replace screws.



**Note:**

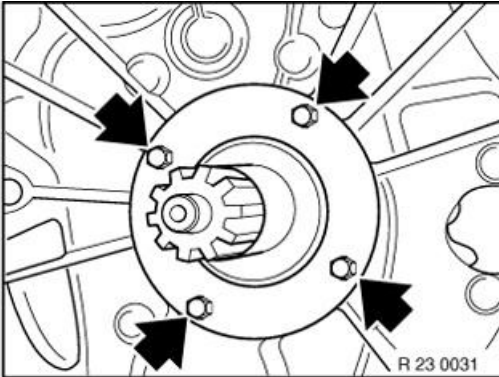
Remove sticker (1) and adhesive with a suitable solvent.

**Note:** (transmission removed)



**Necessary preliminary tasks:**

- Remove [clutch release bearing and release lever](#) from guide tube.



Release screws.

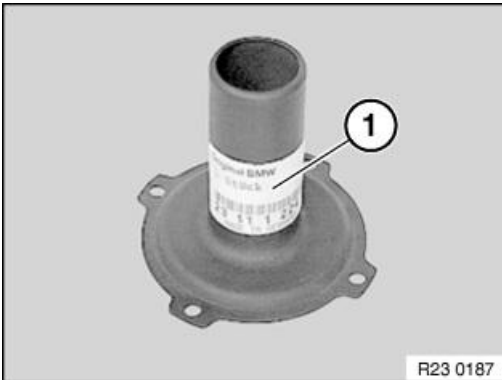
Remove guide tube (1).

**Installation:**

Clean thread.

Install screws with Loctite 243.

Tightening torque [23 11 2AZ](#) .



**Note:**

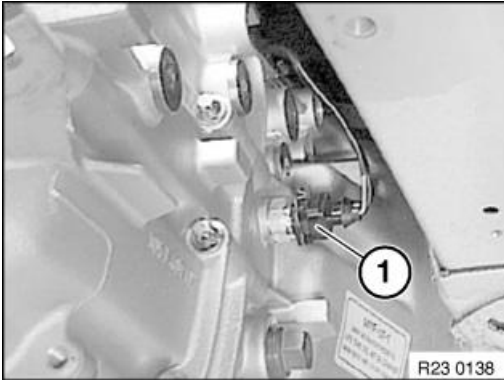
Remove sticker (1) and adhesive with a suitable solvent.

## 23 14 ... Replacing reversing light switch



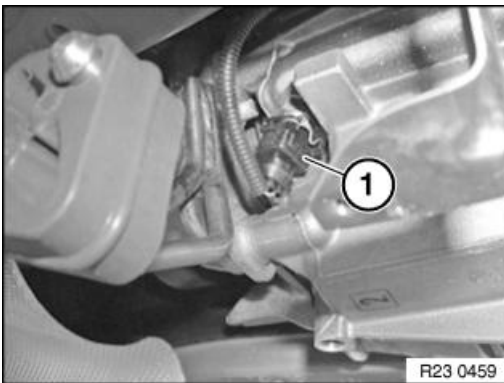
### Necessary preliminary tasks:

- Remove rear [underbody protection](#)



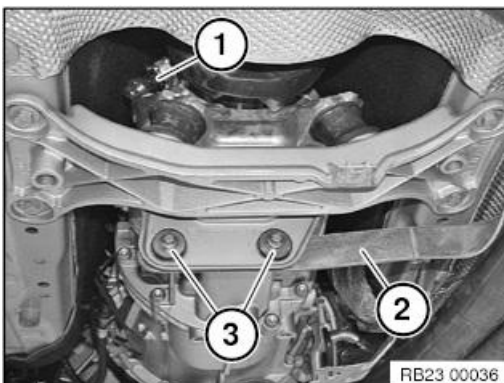
Only transmissions GS6-17DG/BG and GS6-37DG/BG  
Disconnect plug connection (1) on reverse gear switch.  
Remove reverse gear switch.  
Tightening torque [23 14 1AZ](#).

*Note:*  
Graphic similar



Only transmission GS6-53DG/BG  
Disconnect plug connection (1) on reverse gear switch.  
Remove reverse gear switch.  
Tightening torque [23 14 1AZ](#).

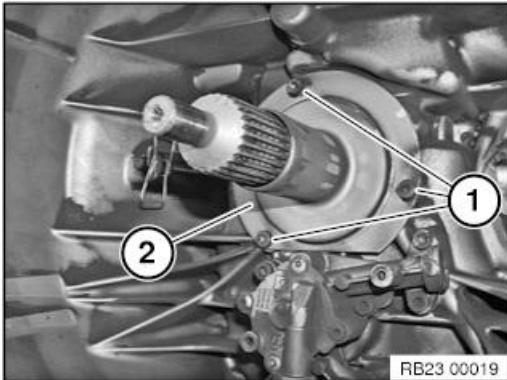
*Note:*  
Graphic similar



Only transmission GS6-45DZ/BZ  
Disconnect plug connection (1) on reverse gear switch.  
Remove reverse gear switch.  
Tightening torque [23 14 1AZ](#).

*Necessary preliminary tasks:*

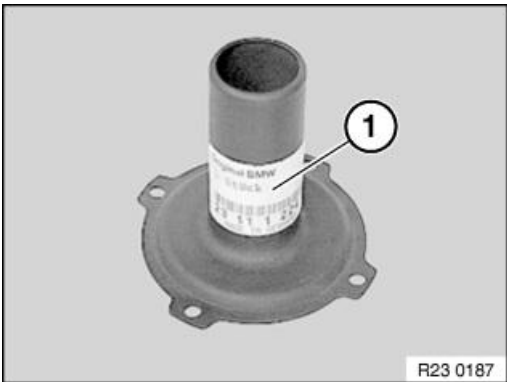
- Remove [gearbox](#)
- Remove [clutch operator](#) and release lever from guide tube.



Release screws (1).

Remove guide tube (2).

Tightening torque: [23 11 2 Tightening torque](#).

**Installation note:**

Clean thread.

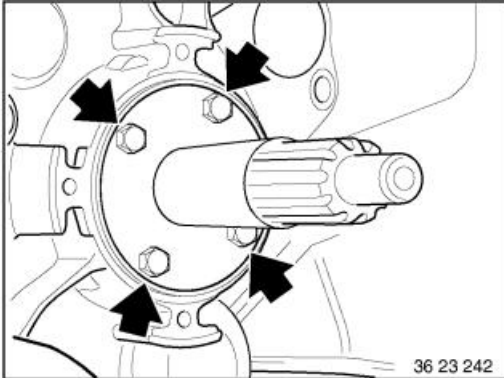
Install screws with Loctite 243.

Remove all traces of label (1) and adhesive from guide tube using suitable solvent.



*Necessary preliminary tasks:*

- [Remove transmission.](#)
- [Remove](#) clutch operator and release lever from guide tube.



Release screws.

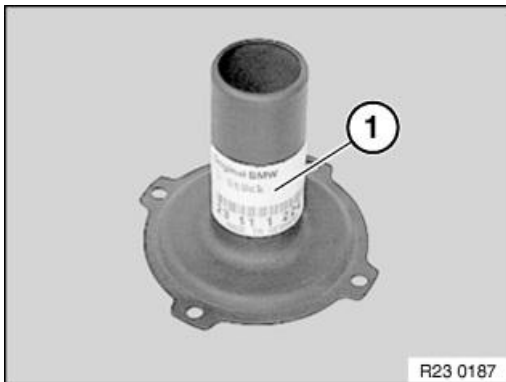
Remove guide tube.

Tightening torque: [23 11 2AZ](#).

**Installation note:**

Clean thread.

Replace screws.



**Note:**

Remove sticker (1) and adhesive with a suitable solvent.

**Special tools required:**

- [23 0 320](#)
- [23 0 490](#)

**Important!**

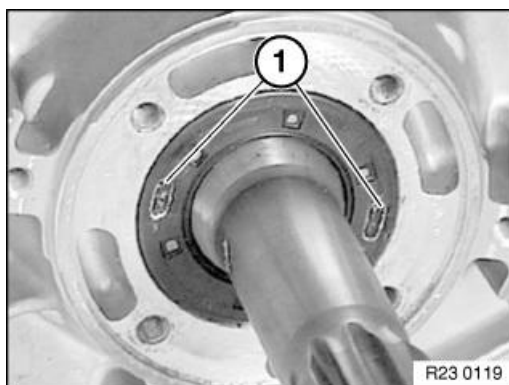
After completion of work, change [transmission oil](#).

Use only approved transmission oil.

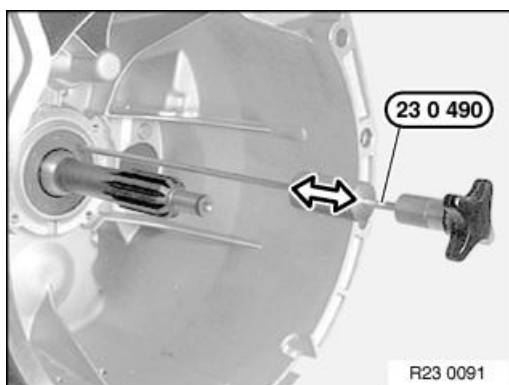
Failure to comply with this instruction will result in serious damage to the transmission.

