# 28 00 010 Replace double-clutch transmission (DKG) (7DCT300)

**WARNING**

**Motor vehicle may slip off the vehicle hoist where components are supported.**

**Danger! Life-threatening injuries!**

- Secure the vehicle hoist against lowering and lifting.

**WARNING**

**Motor vehicle may slip off the vehicle hoist if the weight is distributed unevenly.**

**Danger! Life-threatening injuries!**

- Ensure there is a specific weight compensation on the motor vehicle.

**WARNING**

**Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.**

**Danger! Life-threatening injuries!**

- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raising the vehicle using a vehicle hoist.

**CAUTION**

**Component with heavy weight.**

**Danger of injury!**

- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the double-clutch transmission (DKG).

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**TECHNICAL INFORMATION**

After completing work:
Check gearbox oil level. Use only the approved transmission oil.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

### 1 – Bring front compartment lid in the service position

**Prerequisite**

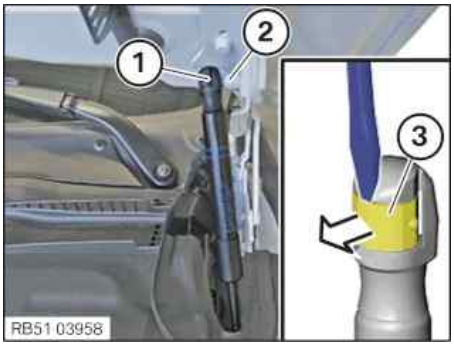
Engine compartment lid is open.

**CAUTION**

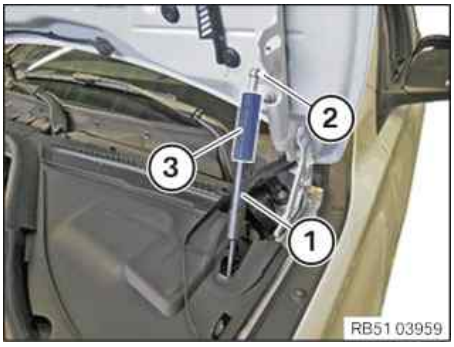
**Shutting bonnet or tailgate.**

**Danger of injury!**

- Support bonnet/tailgate in fully open position with the aid of a suitable device.




- Lift clamp (3) slightly using a screwdriver, in the direction of the arrow.
- Lift off ball socket (1) from ball pin (2).
- Repeat the operation on the other side of vehicle.




**TECHNICAL INFORMATION**

Conduct the following operation with the assistance of a second person.

- Remove the bonnet support and open the bonnet further.
- Push special tool **2 353 020** (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

### 2 – Disconnecting all battery earth leads



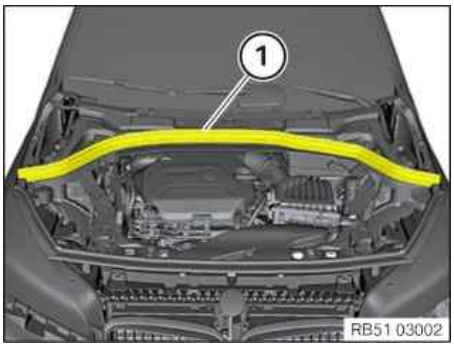

- See additional information.

### 3 – Remove the seal for the rear bonnet

**NOTICE**

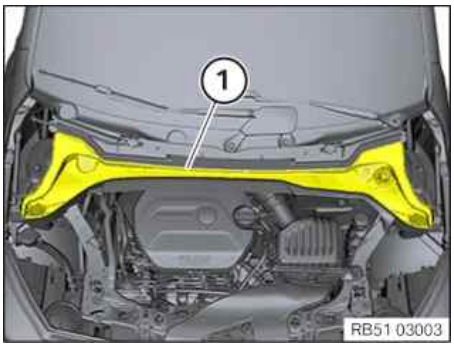
Schematic diagram is for example purposes. Some parts may differ in certain details.

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- Pull off rear bonnet seal (1) towards the top and remove.

**4 – Removing front cowl panel cover**

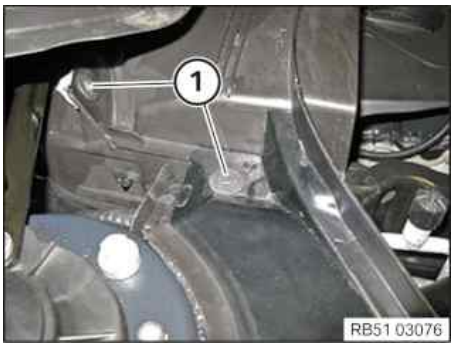



- Guide the front cowl panel cover (1) out toward the top and remove it.

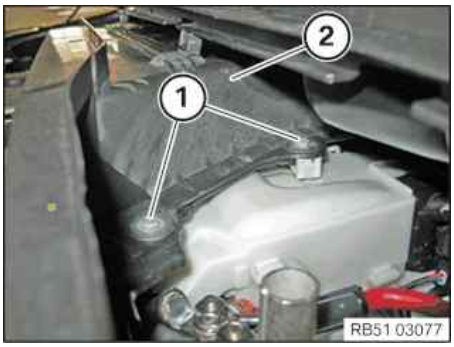
**5 – Removing the upper bulkhead cover**




- Loosen screws (1).




- Loosen screws (1).




- Loosen screws (1).
- Feed out and remove the upper bulkhead cover (2).

**6 – Removing the acoustic cover**

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**WARNING**

**Hot surfaces.**

**Risk of burning!**

- Perform all work only on components that have cooled down.




**RISK OF DAMAGE**

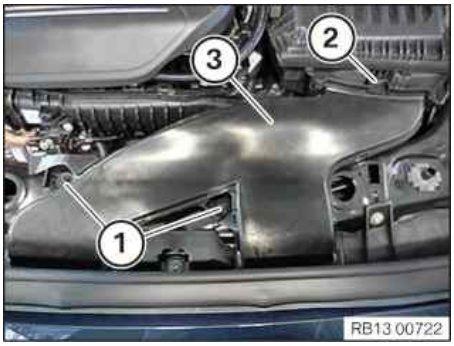
**Damage to the acoustic cover.**

**Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.**

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

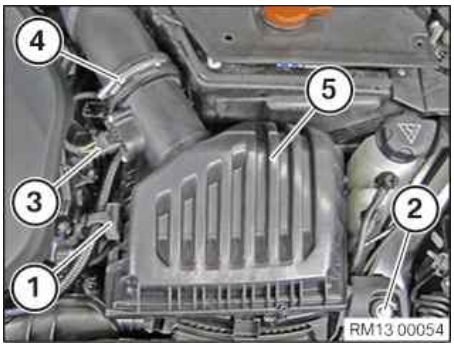
- Unclip the acoustic cover from the marked areas towards the top.

### 7 – Remove the intake neck for intake silencer housing




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

### 8 – Removing intake silencer housing




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

### 9 – Remove electronics box

**Prerequisite**

Battery earth lead is disconnected.

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**RISK OF DAMAGE**

**Electrostatic discharge.**

**Damage to or destruction of electrical components.**

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.

**RISK OF DAMAGE**

**Damage to wires when disconnecting connectors and plug connections.**

**Sheared wires can cause a short circuit.**

- Do not pull on the wires when disconnecting connectors and plug connections.

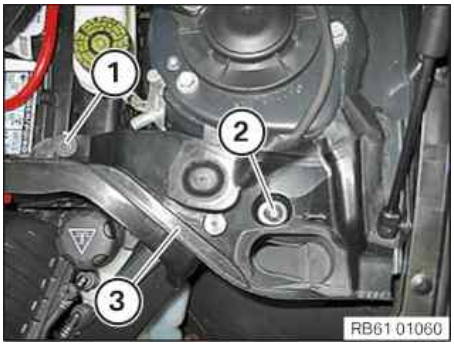
**TECHNICAL INFORMATION**

Follow instructions for removing and installing control units.

For additional information see: 12 00 ... Notes on removal and installation of control units

**TECHNICAL INFORMATION**

Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

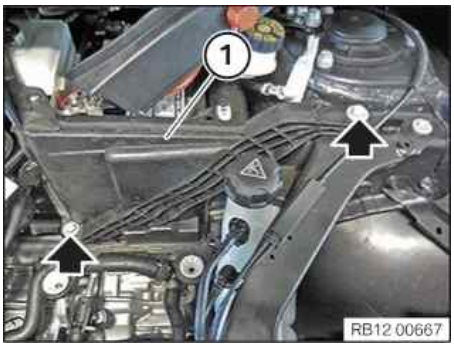



- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).

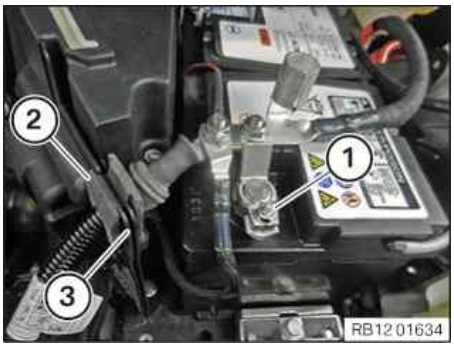



- Loosen screw (1).
- Place cover (2) of the positive battery connection point to one side.

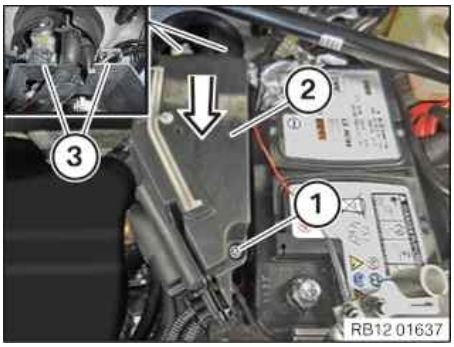
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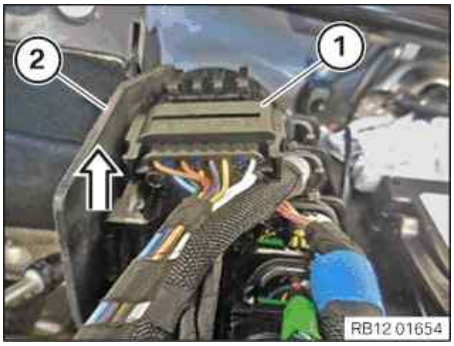

- Remove screws (arrows).
- Guide out tension strut (1) and remove.



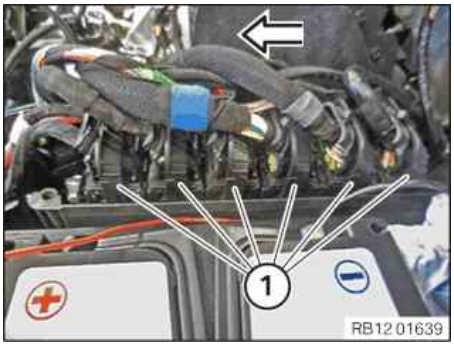

- Undo positive battery terminal (1).
- Feed out positive battery terminal (1) and set aside.
- Guide the positive battery cable (2) out of the holder (3) and lay to one side.



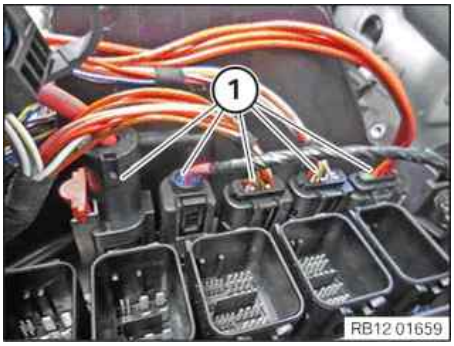

- Loosen screw (1).
- Unlock cover (2) and feed out and remove from the guides (3) in the direction of arrow.




- Feed out connector (1) from the electronics box (2) and remove in the direction of arrow.
- Unlock and loosen connector (1).

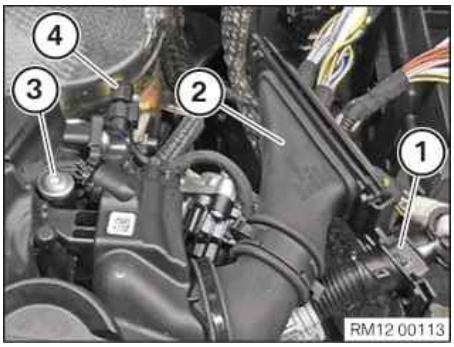



- Unlock and remove the connector (1) in the direction of the arrow.
- Feed out connector (1) and place to one side.

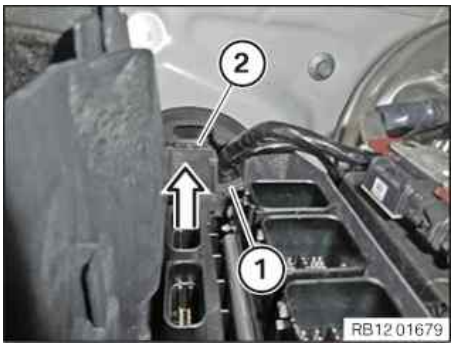



- Unlock and loosen connector (1).

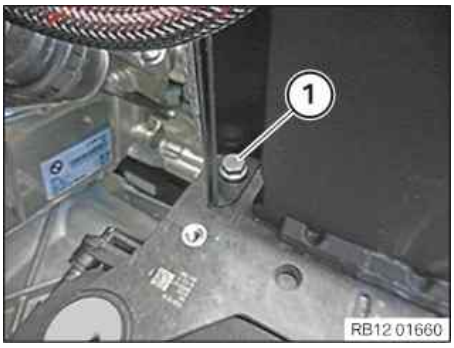
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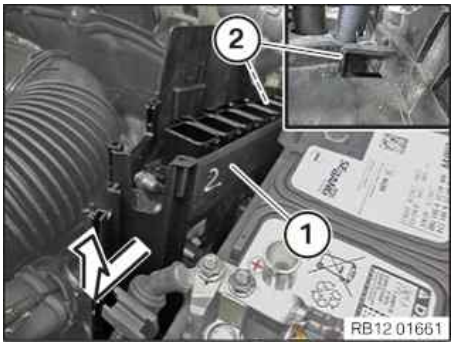

- Detach the wiring harness (1) from the electronics box.
- Detach the wiring harnesses (2) from electronics box.
- Loosen screw (3).
- Set wiring harnesses (1) and (2) aside.
- Unlock the connector (4) and disconnect it from the differential pressure sensor.




- Unlock and loosen holder (1).
- Guide the holder (1) out of the electronics box (2) in direction of arrow and set it aside.




- Loosen screw (1).




- Guide the electronics box (1) out of the guide (2) in direction of arrow and remove.

**10 – Remove vehicle battery**

**WARNING**

**Working on 12 V vehicle electrical system.**

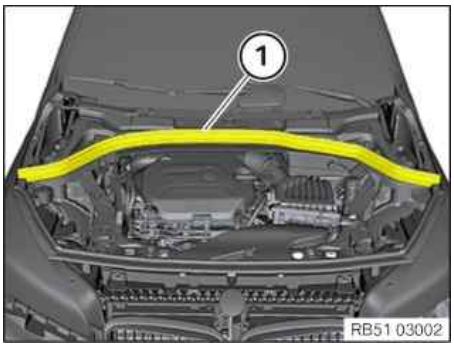
**Risk of short circuits! Risk of fire!**

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

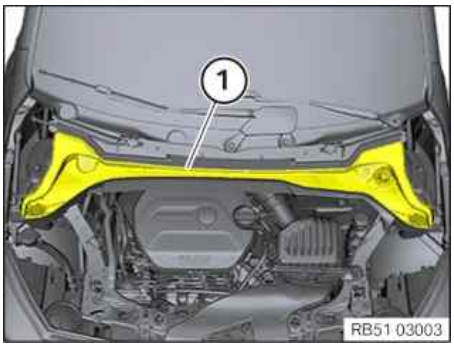
**TECHNICAL INFORMATION**

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)

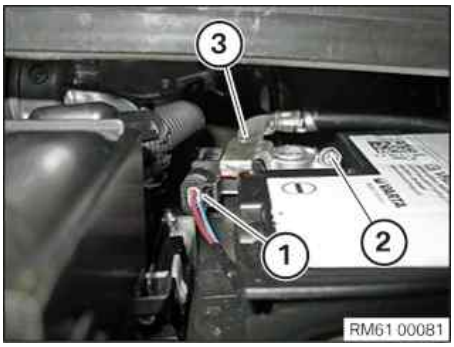
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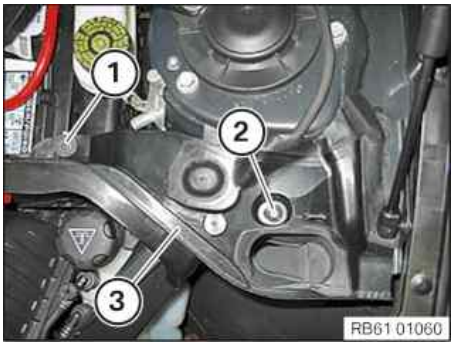

- pull off gasket (1) upwards.



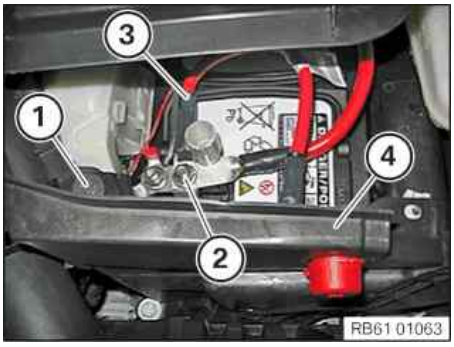

- Remove the cowl panel cover (1) to the top.



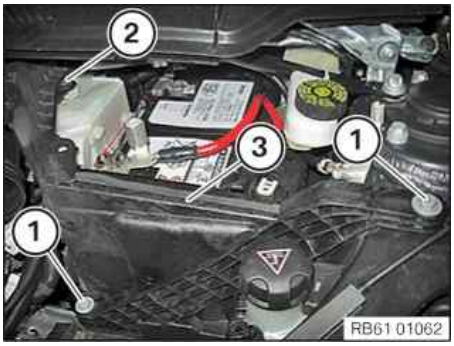

- Unlock and disconnect connector (1).
- Slacken nut (2).
- Disconnect the negative battery terminal (3).




- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).

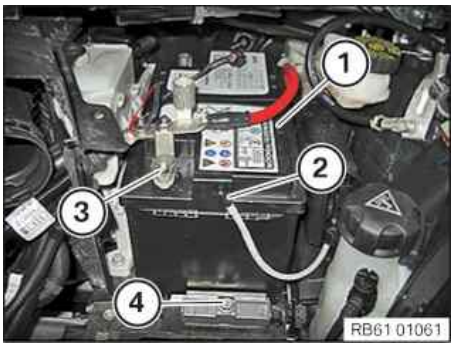



- Loosen screw (1).
- Unscrew the nut (2) and remove the positive battery cable (3) with the cover of the remote positive terminal (4).
- Tighten nuts (2) on the positive terminal hand-tight.




- Loosen screws (1).
- Unscrew the bolt (2) and guide the tension strut (3) out.

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- Pull off the vent hose (2).
- Slacken the nut (3) on the positive terminal and remove the positive terminal.

**WARNING**

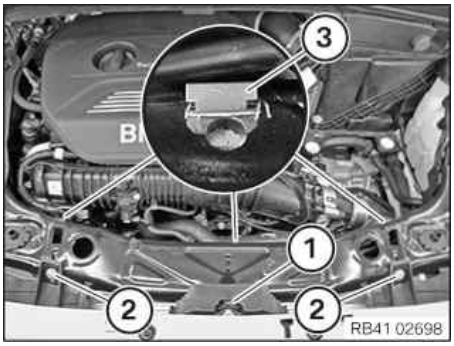
**Unprotected battery terminals.**

**Risk of short circuits! Risk of fire!**

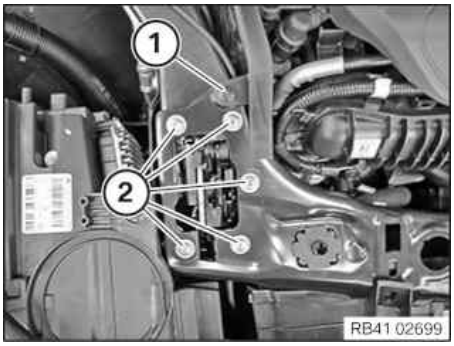
- Cover the vehicle battery.

- Loosen the screw (4) and remove the holder.
- Remove vehicle battery (1).

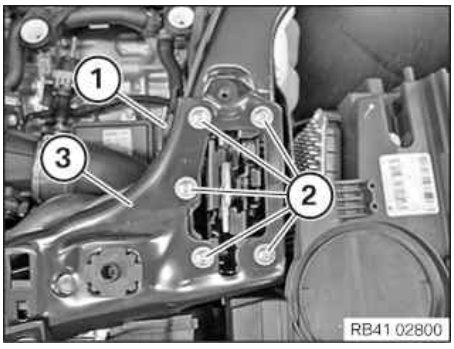
### 11 – Remove cross connection




- Loosen screws (1) and (2).
- Detach clamps (3) for bonnet lock Bowden cable.

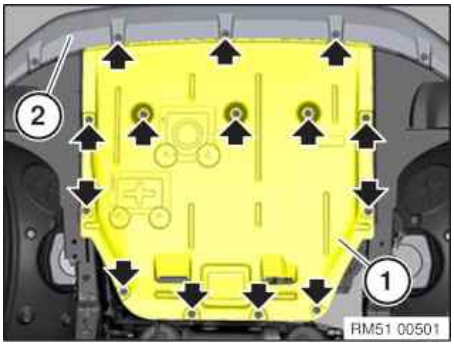



- Lever out expanding rivet (1).
- Loosen screws (2).




- Lever out expanding rivet (1).
- Loosen the screws (2) and remove the cross connection (3).

### 12 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 13 – Draining the transmission oil in defective double-clutch transmission (DKG) 7DCT300)

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

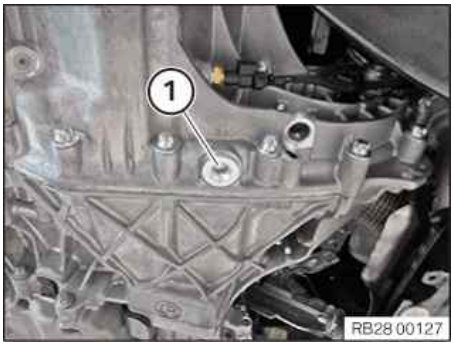
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**14 – Draining coolant**

**WARNING**

**Hot fluids.**

**Risk of scalding!**

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

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**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

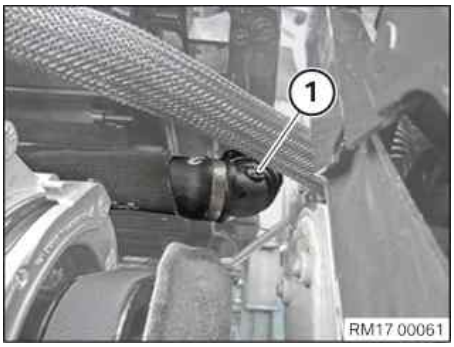
In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

**TECHNICAL INFORMATION**

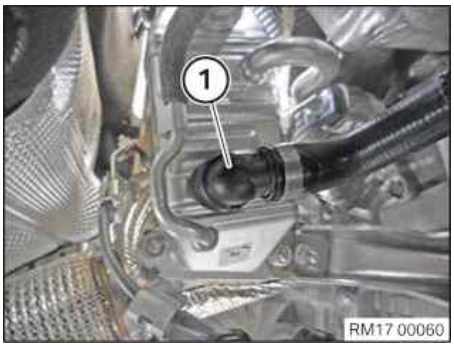
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.




- Loosen sealing cap (1).




- Unlock and disconnect the coolant line (1) from the radiator on the right.
- Catch and dispose of escaping coolant.



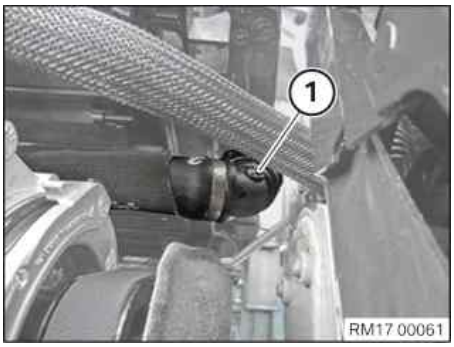

- Unlock and pull off the coolant line (1) from the low pressure exhaust-gas recirculation cooler on the diesel particulate filter.
- Catch and dispose of escaping coolant.

**15 – Connect the coolant line**

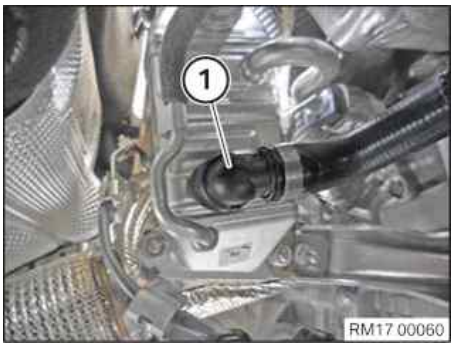
**TECHNICAL INFORMATION**

Make sure that the connections are locked correctly. The locks must engage audibly.

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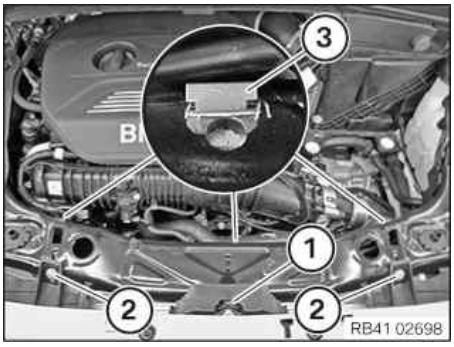



- Connect the right coolant line (1) to the radiator and lock audibly.




- Connect the coolant line (1) to the low pressure exhaust-gas recirculation cooler on the diesel particulate filter and lock audibly.

**16 – Install cross connection**




- Install cross connection.
- Position all screws.
- Tighten down screw (1).

**Bracing strut to top cross connection**

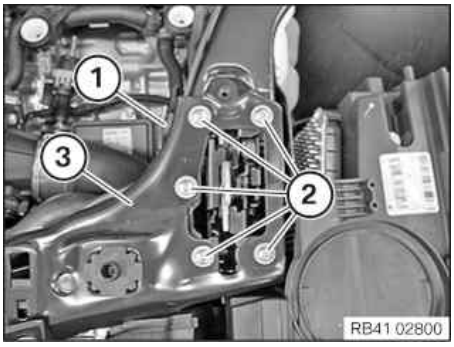
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

- Tighten down screws (2).

**Air duct to deformation element/cross connection**

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

- Fasten clamps (3) for bonnet lock Bowden cable to cross connection.

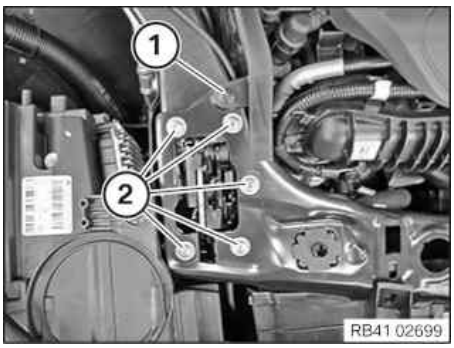



- Tighten screws (2) of cross connection (3).

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).




- Tighten down screws (2).

**Cross connection on support for cross connection**

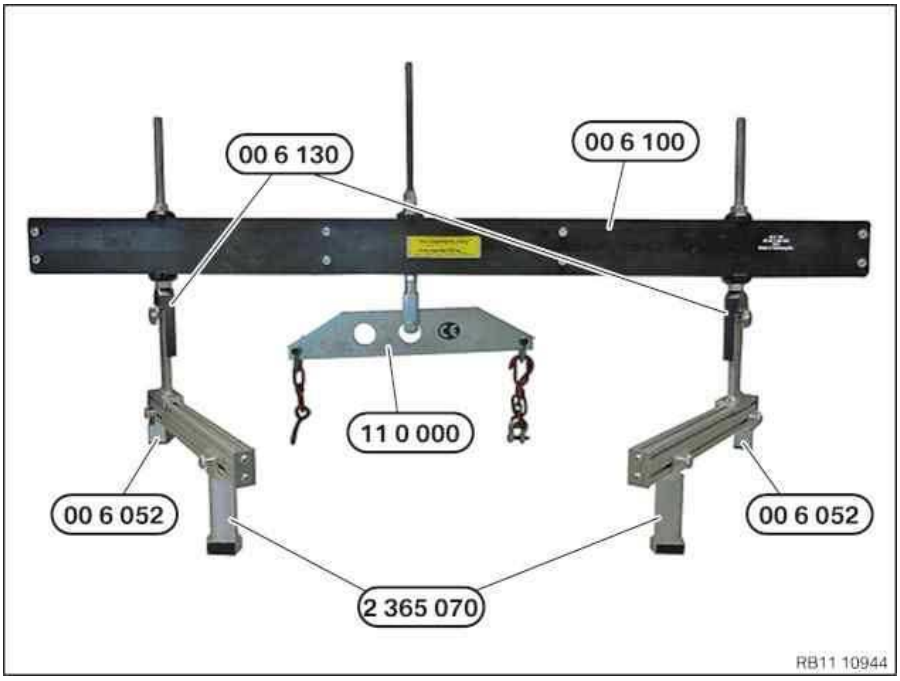
| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).

**17 – Install the engine bridge**

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**Overview: Prepared engine bridge**




**Prerequisite**

Front compartment lid is in service position.

**CAUTION**

**Components connected to the engine joint or cross member.**

**Danger of injury!**

- Check lifting eyes and engine mounting brackets for damage, e.g. cracks.
- Attach the component to correctly mounted engine joints or cross members only.
- Exclusively lift the component, do not move it forwards, backwards or in transverse direction.

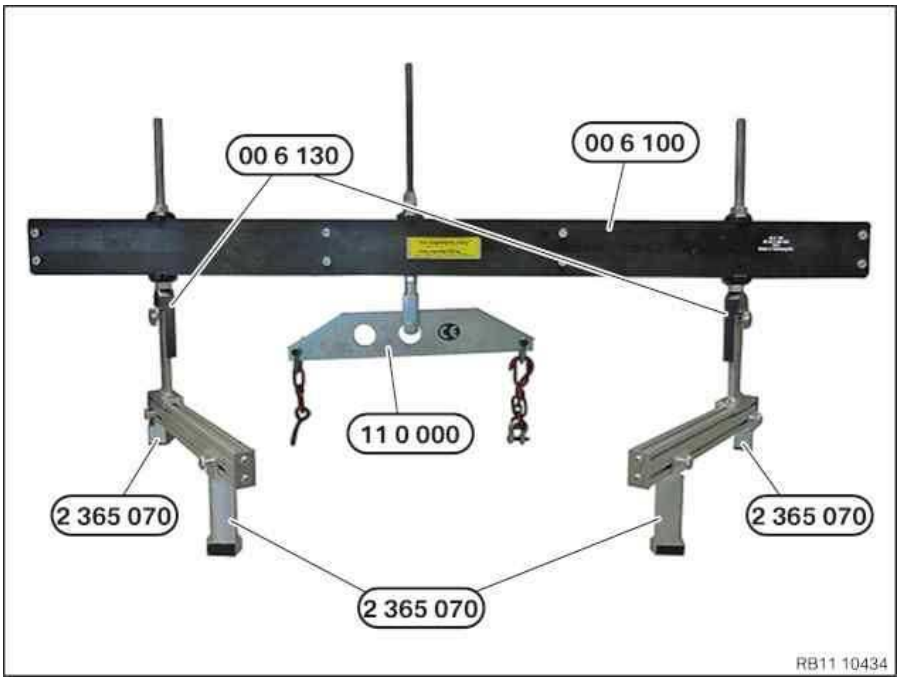



- Guide in and position special tool **2 459 012** on cylinder head.
- Tighten the screws (1) of special tool **2 459 012**.

**Special tool to cylinder head**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 21,5 Nm |

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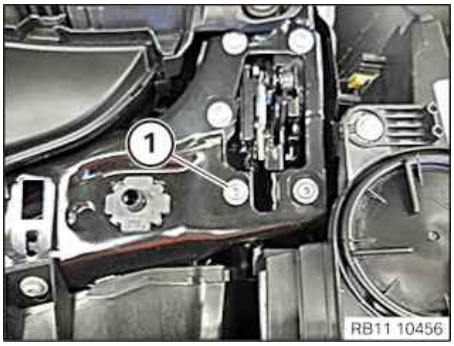

**CAUTION**

**Heavy component.**

**Heavy components can lead to injury or damage.**

- Remove and install heavy components with the aid of another person/other persons.

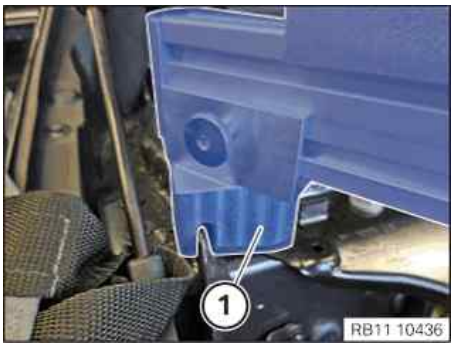
- Set entire cross member **0 496 852 (00 6 100)** on the vehicle and position with the help of an auxiliary person.



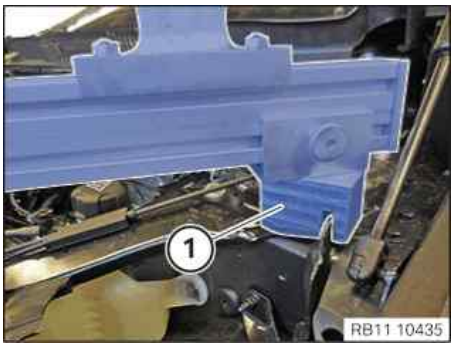

- Loosen screw (1) of the left bonnet catch.




- Loosen screw (1) of the right bonnet catch.

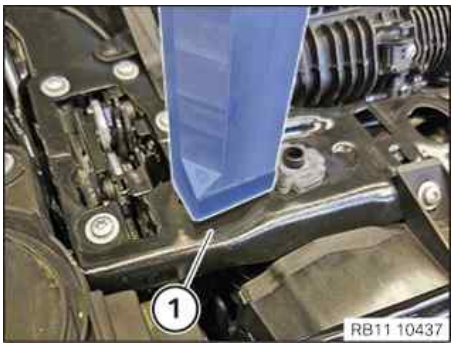



- Position special tool **2 365 070** to the rear mounting point (1) at the right.

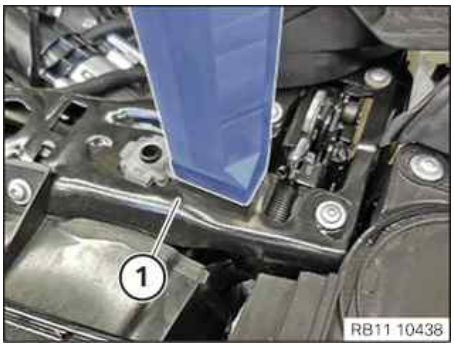



- Position special tool **2 365 070** to the rear mounting point (1) at the left.

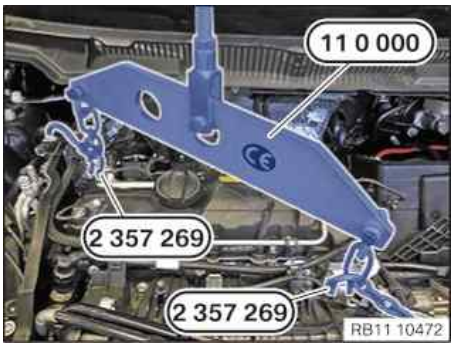
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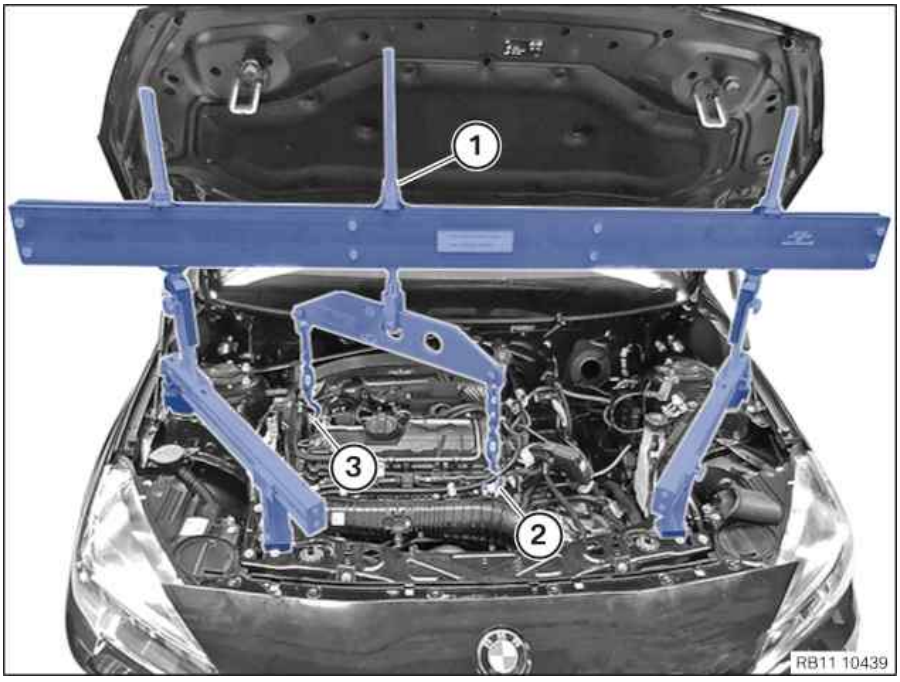

- Position special tool **2 365 070** to the front mounting point (1) at the right.




- Position special tool **2 365 070** to the front mounting point (1) at the left.




- Position special tool **0 490 561 (11 0 000)** above the engine.
- Attach special tools **2 357 269** to the mounting lugs of the engine.




- Tighten side screws (2) and (3).
- Slightly pretension the spindle screw (1) of the engine support beams.
- Tighten down all adjusting screws, knurled screws and nuts on cross member **0 496 852 (00 6 100)** and on special tool .

**18 – Removing starter motor**

**WARNING**

**Hot surfaces.**

**Risk of burning!**

- Perform all work only on components that have cooled down.

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**WARNING**

**Working on 12 V vehicle electrical system.**

**Risk of short circuits! Risk of fire!**

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

**RISK OF DAMAGE**

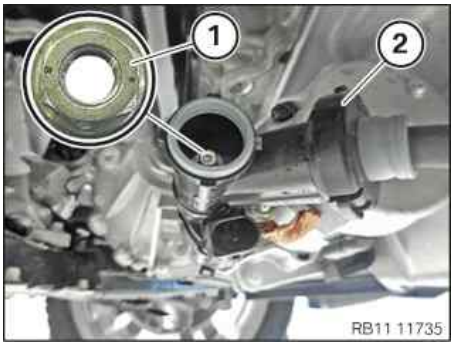
**Electrostatic discharge.**

**Damage to or destruction of electrical components.**

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.




- Unlock and loosen connector (1).
- Detach the sealing cap (2) in the direction of the arrow.
- Feed out and remove the sealing cap (2).



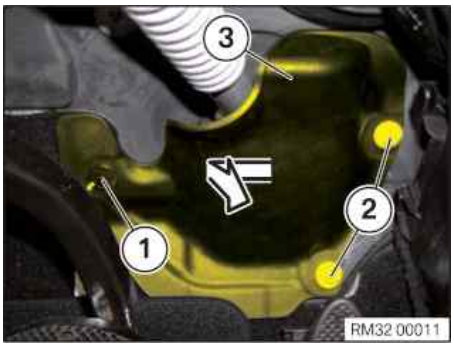

- Unfasten nut (1).
- Feed out the positive battery cable (2) of the starter motor and set it aside.




- Loosen screws (1).
- Feed out starter motor and remove.

**19 – Releasing lower steering shaft from steering gear**

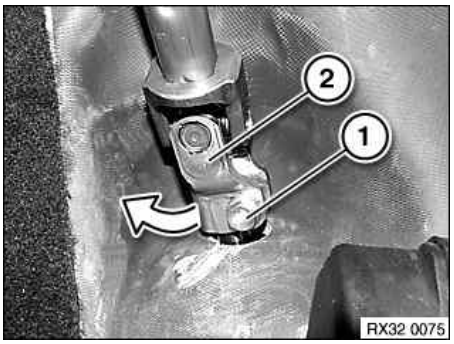
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- **If installed:**
- Unfasten nut (1).
- Unscrew the nuts (2) by 1 rotation.

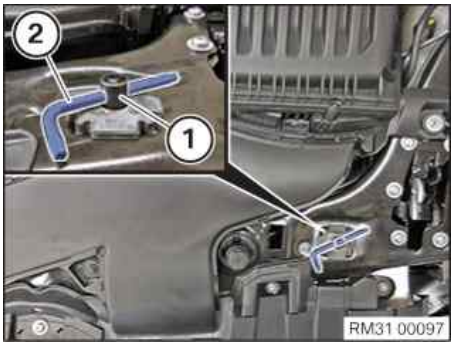
  Do not remove the nuts (2) !
- Remove the cover (3) on the steering column in the direction of the arrow.

  The side footwell trim must not be disassembled!




- Loosen screw (1).
- Swivel out the universal joint (2) of the bottom steering shaft from the steering gear in the direction of the arrow.

**20 – Securing radiator on left and right**




**NOTICE**

Perform the operations on the left and right side.

- Fasten radiator at centring pin (1) with suitable tool (2).

**21 – Remove the front left and right wheel**

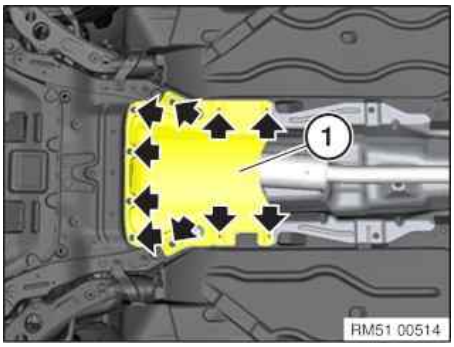
▸ **Removing the wheel**




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set  (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**22 – If installed: Removing rear underbody protection**




- Remove screws (arrows).
- Remove the rear underbody protection (1).

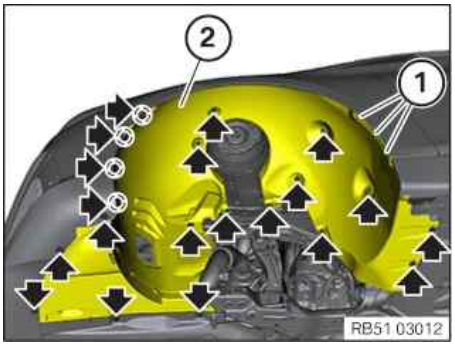
**23 – Removing front left and right wheel arch cover**

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**NOTICE**

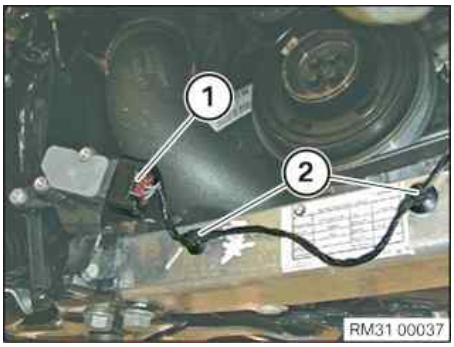
Perform the operations on the left and right side.

▸ **Remove front wheel arch cover**




- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

**24 – With right installation: Detaching ride height sensor cable**



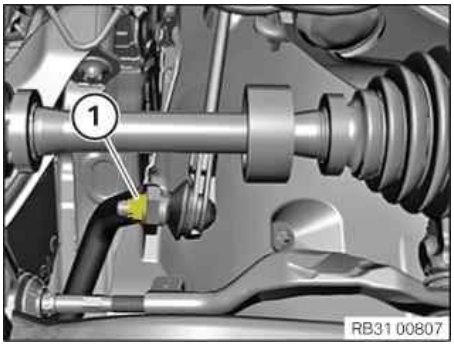

- Unlock plug connection (1) and disconnect.
- Release cable clip (2) from deformation element adapter.

**25 – Releasing anti-roll bar on left and right from anti-roll bar link**

**NOTICE**

Perform the operations on the left and right side.

▸ **Detach the anti-roll bar from the anti-roll bar link**




- Unfasten nut (1).

**Note:** Use the Torx socket for counter support.

- Loosen the anti-roll bar link from the anti-roll bar .

**26 – Detaching rubber mount from front axle support**

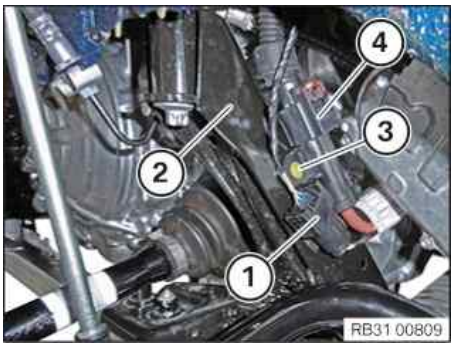



- Spray rubber mount (1) with lubricant and release from holder on front axle support.

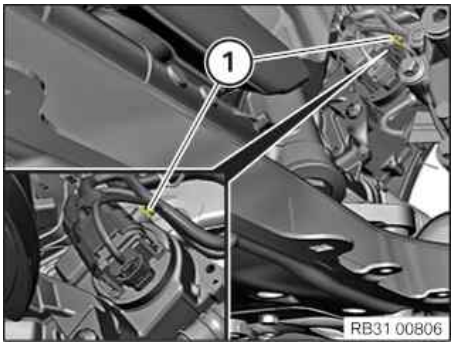
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### 27 – Disconnecting plug connections from steering gear

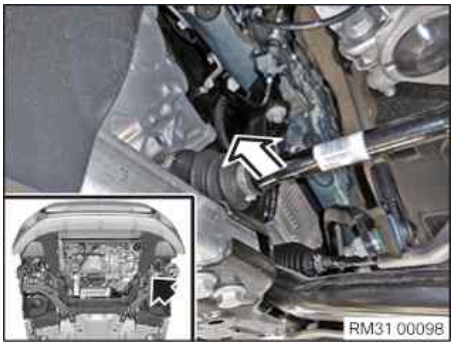
▶ **If installed: Detach connectors from the front axle carrier**




- Release the plug connection (1) from the front axle support (2).
- Loosen screw (3).
- Release the plug connection (4) from the front axle support (2).

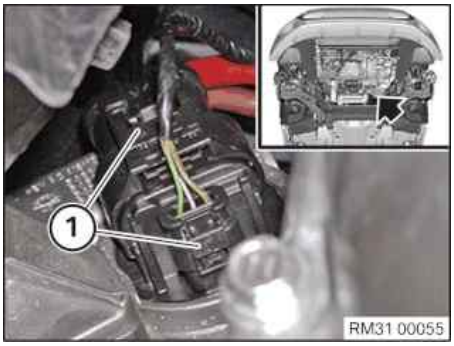



- Disconnect wiring harness (1) from steering gear.



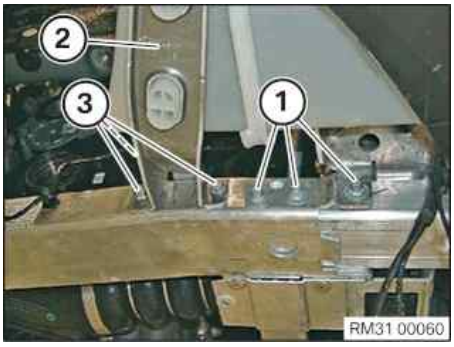

- To unlock the plug connections (see the following work step): unlock plug connections (arrow) with the right hand.

  The plug connections can be reached via the left-hand output shaft.




- Unlock plug connections (arrow) (1)and disconnect from the steering gear.
- Make sure when lowering the front axle that the cables are not damaged!

### 28 – Releasing the mounted part from the front axle support



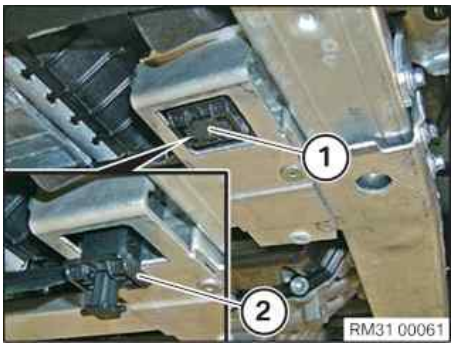

- **Only on right side:** Loosen screws (3) and remove holder for washer fluid reservoir (2).

**NOTICE**

Perform the operations on the left and right side.

- Loosen screws (1).

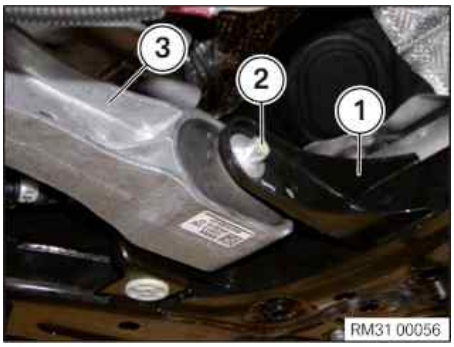
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**NOTICE**

Perform the operations on the left and right side.

- Unlock safety catch (1) of the lock (2) from the holder for the charge air cooler.
- Completely remove locks (2).




- Loosen screw (2) of the engine support (3) on the front axle (1).

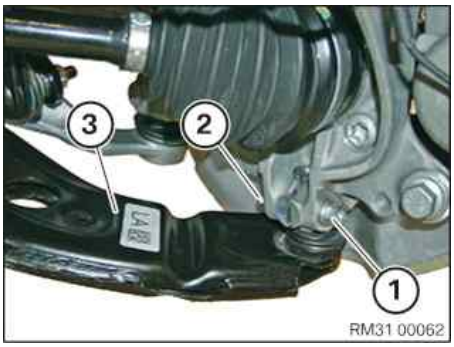



**NOTICE**

Perform the operations on the left and right side.

- Loosen screws (1).

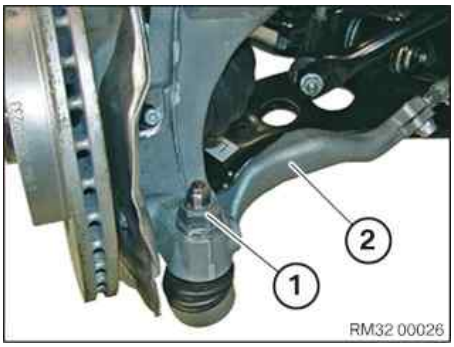
**29 – Detaching and removing front axle completely**




**NOTICE**

Perform the operations on the left and right side.

- Unfasten nut (1).
- (2)Pull out screw.
- Detach the wishbone (3) from the swivel bearing .

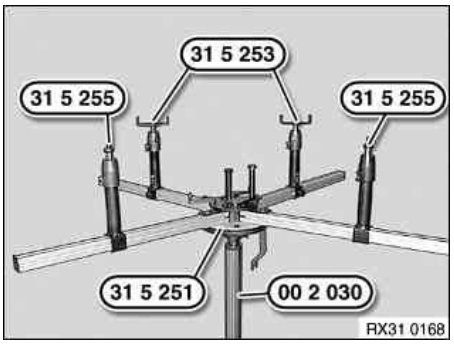



**NOTICE**

Perform the operations on the left and right side.

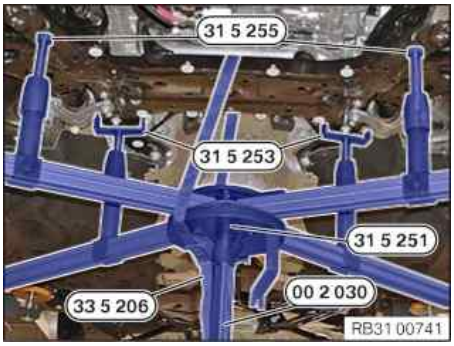
- Unfasten nut (1).
- Detach the track rod (2) from the swivel bearing.

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- Fit the special tool **0 495 817 (31 5 251)** completely onto the workshop jack **0 490 133 (00 2 030)** with an auxiliary person.
- Insert special tools **0 495 821 (31 5 255)** in telescopic supports of a profile rail pair.
- Insert special tools **0 495 819 (31 5 253)** in telescopic supports of other profile rail pair.

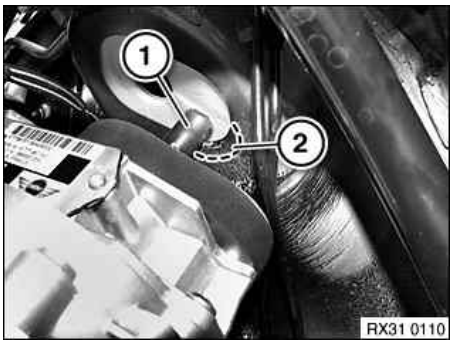
**Note:** In a profile rail pair, two profile rails are connected to one another by gearing.




- Align special tools **0 495 821 (31 5 255)** and **0 495 819 (31 5 253)** to front axle support.
- Support front axle support by operating workshop jack **0 490 133 (00 2 030)**.

**Note:** The centre of gravity of the front axle support must be positioned centrally over the workshop jack!

- Secure front axle support with special tool **0 496 080 (33 5 206)** to special tool **0 495 817 (31 5 251)**.

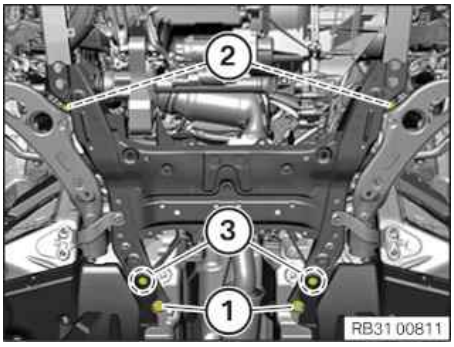



**TECHNICAL INFORMATION**

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

**Note:** Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!



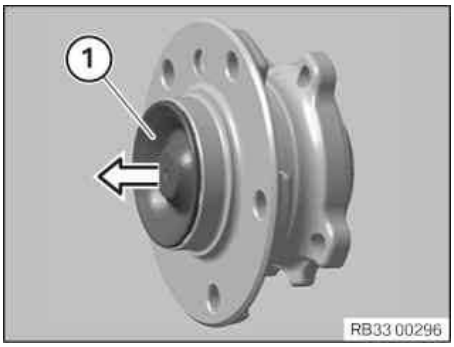

- If applicable, release the screws in area (3).
- Release screws (1) (front axle support, rear).
- Release screws (2) (front axle support, front).
- Bend the underbody panelling to the side in area (3).
- When lowering, release charge air cooler from its rubber mounts.
- Completely lower and remove the front axle.

**TECHNICAL INFORMATION**

Note the information on thread repairs using Helicoil thread inserts.
For more information see: 41 00 ... Notes on repairing threads

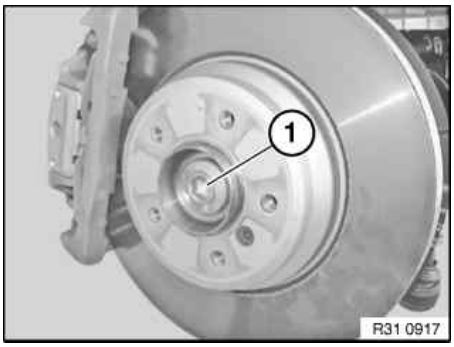
- Check threads for damage; if necessary, repair with Helicoil thread inserts.

**30 – Remove the left drive shaft (double-clutch transmission (DKG))**

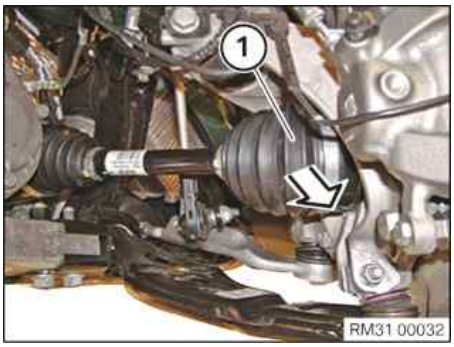



- If necessary, lever off the protective cap (1).

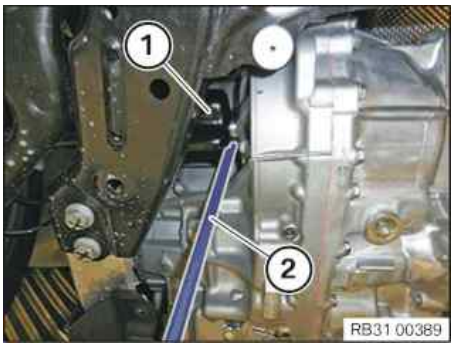
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- Press the brake pedal to the floor to unscrew the collar bolt (1).




- Turn steering wheel to left.
- Pull the output shaft (1) out toward the front.




- Protect the output shaft (1) from falling.
- Lever out the output shaft (1) with a mounting lever (2) from the transmission.
- Remove output shaft (1).

### ▸ Removing the left radial shaft seal on the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

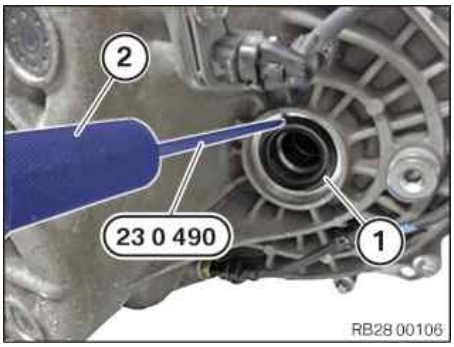
**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!

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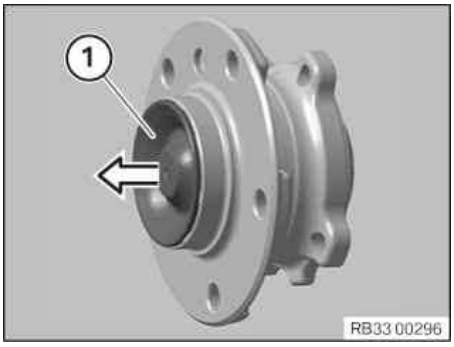



**TECHNICAL INFORMATION**

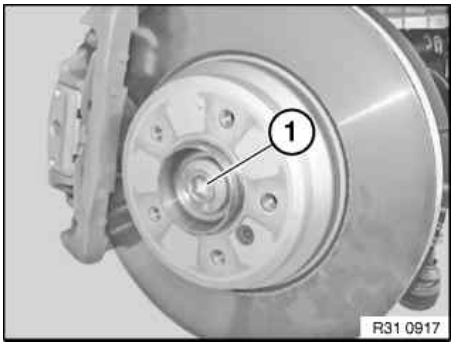
Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drill a hole in the radial shaft seal (1) using a centre punch.
- Screw special tool **0 491 454 (23 0 490)** in the radial shaft seal (1).
- Drive out radial shaft seal (1) with the impact weight (2).

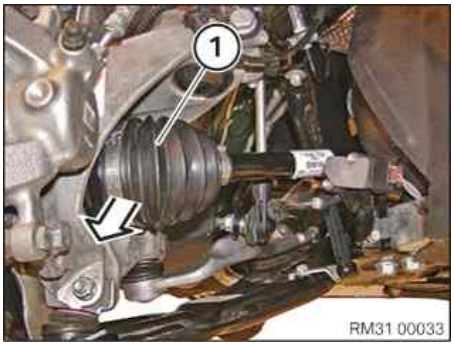
### 31 – Removing right output shaft (double-clutch transmission (DKG))



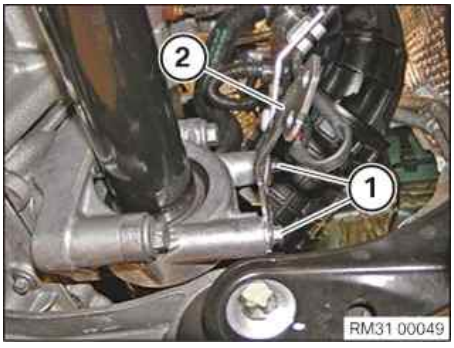

- If necessary, lever off the protective cap (1).




- Press the brake pedal to the floor to unscrew the collar bolt (1).

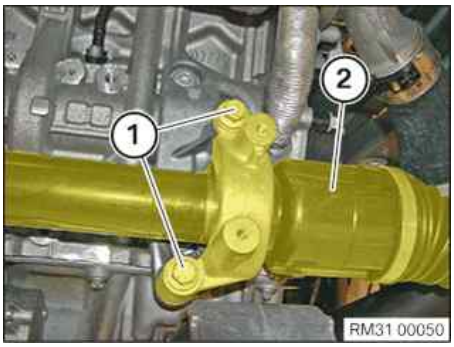



- Protect the output shaft (1) from falling.
- Turn steering wheel to right.
- Pull the output shaft (1) out.




- If necessary, unscrew the bolts (1) and remove the holder (heat shield) (2).

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- Loosen screws (1).
- Pull the output shaft (2) out of the transmission and remove it sideways.
- Remove output shaft (1).

▸ **Removing the right radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!




**TECHNICAL INFORMATION**

Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drive a hole into the radial shaft seal (1) using a centre punch.
- Screw the special tool **0 491 454 (23 0 490)** into the radial shaft seal (1).
- Drive out the radial shaft seal (1) with the impact weight (2).

**MAIN WORK**

**32 – Removing the double-clutch transmission (DKG)**

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the engine block.**

**Damaged and corroded bolts will lead to major damage in the engine block and the transmission.**

- It is imperative that protruding threads of the transmission bolts are checked for corrosion and damage prior to removal.
- It is imperative that all rust is removed from corroded threads and that they are cleaned prior to removal.
- Renew rusted and damaged bolts.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**RISK OF DAMAGE**

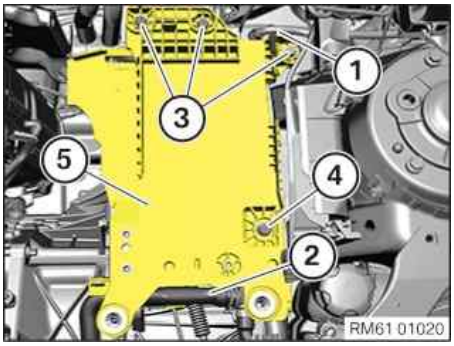
**Damage to the flywheel and the double-clutch transmission (DKG).**

**Damage to the flywheel and the double-clutch transmission (DKG) due to incorrect removal and installation of the double-clutch transmission (DKG).**

- Align the double-clutch transmission (DKG) absolutely horizontally during removal and installation.

**TECHNICAL INFORMATION**

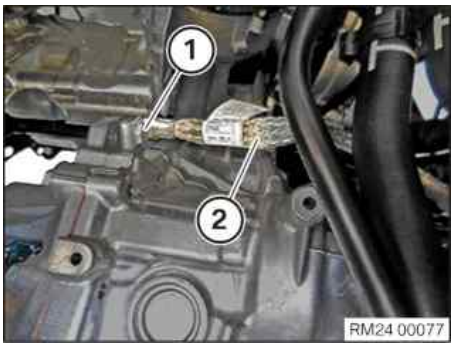
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the double-clutch transmission (DKG).



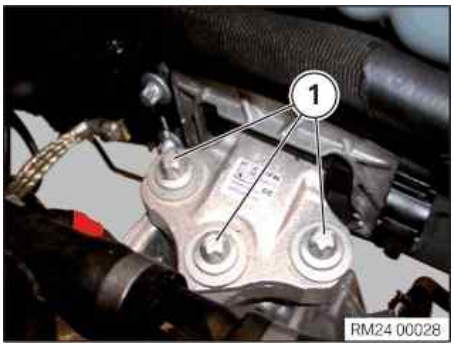

▸ **Remove battery holder**

- Detach the cable clip (1) from the battery holder (5).
- Detach the coolant line (2) from the battery holder (5).
- Loosen screws (3).
- Loosen screw (4).
- Thread out and remove the battery holder (5).

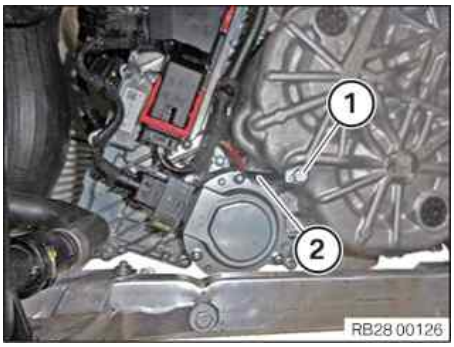
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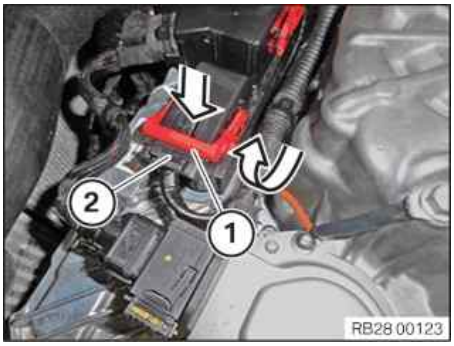

- Loosen screw (1).
- Detach the ground strap (2) from the transmission and set it aside.




- Loosen screws (1).



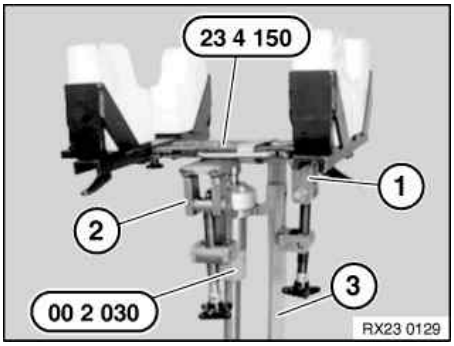

- Release the screw (1) and put the grounding cable (2) to one side.




- Fold down the red lever (1) in direction of arrow and pull the plug connection (2) out of the control unit.

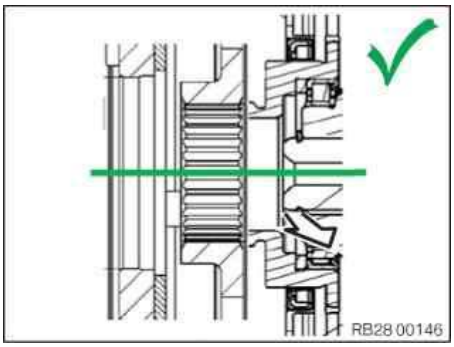



- Unlock and release coolant line (1).

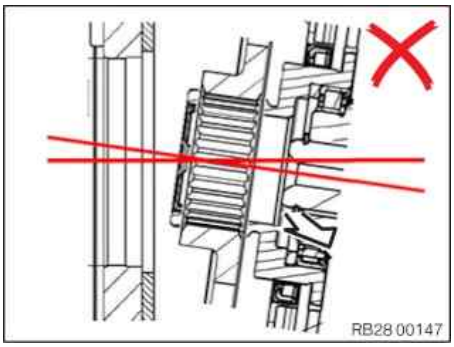



- Support the transmission with special tool **0 490 133 (00 2 030)** and .
- Secure the double-clutch transmission (DKG) with the tensioning strap (3).

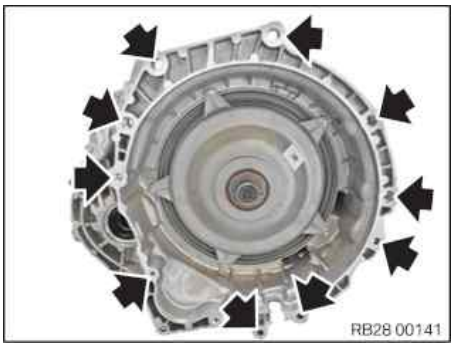
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- **Correct:** Pull the double-clutch transmission (DKG) horizontally off the flywheel.




- **Wrong:** Do not pull the double-clutch transmission (DKG) off the flywheel if it is tilted.




- Remove screws (arrows).
- Pull the double-clutch transmission (DKG) off the flywheel when it is absolutely horizontal.

**33 – Installing the double-clutch transmission (DKG)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the engine block.**

**Damaged and corroded bolts will lead to major damage in the engine block and the transmission.**

- It is imperative that protruding threads of the transmission bolts are checked for corrosion and damage prior to removal.
- It is imperative that all rust is removed from corroded threads and that they are cleaned prior to removal.
- Renew rusted and damaged bolts.

**RISK OF DAMAGE**

**Damage to the flywheel and the double-clutch transmission (DKG).**

**Damage to the flywheel and the double-clutch transmission (DKG) due to incorrect removal and installation of the double-clutch transmission (DKG).**

- Align the double-clutch transmission (DKG) absolutely horizontally during removal and installation.

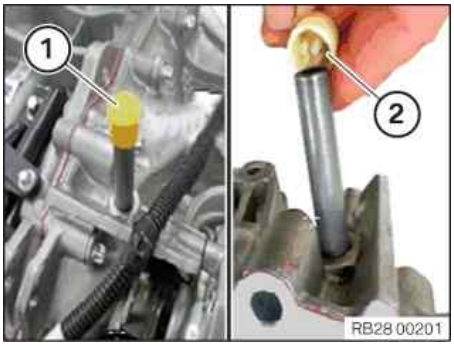
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## TECHNICAL INFORMATION

After completing work:

Check gearbox oil level. Use only the approved transmission oil.

Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

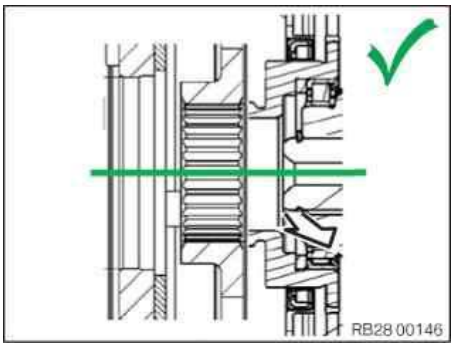



- Remove the protective caps (1) on the new transmission and renew them with the white series vent cap (2).

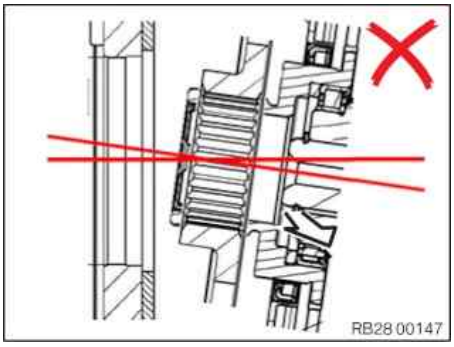
**Note:** Failure to comply with this may result in damage or leakage in the transmission.