**Necessary preliminary tasks:**

- Remove [guide tube](#)

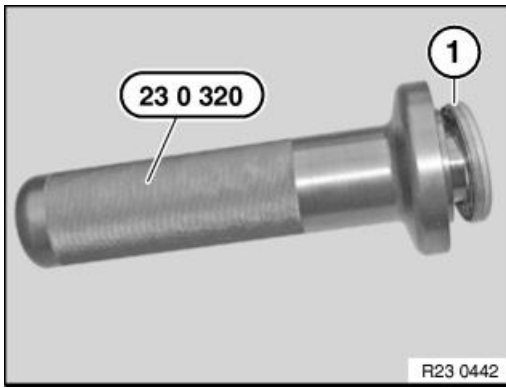
**Note:**

Two covered removal holes (1) are located on end face of radial shaft seal.

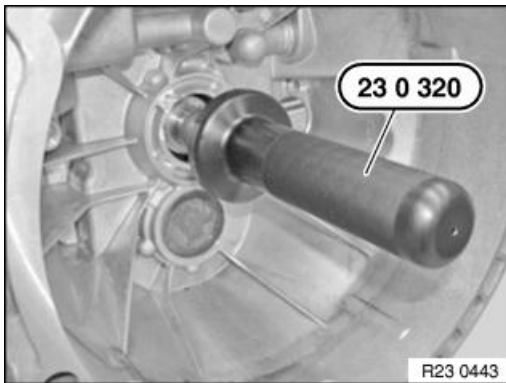


Screw special tool [23 0 490](#) into one of the two removal holes.

Withdraw radial shaft seal from transmission housing with aid of impact weight.



Push radial shaft seal (1) onto special tool [23 0 320](#) .



*Installation note:*

Coat sealing lips of radial shaft seal with transmission oil.

Slide special tool [23 0 320](#) onto drive shaft.

Drive in radial shaft seal with plastic hammer as far as it will go.

**Special tools required:**

- [23 3 151](#)
- [23 3 152](#)

**Important!**

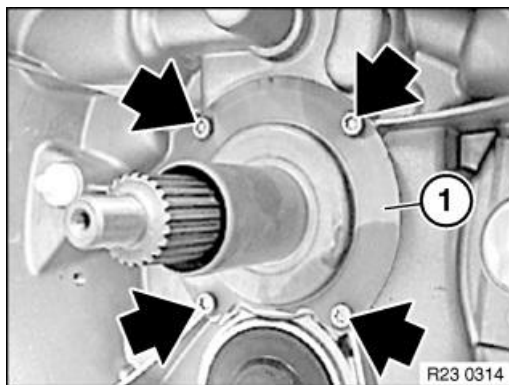
After completion of work, check [transmission oil level](#) .

Use only approved [transmission oil](#) .

Failure to comply with this requirement will result in serious damage to the automatic transmission!

**Necessary preliminary tasks:**

- Remove [transmission](#) .
- Remove [clutch release unit and release lever](#) from guide tube.



Release screws.

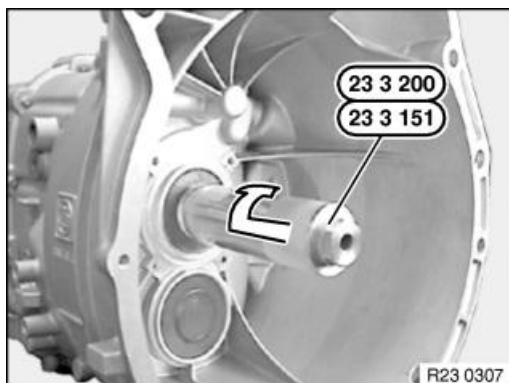
Tightening torque: [23 11 2AZ](#) .

Remove guide tube (1).

**Installation:**

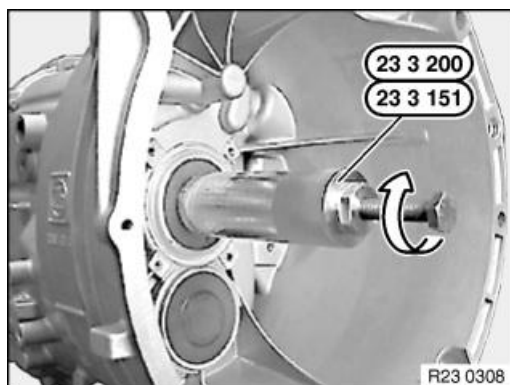
Clean guide tube.

Do not grease guide tube.

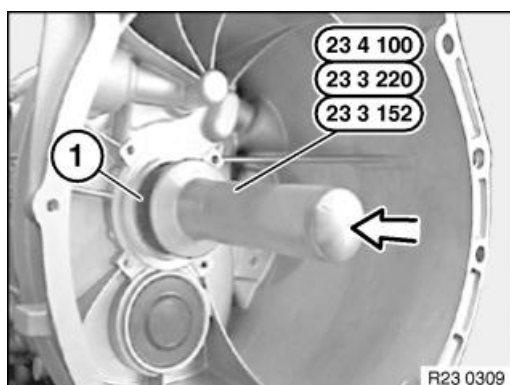


Release screw on special tool [23 3 151](#) .

Push special tool onto drive shaft and screw into sealing ring.



Insert screw into special tool [23 3 151](#) again and continue turning until sealing ring is pulled out of transmission housing.



*Installation:*

Coat sealing lips of radial seal with gear oil.

Push radial seal (1) onto drive shaft up to housing.

Drive in radial shaft seal (1) as far as it will go with special tool [23 3 152](#) and plastic hammer.

**Special tools required:**

- [23 0 490](#)
- [23 0 220](#)

**Important!**

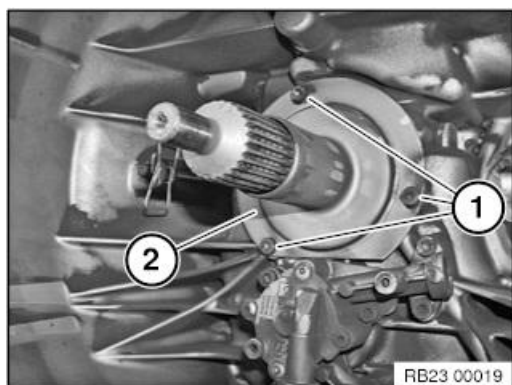
After completion of repair work, check [transmission oil level](#).

Use only approved [gearbox oil](#).

Failure to comply with this requirement will result in serious damage to the automatic transmission!

**Necessary preliminary tasks:**

- Remove [transmission](#)
- Remove [clutch operator and release lever](#) from guide tube.



Release screws (1).

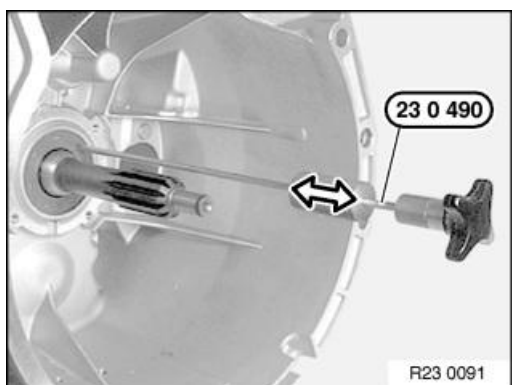
Tightening torque: [23 11 2AZ](#).

Remove guide tube (2).

*Installation note:*

Clean guide tube.

Do not grease guide tube.



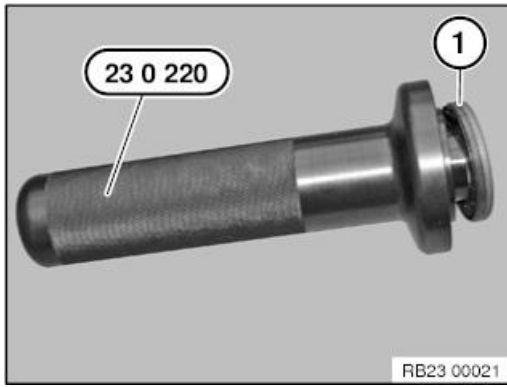
Drive a hole into radial shaft seal using a centre punch.

**Important!**

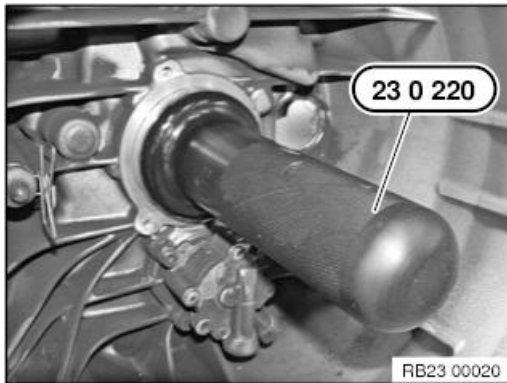
Do not use a drill as drillings may result in transmission malfunction.

Screw special tool [23 0 490](#) into radial shaft seal.

Withdraw radial shaft seal from transmission housing with aid of impact weight.



Push radial shaft seal (1) onto special tool [23 0 220](#) . *Installation note:*  
Coat sealing lips of radial shaft seal with transmission oil.



Slide special tool [23 0 220](#) onto drive shaft.  
Drive in radial shaft seal with plastic hammer as far as it will go.

**Special tools required:**

- [23 0 210](#)
- [23 0 220](#)

**Note:**

After completion of work, check transmission fluid level.