- Check for correct fit of fitting sleeves(1).
- Replace damaged fitting sleeves.




- **Correct:** Insert the double-clutch transmission (DKG) horizontally into the flywheel.



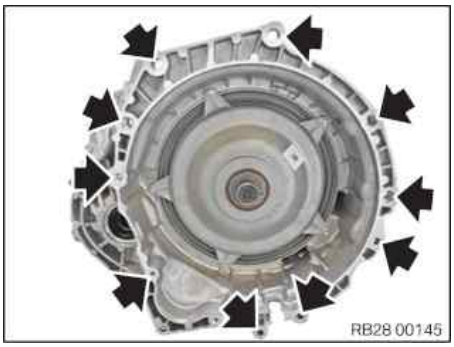

- **Wrong:** Do not tilt the double-clutch transmission (DKG) when inserting it into the flywheel.




- Clean the gearing (1) of the drive shaft.
- Coat the gearing (1) with MI-Setral-43N grease (BMW part number 83 23 2 152 082).

  Tooth gaps must be filled with grease up to tooth height.

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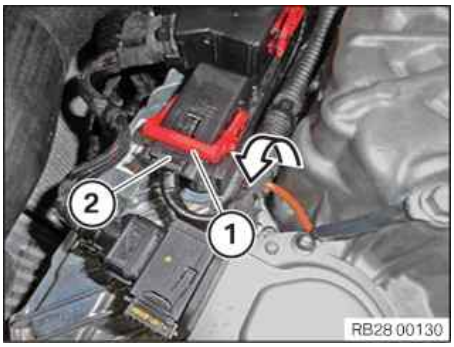

- Flange-mount the double-clutch transmission (DKG) to the engine so that it is absolutely horizontal.
- Hand-tighten the bolts (arrows).
- Tighten screws (arrows).

**Transmission to engine**

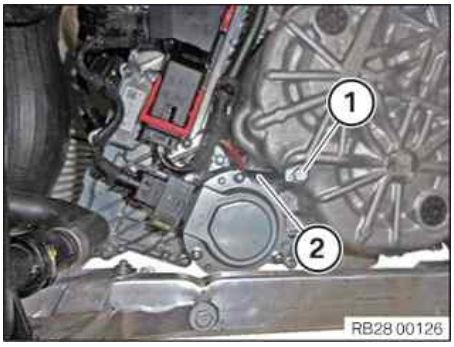
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |
| M12 | | Tightening torque | 66 Nm |




- Connect and lock the coolant lines (1).



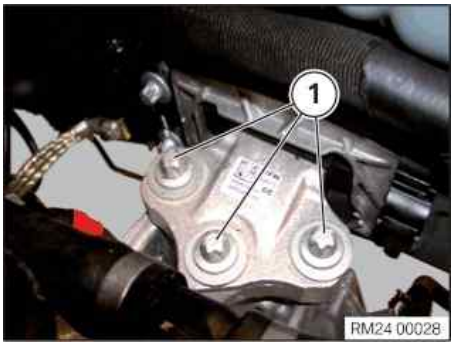

- Install the connector (2) on the control unit and fold down the red lever (1) in the direction of arrow up to the limit position.
- Check the correct fit of the plug connection (2).




- Install the grounding cable (2) and tighten the bolt (1).

**Standard screw connection M6**

| | | |
|---|---|---|
| M6 | | 8 Nm |

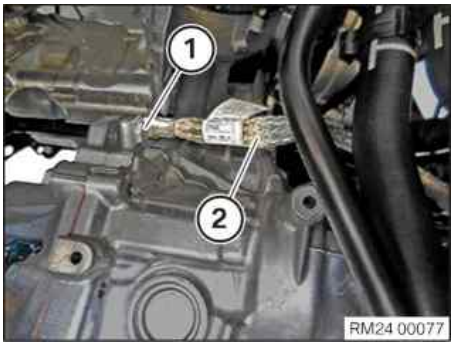



- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Transmission mounting**

| | | | |
|---|---|---|---|
| M10 | Renew screws. | Jointing torque | 40 Nm |
| | | Angle of rotation | 90 ° |



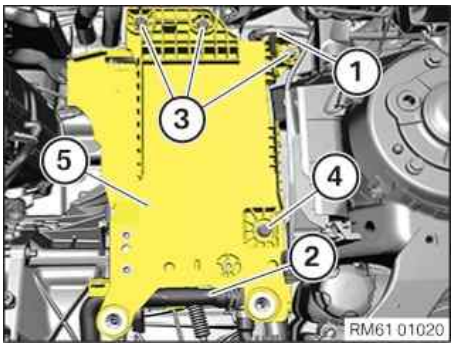

- Screw ground strap (2) onto transmission with screw (1).

**Standard screw connection M8**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

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▸ **Install the battery holder**




- Feed in and install the battery holder (5).
- Hand-tighten the bolt (4).
- Hand-tighten the bolts (3).
- Tighten down screw (4).

**Battery holder to engine support**

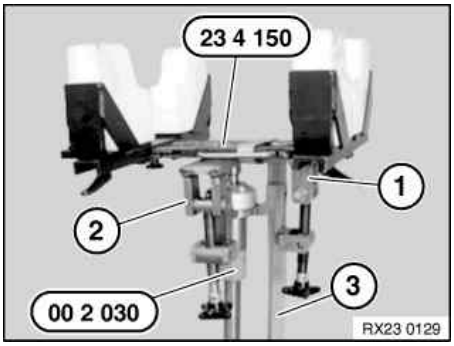
| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

- Tighten down screws (3).

**Battery holder to engine support**

| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

- Fasten the coolant line (2) on the battery holder (5).
- Fasten the cable clip (1) on the battery holder (5).




- Loosening the tensioning strap (3).
- Remove special tools **0 490 133 (00 2 030)** and .

## POSTPROCESSES

### 34 – Installing left output shaft (double-clutch transmission (DKG))

▸ **Installing the left radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

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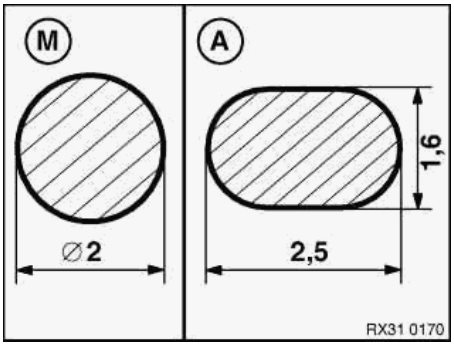

- Coat sealing lips of radial shaft seal with transmission oil.
- Drive in radial shaft seal using the special tool **2 409 230** into the transmission housing.

  The sealing ring must close flush with the transmission housing.



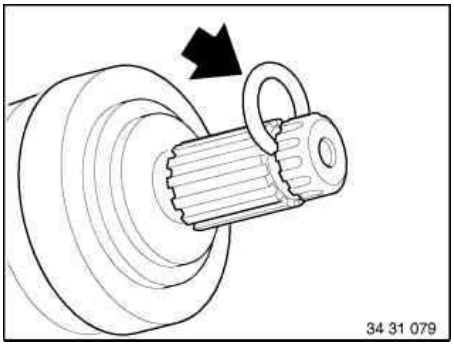

- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).

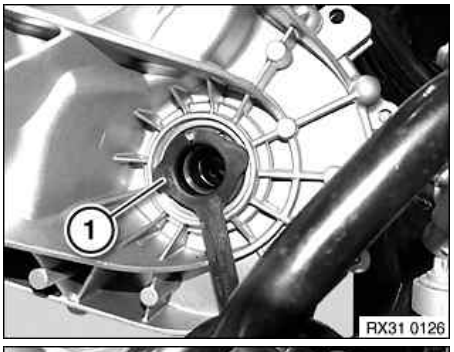



- Do not mix up circlips.

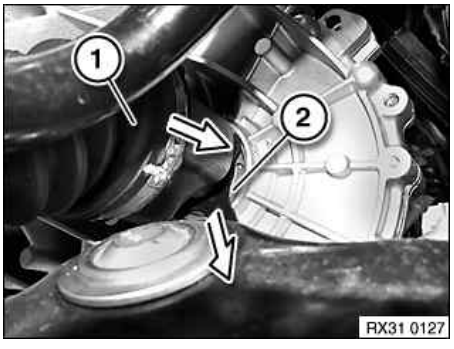
  Different types of output shafts fitted:
  - M: Manual transmission
  - A: Automatic transmission




- Renew circlip (arrow).




- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.



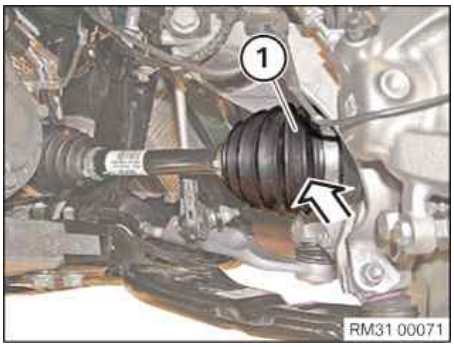

- Insert output shaft (1) into transmission.

**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

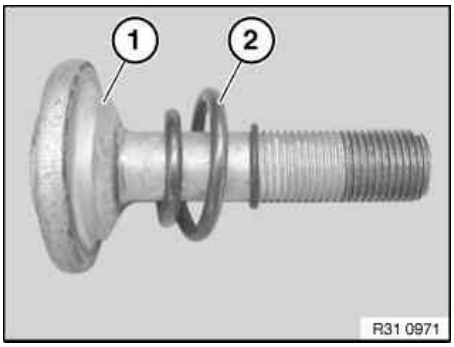
- **Manual gearbox only:** Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.

  The output shaft (1) must engage audibly.
- Check for secure seat by levering.

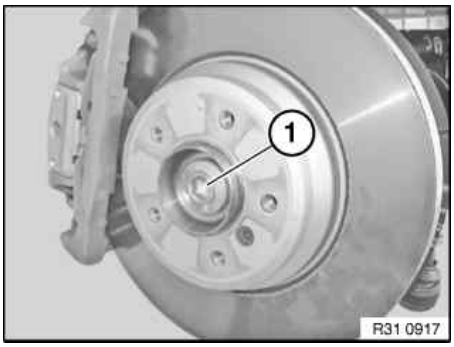
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- Turn steering wheel to left.
- Insert the output shaft (1) into the swivel bearing from the front.

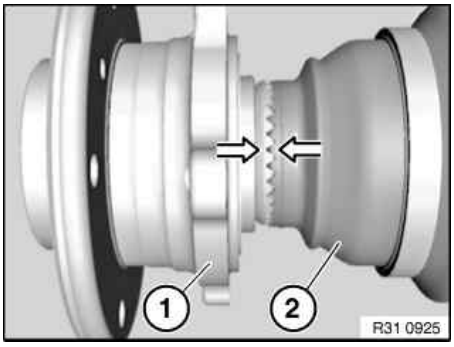



- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.




- Renew collar bolt (1) with compression spring.

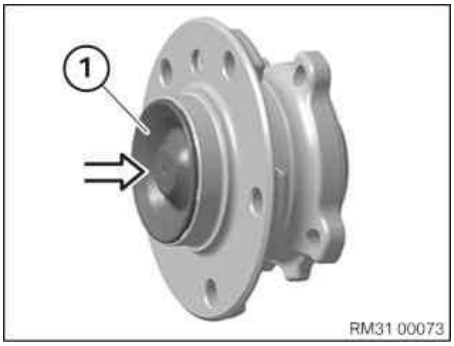
  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.




- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- When positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

**Output shaft to wheel bearing**

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |




- If necessary, attach protective cap (1).

**35 – Installing the output shaft, right (double-clutch transmission (DKG))**

▸ **Installing the right radial shaft seal on the differential (7DCT300)**

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.



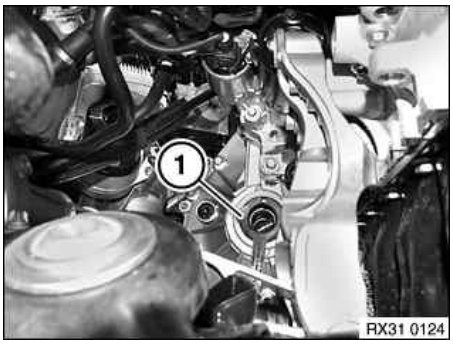

- Coat sealing lips of radial shaft seal with transmission oil.
- Drive the radial shaft seal into the gearbox housing using the special tool **2 409 230**.

  The sealing ring must lie flush with the gearbox housing.

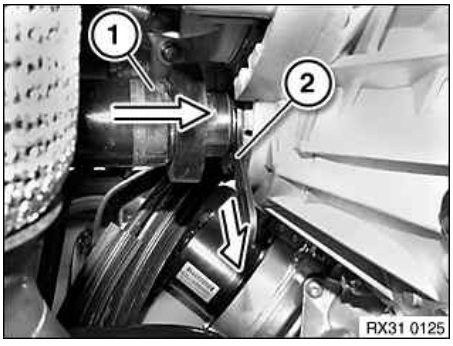



- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).




- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.

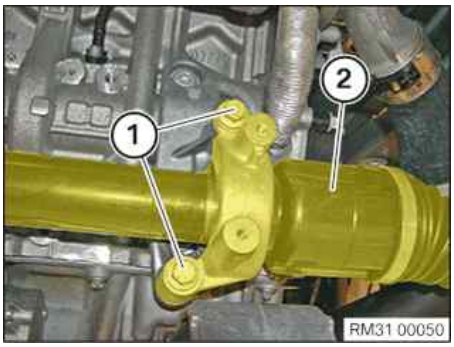



- Insert output shaft (1) into transmission.

**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

- Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.
- Check for secure seat by levering.

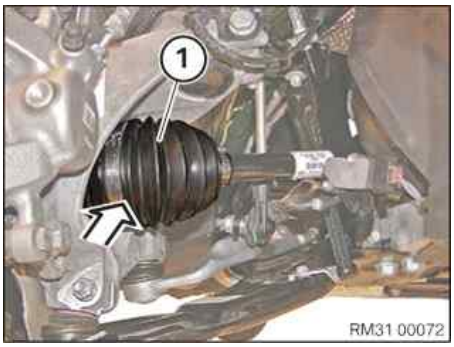
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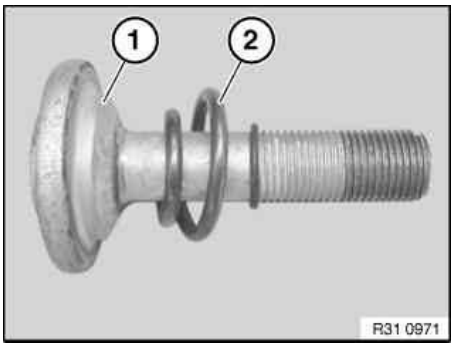

- Tighten the screws (1).

**Output shaft bearing to engine block**

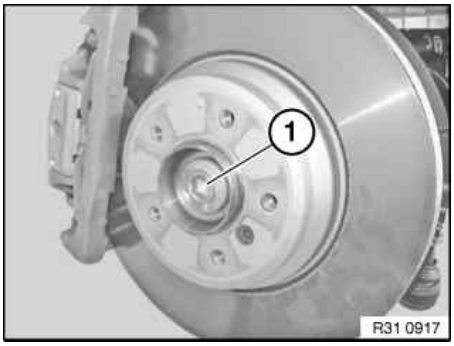
| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |




- Turn steering wheel to right.
- Insert the output shaft (1) into the swivel bearing from the front.

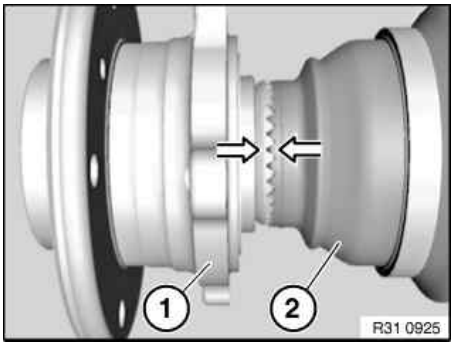



- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.




- Renew collar bolt (1) with compression spring.

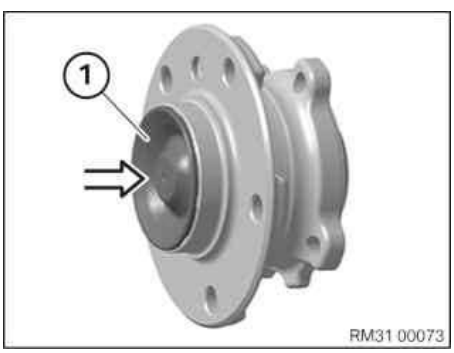
  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.




- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- If positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

**Output shaft to wheel bearing**

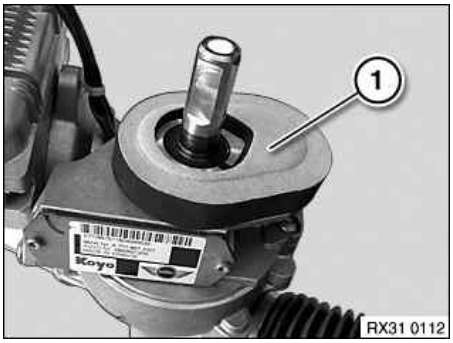
| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |




- If necessary, attach protective cap (1).

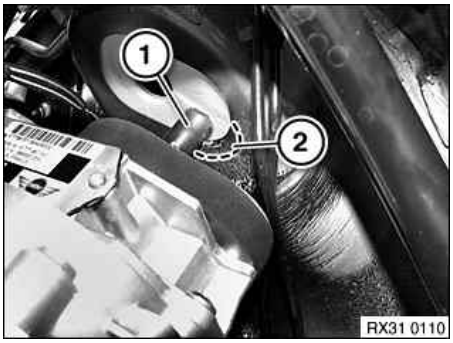
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### 36 – Mount and secure the complete front axle




- Remove the seal (1).
- Clean surface on steering gear.
- Renew gasket (1).

  **Parts:** Gasket
- Position the seal (1) and glue it on.

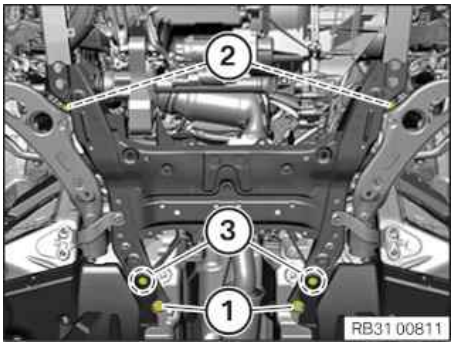



**TECHNICAL INFORMATION**

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

**Note:** Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!




- Position front axle support.
- Bend underbody panellings in the areas (3) to one side.
- Raise front axle support.
- When raising, insert charge air cooler into the rubber mount of the charge air cooler on cross member.
- Renew screws (1) and (2).

  **Parts:** Bolts
- Tighten the screws (1).

**Rear end of front axle support to body**

| | | | |
|---|---|---|---|
| M14 screw | Renew screw. | Tightening torque | 175 Nm |

- Tighten down screws (2).

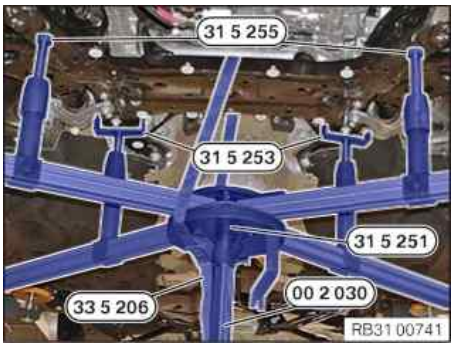
**Front axle support, front to body**

| | | | |
|---|---|---|---|
| M12 screw | Renew screw. | Tightening torque | 108 Nm |

- If necessary, tighten the screws in the areas (3).

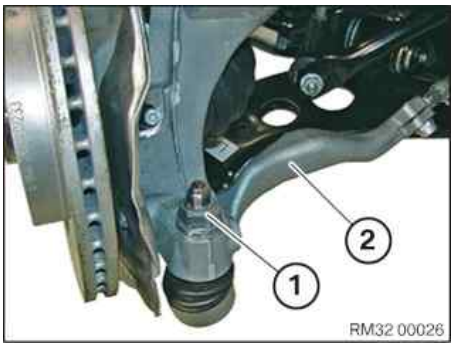
**Underbody protection to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Remove special tool **0 496 080 (33 5 206)** from special tool **0 495 817 (31 5 251)**.
- Lower universal jack **0 490 133 (00 2 030)** with the special tool **0 495 817 (31 5 251)** and place it to the side.

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**NOTICE**

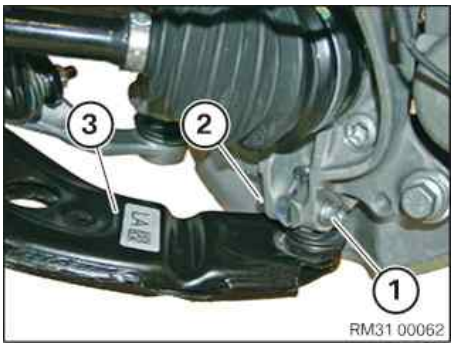
Perform the operations on the left and right side.

- Position the track rod (2) on the swivel bearing .
- Renew nut (1).

  **Parts:** Nut
- Tighten nut (1).

**Track rod end to swivel bearing**

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |




**NOTICE**

Perform the operations on the left and right side.

- Position the wishbone (3) on the swivel bearing .
- Renew the bolt (2) and the nut (1).

  **Parts:** Bolt, nut
- Insert screw (2).
- Tighten nut (1).

**Wishbone to swivel bearing**

| | | | |
|---|---|---|---|
| M10 | Exclusively use the screw to tighten!<br>Renew screw and nut. | Tightening torque | 60 Nm |

### 37 – Install the mounted parts on the front axle support




**NOTICE**

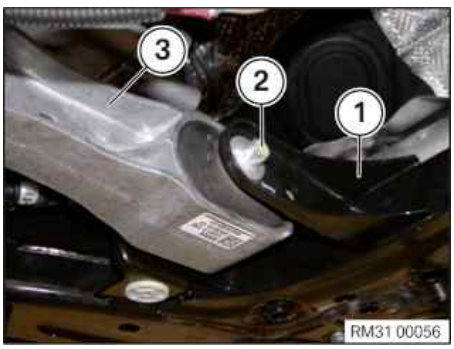
Perform the operations on the left and right side.

- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Holder, wishbone rubber mount, to body**

| | | | |
|---|---|---|---|
| M10 screw | Renew screw. | Jointing torque<br>Angle of rotation | 56 Nm<br>90 ° |

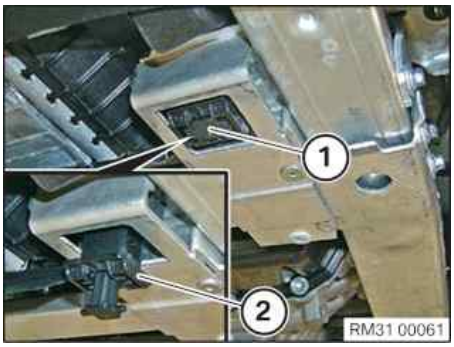



- Position the engine support (3) on the front axle support (1).
- Tighten down screw (2).

**Holder with rubber mount to front axle support**

| | | |
|---|---|---|
| M12 screw | | 100 Nm |

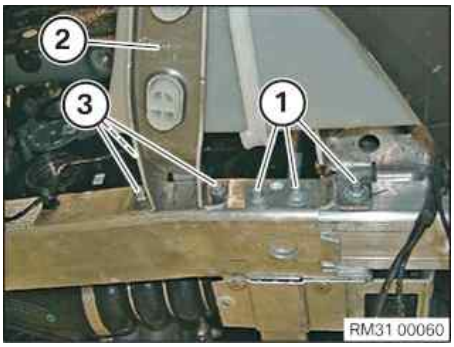
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**NOTICE**

Perform the operations on the left and right side.

- Position the lock (2).
- Lock the bracket (1) of the lock (2) of the holder for the charge air cooler.




- **Only on right side:** Position the holder for the washer fluid reservoir (2).
- Tighten down screws (3).

**Washer fluid reservoir holder to front axle support adapter plate**

| | | | |
|---|---|---|---|
| | | Tightening torque | 10 Nm |

**NOTICE**

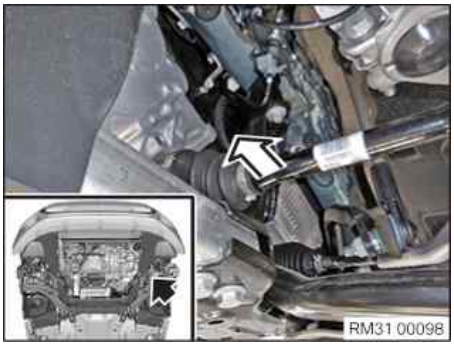
Perform the operations on the left and right side.

- Tighten the screws (1).

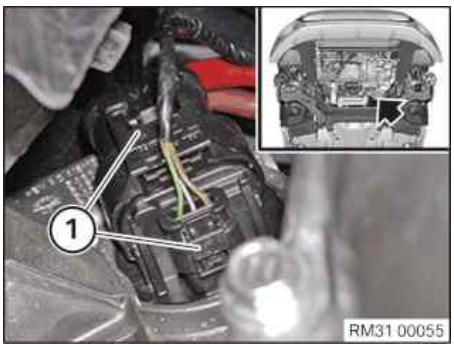
**Deformation element, bottom, to adapter plate, front axle carrier**

| | | | |
|---|---|---|---|
| | | Tightening torque | 11,8 Nm |

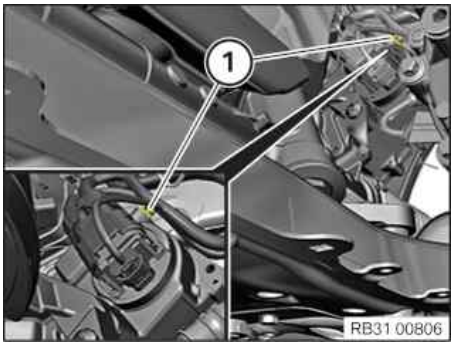
### 38 – Attaching connector at steering gear




- To connect the connector (see the following step): Connect the connector with the right hand.
  The connectors can be accessed via the left output shaft.



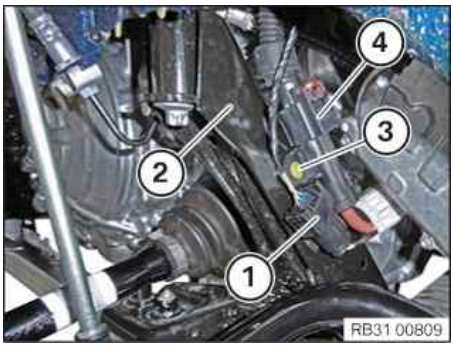

- Connect and lock connector (arrow) (1) with the steering gear.




- Fasten the wiring harness (1) on the steering gear.

▸ **If installed: Fasten the plug connections at the front axle support**

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- Position the plug connection (4) at the front axle support (2).
- Tighten down screw (3).

**Holder to front axle support**

| | | | |
|---|---|---|---|
| Oval-head screw TS5 x 16 | | Tightening torque | 2,6 Nm |

- Fasten the plug connection (1) at the front axle support (2).

### 39 – Securing rubber mount on front axle support




- Check rubber mount (1), replace if necessary.

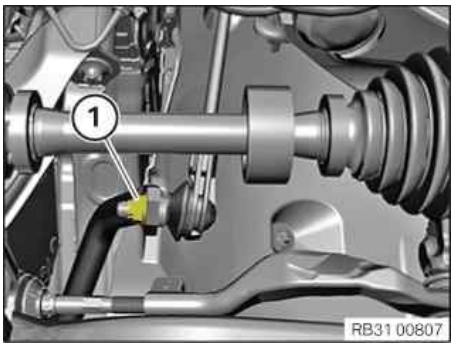
  **Parts:** Rubber mount
- Spray rubber mount (1) with lubricant and slide onto holder on front axle support.

### 40 – Securing anti-roll bar on left and right on the anti-roll bar link

**NOTICE**

Perform the operations on the left and right side.

▸ **Fastening anti-roll bar on the anti-roll bar link**




- Position the anti-roll bar link on the anti-roll bar .
- Renew nut (1).

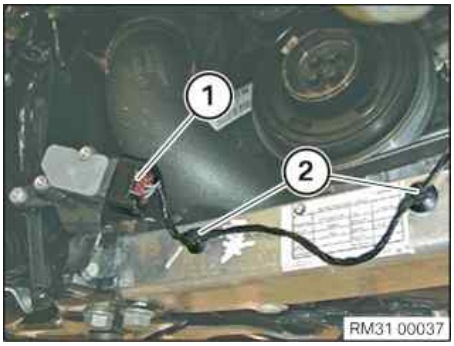
  **Parts:** Nut
- Tighten nut (1).

**Note:** Use the Torx socket for counter support.

**Anti-roll bar link to anti-roll bar**

| | | | |
|---|---|---|---|
| M10 | Renew nut. | Tightening torque | 56 Nm |

### 41 – With right installation: Securing the cable for the ride height sensor




- Secure the cable clip (2) on the adapter of the deformation element.
- Connect connectors (1) and lock.

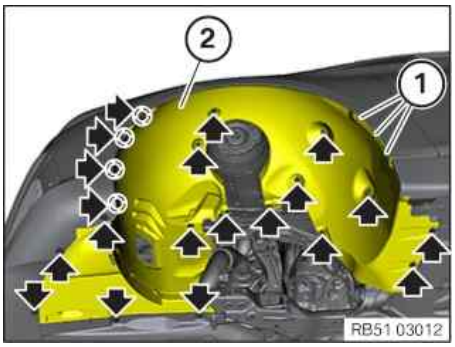
### 42 – Installing front left and right wheel arch cover

**NOTICE**

Perform the operations on the left and right side.

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▸ **Installing the front wheel arch cover**




- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

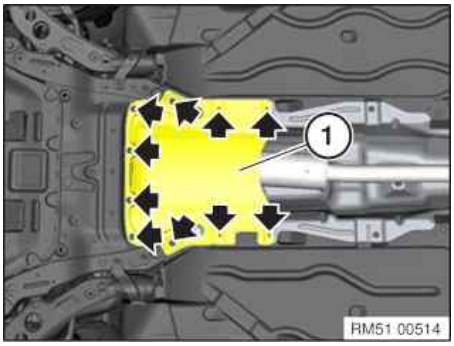
| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

**43 – If installed: Installing underbody protection at rear**




- Position rear underbody protection (1).
- Tighten screws (arrows).

**Underbody protection to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

**44 – Mount the front left and right wheels**

▸ **Mounting the wheel**

▹ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

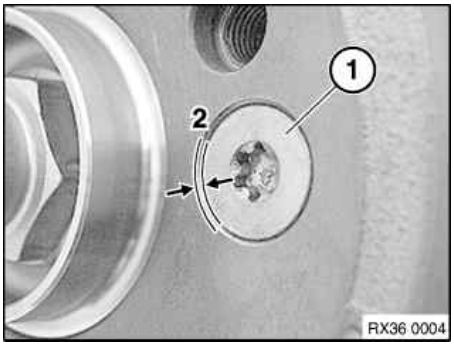
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue around the wheel bolt holes: remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Check the mounting bolt for the brake disc (1) for secure fit.

  The mounting bolt for the brake disc (1) must not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

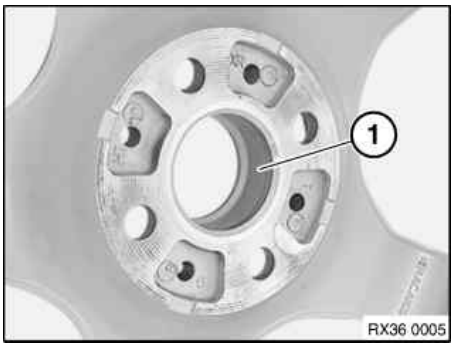
**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

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- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring.

◁




**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts (arrows) and threads for damage, renew the wheel bolts if necessary.
- Mount wheel bolts and tighten.

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

### 45 – Installing starter motor

**CAUTION**

**Improper routing of the positive battery cable.**

**Risk of short circuits!**

- Route the positive battery cable without abrasions and do not trap.

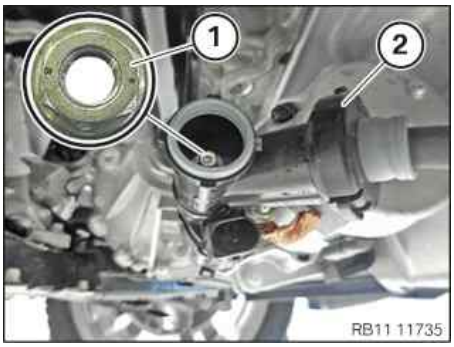



- Insert and install the starter motor .
- Tighten the screws (1).

**Starter motor to transmission**

| | | | |
|---|---|---|---|
| M8x45 | | Tightening torque | 19 Nm |

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- Feed the positive battery cable (2) in on the starter and install.
- Tighten nut (1).

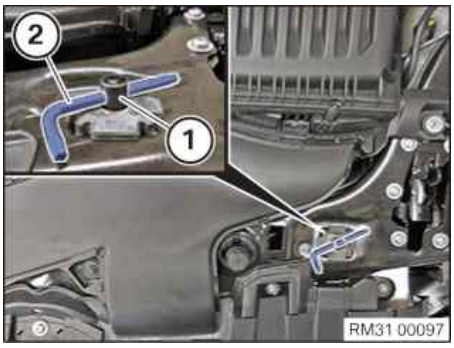
**Battery positive lead to starter**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 13,5 Nm |




- Insert and install the new sealing cap (2).
- Secure the sealing cap (2) in the direction of the arrow.
- Connect and lock the connector (1).
- Make sure the connector (1) engages audibly.

### 46 – Removing fastener for left and right radiator

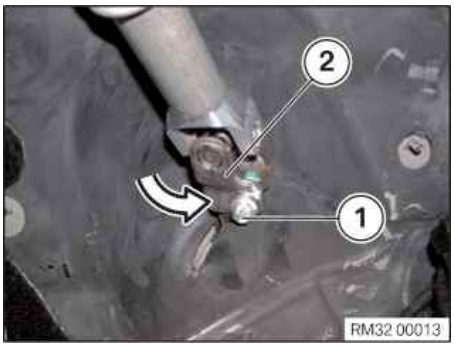



**NOTICE**

Perform the operations on the left and right side.

- Remove suitable tool (2) from the centering pin (1).

### 47 – Secure the steering shaft at the bottom on the steering gear




- Clean the screw lock residue from the screw thread in the universal joint (2).
- Pivot the universal joint (2) in the direction of the arrow to the steering gear.
- Renew the screw (1).

  **Parts:** Screw
- Tighten down screw (1).

**Lower steering shaft to steering gear**

| | | | |
|---|---|---|---|
| M10 | Clean screw thread and remove remains of screw locking agent.<br>Renew screw. | Tightening torque | 28 Nm |




- **If installed:**
- Position the cover on the steering column (2).
- Tighten nuts (1).

**Steering column cover to bulkhead**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

### 48 – Remove the engine bridge

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**CAUTION**

**Heavy component.**

**Heavy components can lead to injury or damage.**

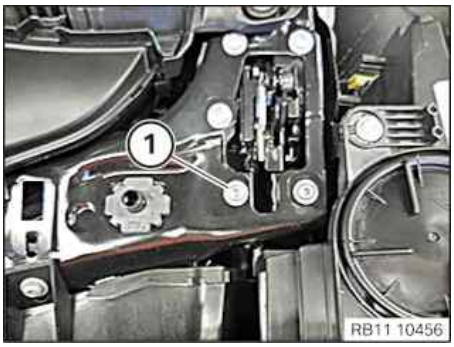
- Remove and install heavy components with the aid of another person/other persons.




- Detach the spindle screw (1) from the engine bridge.
- Unscrew the leg screws (2) and (3).
- Guide the engine bridge out of the vehicle with the help of another person and remove.




- Unscrew the bolts (1) of the special tool **2 459 012**.
- Feed out the special tool **2 459 012** at the cylinder head and remove.




- Tighten the screw (1) of the bonnet catch.

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |




- Tighten the screw (1) of the bonnet catch.

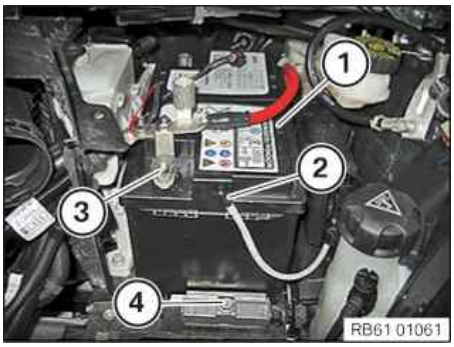
**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

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## TECHNICAL INFORMATION

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)




- Install vehicle battery (1).
- Tighten the holder with the bolt (4).

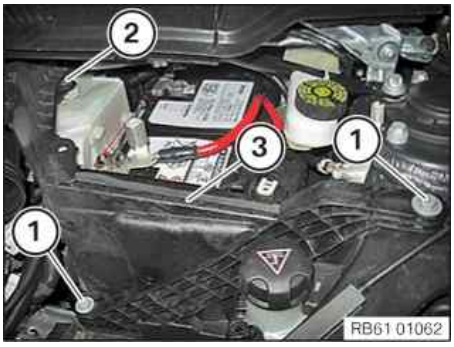
**Battery terminal rail to battery tray**

| | | |
|---|---|---|
| M8 screw | | 19 Nm |

- Position the vent hose (2).
- Position the positive terminal.
- Tighten the nut (3) on the positive terminal.

**Positive battery terminal**

| | | |
|---|---|---|
| NutM6 | | 5 Nm |




- Insert the tension strut (3).
- Tighten down screw (2).

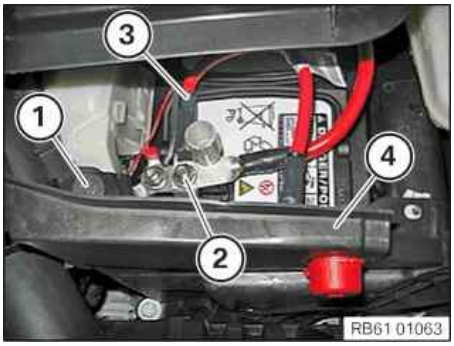
**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

- Tighten the screws (1).

**Trailing link**

| | | |
|---|---|---|
| M8 screw | | 19 Nm |




- Position the positive battery cable (3) with the cover of the remote positive terminal (4).
- Tighten down screw (1).

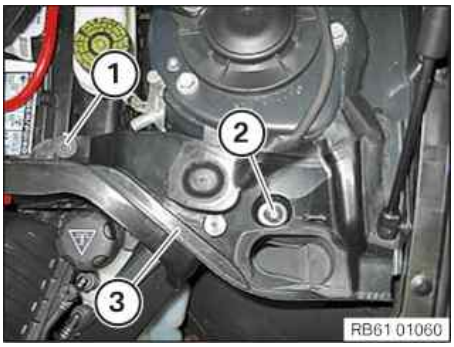
**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

- Tighten the nut (2) on the positive terminal.

**Positive battery cable to battery terminal**

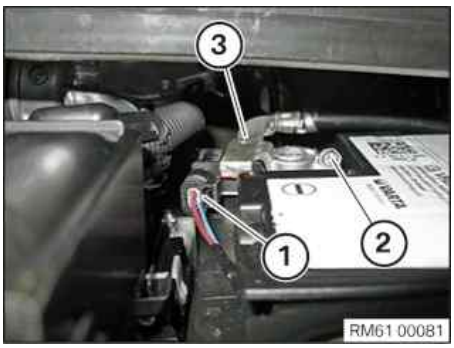
| | | |
|---|---|---|
| Nut M8 | | 15,2 Nm |




- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |



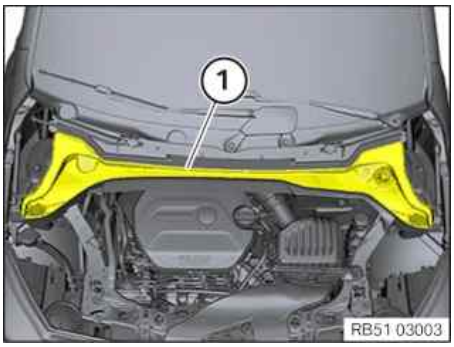

- Position the negative battery terminal (3).
- Tighten nut (2).

**Negative battery terminal (with IBS)**

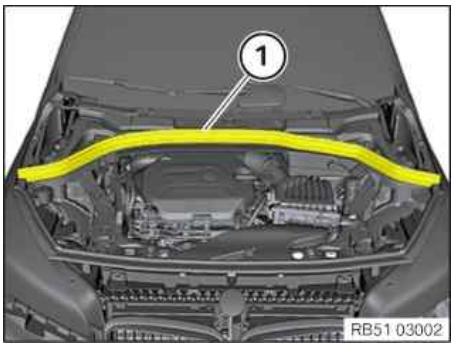
| | | |
|---|---|---|
| NutM6 | | 5 Nm |

- Connect connectors (1) and lock.

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- Feed in the cowl panel cover (1).




- Press the gasket (1) in a downwards direction.

**50 – Install electronics box**

**Prerequisite**

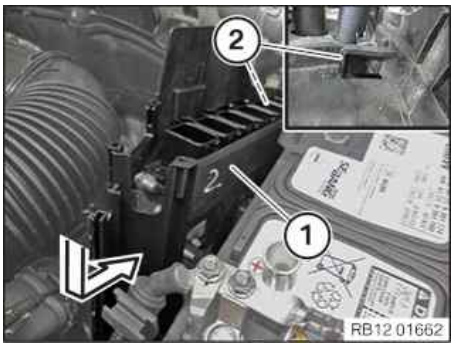
Battery earth lead is disconnected.

**RISK OF DAMAGE**

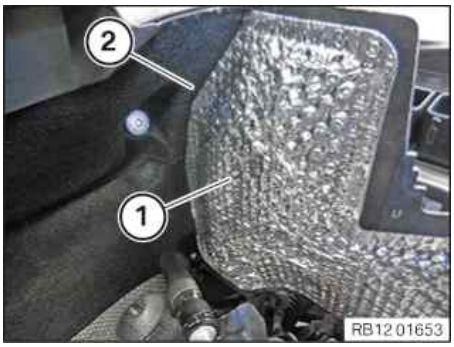
**Improper routing of cables and wiring harnesses.**

**Trapped, crushed or damaged cables may cause short circuits and malfunctions.**

- Route all cables without abrasions, do not trap and crush.

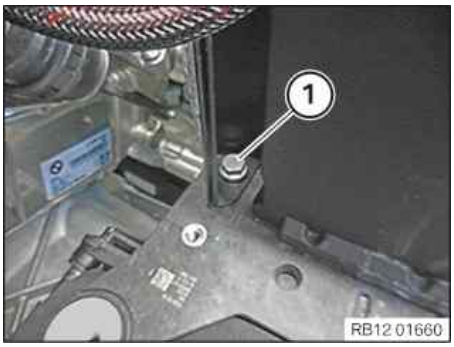



- Guide in and install the electronics box (1) into the guide (2) in direction of arrow.




- Make sure that the electronics box (1) is positioned correctly on the bulkhead (2).

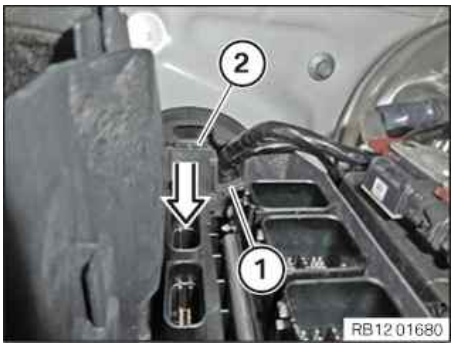
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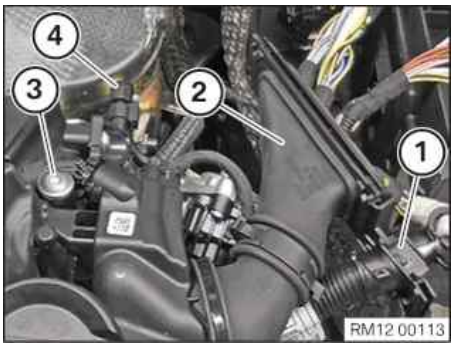

- Tighten down screw (1).

**Electronics box to battery tray**

| | | | |
|---|---|---|---|
| M8X16 | | Tightening torque | 15 Nm |




- Guide in and install the holder (1) in the electronics box (2) in direction of arrow.
- Make sure the bracket (1) engages audibly.

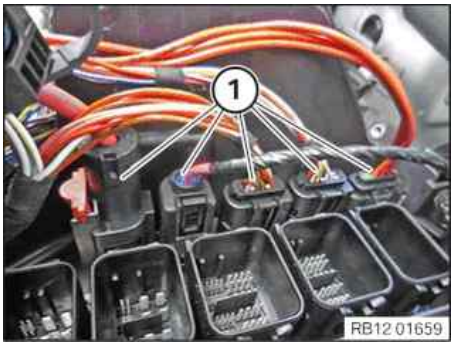



- Lay vehicle wiring harnesses (1) and (2) and mount on electronics box.
- Tighten down screw (3).

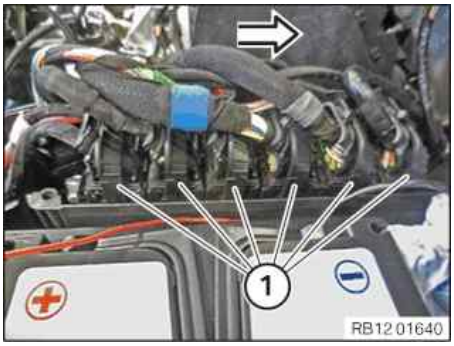
**Wiring harness to cylinder head cover**

| | | | |
|---|---|---|---|
| TS5x20 | | Tightening torque | 3,5 Nm |

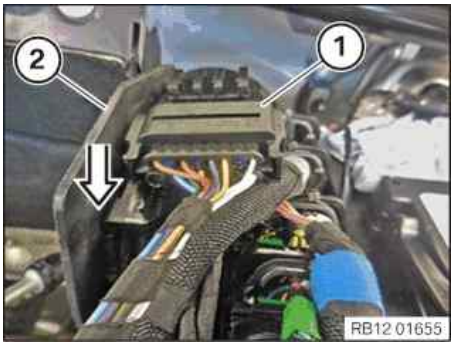
- Attach connector (4) to the differential pressure sensor and lock it audibly.




- Connect and lock the connector (1).
- Make sure the connectors (1) engage audibly.

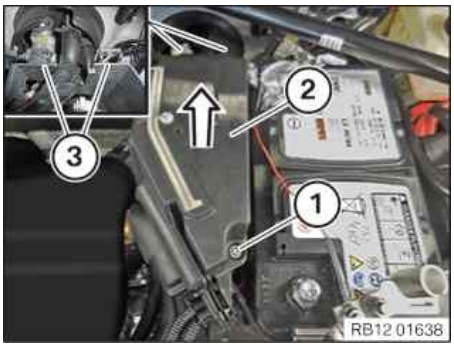



- Connect connector (1) in direction of arrow and lock.
- Make sure the connectors (1) engage audibly.




- Connect and lock the connector (1).
- Make sure the connector (1) engages audibly.
- Insert the connector (1) in the direction of arrow at the electronics box (2) and install.

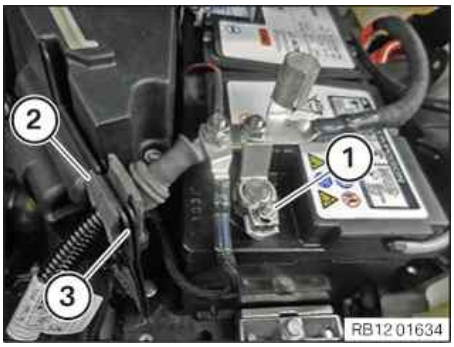
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- Insert the cover (2) into the guides (3) in the direction of arrow and install.
- Make sure the cover audibly engages (2) in the guides (3).
- Tighten down screw (1).

**Cover to electronics box**

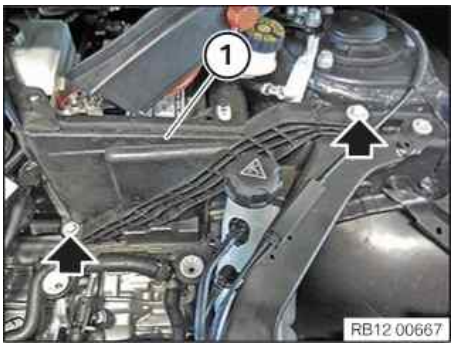
| | | | |
|---|---|---|---|
| RF5x26.5 | | Tightening torque | 2,5 Nm |




- Thread in positive battery cable (2) on holder (3) and install.
- Feed in and install positive battery terminal (1).
- Tighten positive battery terminal (1).

**Positive battery terminal to battery**

| | | | |
|---|---|---|---|
| NutM6 | | Tightening torque | 5 Nm |




- Feed in and install tension strut (1).
- Tighten screws (arrows).

**Tension strut to spring strut dome/battery tray**

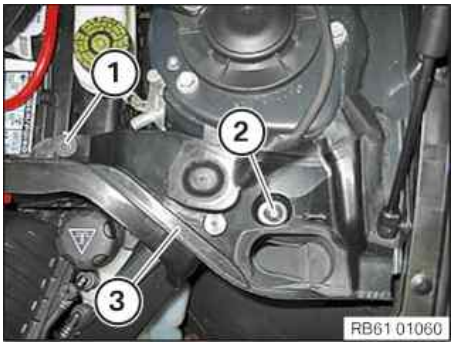
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |




- Feed in and install cover (2) at the positive battery connection point.
- Tighten down screw (1).

**Positive battery connection point cover to engine compartment partition wall**

| | | | |
|---|---|---|---|
| | | Tightening torque | 3 Nm |



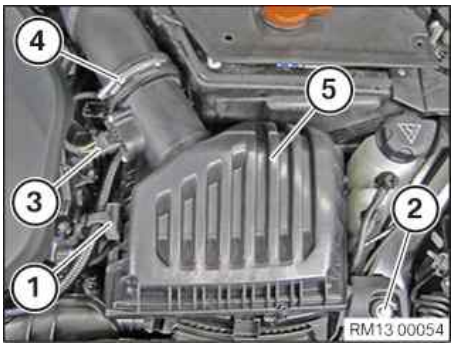

- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

**51 – Installing intake silencer housing**

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

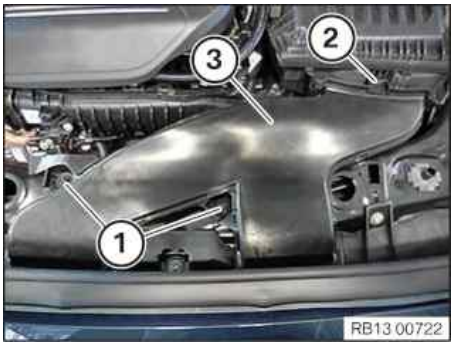
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 52 – Install the intake neck for the intake filter housing



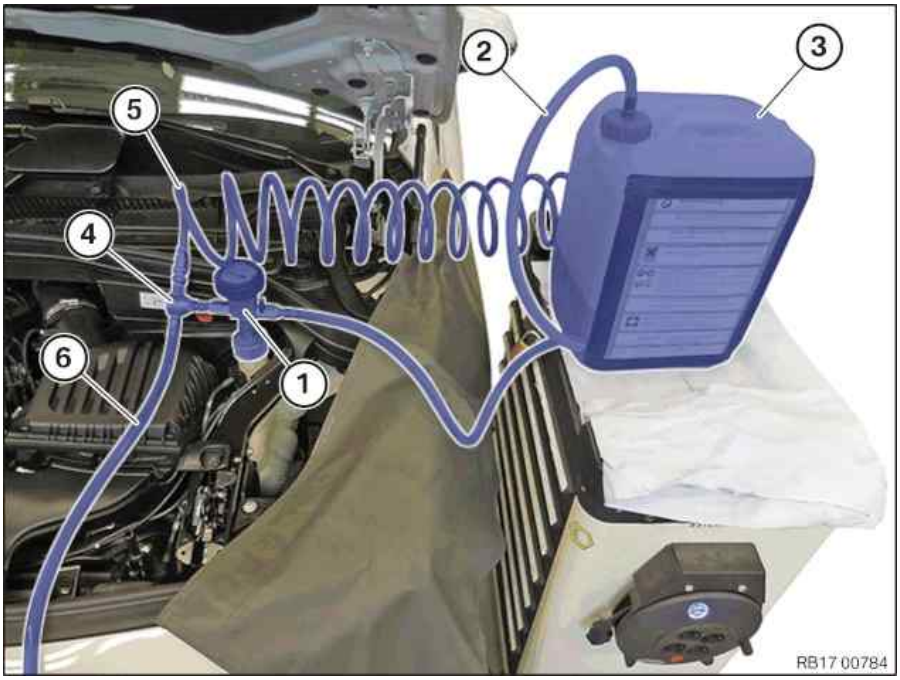

- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 53 – Filling the coolant circuit by means of the vacuum filler device

**Vacuum filler device**




Vacuum filler device - connected to the high-temperature coolant expansion tank

**1 Vacuum filler device with pressure gauge and shutoff valves**

**2 Filling hose**

**3 Fluid tank with coolant**

**4 Venturi nozzle**

**5 Compressed air connection (maximum 6 bar)**

**6 Out-going hose (lead out-going hose into a collecting vessel)**

**Prerequisite**

The coolant expansion tank for the cooling system must be empty. The fluid tank of the vacuum filler device must have a sufficient quantity

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of premixed coolant, 1 l to 2 l more than the specified capacity for the vehicle. The fluid tank of the vacuum filler device must be positioned at the same height as the coolant expansion tank. The compressed air connection must have a pressure of 6 bar. Ignition is switched off.

**TECHNICAL INFORMATION**

Follow notes for repair work on the cooling system.

For additional information see:

Main group 17

17 00 ... Notes for working on the cooling system

**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

**TECHNICAL INFORMATION**

Filling **without** the vacuum filler device (watering can filling) is **not permitted**.

Non-compliance will result in danger of component damage and/or engine damage.

Filling specification **absolutely must** be adhered to.

The operation of the vehicle is not permitted unless the filling procedure has been completed. Otherwise, functional limitations (degradation) and/or overheating may occur.

A bleeding procedure is required after a part has been exchanged in the cooling system and/or after refilling the cooling system.

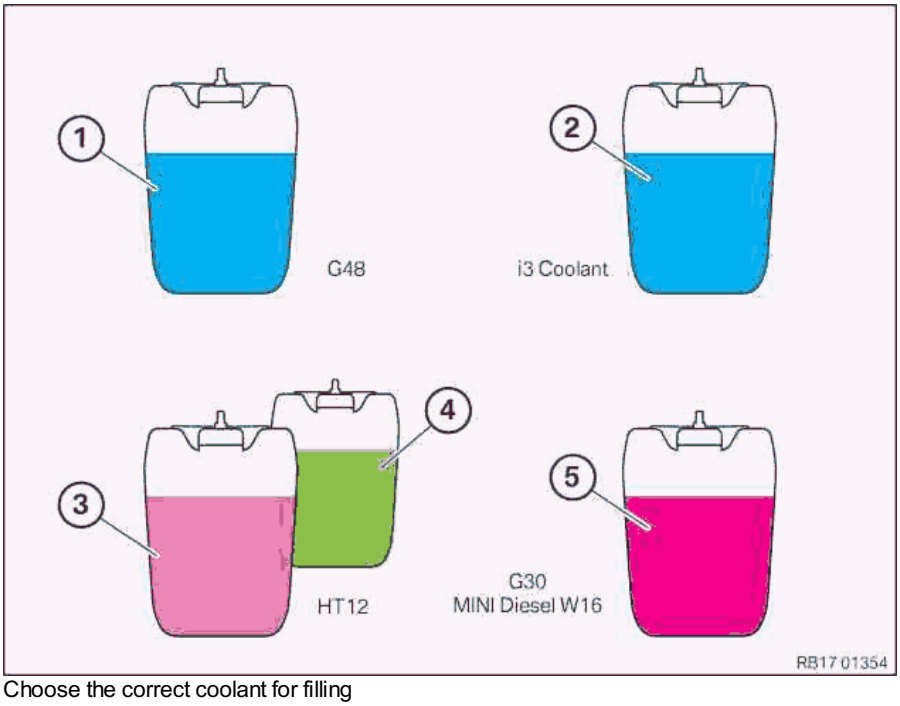
**TECHNICAL INFORMATION**

Make sure that the ignition (terminal 15) is switched off prior to creating the vacuum with the vacuum filler device.

▸ **Observe the coolant type**

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**Coolant in the vacuum filler device container**




Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

1. **G48 (Blue)** G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.
2. **i3 coolant (blue)** is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.
3. **HT12 (Pink)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
4. **HT12 (Green)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
5. **G30 (Pink)** must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

**RISK OF DAMAGE**

**Damage to the engine.**

**The use of an incorrect coolant may lead to corrosion or gelling in the engine.**

- Use only approved coolants for the specific vehicle.
- Fill the vehicle only with the coolant with which it was delivered ex works.
- Mix only compatible coolants. The colour does not allow any assessment about the compatibility of coolants.
- Selection of the correct coolant only by means of the part number.

- Select a suitable adapter (Y) from the set of special tools **0 494 417 (17 0 100)**:

| Type | Engine | Adapter (Y) from 17 0 100 |
|---|---|---|
| F39/F45/F46/F48 | B46/B48/B38/B47/B37 | 17 0 109 |

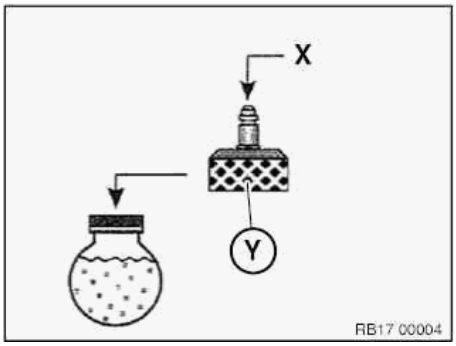
- The fluid tank of the vacuum filler device must be filled with 1 l to 2 l more than the specified capacity of coolant for the vehicle.

**Coolant capacity**

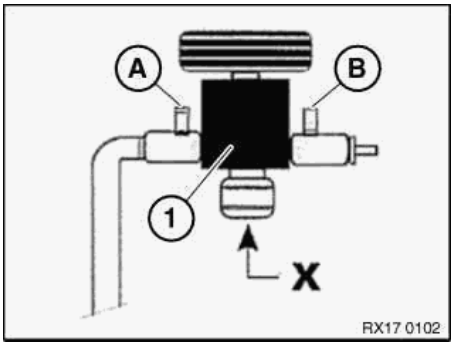
| | |
|---|---|
| B37C15/K/U1 | 6 l |

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

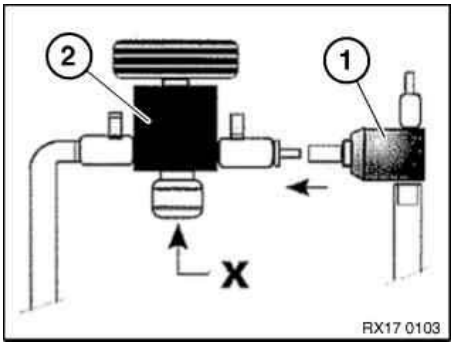
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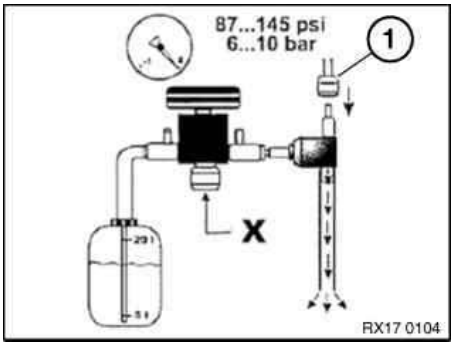

- Connect the selected adapter (Y) to the coolant expansion tank.
- Connect vacuum filler device to connection (X) of the adapter.



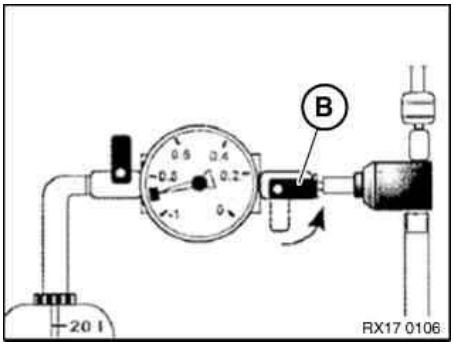

- Make sure that the shutoff valves (A) and (B)of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



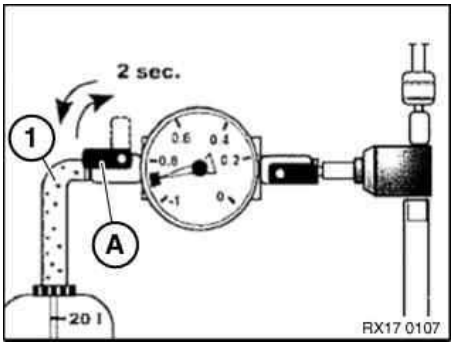

- Connect Venturi nozzle (1) to the vacuum filler device (2).
  (X)is the connection on the coolant expansion tank.




- Connect compressed air (1).
  (X) is the connection to the coolant expansion tank.



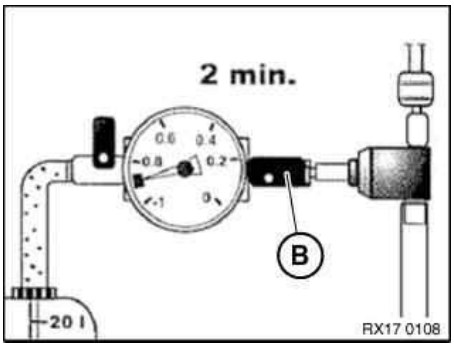

- Open shut-off valve (B).
  The venturi nozzle produces a flow noise.




- Open shutoff valve (A) until the fuel filling hose (1) is full without bubbles.
- Close shutoff valve (A) again.

» The filling hose (1) has now been bled.

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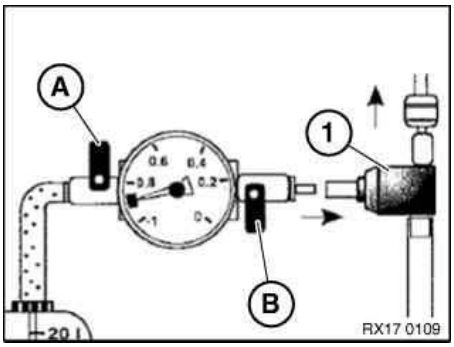



- Check the coolant hoses for porosity and renew porous coolant hoses as required.

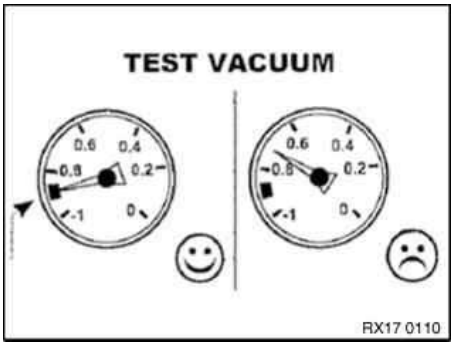
**TECHNICAL INFORMATION**

The coolant hoses contract during vacuum build-up.

- After a vacuum of -0.7 to -0.95 bar has been reached in the coolant circuit (duration approximately 2 minutes), close the shutoff valve (B).




- Check whether the shut-off valves (A) and (B) are closed.
- Disconnect the Venturi nozzle (1).




**Check**

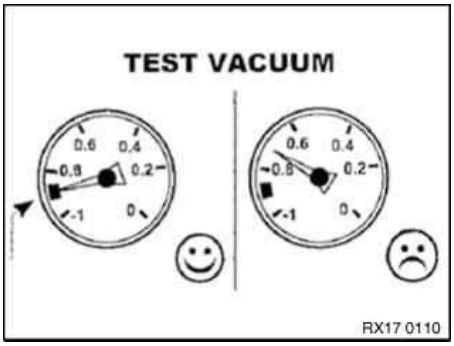
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

**Result**

» Vacuum drops.

**Measure**

- Look for the leak, repair it and start the filling procedure from the beginning.




**Check**

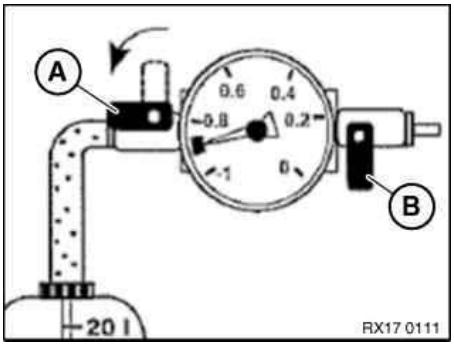
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

**Result**

» Vacuum remains constant.

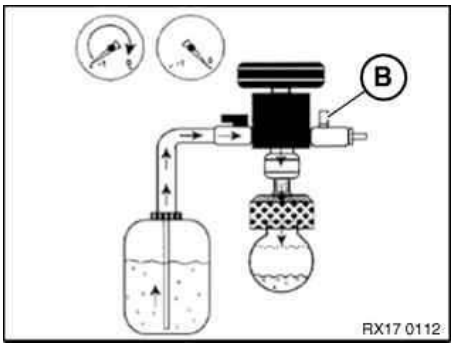
**Measure**

- Continue with filling.

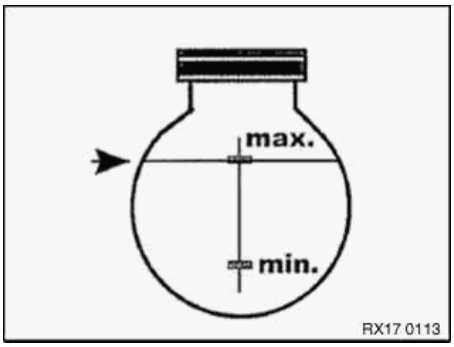



- Keep shutoff valve (B) closed during the filling process.
- To fill the cooling system, open the shutoff valve (A) to the fluid tank of the vacuum filler device.

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- Stop the filling procedure when the needle in the pressure measuring device is on 0 bar or it no longer drops.
- If necessary, reduce remaining vacuum. In order to do so, open shutoff valve (B).




- Remove the vacuum filler device with the adapter from the coolant expansion tank.
- Adjust the coolant level to 700 ml above the maximum mark.
- After filling the cooling system with the vacuum filler device perform the cooling system bleeding routine additionally.

**54 – Disconnecting all battery earth leads**




- See additional information.

**55 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

**56 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).




- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

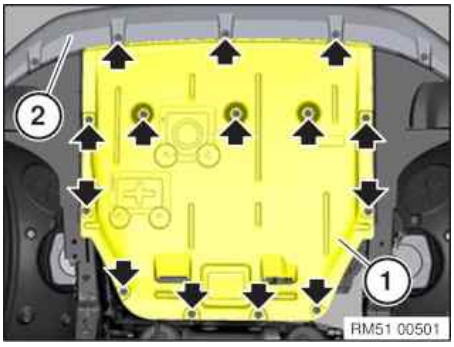
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 57 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

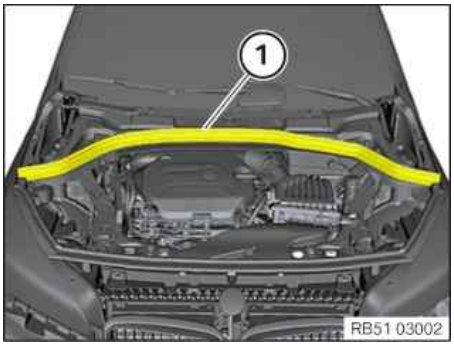
**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 58 – Install the seal for the bonnet

**NOTICE**

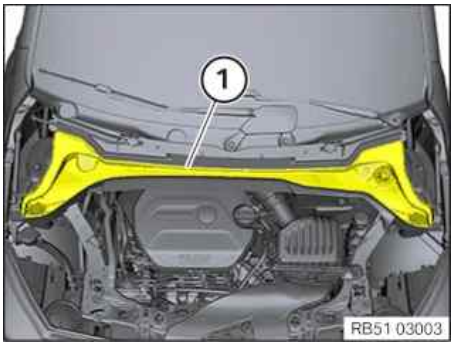
Schematic diagram is for example purposes. Some parts may differ in certain details.




- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

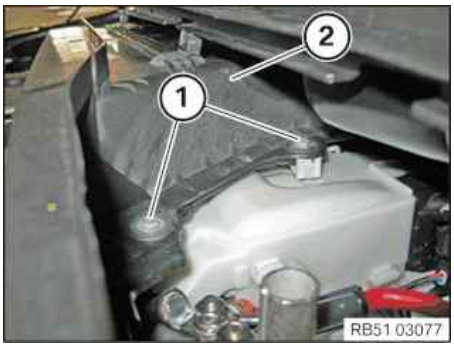
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### 59 – Installing front cowl panel cover




- Insert the cowl panel cover front (1) to the rear and install.
- Check cowl panel cover at front is correctly seated (1).

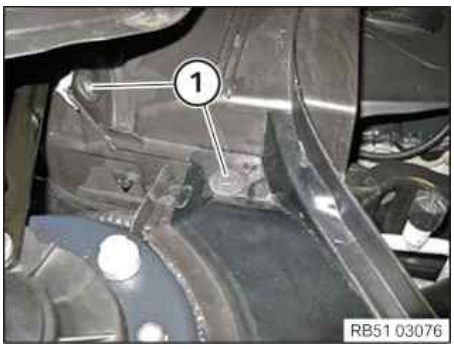
### 60 – Installing the upper bulkhead cover




- Feed in and install cover (2) of the bulkhead at the top.
- Tighten the screws (1).

**Bulkhead cover, top**

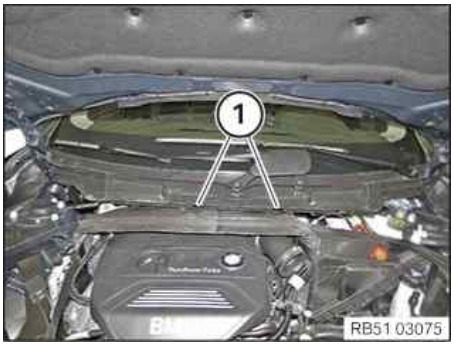
| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Tighten the screws (1).