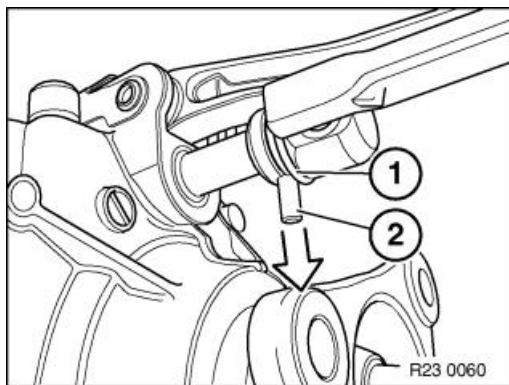
**Important!**

Use only the [approved transmission oil](#) in this manual transmission.

Failure to comply with this requirement will result in serious damage to the manual gearbox.

**Necessary preliminary tasks:**

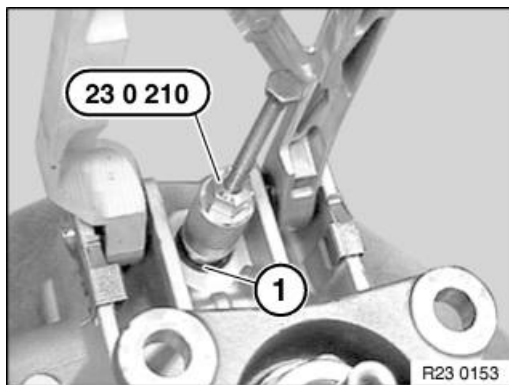
- Shift transmission into 2nd gear
- [Remove transmission cross member.](#)
- [Unflange](#) propeller shaft from transmission and tie to one side



Lever circlamp (1) out of groove with a small screwdriver.

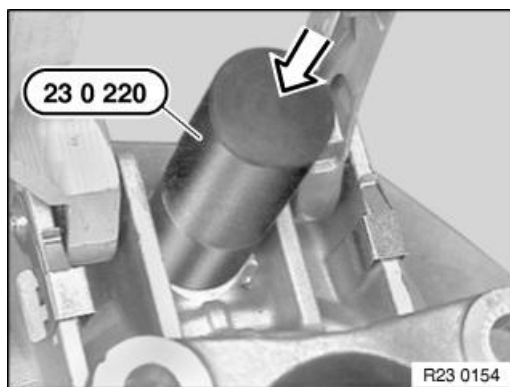
Slide circlamp (1) towards rear.

Drive out cylinder pin (2).



Screw in special tool [23 0 210](#) until it is firmly connected with radial shaft seal (1).

Pull out radial shaft seal with special tool [23 0 210](#).



Coat sealing lips of radial shaft seal and gearshift shaft with transmission oil.

Drive in radial shaft seal with special tool [23 0 220](#) .

## 23 12 088 Replacing radial shaft seal for gearshift shaft (GS6-37BZ/DZ) all-wheel drive vehicle



### Special tools required:

- [23 0 210](#)
- [23 0 220](#)



### Important!

After completion of repair work, check [transmission oil level](#).

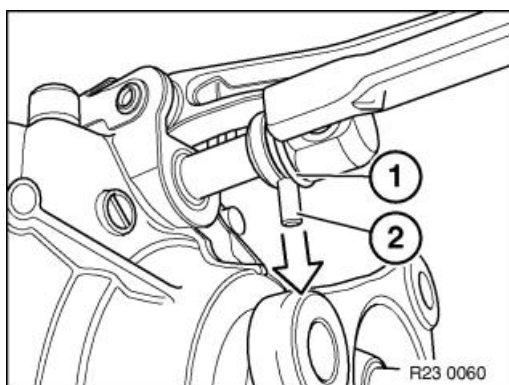
Use only approved [transmission oil](#).

Failure to comply with this instruction will result in serious damage to the transmission.



### Necessary preliminary tasks:

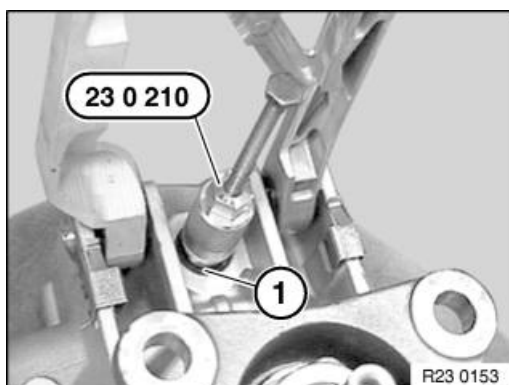
- Remove [transfer box](#).
- Shift transmission into 2nd gear



Lever circlip (1) out of groove with a small screwdriver.

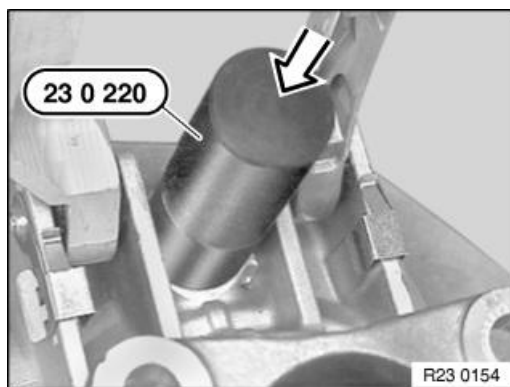
Slide circlamp (1) towards rear.

Drive out cylinder pin (2).



Screw in special tool [23 0 210](#) until it is firmly connected with radial shaft seal (1).

Pull out radial shaft seal with special tool [23 0 210](#).



Coat sealing lips of radial shaft seal and gearshift shaft with transmission oil.

Drive in radial shaft seal with special tool [23 0 220](#) .

**Special tools required:**

- [00 5 011](#)
- [23 0 020](#)
- [23 1 210](#)
- [24 0 110](#)
- [33 1 150](#)

**Important!**

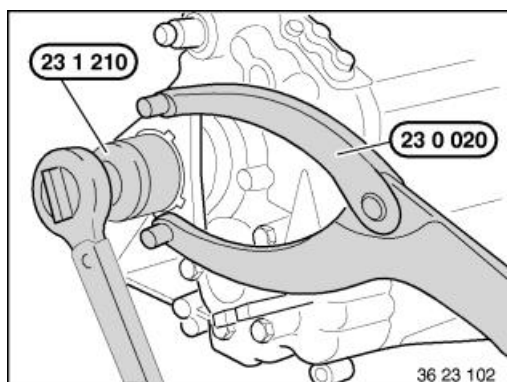
After completion of work, check [transmission oil level](#).

Use only approved [transmission oil](#).

Failure to comply with this instruction will result in serious damage to the transmission.

*Necessary preliminary tasks:*

- Remove underbody protection
- Remove [exhaust system](#)
- Remove front silencer (N45K)
- Remove heat shields
- [Tie](#) propeller shaft to one side.
- [Remove transmission cross member](#).

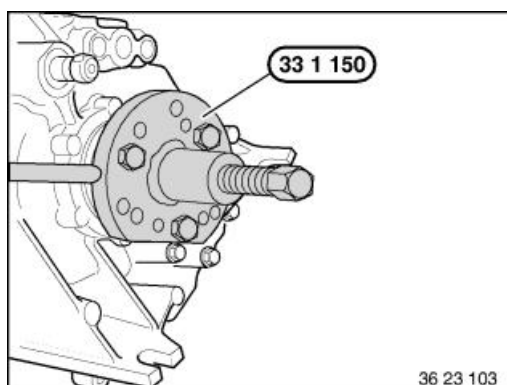


Brace output flange with special tool [23 0 020](#).

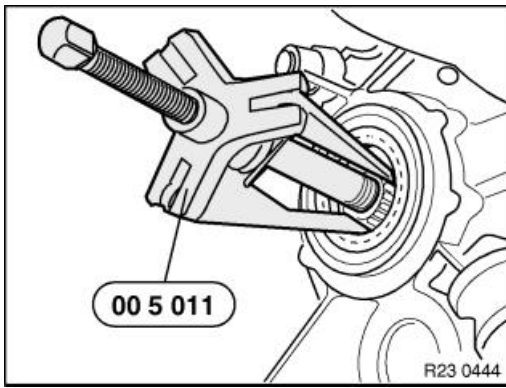
Release collar nut with special tool [23 1 210](#).

Tightening torque [23 21 1AZ](#).

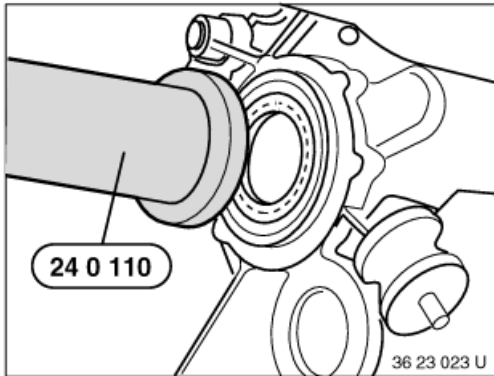
Insert collar nut with Loctite 243 screw locking adhesive (sourcing reference: BMW Parts Service).



Detach output flange from output shaft using special tool [33 1 150](#).



Pull out radial shaft seal with special tool [00 5 011](#) .



*Installation note:*

Coat sealing lips of new radial shaft seal with transmission oil.

Drive in radial shaft seal with special tool [24 0 110](#) and plastic hammer until flush.

## 23 12 061 Replacing radial shaft seal for output flange (GS6-37GS6X45BZBZ/DZ) - all-wheel drive vehicle



### Special tools required:

- [23 0 490](#)
- [24 0 110](#)
- [11 8 180](#)
- [2 286 572](#)
- 23 3 211
- [23 3 210](#)
- [23 3 230](#)



### Important!

After completion of work, check [transmission oil level](#).