**Bulkhead cover, top**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Tighten the screws (1).

**Bulkhead cover, top**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

### 61 – Install acoustic cover

**RISK OF DAMAGE**

**Damage to the acoustic cover.**

**Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.**

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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- Check for correct installation of all rubber mounts in the acoustic cover (1).




- Clip in the acoustic cover into the holders in the indicated areas.
- Make sure that the acoustic cover engages audibly.

**62 – Encode/program control unit(s)**

**Prerequisite**

Replacement of the control unit.

**TECHNICAL INFORMATION**

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

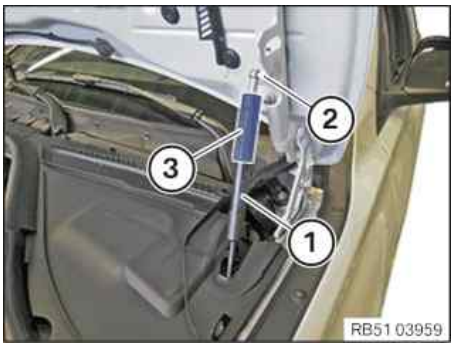
**TECHNICAL INFORMATION**

**No high-voltage switch off is required** in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.
**Exception:**
BMW I01: Note Product and Measures Management Aftersales measure 55176388.

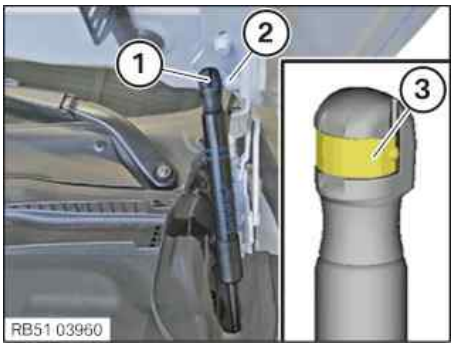
- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.

**63 – Take bonnet out of the service position**

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- Support the bonnet by hand.
- Remove the special tool **2 353 020**(3) from the ball pin (2).
- Pull off the special tool **2 353 020**(3) from the gas pressure spring (1).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.




**CAUTION**

**Shutting bonnet or tailgate.**

**Danger of injury!**

- Support bonnet/tailgate in fully open position with the aid of a suitable device.

- Check the clamp (3) is fitted correctly.
- Connect ball socket (1) to ball pin (2).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.

## Additional Information

### Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** — Used in step 13 55 56

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**Bracing strut to top cross connection** — Used in step 16

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

**Air duct to deformation element/cross connection** — Used in step 16

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

**Cross connection on support for cross connection** — Used in step 16 48

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

**Special tool to cylinder head** — Used in step 17

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 21,5 Nm |

**Transmission to engine** — Used in step 33

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |
| M12 | | Tightening torque | 66 Nm |

**Standard screw connection M6** — Used in step 33

| | | | |
|---|---|---|---|
| M6 | | | 8 Nm |

**Transmission mounting** — Used in step 33

| | | | |
|---|---|---|---|
| M10 | Renew screws. | Jointing torque | 40 Nm |
| | | Angle of rotation | 90 ° |

**Standard screw connection M8** — Used in step 33

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

**Battery holder to engine support** — Used in step 33

| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

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**Output shaft to wheel bearing** — Used in step 34 35

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |

**Output shaft bearing to engine block** — Used in step 35

| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |

**Rear end of front axle support to body** — Used in step 36

| | | | |
|---|---|---|---|
| M14 screw | Renew screw. | Tightening torque | 175 Nm |

**Front axle support, front to body** — Used in step 36

| | | | |
|---|---|---|---|
| M12 screw | Renew screw. | Tightening torque | 108 Nm |

**Underbody protection to body** — Used in step 36 43

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

**Track rod end to swivel bearing** — Used in step 36

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |

**Wishbone to swivel bearing** — Used in step 36

| | | | |
|---|---|---|---|
| M10 | Exclusively use the screw to tighten!<br>Renew screw and nut. | Tightening torque | 60 Nm |

**Holder, wishbone rubber mount, to body** — Used in step 37

| | | | |
|---|---|---|---|
| M10 screw | Renew screw. | Jointing torque | 56 Nm |
| | | Angle of rotation | 90 ° |

**Holder with rubber mount to front axle support** — Used in step 37

| | | | |
|---|---|---|---|
| M12 screw | | | 100 Nm |

**Washer fluid reservoir holder to front axle support adapter plate** — Used in step 37

| | | | |
|---|---|---|---|
| | | Tightening torque | 10 Nm |

**Deformation element, bottom, to adapter plate, front axle carrier** — Used in step 37

| | | | |
|---|---|---|---|
| | | Tightening torque | 11,8 Nm |

**Holder to front axle support** — Used in step 38

| | | | |
|---|---|---|---|
| Oval-head screw TS5 x 16 | | Tightening torque | 2,6 Nm |

**Anti-roll bar link to anti-roll bar** — Used in step 40

| | | | |
|---|---|---|---|
| M10 | Renew nut. | Tightening torque | 56 Nm |

**Wheel arch cover to body** — Used in step 42

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body** — Used in step 42

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Brake disc to front wheel hub** — Used in step 44

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

**Brake disc to rear wheel hub** — Used in step 44

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

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**Wheel bolts** — Used in step 44

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

**Starter motor to transmission** — Used in step 45

| | | | |
|---|---|---|---|
| M8x45 | | Tightening torque | 19 Nm |

**Battery positive lead to starter** — Used in step 45

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 13,5 Nm |

**Lower steering shaft to steering gear** — Used in step 47

| | | | |
|---|---|---|---|
| M10 | Clean screw thread and remove remains of screw locking agent.<br>Renew screw. | Tightening torque | 28 Nm |

**Steering column cover to bulkhead** — Used in step 47

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Battery terminal rail to battery tray** — Used in step 49

| | | |
|---|---|---|
| M8 screw | | 19 Nm |

**Positive battery terminal** — Used in step 49

| | | |
|---|---|---|
| NutM6 | | 5 Nm |

**Battery cover** — Used in step 49 50

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

**Trailing link** — Used in step 49

| | | |
|---|---|---|
| M8 screw | | 19 Nm |

**Positive battery cable to battery terminal** — Used in step 49

| | | |
|---|---|---|
| Nut M8 | | 15,2 Nm |

**Negative battery terminal (with IBS)** — Used in step 49

| | | |
|---|---|---|
| NutM6 | | 5 Nm |

**Electronics box to battery tray** — Used in step 50

| | | | |
|---|---|---|---|
| M8X16 | | Tightening torque | 15 Nm |

**Wiring harness to cylinder head cover** — Used in step 50

| | | | |
|---|---|---|---|
| TS5x20 | | Tightening torque | 3,5 Nm |

**Cover to electronics box** — Used in step 50

| | | | |
|---|---|---|---|
| RF5x26.5 | | Tightening torque | 2,5 Nm |

**Positive battery terminal to battery** — Used in step 50

| | | | |
|---|---|---|---|
| NutM6 | | Tightening torque | 5 Nm |

**Tension strut to spring strut dome/battery tray** — Used in step 50

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

**Positive battery connection point cover to engine compartment partition wall** — Used in step 50

| | | | |
|---|---|---|---|
| | | Tightening torque | 3 Nm |

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**Intake silencer housing to lock bridge** — Used in step 51

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** — Used in step 51

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 52

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 57

| | | | |
|---|---|---|---|
| | | | 3 Nm |

**Bulkhead cover, top** — Used in step 60

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

## Overview of Special Tools

### 2 353 020 Support




**Common** — Used in step 1 63

| | |
|---|---|
| Usage | For service position of engine compartment lid Associated contour-graphic silhouette foil can be ordered under: 83 30 2 356 848. Further information on the contour-graphic silhouette foil can be found in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A74 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 11 13 (960) |

### 2 459 012 Holder

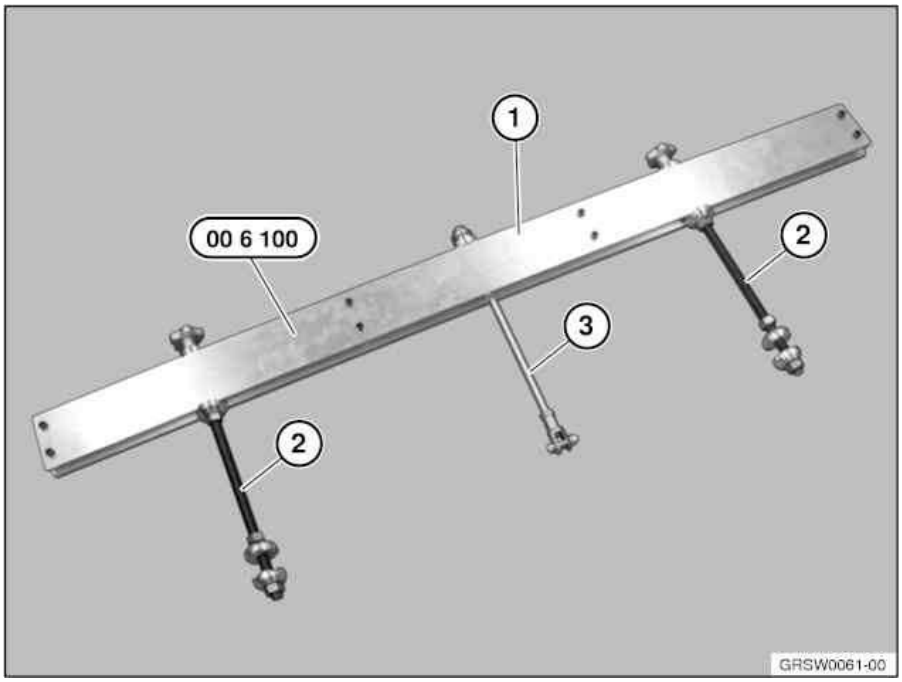



**Common** — Used in step 17 48

| | |
|---|---|
| Usage | For removing and installing the cylinder head. Contour-graphic silhouette foil is included in the delivery specification. |
| Included in the tool or work | |
| Storage location | A58 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 07 17 (487) |

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## 0 496 852 (00 6 100) Device




### Common

Used in step 17

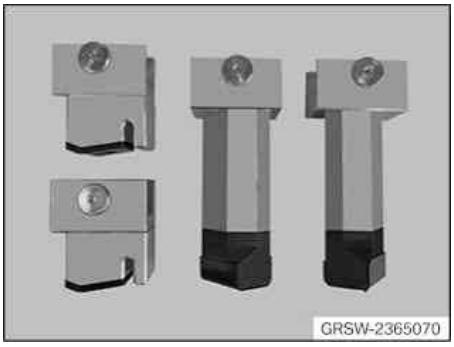
| | |
|---|---|
| Usage | Engine bridge (device) 006000 |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 17 10 (659) |

### Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 2 | 2 361 507 (00 6 102) | | **Spindle** Set (2 pieces) in connection with 00 6 100. | |
| 3 | 2 361 506 (00 6 103) | | **Spindle** Spindle (central spindle) for Traverse 00 6 100. | |

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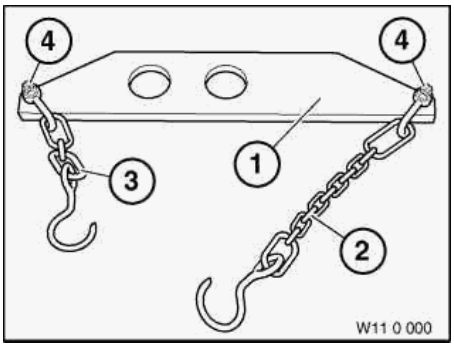
### 2 365 070 Upholstery




**Common** Used in step 17

| | |
|---|---|
| Usage | Washer for securing the engine support. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | Engine bridge 006100 - 0496852 Section 006051 - 0496436 Adapter 006130 - 2209122 Adapter 2318635 |
| SI-Number | 01 45 14 (186) |

### 0 490 561 (11 0 000) Lifting gear




**Common** Used in step 17

| | |
|---|---|
| Usage | (Hoisting gear) For removing and installing engines. As of 08/2011 only available as a complete set. Delivered with TÜV inspection certificate and operating instructions. No delivery of separate parts. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 13 94 (888) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 4 | 0 490 565 (11 0 009) | | **Shackle** (Shackle) 2 pieces. As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 1 | 0 490 562 (11 0 001) | | **Lifting gear** (Cross member) As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 2 | 0 490 563 (11 0 002) | | **Chain** (Chain) Version: long As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 3 | 0 490 564 (11 0 003) | | **Chain** (Chain) Version: short As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |

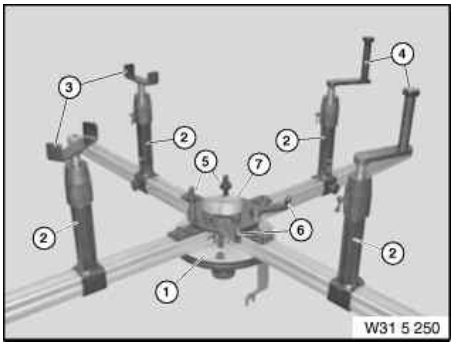
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### 2 357 269 Shackle



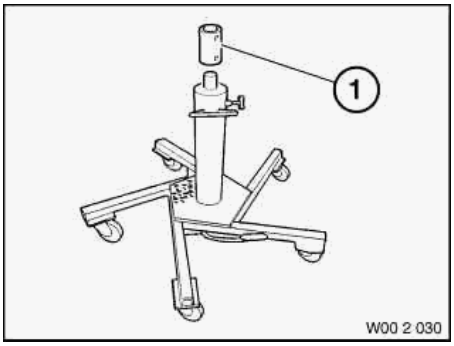

| Common | Used in step 17 |
|---|---|
| Usage | Set consisting of 4 pieces. Was valid as campaign for BMW i Aftersales High Voltage. During the course of the changeover from BMWi to iPerformance, a tool changeover also takes place from campaign to warehouse. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 19 13 (985) |

### 0 495 817 (31 5 251) Basic body




| Common | Used in step 29 36 |
|---|---|
| Usage | (Basic body) No longer available separately, only via special tool set 31 5 250 (83 30 0 495 567) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

### 0 490 133 (00 2 030) Device



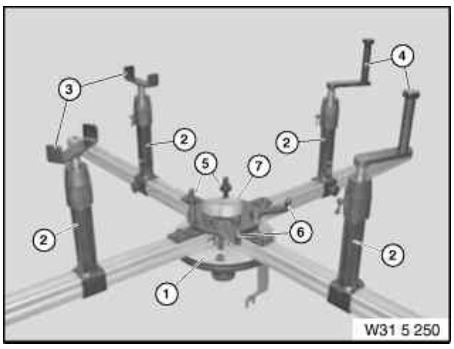

| Common | Used in step 29 32 33 36 |
|---|---|
| Usage | (universal hydraulic lifter base unit) Chassis and hydraulic lifter - For removing and installing rear axle supports and gearboxes. Also for soft top mounts. Is replaced by 81 22 2 219 012 |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 05 90 (207) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 490 134 (00 2 031) | | **Adapter** (adapter for gearbox holder) Model series: E30, E31, E32, E34, E36 | |

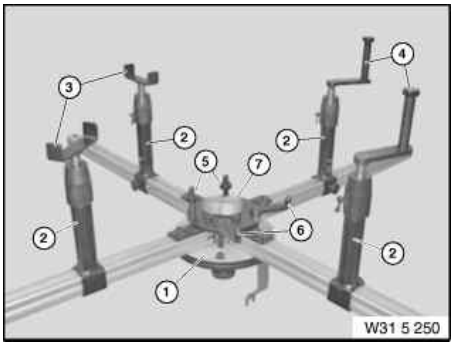
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### 0 495 821 (31 5 255) Adapter



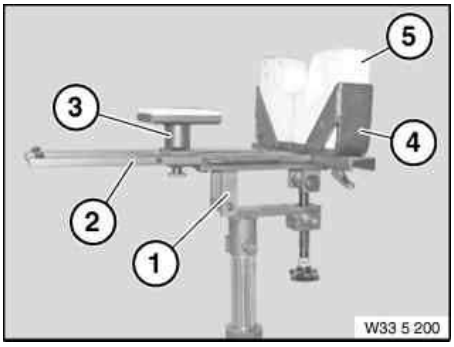

| Common | Used in step 29 |
|---|---|
| Usage | (take-up adapter for bore holes (2 x)) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

### 0 495 819 (31 5 253) Adapter




| Common | Used in step 29 |
|---|---|
| Usage | (take-up adapter U-section (2 x)) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

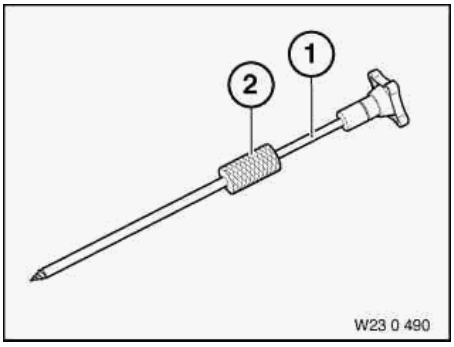
### 0 496 080 (33 5 206) Belt




| Common | Used in step 29 36 |
|---|---|
| Usage | (Tensioning strap) |
| Included in the tool or work | 0 496 009 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 491 454 (23 0 490) Puller




**Common** Used in step 30 31

| | |
|---|---|
| Usage | For removing shaft seal |
| Included in the tool or work | |
| Storage location | A13 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 15 96 (106) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 491 455 (23 0 491) | | **Rod** With self-tapping screw Deletion, only available via tool set | |
| 2 | 0 491 456 (23 0 492) | | **Weight** (Weight) | |

### 2 409 230 Mandrel




**Common** Used in step 34 35

| | |
|---|---|
| Usage | For installing the rear-wheel drive of Transmission output shaft le./ri. silhouette foil is contained in delivery specification. Further information on the contour-graphic silhouette foil is included in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A75 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 56 14 (214) |

### 2 344 011 Tool

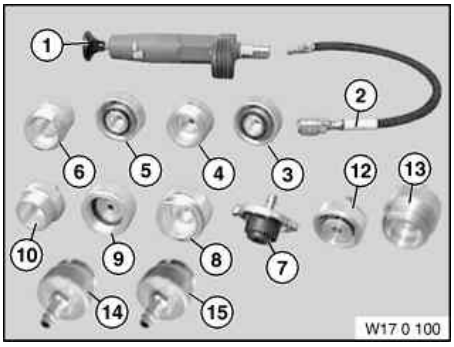



**Common** Used in step 44

| | |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

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## 0 494 417 (17 0 100) Tester




### Common

Used in step 53

| | |
|---|---|
| Usage | For checking engine cooling system on watertightness. For checking radiator cap. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 07 02 (884) |

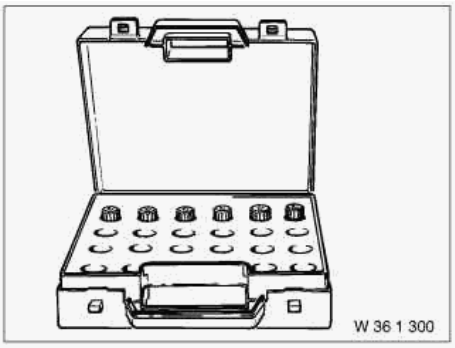
### Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 5 | 0 494 422 (17 0 105) | | **Adapter** For radiator cap (sawtooth thread) | |
| 10 | 0 494 427 (17 0 111) | | **Adapter** For radiator cap R53/W11, R50/W17 adapter replaced 17 0 052. | |
| 1 | 0 494 418 (17 0 101) | | **Pump** | |
| 2 | 0 494 419 (17 0 102) | | **Hose** (hose with quick-release coupling) | |
| 3 | 0 494 420 (17 0 103) | | **Adapter** For radiator cap (normal thread) | |
| 4 | 0 494 421 (17 0 104) | | **Adapter** For radiator cap (normal thread) | |
| 6 | 0 494 423 (17 0 106) | | **Adapter** For radiator cap (sawtooth thread) | |
| 7 | 0 494 424 (17 0 107) | | **Adapter** For radiator cap R50 / W10 | |
| 8 | 0 494 425 (17 0 108) | | **Adapter** For radiator cap R50 / W10 | |
| 9 | 0 494 426 (17 0 109) | | **Adapter** For radiator connection R53/W11, R50/W17 adapter corresponds to 17 0 051 | |
| 11 | 0 494 428 (17 0 112) | | **Case** | |
| 12 | 0 494 642 (17 0 113) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 13 | 0 494 643 (17 0 114) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 14 | 0 495 889 (17 0 115) | | **Adapter** For radiator cap Model series: N12, N14 | |

## Replacement tools:

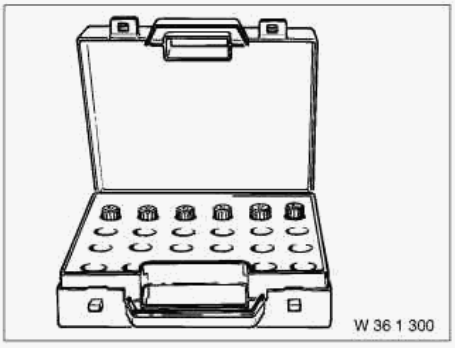
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### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

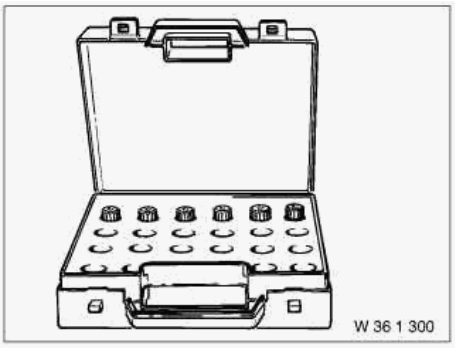
### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 227 (36 1 329) Wheel stud



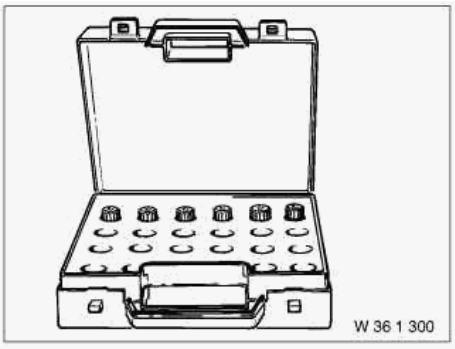

| Common | Used in step 21 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 228 (36 1 331) Wheel stud



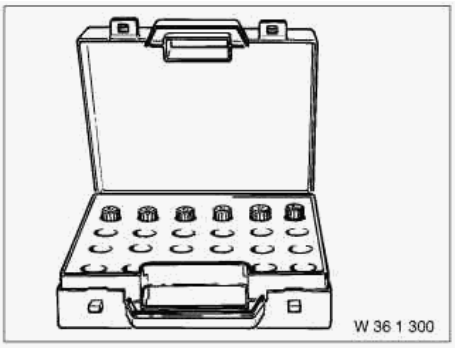

| Common | Used in step 21 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Overview Technical Data

| Coolant capacity | Used in step 53 |
|---|---|
| B37C15/K/U1 | 6 l |

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

## Links

| General repair instructions | Used in step |
|---|---|
| 61 20 ... Notes on AGM battery | 10 49 |

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| | |
|---|---|
| 61 12 ... Notes on intelligent battery sensor (IBS) | 10 49 |
| 61 00 ... Notes for disconnecting and connecting battery | 10 49 |

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 54 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 54 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 54 |
| 61 35 ... Notes on ESD protection (Electro Static Discharge) | 9 |
| 17 00 ... Notes for working on cooling system. | 53 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 13 55 56 |
| 2.0 Grease for wheel centring | 44 |

| Operating materials | Used in step |
|---|---|
| Main group 17 | 53 |

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# 28 00 071 Replacing the radial shaft seal on the left at the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!

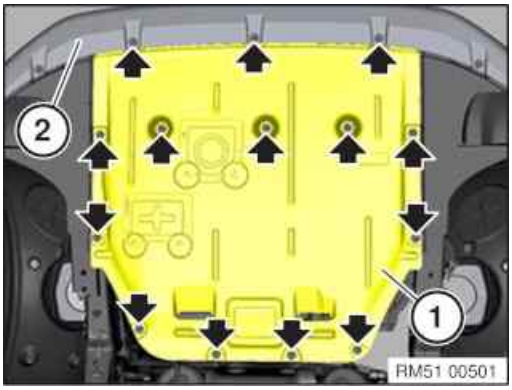
## PRELIMINARY WORK

### 1 – Disconnecting all battery earth leads




- See additional information.

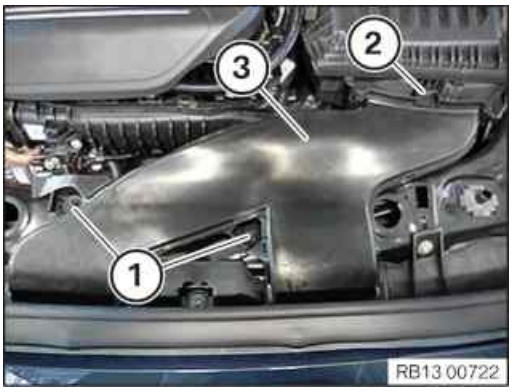
### 2 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

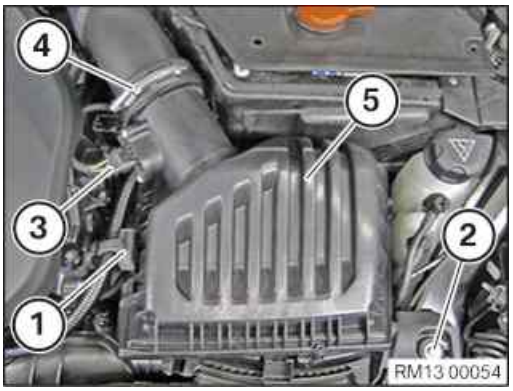
### 3 – Remove the intake neck for intake silencer housing

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- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**4 – Removing intake silencer housing**




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

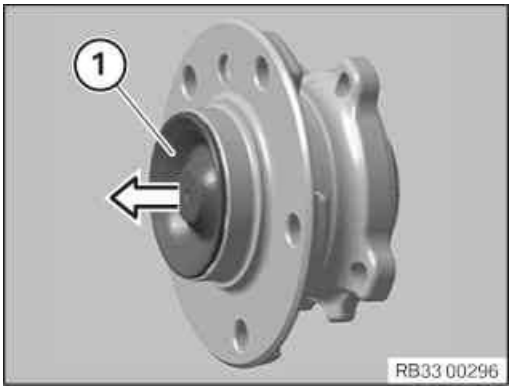
**5 – Removing the wheel**




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

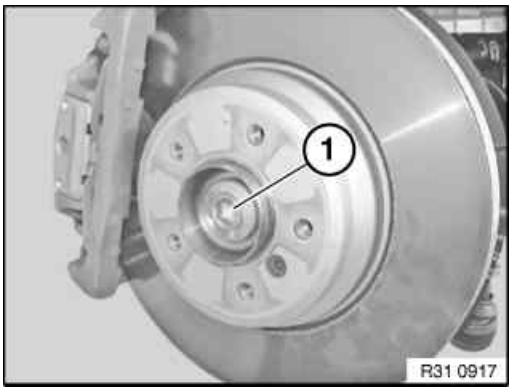
  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**6 – Remove left output shaft**

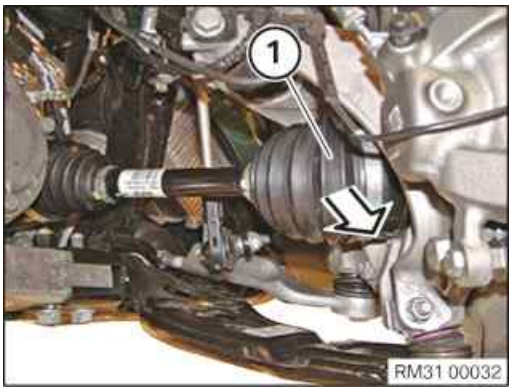



- If necessary, lever off the protective cap (1).

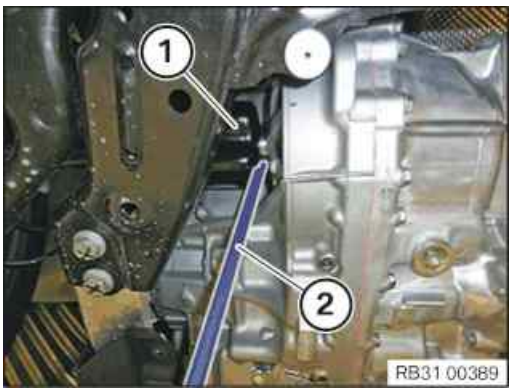
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- Press the brake pedal to the floor to unscrew the collar bolt (1).




- Turn steering wheel to left.
- Pull the output shaft (1) out toward the front.




- Protect the output shaft (1) from falling.
- Lever out the output shaft (1) with a mounting lever (2) from the transmission.
- Remove output shaft (1).

## MAIN WORK

### 7 – Removing the left radial shaft seal on the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

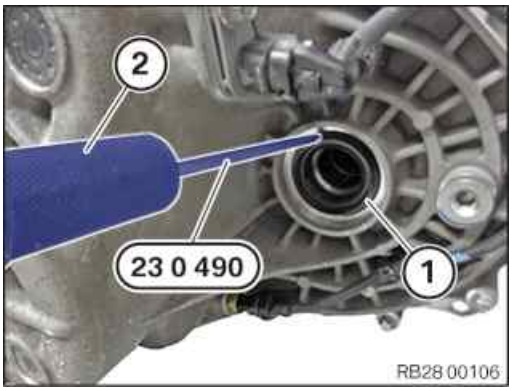
**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

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**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!




**TECHNICAL INFORMATION**

Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drill a hole in the radial shaft seal (1) using a centre punch.
- Screw special tool **0 491 454 (23 0 490)** in the radial shaft seal (1).
- Drive out radial shaft seal (1) with the impact weight (2).

### 8 – Installing the left radial shaft seal on the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.




- Coat sealing lips of radial shaft seal with transmission oil.
- Drive in radial shaft seal using the special tool **2 409 230** into the transmission housing.

  The sealing ring must close flush with the transmission housing.

## POSTPROCESSES

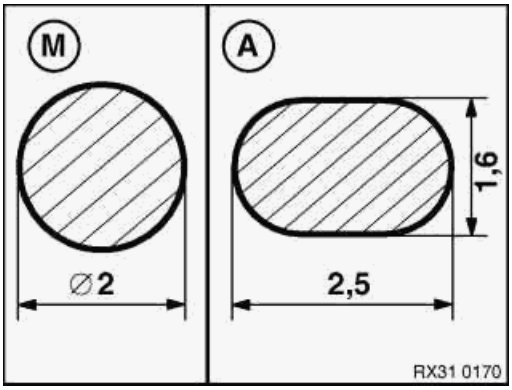
### 9 – Install left output shaft

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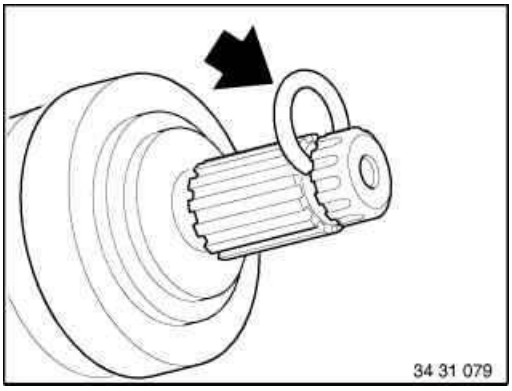

- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).

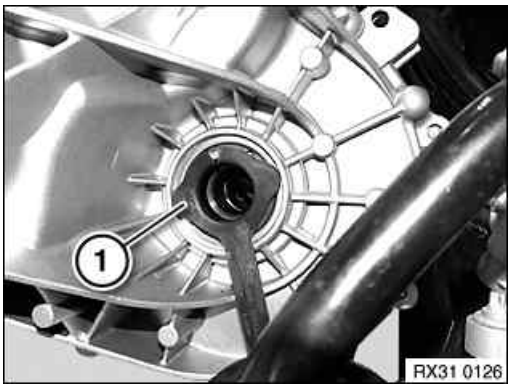



- Do not mix up circlips.

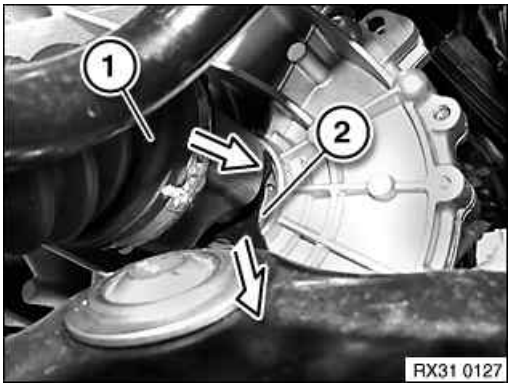
  Different types of output shafts fitted:
  - M: Manual transmission
  - A: Automatic transmission




- Renew circlip (arrow).




- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.



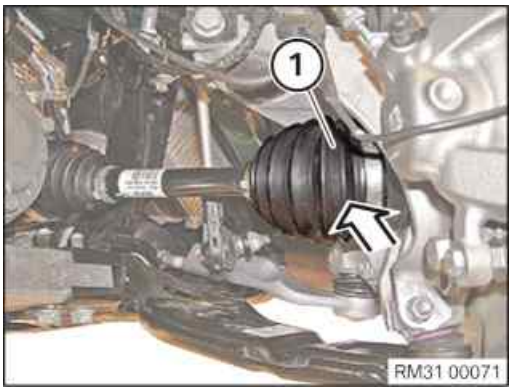

- Insert output shaft (1) into transmission.

**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

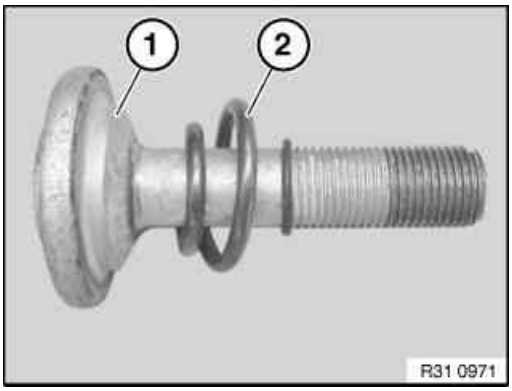
- **Manual gearbox only:** Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.

  The output shaft (1) must engage audibly.
- Check for secure seat by levering.

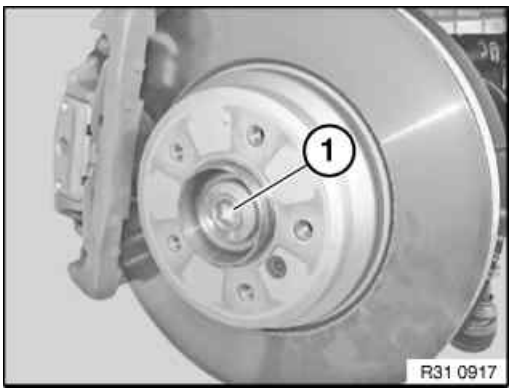
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- Turn steering wheel to left.
- Insert the output shaft (1) into the swivel bearing from the front.

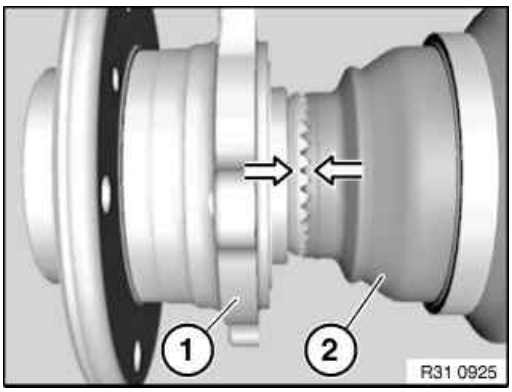



- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.




- Renew collar bolt (1) with compression spring.

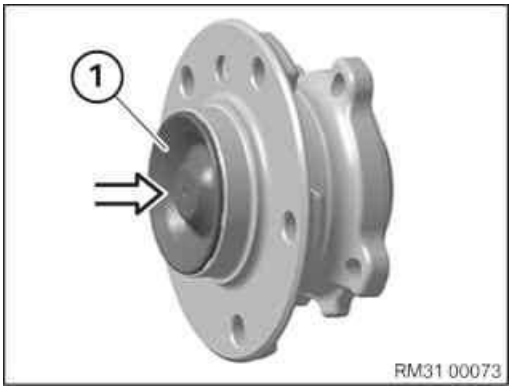
  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.




- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- When positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

**Output shaft to wheel bearing**

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |




- If necessary, attach protective cap (1).

**10 – Mounting the wheel**

▸ **Clean the contact surfaces between the brake disc and the wheel rim**

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**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

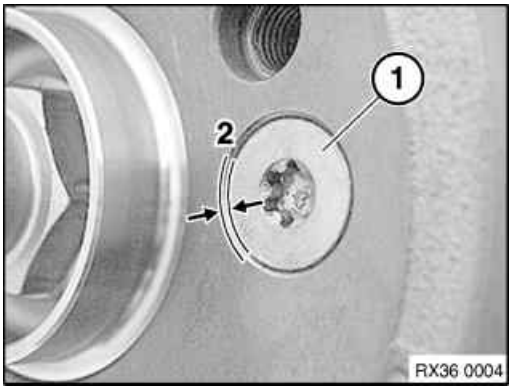
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

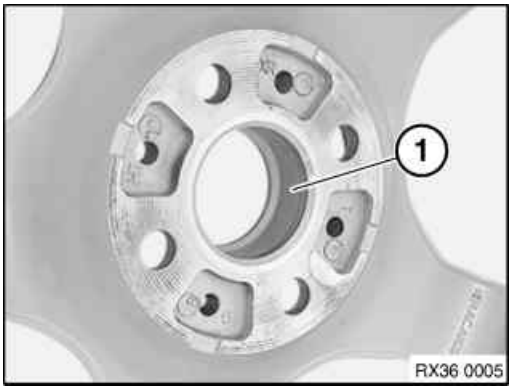
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

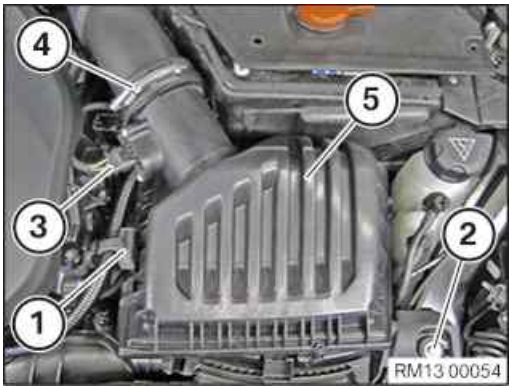
- Renew corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

## 11 – Installing intake silencer housing




- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

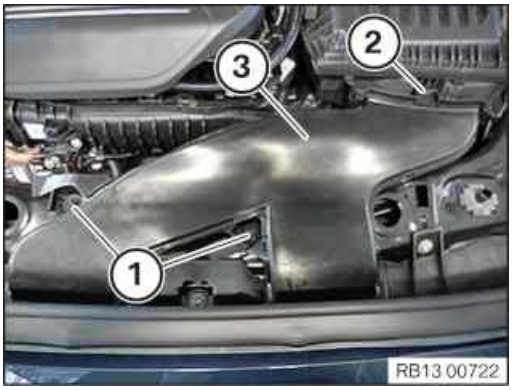
| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

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### 12 – Install the intake neck for the intake filter housing



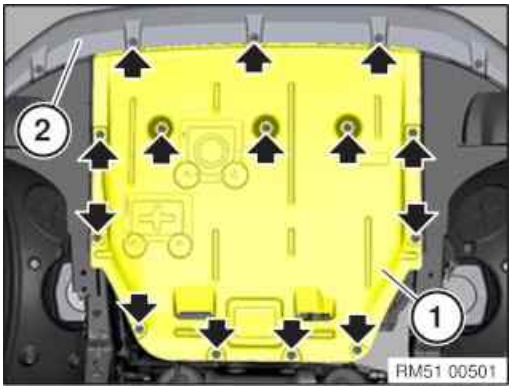

- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 13 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 14 – Disconnecting all battery earth leads




- See additional information.

## Additional Information

## Overview of Tightening Torques

**Output shaft to wheel bearing** Used in step 9

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |

**Brake disc to rear wheel hub** Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub** Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

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### Wheel bolts

Used in step 10

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

### Intake silencer housing to lock bridge

Used in step 11

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

### Clean air pipe to intake silencer housing

Used in step 11

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

### Intake neck to cross connection

Used in step 12

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

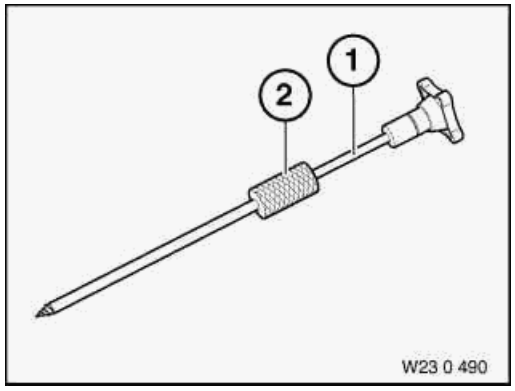
### Underbody protection front

Used in step 13

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

### 0 491 454 (23 0 490) Puller




#### Common

Used in step 7

| | |
|---|---|
| Usage | For removing shaft seal |
| Included in the tool or work | |
| Storage location | A13 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 15 96 (106) |

#### Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 491 455 (23 0 491) | | **Rod**<br>With self-tapping screw<br>Deletion, only available via tool set | |
| 2 | 0 491 456 (23 0 492) | | **Weight**<br>(Weight) | |

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### 2 409 230 Mandrel




| Common | Used in step 8 |
|---|---|
| Usage | For installing the rear-wheel drive of Transmission output shaft le./ri. silhouette foil is contained in delivery specification. Further information on the contour-graphic silhouette foil is included in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A75 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 56 14 (214) |

### 2 344 011 Tool




| Common | Used in step 10 |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

## Replacement tools:

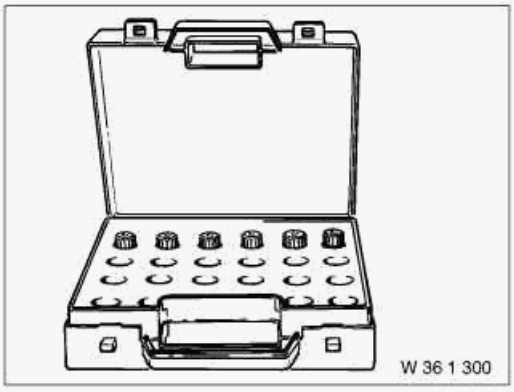
### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

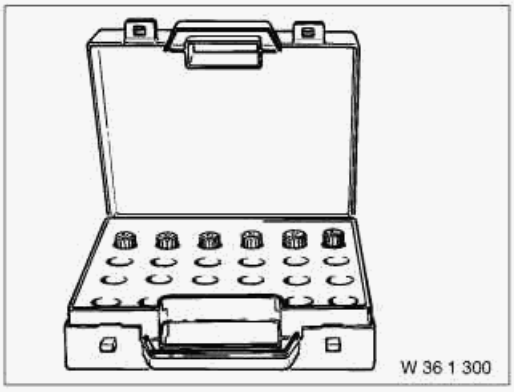
### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

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| | | |
|---|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 14 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |

| Operating materials | Used in step |
|---|---|
| 2.0 Grease for wheel centring | 10 |

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# 28 00 070 Replacing the radial shaft seal on the right at the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!

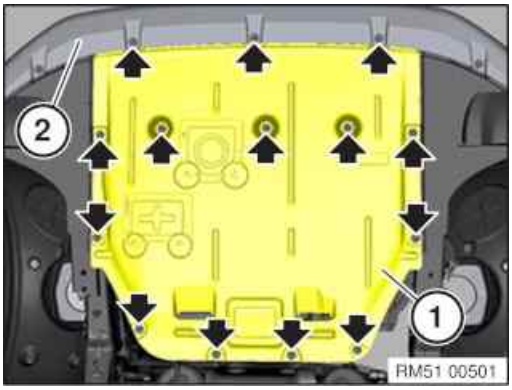
## PRELIMINARY WORK

### 1 – Disconnecting all battery earth leads




- See additional information.

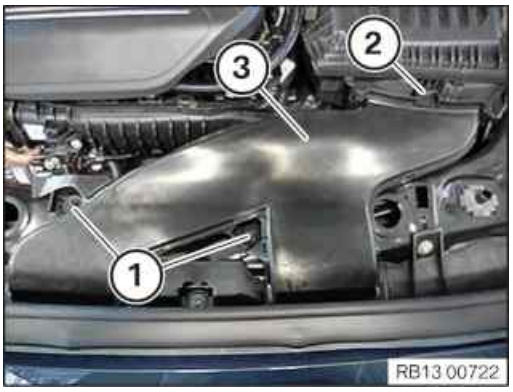
### 2 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

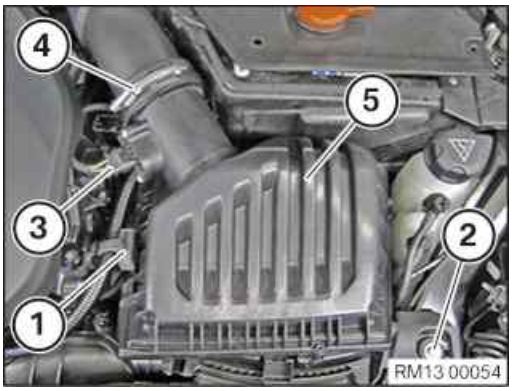
### 3 – Remove the intake neck for intake silencer housing

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- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**4 – Removing intake silencer housing**




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

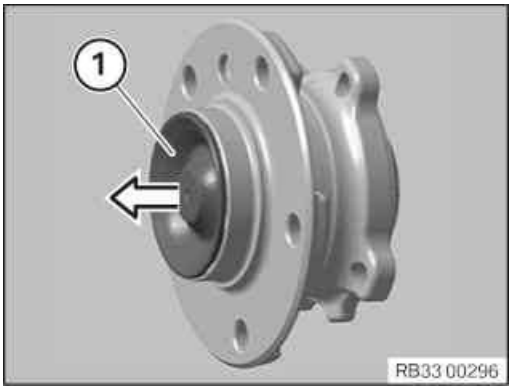
**5 – Removing the wheel**




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

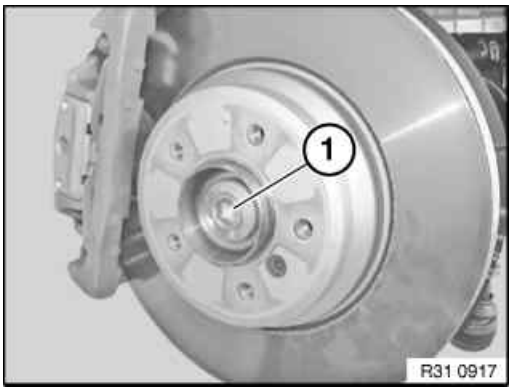
  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**6 – Remove right output shaft**

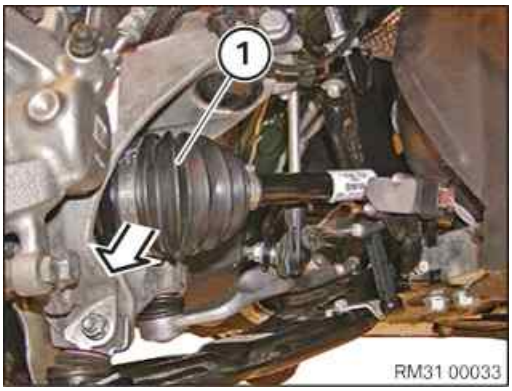



- If necessary, lever off the protective cap (1).

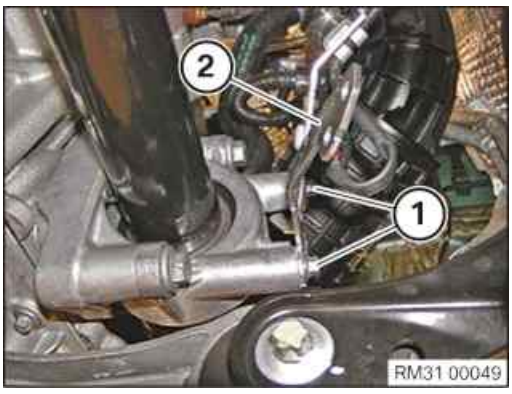
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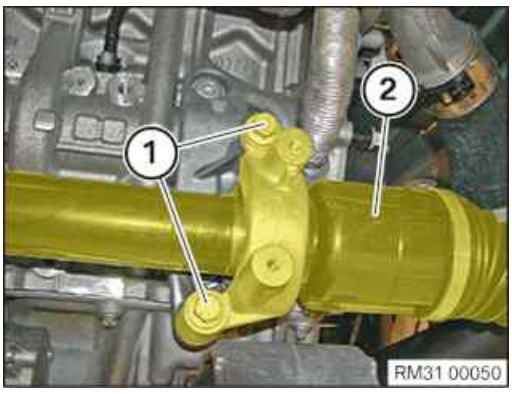

- Press the brake pedal to the floor to unscrew the collar bolt (1).




- Protect the output shaft (1) from falling.
- Turn steering wheel to right.
- Pull the output shaft (1) out.




- If necessary, unscrew the bolts (1) and remove the holder (heat shield) (2).




- Loosen screws (1).
- Pull the output shaft (2) out of the transmission and remove it sideways.
- Remove output shaft (1).

## MAIN WORK

### 7 – Removing the right radial shaft seal on the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!




**TECHNICAL INFORMATION**

Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drive a hole into the radial shaft seal (1) using a centre punch.
- Screw the special tool **0 491 454 (23 0 490)** into the radial shaft seal (1).
- Drive out the radial shaft seal (1) with the impact weight (2).

### 8 – Installing the right radial shaft seal on the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

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- Coat sealing lips of radial shaft seal with transmission oil.
- Drive the radial shaft seal into the gearbox housing using the special tool **2 409 230**.

  The sealing ring must lie flush with the gearbox housing.

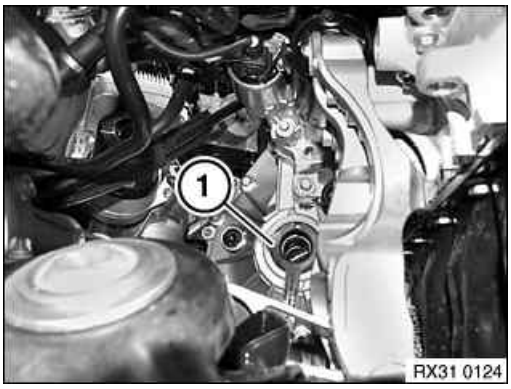
## POSTPROCESSES

### 9 – Install right output shaft

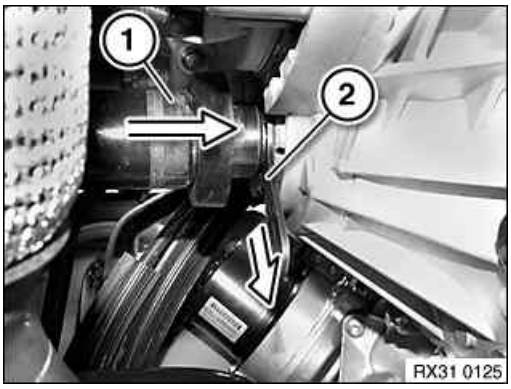



- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).




- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.

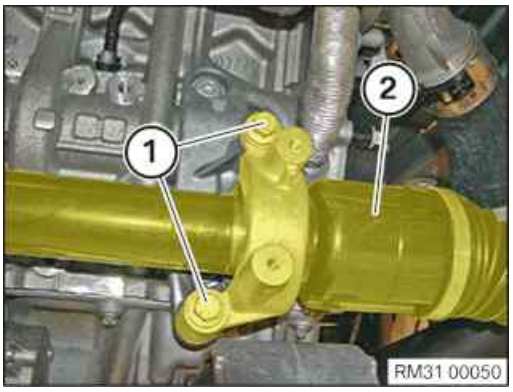



- Insert output shaft (1) into transmission.

**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

- Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.
- Check for secure seat by levering.

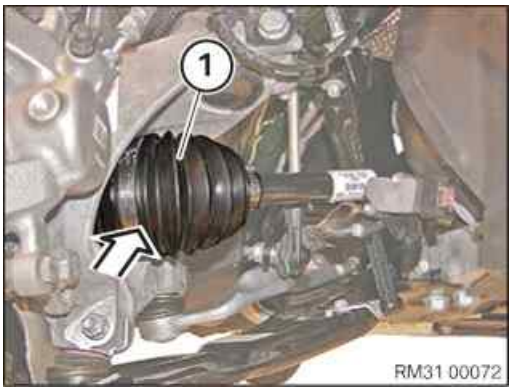
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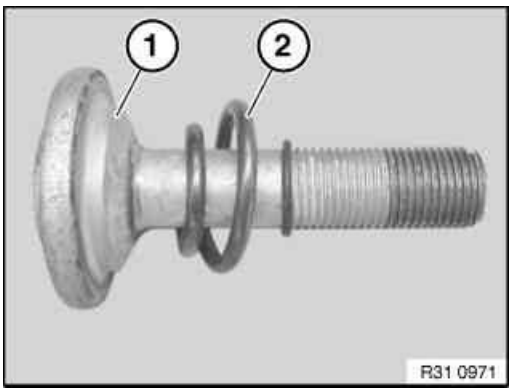

- Tighten the screws (1).

**Output shaft bearing to engine block**

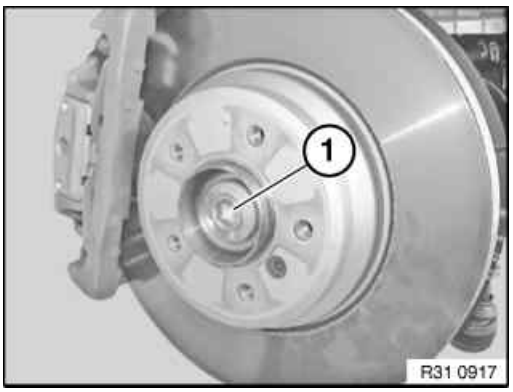
| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |




- Turn steering wheel to right.
- Insert the output shaft (1) into the swivel bearing from the front.

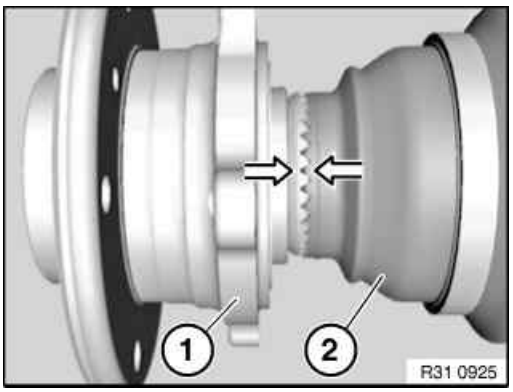



- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.




- Renew collar bolt (1) with compression spring.

  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.

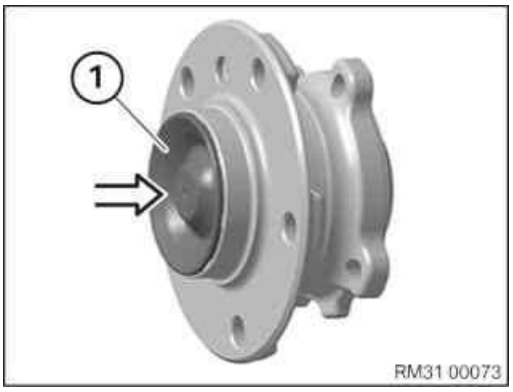



- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- If positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

**Output shaft to wheel bearing**

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |

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- If necessary, attach protective cap (1).

**10 – Mounting the wheel**

▸ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

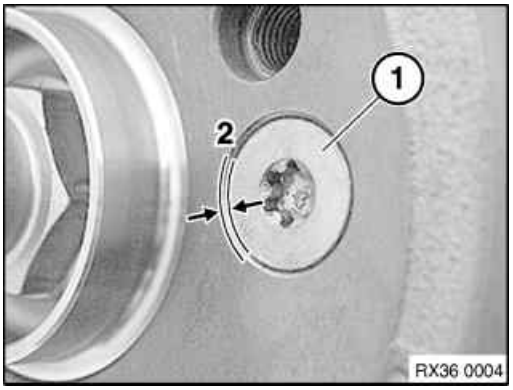
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

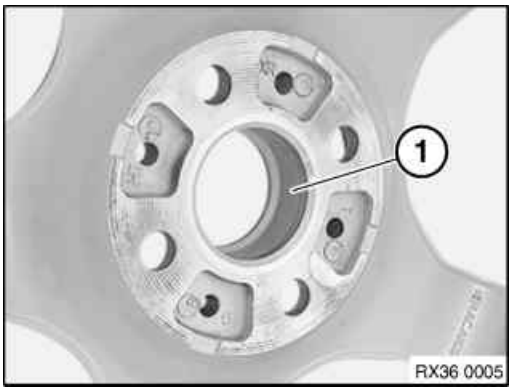
**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

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- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).




**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

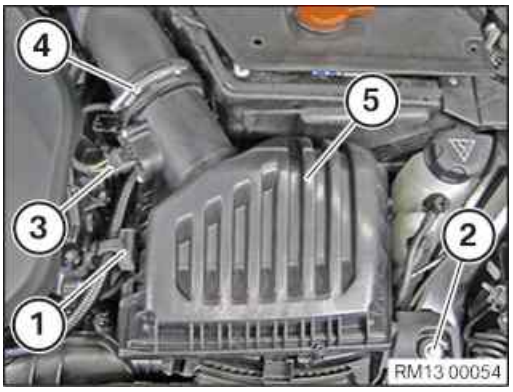
  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

## 11 – Installing intake silencer housing

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- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

- Tighten clamp (4).

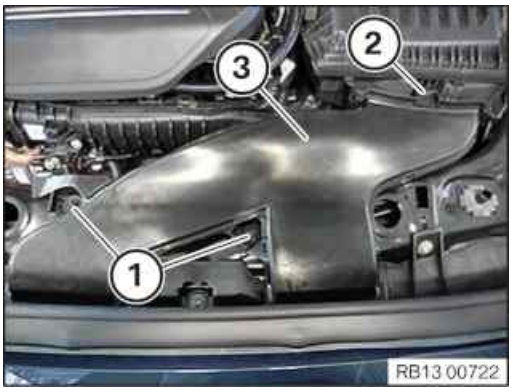
**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 12 – Install the intake neck for the intake filter housing



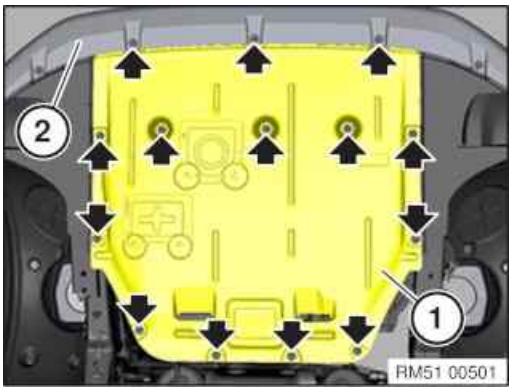

- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 13 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 14 – Disconnecting all battery earth leads




- See additional information.

## Additional Information

### Overview of Tightening Torques

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### Output shaft bearing to engine block

Used in step 9

| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |

### Output shaft to wheel bearing

Used in step 9

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |

### Brake disc to rear wheel hub

Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

### Brake disc to front wheel hub

Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

### Wheel bolts

Used in step 10

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

### Intake silencer housing to lock bridge

Used in step 11

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

### Clean air pipe to intake silencer housing

Used in step 11

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

### Intake neck to cross connection

Used in step 12

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### Underbody protection front

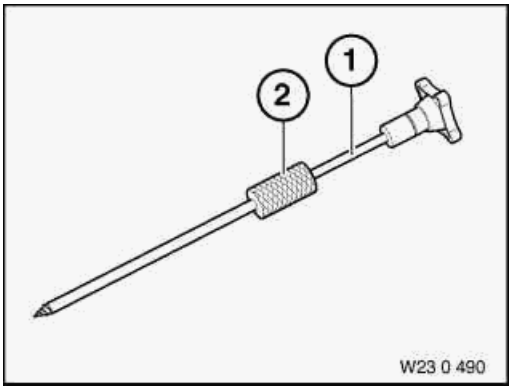
Used in step 13

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

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### 0 491 454 (23 0 490) Puller




**Common** Used in step 7

| | |
|---|---|
| Usage | For removing shaft seal |
| Included in the tool or work | |
| Storage location | A13 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 15 96 (106) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 491 455 (23 0 491) | | **Rod**<br>With self-tapping screw<br>Deletion, only available via tool set | |
| 2 | 0 491 456 (23 0 492) | | **Weight**<br>(Weight) | |

### 2 409 230 Mandrel




**Common** Used in step 8

| | |
|---|---|
| Usage | For installing the rear-wheel drive of Transmission output shaft le./ri. silhouette foil is contained in delivery specification. Further information on the contour-graphic silhouette foil is included in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A75 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 56 14 (214) |

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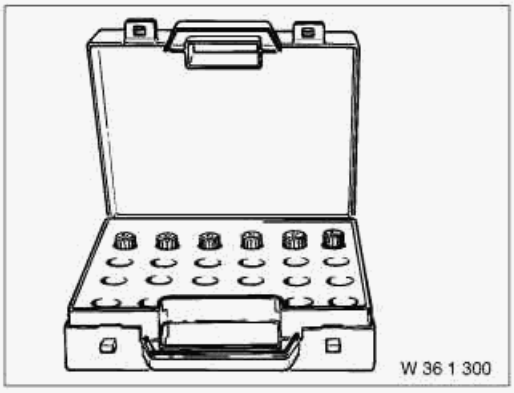
### 2 344 011 Tool




| Common | Used in step 10 |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

## Replacement tools:

### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

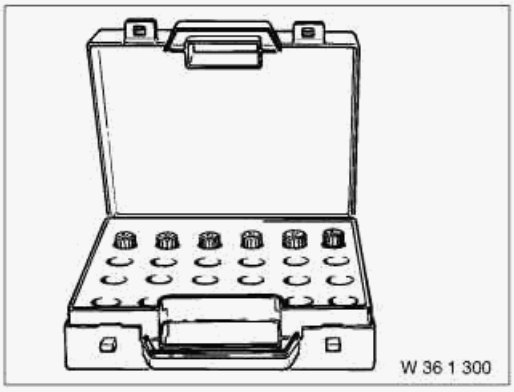
### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 227 (36 1 329) Wheel stud



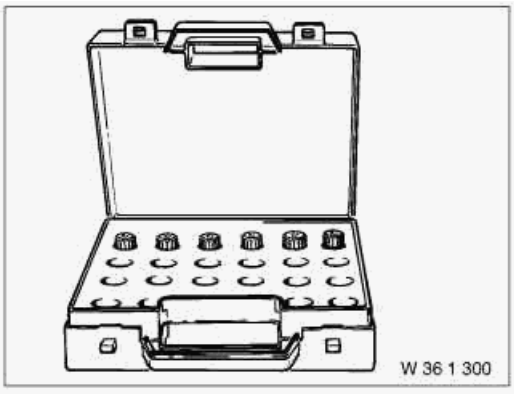

| Common | Used in step 5 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

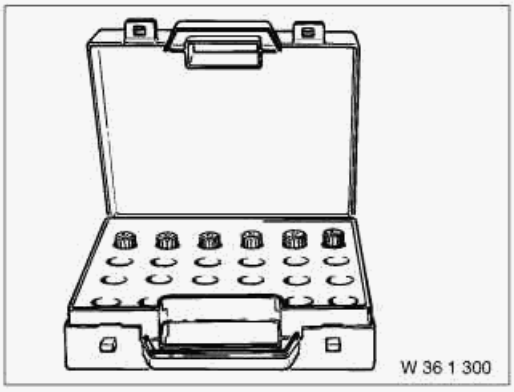
### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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**0 495 230 (36 1 333) Wheel stud**




| Common | Used in step 5 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

| Operating materials | Used in step |
|---|---|
| 2.0 Grease for wheel centring | 10 |

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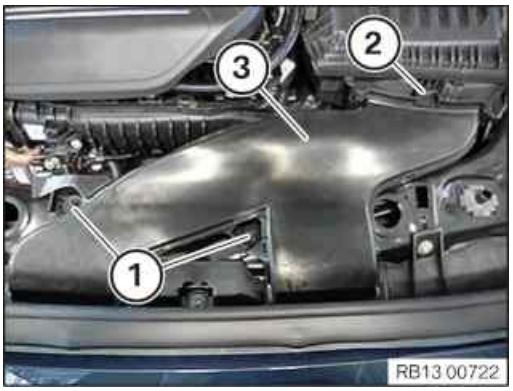
# 28 10 040 Removing and installing/replacing the coolant connection (7DCT300) (left)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the coolant connection.
Hazardous substances!

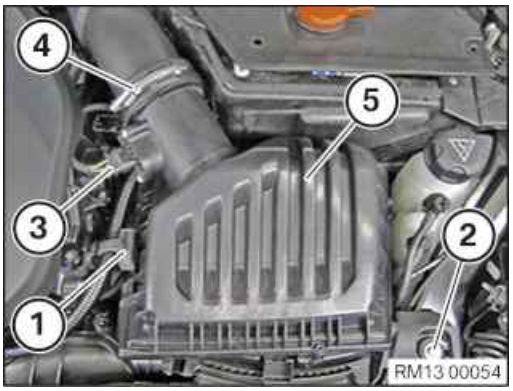
## PRELIMINARY WORK

### 1 – Remove the intake neck for intake silencer housing



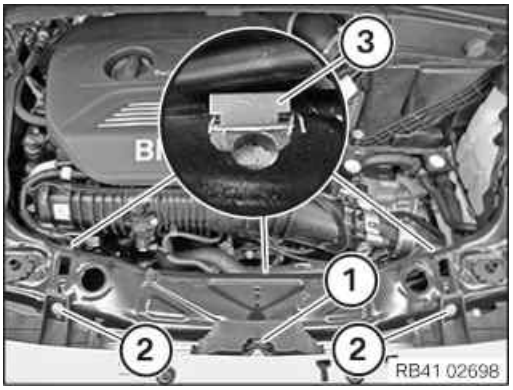

- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

### 2 – Removing intake silencer housing



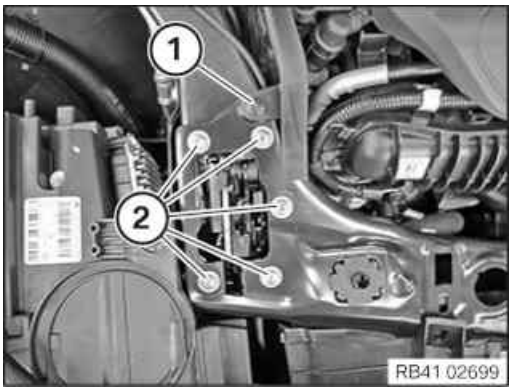

- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

### 3 – Remove cross connection

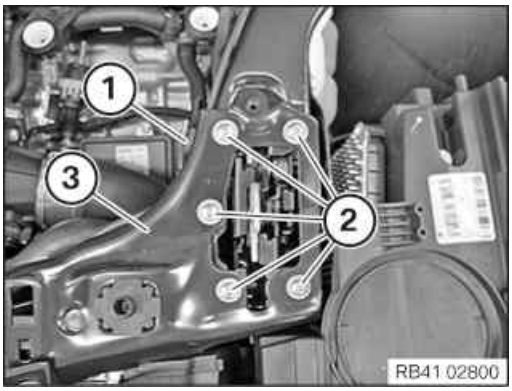



- Loosen screws (1) and (2).
- Detach clamps (3) for bonnet lock Bowden cable.

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- Lever out expanding rivet (1).
- Loosen screws (2).




- Lever out expanding rivet (1).
- Loosen the screws (2) and remove the cross connection (3).

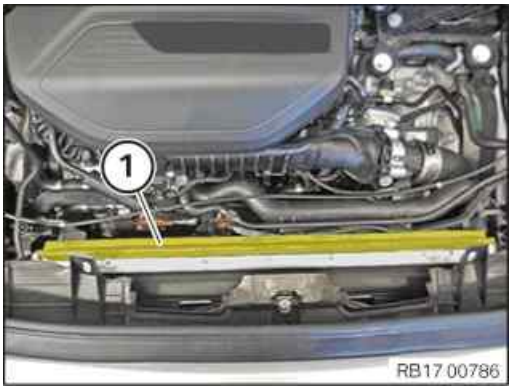
### 4 – Removing the fan cowl with electric fan

**WARNING**

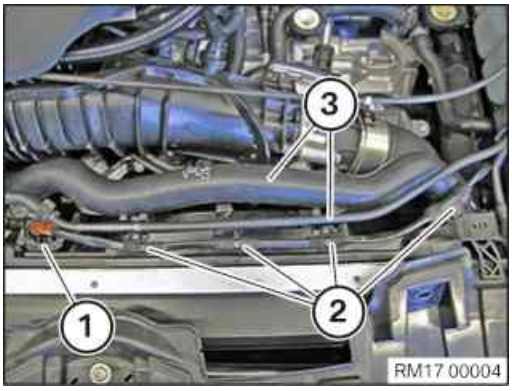
**Hot surfaces.**

**Risk of burning!**

- Perform all work only on components that have cooled down.

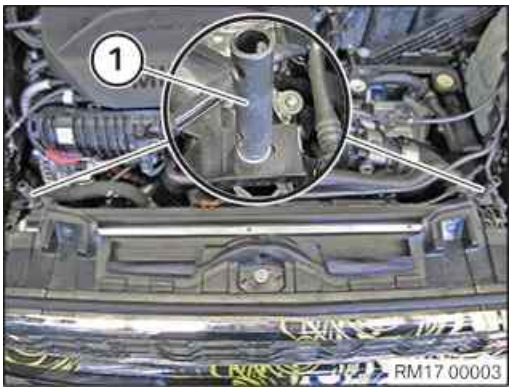



- Feed out and remove the sealing (1) from the radiator.

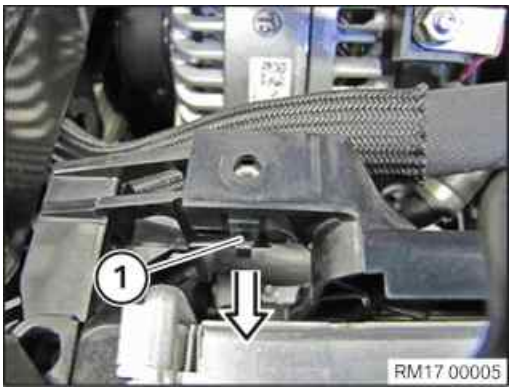



- Unlock plug connection (1) and disconnect.
- Unlock and loosen the clamps (2).
- Feed out connector (1) and place to one side.
- Thread off coolant line (3) and place to the side.