Use only approved [transmission oil](#).

Failure to comply with this instruction will result in serious damage to the transmission.

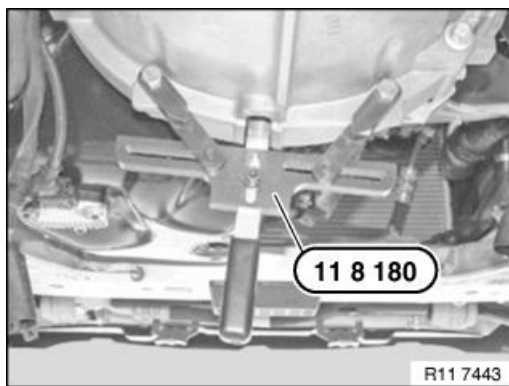


### Necessary preliminary tasks:

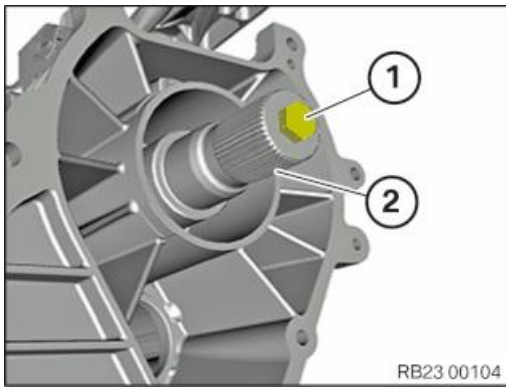
- Remove [transfer box](#).
- Engage gear.



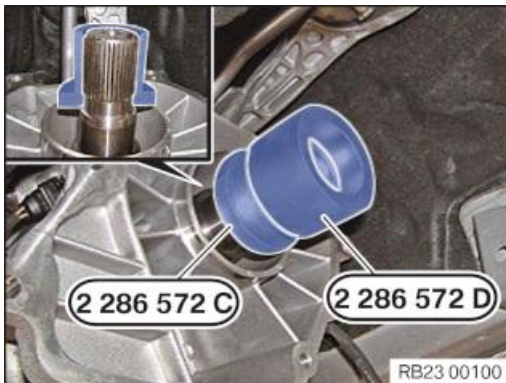
### Removal:



Block crankshaft with special tool [11 8 180](#) .



Loosen and screw out screw (1) from the adapter shaft of the transmission (2).



Mount special tool [2 286 572 C](#) and [2 286 572 D](#) on the adapter shaft.



Screw in special tool [2 286 572 B](#) in adapter shaft (1).  
Pull out adapter shaft (1) using a two or three-claw extractor tool (2).



Mount screw [2 286 572 A](#) on special tool 23 3 211 .

*Note:*

- Special tool 23 3 211 is an element of special tool [23 3 210](#) .

Unscrew screw [2 286 572 A](#) as far as possible out of special tool 23 3 211 .

Screw special tool 23 3 211 tightly into radial shaft seal.

Screw in screw [2 286 572 A](#) into special tool 23 3 211 again until the radial shaft seal is drawn out of the transmission housing.

- If necessary, repeat procedure.



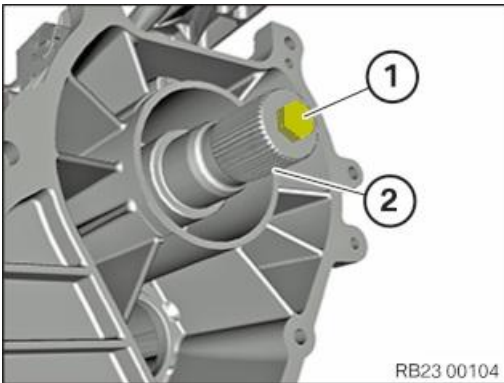
## Installation:



Coat sealing lips of new radial shaft seal with transmission oil.  
Drive in radial shaft seal with special tool [23 3 230](#) until flush.



Heat up adapter shaft (1) using a hot air blower (2). *Note:*  
Maximum temperature of the adapter shaft: 120°C.



### Important!

Risk of burning!  
Wear protective gloves.

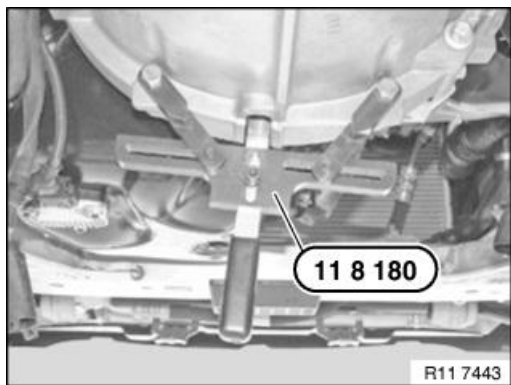
Insert the heated adapter shaft (2) on the output.

- If necessary, carefully hammer in the adapter shaft using a plastic hammer.

**Part:** Replace screw (1).

Tighten screw (1).

Tightening torque [23 21 3AZ](#).



Remove special tool [11 8 180](#) .



**Required follow-up work:**

- Install [transfer box](#).
- Check [transmission oil level](#).

**Special tools required:**

- [23 0 490](#)
- [24 0 110](#)
- [11 7 221](#)
- [11 7 222](#)
- [11 7 223](#)
- [11 6 480](#)
- [2 286 572](#)
- 23 3 211
- [23 3 210](#)
- [23 3 230](#)

**Important!**

After completion of work, check [transmission oil level](#).

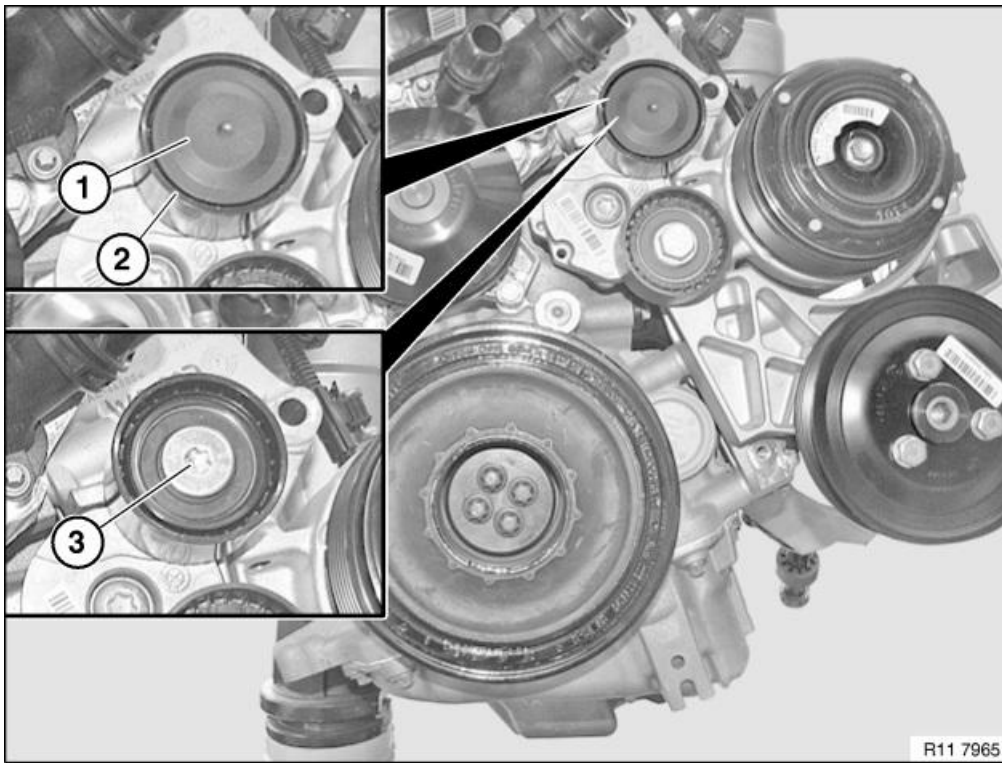
Use only approved [transmission oil](#).

Failure to comply with this instruction will result in serious damage to the transmission.

**Necessary preliminary tasks:**

- Remove [transfer box](#).
- Remove alternator [drive belt](#).
- Engage gear.

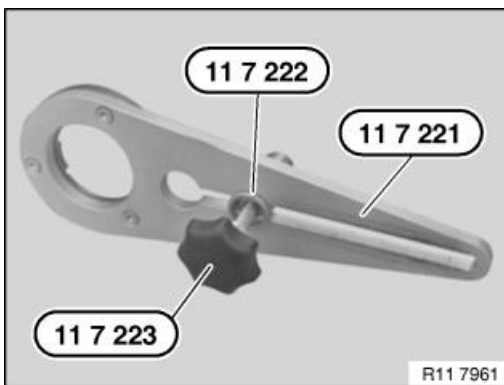
**Removal:**



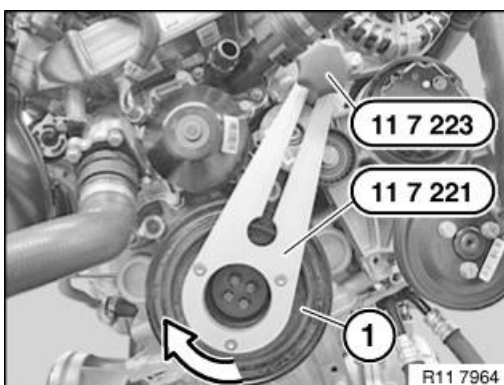
Using a suitable tool, lever off protective cap (1) from deflecting element (2).