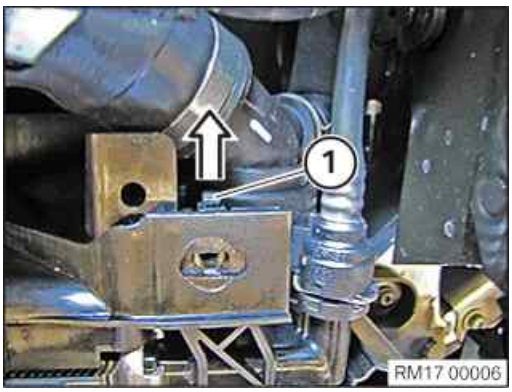
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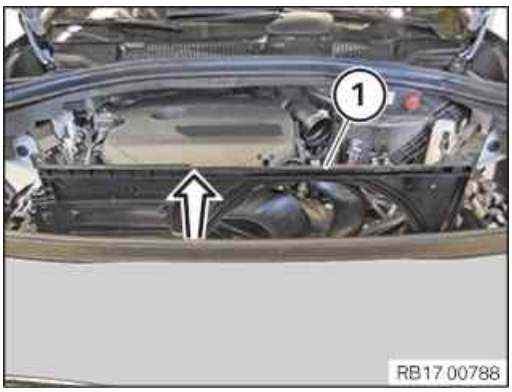

- Loosen screws (1).




- Unlock the right lock (1) on the fan cowl in the direction of the arrow.

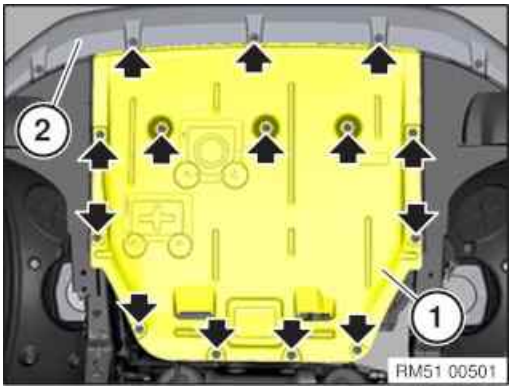



- Unlock the left lock (1) on the fan cowl in the direction of the arrow.




- Guide out fan cowl (1) in direction of arrow and remove.

**5 – Removing the front underbody protection**




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

**6 – Draining coolant**

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**WARNING**

**Hot fluids.**

**Risk of scalding!**

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

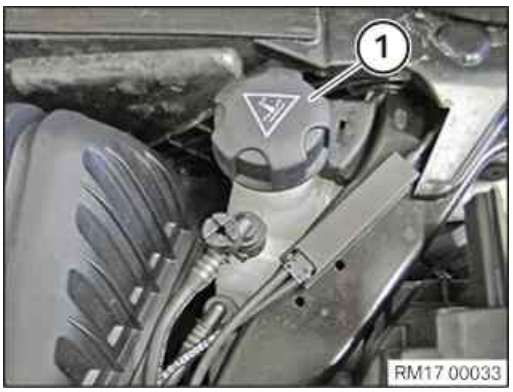
Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

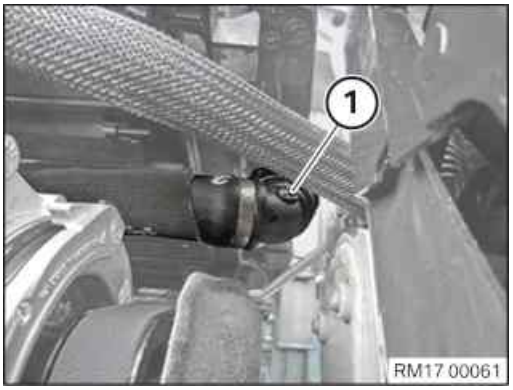
In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

**TECHNICAL INFORMATION**

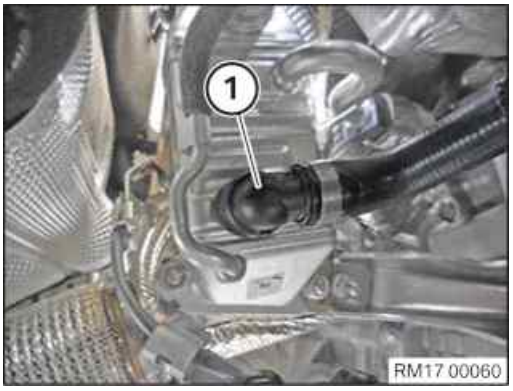
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.




- Loosen sealing cap (1).




- Unlock and disconnect the coolant line (1) from the radiator on the right.
- Catch and dispose of escaping coolant.




- Unlock and pull off the coolant line (1) from the low pressure exhaust-gas recirculation cooler on the diesel particulate filter.
- Catch and dispose of escaping coolant.

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### 7 – Installing the coolant connection (7DCT300)

**CAUTION**

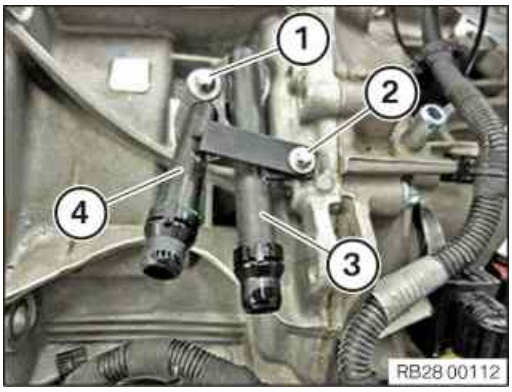
**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the coolant connection.
Hazardous substances!




- Loosen screw (1).
- Loosen screw (2).
- Remove coolant lines (3) and (4).

### 8 – Installing coolant connection (7DCT300)

**CAUTION**

**Materials harmful to health.**

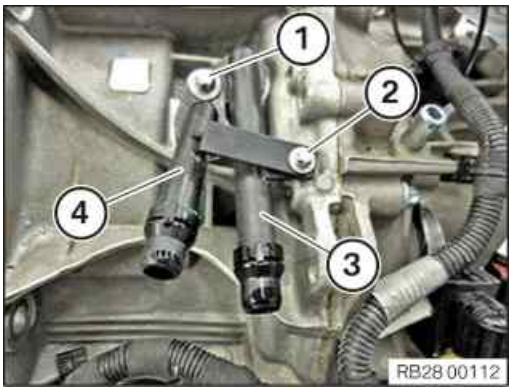
**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the coolant connection.
Hazardous substances!

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- Install coolant line (3) till the limit position.
- Install coolant line (4) till the limit position.
- Renew screws (1) and (2).

  **Parts:** Bolts
- Tighten down screws (1) and (2).

**Coolant connections to transmission**

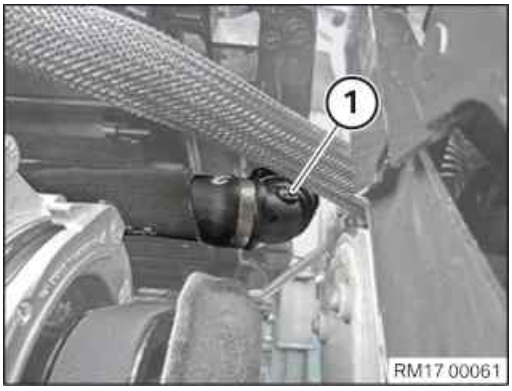
| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 6 Nm |
| M8 | | Tightening torque | 19 Nm |

## POSTPROCESSES

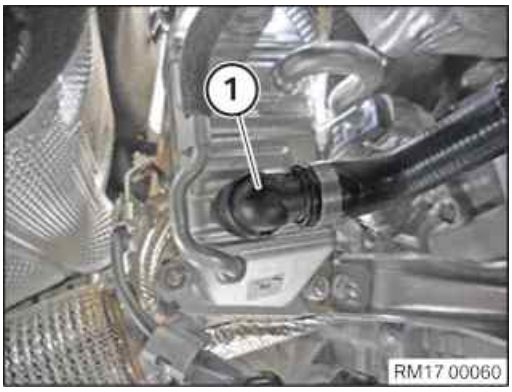
### 9 – Connect the coolant line

**TECHNICAL INFORMATION**

Make sure that the connections are locked correctly. The locks must engage audibly.




- Connect the right coolant line (1) to the radiator and lock audibly.



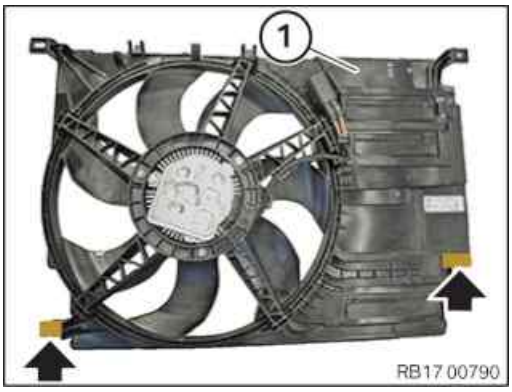

- Connect the coolant line (1) to the low pressure exhaust-gas recirculation cooler on the diesel particulate filter and lock audibly.

### 10 – Installing fan cowl with electric fan

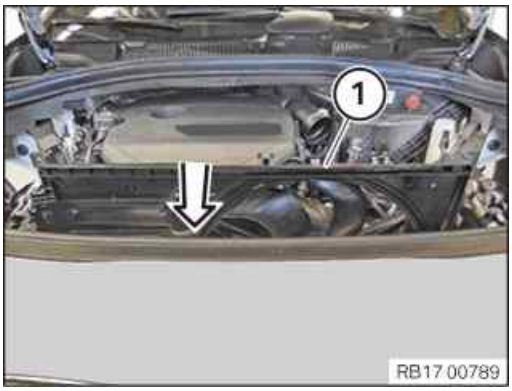
**TECHNICAL INFORMATION**

Make sure that the connections are locked correctly. The locks must engage audibly.

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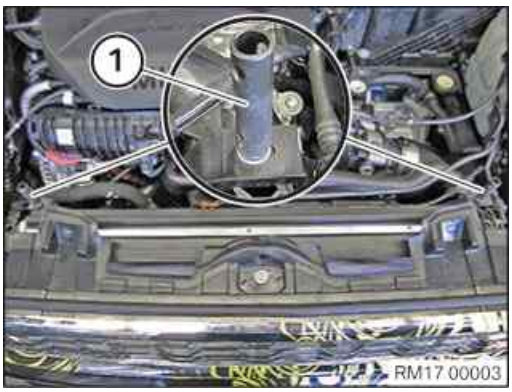

- Feed the guides (arrows) of the fan cowl (1) into the charge air cooler.




- Feed in and install the fan cowl (1) in the direction of the arrow.



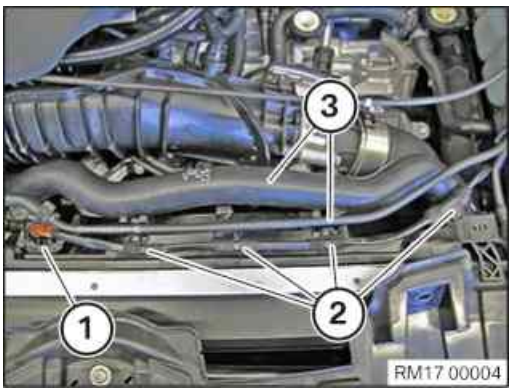

- Lock the left and right locks (arrows).




- Tighten the screws (1).

**Fan cowl on radiator**

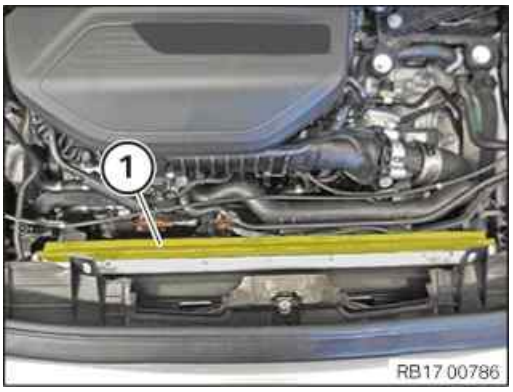
| | | | |
|---|---|---|---|
| M6X12 | | Tightening torque | 6 Nm |




- Connect connectors (1) and lock.

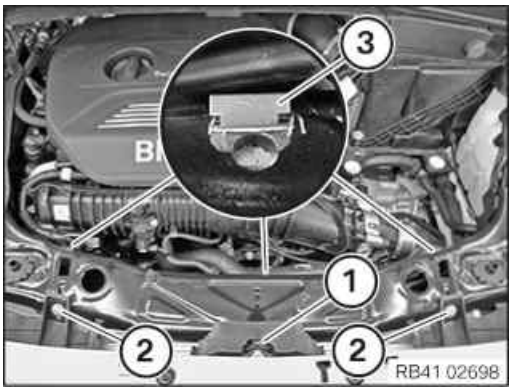
  The connector (1) must engage audibly.
- Secure clamps (2).
- Thread in and install coolant line (3).

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- Guide the sealing (1) on the radiator in and install it.

**11 – Install cross connection**




- Install cross connection.
- Position all screws.
- Tighten down screw (1).

**Bracing strut to top cross connection**

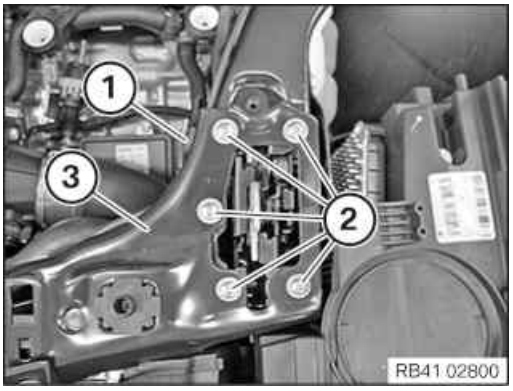
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

- Tighten down screws (2).

**Air duct to deformation element/cross connection**

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

- Fasten clamps (3) for bonnet lock Bowden cable to cross connection.

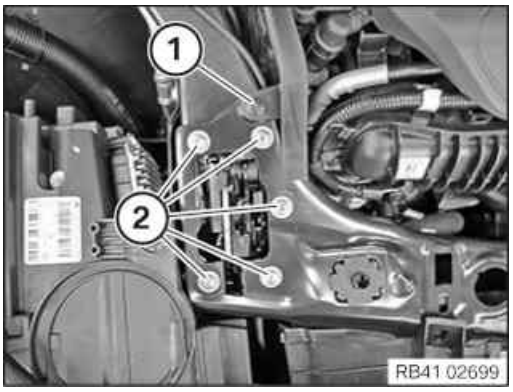



- Tighten screws (2) of cross connection (3).

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).




- Tighten down screws (2).

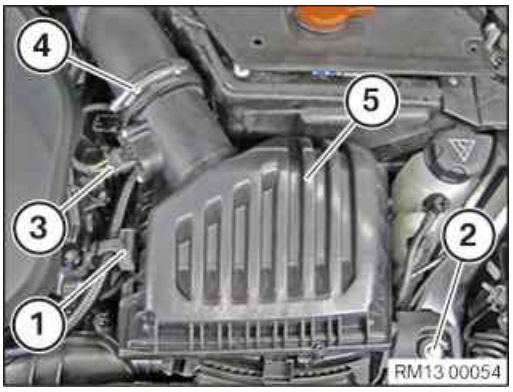
**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).

**12 – Installing intake silencer housing**

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- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

- Tighten clamp (4).

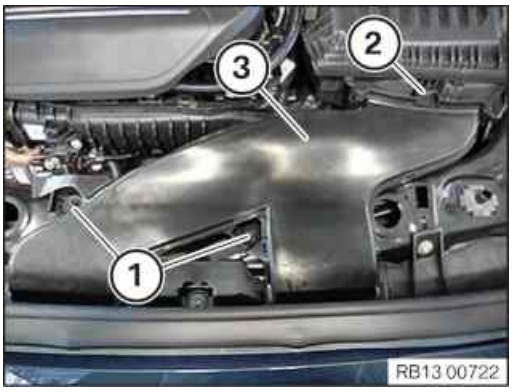
**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 13 – Install the intake neck for the intake filter housing



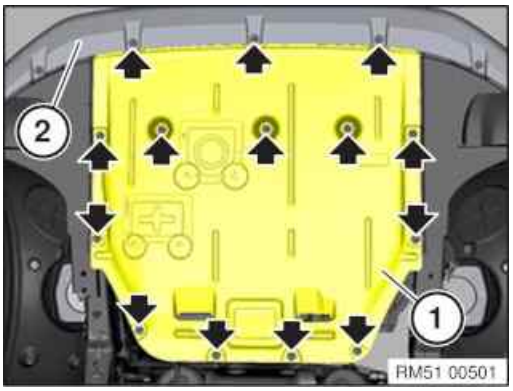

- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 14 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

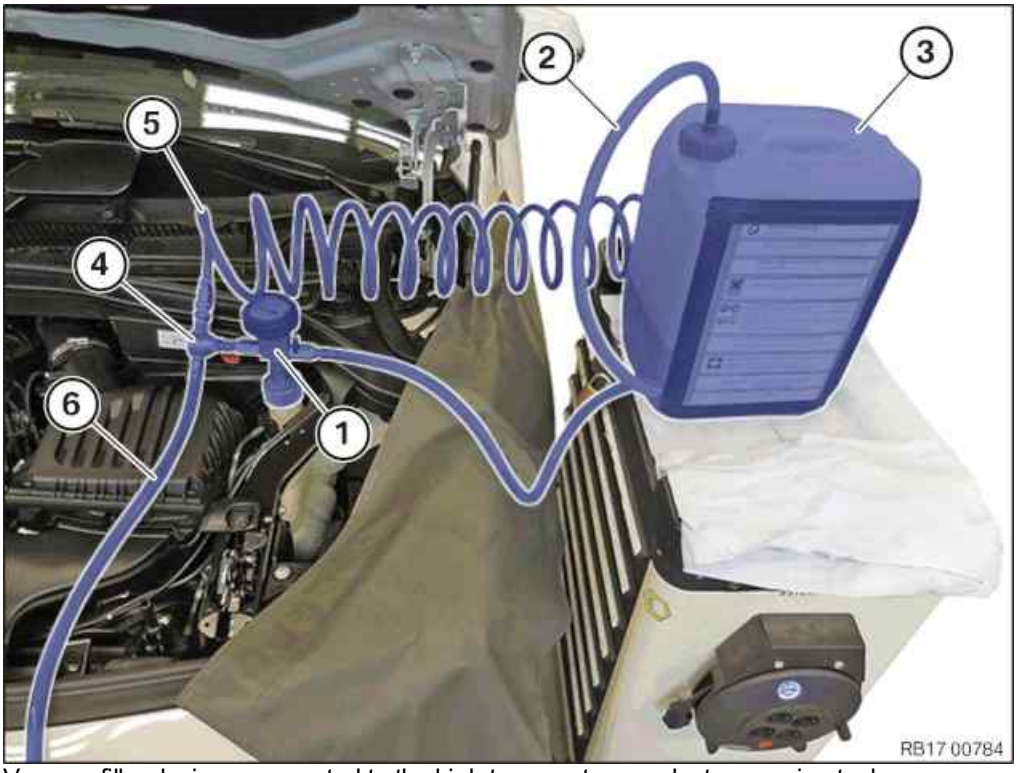
**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 15 – Filling the coolant circuit by means of the vacuum filler device

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**Vacuum filler device**




Vacuum filler device - connected to the high-temperature coolant expansion tank

**1 Vacuum filler device with pressure gauge and shutoff valves**

**2 Filling hose**

**3 Fluid tank with coolant**

**4 Venturi nozzle**

**5 Compressed air connection (maximum 6 bar)**

**6 Out-going hose (lead out-going hose into a collecting vessel)**

**Prerequisite**

The coolant expansion tank for the cooling system must be empty. The fluid tank of the vacuum filler device must have a sufficient quantity of premixed coolant, 1 l to 2 l more than the specified capacity for the vehicle. The fluid tank of the vacuum filler device must be positioned at the same height as the coolant expansion tank. The compressed air connection must have a pressure of 6 bar. Ignition is switched off.

**TECHNICAL INFORMATION**

Follow notes for repair work on the cooling system.

For additional information see:

Main group 17

17 00 ... Notes for working on the cooling system

**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

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**TECHNICAL INFORMATION**

Filling **without** the vacuum filler device (watering can filling) is **not permitted**.

Non-compliance will result in danger of component damage and/or engine damage.

Filling specification **absolutely must** be adhered to.

The operation of the vehicle is not permitted unless the filling procedure has been completed. Otherwise, functional limitations (degradation) and/or overheating may occur.

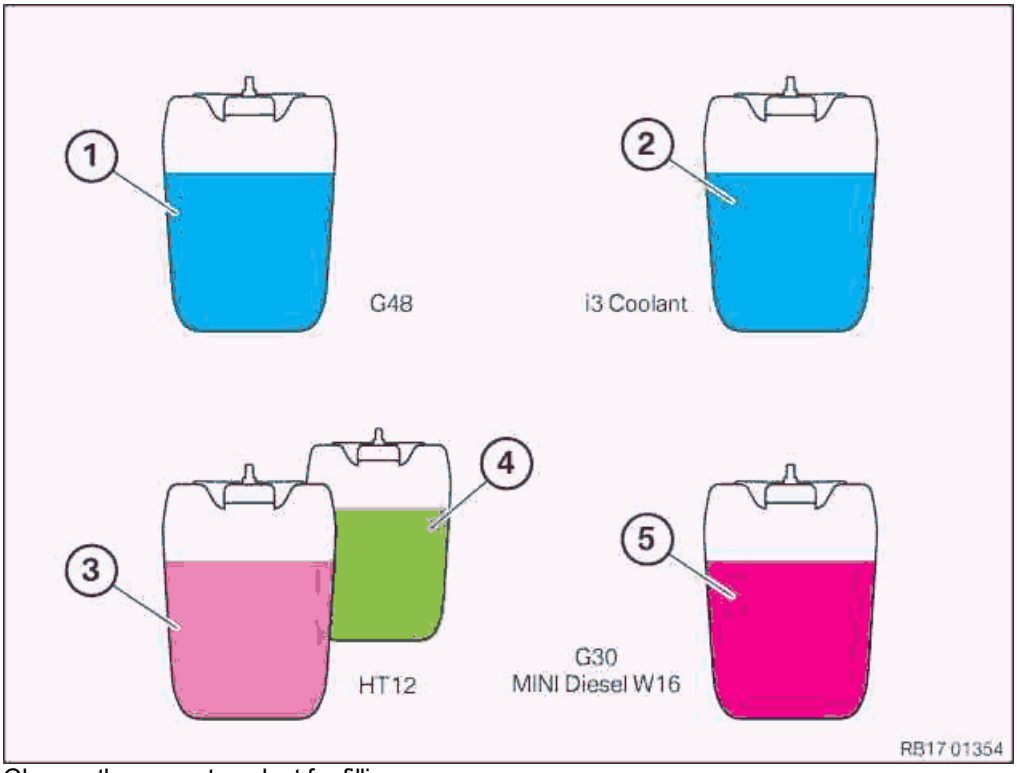
A bleeding procedure is required after a part has been exchanged in the cooling system and/or after refilling the cooling system.

**TECHNICAL INFORMATION**

Make sure that the ignition (terminal 15) is switched off prior to creating the vacuum with the vacuum filler device.

▸ **Observe the coolant type**

**Coolant in the vacuum filler device container**




Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

**1. G48 (Blue)** G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.

**2. i3 coolant (blue)** is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.

**3. HT12 (Pink)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.

**4. HT12 (Green)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.

**5. G30 (Pink)** must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

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**RISK OF DAMAGE**

**Damage to the engine.**

**The use of an incorrect coolant may lead to corrosion or gelling in the engine.**

- Use only approved coolants for the specific vehicle.
- Fill the vehicle only with the coolant with which it was delivered ex works.
- Mix only compatible coolants. The colour does not allow any assessment about the compatibility of coolants.
- Selection of the correct coolant only by means of the part number.

- Select a suitable adapter (Y) from the set of special tools **0 494 417 (17 0 100)**:

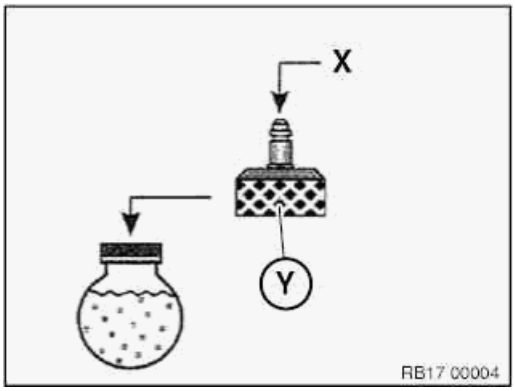
| Type | Engine | Adapter (Y) from 17 0 100 |
|---|---|---|
| F39/F45/F46/F48 | B46/B48/B38/B47/B37 | 17 0 109 |

- The fluid tank of the vacuum filler device must be filled with 1 l to 2 l more than the specified capacity of coolant for the vehicle.

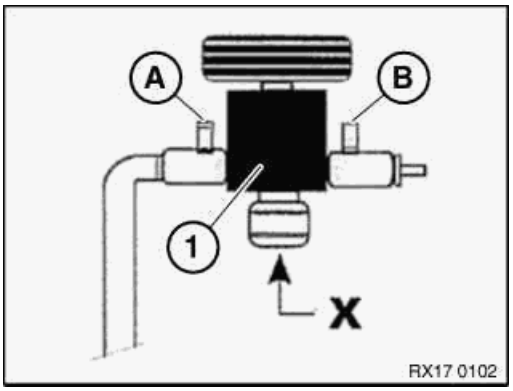
**Coolant capacity**

| | |
|---|---|
| B37C15/K/U1 | 6 l |

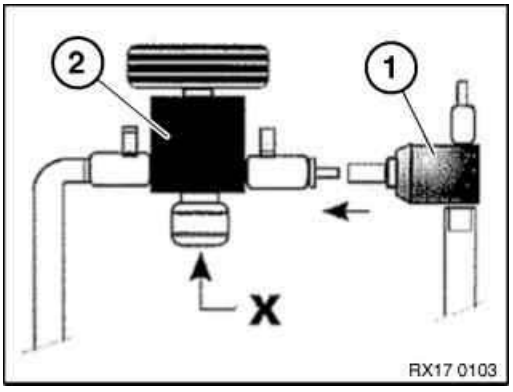
Expendable materials: Technically suitable antifreeze and corrosion inhibitor




- Connect the selected adapter (Y) to the coolant expansion tank.
- Connect vacuum filler device to connection (X) of the adapter.



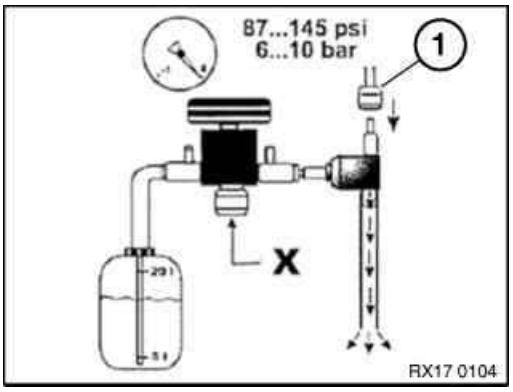

- Make sure that the shutoff valves (A) and (B)of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.




- Connect Venturi nozzle (1) to the vacuum filler device (2).

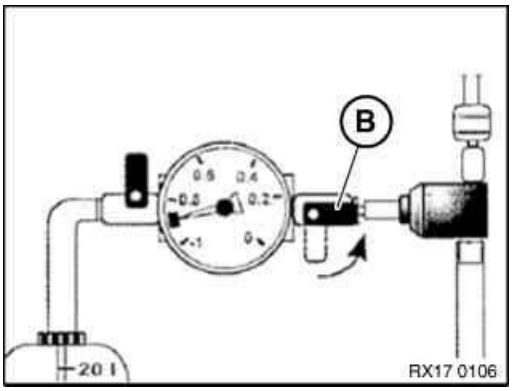
  (X)is the connection on the coolant expansion tank.

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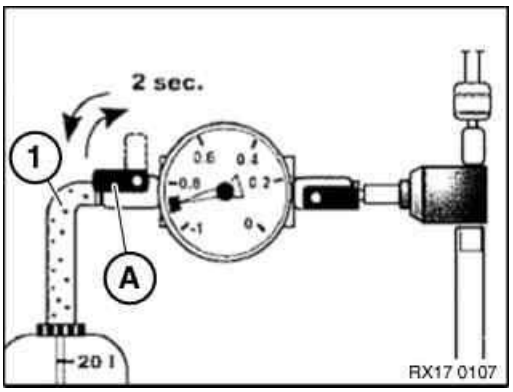

- Connect compressed air (1).

  (X) is the connection to the coolant expansion tank.



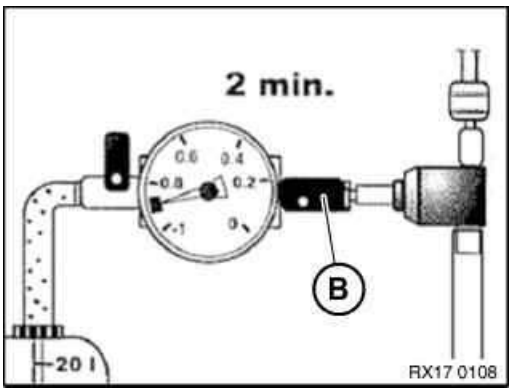

- Open shut-off valve (B).

  The venturi nozzle produces a flow noise.




- Open shutoff valve (A) until the fuel filling hose (1) is full without bubbles.
- Close shutoff valve (A) again.

» The filling hose (1) has now been bled.

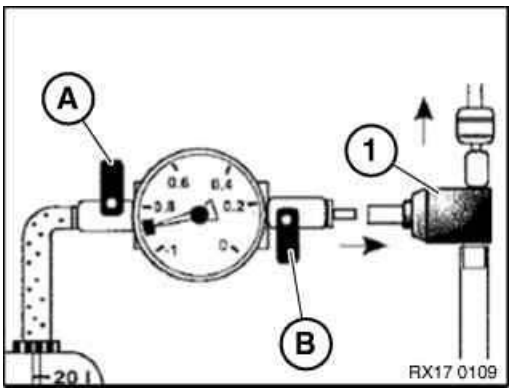



- Check the coolant hoses for porosity and renew porous coolant hoses as required.

**TECHNICAL INFORMATION**

The coolant hoses contract during vacuum build-up.

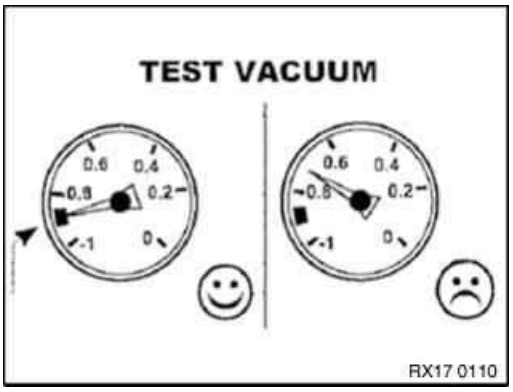
- After a vacuum of -0.7 to -0.95 bar has been reached in the coolant circuit (duration approximately 2 minutes), close the shutoff valve (B).




- Check whether the shut-off valves (A) and (B) are closed.
- Disconnect the Venturi nozzle (1).

**Check**

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- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

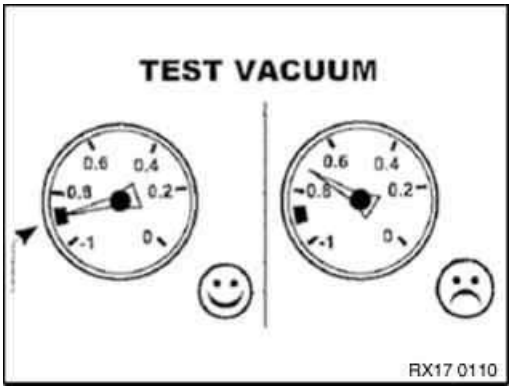
**Result**

» Vacuum drops.

**Measure**

- Look for the leak, repair it and start the filling procedure from the beginning.

**Check**



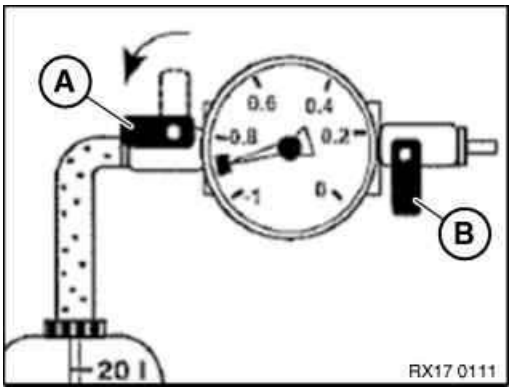

- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

**Result**

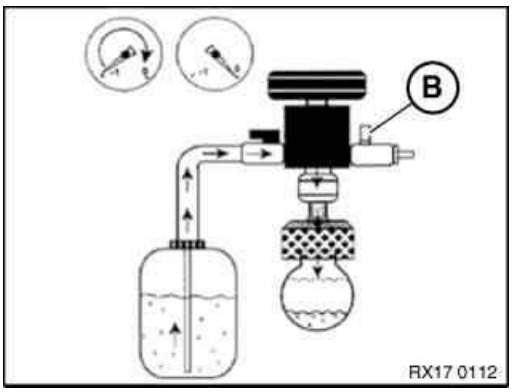
» Vacuum remains constant.

**Measure**

- Continue with filling.

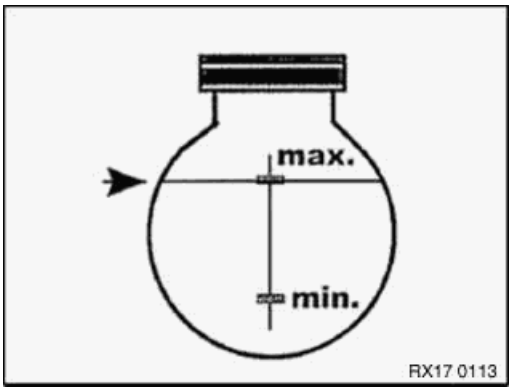



- Keep shutoff valve (B) closed during the filling process.
- To fill the cooling system, open the shutoff valve (A) to the fluid tank of the vacuum filler device.




- Stop the filling procedure when the needle in the pressure measuring device is on 0 bar or it no longer drops.
- If necessary, reduce remaining vacuum. In order to do so, open shutoff valve (B).

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- Remove the vacuum filler device with the adapter from the coolant expansion tank.
- Adjust the coolant level to 700 ml above the maximum mark.
- After filling the cooling system with the vacuum filler device perform the cooling system bleeding routine additionally.

**16 – Vent cooling system**

**TECHNICAL INFORMATION**

Filling **without** the vacuum filler device (watering can filling) is **not permitted**.

Non-compliance will result in danger of component damage and/or engine damage.

Filling specification **absolutely must** be adhered to.

The operation of the vehicle is not permitted unless the filling procedure has been completed. Otherwise, functional limitations (degradation) and/or overheating may occur.

A bleeding procedure is required after a part has been exchanged in the cooling system and/or after refilling the cooling system.

- Fill the coolant circuit with the vacuum filler device.
- Remove the vacuum filler device from the coolant expansion tank.
- Adjust the filling level in the coolant expansion tank to the maximum mark.
- The sealing cap on the coolant expansion tank must remain **open**.
- With automatic transmission: Select the selector lever position P (Park) and operate the parking brake.
- Switch the ignition on.
- Adjust the heating to **maximum** temperature and adjust the blower to the **lowest** stage.
- Press the accelerator pedal down to the limit position for 10 seconds.
- Start engine and run at idle speed.

  The electrical valve and the electric coolant pump are automatically switched on.
- Continue to top up the filling level in the coolant expansion tank to the maximum mark.
- Leave the engine running at idle for 5 minutes before you continue.

**TECHNICAL INFORMATION**

Carry out the following steps "Press accelerator pedal" and "Hold idle speed" 10 times. Continue to top up the filling level in the coolant expansion tank to the maximum mark.

- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.

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- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Continue to top up the filling level in the coolant expansion tank to the maximum mark.
- Leave the engine running at idle again for 5 minutes before you continue.

**TECHNICAL INFORMATION**

Carry out the following steps "Press accelerator pedal" and "Hold idle speed" 10 times. Continue to top up the filling level in the coolant expansion tank to the maximum mark.

- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
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- Operate the accelerator pedal once to approximately 2000 rpm.
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- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.
- Operate the accelerator pedal once to approximately 2000 rpm.
- Hold idle speed for 10 s.

  The cooling system bleeding routine has finished approximately 10 min after the engine starts.

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- Switch off engine.
- Allow the engine to cool down.
- Adjust the filling level in the coolant expansion tank to the maximum mark.
- Close the sealing cap (1) on the coolant expansion tank.




## Additional Information

### Overview of Tightening Torques

| Coolant connections to transmission | | | Used in step 8 |
|---|---|---|---|
| M6 | | Tightening torque | 6 Nm |
| M8 | | Tightening torque | 19 Nm |

| Fan cowl on radiator | | | Used in step 10 |
|---|---|---|---|
| M6X12 | | Tightening torque | 6 Nm |

| Bracing strut to top cross connection | | | Used in step 11 |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

| Air duct to deformation element/cross connection | | | Used in step 11 |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

| Cross connection on support for cross connection | | | Used in step 11 |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

| Intake silencer housing to lock bridge | | | Used in step 12 |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

| Clean air pipe to intake silencer housing | | | Used in step 12 |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

| Intake neck to cross connection | | | Used in step 13 |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

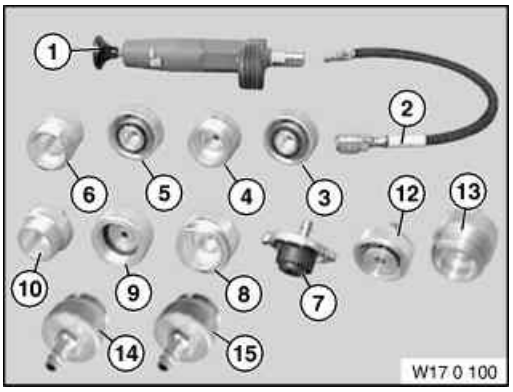
| Underbody protection front | | | Used in step 14 |
|---|---|---|---|
| | | | 3 Nm |

### Overview of Special Tools

**0 494 417 (17 0 100) Tester**

| Common | Used in step 15 |
|---|---|
| Usage | For checking engine cooling system on watertightness.<br>For checking radiator cap. |

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| | |
|---|---|
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 07 02 (884) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 5 | 0 494 422 (17 0 105) | | **Adapter** For radiator cap (sawtooth thread) | |
| 10 | 0 494 427 (17 0 111) | | **Adapter** For radiator cap R53/W11, R50/W17 adapter replaced 17 0 052. | |
| 1 | 0 494 418 (17 0 101) | | **Pump** | |
| 2 | 0 494 419 (17 0 102) | | **Hose** (hose with quick-release coupling) | |
| 3 | 0 494 420 (17 0 103) | | **Adapter** For radiator cap (normal thread) | |
| 4 | 0 494 421 (17 0 104) | | **Adapter** For radiator cap (normal thread) | |
| 6 | 0 494 423 (17 0 106) | | **Adapter** For radiator cap (sawtooth thread) | |
| 7 | 0 494 424 (17 0 107) | | **Adapter** For radiator cap R50 / W10 | |
| 8 | 0 494 425 (17 0 108) | | **Adapter** For radiator cap R50 / W10 | |
| 9 | 0 494 426 (17 0 109) | | **Adapter** For radiator connection R53/W11, R50/W17 adapter corresponds to 17 0 051 | |
| 11 | 0 494 428 (17 0 112) | | **Case** | |
| 12 | 0 494 642 (17 0 113) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 13 | 0 494 643 (17 0 114) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 14 | 0 495 889 (17 0 115) | | **Adapter** For radiator cap Model series: N12, N14 | |

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## Overview Technical Data

| Coolant capacity | Used in step 15 |
|---|---|
| B37C15/K/U1 | 6 l |

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

## Links

| Functional descriptions | Used in step |
|---|---|
| Automated coolant - cooling system bleeding routine | |

| Repair instructions | Used in step |
|---|---|
| 17 00 ... Notes for working on cooling system. | 15 |

| Operating materials | Used in step |
|---|---|
| Main group 17 | 15 |

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# 28 40 011 Removing and installing or replacing double clutch (7DCT300)

**WARNING**

**Motor vehicle may slip off the vehicle hoist where components are supported.**

**Danger! Life-threatening injuries!**

- Secure the vehicle hoist against lowering and lifting.

**WARNING**

**Motor vehicle may slip off the vehicle hoist if the weight is distributed unevenly.**

**Danger! Life-threatening injuries!**

- Ensure there is a specific weight compensation on the motor vehicle.

**WARNING**

**Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.**

**Danger! Life-threatening injuries!**

- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raising the vehicle using a vehicle hoist.

**CAUTION**

**Component with heavy weight.**

**Danger of injury!**

- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Double-clutch transmission must be switched to neutral (position "N") prior to removal of double clutch or double-clutch transmission (DKG)!
Position "N" can only be engaged when the engine is running!
To prevent the transmission oil from spilling out, set the transmission upright before removing the double clutch.
It must hereby be ensured that the output flange or rear main shaft is not blocked and can be rotated freely.

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It must hereby be ensured that the output flange of rear main shaft is not blocked and can be rotated freely.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the double clutch.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Renew double clutch" service function with the diagnosis system.
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

### 1 – Bring front compartment lid in the service position

**Prerequisite**

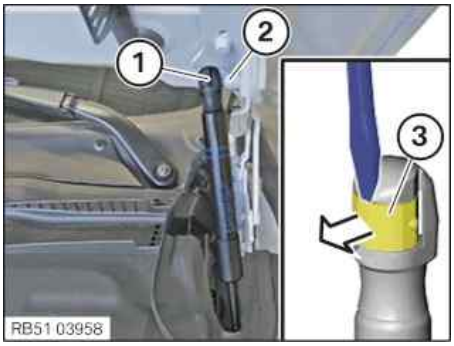
Engine compartment lid is open.

**CAUTION**

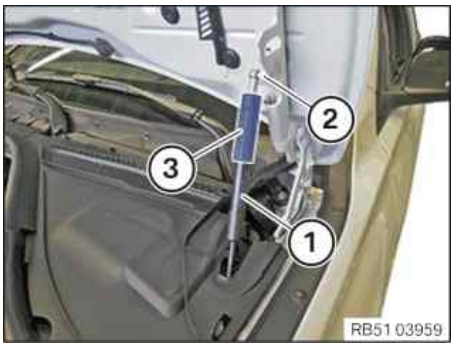
**Shutting bonnet or tailgate.**

**Danger of injury!**

- Support bonnet/tailgate in fully open position with the aid of a suitable device.




- Lift clamp (3) slightly using a screwdriver, in the direction of the arrow.
- Lift off ball socket (1) from ball pin (2).
- Repeat the operation on the other side of vehicle.




**TECHNICAL INFORMATION**

Conduct the following operation with the assistance of a second person.

- Remove the bonnet support and open the bonnet further.
- Push special tool **2 353 020** (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

### 2 – Disconnecting all battery earth leads

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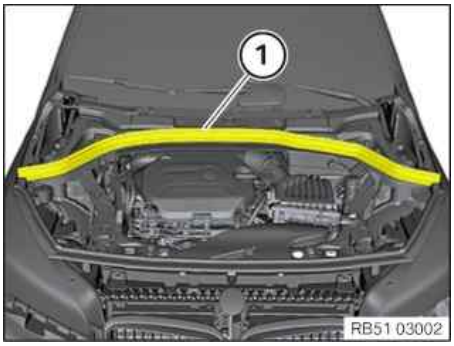



- See additional information.

### 3 – Remove the seal for the rear bonnet

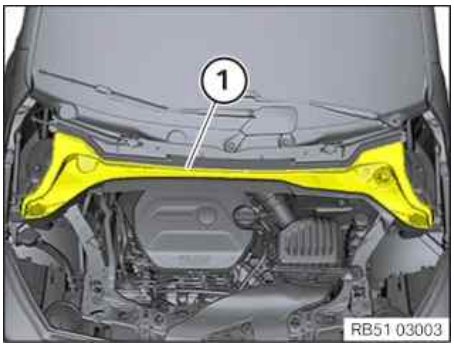
**NOTICE**

Schematic diagram is for example purposes. Some parts may differ in certain details.




- Pull off rear bonnet seal (1) towards the top and remove.

### 4 – Removing front cowl panel cover

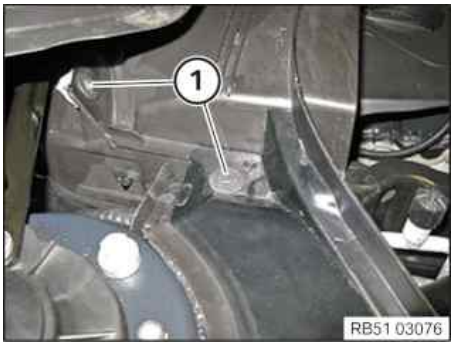



- Guide the front cowl panel cover (1) out toward the top and remove it.

### 5 – Removing the upper bulkhead cover

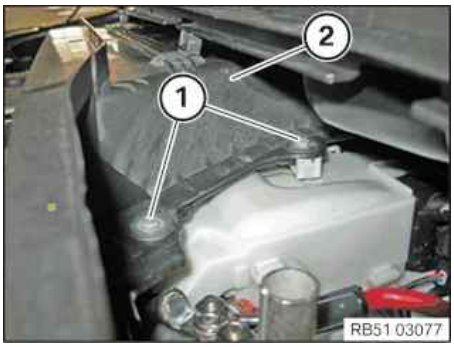



- Loosen screws (1).




- Loosen screws (1).

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- Loosen screws (1).
- Feed out and remove the upper bulkhead cover (2).

### 6 – Removing the acoustic cover

**WARNING**

**Hot surfaces.**

**Risk of burning!**

- Perform all work only on components that have cooled down.




**RISK OF DAMAGE**

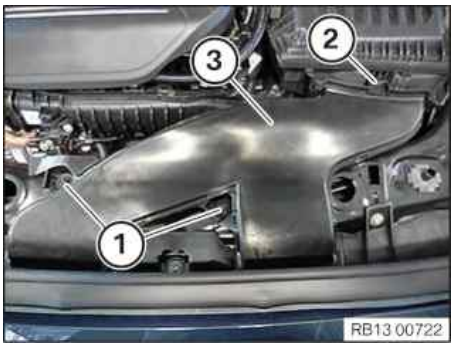
**Damage to the acoustic cover.**

**Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.**

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

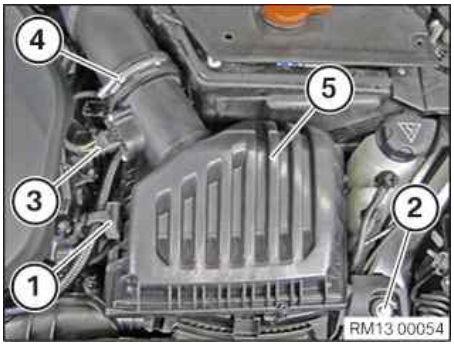
- Unclip the acoustic cover from the marked areas towards the top.

### 7 – Remove the intake neck for intake silencer housing




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

### 8 – Removing intake silencer housing




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

### 9 – Remove electronics box

**Prerequisite**

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Battery earth lead is disconnected.

**RISK OF DAMAGE**

**Electrostatic discharge.**

**Damage to or destruction of electrical components.**

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.

**RISK OF DAMAGE**

**Damage to wires when disconnecting connectors and plug connections.**

**Sheared wires can cause a short circuit.**

- Do not pull on the wires when disconnecting connectors and plug connections.

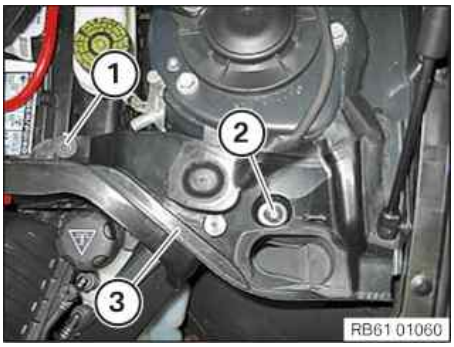
**TECHNICAL INFORMATION**

Follow instructions for removing and installing control units.

For additional information see: 12 00 ... Notes on removal and installation of control units

**TECHNICAL INFORMATION**

Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

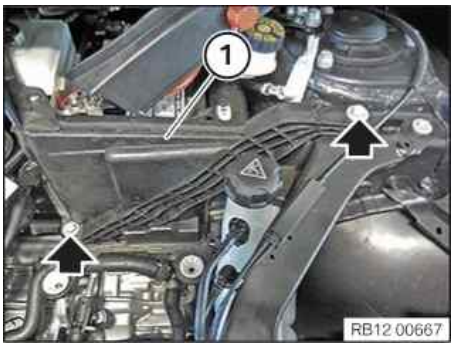



- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).

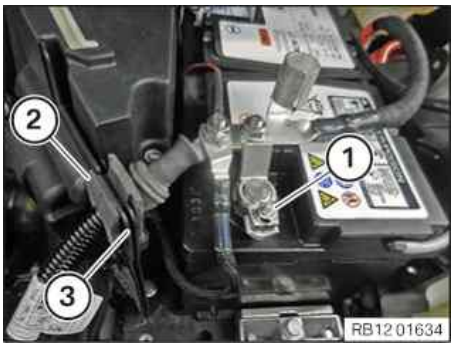



- Loosen screw (1).
- Place cover (2) of the positive battery connection point to one side.

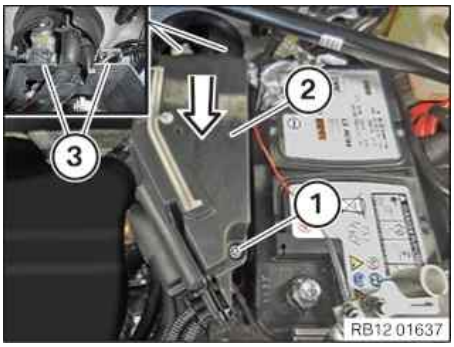
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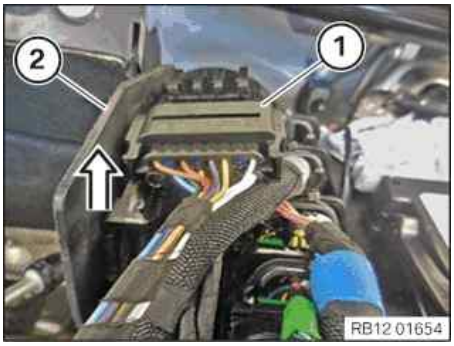

- Remove screws (arrows).
- Guide out tension strut (1) and remove.



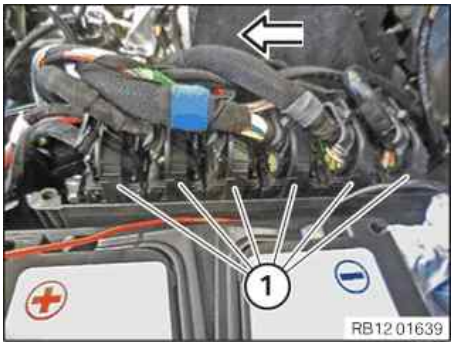

- Undo positive battery terminal (1).
- Feed out positive battery terminal (1) and set aside.
- Guide the positive battery cable (2) out of the holder (3) and lay to one side.



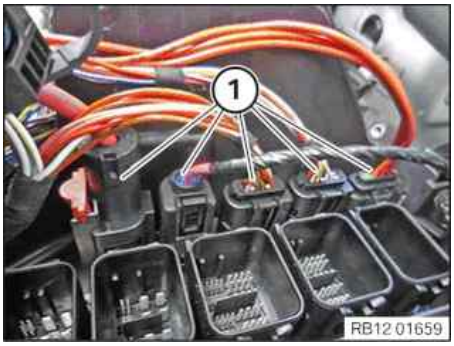

- Loosen screw (1).
- Unlock cover (2) and feed out and remove from the guides (3) in the direction of arrow.




- Feed out connector (1) from the electronics box (2) and remove in the direction of arrow.
- Unlock and loosen connector (1).

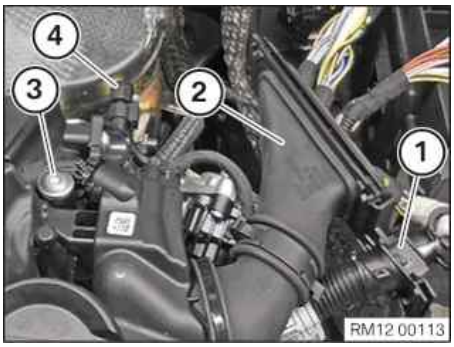



- Unlock and remove the connector (1) in the direction of the arrow.
- Feed out connector (1) and place to one side.

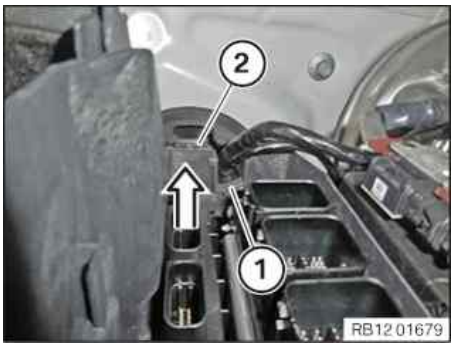



- Unlock and loosen connector (1).

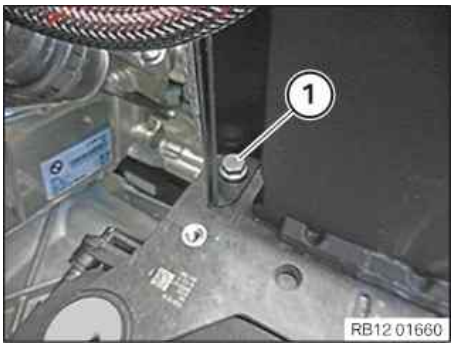
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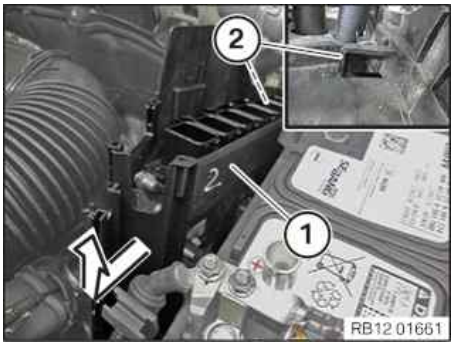

- Detach the wiring harness (1) from the electronics box.
- Detach the wiring harnesses (2) from electronics box.
- Loosen screw (3).
- Set wiring harnesses (1) and (2) aside.
- Unlock the connector (4) and disconnect it from the differential pressure sensor.




- Unlock and loosen holder (1).
- Guide the holder (1) out of the electronics box (2) in direction of arrow and set it aside.




- Loosen screw (1).




- Guide the electronics box (1) out of the guide (2) in direction of arrow and remove.

**10 – Remove vehicle battery**

**WARNING**

**Working on 12 V vehicle electrical system.**

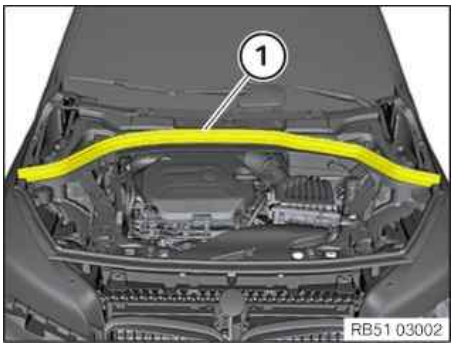
**Risk of short circuits! Risk of fire!**

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

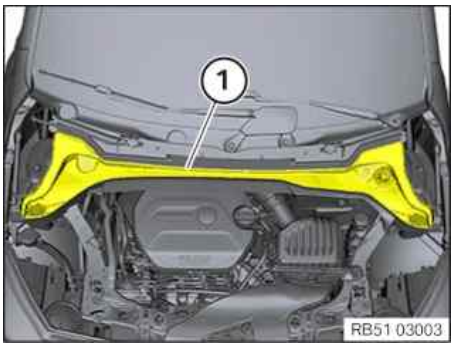
**TECHNICAL INFORMATION**

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)

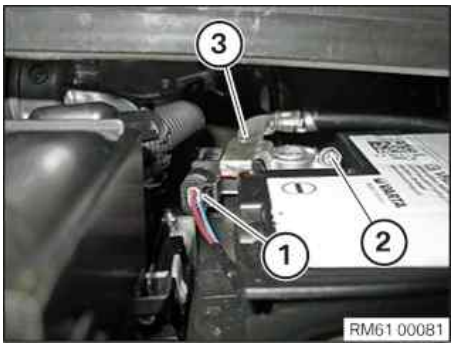
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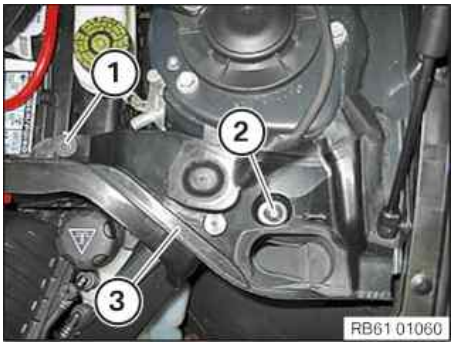

- pull off gasket (1) upwards.



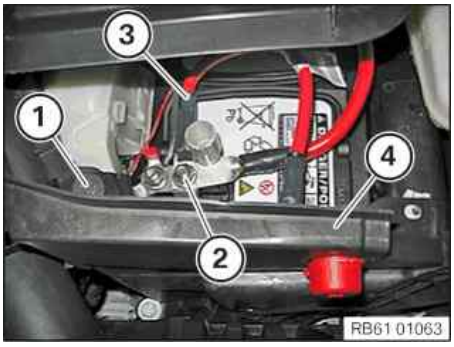

- Remove the cowl panel cover (1) to the top.



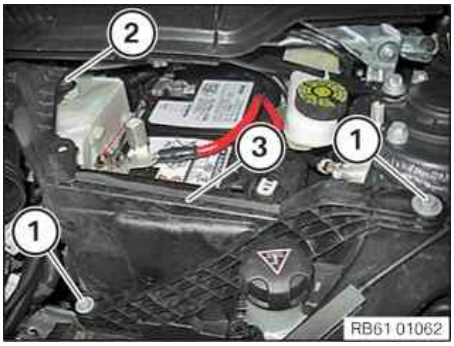

- Unlock and disconnect connector (1).
- Slacken nut (2).
- Disconnect the negative battery terminal (3).




- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).

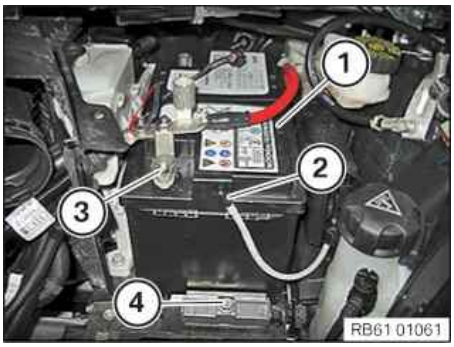



- Loosen screw (1).
- Unscrew the nut (2) and remove the positive battery cable (3) with the cover of the remote positive terminal (4).
- Tighten nuts (2) on the positive terminal hand-tight.




- Loosen screws (1).
- Unscrew the bolt (2) and guide the tension strut (3) out.

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- Pull off the vent hose (2).
- Slacken the nut (3) on the positive terminal and remove the positive terminal.

**WARNING**

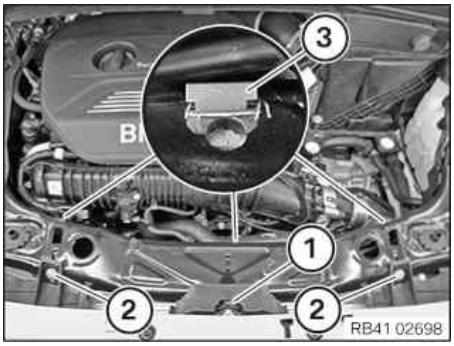
**Unprotected battery terminals.**

**Risk of short circuits! Risk of fire!**

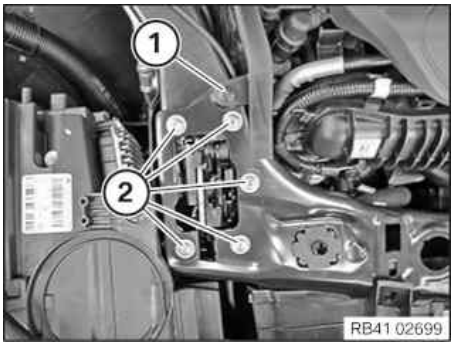
- Cover the vehicle battery.

- Loosen the screw (4) and remove the holder.
- Remove vehicle battery (1).

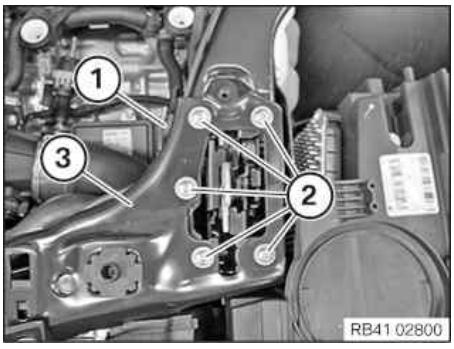
### 11 – Remove cross connection




- Loosen screws (1) and (2).
- Detach clamps (3) for bonnet lock Bowden cable.

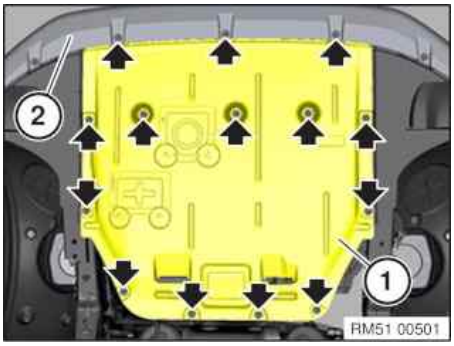



- Lever out expanding rivet (1).
- Loosen screws (2).




- Lever out expanding rivet (1).
- Loosen the screws (2) and remove the cross connection (3).

### 12 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 13 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

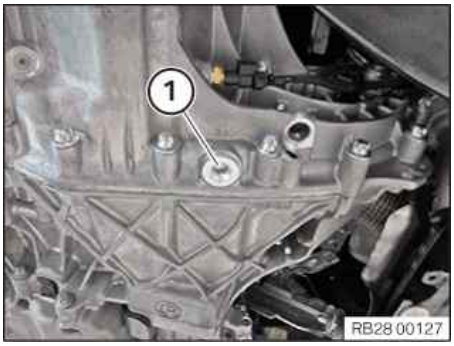
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**14 – Draining coolant**

**WARNING**

**Hot fluids.**

**Risk of scalding!**

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

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**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

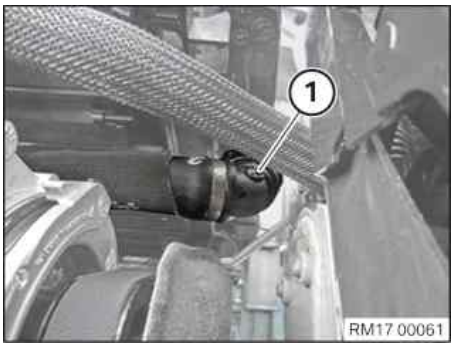
In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

**TECHNICAL INFORMATION**

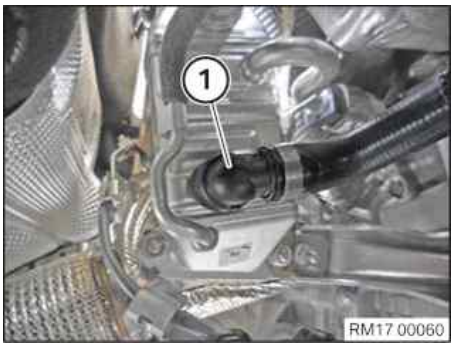
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.




- Loosen sealing cap (1).




- Unlock and disconnect the coolant line (1) from the radiator on the right.
- Catch and dispose of escaping coolant.



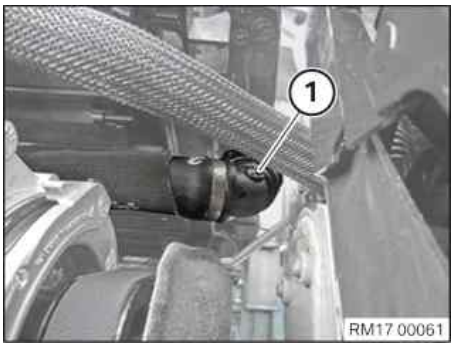

- Unlock and pull off the coolant line (1) from the low pressure exhaust-gas recirculation cooler on the diesel particulate filter.
- Catch and dispose of escaping coolant.

**15 – Connect the coolant line**

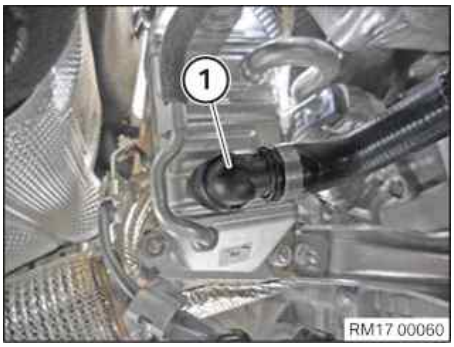
**TECHNICAL INFORMATION**

Make sure that the connections are locked correctly. The locks must engage audibly.

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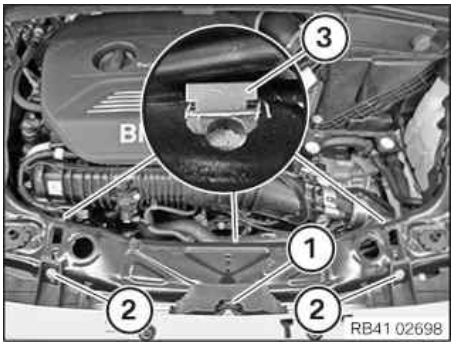



- Connect the right coolant line (1) to the radiator and lock audibly.




- Connect the coolant line (1) to the low pressure exhaust-gas recirculation cooler on the diesel particulate filter and lock audibly.

**16 – Install cross connection**




- Install cross connection.
- Position all screws.
- Tighten down screw (1).

**Bracing strut to top cross connection**

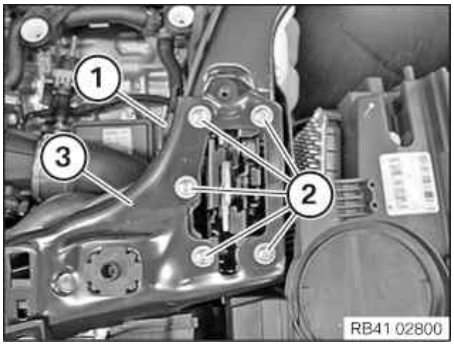
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

- Tighten down screws (2).

**Air duct to deformation element/cross connection**

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

- Fasten clamps (3) for bonnet lock Bowden cable to cross connection.

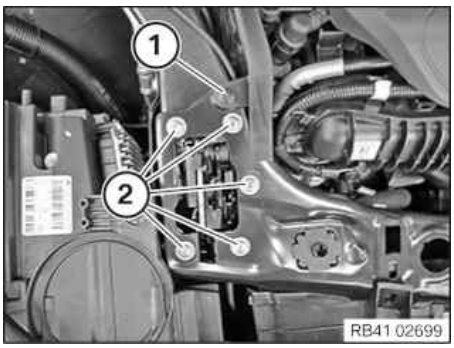



- Tighten screws (2) of cross connection (3).

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).




- Tighten down screws (2).

**Cross connection on support for cross connection**

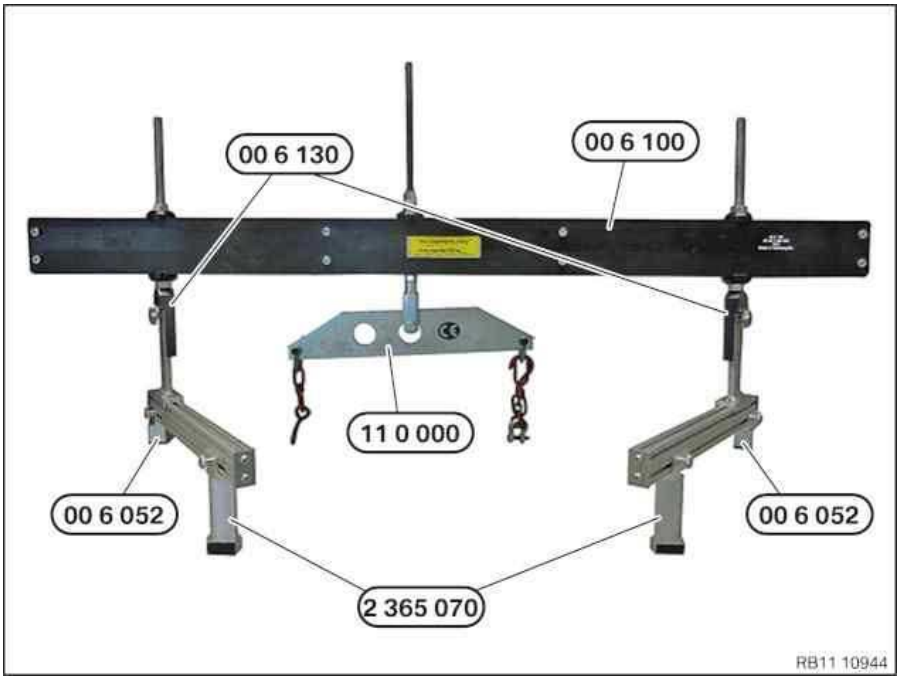
| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).

**17 – Install the engine bridge**

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**Overview: Prepared engine bridge**




**Prerequisite**

Front compartment lid is in service position.

**CAUTION**

**Components connected to the engine joint or cross member.**

**Danger of injury!**

- Check lifting eyes and engine mounting brackets for damage, e.g. cracks.
- Attach the component to correctly mounted engine joints or cross members only.
- Exclusively lift the component, do not move it forwards, backwards or in transverse direction.