Release screw (3).

Remove deflection pulley (2).



Assemble special tool [11 7 221](#) with special tool [11 7 222](#) and [11 7 223](#)

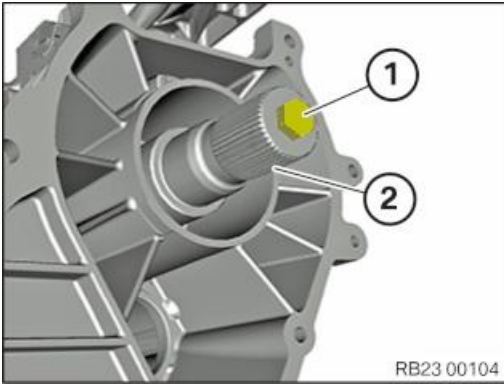


Screw special tool [11 7 221](#) with special tool [11 7 223](#) into receptacle of the deflecting element.

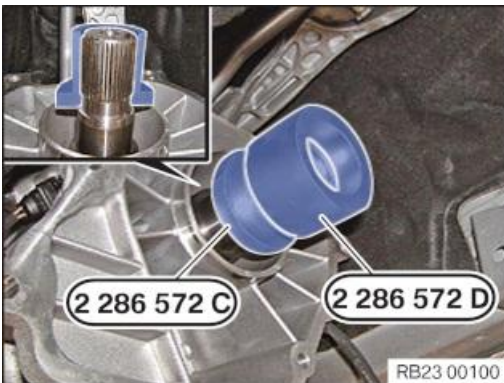
Secure special tool [11 7 221](#) vibration damper (1).

*Note:*

If necessary, use special tool [11 7 221](#) to turn the vibration damper in the direction of travel until the special tool [11 6 480](#) audibly clicks into place on the vibration damper.



Loosen and screw out screw (1) from the adapter shaft of the transmission (2).



Mount special tool [2 286 572 C](#) and [2 286 572 D](#) to the adapter shaft.



Screw special tool [2 286 572 B](#) into the adapter shaft (1).

Pull out adapter shaft (1) using a two or three-claw extractor tool (2).



Mount screw [2 286 572 A](#) to the special tool 23 3 211 .

*Note:*

- The special tool 23 3 211 is an element of special tool [23 3 210](#) .

Undo the screw [2 286 572 A](#) from the special tool 23 3 211 as far as you can.

Firmly screw special tool 23 3 211 into radial shaft seal.

Insert screw [2 286 572 A](#) into special tool 23 3 211 again until the radial shaft seal is pulled out of the transmission housing.

- If necessary, repeat procedure.



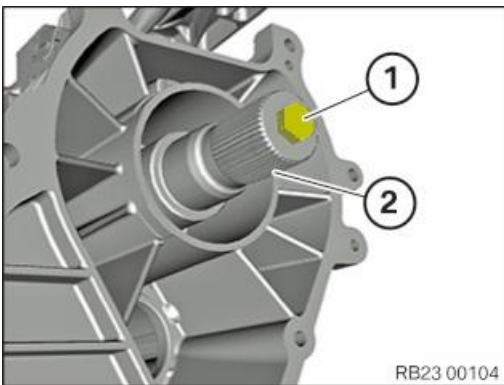
## Installation:



Coat sealing lips of new radial shaft seal with transmission oil.  
Drive in radial shaft seal with special tool [23 3 230](#) until flush.



Heat up adapter shaft (1) using a hot air blower (2). *Note:*  
Maximum temperature of the adapter shaft: 120°C.



### Important!

Risk of burning!  
Wear protective gloves.

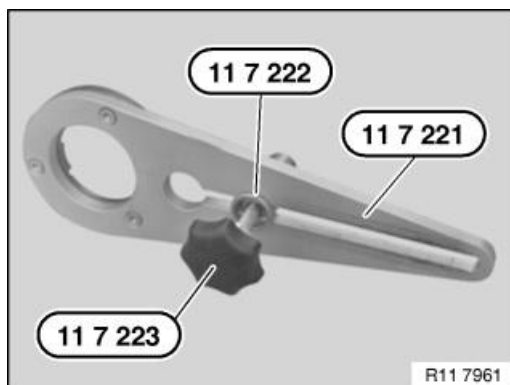
Insert the heated adapter shaft (2) on the output.

- If necessary, carefully hammer in the adapter shaft using a plastic hammer.

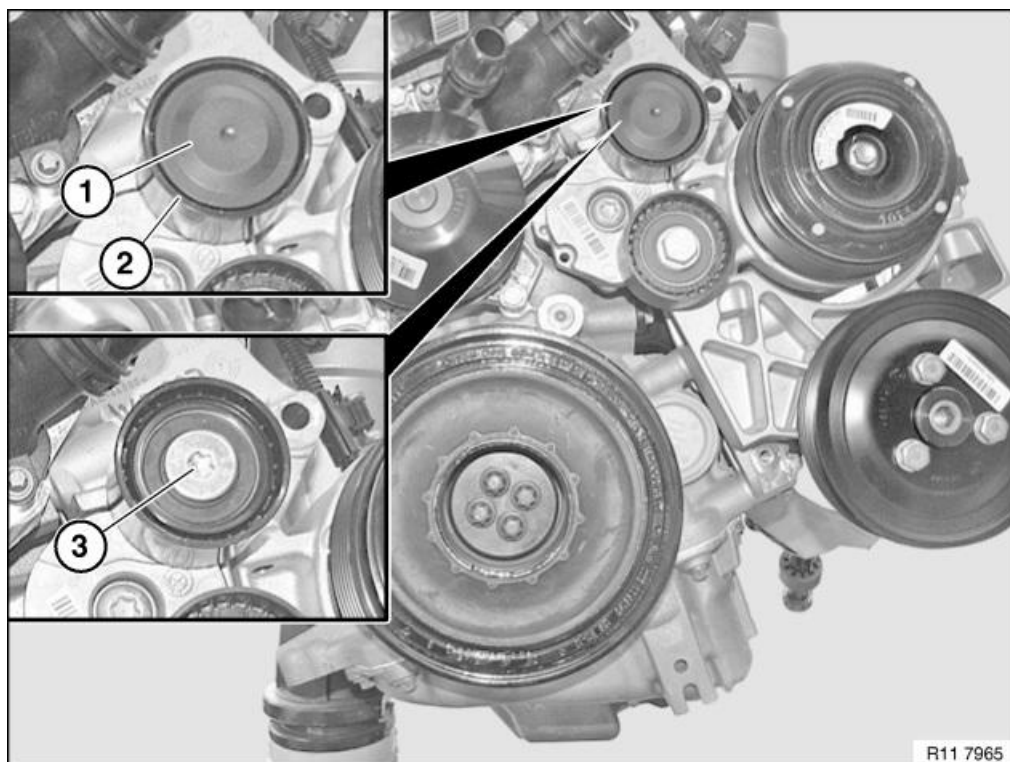
**Part:** Replace screw (1).

Tighten screw (1).

Tightening torque [23 21 3AZ](#).



Remove special tool [11 7 221](#) , [11 7 222](#) and [11 7 223](#) .



Position deflecting element (2).  
Tighten screw (3).  
Tightening torque [11 00 4AZ](#).  
Secure protective cap (1) at deflecting element (2).



#### Required follow-up work:

- Install for [drive belt](#) for alternator.
- Install [transfer box](#).
- Check [transmission oil level](#).

## 23 12 092 Replacing the radial shaft seal for the gearshift shaft (GS6-45DZ) all-wheel drive vehicle



### Special tools required:

- [2 219 637](#)
- [23 0 220](#)



### Important!

After completion of repair work, check [transmission oil level](#).

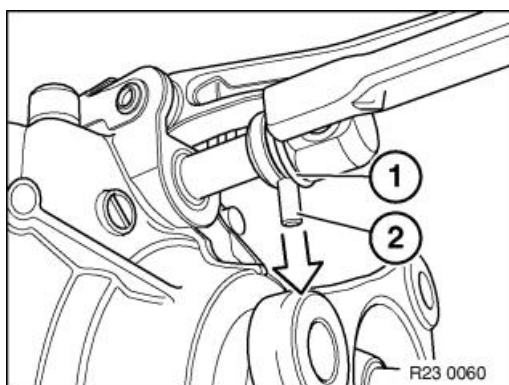
[Use only approved transmission oil.](#)

Failure to comply with this instruction will result in serious damage to the transmission.



### Necessary preliminary tasks:

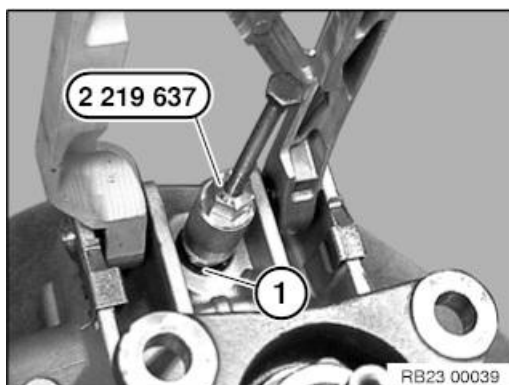
- Remove [transfer box](#).
- Shift transmission into 2nd gear.



Lever circlip (1) out of groove with a small screwdriver.