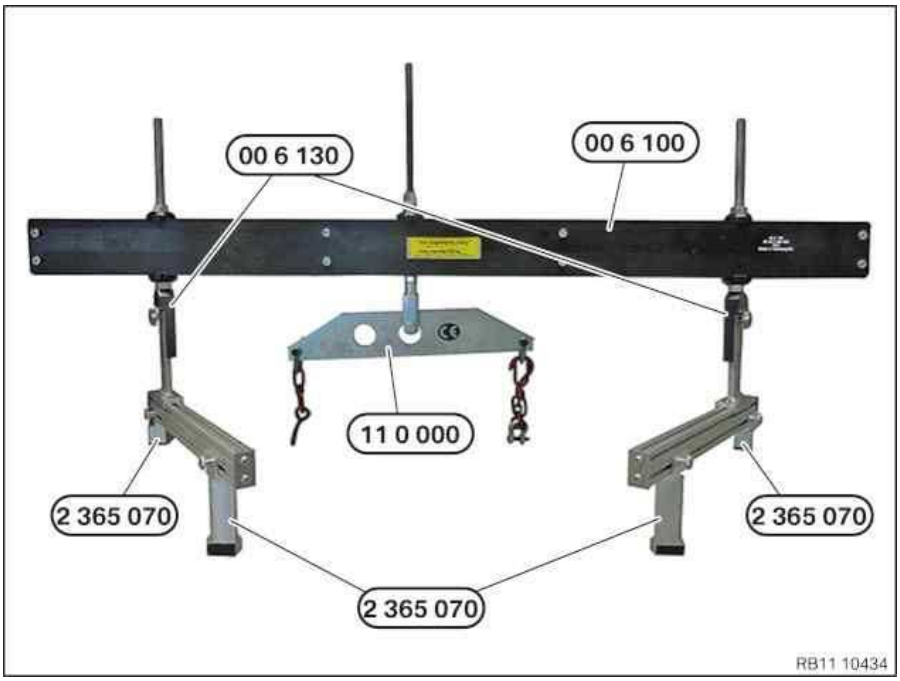



- Guide in and position special tool **2 459 012** on cylinder head.
- Tighten the screws (1) of special tool **2 459 012**.

**Special tool to cylinder head**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 21,5 Nm |

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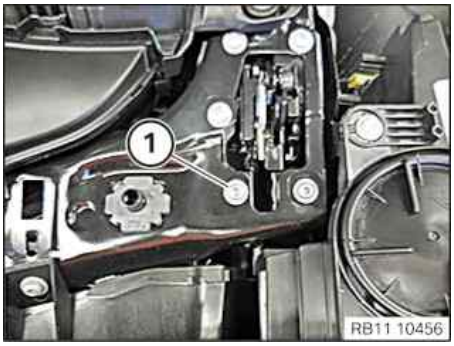

**CAUTION**

**Heavy component.**

**Heavy components can lead to injury or damage.**

- Remove and install heavy components with the aid of another person/other persons.

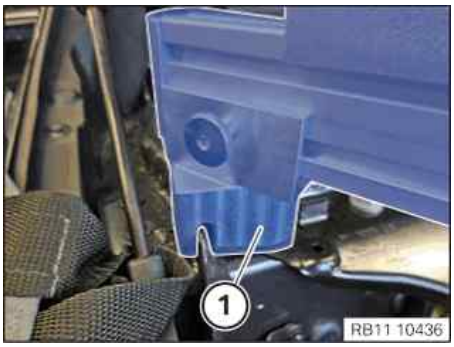
- Set entire cross member **0 496 852 (00 6 100)** on the vehicle and position with the help of an auxiliary person.



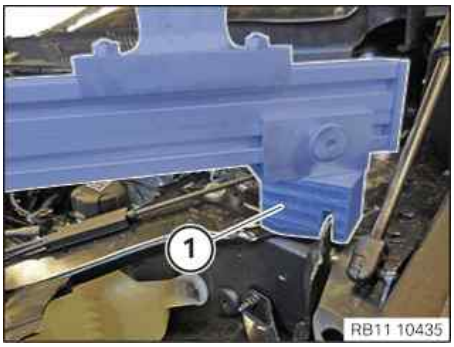

- Loosen screw (1) of the left bonnet catch.




- Loosen screw (1) of the right bonnet catch.

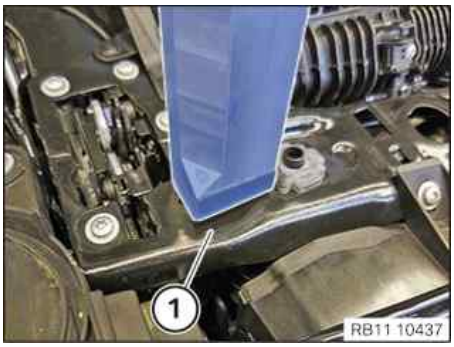



- Position special tool **2 365 070** to the rear mounting point (1) at the right.

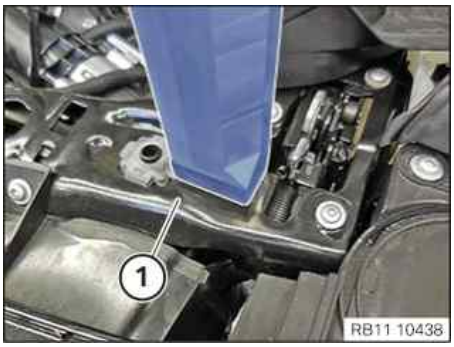



- Position special tool **2 365 070** to the rear mounting point (1) at the left.

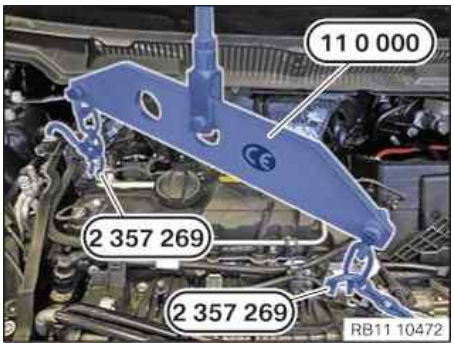
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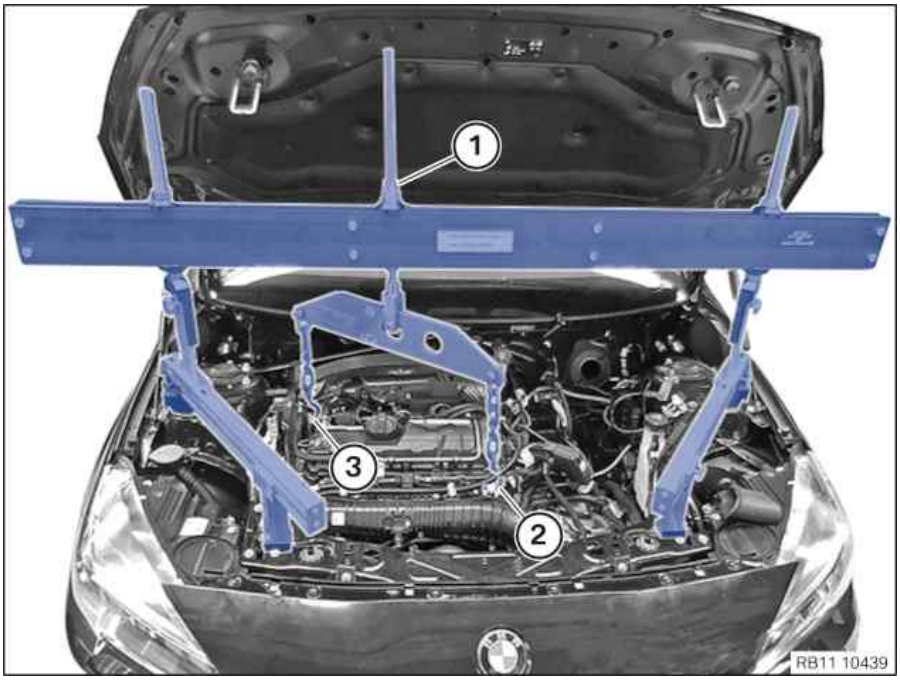

- Position special tool **2 365 070** to the front mounting point (1) at the right.




- Position special tool **2 365 070** to the front mounting point (1) at the left.




- Position special tool **0 490 561 (11 0 000)** above the engine.
- Attach special tools **2 357 269** to the mounting lugs of the engine.




- Tighten side screws (2) and (3).
- Slightly pretension the spindle screw (1) of the engine support beams.
- Tighten down all adjusting screws, knurled screws and nuts on cross member **0 496 852 (00 6 100)** and on special tool .

**18 – Removing starter motor**

**WARNING**

**Hot surfaces.**

**Risk of burning!**

- Perform all work only on components that have cooled down.

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**WARNING**

**Working on 12 V vehicle electrical system.**

**Risk of short circuits! Risk of fire!**

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

**RISK OF DAMAGE**

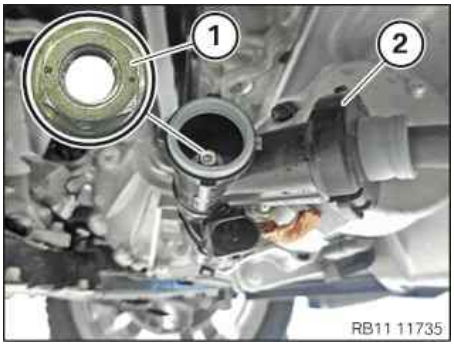
**Electrostatic discharge.**

**Damage to or destruction of electrical components.**

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.




- Unlock and loosen connector (1).
- Detach the sealing cap (2) in the direction of the arrow.
- Feed out and remove the sealing cap (2).



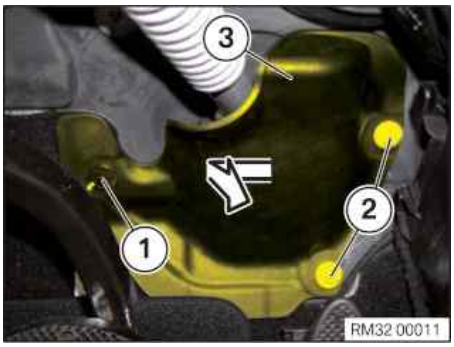

- Unfasten nut (1).
- Feed out the positive battery cable (2) of the starter motor and set it aside.




- Loosen screws (1).
- Feed out starter motor and remove.

**19 – Releasing lower steering shaft from steering gear**

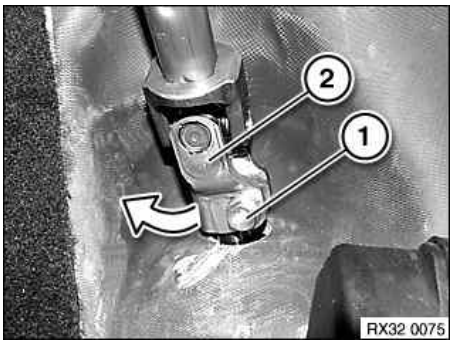
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- **If installed:**
- Unfasten nut (1).
- Unscrew the nuts (2) by 1 rotation.

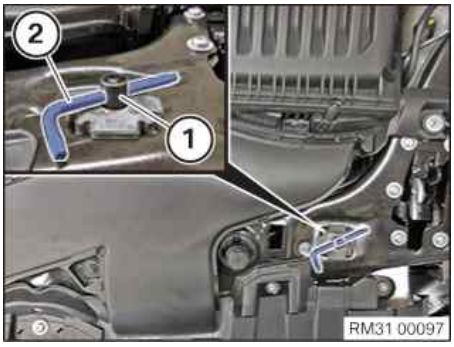
  Do not remove the nuts (2) !
- Remove the cover (3) on the steering column in the direction of the arrow.

  The side footwell trim must not be disassembled!




- Loosen screw (1).
- Swivel out the universal joint (2) of the bottom steering shaft from the steering gear in the direction of the arrow.

**20 – Securing radiator on left and right**




**NOTICE**

Perform the operations on the left and right side.

- Fasten radiator at centring pin (1) with suitable tool (2).

**21 – Remove the front left and right wheel**

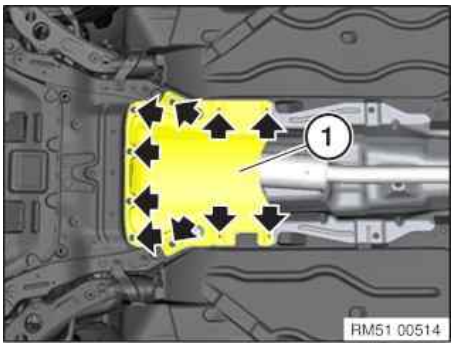
▸ **Removing the wheel**




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set  (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**22 – If installed: Removing rear underbody protection**




- Remove screws (arrows).
- Remove the rear underbody protection (1).

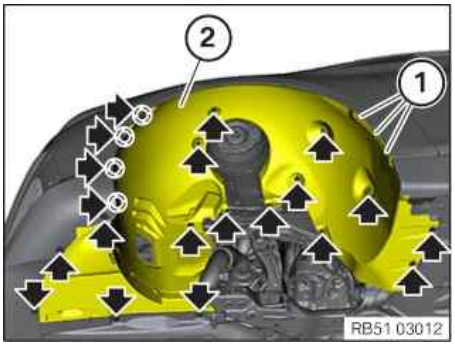
**23 – Removing front left and right wheel arch cover**

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**NOTICE**

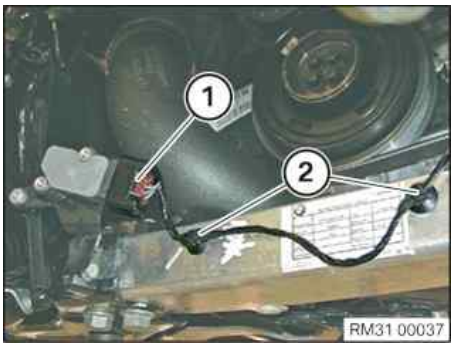
Perform the operations on the left and right side.

▸ **Remove front wheel arch cover**




- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

**24 – With right installation: Detaching ride height sensor cable**



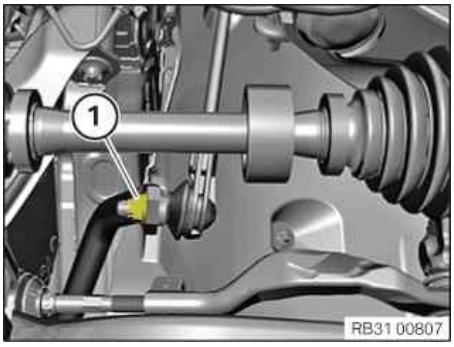

- Unlock plug connection (1) and disconnect.
- Release cable clip (2) from deformation element adapter.

**25 – Releasing anti-roll bar on left and right from anti-roll bar link**

**NOTICE**

Perform the operations on the left and right side.

▸ **Detach the anti-roll bar from the anti-roll bar link**




- Unfasten nut (1).

**Note:** Use the Torx socket for counter support.

- Loosen the anti-roll bar link from the anti-roll bar .

**26 – Detaching rubber mount from front axle support**

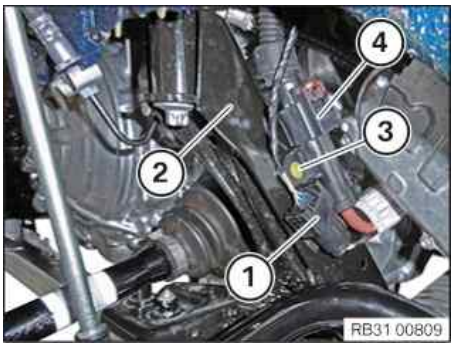



- Spray rubber mount (1) with lubricant and release from holder on front axle support.

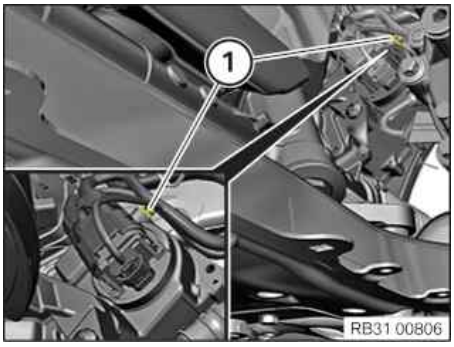
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### 27 – Disconnecting plug connections from steering gear

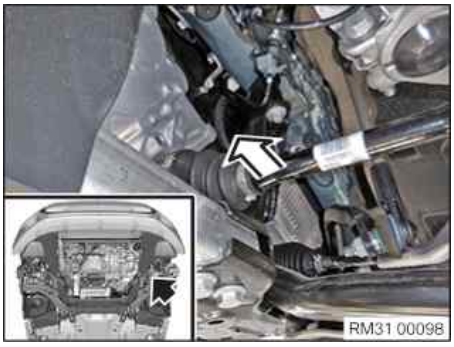
▶ **If installed: Detach connectors from the front axle carrier**




- Release the plug connection (1) from the front axle support (2).
- Loosen screw (3).
- Release the plug connection (4) from the front axle support (2).

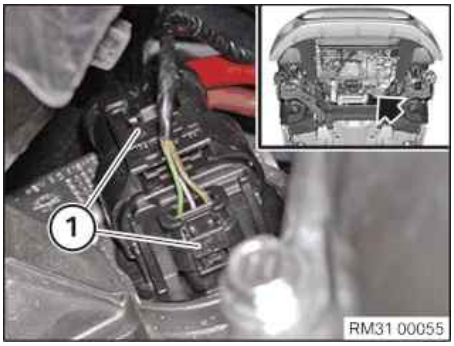



- Disconnect wiring harness (1) from steering gear.



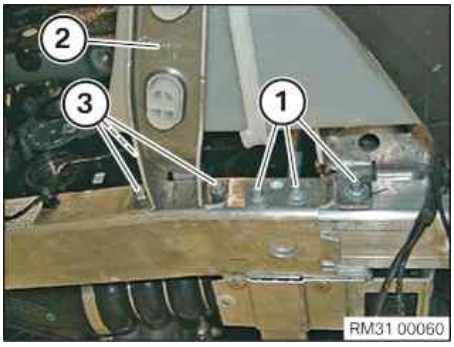

- To unlock the plug connections (see the following work step): unlock plug connections (arrow) with the right hand.

  The plug connections can be reached via the left-hand output shaft.




- Unlock plug connections (arrow) (1)and disconnect from the steering gear.
- Make sure when lowering the front axle that the cables are not damaged!

### 28 – Releasing the mounted part from the front axle support



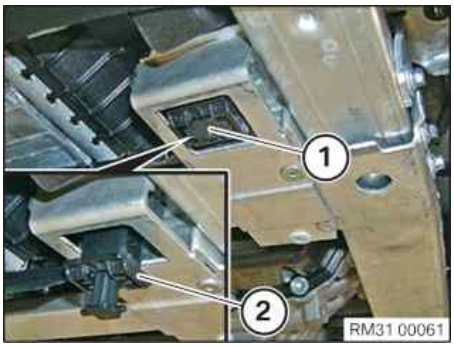

- **Only on right side:** Loosen screws (3) and remove holder for washer fluid reservoir (2).

**NOTICE**

Perform the operations on the left and right side.

- Loosen screws (1).

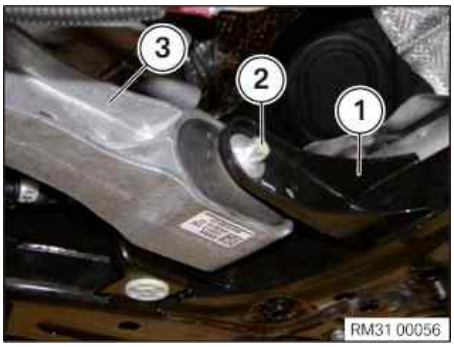
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**NOTICE**

Perform the operations on the left and right side.

- Unlock safety catch (1) of the lock (2) from the holder for the charge air cooler.
- Completely remove locks (2).




- Loosen screw (2) of the engine support (3) on the front axle (1).

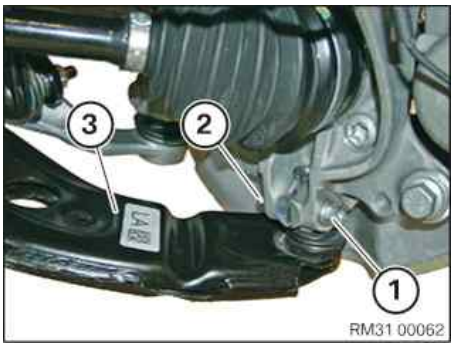



**NOTICE**

Perform the operations on the left and right side.

- Loosen screws (1).

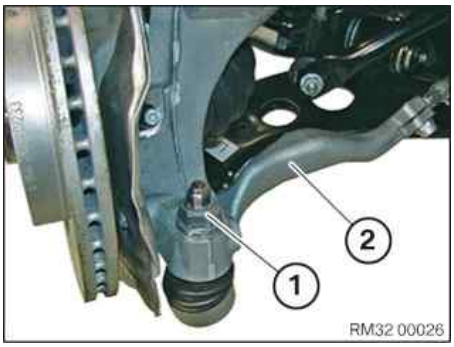
**29 – Detaching and removing front axle completely**




**NOTICE**

Perform the operations on the left and right side.

- Unfasten nut (1).
- (2)Pull out screw.
- Detach the wishbone (3) from the swivel bearing .

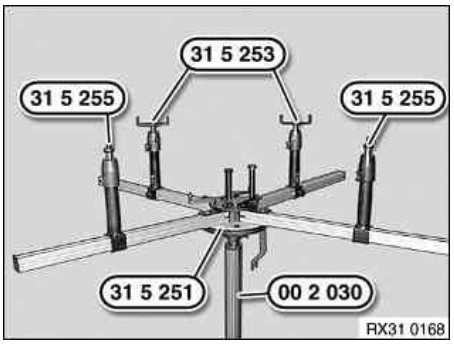



**NOTICE**

Perform the operations on the left and right side.

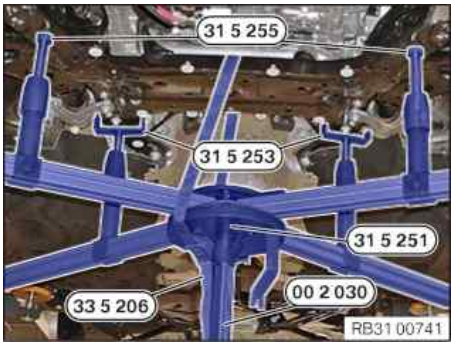
- Unfasten nut (1).
- Detach the track rod (2) from the swivel bearing.

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- Fit the special tool **0 495 817 (31 5 251)** completely onto the workshop jack **0 490 133 (00 2 030)** with an auxiliary person.
- Insert special tools **0 495 821 (31 5 255)** in telescopic supports of a profile rail pair.
- Insert special tools **0 495 819 (31 5 253)** in telescopic supports of other profile rail pair.

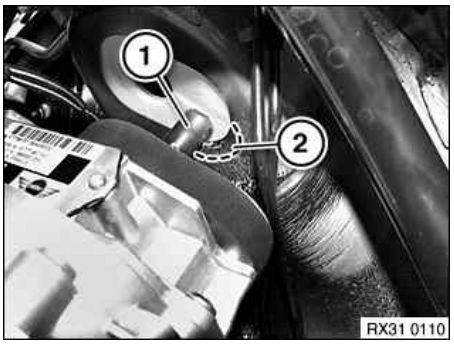
**Note:** In a profile rail pair, two profile rails are connected to one another by gearing.




- Align special tools **0 495 821 (31 5 255)** and **0 495 819 (31 5 253)** to front axle support.
- Support front axle support by operating workshop jack **0 490 133 (00 2 030)**.

**Note:** The centre of gravity of the front axle support must be positioned centrally over the workshop jack!

- Secure front axle support with special tool **0 496 080 (33 5 206)** to special tool **0 495 817 (31 5 251)**.

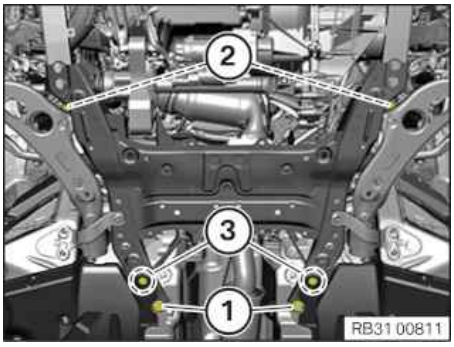



**TECHNICAL INFORMATION**

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

**Note:** Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!



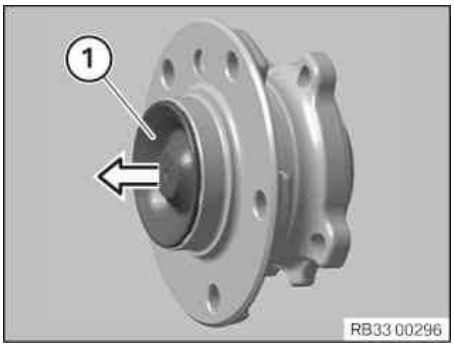

- If applicable, release the screws in area (3).
- Release screws (1) (front axle support, rear).
- Release screws (2) (front axle support, front).
- Bend the underbody panelling to the side in area (3).
- When lowering, release charge air cooler from its rubber mounts.
- Completely lower and remove the front axle.

**TECHNICAL INFORMATION**

Note the information on thread repairs using Helicoil thread inserts.
For more information see: 41 00 ... Notes on repairing threads

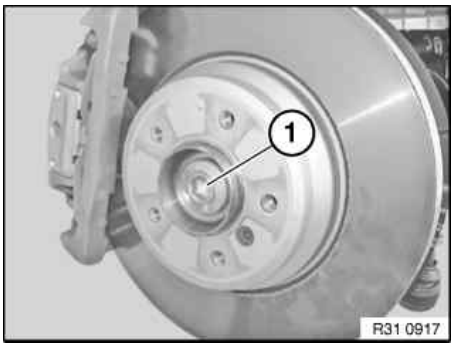
- Check threads for damage; if necessary, repair with Helicoil thread inserts.

**30 – Remove the left drive shaft (double-clutch transmission (DKG))**

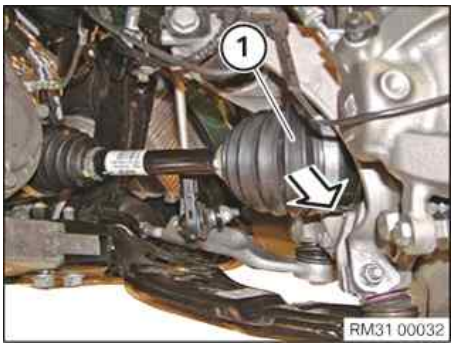



- If necessary, lever off the protective cap (1).

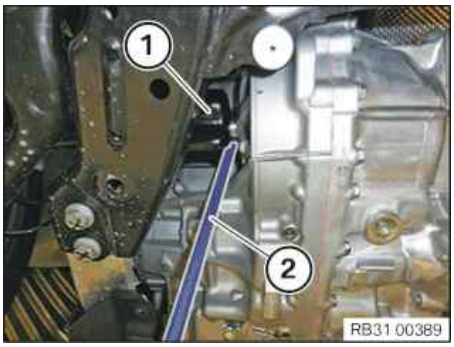
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- Press the brake pedal to the floor to unscrew the collar bolt (1).




- Turn steering wheel to left.
- Pull the output shaft (1) out toward the front.




- Protect the output shaft (1) from falling.
- Lever out the output shaft (1) with a mounting lever (2) from the transmission.
- Remove output shaft (1).

### ▸ Removing the left radial shaft seal on the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

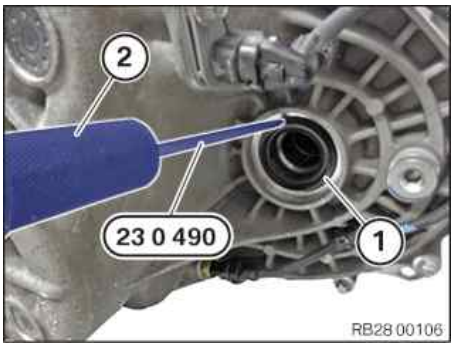
**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!

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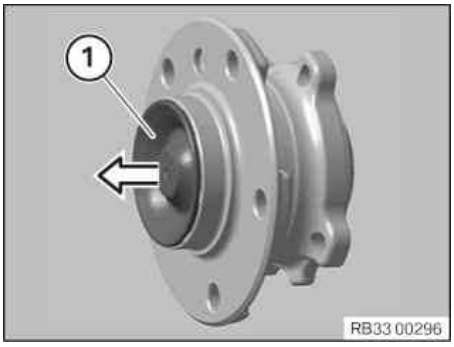



**TECHNICAL INFORMATION**

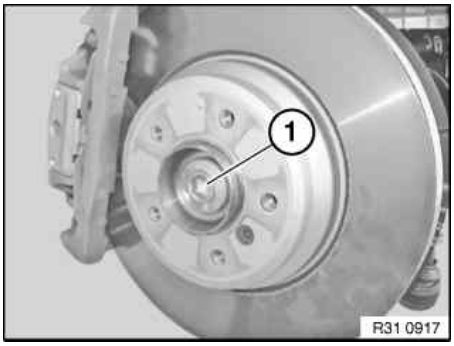
Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drill a hole in the radial shaft seal (1) using a centre punch.
- Screw special tool **0 491 454 (23 0 490)** in the radial shaft seal (1).
- Drive out radial shaft seal (1) with the impact weight (2).

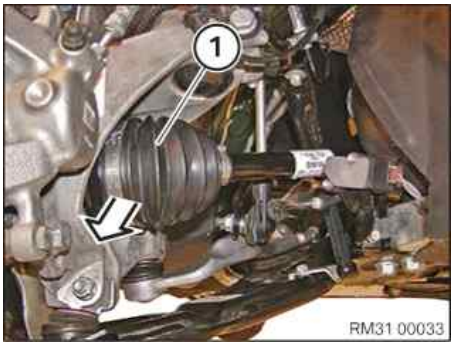
### 31 – Removing right output shaft (double-clutch transmission (DKG))



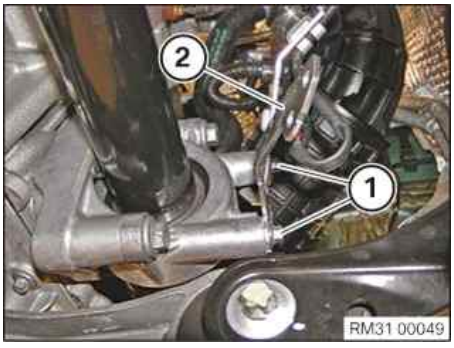

- If necessary, lever off the protective cap (1).




- Press the brake pedal to the floor to unscrew the collar bolt (1).

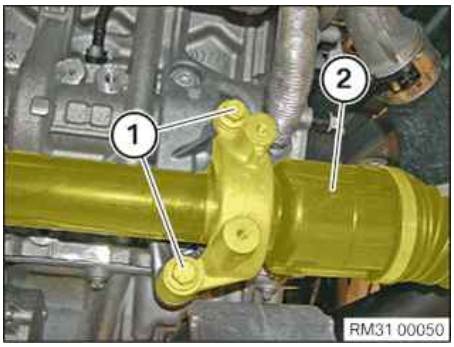



- Protect the output shaft (1) from falling.
- Turn steering wheel to right.
- Pull the output shaft (1) out.




- If necessary, unscrew the bolts (1) and remove the holder (heat shield) (2).

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- Loosen screws (1).
- Pull the output shaft (2) out of the transmission and remove it sideways.
- Remove output shaft (1).

▸ **Removing the right radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!




**TECHNICAL INFORMATION**

Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drive a hole into the radial shaft seal (1) using a centre punch.
- Screw the special tool **0 491 454 (23 0 490)** into the radial shaft seal (1).
- Drive out the radial shaft seal (1) with the impact weight (2).

**32 – Removing the double-clutch transmission (DKG)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the engine block.**

**Damaged and corroded bolts will lead to major damage in the engine block and the transmission.**

- It is imperative that protruding threads of the transmission bolts are checked for corrosion and damage prior to removal.
- It is imperative that all rust is removed from corroded threads and that they are cleaned prior to removal.
- Renew rusted and damaged bolts.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**RISK OF DAMAGE**

**Damage to the flywheel and the double-clutch transmission (DKG).**

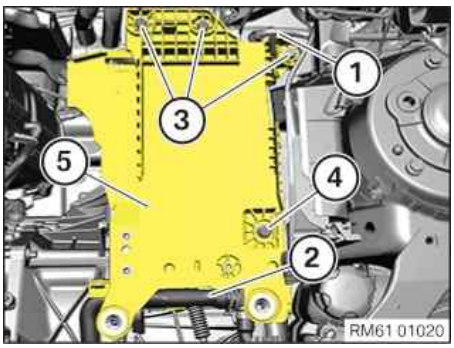
**Damage to the flywheel and the double-clutch transmission (DKG) due to incorrect removal and installation of the double-clutch transmission (DKG).**

- Align the double-clutch transmission (DKG) absolutely horizontally during removal and installation.

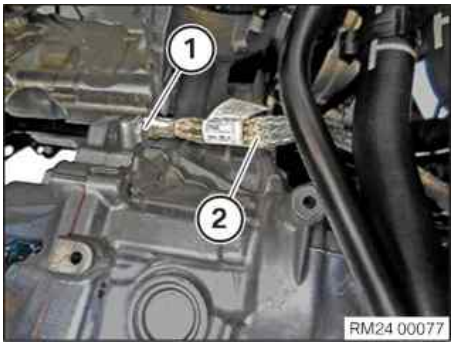
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the double-clutch transmission (DKG).

▸ **Remove battery holder**

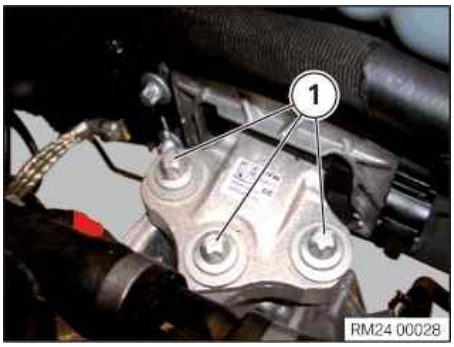



- Detach the cable clip (1) from the battery holder (5).
- Detach the coolant line (2) from the battery holder (5).
- Loosen screws (3).
- Loosen screw (4).
- Thread out and remove the battery holder (5).

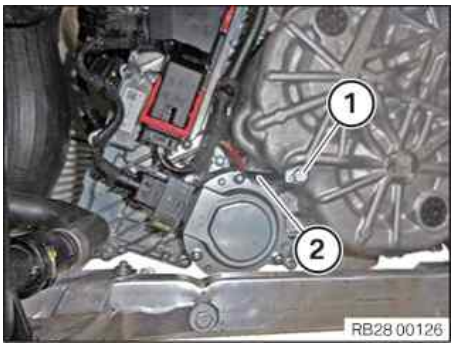



- Loosen screw (1).
- Detach the ground strap (2) from the transmission and set it aside.

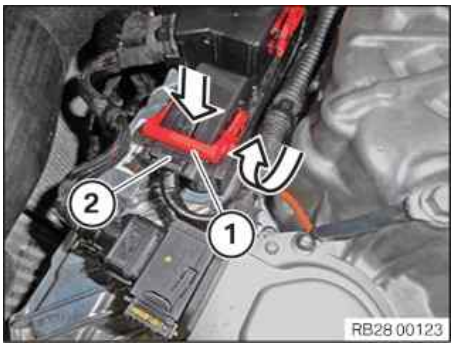
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- Loosen screws (1).



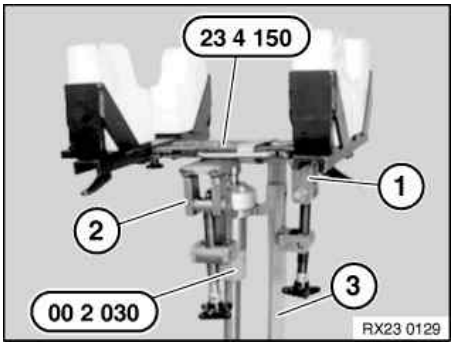

- Release the screw (1) and put the grounding cable (2) to one side.



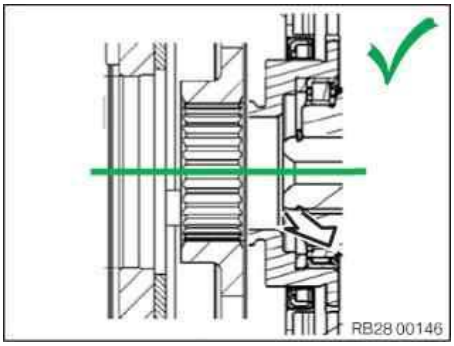

- Fold down the red lever (1) in direction of arrow and pull the plug connection (2) out of the control unit.




- Unlock and release coolant line (1).

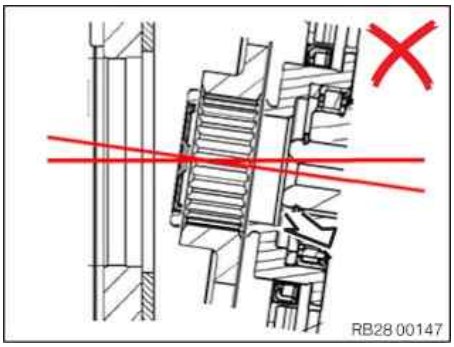



- Support the transmission with special tool **0 490 133 (00 2 030)** and .
- Secure the double-clutch transmission (DKG) with the tensioning strap (3).

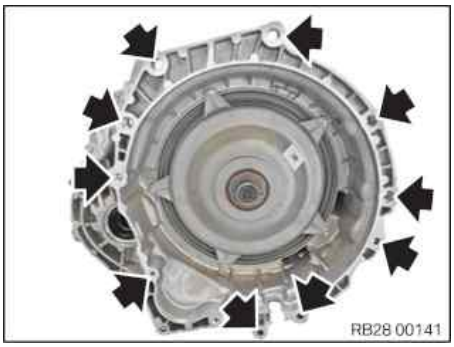



- **Correct:** Pull the double-clutch transmission (DKG) horizontally off the flywheel.

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- **Wrong:** Do not pull the double-clutch transmission (DKG) off the flywheel if it is tilted.




- Remove screws (arrows).
- Pull the double-clutch transmission (DKG) off the flywheel when it is absolutely horizontal.

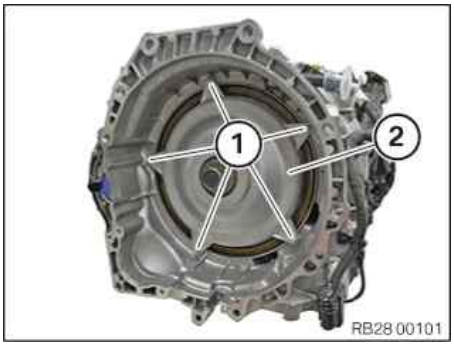
**33 – Remove clutch cover (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the clutch cover.
Hazardous substances!

**TECHNICAL INFORMATION**

**Replacement clutch cover:**
Renew the clutch cover only as an assembly (incl. radial shaft seal, O-ring and cylindrical roller ring).

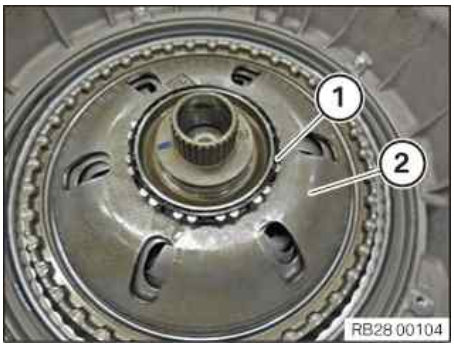



- Loosen screws (1) on the clutch cover (2).




- Using special tool **0 496 716 (24 1 420)** and **0 493 321 (13 5 250)** access the rear of the clutch cover (1).
- Release the clutch cover (1) at the bolting points using special tool **0 496 716 (24 1 420)** and **0 493 321 (13 5 250)** and remove.

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- Remove cylinder roller (1) from the double clutch(2).

## MAIN WORK

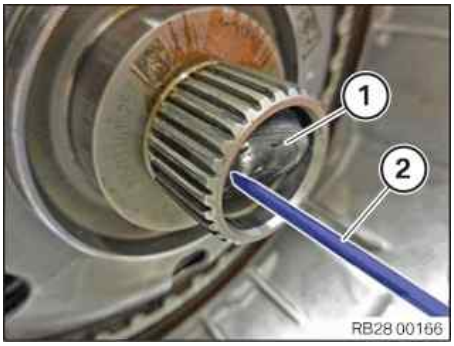
### 34 – Remove double clutch (7DCT300)

**TECHNICAL INFORMATION**

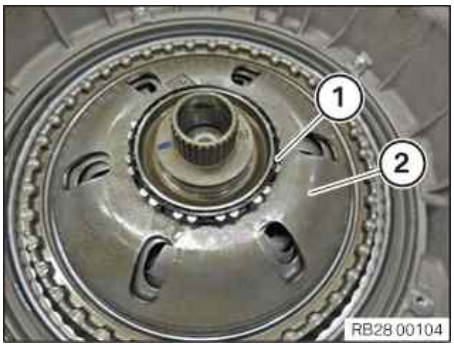
Double-clutch transmission must be switched to neutral (position "N") prior to removal of double clutch or double-clutch transmission (DKG)!
Position "N" can only be engaged when the engine is running!
To prevent the transmission oil from spilling out, set the transmission upright before removing the double clutch.
It must hereby be ensured that the output flange or rear main shaft is not blocked and can be rotated freely.

**TECHNICAL INFORMATION**

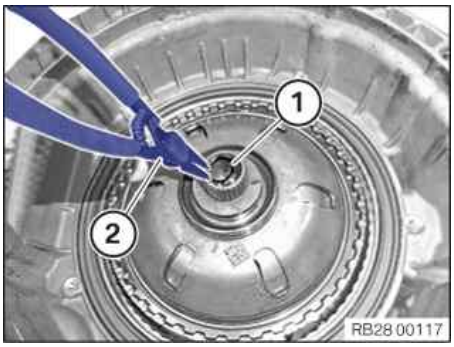
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the double clutch.




- Remove cover (1) using suitable tool (2).

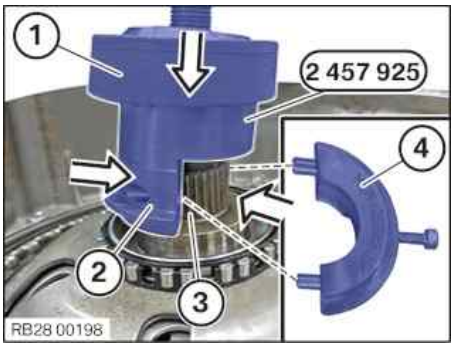



- Remove cylinder roller (1) from the double clutch(2).

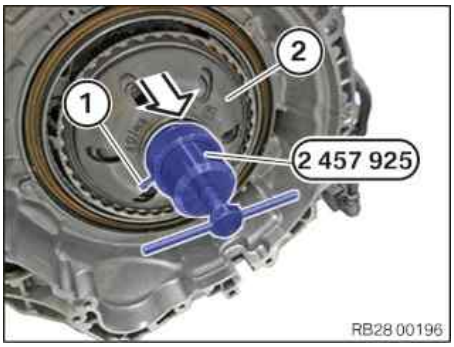



- Remove snap ring (1) using a suitable tool (2).

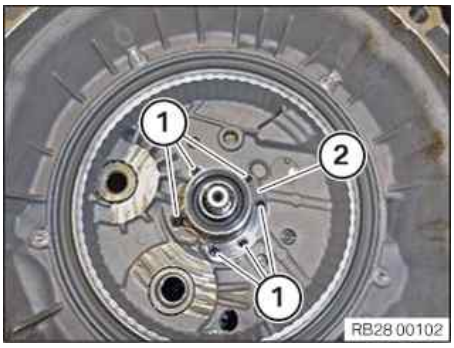
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- Slide special tool **2 457 925** in the area of (2) onto the shaft (3).
- Insert shell (4) sideways into the special tool **2 457 925** and lock using the snap ring (1).




- Secure the special tool **2 457 925** with the knurled screw (1).
- Remove double clutch (2) using the special tool **2 457 925**.




- **Replace clutch support:**
- Loosen screws (1).
- Remove clutch support (2).

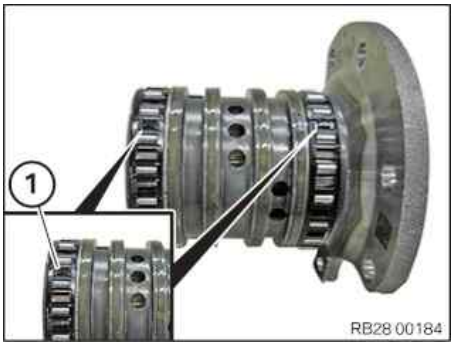
**35 – Install double clutch (7DCT300)**

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Renew double clutch" service function with the diagnosis system.
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.




- **Caution!**

  While installing the clutch support, make sure that there are piston rings and locks (1) for the needle bearing present and that they are correctly fitted.

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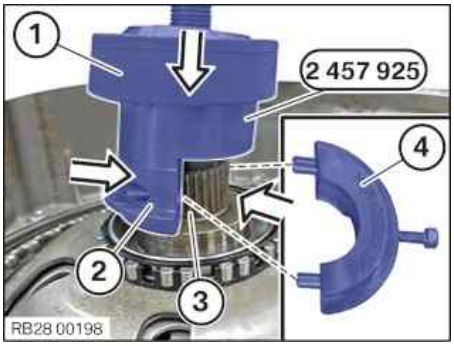

- Install clutch support (7).
- Renew screws (1) to (6).

  **Parts:** Bolts
- **Observe tightening sequence.**
- Tighten screws in the order (1) to (6).

**E-motor to transmission**

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

- Install the connector (3).
- Press connector fastener (2) to left/right in the direction of the arrow until the connector (3) engages completely.
- Press connector fastener (1) in direction of arrow till it engages.



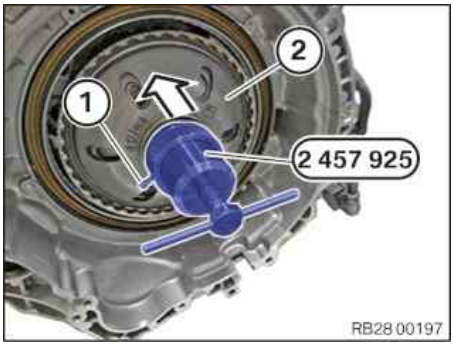

**TECHNICAL INFORMATION**

Warning: Installing the double clutch may involve the danger of injury!

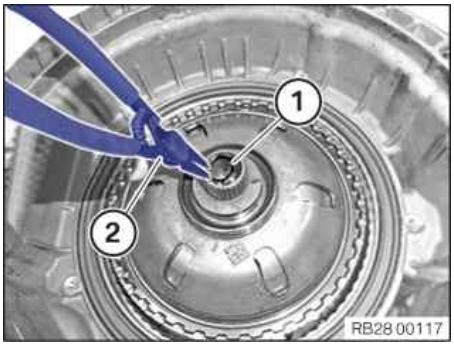
Under no circumstances are hammers or other striking tools to be used when installing the double clutch.

The double clutch must be slid over the piston rings and onto the hydraulic guide sleeve.

- Push the special tool **2 457 925** laterally (2) onto the shaft (3).
- Insert shell (4) into the special tool on the side **2 457 925** and lock with circlip (1).




- Install double clutch (2) with special tool **2 457 925**.
- Loosen and remove special tool **2 457 925** with knurled screw (1).

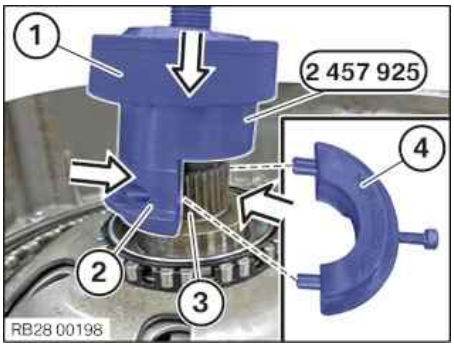



- Install circlip (1) with a suitable tool (2).

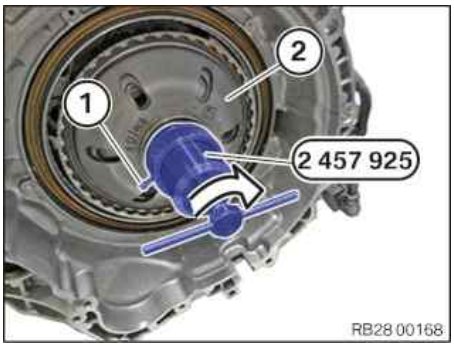



- Position lid (1).

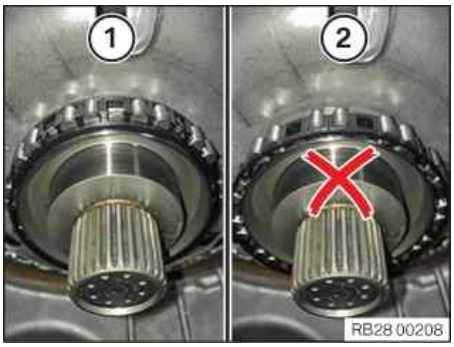
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- Move special tool **2 457 925** in area (2) onto shaft (3).




- Install special tool **2 457 925** on double clutch (2) and secure with knurled screw (1).
- Rotate spindle in direction of arrow up to limit position until the lid is in the installation position.
- Remove special tool **2 457 925**.




- Install cylindrical roller ring.
- **Ensure the correct mounting position of the cylinder roller ring!**

  (1) **= Correctly installed**

  (2) **= Incorrectly installed**

## POSTPROCESSES

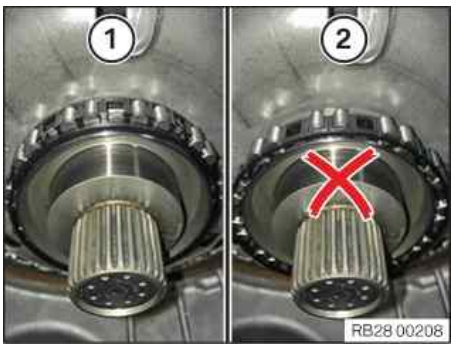
### 36 – Install the clutch cover (7DCT300)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the clutch cover.
Hazardous substances!

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Install the cylinder roller.
- **Observe the correct mounting location of the cylinder roller.**

  (1) **= Correctly installed**

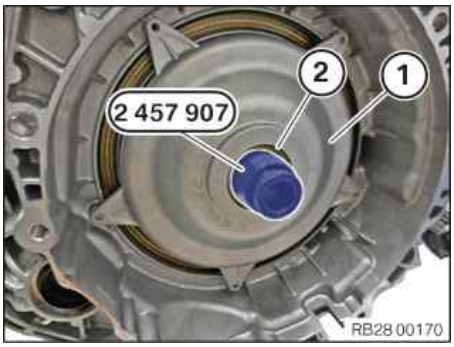
  (2) **= Incorrectly installed**

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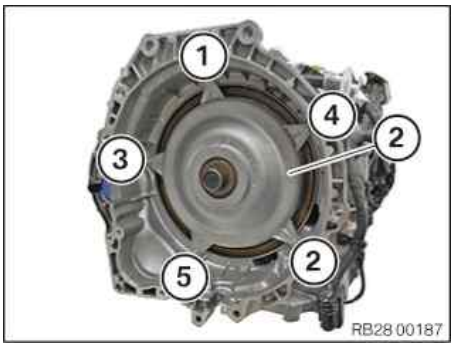



- Renew the seal (1) on the clutch cover (2).

  **Parts:** Gasket




- Before installing the clutch cover (1), position special tool **2 457 907** on the shaft so that the radial shaft seal (2) is not damaged.




- Renew screws (1) to (5) on the clutch cover (2).

  **Parts:** Bolts

- Tighten screws in the order (1) to (5).

**Clutch cover to transmission**

| | | | |
|---|---|---|---|
| | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 5,5 Nm |

### 37 – Installing the double-clutch transmission (DKG)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the engine block.**

**Damaged and corroded bolts will lead to major damage in the engine block and the transmission.**

- It is imperative that protruding threads of the transmission bolts are checked for corrosion and damage prior to removal.
- It is imperative that all rust is removed from corroded threads and that they are cleaned prior to removal.
- Renew rusted and damaged bolts.

**RISK OF DAMAGE**

**Damage to the flywheel and the double-clutch transmission (DKG).**

**Damage to the flywheel and the double-clutch transmission (DKG) due to incorrect removal and installation of the double-clutch transmission (DKG).**

- Align the double-clutch transmission (DKG) absolutely horizontally during removal and installation.

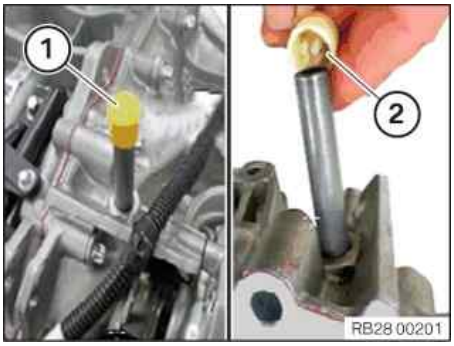
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## TECHNICAL INFORMATION

After completing work:

Check gearbox oil level. Use only the approved transmission oil.

Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

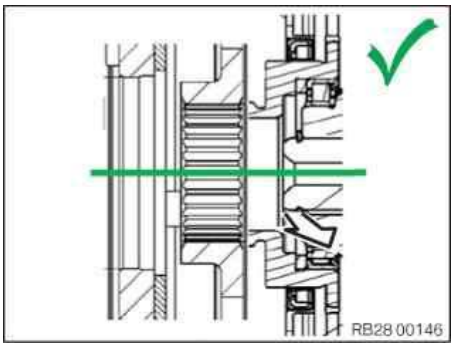



- Remove the protective caps (1) on the new transmission and renew them with the white series vent cap (2).

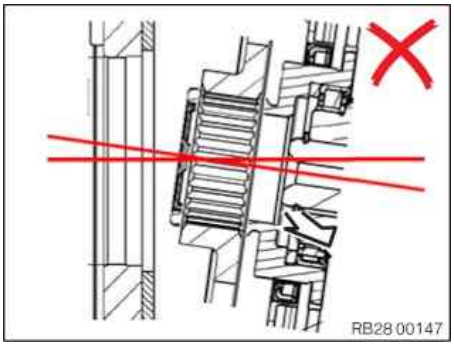
**Note:** Failure to comply with this may result in damage or leakage in the transmission.




- Check for correct fit of fitting sleeves(1).
- Replace damaged fitting sleeves.




- **Correct:** Insert the double-clutch transmission (DKG) horizontally into the flywheel.



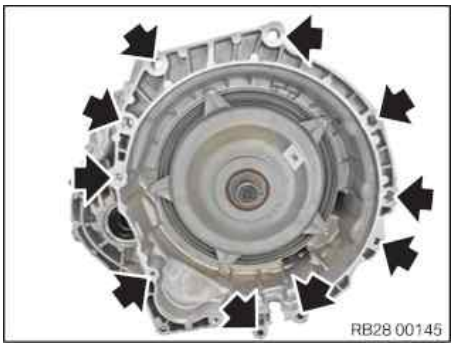

- **Wrong:** Do not tilt the double-clutch transmission (DKG) when inserting it into the flywheel.




- Clean the gearing (1) of the drive shaft.
- Coat the gearing (1) with MI-Setral-43N grease (BMW part number 83 23 2 152 082).

  Tooth gaps must be filled with grease up to tooth height.

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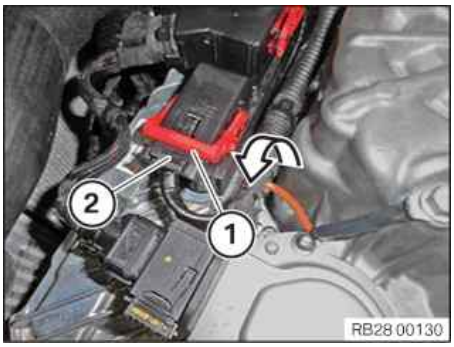

- Flange-mount the double-clutch transmission (DKG) to the engine so that it is absolutely horizontal.
- Hand-tighten the bolts (arrows).
- Tighten screws (arrows).

**Transmission to engine**

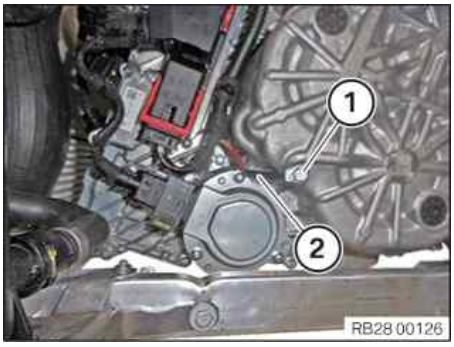
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |
| M12 | | Tightening torque | 66 Nm |




- Connect and lock the coolant lines (1).



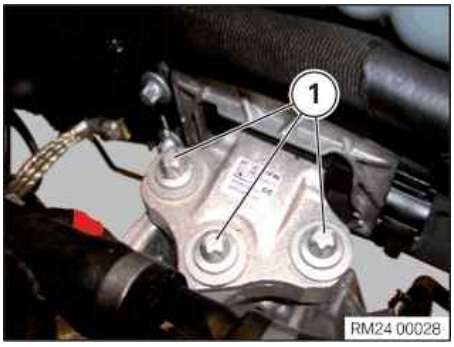

- Install the connector (2) on the control unit and fold down the red lever (1) in the direction of arrow up to the limit position.
- Check the correct fit of the plug connection (2).




- Install the grounding cable (2) and tighten the bolt (1).

**Standard screw connection M6**

| | | |
|---|---|---|
| M6 | | 8 Nm |

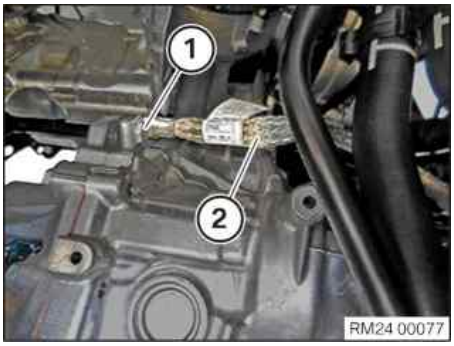



- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Transmission mounting**

| | | | |
|---|---|---|---|
| M10 | Renew screws. | Jointing torque | 40 Nm |
| | | Angle of rotation | 90 ° |



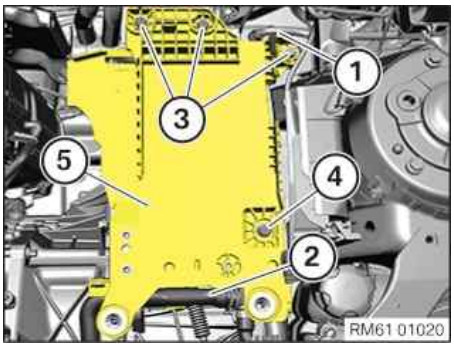

- Screw ground strap (2) onto transmission with screw (1).

**Standard screw connection M8**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

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▸ **Install the battery holder**




- Feed in and install the battery holder (5).
- Hand-tighten the bolt (4).
- Hand-tighten the bolts (3).
- Tighten down screw (4).

**Battery holder to engine support**

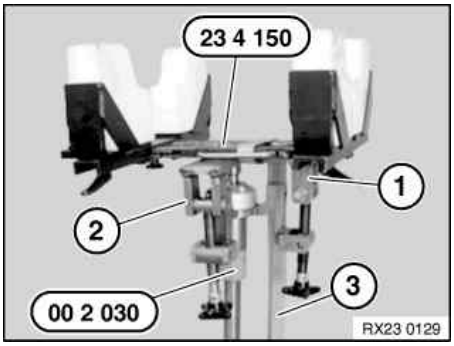
| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

- Tighten down screws (3).

**Battery holder to engine support**

| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

- Fasten the coolant line (2) on the battery holder (5).
- Fasten the cable clip (1) on the battery holder (5).




- Loosening the tensioning strap (3).
- Remove special tools **0 490 133 (00 2 030)** and .

## 38 – Installing left output shaft (double-clutch transmission (DKG))

▸ **Installing the left radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.




- Coat sealing lips of radial shaft seal with transmission oil.
- Drive in radial shaft seal using the special tool **2 409 230** into the transmission housing.

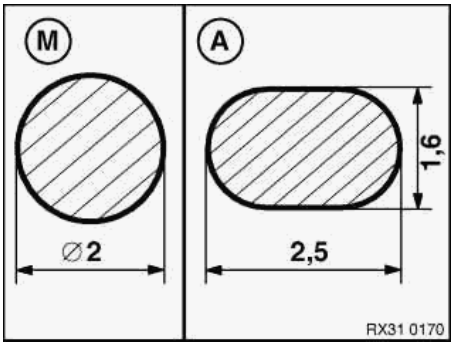
  The sealing ring must close flush with the transmission housing.

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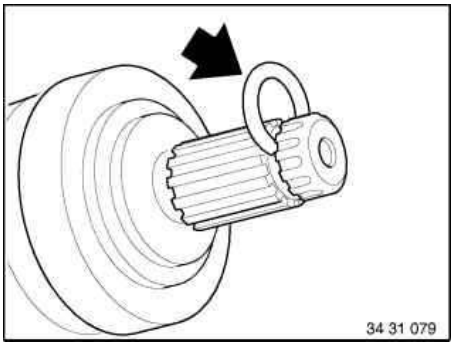

- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).

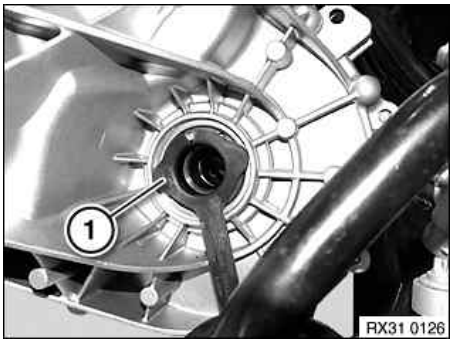



- Do not mix up circlips.

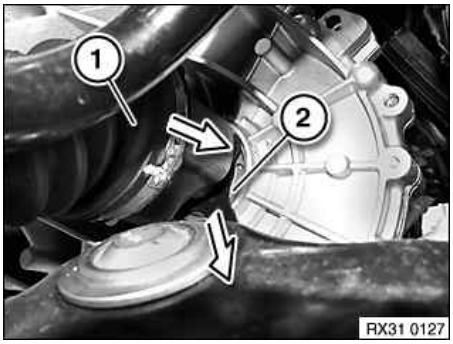
  Different types of output shafts fitted:
  - M: Manual transmission
  - A: Automatic transmission




- Renew circlip (arrow).




- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.

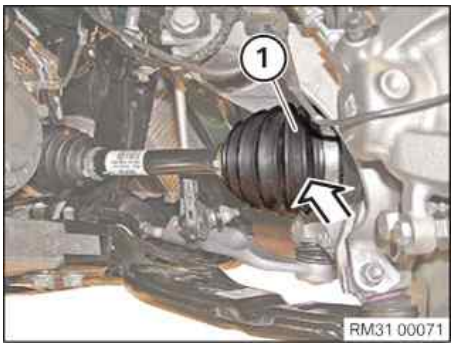



- Insert output shaft (1) into transmission.

**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

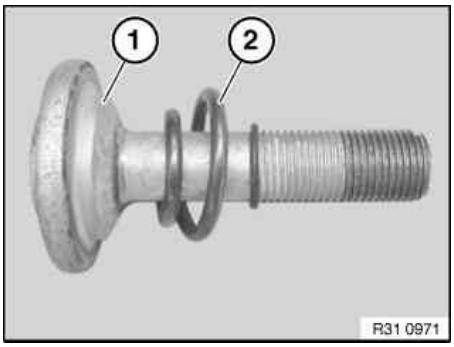
- **Manual gearbox only:** Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.

  The output shaft (1) must engage audibly.
- Check for secure seat by levering.

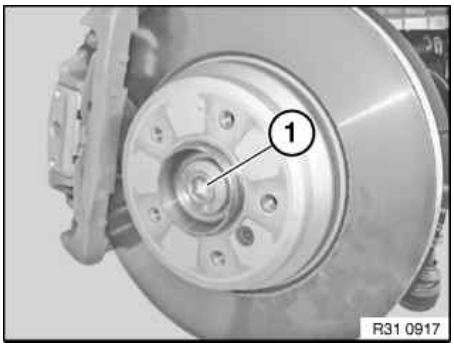



- Turn steering wheel to left.
- Insert the output shaft (1) into the swivel bearing from the front.

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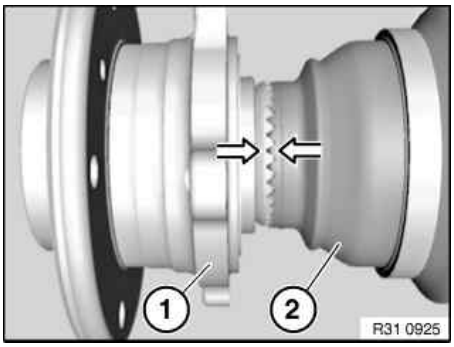



- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.




- Renew collar bolt (1) with compression spring.

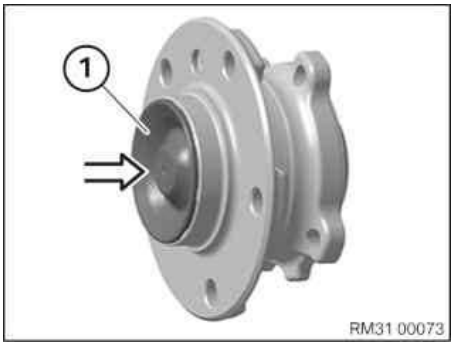
  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.




- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- When positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

**Output shaft to wheel bearing**

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |




- If necessary, attach protective cap (1).

**39 – Installing the output shaft, right (double-clutch transmission (DKG))**

▸ **Installing the right radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.



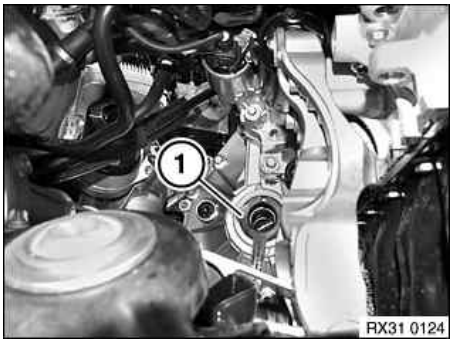

- Coat sealing lips of radial shaft seal with transmission oil.
- Drive the radial shaft seal into the gearbox housing using the special tool **2 409 230**.

  The sealing ring must lie flush with the gearbox housing.

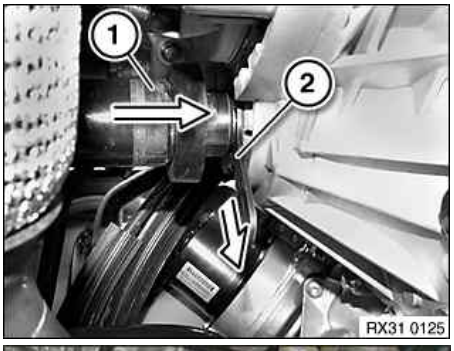



- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).



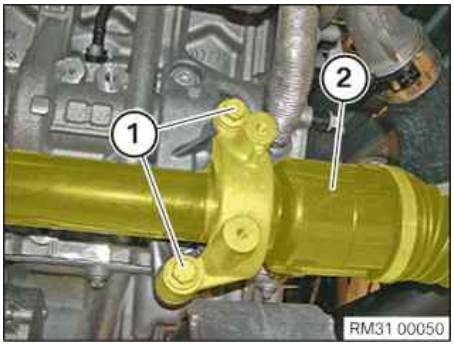

- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.




- Insert output shaft (1) into transmission.

**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

- Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.
- Check for secure seat by levering.

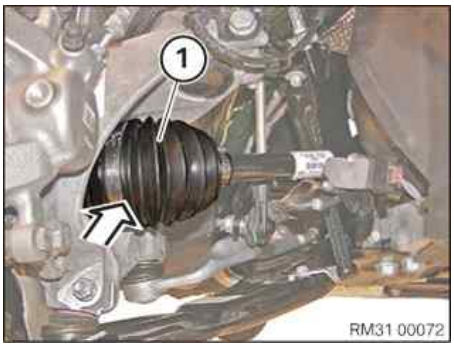



- Tighten the screws (1).

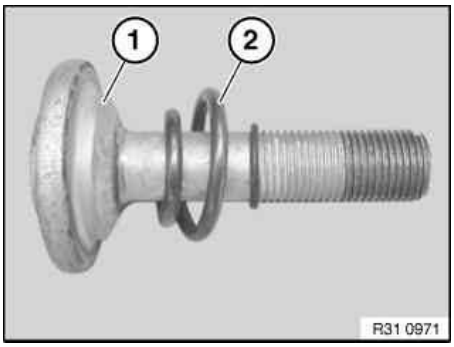
**Output shaft bearing to engine block**

| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |

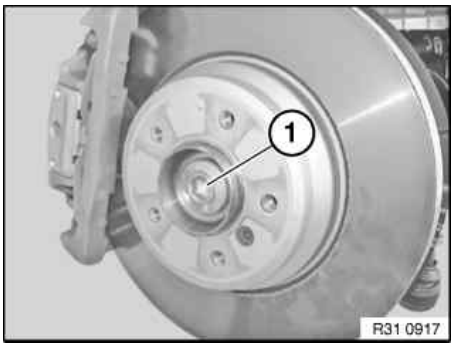
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- Turn steering wheel to right.
- Insert the output shaft (1) into the swivel bearing from the front.

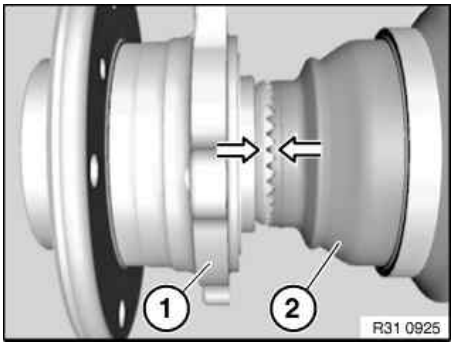



- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.




- Renew collar bolt (1) with compression spring.

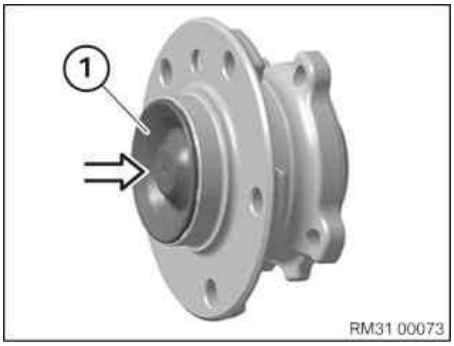
  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.




- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- If positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

**Output shaft to wheel bearing**

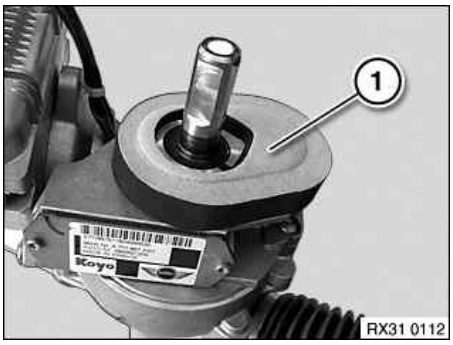
| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |




- If necessary, attach protective cap (1).

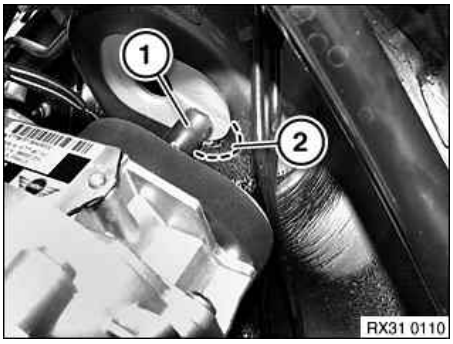
**40 – Mount and secure the complete front axle**

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- Remove the seal (1).
- Clean surface on steering gear.
- Renew gasket (1).

  **Parts:** Gasket
- Position the seal (1) and glue it on.

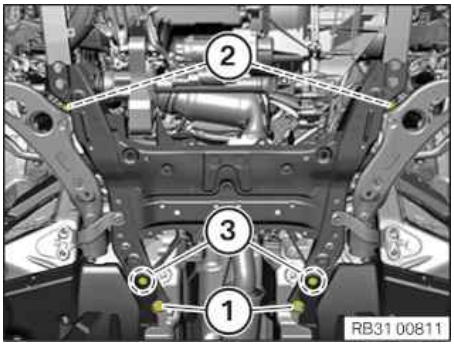



**TECHNICAL INFORMATION**

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

**Note:** Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!




- Position front axle support.
- Bend underbody panellings in the areas (3) to one side.
- Raise front axle support.
- When raising, insert charge air cooler into the rubber mount of the charge air cooler on cross member.
- Renew screws (1) and (2).

  **Parts:** Bolts
- Tighten the screws (1).

**Rear end of front axle support to body**

| | | | |
|---|---|---|---|
| M14 screw | Renew screw. | Tightening torque | 175 Nm |

- Tighten down screws (2).

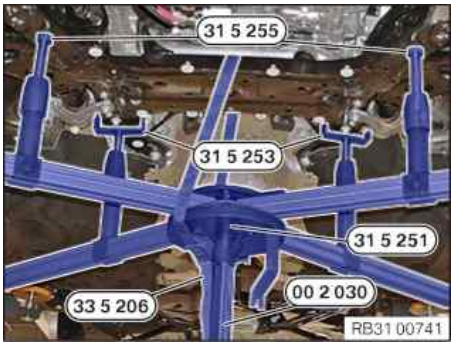
**Front axle support, front to body**

| | | | |
|---|---|---|---|
| M12 screw | Renew screw. | Tightening torque | 108 Nm |

- If necessary, tighten the screws in the areas (3).

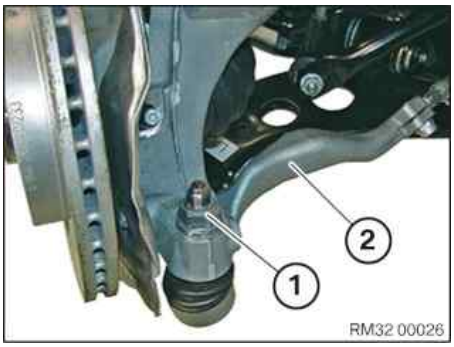
**Underbody protection to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Remove special tool **0 496 080 (33 5 206)** from special tool **0 495 817 (31 5 251)**.
- Lower universal jack **0 490 133 (00 2 030)** with the special tool **0 495 817 (31 5 251)** and place it to the side.

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**NOTICE**

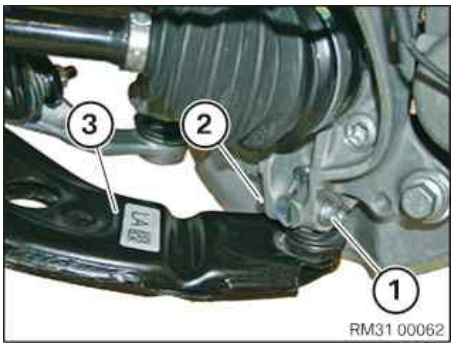
Perform the operations on the left and right side.

- Position the track rod (2) on the swivel bearing .
- Renew nut (1).

  **Parts:** Nut
- Tighten nut (1).

**Track rod end to swivel bearing**

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |




**NOTICE**

Perform the operations on the left and right side.

- Position the wishbone (3) on the swivel bearing .
- Renew the bolt (2) and the nut (1).

  **Parts:** Bolt, nut
- Insert screw (2).
- Tighten nut (1).

**Wishbone to swivel bearing**

| | | | |
|---|---|---|---|
| M10 | Exclusively use the screw to tighten!<br>Renew screw and nut. | Tightening torque | 60 Nm |

### 41 – Install the mounted parts on the front axle support




**NOTICE**

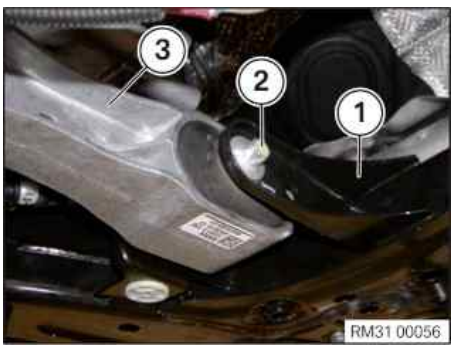
Perform the operations on the left and right side.

- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Holder, wishbone rubber mount, to body**

| | | | |
|---|---|---|---|
| M10 screw | Renew screw. | Jointing torque<br>Angle of rotation | 56 Nm<br>90 ° |

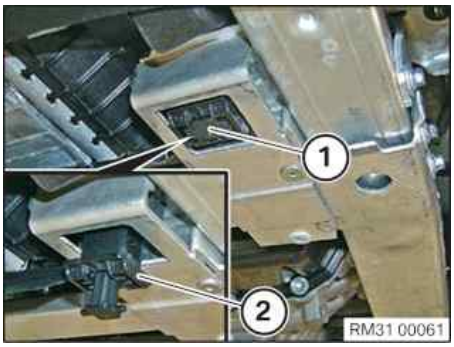



- Position the engine support (3) on the front axle support (1).
- Tighten down screw (2).

**Holder with rubber mount to front axle support**

| | | |
|---|---|---|
| M12 screw | | 100 Nm |

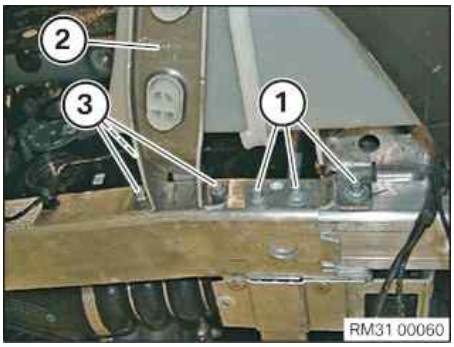
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**NOTICE**

Perform the operations on the left and right side.

- Position the lock (2).
- Lock the bracket (1) of the lock (2) of the holder for the charge air cooler.




- **Only on right side:** Position the holder for the washer fluid reservoir (2).
- Tighten down screws (3).

**Washer fluid reservoir holder to front axle support adapter plate**

| | | | |
|---|---|---|---|
| | | Tightening torque | 10 Nm |

**NOTICE**

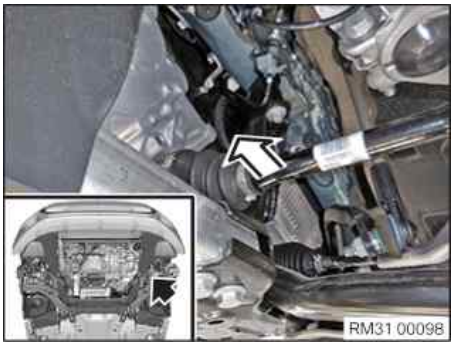
Perform the operations on the left and right side.

- Tighten the screws (1).

**Deformation element, bottom, to adapter plate, front axle carrier**

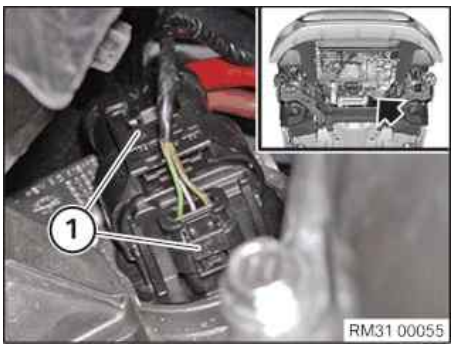
| | | | |
|---|---|---|---|
| | | Tightening torque | 11,8 Nm |

**42 – Attaching connector at steering gear**

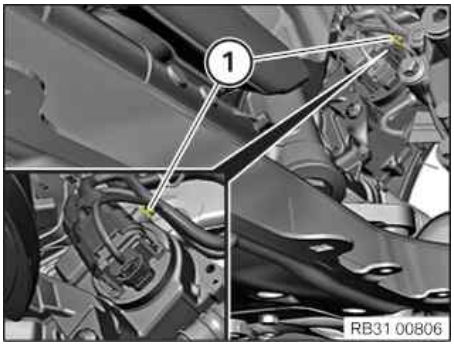



- To connect the connector (see the following step): Connect the connector with the right hand.

  The connectors can be accessed via the left output shaft.



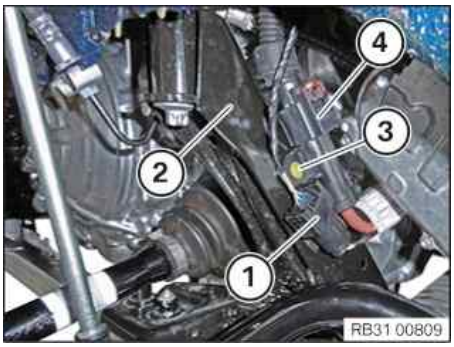

- Connect and lock connector (arrow) (1) with the steering gear.




- Fasten the wiring harness (1) on the steering gear.

▸ **If installed: Fasten the plug connections at the front axle support**

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- Position the plug connection (4) at the front axle support (2).
- Tighten down screw (3).

**Holder to front axle support**

| | | | |
|---|---|---|---|
| Oval-head screw TS5 x 16 | | Tightening torque | 2,6 Nm |

- Fasten the plug connection (1) at the front axle support (2).

### 43 – Securing rubber mount on front axle support




- Check rubber mount (1), replace if necessary.

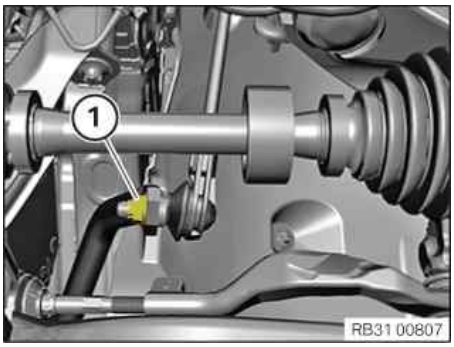
  **Parts:** Rubber mount
- Spray rubber mount (1) with lubricant and slide onto holder on front axle support.

### 44 – Securing anti-roll bar on left and right on the anti-roll bar link

**NOTICE**

Perform the operations on the left and right side.

▸ **Fastening anti-roll bar on the anti-roll bar link**




- Position the anti-roll bar link on the anti-roll bar .
- Renew nut (1).

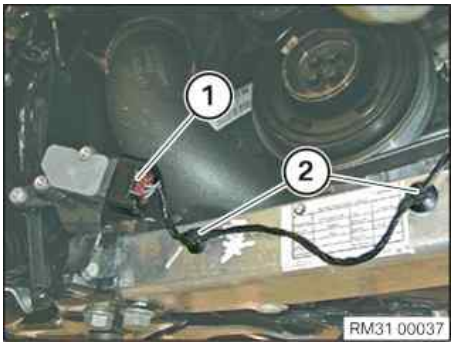
  **Parts:** Nut
- Tighten nut (1).

**Note:** Use the Torx socket for counter support.

**Anti-roll bar link to anti-roll bar**

| | | | |
|---|---|---|---|
| M10 | Renew nut. | Tightening torque | 56 Nm |

### 45 – With right installation: Securing the cable for the ride height sensor




- Secure the cable clip (2) on the adapter of the deformation element.
- Connect connectors (1) and lock.

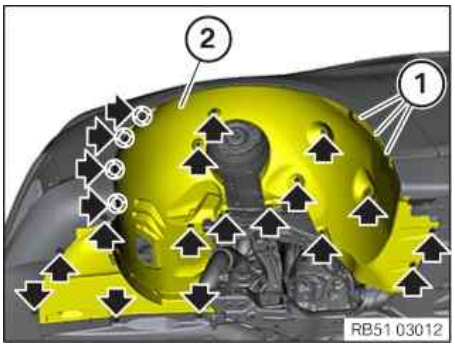
### 46 – Installing front left and right wheel arch cover

**NOTICE**

Perform the operations on the left and right side.

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▸ **Installing the front wheel arch cover**




- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

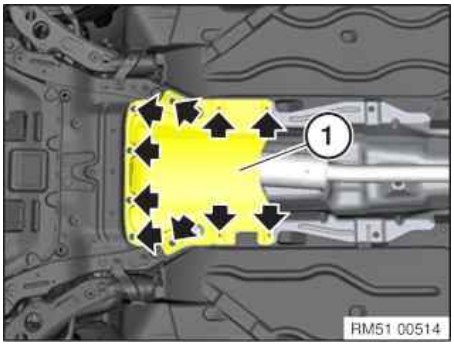
| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

**47 – If installed: Installing underbody protection at rear**




- Position rear underbody protection (1).
- Tighten screws (arrows).

**Underbody protection to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

**48 – Mount the front left and right wheels**

▸ **Mounting the wheel**

▹ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

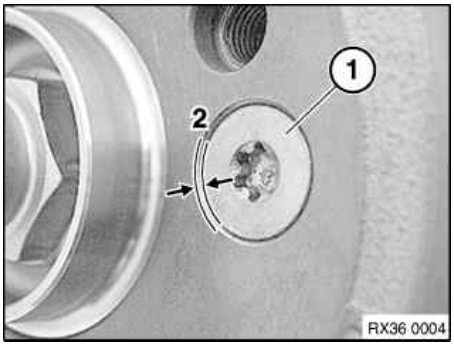
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue around the wheel bolt holes: remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Check the mounting bolt for the brake disc (1) for secure fit.

  The mounting bolt for the brake disc (1) must not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

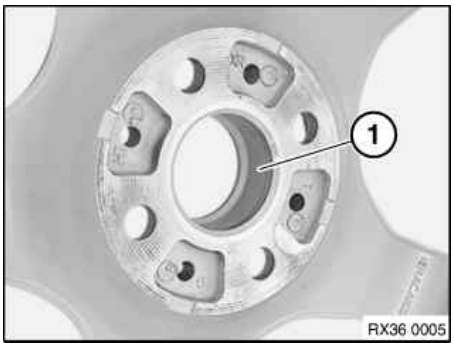
**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

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- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring.

◁




**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts (arrows) and threads for damage, renew the wheel bolts if necessary.
- Mount wheel bolts and tighten.

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

### 49 – Installing starter motor

**CAUTION**

**Improper routing of the positive battery cable.**

**Risk of short circuits!**

- Route the positive battery cable without abrasions and do not trap.

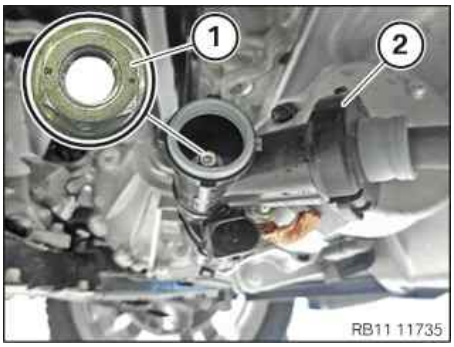



- Insert and install the starter motor .
- Tighten the screws (1).

**Starter motor to transmission**

| | | | |
|---|---|---|---|
| M8x45 | | Tightening torque | 19 Nm |

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- Feed the positive battery cable (2) in on the starter and install.
- Tighten nut (1).

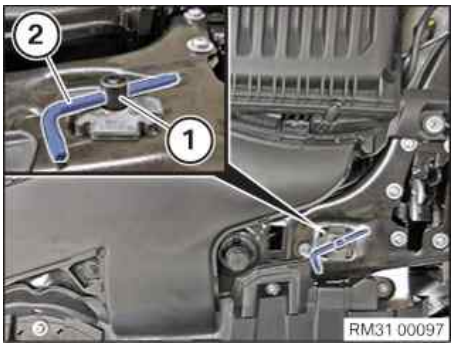
**Battery positive lead to starter**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 13,5 Nm |




- Insert and install the new sealing cap (2).
- Secure the sealing cap (2) in the direction of the arrow.
- Connect and lock the connector (1).
- Make sure the connector (1) engages audibly.

### 50 – Removing fastener for left and right radiator

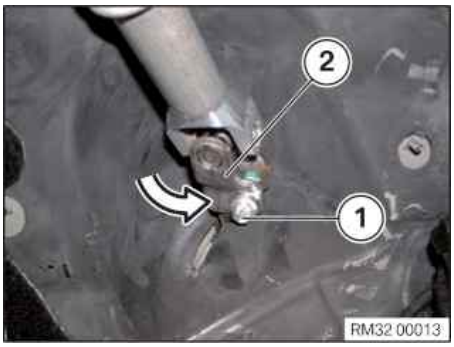



**NOTICE**

Perform the operations on the left and right side.

- Remove suitable tool (2) from the centering pin (1).

### 51 – Secure the steering shaft at the bottom on the steering gear




- Clean the screw lock residue from the screw thread in the universal joint (2).
- Pivot the universal joint (2) in the direction of the arrow to the steering gear.
- Renew the screw (1).

  **Parts:** Screw
- Tighten down screw (1).

**Lower steering shaft to steering gear**

| | | | |
|---|---|---|---|
| M10 | Clean screw thread and remove remains of screw locking agent.<br>Renew screw. | Tightening torque | 28 Nm |




- **If installed:**
- Position the cover on the steering column (2).
- Tighten nuts (1).

**Steering column cover to bulkhead**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

### 52 – Remove the engine bridge

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**CAUTION**

**Heavy component.**

**Heavy components can lead to injury or damage.**

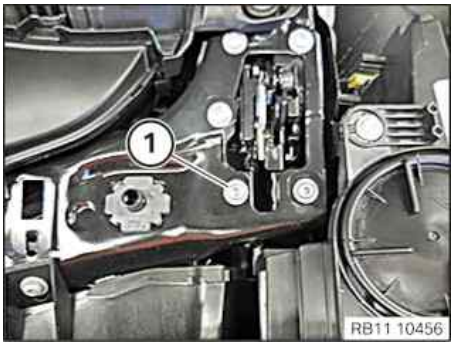
- Remove and install heavy components with the aid of another person/other persons.




- Detach the spindle screw (1) from the engine bridge.
- Unscrew the leg screws (2) and (3).
- Guide the engine bridge out of the vehicle with the help of another person and remove.




- Unscrew the bolts (1) of the special tool **2 459 012**.
- Feed out the special tool **2 459 012** at the cylinder head and remove.




- Tighten the screw (1) of the bonnet catch.

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |




- Tighten the screw (1) of the bonnet catch.

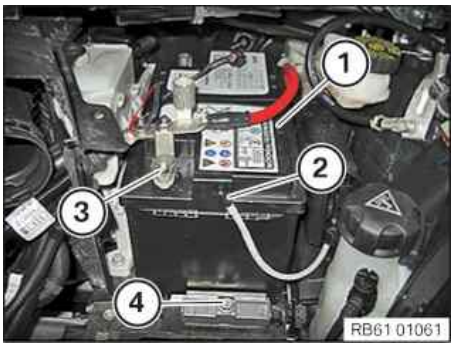
**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

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## TECHNICAL INFORMATION

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)




- Install vehicle battery (1).
- Tighten the holder with the bolt (4).

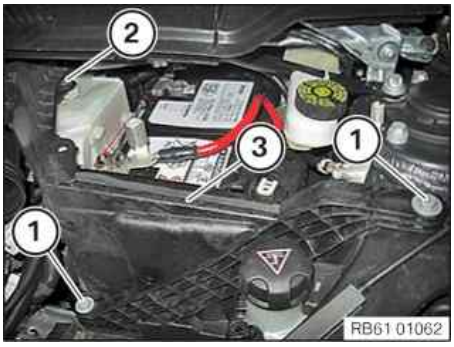
**Battery terminal rail to battery tray**

| | | |
|---|---|---|
| M8 screw | | 19 Nm |

- Position the vent hose (2).
- Position the positive terminal.
- Tighten the nut (3) on the positive terminal.

**Positive battery terminal**

| | | |
|---|---|---|
| NutM6 | | 5 Nm |




- Insert the tension strut (3).
- Tighten down screw (2).

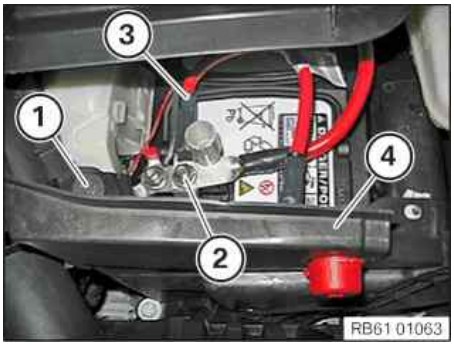
**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

- Tighten the screws (1).

**Trailing link**

| | | |
|---|---|---|
| M8 screw | | 19 Nm |




- Position the positive battery cable (3) with the cover of the remote positive terminal (4).
- Tighten down screw (1).

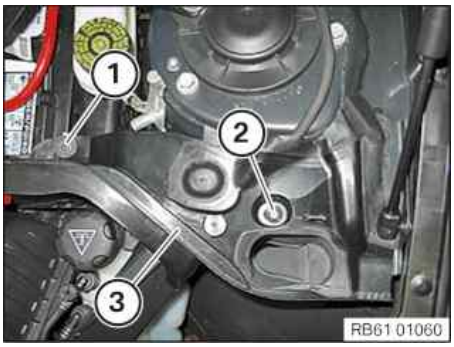
**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

- Tighten the nut (2) on the positive terminal.

**Positive battery cable to battery terminal**

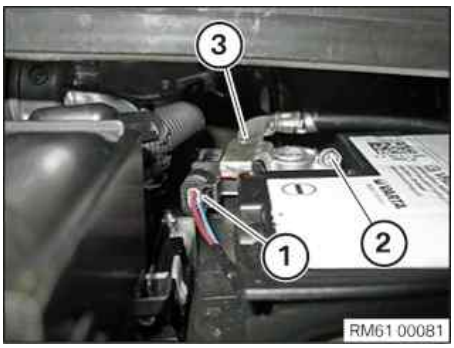
| | | |
|---|---|---|
| Nut M8 | | 15,2 Nm |




- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |



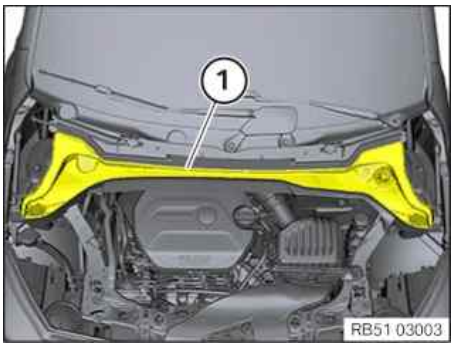

- Position the negative battery terminal (3).
- Tighten nut (2).

**Negative battery terminal (with IBS)**

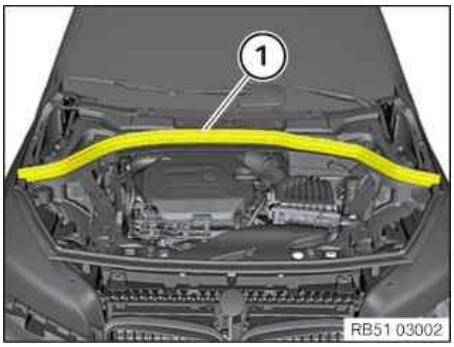
| | | |
|---|---|---|
| NutM6 | | 5 Nm |

- Connect connectors (1) and lock.

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- Feed in the cowl panel cover (1).




- Press the gasket (1) in a downwards direction.

**54 – Install electronics box**

**Prerequisite**

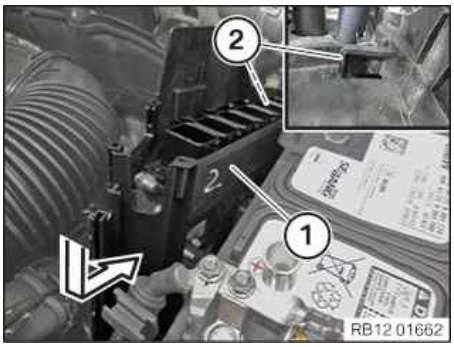
Battery earth lead is disconnected.

**RISK OF DAMAGE**

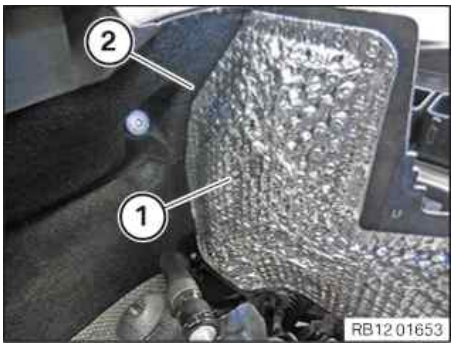
**Improper routing of cables and wiring harnesses.**

**Trapped, crushed or damaged cables may cause short circuits and malfunctions.**

- Route all cables without abrasions, do not trap and crush.

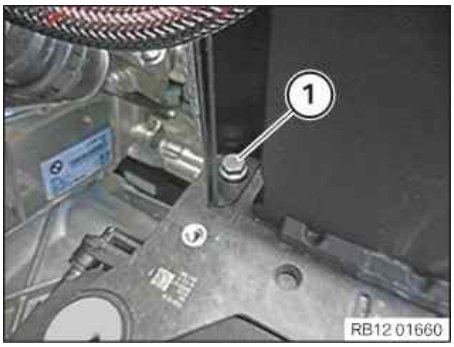



- Guide in and install the electronics box (1) into the guide (2) in direction of arrow.




- Make sure that the electronics box (1) is positioned correctly on the bulkhead (2).

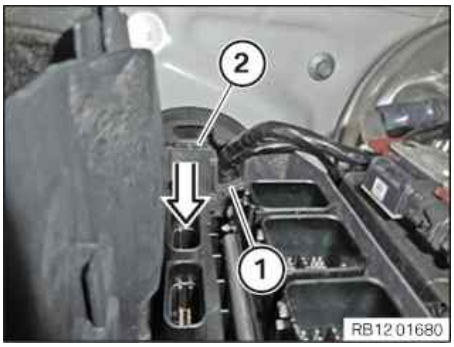
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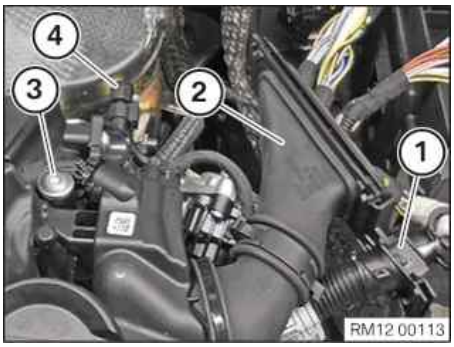

- Tighten down screw (1).

**Electronics box to battery tray**

| | | | |
|---|---|---|---|
| M8X16 | | Tightening torque | 15 Nm |




- Guide in and install the holder (1) in the electronics box (2) in direction of arrow.
- Make sure the bracket (1) engages audibly.

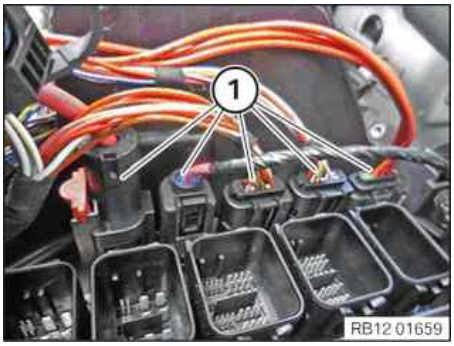



- Lay vehicle wiring harnesses (1) and (2) and mount on electronics box.
- Tighten down screw (3).

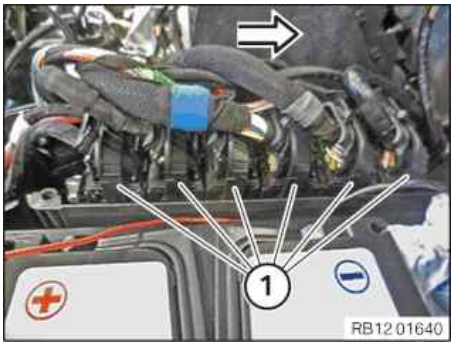
**Wiring harness to cylinder head cover**

| | | | |
|---|---|---|---|
| TS5x20 | | Tightening torque | 3,5 Nm |

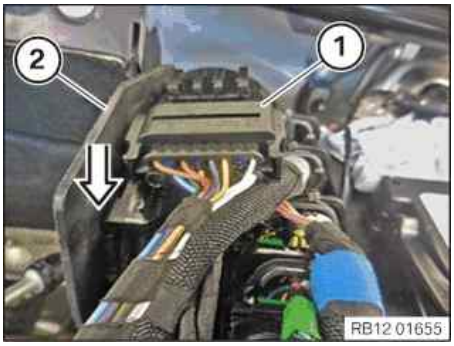
- Attach connector (4) to the differential pressure sensor and lock it audibly.




- Connect and lock the connector (1).
- Make sure the connectors (1) engage audibly.

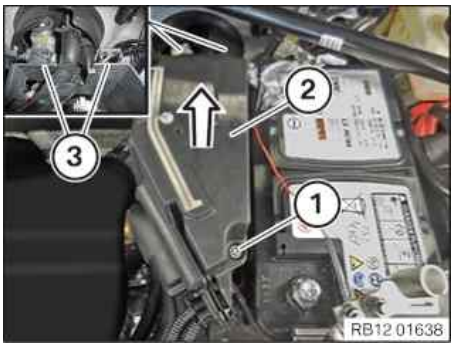



- Connect connector (1) in direction of arrow and lock.
- Make sure the connectors (1) engage audibly.




- Connect and lock the connector (1).
- Make sure the connector (1) engages audibly.
- Insert the connector (1) in the direction of arrow at the electronics box (2) and install.

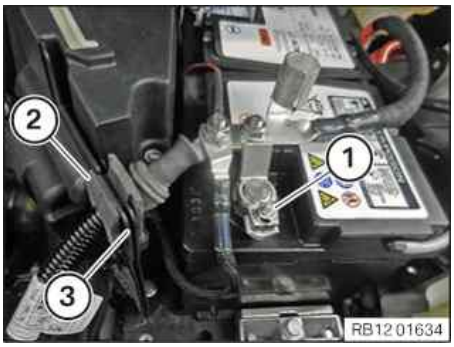
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- Insert the cover (2) into the guides (3) in the direction of arrow and install.
- Make sure the cover audibly engages (2) in the guides (3).
- Tighten down screw (1).

**Cover to electronics box**

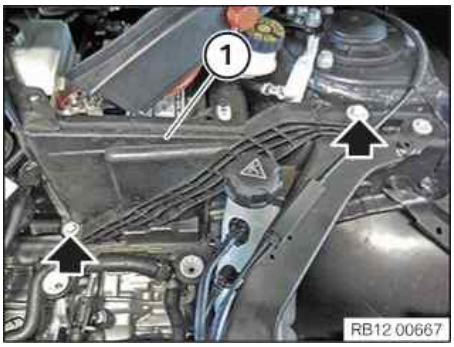
| | | | |
|---|---|---|---|
| RF5x26.5 | | Tightening torque | 2,5 Nm |




- Thread in positive battery cable (2) on holder (3) and install.
- Feed in and install positive battery terminal (1).
- Tighten positive battery terminal (1).

**Positive battery terminal to battery**

| | | | |
|---|---|---|---|
| NutM6 | | Tightening torque | 5 Nm |




- Feed in and install tension strut (1).
- Tighten screws (arrows).

**Tension strut to spring strut dome/battery tray**

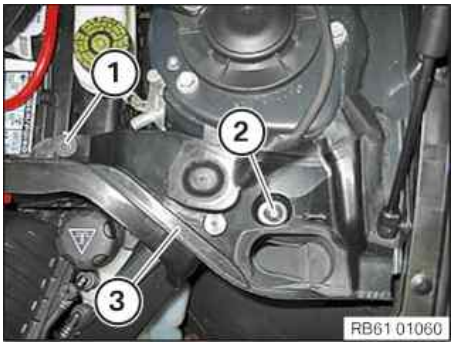
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |




- Feed in and install cover (2) at the positive battery connection point.
- Tighten down screw (1).

**Positive battery connection point cover to engine compartment partition wall**

| | | | |
|---|---|---|---|
| | | Tightening torque | 3 Nm |



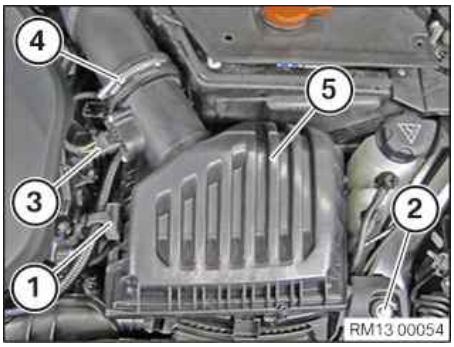

- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

**55 – Installing intake silencer housing**

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

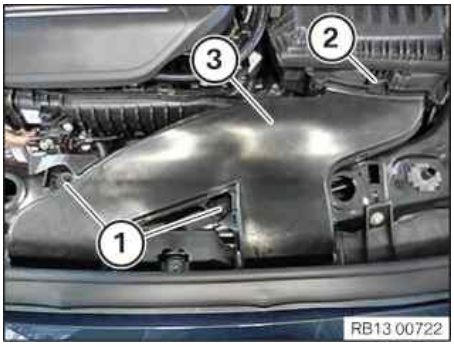
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

**56 – Install the intake neck for the intake filter housing**



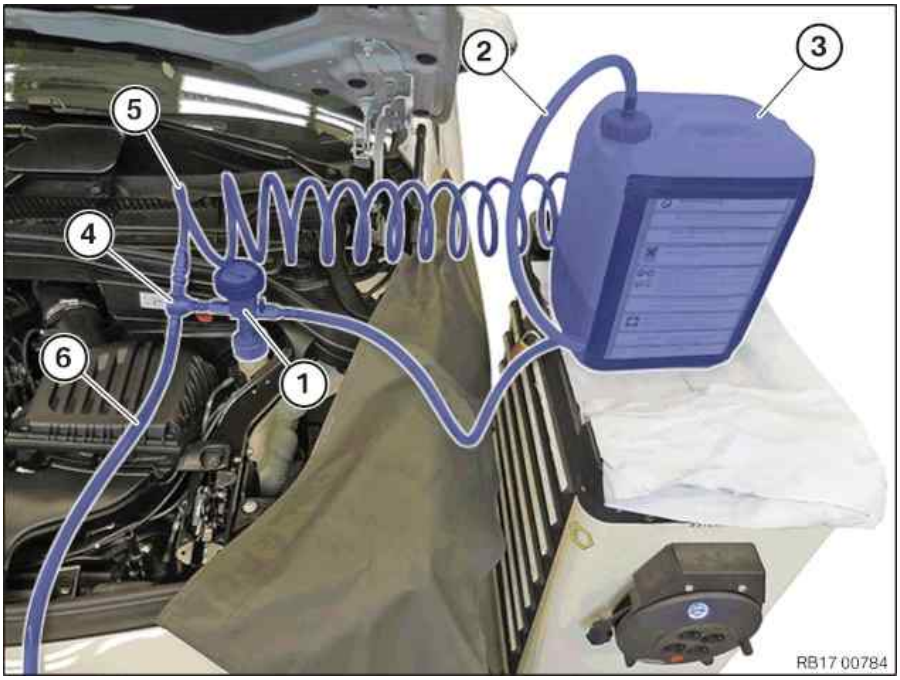

- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**57 – Filling the coolant circuit by means of the vacuum filler device**

**Vacuum filler device**




Vacuum filler device - connected to the high-temperature coolant expansion tank

**1 Vacuum filler device with pressure gauge and shutoff valves**

**2 Filling hose**

**3 Fluid tank with coolant**

**4 Venturi nozzle**

**5 Compressed air connection (maximum 6 bar)**

**6 Out-going hose (lead out-going hose into a collecting vessel)**

**Prerequisite**

The coolant expansion tank for the cooling system must be empty. The fluid tank of the vacuum filler device must have a sufficient quantity

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of premixed coolant, 1 l to 2 l more than the specified capacity for the vehicle. The fluid tank of the vacuum filler device must be positioned at the same height as the coolant expansion tank. The compressed air connection must have a pressure of 6 bar. Ignition is switched off.

**TECHNICAL INFORMATION**

Follow notes for repair work on the cooling system.

For additional information see:

Main group 17

17 00 ... Notes for working on the cooling system

**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

**TECHNICAL INFORMATION**

Filling **without** the vacuum filler device (watering can filling) is **not permitted**.

Non-compliance will result in danger of component damage and/or engine damage.

Filling specification **absolutely must** be adhered to.

The operation of the vehicle is not permitted unless the filling procedure has been completed. Otherwise, functional limitations (degradation) and/or overheating may occur.

A bleeding procedure is required after a part has been exchanged in the cooling system and/or after refilling the cooling system.

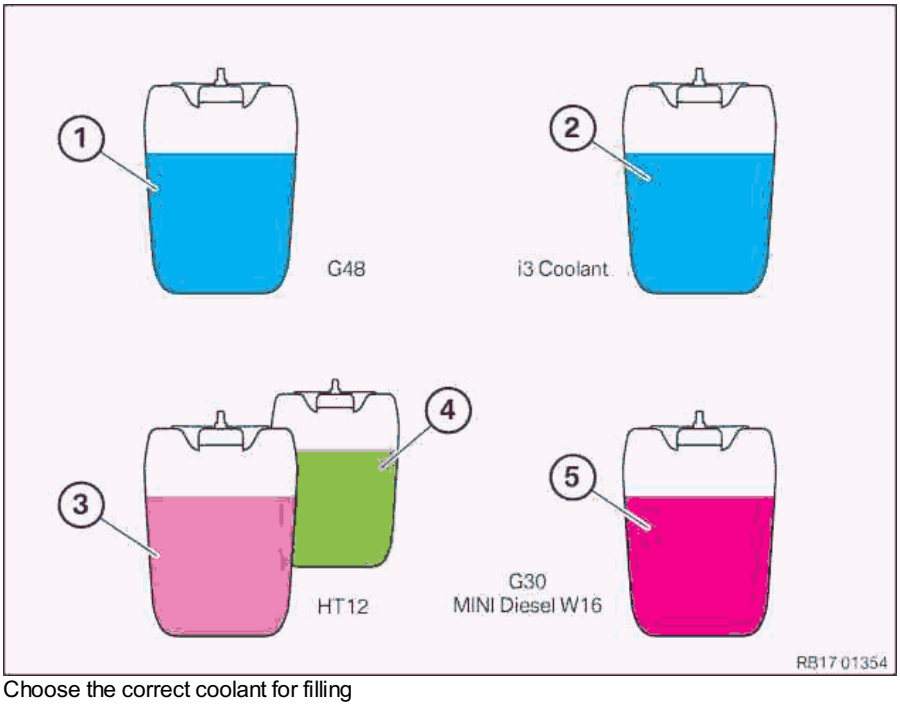
**TECHNICAL INFORMATION**

Make sure that the ignition (terminal 15) is switched off prior to creating the vacuum with the vacuum filler device.

▸ **Observe the coolant type**

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**Coolant in the vacuum filler device container**




Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

1. **G48 (Blue)** G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.
2. **i3 coolant (blue)** is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.
3. **HT12 (Pink)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
4. **HT12 (Green)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
5. **G30 (Pink)** must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

**RISK OF DAMAGE**

**Damage to the engine.**

**The use of an incorrect coolant may lead to corrosion or gelling in the engine.**

- Use only approved coolants for the specific vehicle.
- Fill the vehicle only with the coolant with which it was delivered ex works.
- Mix only compatible coolants. The colour does not allow any assessment about the compatibility of coolants.
- Selection of the correct coolant only by means of the part number.

- Select a suitable adapter (Y) from the set of special tools **0 494 417 (17 0 100)**:

| Type | Engine | Adapter (Y) from 17 0 100 |
|---|---|---|
| F39/F45/F46/F48 | B46/B48/B38/B47/B37 | 17 0 109 |

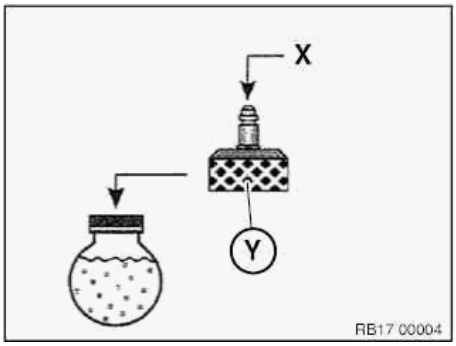
- The fluid tank of the vacuum filler device must be filled with 1 l to 2 l more than the specified capacity of coolant for the vehicle.

**Coolant capacity**

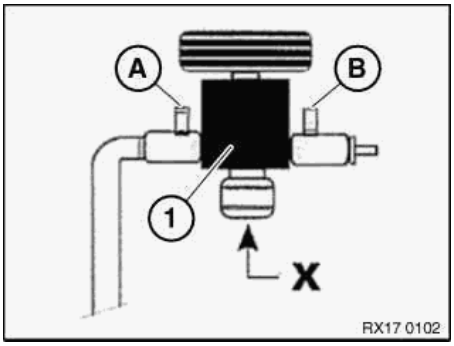
| | |
|---|---|
| B37C15/K/U1 | 6 l |

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

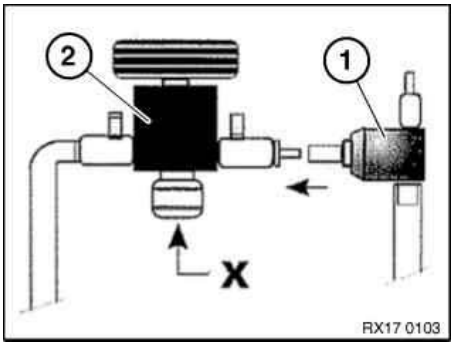
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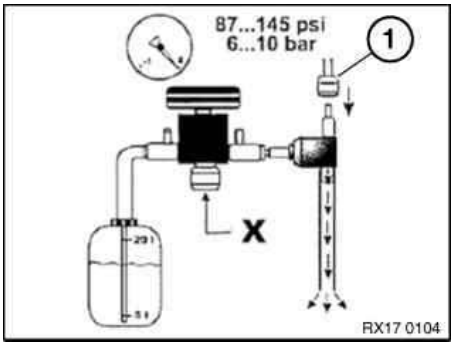

- Connect the selected adapter (Y) to the coolant expansion tank.
- Connect vacuum filler device to connection (X) of the adapter.



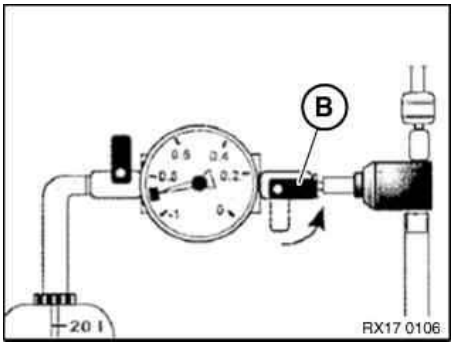

- Make sure that the shutoff valves (A) and (B)of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



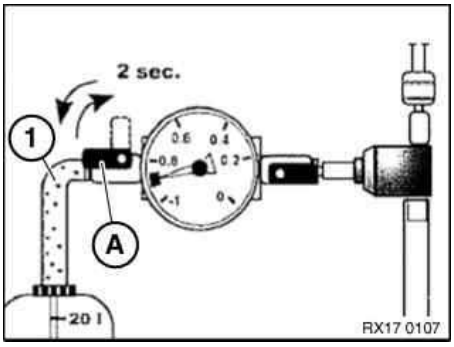

- Connect Venturi nozzle (1) to the vacuum filler device (2).
  (X)is the connection on the coolant expansion tank.




- Connect compressed air (1).
  (X) is the connection to the coolant expansion tank.



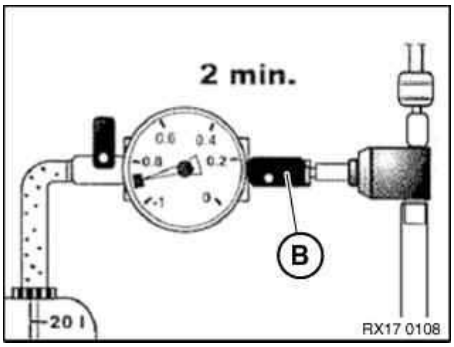

- Open shut-off valve (B).
  The venturi nozzle produces a flow noise.




- Open shutoff valve (A) until the fuel filling hose (1) is full without bubbles.
- Close shutoff valve (A) again.

» The filling hose (1) has now been bled.

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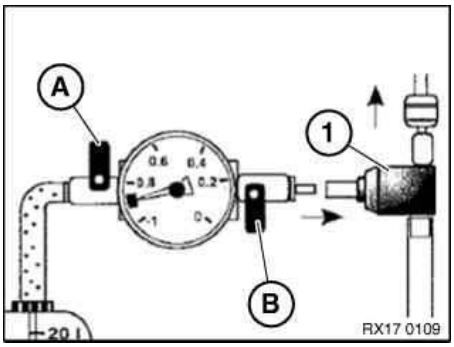



- Check the coolant hoses for porosity and renew porous coolant hoses as required.

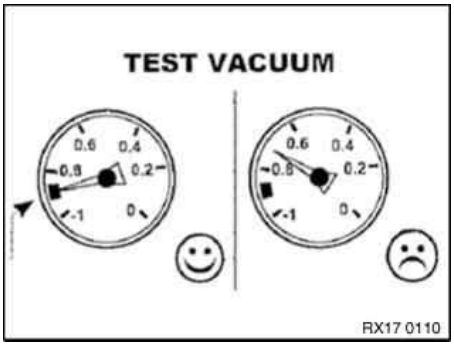
**TECHNICAL INFORMATION**

The coolant hoses contract during vacuum build-up.

- After a vacuum of -0.7 to -0.95 bar has been reached in the coolant circuit (duration approximately 2 minutes), close the shutoff valve (B).




- Check whether the shut-off valves (A) and (B) are closed.
- Disconnect the Venturi nozzle (1).




**Check**

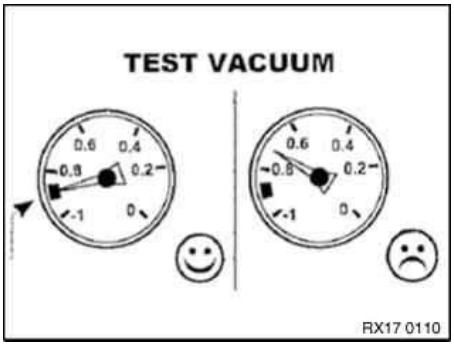
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

**Result**

» Vacuum drops.

**Measure**

- Look for the leak, repair it and start the filling procedure from the beginning.




**Check**

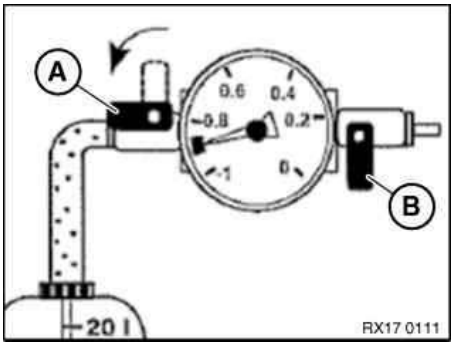
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

**Result**

» Vacuum remains constant.

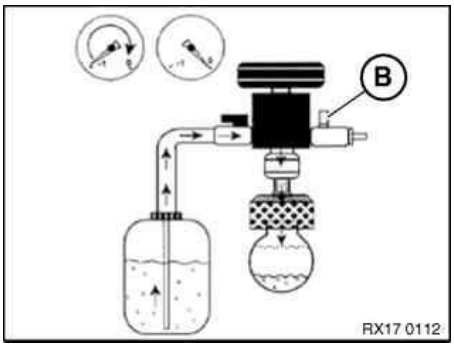
**Measure**

- Continue with filling.

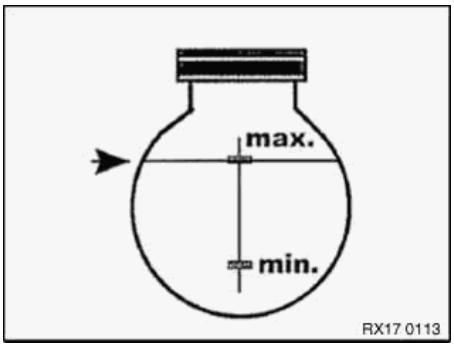



- Keep shutoff valve (B) closed during the filling process.
- To fill the cooling system, open the shutoff valve (A) to the fluid tank of the vacuum filler device.

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- Stop the filling procedure when the needle in the pressure measuring device is on 0 bar or it no longer drops.
- If necessary, reduce remaining vacuum. In order to do so, open shutoff valve (B).




- Remove the vacuum filler device with the adapter from the coolant expansion tank.
- Adjust the coolant level to 700 ml above the maximum mark.
- After filling the cooling system with the vacuum filler device perform the cooling system bleeding routine additionally.

**58 – Disconnecting all battery earth leads**




- See additional information.

**59 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

**60 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).




- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

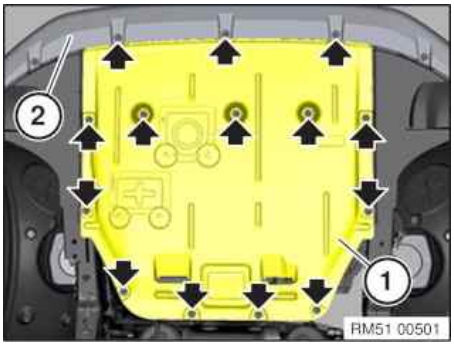
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 61 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

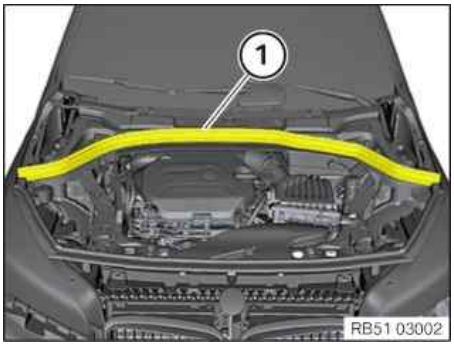
**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 62 – Install the seal for the bonnet

**NOTICE**

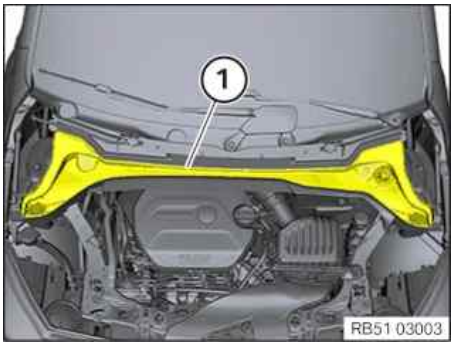
Schematic diagram is for example purposes. Some parts may differ in certain details.




- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

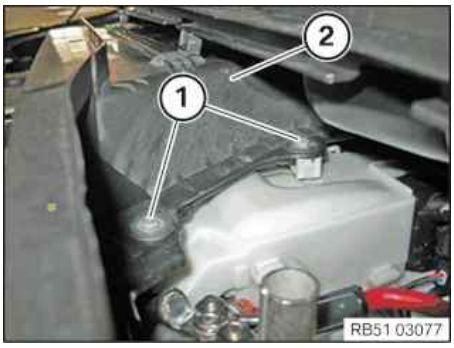
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### 63 – Installing front cowl panel cover




- Insert the cowl panel cover front (1) to the rear and install.
- Check cowl panel cover at front is correctly seated (1).

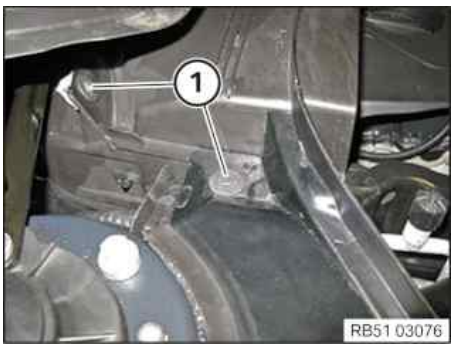
### 64 – Installing the upper bulkhead cover




- Feed in and install cover (2) of the bulkhead at the top.
- Tighten the screws (1).

**Bulkhead cover, top**

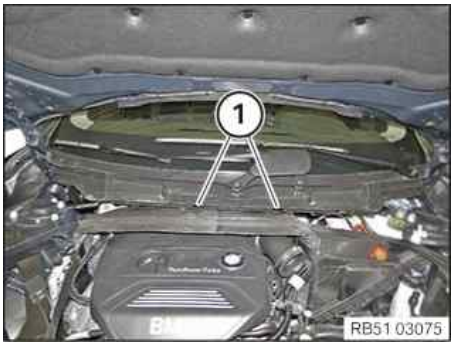
| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Tighten the screws (1).

**Bulkhead cover, top**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Tighten the screws (1).

**Bulkhead cover, top**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

### 65 – Install acoustic cover

**RISK OF DAMAGE**

**Damage to the acoustic cover.**

**Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.**

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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- Check for correct installation of all rubber mounts in the acoustic cover (1).




- Clip in the acoustic cover into the holders in the indicated areas.
- Make sure that the acoustic cover engages audibly.

**66 – Encode/program control unit(s)**

**Prerequisite**

Replacement of the control unit.

**TECHNICAL INFORMATION**

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

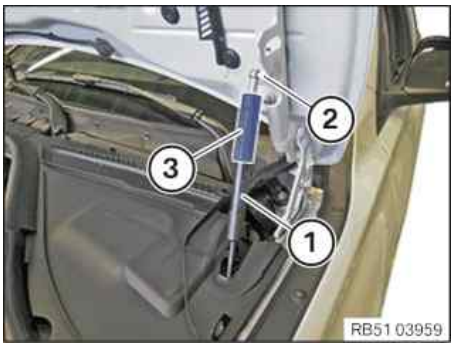
**TECHNICAL INFORMATION**

**No high-voltage switch off is required** in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.
**Exception:**
BMW I01: Note Product and Measures Management Aftersales measure 55176388.

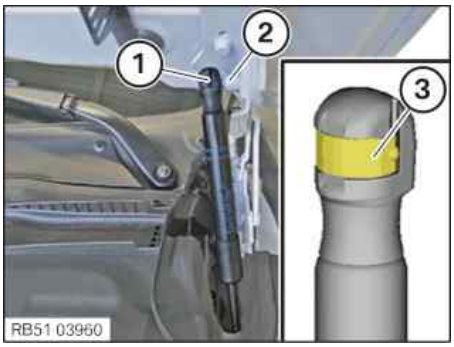
- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.

**67 – Take bonnet out of the service position**

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- Support the bonnet by hand.
- Remove the special tool **2 353 020**(3) from the ball pin (2).
- Pull off the special tool **2 353 020**(3) from the gas pressure spring (1).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.




**CAUTION**

**Shutting bonnet or tailgate.**

**Danger of injury!**

- Support bonnet/tailgate in fully open position with the aid of a suitable device.

- Check the clamp (3) is fitted correctly.
- Connect ball socket (1) to ball pin (2).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.

## Additional Information

### Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** — Used in step 13 59 60

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**Bracing strut to top cross connection** — Used in step 16

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

**Air duct to deformation element/cross connection** — Used in step 16

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

**Cross connection on support for cross connection** — Used in step 16 52

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

**Special tool to cylinder head** — Used in step 17

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 21,5 Nm |

**E-motor to transmission** — Used in step 35

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

**Clutch cover to transmission** — Used in step 36

| | | | |
|---|---|---|---|
| | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 5,5 Nm |

**Transmission to engine** — Used in step 37

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |
| M12 | | Tightening torque | 66 Nm |

**Standard screw connection M6** — Used in step 37

| | | | |
|---|---|---|---|
| M6 | | | 8 Nm |

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**Transmission mounting** — Used in step 37

| | | | |
|---|---|---|---|
| M10 | Renew screws. | Jointing torque | 40 Nm |
| | | Angle of rotation | 90 ° |

**Standard screw connection M8** — Used in step 37

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

**Battery holder to engine support** — Used in step 37

| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

**Output shaft to wheel bearing** — Used in step 38 39

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |

**Output shaft bearing to engine block** — Used in step 39

| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |

**Rear end of front axle support to body** — Used in step 40

| | | | |
|---|---|---|---|
| M14 screw | Renew screw. | Tightening torque | 175 Nm |

**Front axle support, front to body** — Used in step 40

| | | | |
|---|---|---|---|
| M12 screw | Renew screw. | Tightening torque | 108 Nm |

**Underbody protection to body** — Used in step 40 47

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

**Track rod end to swivel bearing** — Used in step 40

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |

**Wishbone to swivel bearing** — Used in step 40

| | | | |
|---|---|---|---|
| M10 | Exclusively use the screw to tighten!<br>Renew screw and nut. | Tightening torque | 60 Nm |

**Holder, wishbone rubber mount, to body** — Used in step 41

| | | | |
|---|---|---|---|
| M10 screw | Renew screw. | Jointing torque | 56 Nm |
| | | Angle of rotation | 90 ° |

**Holder with rubber mount to front axle support** — Used in step 41

| | | | |
|---|---|---|---|
| M12 screw | | | 100 Nm |

**Washer fluid reservoir holder to front axle support adapter plate** — Used in step 41

| | | | |
|---|---|---|---|
| | | Tightening torque | 10 Nm |

**Deformation element, bottom, to adapter plate, front axle carrier** — Used in step 41

| | | | |
|---|---|---|---|
| | | Tightening torque | 11,8 Nm |

**Holder to front axle support** — Used in step 42

| | | | |
|---|---|---|---|
| Oval-head screw TS5 x 16 | | Tightening torque | 2,6 Nm |

**Anti-roll bar link to anti-roll bar** — Used in step 44

| | | | |
|---|---|---|---|
| M10 | Renew nut. | Tightening torque | 56 Nm |

**Wheel arch cover to body** — Used in step 46

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body** — Used in step 46

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

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**Brake disc to front wheel hub** — Used in step 48

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

**Brake disc to rear wheel hub** — Used in step 48

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

**Wheel bolts** — Used in step 48

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

**Starter motor to transmission** — Used in step 49

| | | | |
|---|---|---|---|
| M8x45 | | Tightening torque | 19 Nm |

**Battery positive lead to starter** — Used in step 49

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 13,5 Nm |

**Lower steering shaft to steering gear** — Used in step 51

| | | | |
|---|---|---|---|
| M10 | Clean screw thread and remove remains of screw locking agent.<br>Renew screw. | Tightening torque | 28 Nm |

**Steering column cover to bulkhead** — Used in step 51

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Battery terminal rail to battery tray** — Used in step 53

| | | | |
|---|---|---|---|
| M8 screw | | | 19 Nm |

**Positive battery terminal** — Used in step 53

| | | | |
|---|---|---|---|
| NutM6 | | | 5 Nm |

**Battery cover** — Used in step 53 54

| | | | |
|---|---|---|---|
| Screw | | | 2,8 Nm |

**Trailing link** — Used in step 53

| | | | |
|---|---|---|---|
| M8 screw | | | 19 Nm |

**Positive battery cable to battery terminal** — Used in step 53

| | | | |
|---|---|---|---|
| Nut M8 | | | 15,2 Nm |

**Negative battery terminal (with IBS)** — Used in step 53

| | | | |
|---|---|---|---|
| NutM6 | | | 5 Nm |

**Electronics box to battery tray** — Used in step 54

| | | | |
|---|---|---|---|
| M8X16 | | Tightening torque | 15 Nm |

**Wiring harness to cylinder head cover** — Used in step 54

| | | | |
|---|---|---|---|
| TS5x20 | | Tightening torque | 3,5 Nm |

**Cover to electronics box** — Used in step 54

| | | | |
|---|---|---|---|
| RF5x26.5 | | Tightening torque | 2,5 Nm |

**Positive battery terminal to battery** — Used in step 54

| | | | |
|---|---|---|---|
| NutM6 | | Tightening torque | 5 Nm |

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**Tension strut to spring strut dome/battery tray** — Used in step 54

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

**Positive battery connection point cover to engine compartment partition wall** — Used in step 54

| | | | |
|---|---|---|---|
| | | Tightening torque | 3 Nm |

**Intake silencer housing to lock bridge** — Used in step 55

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** — Used in step 55

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 56

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 61

| | | | |
|---|---|---|---|
| | | | 3 Nm |

**Bulkhead cover, top** — Used in step 64

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

## Overview of Special Tools

### 2 353 020 Support




**Common** — Used in step 1 67

| | |
|---|---|
| Usage | For service position of engine compartment lid Associated contour-graphic silhouette foil can be ordered under: 83 30 2 356 848. Further information on the contour-graphic silhouette foil can be found in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A74 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 11 13 (960) |

### 2 459 012 Holder

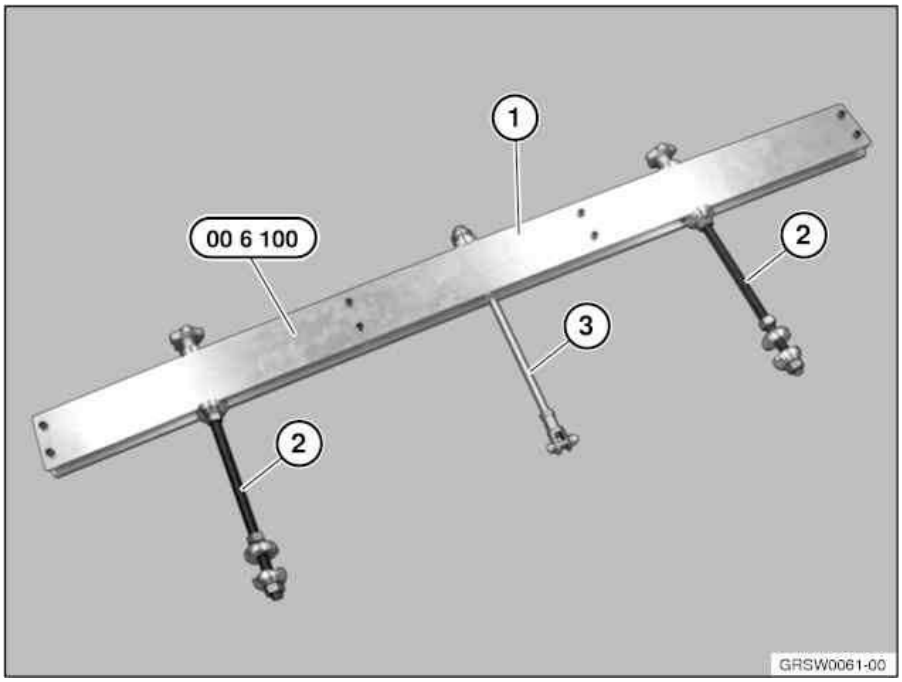



**Common** — Used in step 17 52

| | |
|---|---|
| Usage | For removing and installing the cylinder head. Contour-graphic silhouette foil is included in the delivery specification. |
| Included in the tool or work | |
| Storage location | A58 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 07 17 (487) |

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**0 496 852 (00 6 100) Device**




## Common

Used in step 17

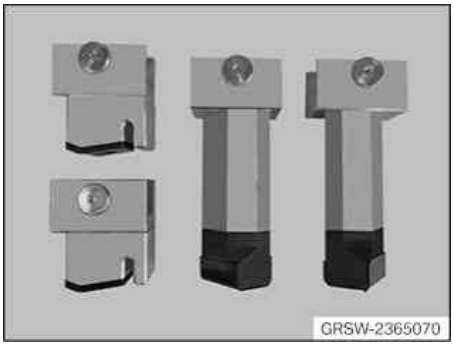
| | |
|---|---|
| Usage | Engine bridge (device) 006000 |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 17 10 (659) |

## Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 2 | 2 361 507 (00 6 102) | | **Spindle** Set (2 pieces) in connection with 00 6 100. | |
| 3 | 2 361 506 (00 6 103) | | **Spindle** Spindle (central spindle) for Traverse 00 6 100. | |

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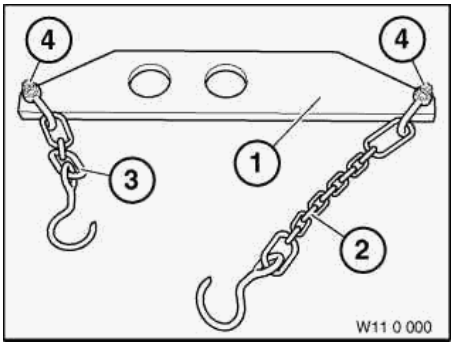
### 2 365 070 Upholstery




**Common** Used in step 17

| | |
|---|---|
| Usage | Washer for securing the engine support. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | Engine bridge 006100 - 0496852 Section 006051 - 0496436 Adapter 006130 - 2209122 Adapter 2318635 |
| SI-Number | 01 45 14 (186) |

### 0 490 561 (11 0 000) Lifting gear




**Common** Used in step 17

| | |
|---|---|
| Usage | (Hoisting gear) For removing and installing engines. As of 08/2011 only available as a complete set. Delivered with TÜV inspection certificate and operating instructions. No delivery of separate parts. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 13 94 (888) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 4 | 0 490 565 (11 0 009) | | **Shackle** (Shackle) 2 pieces. As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 1 | 0 490 562 (11 0 001) | | **Lifting gear** (Cross member) As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 2 | 0 490 563 (11 0 002) | | **Chain** (Chain) Version: long As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 3 | 0 490 564 (11 0 003) | | **Chain** (Chain) Version: short As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |

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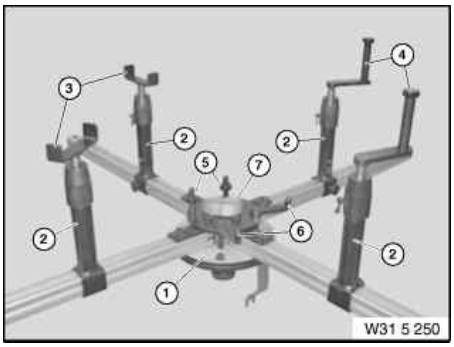
### 2 357 269 Shackle




**Common** Used in step 17

| | |
|---|---|
| Usage | Set consisting of 4 pieces. Was valid as campaign for BMW i Aftersales High Voltage. During the course of the changeover from BMWi to iPerformance, a tool changeover also takes place from campaign to warehouse. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 19 13 (985) |

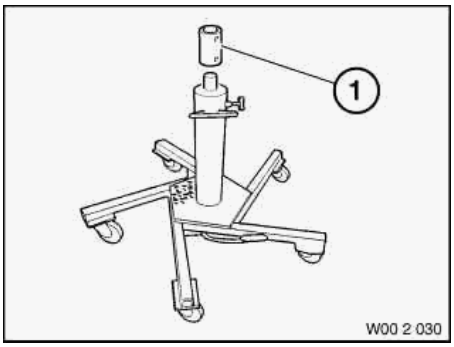
### 0 495 817 (31 5 251) Basic body




**Common** Used in step 29 40

| | |
|---|---|
| Usage | (Basic body) No longer available separately, only via special tool set 31 5 250 (83 30 0 495 567) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

### 0 490 133 (00 2 030) Device



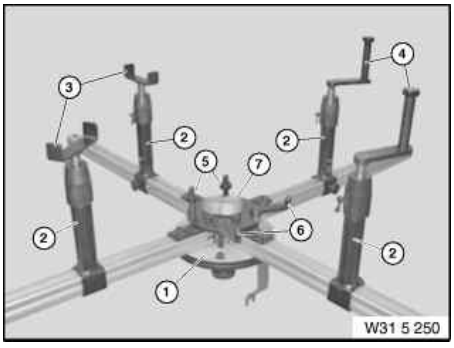

**Common** Used in step 29 32 37 40

| | |
|---|---|
| Usage | (universal hydraulic lifter base unit) Chassis and hydraulic lifter - For removing and installing rear axle supports and gearboxes. Also for soft top mounts. Is replaced by 81 22 2 219 012 |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 05 90 (207) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 490 134 (00 2 031) | | **Adapter** (adapter for gearbox holder) Model series: E30, E31, E32, E34, E36 | |

### 0 495 821 (31 5 255) Adapter

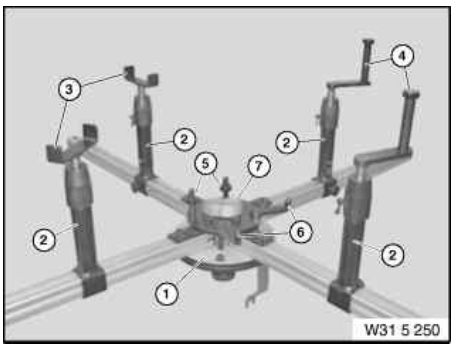



**Common** Used in step 29

| | |
|---|---|
| Usage | (take-up adapter for bore holes (2 x)) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