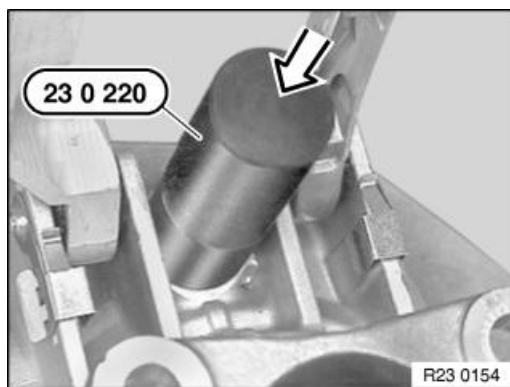
Slide circlip (1) towards rear.

Drive out cylinder pin (2).



Screw in special tool [2 219 637](#) until it is firmly connected with radial shaft seal (1).

Pull out radial shaft seal with special tool [2 219 637](#).



Coat sealing lips of radial shaft seal and gearshift shaft with transmission oil.

Drive in radial shaft seal with special tool [23 0 220](#) .

**Special tools required:**

- [23 4 050](#)
- [00 2 030](#)

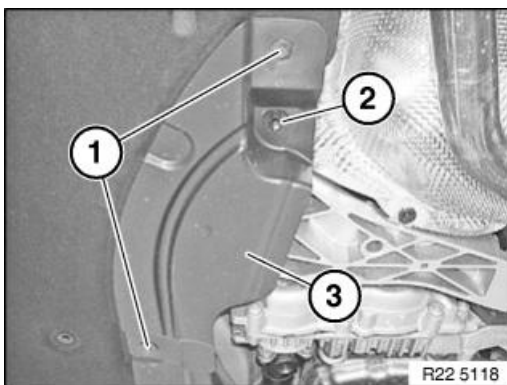
**Important!**

After installing the zero-gear sensor, it is necessary to teach in the position of the zero-gear sensor again.

Calibration is carried out using the BMW Diagnosis System "Service Function" (Learn/record zero-gear sensor).

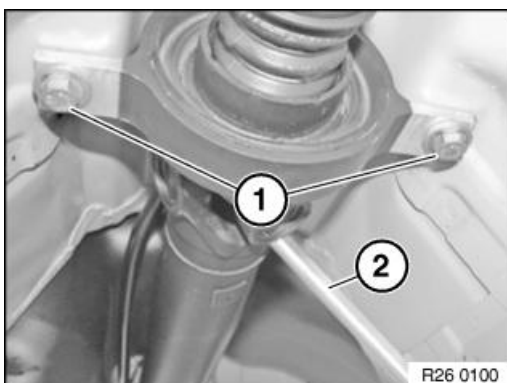
**Necessary preliminary tasks:**

- Remove rear [underbody protection](#).
- Remove [complete exhaust system](#).
- Remove middle heat shield.



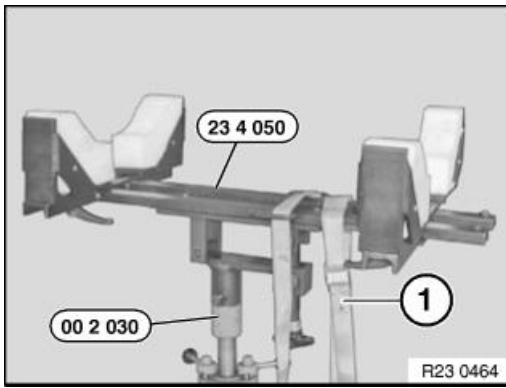
Release screws (1) and nuts (2).

Remove underbody panelling (3).

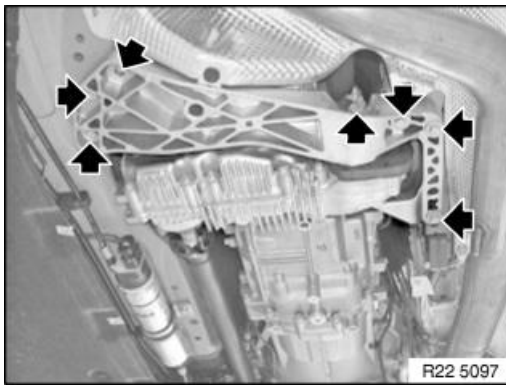


Release screws (1) on propeller shaft centre mount.

Tightening torque [26 11 6AZ](#).



Support transmission with special tools [23 4 050](#) , [00 2 030](#) .



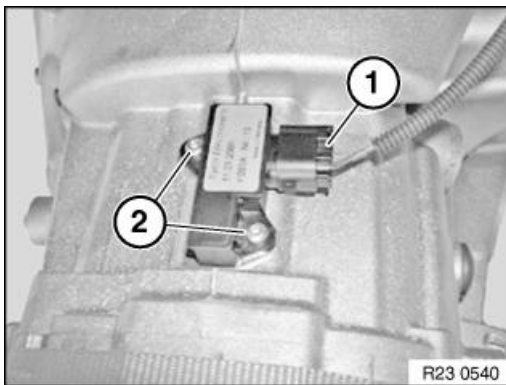
Release screws from cross member to body.

Tightening torque [22 32 3AZ](#).

*Note:*

Do **not** release screw connection on transfer box rubber mount.

Lower transmission.



Disconnect plug connection (1).

Unfasten screws (2).

*Installation note:*

Replace screws.

Tightening torque [23 14 2AZ](#).

Remove zero gear sensor.

**Important!**

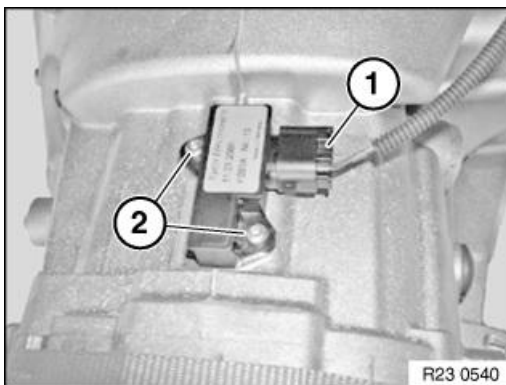
After installing the zero-gear sensor, it is necessary to teach in the position of the zero-gear sensor again.

Calibration is carried out using the BMW Diagnosis System "Service Function" (Learn/record zero-gear sensor).

**Necessary preliminary tasks:**

- Lower transmission

Tasks are described in Removing [transmission](#).



Disconnect plug connection (1) on zero gear sensor.

Unfasten screws (2).

Remove zero gear sensor.

*Installation note:*

Replace screws (2).

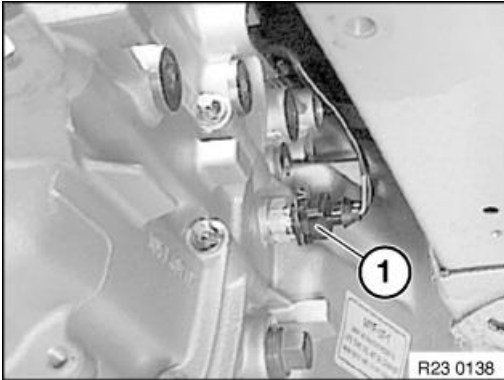
Tightening torque [23 14 2AZ](#).

## 23 14 ... Replacing reversing light switch



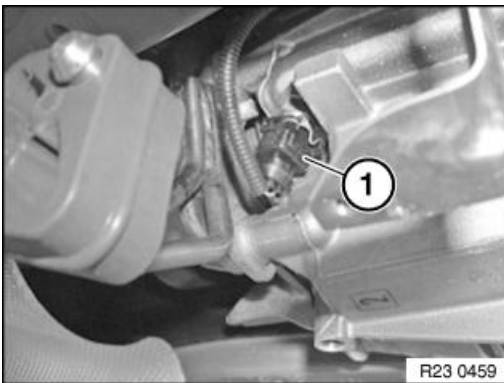
### Necessary preliminary tasks:

- Remove rear [underbody protection](#)



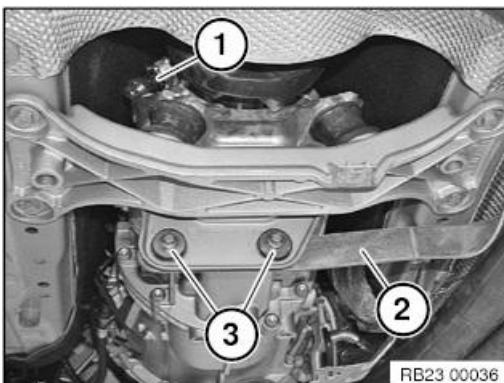
Only transmissions GS6-17DG/BG and GS6-37DG/BG  
Disconnect plug connection (1) on reverse gear switch.  
Remove reverse gear switch.  
Tightening torque [23 14 1AZ](#).

*Note:*  
Graphic similar



Only transmission GS6-53DG/BG  
Disconnect plug connection (1) on reverse gear switch.  
Remove reverse gear switch.  
Tightening torque [23 14 1AZ](#).

*Note:*  
Graphic similar



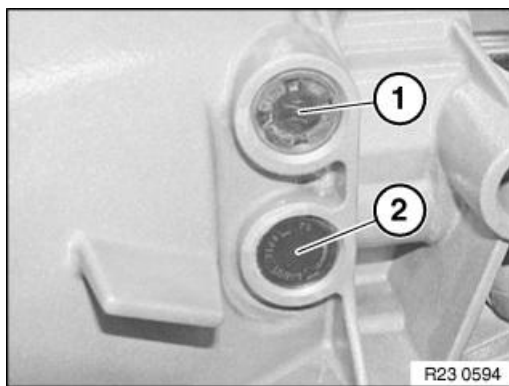
Only transmission GS6-45DZ/BZ  
Disconnect plug connection (1) on reverse gear switch.  
Remove reverse gear switch.  
Tightening torque [23 14 1AZ](#).