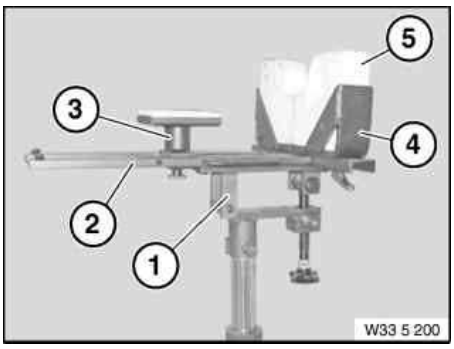
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### 0 495 819 (31 5 253) Adapter



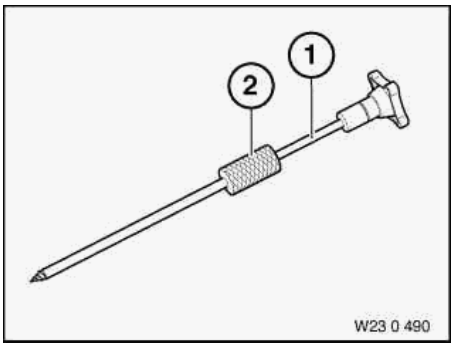

| Common | Used in step 29 |
|---|---|
| Usage | (take-up adapter U-section (2 x)) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

### 0 496 080 (33 5 206) Belt




| Common | Used in step 29 40 |
|---|---|
| Usage | (Tensioning strap) |
| Included in the tool or work | 0 496 009 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 491 454 (23 0 490) Puller



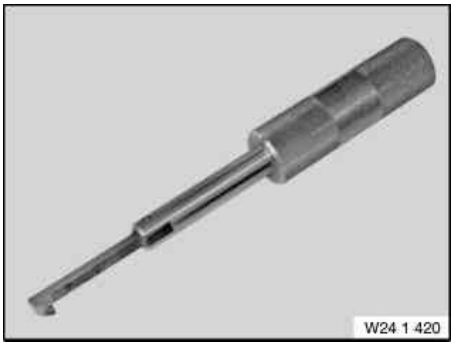

| Common | Used in step 30 31 |
|---|---|
| Usage | For removing shaft seal |
| Included in the tool or work | |
| Storage location | A13 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 15 96 (106) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 491 455 (23 0 491) | | **Rod** With self-tapping screw Deletion, only available via tool set | |
| 2 | 0 491 456 (23 0 492) | | **Weight** (Weight) | |

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**0 496 716 (24 1 420) Puller**




## Common

Used in step 33

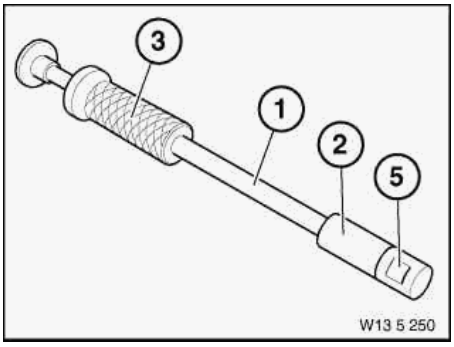
| | |
|---|---|
| Usage | Removing radial shaft seal from torque converter. |
| Included in the tool or work | |
| Storage location | B54 |
| Replaced by | |
| In connection with | 13 5 250 = 0493321 |
| SI-Number | 01 17 09 (577) |

## Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 2 209 493 (24 1 421) | | **Blade**<br>Replacement blades for 24 1 420 Only available as part of complete tool set 24 1 420 (83 30 0 496 716). | |

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**0 493 321 (13 5 250) Puller**




## Common

Used in step 33

| | |
|---|---|
| Usage | For removing injector nozzles or injectors from cylinder head |
| Included in the tool or work | |
| Storage location | A16 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 06 98 (306) |

## Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 493 338 (13 5 251) | | **Rod** (guide rod) | |
| 2 | 0 493 339 (13 5 252) | | **Bush** (Threaded bush) | |
| 3 | 0 493 340 (13 5 253) | | **Weight** (Weight) | |
| 4 | 0 493 379 (13 5 254) | | **Claw** (Clamping claw) For removal of injector nozzles / engine: M57 | |
| 5 | 0 495 579 (13 5 255) | | **Adapter** For removing steering shaft on E85. Refer to SI 01 11 06 (265) | |

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### 2 457 925 Device




| Common | Used in step 34 35 |
|---|---|
| Usage | For the removal/installation of the clutch package and also for the installation of the sealing plug of the drive shaft. Contour-graphic silhouette foil is included in the delivery specification. |
| Included in the tool or work | |
| Storage location | C6 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 19 17 (511) |

### 2 457 907 Fitting aid




| Common | Used in step 36 |
|---|---|
| Usage | For installing the clutch cover. Contour-graphic silhouette foil is included in the delivery specification. Further information on the contour-graphic silhouette foil is included in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | B6 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 19 17 (511) |

### 2 409 230 Mandrel




| Common | Used in step 38 39 |
|---|---|
| Usage | For installing the rear-wheel drive of Transmission output shaft le./ri. silhouette foil is contained in delivery specification. Further information on the contour-graphic silhouette foil is included in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A75 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 56 14 (214) |

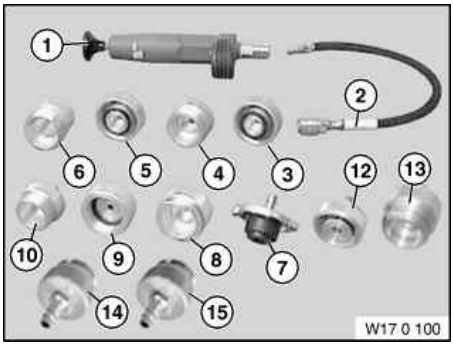
### 2 344 011 Tool




| Common | Used in step 48 |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

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**0 494 417 (17 0 100) Tester**




**Common** Used in step 57

| | |
|---|---|
| Usage | For checking engine cooling system on watertightness. For checking radiator cap. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 07 02 (884) |

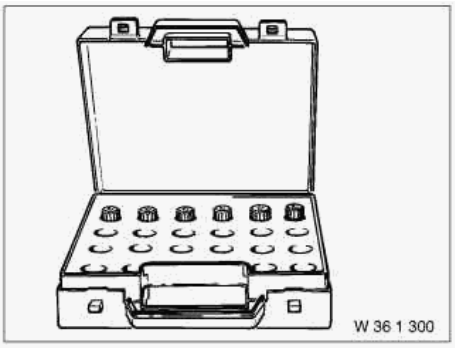
**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 5 | 0 494 422 (17 0 105) | | **Adapter** For radiator cap (sawtooth thread) | |
| 10 | 0 494 427 (17 0 111) | | **Adapter** For radiator cap R53/W11, R50/W17 adapter replaced 17 0 052. | |
| 1 | 0 494 418 (17 0 101) | | **Pump** | |
| 2 | 0 494 419 (17 0 102) | | **Hose** (hose with quick-release coupling) | |
| 3 | 0 494 420 (17 0 103) | | **Adapter** For radiator cap (normal thread) | |
| 4 | 0 494 421 (17 0 104) | | **Adapter** For radiator cap (normal thread) | |
| 6 | 0 494 423 (17 0 106) | | **Adapter** For radiator cap (sawtooth thread) | |
| 7 | 0 494 424 (17 0 107) | | **Adapter** For radiator cap R50 / W10 | |
| 8 | 0 494 425 (17 0 108) | | **Adapter** For radiator cap R50 / W10 | |
| 9 | 0 494 426 (17 0 109) | | **Adapter** For radiator connection R53/W11, R50/W17 adapter corresponds to 17 0 051 | |
| 11 | 0 494 428 (17 0 112) | | **Case** | |
| 12 | 0 494 642 (17 0 113) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 13 | 0 494 643 (17 0 114) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 14 | 0 495 889 (17 0 115) | | **Adapter** For radiator cap Model series: N12, N14 | |

**Replacement tools:**

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### 0 495 221 (36 1 323) Wheel stud



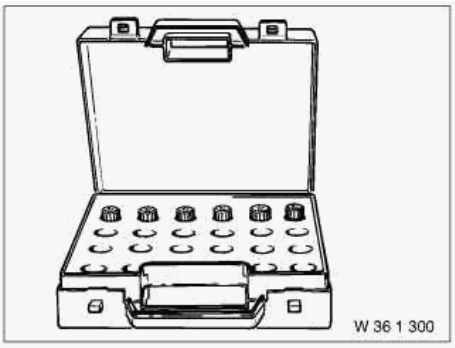

| Common | Used in step 21 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 224 (36 1 326) Wheel stud



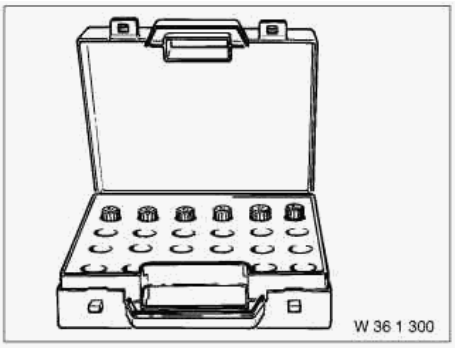

| Common | Used in step 21 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 225 (36 1 327) Wheel stud



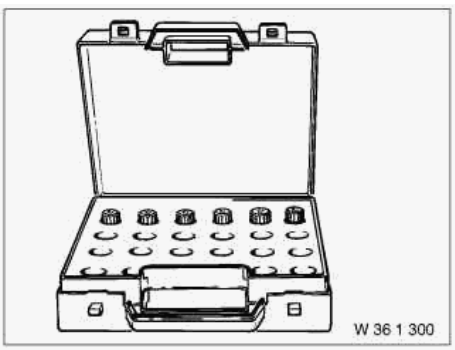

| Common | Used in step 21 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

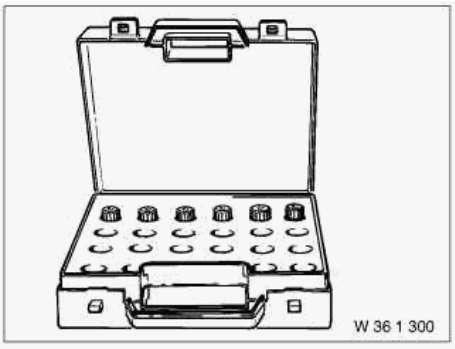
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**0 495 228 (36 1 331) Wheel stud**



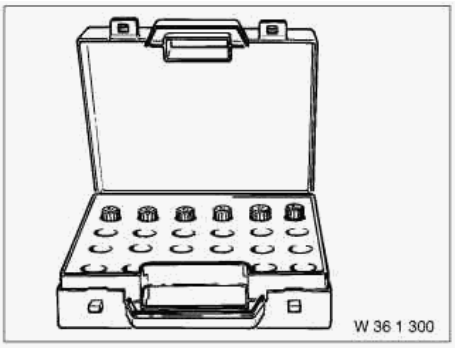

| Common | Used in step 21 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

**0 495 229 (36 1 332) Wheel stud**




| Common | Used in step 21 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

**0 495 230 (36 1 333) Wheel stud**




| Common | Used in step 21 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Overview Technical Data

| Coolant capacity | Used in step 57 |
|---|---|
| B37C15/K/U1 | 6 l |

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

## Links

| General repair instructions | Used in step |
|---|---|
| 61 20 ... Notes on AGM battery | 10 53 |

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| | |
|---|---|
| 61 12 ... Notes on intelligent battery sensor (IBS) | 10 53 |
| 61 00 ... Notes for disconnecting and connecting battery | 10 53 |

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 58 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 58 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 58 |
| 61 35 ... Notes on ESD protection (Electro Static Discharge) | 9 |
| 17 00 ... Notes for working on cooling system. | 57 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 13 59 60 |
| 2.0 Grease for wheel centring | 48 |

| Operating materials | Used in step |
|---|---|
| Main group 17 | 57 |

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# 28 40 001 Removing and installing/replacing clutch cover (7DCT300)

**WARNING**

**Motor vehicle may slip off the vehicle hoist where components are supported.**

**Danger! Life-threatening injuries!**

- Secure the vehicle hoist against lowering and lifting.

**WARNING**

**Motor vehicle may slip off the vehicle hoist if the weight is distributed unevenly.**

**Danger! Life-threatening injuries!**

- Ensure there is a specific weight compensation on the motor vehicle.

**WARNING**

**Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.**

**Danger! Life-threatening injuries!**

- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raising the vehicle using a vehicle hoist.

**CAUTION**

**Component with heavy weight.**

**Danger of injury!**

- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the double-clutch transmission (DKG).

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**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

### 1 – Bring front compartment lid in the service position

**Prerequisite**

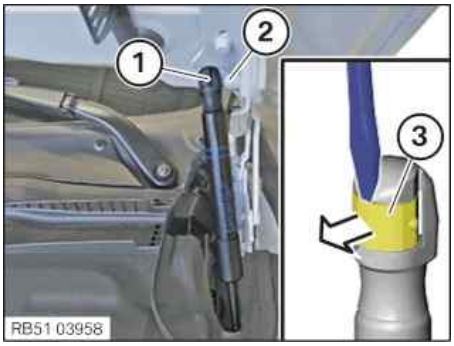
Engine compartment lid is open.

**CAUTION**

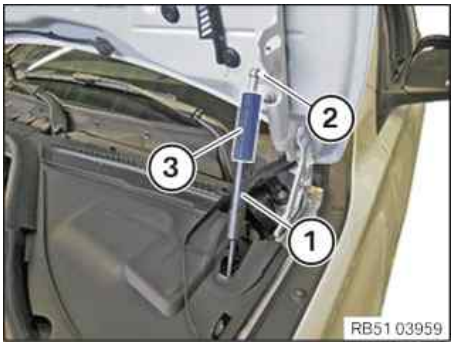
**Shutting bonnet or tailgate.**

**Danger of injury!**

- Support bonnet/tailgate in fully open position with the aid of a suitable device.




- Lift clamp (3) slightly using a screwdriver, in the direction of the arrow.
- Lift off ball socket (1) from ball pin (2).
- Repeat the operation on the other side of vehicle.




**TECHNICAL INFORMATION**

Conduct the following operation with the assistance of a second person.

- Remove the bonnet support and open the bonnet further.
- Push special tool **2 353 020** (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

### 2 – Disconnecting all battery earth leads



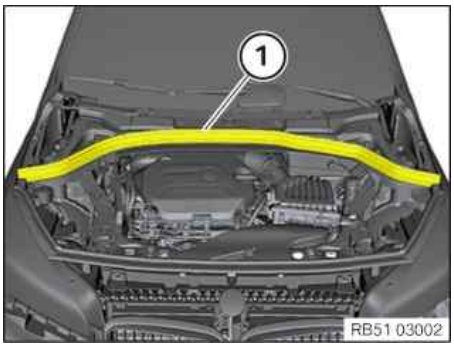

- See additional information.

### 3 – Remove the seal for the rear bonnet

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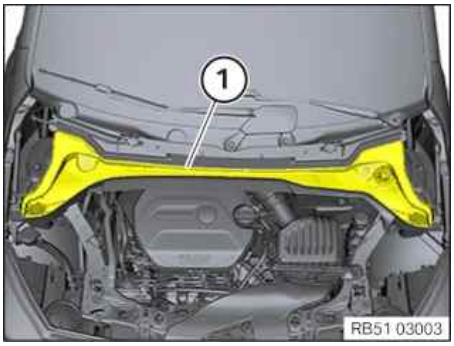
**NOTICE**

Schematic diagram is for example purposes. Some parts may differ in certain details.




- Pull off rear bonnet seal (1) towards the top and remove.

**4 – Removing front cowl panel cover**

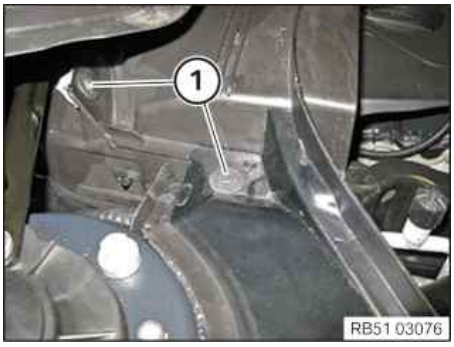



- Guide the front cowl panel cover (1) out toward the top and remove it.

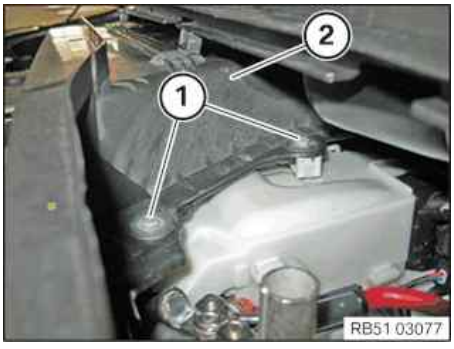
**5 – Removing the upper bulkhead cover**




- Loosen screws (1).




- Loosen screws (1).




- Loosen screws (1).
- Feed out and remove the upper bulkhead cover (2).

**6 – Removing the acoustic cover**

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**WARNING**

**Hot surfaces.**

**Risk of burning!**

- Perform all work only on components that have cooled down.




**RISK OF DAMAGE**

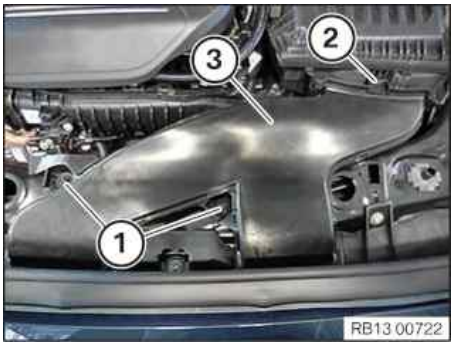
**Damage to the acoustic cover.**

**Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.**

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

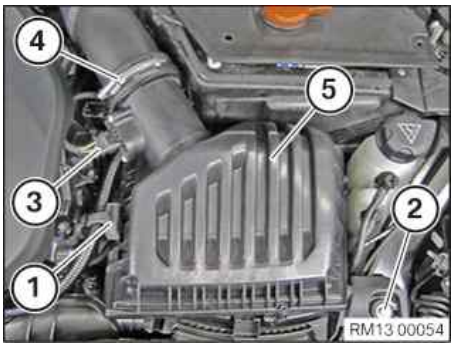
- Unclip the acoustic cover from the marked areas towards the top.

### 7 – Remove the intake neck for intake silencer housing




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

### 8 – Removing intake silencer housing




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

### 9 – Remove electronics box

**Prerequisite**

Battery earth lead is disconnected.

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**RISK OF DAMAGE**

**Electrostatic discharge.**

**Damage to or destruction of electrical components.**

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.

**RISK OF DAMAGE**

**Damage to wires when disconnecting connectors and plug connections.**

**Sheared wires can cause a short circuit.**

- Do not pull on the wires when disconnecting connectors and plug connections.

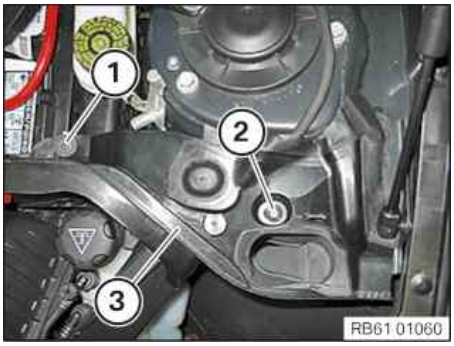
**TECHNICAL INFORMATION**

Follow instructions for removing and installing control units.

For additional information see: 12 00 ... Notes on removal and installation of control units

**TECHNICAL INFORMATION**

Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

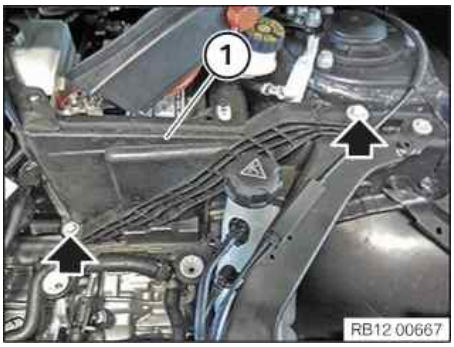



- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).

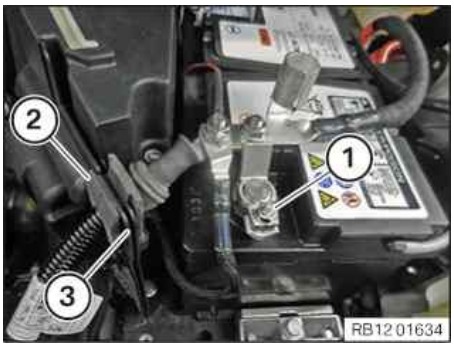



- Loosen screw (1).
- Place cover (2) of the positive battery connection point to one side.

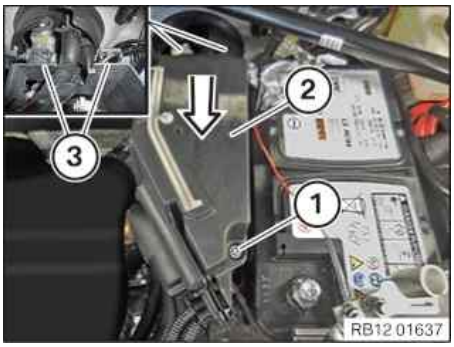
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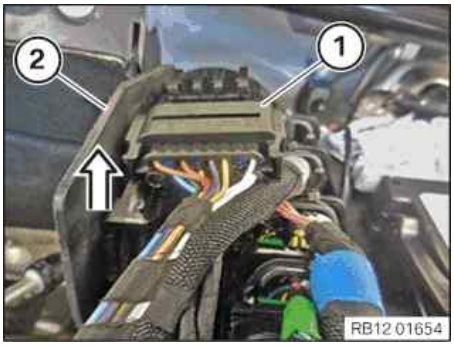

- Remove screws (arrows).
- Guide out tension strut (1) and remove.



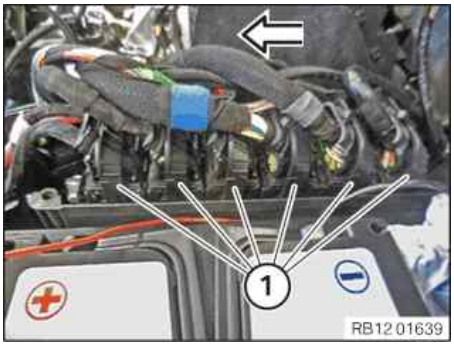

- Undo positive battery terminal (1).
- Feed out positive battery terminal (1) and set aside.
- Guide the positive battery cable (2) out of the holder (3) and lay to one side.



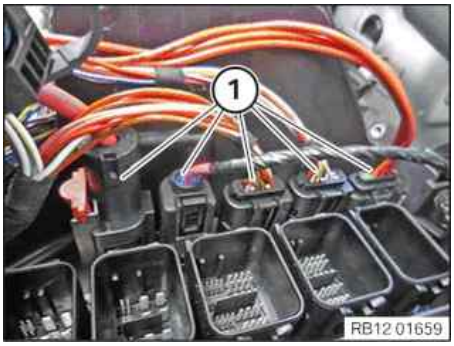

- Loosen screw (1).
- Unlock cover (2) and feed out and remove from the guides (3) in the direction of arrow.




- Feed out connector (1) from the electronics box (2) and remove in the direction of arrow.
- Unlock and loosen connector (1).

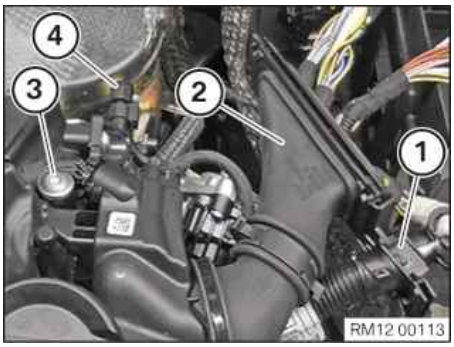



- Unlock and remove the connector (1) in the direction of the arrow.
- Feed out connector (1) and place to one side.

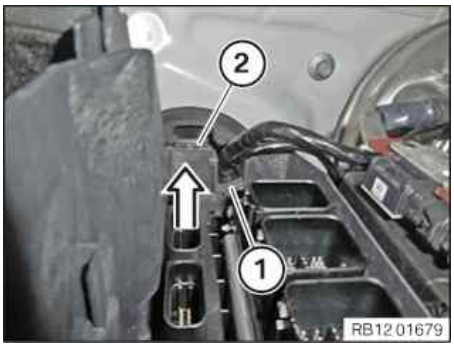



- Unlock and loosen connector (1).

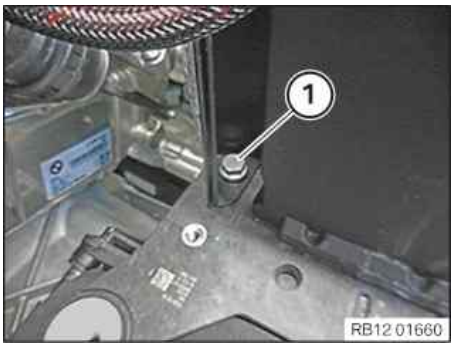
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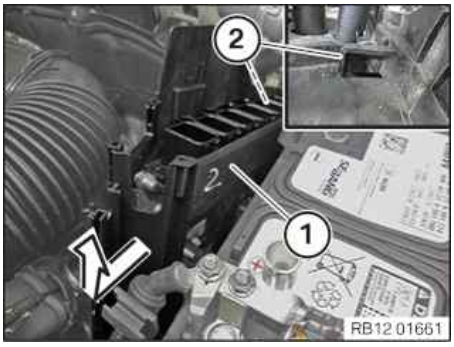

- Detach the wiring harness (1) from the electronics box.
- Detach the wiring harnesses (2) from electronics box.
- Loosen screw (3).
- Set wiring harnesses (1) and (2) aside.
- Unlock the connector (4) and disconnect it from the differential pressure sensor.




- Unlock and loosen holder (1).
- Guide the holder (1) out of the electronics box (2) in direction of arrow and set it aside.




- Loosen screw (1).




- Guide the electronics box (1) out of the guide (2) in direction of arrow and remove.

**10 – Remove vehicle battery**

**WARNING**

**Working on 12 V vehicle electrical system.**

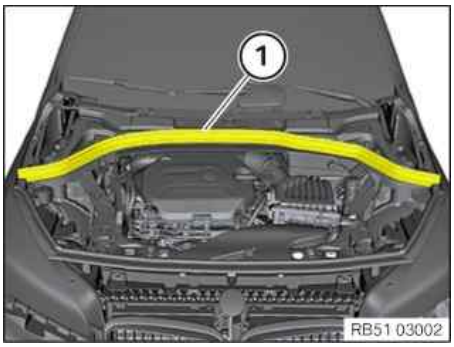
**Risk of short circuits! Risk of fire!**

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

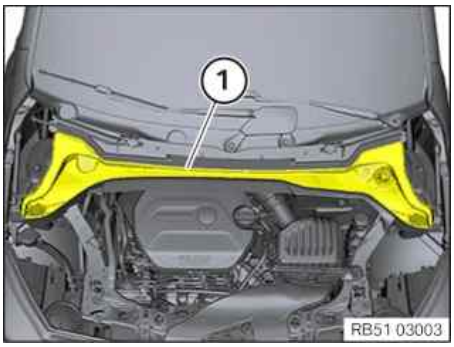
**TECHNICAL INFORMATION**

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)

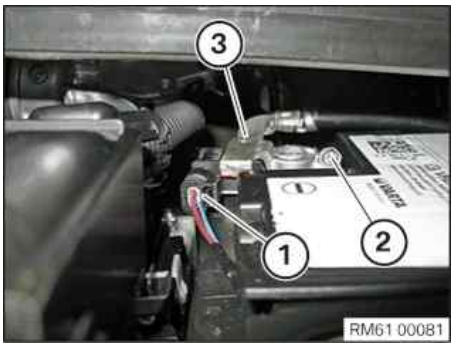
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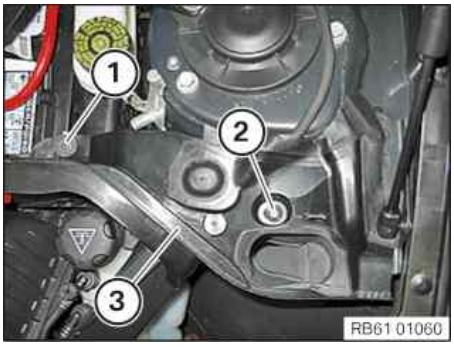

- pull off gasket (1) upwards.



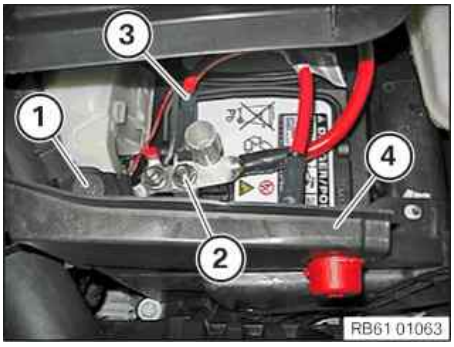

- Remove the cowl panel cover (1) to the top.



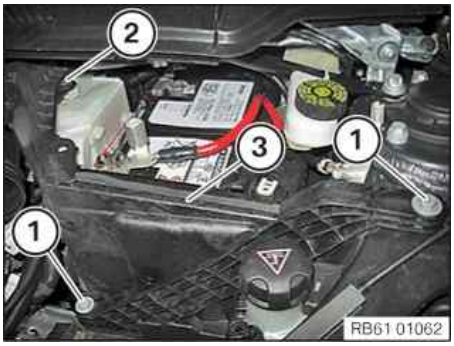

- Unlock and disconnect connector (1).
- Slacken nut (2).
- Disconnect the negative battery terminal (3).




- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).

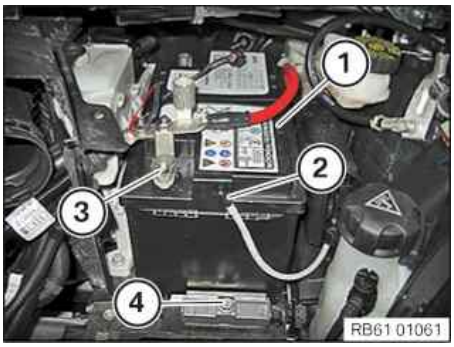



- Loosen screw (1).
- Unscrew the nut (2) and remove the positive battery cable (3) with the cover of the remote positive terminal (4).
- Tighten nuts (2) on the positive terminal hand-tight.




- Loosen screws (1).
- Unscrew the bolt (2) and guide the tension strut (3) out.

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- Pull off the vent hose (2).
- Slacken the nut (3) on the positive terminal and remove the positive terminal.

**WARNING**

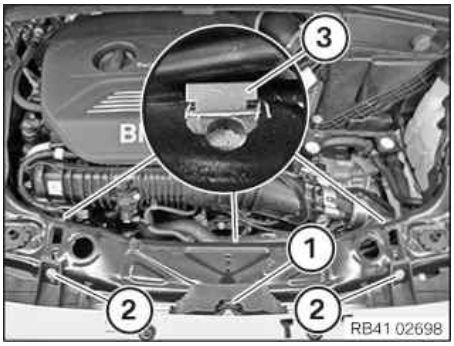
**Unprotected battery terminals.**

**Risk of short circuits! Risk of fire!**

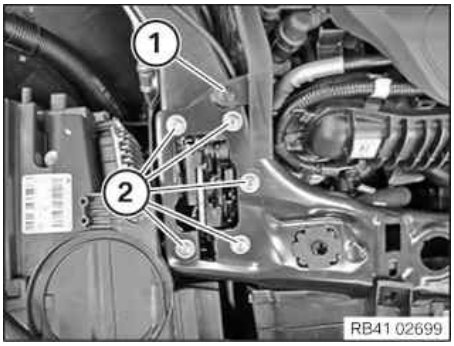
- Cover the vehicle battery.

- Loosen the screw (4) and remove the holder.
- Remove vehicle battery (1).

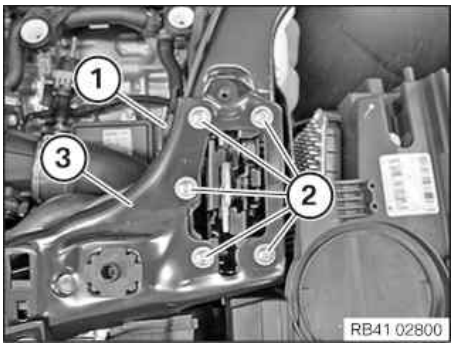
### 11 – Remove cross connection




- Loosen screws (1) and (2).
- Detach clamps (3) for bonnet lock Bowden cable.

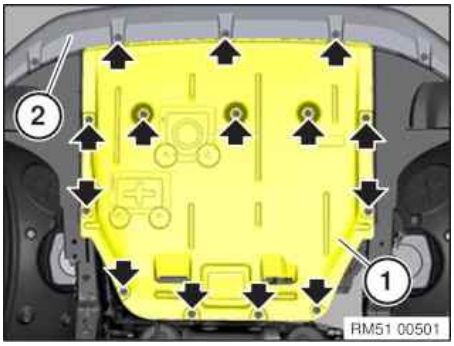



- Lever out expanding rivet (1).
- Loosen screws (2).




- Lever out expanding rivet (1).
- Loosen the screws (2) and remove the cross connection (3).

### 12 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 13 – Draining the transmission oil in defective double-clutch transmission (DKG) 7DCT300)

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

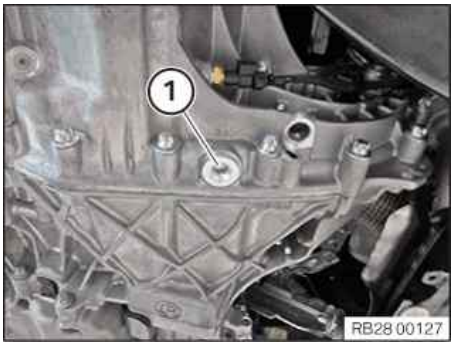
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**14 – Draining coolant**

**WARNING**

**Hot fluids.**

**Risk of scalding!**

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

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**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

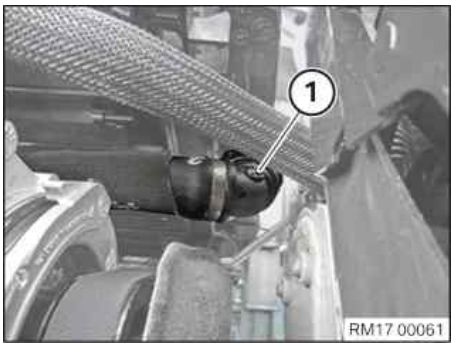
In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

**TECHNICAL INFORMATION**

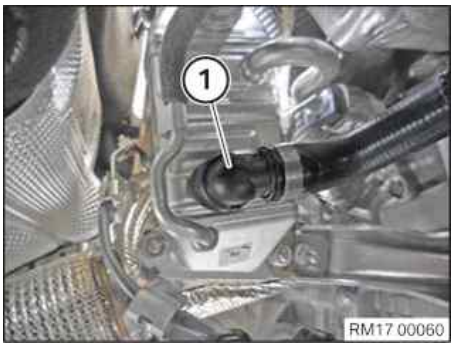
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.




- Loosen sealing cap (1).




- Unlock and disconnect the coolant line (1) from the radiator on the right.
- Catch and dispose of escaping coolant.



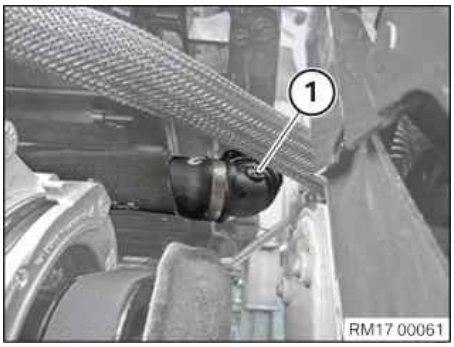

- Unlock and pull off the coolant line (1) from the low pressure exhaust-gas recirculation cooler on the diesel particulate filter.
- Catch and dispose of escaping coolant.

**15 – Connect the coolant line**

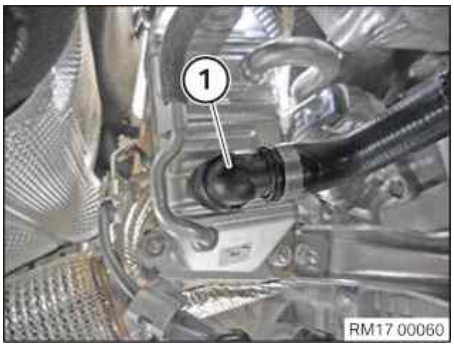
**TECHNICAL INFORMATION**

Make sure that the connections are locked correctly. The locks must engage audibly.

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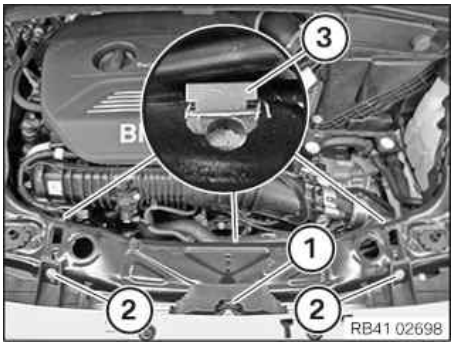



- Connect the right coolant line (1) to the radiator and lock audibly.




- Connect the coolant line (1) to the low pressure exhaust-gas recirculation cooler on the diesel particulate filter and lock audibly.

**16 – Install cross connection**




- Install cross connection.
- Position all screws.
- Tighten down screw (1).

**Bracing strut to top cross connection**

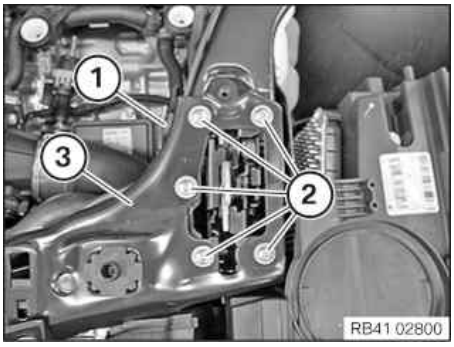
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

- Tighten down screws (2).

**Air duct to deformation element/cross connection**

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

- Fasten clamps (3) for bonnet lock Bowden cable to cross connection.

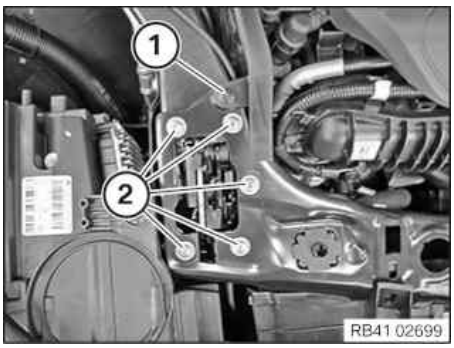



- Tighten screws (2) of cross connection (3).

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).




- Tighten down screws (2).

**Cross connection on support for cross connection**

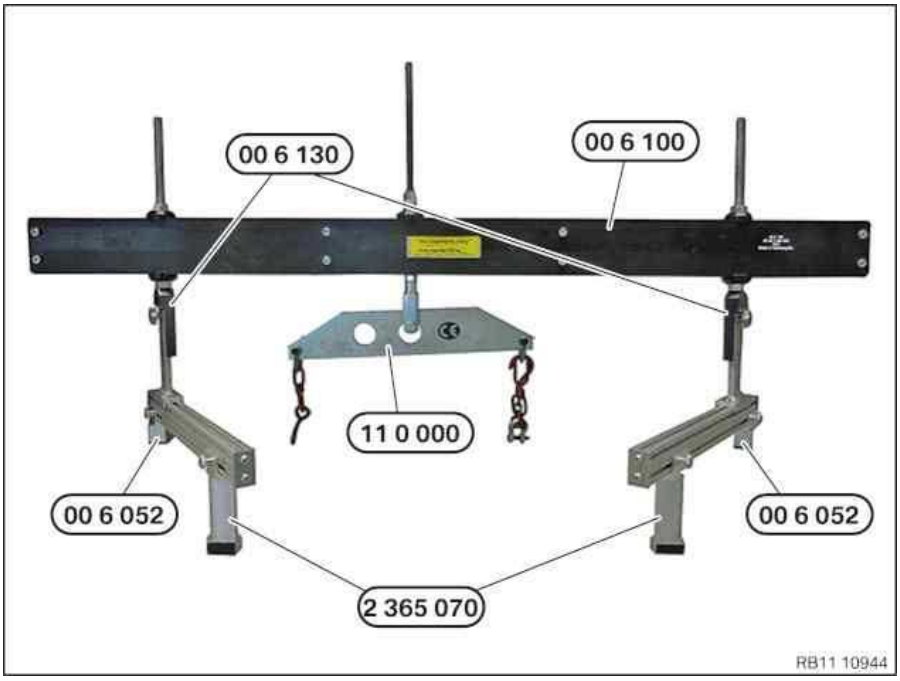
| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).

**17 – Install the engine bridge**

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**Overview: Prepared engine bridge**




**Prerequisite**

Front compartment lid is in service position.

**CAUTION**

**Components connected to the engine joint or cross member.**

**Danger of injury!**

- Check lifting eyes and engine mounting brackets for damage, e.g. cracks.
- Attach the component to correctly mounted engine joints or cross members only.
- Exclusively lift the component, do not move it forwards, backwards or in transverse direction.

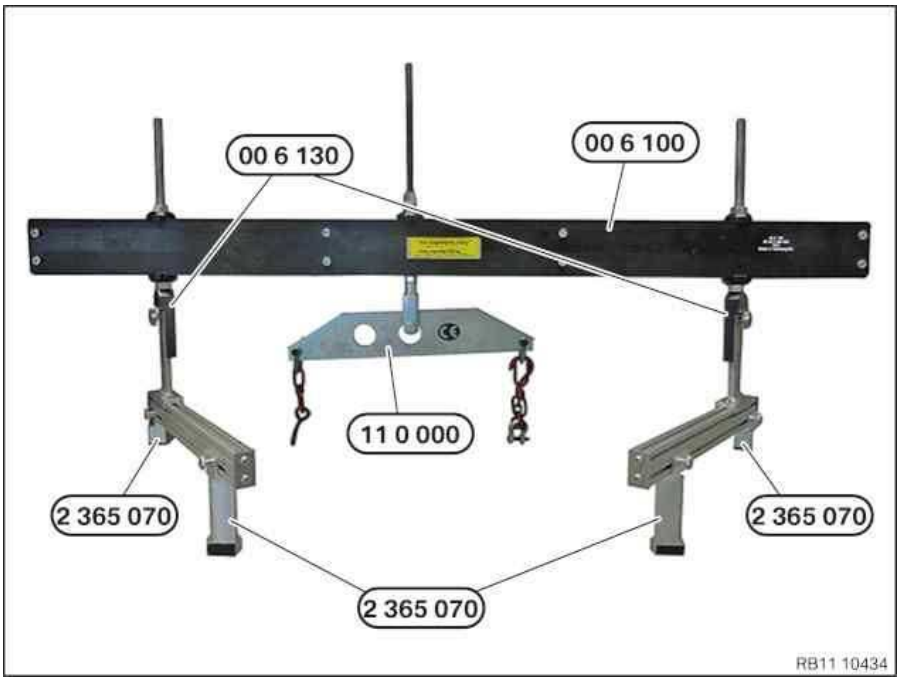



- Guide in and position special tool **2 459 012** on cylinder head.
- Tighten the screws (1) of special tool **2 459 012**.

**Special tool to cylinder head**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 21,5 Nm |

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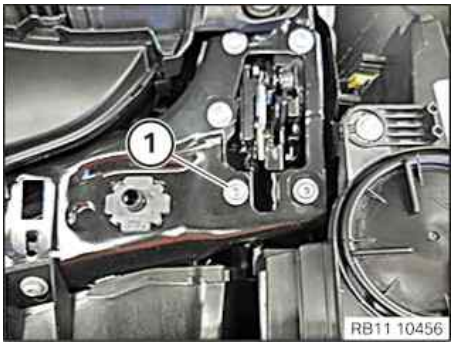

**CAUTION**

**Heavy component.**

**Heavy components can lead to injury or damage.**

- Remove and install heavy components with the aid of another person/other persons.

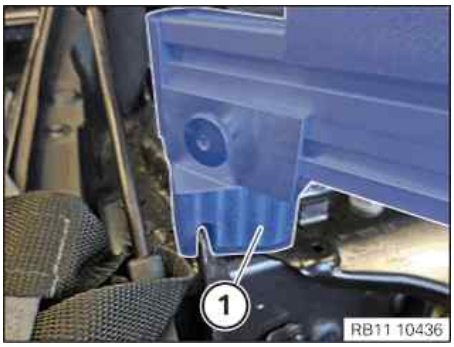
- Set entire cross member **0 496 852 (00 6 100)** on the vehicle and position with the help of an auxiliary person.



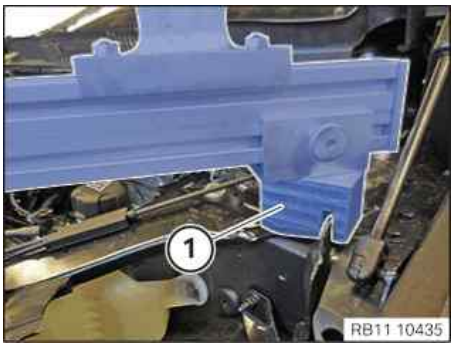

- Loosen screw (1) of the left bonnet catch.




- Loosen screw (1) of the right bonnet catch.

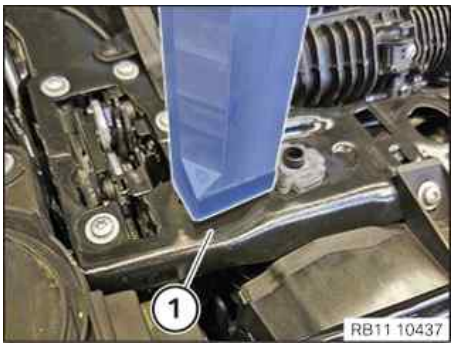



- Position special tool **2 365 070** to the rear mounting point (1) at the right.

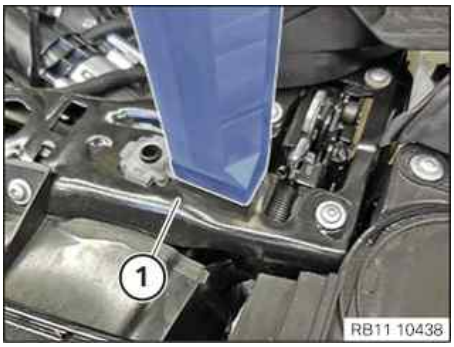



- Position special tool **2 365 070** to the rear mounting point (1) at the left.

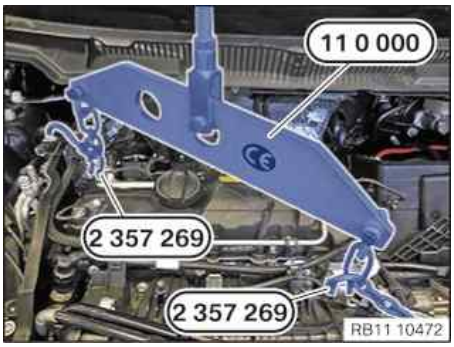
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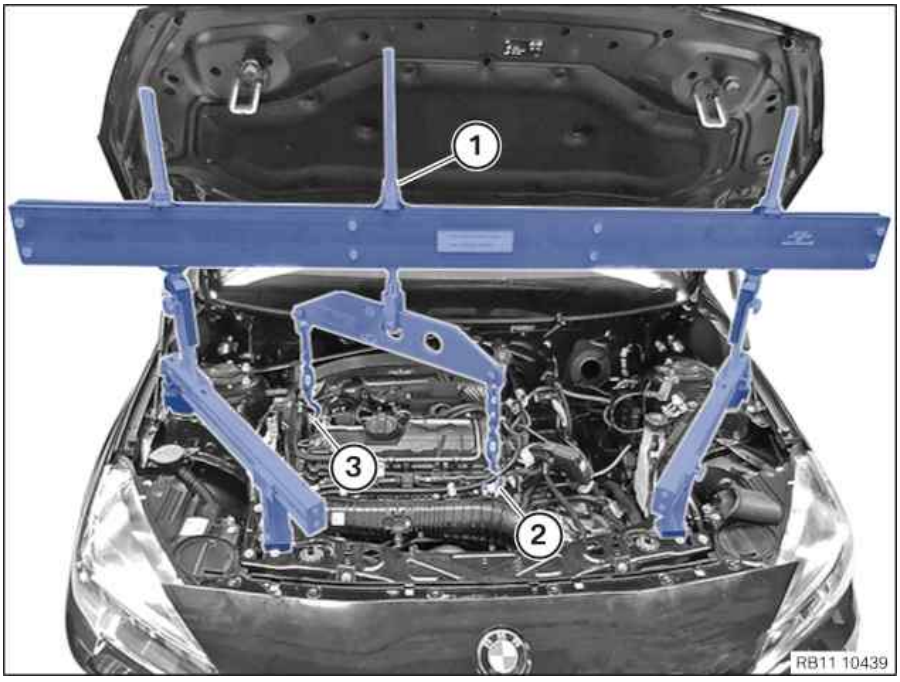

- Position special tool **2 365 070** to the front mounting point (1) at the right.




- Position special tool **2 365 070** to the front mounting point (1) at the left.




- Position special tool **0 490 561 (11 0 000)** above the engine.
- Attach special tools **2 357 269** to the mounting lugs of the engine.




- Tighten side screws (2) and (3).
- Slightly pretension the spindle screw (1) of the engine support beams.
- Tighten down all adjusting screws, knurled screws and nuts on cross member **0 496 852 (00 6 100)** and on special tool .

**18 – Removing starter motor**

**WARNING**

**Hot surfaces.**

**Risk of burning!**

- Perform all work only on components that have cooled down.

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**WARNING**

**Working on 12 V vehicle electrical system.**

**Risk of short circuits! Risk of fire!**

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

**RISK OF DAMAGE**

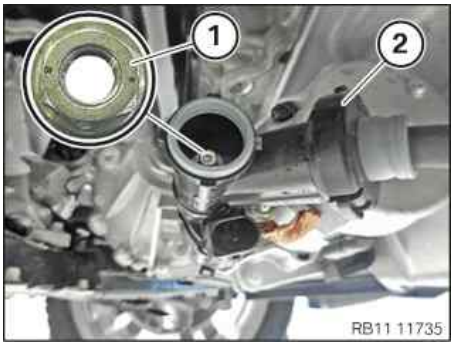
**Electrostatic discharge.**

**Damage to or destruction of electrical components.**

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.




- Unlock and loosen connector (1).
- Detach the sealing cap (2) in the direction of the arrow.
- Feed out and remove the sealing cap (2).



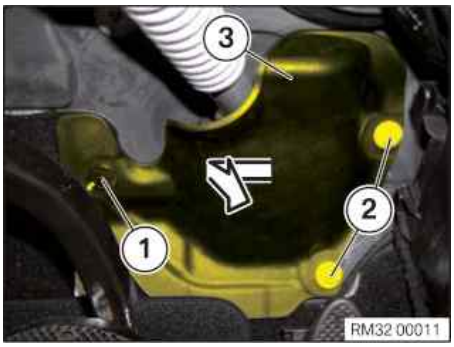

- Unfasten nut (1).
- Feed out the positive battery cable (2) of the starter motor and set it aside.




- Loosen screws (1).
- Feed out starter motor and remove.

**19 – Releasing lower steering shaft from steering gear**

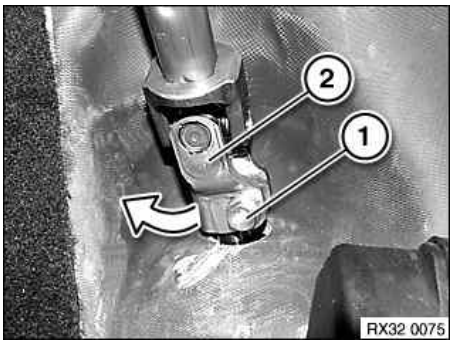
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- **If installed:**
- Unfasten nut (1).
- Unscrew the nuts (2) by 1 rotation.

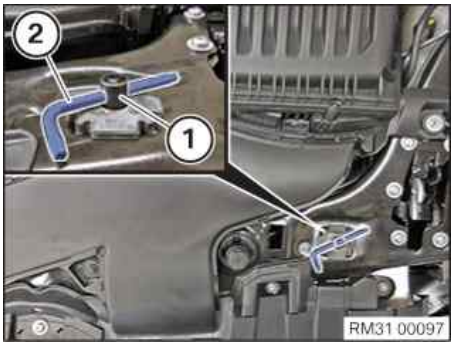
  Do not remove the nuts (2) !
- Remove the cover (3) on the steering column in the direction of the arrow.

  The side footwell trim must not be disassembled!




- Loosen screw (1).
- Swivel out the universal joint (2) of the bottom steering shaft from the steering gear in the direction of the arrow.

**20 – Securing radiator on left and right**




**NOTICE**

Perform the operations on the left and right side.

- Fasten radiator at centring pin (1) with suitable tool (2).

**21 – Remove the front left and right wheel**

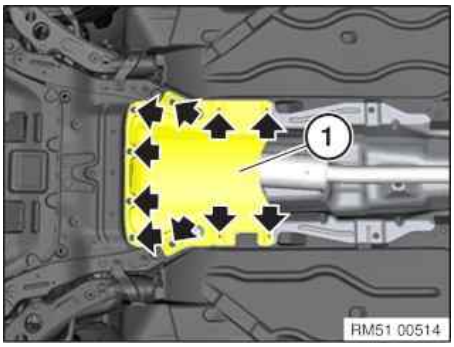
▸ **Removing the wheel**




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set  (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**22 – If installed: Removing rear underbody protection**




- Remove screws (arrows).
- Remove the rear underbody protection (1).

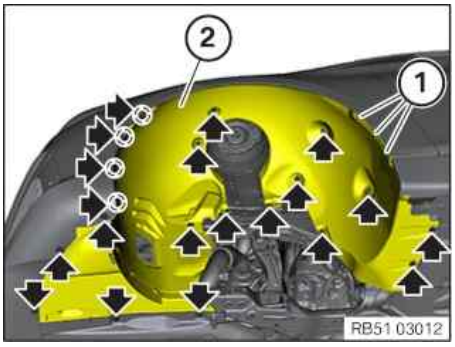
**23 – Removing front left and right wheel arch cover**

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**NOTICE**

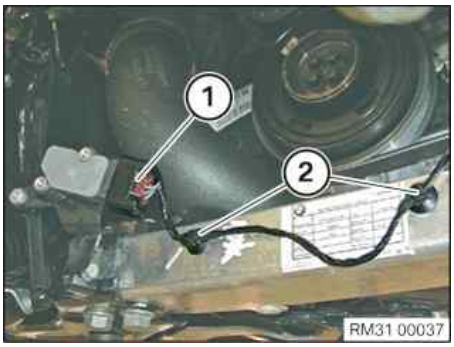
Perform the operations on the left and right side.

▸ **Remove front wheel arch cover**




- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

**24 – With right installation: Detaching ride height sensor cable**



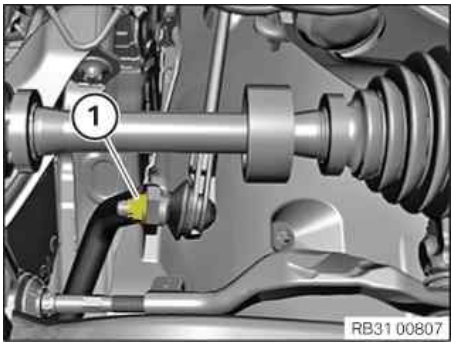

- Unlock plug connection (1) and disconnect.
- Release cable clip (2) from deformation element adapter.

**25 – Releasing anti-roll bar on left and right from anti-roll bar link**

**NOTICE**

Perform the operations on the left and right side.

▸ **Detach the anti-roll bar from the anti-roll bar link**




- Unfasten nut (1).

**Note:** Use the Torx socket for counter support.

- Loosen the anti-roll bar link from the anti-roll bar .

**26 – Detaching rubber mount from front axle support**

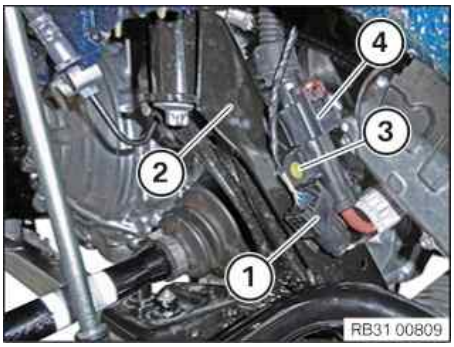



- Spray rubber mount (1) with lubricant and release from holder on front axle support.

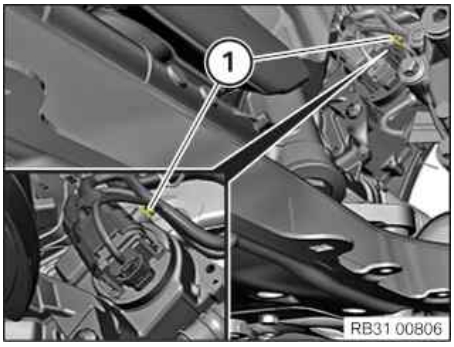
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### 27 – Disconnecting plug connections from steering gear

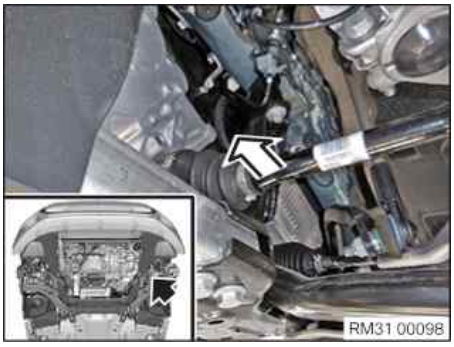
▶ **If installed: Detach connectors from the front axle carrier**




- Release the plug connection (1) from the front axle support (2).
- Loosen screw (3).
- Release the plug connection (4) from the front axle support (2).

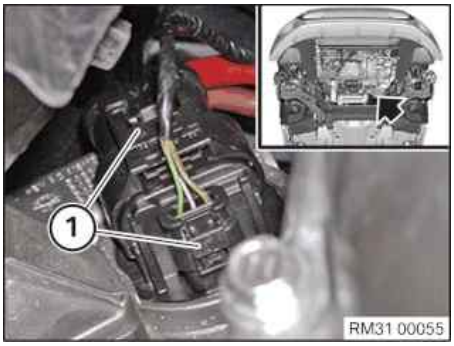



- Disconnect wiring harness (1) from steering gear.



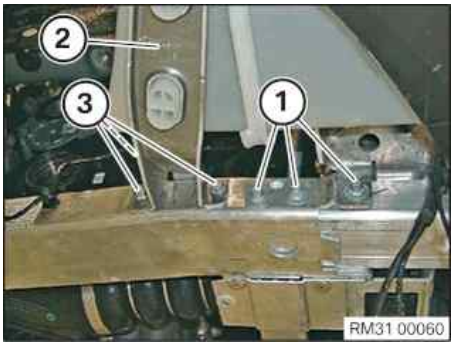

- To unlock the plug connections (see the following work step): unlock plug connections (arrow) with the right hand.

  The plug connections can be reached via the left-hand output shaft.




- Unlock plug connections (arrow) (1)and disconnect from the steering gear.
- Make sure when lowering the front axle that the cables are not damaged!

### 28 – Releasing the mounted part from the front axle support



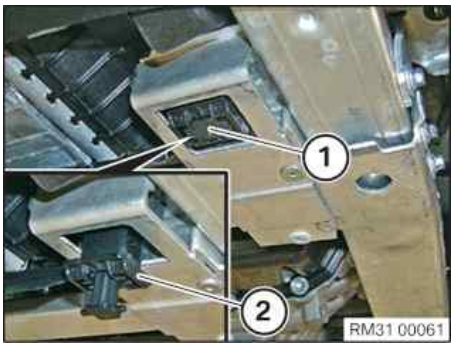

- **Only on right side:** Loosen screws (3) and remove holder for washer fluid reservoir (2).

**NOTICE**

Perform the operations on the left and right side.

- Loosen screws (1).

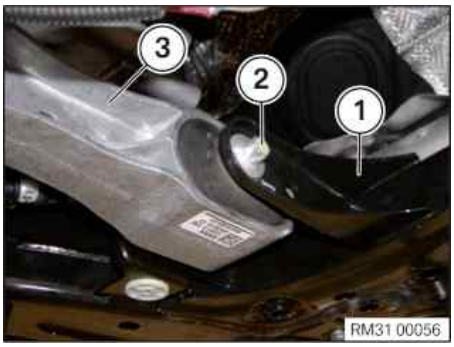
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**NOTICE**

Perform the operations on the left and right side.

- Unlock safety catch (1) of the lock (2) from the holder for the charge air cooler.
- Completely remove locks (2).




- Loosen screw (2) of the engine support (3) on the front axle (1).

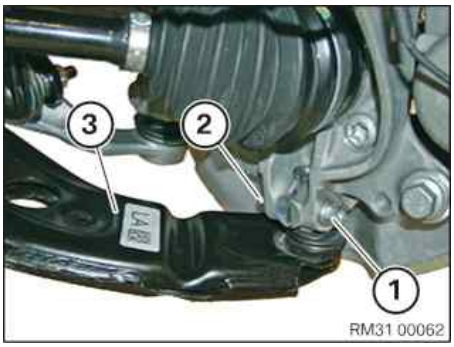



**NOTICE**

Perform the operations on the left and right side.

- Loosen screws (1).

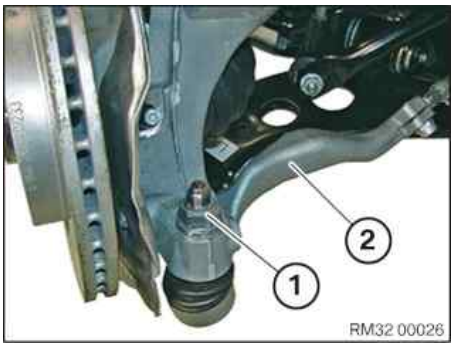
**29 – Detaching and removing front axle completely**




**NOTICE**

Perform the operations on the left and right side.

- Unfasten nut (1).
- (2)Pull out screw.
- Detach the wishbone (3) from the swivel bearing .

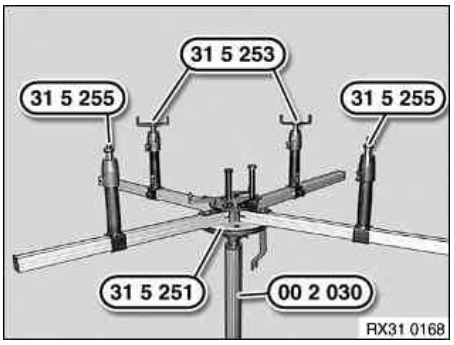



**NOTICE**

Perform the operations on the left and right side.

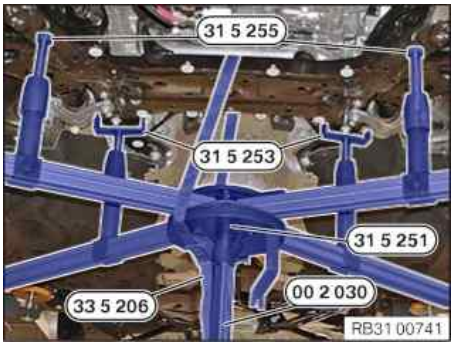
- Unfasten nut (1).
- Detach the track rod (2) from the swivel bearing.

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- Fit the special tool **0 495 817 (31 5 251)** completely onto the workshop jack **0 490 133 (00 2 030)** with an auxiliary person.
- Insert special tools **0 495 821 (31 5 255)** in telescopic supports of a profile rail pair.
- Insert special tools **0 495 819 (31 5 253)** in telescopic supports of other profile rail pair.

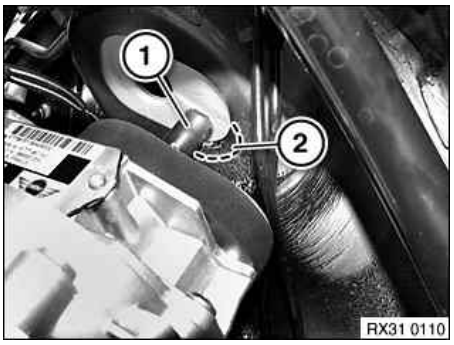
**Note:** In a profile rail pair, two profile rails are connected to one another by gearing.




- Align special tools **0 495 821 (31 5 255)** and **0 495 819 (31 5 253)** to front axle support.
- Support front axle support by operating workshop jack **0 490 133 (00 2 030)**.

**Note:** The centre of gravity of the front axle support must be positioned centrally over the workshop jack!

- Secure front axle support with special tool **0 496 080 (33 5 206)** to special tool **0 495 817 (31 5 251)**.

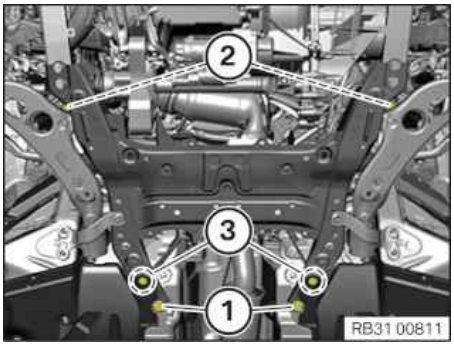



**TECHNICAL INFORMATION**

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

**Note:** Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!



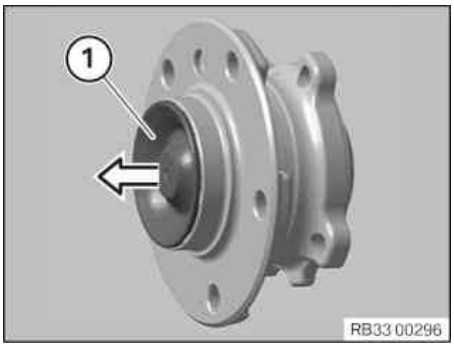

- If applicable, release the screws in area (3).
- Release screws (1) (front axle support, rear).
- Release screws (2) (front axle support, front).
- Bend the underbody panelling to the side in area (3).
- When lowering, release charge air cooler from its rubber mounts.
- Completely lower and remove the front axle.

**TECHNICAL INFORMATION**

Note the information on thread repairs using Helicoil thread inserts.
For more information see: 41 00 ... Notes on repairing threads

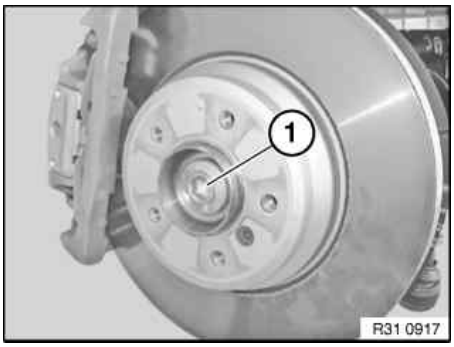
- Check threads for damage; if necessary, repair with Helicoil thread inserts.

**30 – Remove the left drive shaft (double-clutch transmission (DKG))**

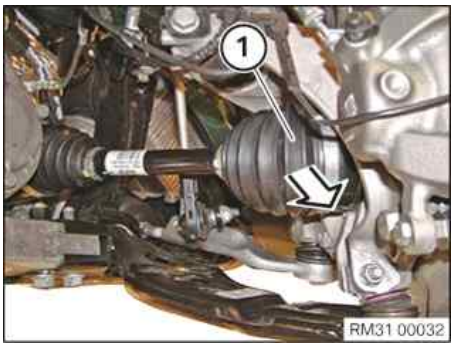



- If necessary, lever off the protective cap (1).

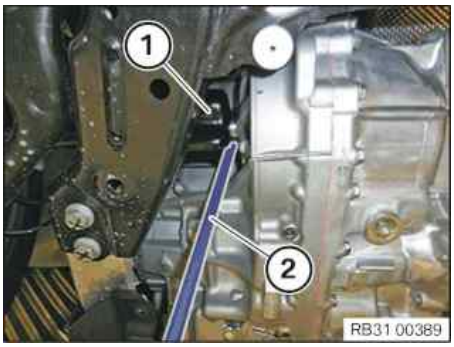
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- Press the brake pedal to the floor to unscrew the collar bolt (1).




- Turn steering wheel to left.
- Pull the output shaft (1) out toward the front.




- Protect the output shaft (1) from falling.
- Lever out the output shaft (1) with a mounting lever (2) from the transmission.
- Remove output shaft (1).

### ▸ Removing the left radial shaft seal on the differential (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

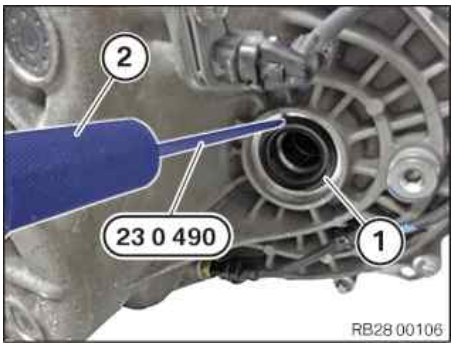
**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!

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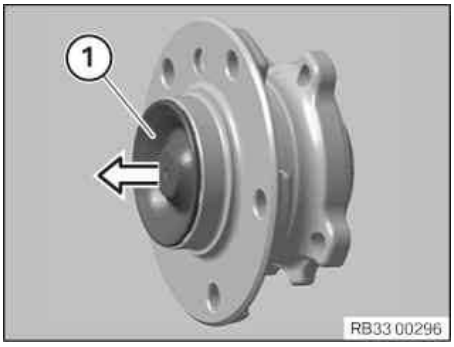



**TECHNICAL INFORMATION**

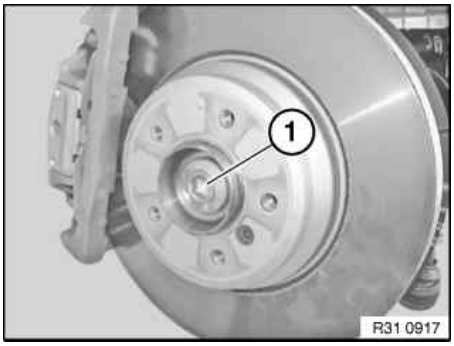
Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drill a hole in the radial shaft seal (1) using a centre punch.
- Screw special tool **0 491 454 (23 0 490)** in the radial shaft seal (1).
- Drive out radial shaft seal (1) with the impact weight (2).