## 23 31 545 Replacing both locking bolts for 6th / reverse gear (I transmission) - transmission removed



Special tools required:

- [23 4 021](#)
- [23 4 023](#)

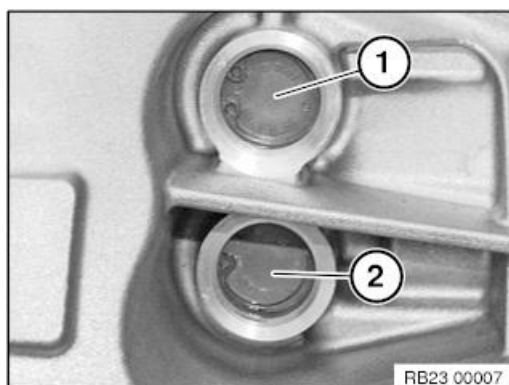


**Important!**

In petrol engines, sealing caps 1 and 2 are located **above** the circlip.

1=Locking bolt for 6th gear

2=Locking bolt for reverse gear

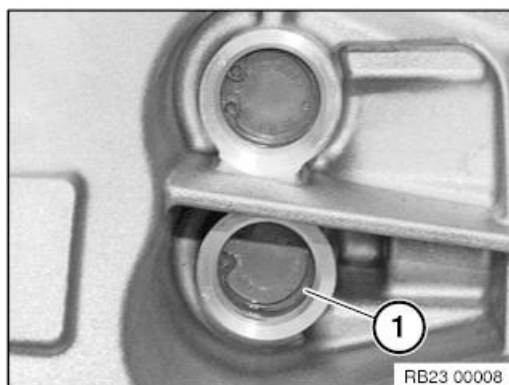


**Important!**

In diesel engines, sealing caps 1 and 2 are located **below** the circlip.

1=Locking bolt for 6th gear

2=Locking bolt for reverse gear

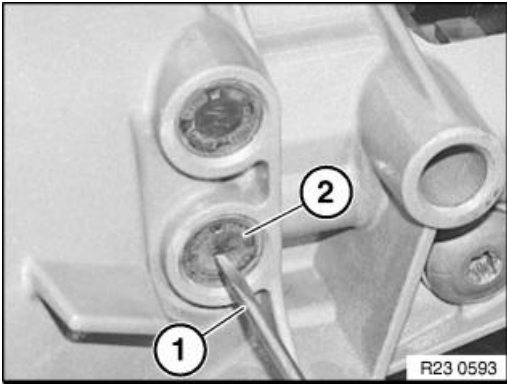


**For diesel engines:**

Lever circlip (1) out of housing with a suitable tool.

*Installation note:*

Install retaining ring (1).



Using a suitable tool (1), drive hole into sealing cap (2) and lever out of housing. **Important!**

Bore hole must not be damaged.

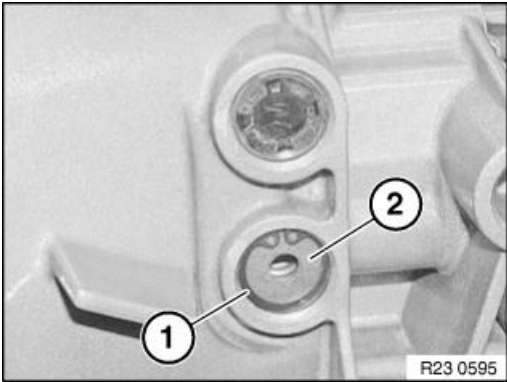
A burr or a dent can cause the sealing cap to leak.

*Installation note:*

Replacing sealing cap (2).

*Note:*

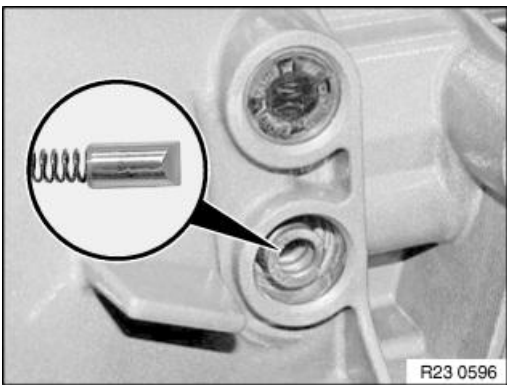
Illustration shows: Sealing cap for reverse gear



**With petrol engines:**

Remove circlip (1) and washer (2).

In diesel engines, **no** washer is fitted.



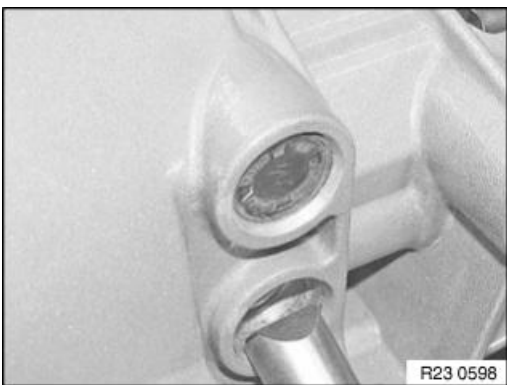
Remove compression spring and locking bolt. **Important!**

Compression springs and locking bolts for 6th gear and reverse gear must not be mixed up.

|                           |                             |
|---------------------------|-----------------------------|
| 6th gear locking bolt     | Reverse gear locking bolt   |
| Curved chamfer            | Straight chamfer            |
| Weaker compression spring | Stronger compression spring |

*Note:*

Graphic shows: Reverse gear locking bolt



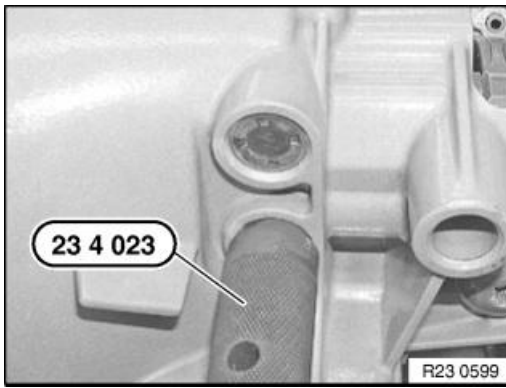
**Important!**

6th gear locking bolt:

Bevel must point in bell housing downwards to reverse gear!

Reverse gear locking bolt:

Bevel must point in bell housing upwards to 6th gear!



**With petrol engines:**

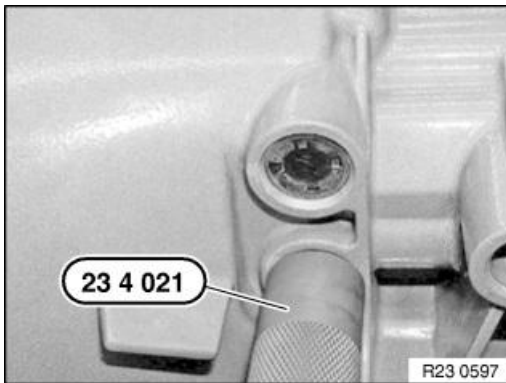
Using special tool [23 4 023](#), drive locking bolt with compression spring, washer and circlip simultaneously into housing.

**For diesel engines:**

Using special tool [23 4 023](#), drive locking bolt with compression spring, sealing cap and circlip simultaneously into housing.

**Important!**

It is essential to ensure the circlip engages completely.



**With petrol engines:**

Drive in sealing cap (1) with special tool [23 4 021](#).

## 23 Transmission designations

### Breakdown of BMW designation:

| A5S 300J (former designation) |                                          |                                                                                                                                                                               |
|-------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A                             | Transmission type                        | <ul style="list-style-type: none"> <li>S = Manual gearbox</li> <li>A = Automatic transmission</li> </ul>                                                                      |
| 5                             | Number of forward gears                  |                                                                                                                                                                               |
| S                             | Type of top gear                         | <ul style="list-style-type: none"> <li>D = Direct gear</li> <li>S = Overdrive gear</li> </ul>                                                                                 |
| 300                           | Max. input torque (Nm)                   |                                                                                                                                                                               |
| J                             | Code letter of transmission manufacturer | <ul style="list-style-type: none"> <li>G = Getrag</li> <li>J = Jatco</li> <li>R = GMPT (General Motors Powertrain)</li> <li>Z = ZF (Zahnradfabrik Friedrichshafen)</li> </ul> |
| SMG                           | Notes                                    | SMG = Sequential M gearbox/transmission                                                                                                                                       |

| GS6-37BZ (new designation according to BMW Group Standard GS 90007) |                         |                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| G                                                                   | Transmission            |                                                                                                                                                                                                                                                                                                                            |
| S                                                                   | Transmission type       | <ul style="list-style-type: none"> <li>S = Manual gearbox</li> <li>A = Automatic transmission</li> </ul>                                                                                                                                                                                                                   |
| 6                                                                   | Number of forward gears |                                                                                                                                                                                                                                                                                                                            |
| -                                                                   |                         | <ul style="list-style-type: none"> <li>- = Standard with manual gearshift</li> <li>HP = Hydraulic planetary gear</li> <li>DKG= twin-clutch gearbox</li> </ul>                                                                                                                                                              |
| 37                                                                  | Transmission type       | <ul style="list-style-type: none"> <li>26 = D-transmission</li> <li>31 = C-transmission</li> <li>39 = F-transmission</li> <li>37 = H-transmission</li> <li>53 = G-transmission</li> <li>17 = I-transmission</li> <li>47= J transmission SMG -7-speed</li> <li>45 = K transmission</li> <li>36= Transmission DKG</li> </ul> |
| B                                                                   | Gear set                | <ul style="list-style-type: none"> <li>B = Petrol gear ratio</li> <li>D = Diesel gear ratio</li> <li>S= Sport gear ratio</li> </ul>                                                                                                                                                                                        |

|   |                                          |                                                                                                                                 |
|---|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Z | Code letter of transmission manufacturer | <ul style="list-style-type: none"> <li>G = Getrag</li> <li>Z = ZF (Zahnradfabrik Friedrichshafen)</li> <li>A = AISIN</li> </ul> |
|---|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|

#### Manual gearbox:

| BMW designation | Manufacturer | Manufacturer designation | Remarks                        |
|-----------------|--------------|--------------------------|--------------------------------|
|                 |              |                          |                                |
| S5D 200G        | Getrag       | B transmission (220/5)   |                                |
| S5D 200G        | Getrag       | B transmission (221/5)   | for M41 engine only            |
| S5D 250G        | Getrag       | B transmission (220/5)   | Reinforced version             |
|                 |              |                          |                                |
| S5D 260Z        | ZF           | C-transmission (S5-31 D) | for M51 engine only            |
| S5D 280Z        | ZF           | C-transmission (S5-31)   |                                |
| S5D 310Z        | ZF           | C-transmission (S5-31)   | up to 9.95                     |
| S5D 320Z        | ZF           | C-transmission (S5-31)   | from 9.95 (reinforced version) |
| GS5S31BZ (SMG)  | ZF           | C transmission           | SMG                            |
|                 |              |                          |                                |
| GS5-39DZ        | ZF           | F transmission           |                                |
| S6S 420G        | Getrag       | D-transmission (226/6)   |                                |
| S6S 420G (SMG)  | Getrag       | D transmission           | SMG                            |
| S6S 560G        | Getrag       | E-transmission (286/6)   |                                |
|                 |              |                          |                                |
|                 |              |                          |                                |
| GS6-37BZ        | ZF           | H-transmission           |                                |
| GS6S37BZ (SMG)  | ZF           | H-transmission           |                                |
| GS6-37DZ        | ZF           | H-transmission           |                                |
| GS6-37BG        | Getrag       | H-transmission           |                                |
|                 |              |                          |                                |
| GS6-53BZ        | ZF           | G-transmission           |                                |
| GS6-53DZ        | ZF           | G-transmission           |                                |
|                 |              |                          |                                |
| GS6-17BG        | Getrag       | I-transmission           |                                |
| GS6-17DG        | Getrag       | I-transmission           |                                |
|                 |              |                          |                                |
| GS7S47BG (SMG)  | Getrag       | J-transmission (247)     | SMG -7-gear                    |
|                 |              |                          |                                |
| GS7D36SG        | Getrag       | DKG (436)                | DKG -7-gear                    |
|                 |              |                          |                                |
| GS6- 45BZ       | ZF           | K transmission           |                                |
| GS6- 45DZ       | ZF           | K transmission           |                                |
|                 |              |                          |                                |
| GS6-60DA/BA     | AISIN        | BG6                      |                                |

|             |        |      |             |
|-------------|--------|------|-------------|
| 7DCT300     | Getrag | 7DCT | DKG -7-gear |
|             |        |      |             |
| GS6-58DG/BG | Getrag |      |             |
| GS6-59DG/BG | Getrag |      |             |

**Automatic transmission:**

| BMW designation | Manufacturer              | Manufacturer designation | Remarks                   |
|-----------------|---------------------------|--------------------------|---------------------------|
|                 |                           |                          |                           |
| A4S 200R        | General Motors Powertrain | GM4                      |                           |
|                 |                           |                          |                           |
| A4S 270R        | General Motors Powertrain | THM-R1w                  | Transmission wide-stepped |
| A4S 310R        | General Motors Powertrain | THM-R1                   |                           |
|                 |                           |                          |                           |
| A5S 300J        | Jatco                     | Jatco                    |                           |
|                 |                           |                          |                           |
| A5S 310Z        | ZF                        | 5HP-18                   |                           |
| A5S 325Z        | ZF                        | 5HP-19                   |                           |
| A5S 440Z        | ZF                        | 5HP-24                   |                           |
| A5S 560Z        | ZF                        | 5HP-30                   |                           |
|                 |                           |                          |                           |
| A5S 360R / 390R | GM                        | GM5                      |                           |
|                 |                           |                          |                           |
| GA6F21AW        | AISIN                     | GA6F21AW                 |                           |
| GA6HP19Z        | ZF                        | 6HP19                    |                           |
| GA6HP26Z        | ZF                        | 6HP26                    |                           |
| GA6HP32Z        | ZF                        | 6HP32                    |                           |
|                 |                           |                          |                           |
| GA6L45R         | GM                        | GM6                      |                           |
|                 |                           |                          |                           |
| GA6F21AW        | AISIN                     | GA6F21AW                 |                           |
| GA8F22AW        | AISIN                     | GA8F22AW                 |                           |
| GA8G45          | AISIN                     | 8G45                     |                           |
| GA8HP45Z        | ZF                        | 8HP45                    |                           |
| GA8HP50Z        | ZF                        | 8HP50                    |                           |
| GA8HP51Z        | ZF                        | 8HP51                    |                           |
| GA8HP70Z        | ZF                        | 8HP70                    |                           |
| GA8HP75Z        | ZF                        | 8HP75                    |                           |
| GA8HP76Z        | ZF                        | 8HP76                    |                           |
| GA8P70H         | ZF                        | 8P70                     | Hybrid                    |
| GA8P75H         | ZF                        | 8P75                     | Hybrid                    |
| GA8HP90Z        | ZF                        | 8HP90                    |                           |
| GA8HP95Z        | ZF                        | 8HP95                    |                           |
|                 |                           |                          |                           |

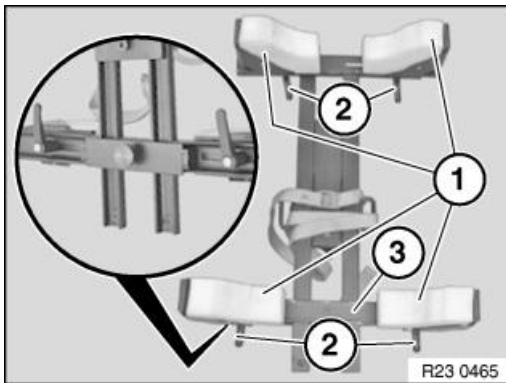
|          |         |       |        |
|----------|---------|-------|--------|
| GA7AHSCD | Daimler | AHS-C | Hybrid |
|----------|---------|-------|--------|

**Special tools required:**

- [00 2 030](#)
- [23 4 050](#)

**Note:**

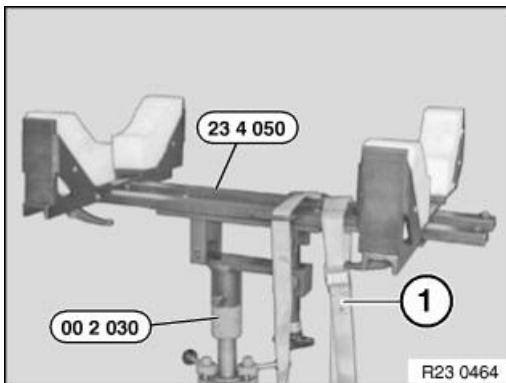
- The universal transmission bracket is introduced for the E60 AWD
- Suitable for manual and automatic transmissions

**Important!**

Front and rear supports (1) can be laterally adjusted by means of screws (2).

Carrier (3) of rear supports (1) can be longitudinally adjusted by means of screw.

Supports must be adapted in length and width to the transmission.

**Supporting transmission:**

Support transmission with special tools [23 4 050](#) , [00 2 030](#) .

**Important!**

Transmission must be secured with tensioning strap (1).

## 23 Universal transmission retaining bridge



### Special tools required:

- 0 495 187
- [24 0 200](#)



### Note:

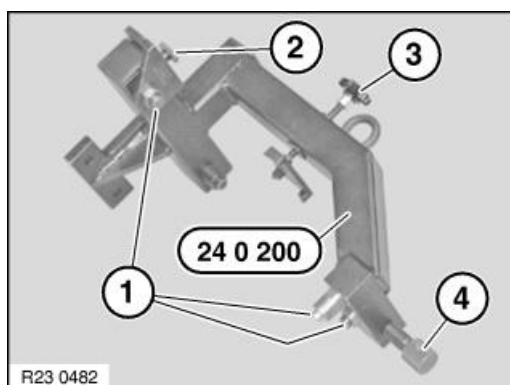
- Transmission retaining bridge [24 0 200](#) is suitable for manual and automatic transmissions



### Attention!

The adapter and shaft must be adapted to positively lock with the transmission.

**(Danger of injury)**



Adapt the adapter (1) and spindle with the thrust piece (3) on the transmission.

Adjust the length using the sliding piece (2).

Screw in spindle (4).

### Attention!

Before mounting on assembly stand 0 495 187 check retraining bridge for tight fit.