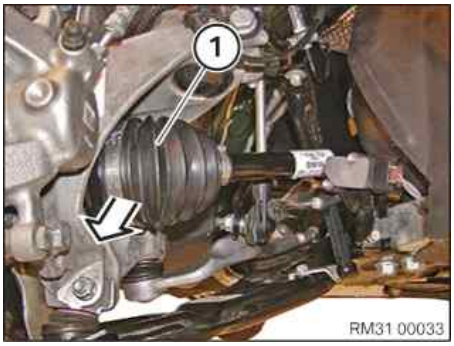
### 31 – Removing right output shaft (double-clutch transmission (DKG))



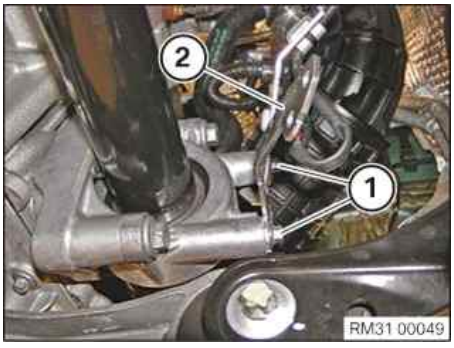

- If necessary, lever off the protective cap (1).




- Press the brake pedal to the floor to unscrew the collar bolt (1).

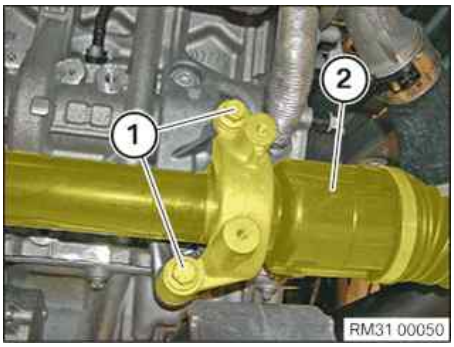



- Protect the output shaft (1) from falling.
- Turn steering wheel to right.
- Pull the output shaft (1) out.




- If necessary, unscrew the bolts (1) and remove the holder (heat shield) (2).

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- Loosen screws (1).
- Pull the output shaft (2) out of the transmission and remove it sideways.
- Remove output shaft (1).

▸ **Removing the right radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Clean the transmission around the radial shaft seal prior to removing the propeller shaft!
Transmission oil (at maximum 0.3 l) may escape from the radial shaft seal opening when pulling off the propeller shaft!
Collect and dispose of escaping transmission oil!




**TECHNICAL INFORMATION**

Do not use a drill.
Swarf may damage the transmission and result in a failure of the transmission.

- Drive a hole into the radial shaft seal (1) using a centre punch.
- Screw the special tool **0 491 454 (23 0 490)** into the radial shaft seal (1).
- Drive out the radial shaft seal (1) with the impact weight (2).

**32 – Removing the double-clutch transmission (DKG)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the engine block.**

**Damaged and corroded bolts will lead to major damage in the engine block and the transmission.**

- It is imperative that protruding threads of the transmission bolts are checked for corrosion and damage prior to removal.
- It is imperative that all rust is removed from corroded threads and that they are cleaned prior to removal.
- Renew rusted and damaged bolts.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**RISK OF DAMAGE**

**Damage to the flywheel and the double-clutch transmission (DKG).**

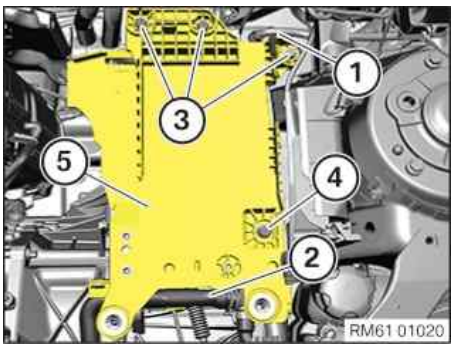
**Damage to the flywheel and the double-clutch transmission (DKG) due to incorrect removal and installation of the double-clutch transmission (DKG).**

- Align the double-clutch transmission (DKG) absolutely horizontally during removal and installation.

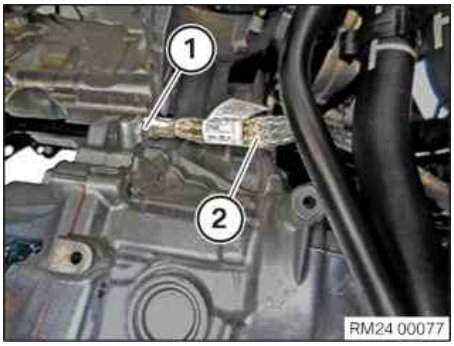
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the double-clutch transmission (DKG).

▸ **Remove battery holder**

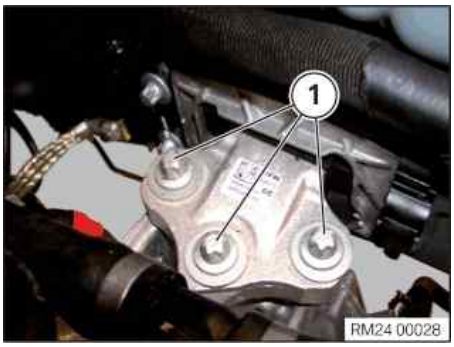



- Detach the cable clip (1) from the battery holder (5).
- Detach the coolant line (2) from the battery holder (5).
- Loosen screws (3).
- Loosen screw (4).
- Thread out and remove the battery holder (5).

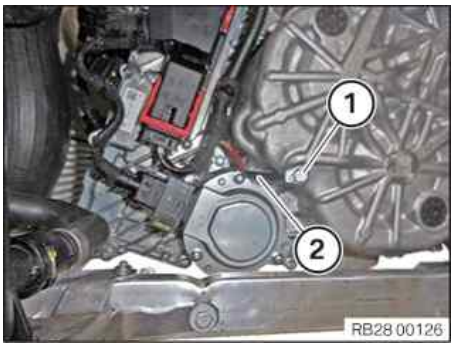



- Loosen screw (1).
- Detach the ground strap (2) from the transmission and set it aside.

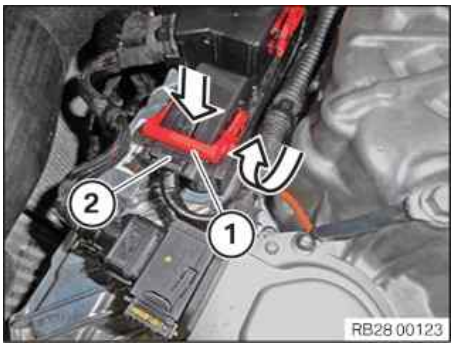
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- Loosen screws (1).



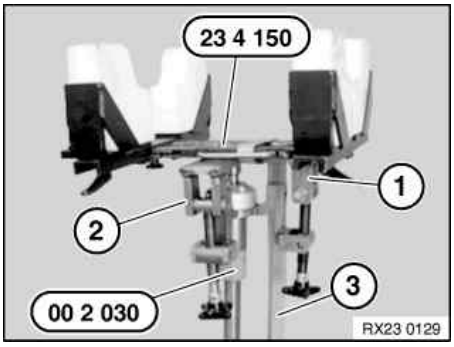

- Release the screw (1) and put the grounding cable (2) to one side.



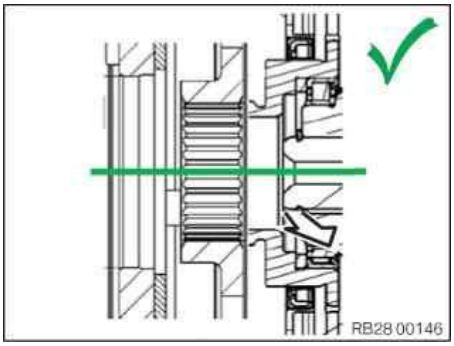

- Fold down the red lever (1) in direction of arrow and pull the plug connection (2) out of the control unit.




- Unlock and release coolant line (1).

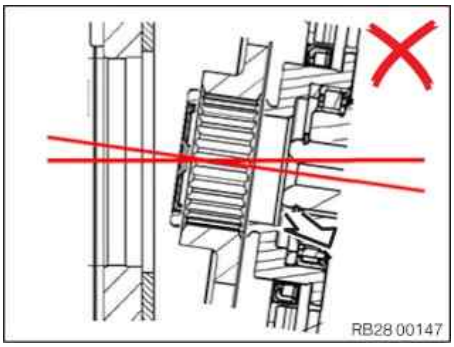



- Support the transmission with special tool **0 490 133 (00 2 030)** and .
- Secure the double-clutch transmission (DKG) with the tensioning strap (3).

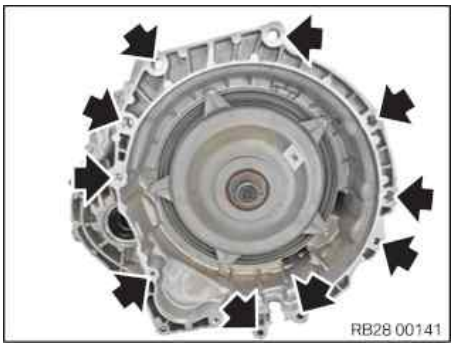



- **Correct:** Pull the double-clutch transmission (DKG) horizontally off the flywheel.

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- **Wrong:** Do not pull the double-clutch transmission (DKG) off the flywheel if it is tilted.




- Remove screws (arrows).
- Pull the double-clutch transmission (DKG) off the flywheel when it is absolutely horizontal.

## MAIN WORK

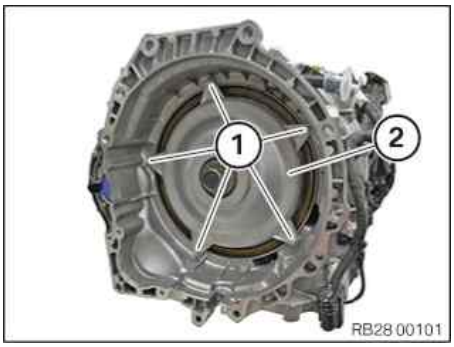
### 33 – Remove clutch cover (7DCT300)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the clutch cover.
Hazardous substances!

**TECHNICAL INFORMATION**

**Replacement clutch cover:**
Renew the clutch cover only as an assembly (incl. radial shaft seal, O-ring and cylindrical roller ring).

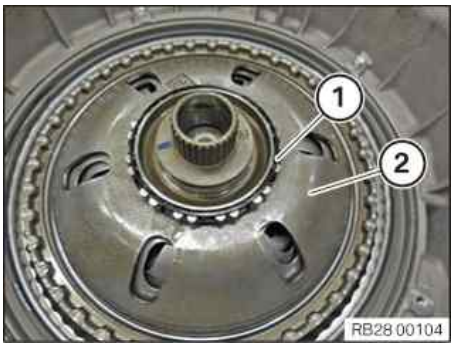



- Loosen screws (1) on the clutch cover (2).




- Using special tool **0 496 716 (24 1 420)** and **0 493 321 (13 5 250)** access the rear of the clutch cover (1).
- Release the clutch cover (1) at the bolting points using special tool **0 496 716 (24 1 420)** and **0 493 321 (13 5 250)** and remove.

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- Remove cylinder roller (1) from the double clutch(2).

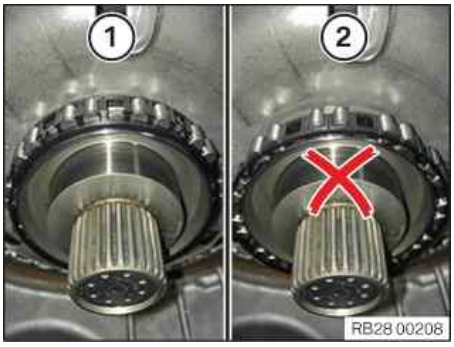
**34 – Install the clutch cover (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the clutch cover.
Hazardous substances!

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Install the cylinder roller.
- **Observe the correct mounting location of the cylinder roller.**

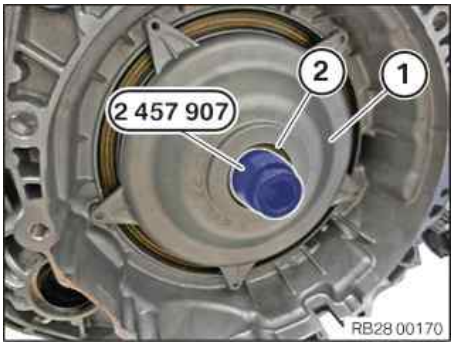
  (1) **= Correctly installed**

  (2) **= Incorrectly installed**



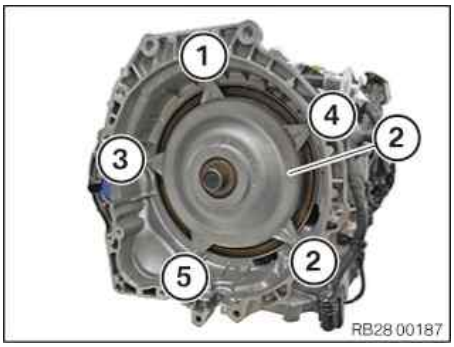

- Renew the seal (1) on the clutch cover (2).

  **Parts:** Gasket




- Before installing the clutch cover (1), position special tool **2 457 907** on the shaft so that the radial shaft seal (2) is not damaged.

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- Renew screws (1) to (5) on the clutch cover (2).

  **Parts:** Bolts
- Tighten screws in the order (1) to (5).

**Clutch cover to transmission**

| | | | |
|---|---|---|---|
| | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 5,5 Nm |

## POSTPROCESSES

### 35 – Installing the double-clutch transmission (DKG)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the engine block.**

**Damaged and corroded bolts will lead to major damage in the engine block and the transmission.**

- It is imperative that protruding threads of the transmission bolts are checked for corrosion and damage prior to removal.
- It is imperative that all rust is removed from corroded threads and that they are cleaned prior to removal.
- Renew rusted and damaged bolts.

**RISK OF DAMAGE**

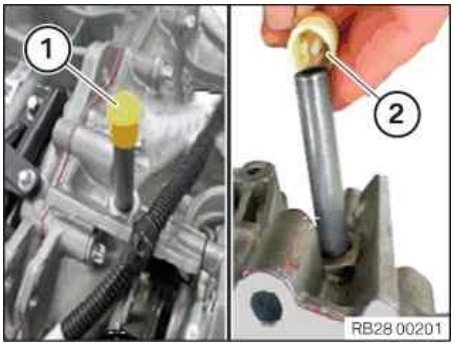
**Damage to the flywheel and the double-clutch transmission (DKG).**

**Damage to the flywheel and the double-clutch transmission (DKG) due to incorrect removal and installation of the double-clutch transmission (DKG).**

- Align the double-clutch transmission (DKG) absolutely horizontally during removal and installation.

**TECHNICAL INFORMATION**

After completing work:
Check gearbox oil level. Use only the approved transmission oil.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).



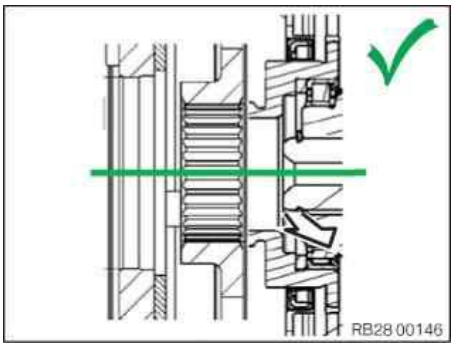

- Remove the protective caps (1) on the new transmission and renew them with the white series vent cap (2).

**Note:** Failure to comply with this may result in damage or leakage in the transmission.

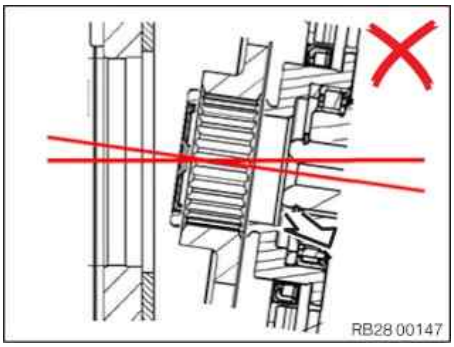
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- Check for correct fit of fitting sleeves(1).
- Replace damaged fitting sleeves.




- **Correct:** Insert the double-clutch transmission (DKG) horizontally into the flywheel.

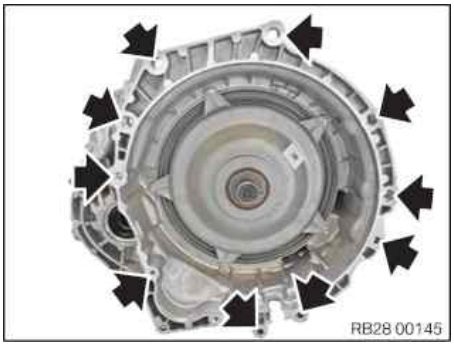



- **Wrong:** Do not tilt the double-clutch transmission (DKG) when inserting it into the flywheel.




- Clean the gearing (1) of the drive shaft.
- Coat the gearing (1) with MI-Setral-43N grease (BMW part number 83 23 2 152 082).

  Tooth gaps must be filled with grease up to tooth height.




- Flange-mount the double-clutch transmission (DKG) to the engine so that it is absolutely horizontal.
- Hand-tighten the bolts (arrows).
- Tighten screws (arrows).

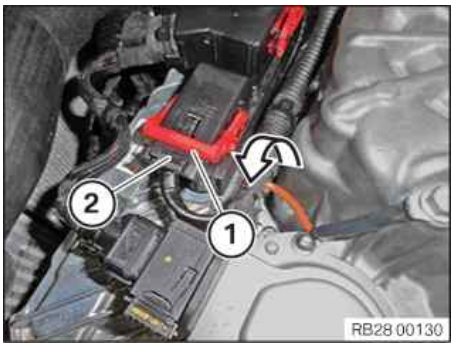
**Transmission to engine**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |
| M12 | | Tightening torque | 66 Nm |

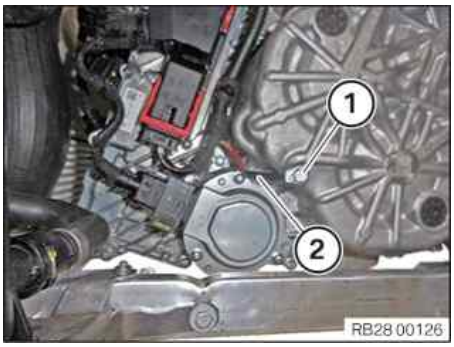



- Connect and lock the coolant lines (1).

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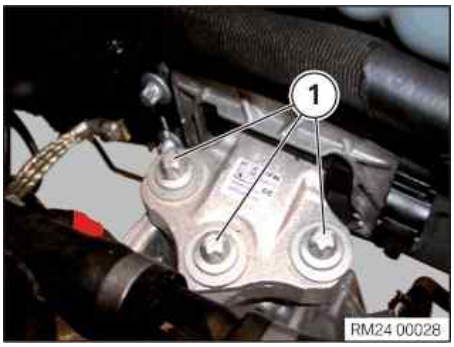

- Install the connector (2) on the control unit and fold down the red lever (1) in the direction of arrow up to the limit position.
- Check the correct fit of the plug connection (2).




- Install the grounding cable (2) and tighten the bolt (1).

**Standard screw connection M6**

| | | | |
|---|---|---|---|
| M6 | | | 8 Nm |

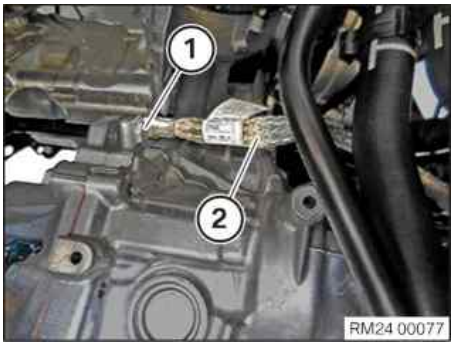



- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Transmission mounting**

| | | | |
|---|---|---|---|
| M10 | Renew screws. | Jointing torque | 40 Nm |
| | | Angle of rotation | 90 ° |

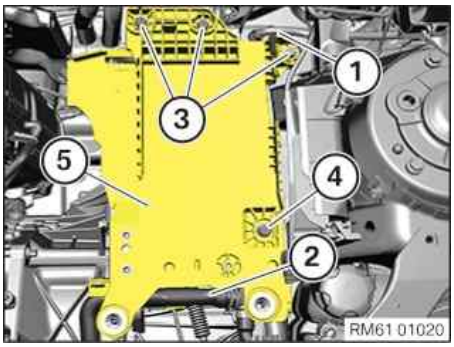



- Screw ground strap (2) onto transmission with screw (1).

**Standard screw connection M8**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

▸ **Install the battery holder**




- Feed in and install the battery holder (5).
- Hand-tighten the bolt (4).
- Hand-tighten the bolts (3).
- Tighten down screw (4).

**Battery holder to engine support**

| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

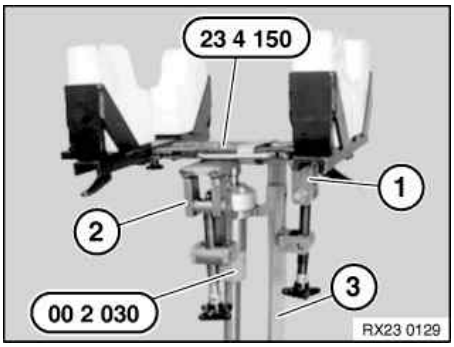
- Tighten down screws (3).

**Battery holder to engine support**

| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

- Fasten the coolant line (2) on the battery holder (5).
- Fasten the cable clip (1) on the battery holder (5).

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- Loosening the tensioning strap (3).
- Remove special tools **0 490 133 (00 2 030)** and .

**36 – Installing left output shaft (double-clutch transmission (DKG))**

▸ **Installing the left radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.




- Coat sealing lips of radial shaft seal with transmission oil.
- Drive in radial shaft seal using the special tool **2 409 230** into the transmission housing.

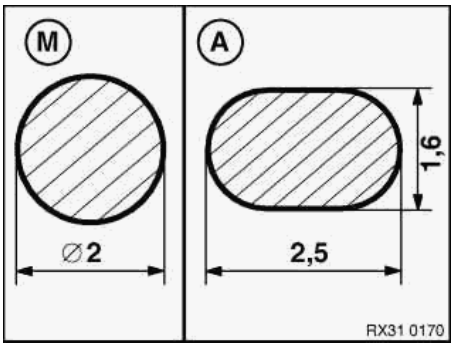
  The sealing ring must close flush with the transmission housing.




- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).

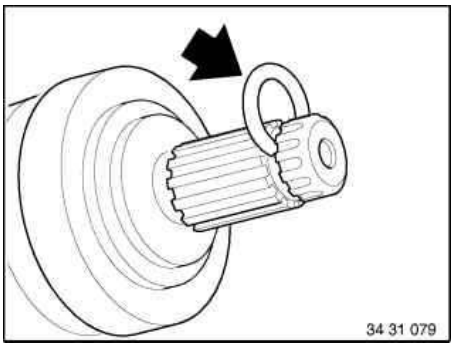
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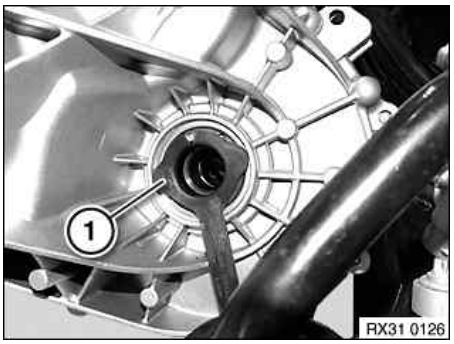

- Do not mix up circlips.

  Different types of output shafts fitted:

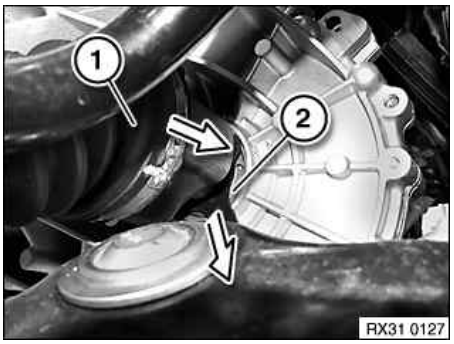
  - M: Manual transmission
  - A: Automatic transmission




- Renew circlip (arrow).




- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.

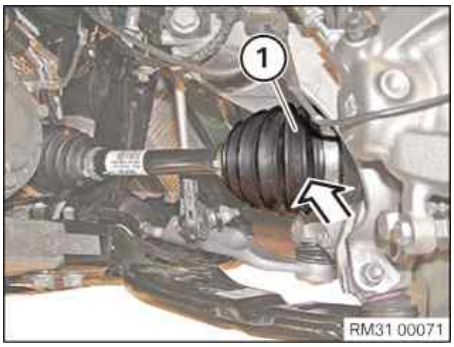



- Insert output shaft (1) into transmission.

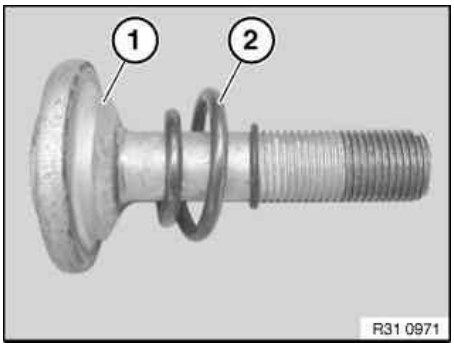
**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

- **Manual gearbox only:** Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.

  The output shaft (1) must engage audibly.
- Check for secure seat by levering.

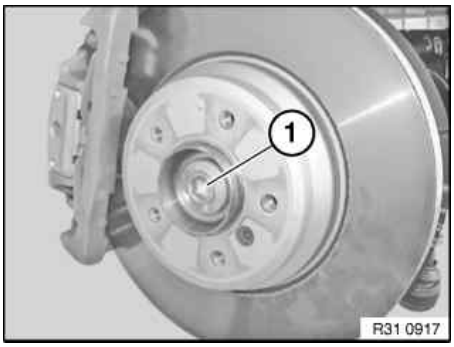



- Turn steering wheel to left.
- Insert the output shaft (1) into the swivel bearing from the front.



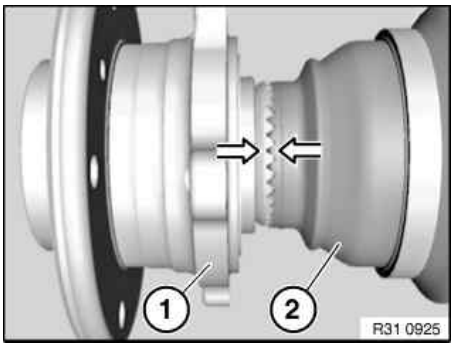

- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.

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- Renew collar bolt (1) with compression spring.

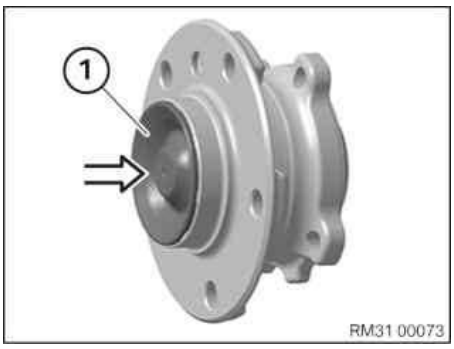
  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.




- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- When positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

**Output shaft to wheel bearing**

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |




- If necessary, attach protective cap (1).

**37 – Installing the output shaft, right (double-clutch transmission (DKG))**

▸ **Installing the right radial shaft seal on the differential (7DCT300)**

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

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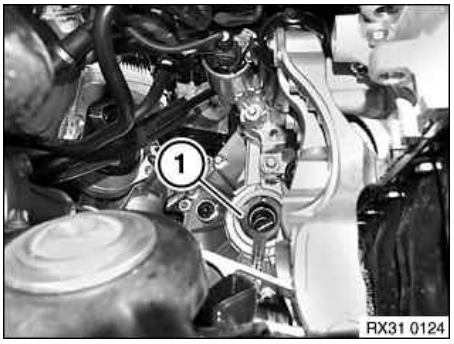

- Coat sealing lips of radial shaft seal with transmission oil.
- Drive the radial shaft seal into the gearbox housing using the special tool **2 409 230**.

  The sealing ring must lie flush with the gearbox housing.

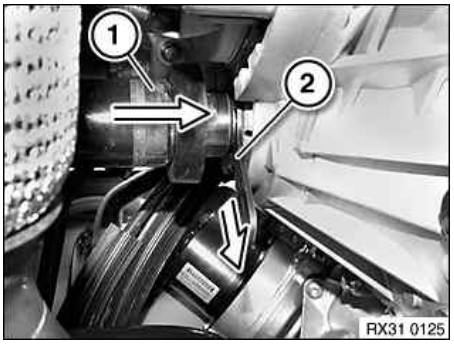



- **With automatic transmission only:**
- Lever out O-ring (1).
- Renew O-ring (1).

  **Parts:** O-ring
- Insert new O-ring (1).



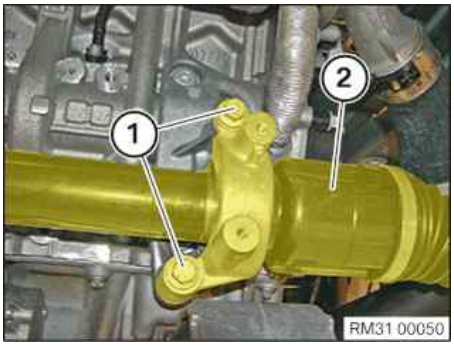

- Insert installation protection ring (1) into the radial shaft seal.
- Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.




- Insert output shaft (1) into transmission.

**Note:** Make sure the output shaft is joined in parallel to the axle and without being entangled.

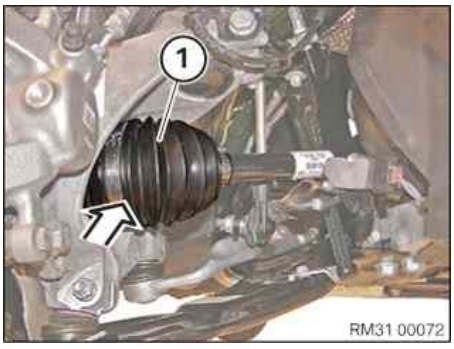
- Pull on the handle to remove the installation protection ring (2) and dispose of it.
- Slide output shaft (1) into the transmission as far as the limit position.
- Check for secure seat by levering.




- Tighten the screws (1).

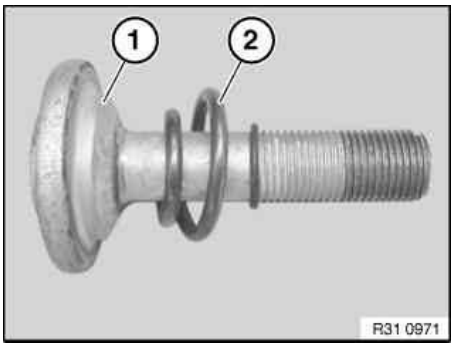
**Output shaft bearing to engine block**

| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |

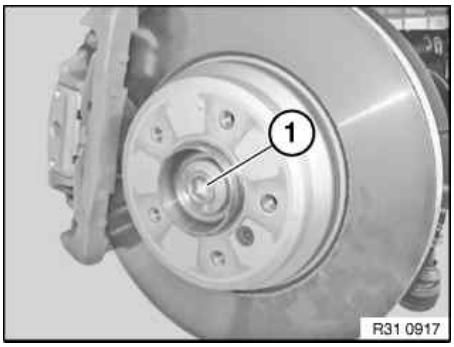



- Turn steering wheel to right.
- Insert the output shaft (1) into the swivel bearing from the front.

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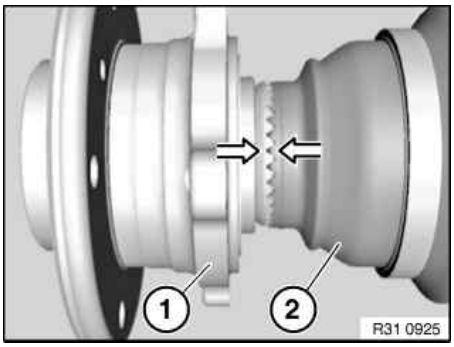



- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.




- Renew collar bolt (1) with compression spring.

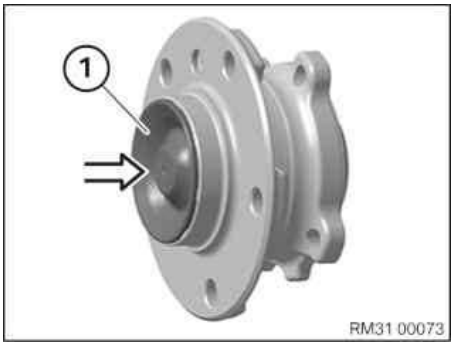
  **Parts:** Collar bolt with compression spring
- Hand-tighten the collar bolt (1) with the compression spring.




- Install the front gearing of the wheel bearing (1) and output shaft (2) in an interlocking position (tooth-in-tooth position).
- Check whether the front gearing is locked tooth in tooth by reciprocally rotating wheel hub and the output shaft.
- If positive locking is ensured: Tighten the collar bolt to tightening torque. For this purpose, press the brake pedal.

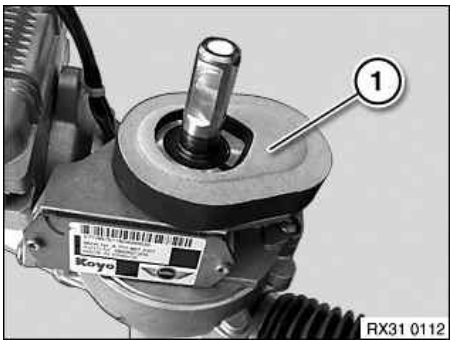
**Output shaft to wheel bearing**

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque | 210 Nm |
| | | Angle of rotation | 90 ° |




- If necessary, attach protective cap (1).

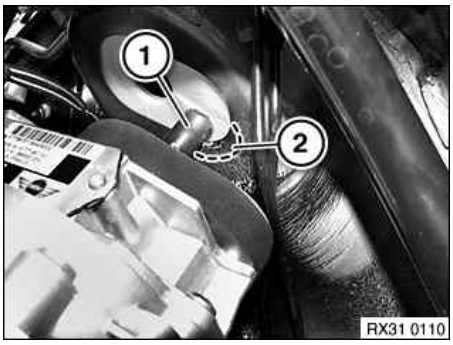
**38 – Mount and secure the complete front axle**




- Remove the seal (1).
- Clean surface on steering gear.
- Renew gasket (1).

  **Parts:** Gasket
- Position the seal (1) and glue it on.

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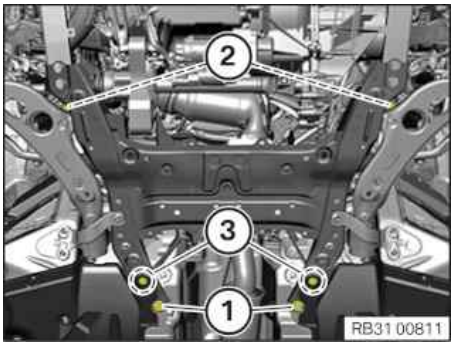



**TECHNICAL INFORMATION**

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

**Note:** Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!




- Position front axle support.
- Bend underbody panellings in the areas (3) to one side.
- Raise front axle support.
- When raising, insert charge air cooler into the rubber mount of the charge air cooler on cross member.
- Renew screws (1) and (2).

  **Parts:** Bolts
- Tighten the screws (1).

**Rear end of front axle support to body**

| | | | |
|---|---|---|---|
| M14 screw | Renew screw. | Tightening torque | 175 Nm |

- Tighten down screws (2).

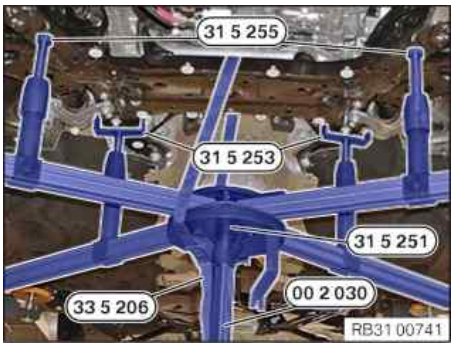
**Front axle support, front to body**

| | | | |
|---|---|---|---|
| M12 screw | Renew screw. | Tightening torque | 108 Nm |

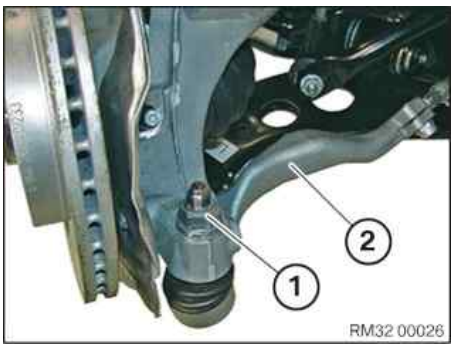
- If necessary, tighten the screws in the areas (3).

**Underbody protection to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Remove special tool **0 496 080 (33 5 206)** from special tool **0 495 817 (31 5 251)**.
- Lower universal jack **0 490 133 (00 2 030)** with the special tool **0 495 817 (31 5 251)** and place it to the side.




**NOTICE**

Perform the operations on the left and right side.

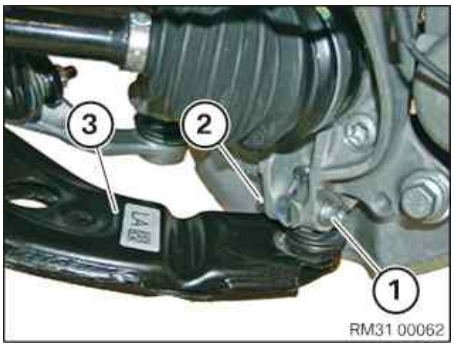
- Position the track rod (2) on the swivel bearing .
- Renew nut (1).

  **Parts:** Nut
- Tighten nut (1).

**Track rod end to swivel bearing**

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |

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**NOTICE**

Perform the operations on the left and right side.

- Position the wishbone (3) on the swivel bearing .
- Renew the bolt (2) and the nut (1).

  **Parts:** Bolt, nut
- Insert screw (2).
- Tighten nut (1).

**Wishbone to swivel bearing**

| | | | |
|---|---|---|---|
| M10 | Exclusively use the screw to tighten!<br>Renew screw and nut. | Tightening torque | 60 Nm |

### 39 – Install the mounted parts on the front axle support




**NOTICE**

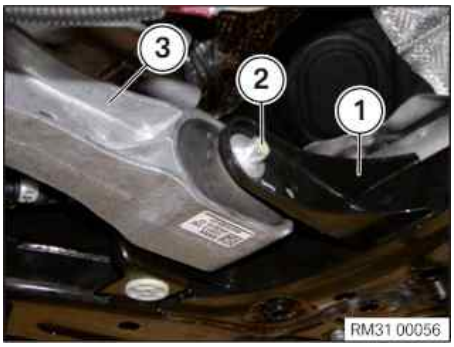
Perform the operations on the left and right side.

- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Holder, wishbone rubber mount, to body**

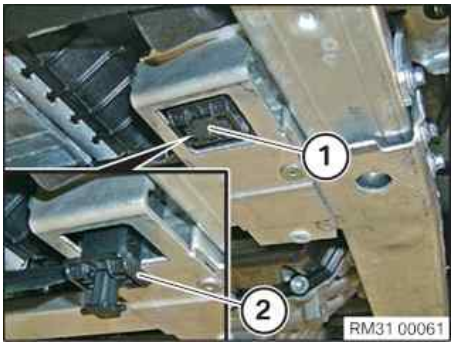
| | | | |
|---|---|---|---|
| M10 screw | Renew screw. | Jointing torque<br>Angle of rotation | 56 Nm<br>90 ° |




- Position the engine support (3) on the front axle support (1).
- Tighten down screw (2).

**Holder with rubber mount to front axle support**

| | | |
|---|---|---|
| M12 screw | | 100 Nm |

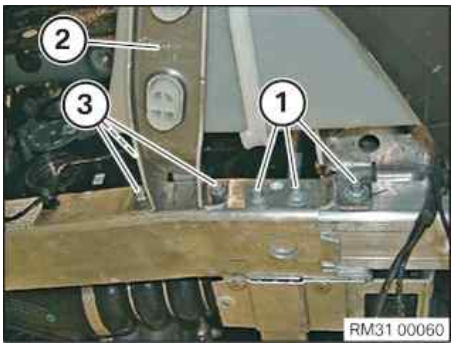



**NOTICE**

Perform the operations on the left and right side.

- Position the lock (2).
- Lock the bracket (1) of the lock (2) of the holder for the charge air cooler.

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- **Only on right side:** Position the holder for the washer fluid reservoir (2).
- Tighten down screws (3).

**Washer fluid reservoir holder to front axle support adapter plate**

| | | | |
|---|---|---|---|
| | | Tightening torque | 10 Nm |

**NOTICE**

Perform the operations on the left and right side.

- Tighten the screws (1).

**Deformation element, bottom, to adapter plate, front axle carrier**

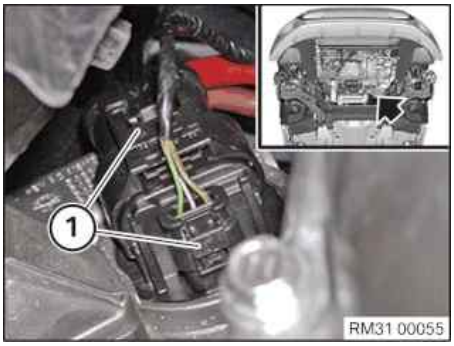
| | | | |
|---|---|---|---|
| | | Tightening torque | 11,8 Nm |

**40 – Attaching connector at steering gear**

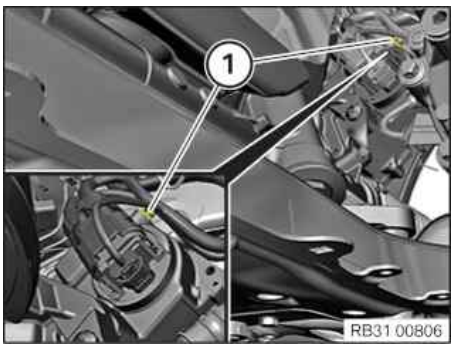



- To connect the connector (see the following step): Connect the connector with the right hand.

  The connectors can be accessed via the left output shaft.

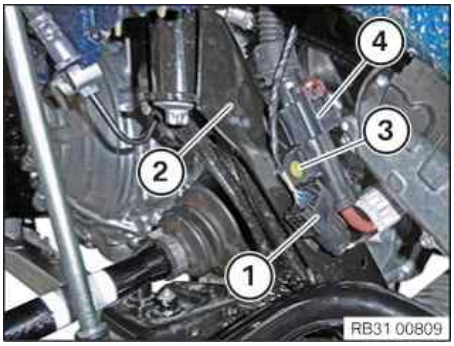



- Connect and lock connector (arrow) (1) with the steering gear.




- Fasten the wiring harness (1) on the steering gear.

▸ **If installed: Fasten the plug connections at the front axle support**




- Position the plug connection (4) at the front axle support (2).
- Tighten down screw (3).

**Holder to front axle support**

| | | | |
|---|---|---|---|
| Oval-head screw TS5 x 16 | | Tightening torque | 2,6 Nm |

- Fasten the plug connection (1) at the front axle support (2).

**41 – Securing rubber mount on front axle support**

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- Check rubber mount (1), replace if necessary.

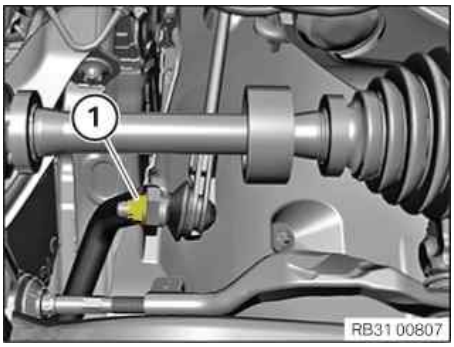
  **Parts:** Rubber mount
- Spray rubber mount (1) with lubricant and slide onto holder on front axle support.

### 42 – Securing anti-roll bar on left and right on the anti-roll bar link

**NOTICE**

Perform the operations on the left and right side.

▸ **Fastening anti-roll bar on the anti-roll bar link**




- Position the anti-roll bar link on the anti-roll bar .
- Renew nut (1).

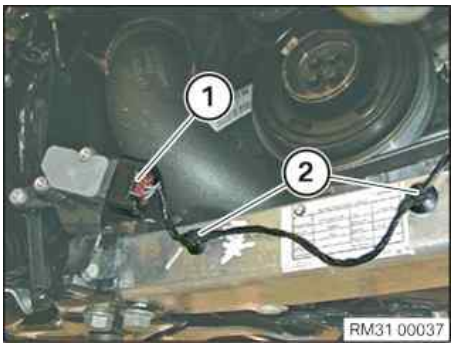
  **Parts:** Nut
- Tighten nut (1).

**Note:** Use the Torx socket for counter support.

**Anti-roll bar link to anti-roll bar**

| | | | |
|---|---|---|---|
| M10 | Renew nut. | Tightening torque | 56 Nm |

### 43 – With right installation: Securing the cable for the ride height sensor



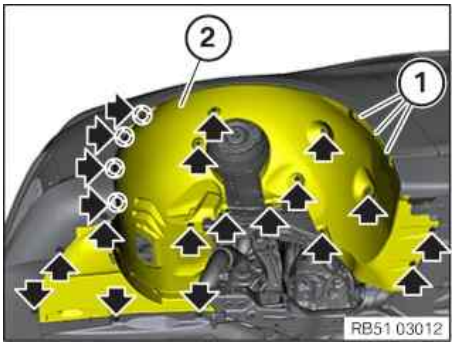

- Secure the cable clip (2) on the adapter of the deformation element.
- Connect connectors (1) and lock.

### 44 – Installing front left and right wheel arch cover

**NOTICE**

Perform the operations on the left and right side.

▸ **Installing the front wheel arch cover**




- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

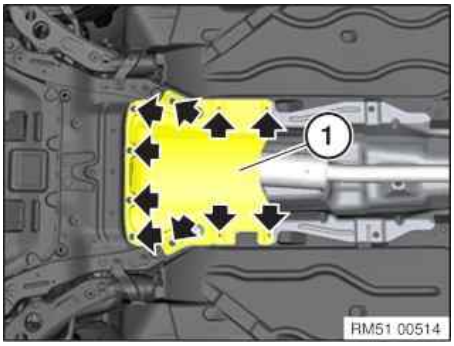
**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

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### 45 – If installed: Installing underbody protection at rear




- Position rear underbody protection (1).
- Tighten screws (arrows).

**Underbody protection to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

### 46 – Mount the front left and right wheels

▸ **Mounting the wheel**

▹ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

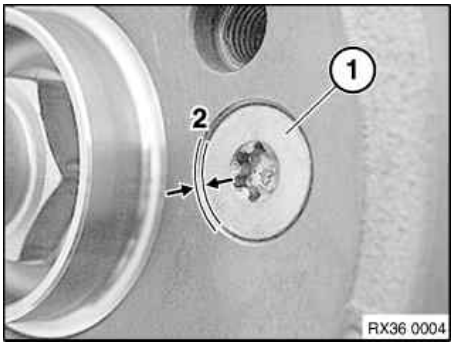
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue around the wheel bolt holes: remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Check the mounting bolt for the brake disc (1) for secure fit.

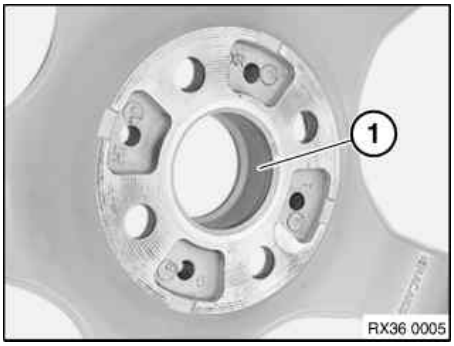
  The mounting bolt for the brake disc (1) must not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |




- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring.

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**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts (arrows) and threads for damage, renew the wheel bolts if necessary.
- Mount wheel bolts and tighten.

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

## 47 – Installing starter motor

**CAUTION**

**Improper routing of the positive battery cable.**

**Risk of short circuits!**

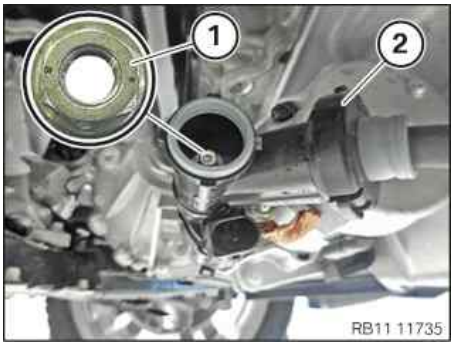
- Route the positive battery cable without abrasions and do not trap.




- Insert and install the starter motor .
- Tighten the screws (1).

**Starter motor to transmission**

| | | | |
|---|---|---|---|
| M8x45 | | Tightening torque | 19 Nm |




- Feed the positive battery cable (2) in on the starter and install.
- Tighten nut (1).

**Battery positive lead to starter**

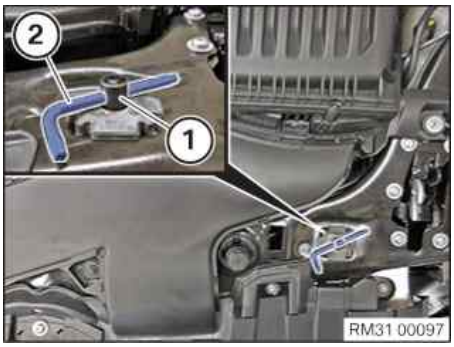
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 13,5 Nm |

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- Insert and install the new sealing cap (2).
- Secure the sealing cap (2) in the direction of the arrow.
- Connect and lock the connector (1).
- Make sure the connector (1) engages audibly.

### 48 – Removing fastener for left and right radiator

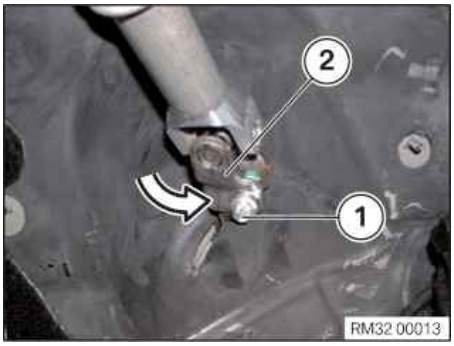



**NOTICE**

Perform the operations on the left and right side.

- Remove suitable tool (2) from the centering pin (1).

### 49 – Secure the steering shaft at the bottom on the steering gear

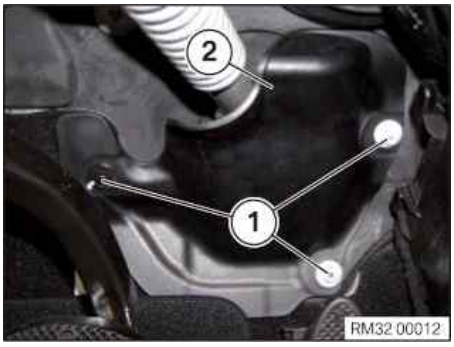



- Clean the screw lock residue from the screw thread in the universal joint (2).
- Pivot the universal joint (2) in the direction of the arrow to the steering gear.
- Renew the screw (1).

  **Parts:** Screw
- Tighten down screw (1).

**Lower steering shaft to steering gear**

| | | | |
|---|---|---|---|
| M10 | Clean screw thread and remove remains of screw locking agent.<br>Renew screw. | Tightening torque | 28 Nm |




- **If installed:**
- Position the cover on the steering column (2).
- Tighten nuts (1).

**Steering column cover to bulkhead**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

### 50 – Remove the engine bridge

**CAUTION**

**Heavy component.**

**Heavy components can lead to injury or damage.**

- Remove and install heavy components with the aid of another person/other persons.

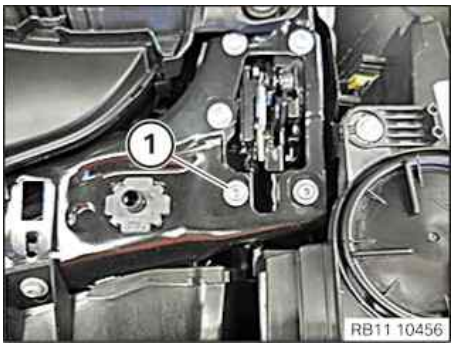
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- Detach the spindle screw (1) from the engine bridge.
- Unscrew the leg screws (2) and (3).
- Guide the engine bridge out of the vehicle with the help of another person and remove.



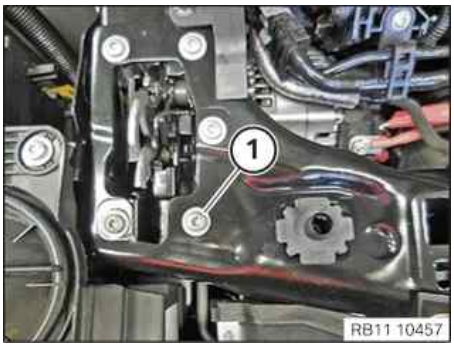

- Unscrew the bolts (1) of the special tool **2 459 012**.
- Feed out the special tool **2 459 012** at the cylinder head and remove.




- Tighten the screw (1) of the bonnet catch.

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |




- Tighten the screw (1) of the bonnet catch.

**Cross connection on support for cross connection**

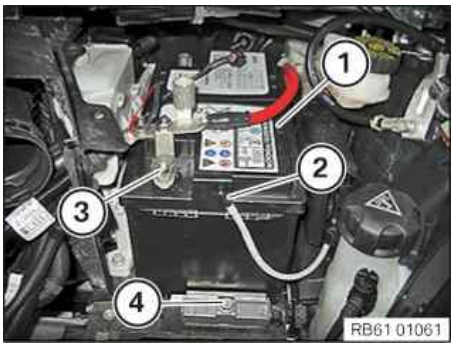
| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

**51 – Install vehicle battery**

**TECHNICAL INFORMATION**

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)

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- Install vehicle battery (1).
- Tighten the holder with the bolt (4).

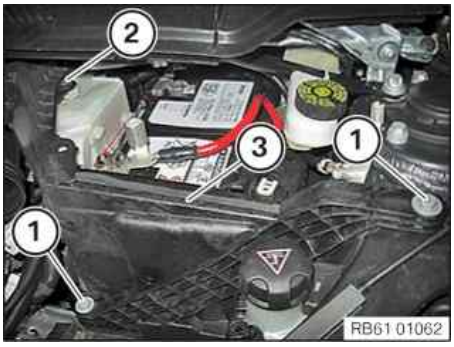
**Battery terminal rail to battery tray**

| | | |
|---|---|---|
| M8 screw | | 19 Nm |

- Position the vent hose (2).
- Position the positive terminal.
- Tighten the nut (3) on the positive terminal.

**Positive battery terminal**

| | | |
|---|---|---|
| NutM6 | | 5 Nm |




- Insert the tension strut (3).
- Tighten down screw (2).

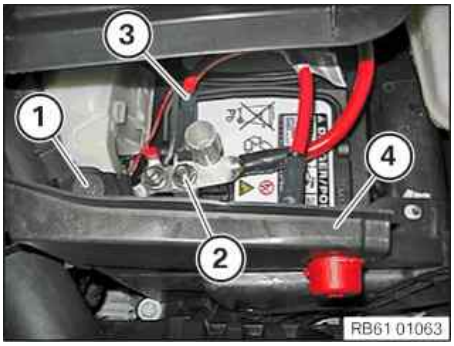
**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

- Tighten the screws (1).

**Trailing link**

| | | |
|---|---|---|
| M8 screw | | 19 Nm |




- Position the positive battery cable (3) with the cover of the remote positive terminal (4).
- Tighten down screw (1).

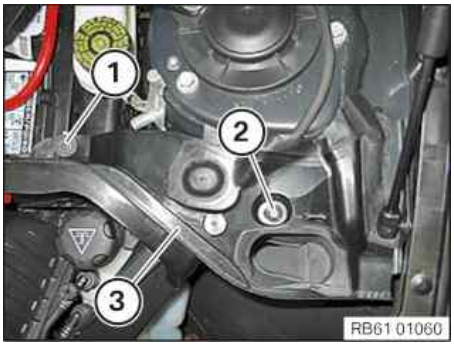
**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

- Tighten the nut (2) on the positive terminal.

**Positive battery cable to battery terminal**

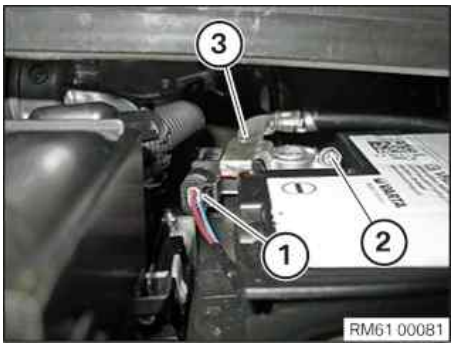
| | | |
|---|---|---|
| Nut M8 | | 15,2 Nm |




- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |



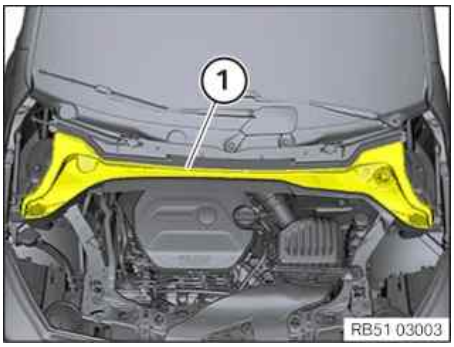

- Position the negative battery terminal (3).
- Tighten nut (2).

**Negative battery terminal (with IBS)**

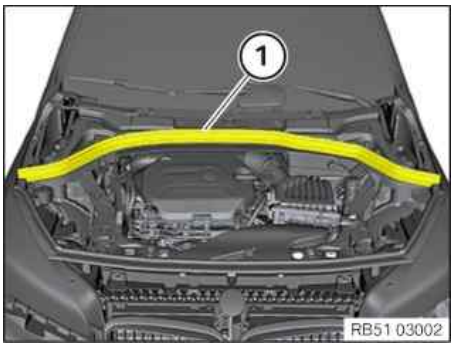
| | | |
|---|---|---|
| NutM6 | | 5 Nm |

- Connect connectors (1) and lock.

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- Feed in the cowl panel cover (1).




- Press the gasket (1) in a downwards direction.

**52 – Install electronics box**

**Prerequisite**

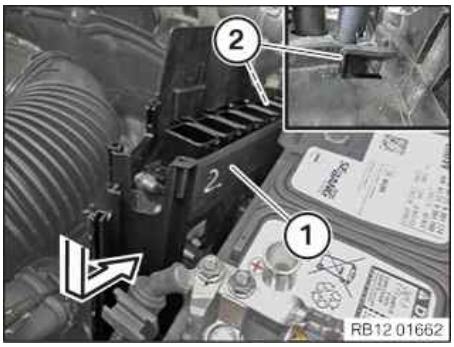
Battery earth lead is disconnected.

**RISK OF DAMAGE**

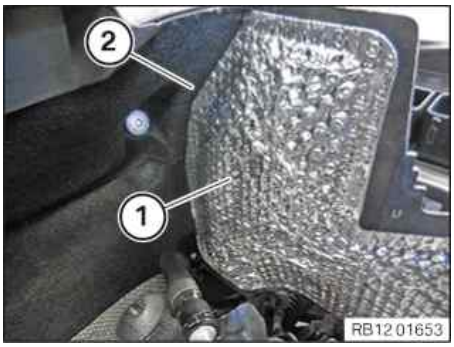
**Improper routing of cables and wiring harnesses.**

**Trapped, crushed or damaged cables may cause short circuits and malfunctions.**

- Route all cables without abrasions, do not trap and crush.

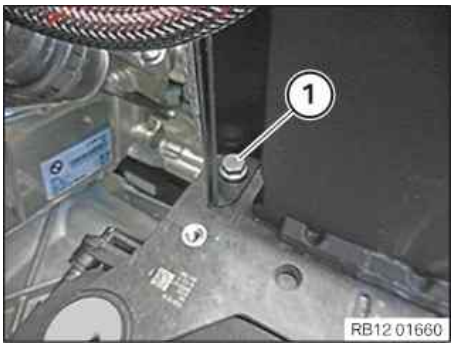



- Guide in and install the electronics box (1) into the guide (2) in direction of arrow.




- Make sure that the electronics box (1) is positioned correctly on the bulkhead (2).

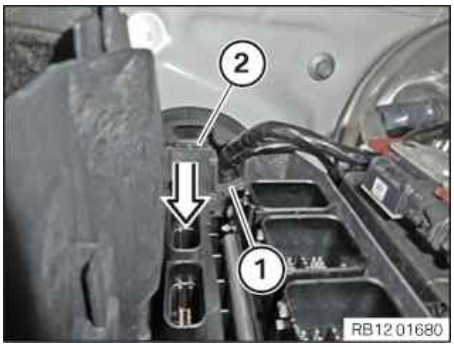
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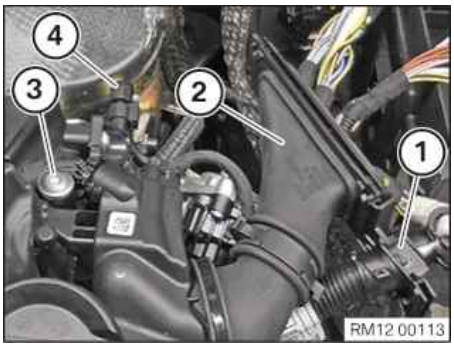

- Tighten down screw (1).

**Electronics box to battery tray**

| | | | |
|---|---|---|---|
| M8X16 | | Tightening torque | 15 Nm |




- Guide in and install the holder (1) in the electronics box (2) in direction of arrow.
- Make sure the bracket (1) engages audibly.

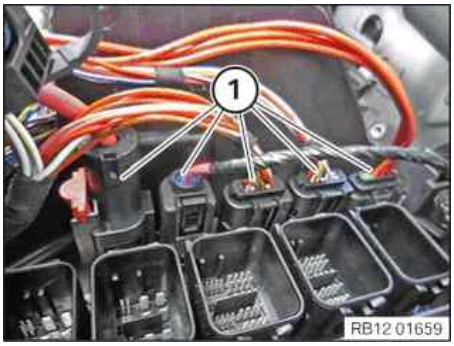



- Lay vehicle wiring harnesses (1) and (2) and mount on electronics box.
- Tighten down screw (3).

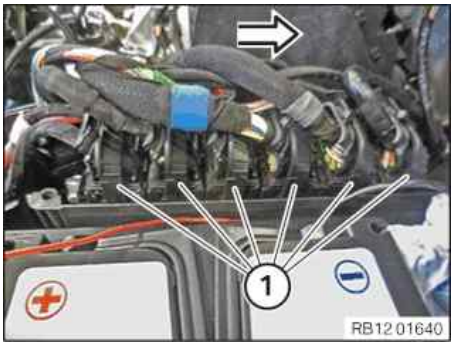
**Wiring harness to cylinder head cover**

| | | | |
|---|---|---|---|
| TS5x20 | | Tightening torque | 3,5 Nm |

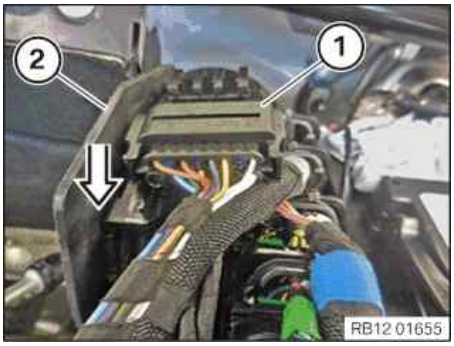
- Attach connector (4) to the differential pressure sensor and lock it audibly.




- Connect and lock the connector (1).
- Make sure the connectors (1) engage audibly.

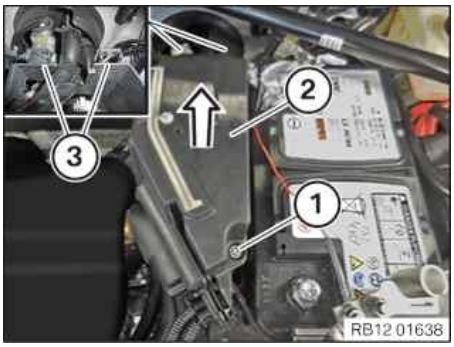



- Connect connector (1) in direction of arrow and lock.
- Make sure the connectors (1) engage audibly.




- Connect and lock the connector (1).
- Make sure the connector (1) engages audibly.
- Insert the connector (1) in the direction of arrow at the electronics box (2) and install.

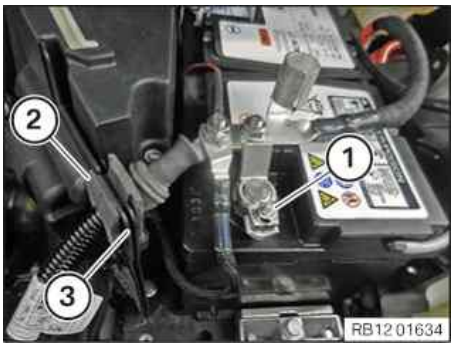
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- Insert the cover (2) into the guides (3) in the direction of arrow and install.
- Make sure the cover audibly engages (2) in the guides (3).
- Tighten down screw (1).

**Cover to electronics box**

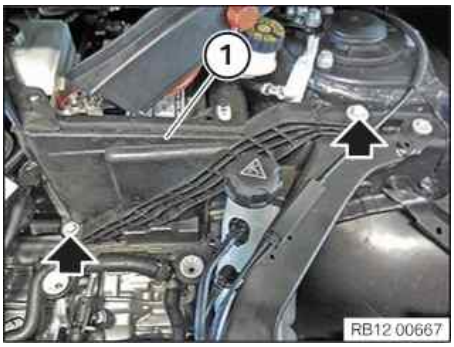
| | | | |
|---|---|---|---|
| RF5x26.5 | | Tightening torque | 2,5 Nm |




- Thread in positive battery cable (2) on holder (3) and install.
- Feed in and install positive battery terminal (1).
- Tighten positive battery terminal (1).

**Positive battery terminal to battery**

| | | | |
|---|---|---|---|
| NutM6 | | Tightening torque | 5 Nm |




- Feed in and install tension strut (1).
- Tighten screws (arrows).

**Tension strut to spring strut dome/battery tray**

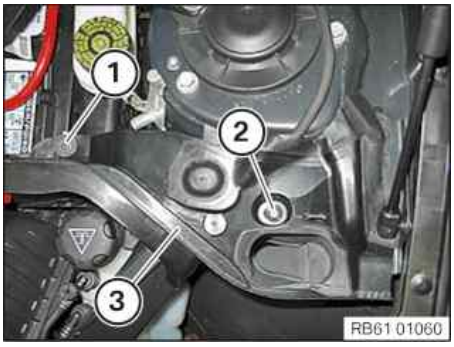
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |




- Feed in and install cover (2) at the positive battery connection point.
- Tighten down screw (1).

**Positive battery connection point cover to engine compartment partition wall**

| | | | |
|---|---|---|---|
| | | Tightening torque | 3 Nm |



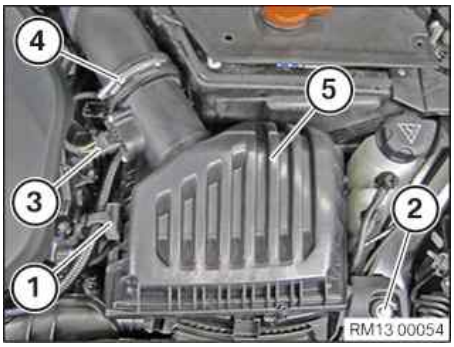

- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

**Battery cover**

| | | |
|---|---|---|
| Screw | | 2,8 Nm |

**53 – Installing intake silencer housing**

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

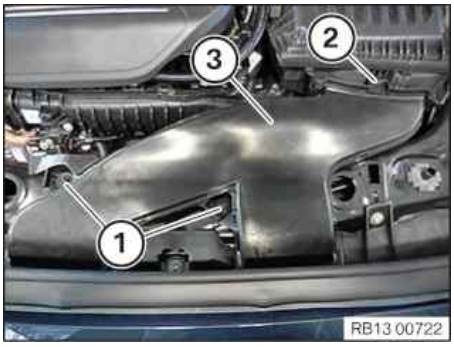
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 54 – Install the intake neck for the intake filter housing



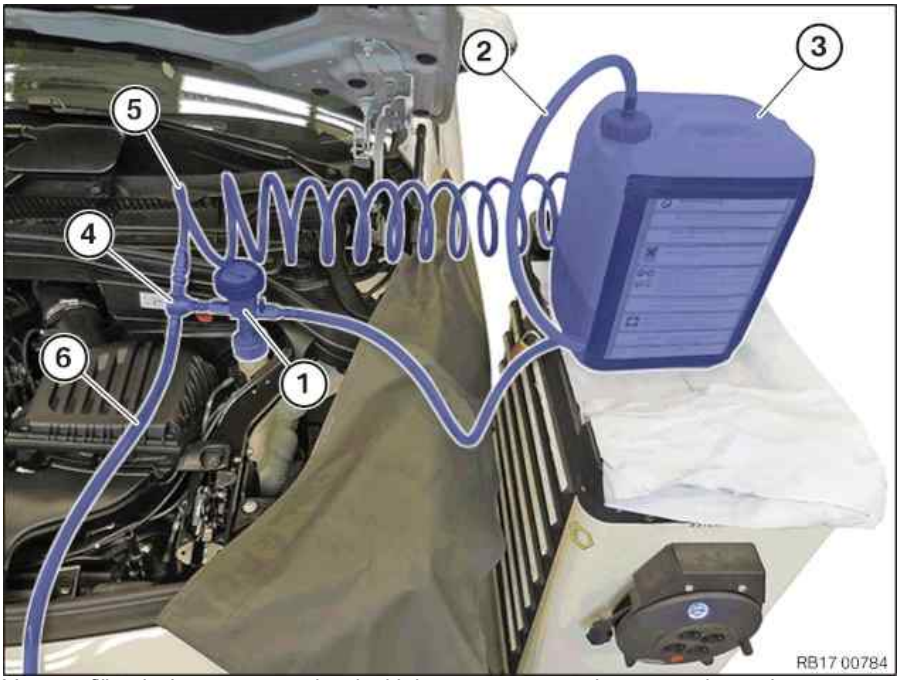

- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 55 – Filling the coolant circuit by means of the vacuum filler device

**Vacuum filler device**




Vacuum filler device - connected to the high-temperature coolant expansion tank

**1 Vacuum filler device with pressure gauge and shutoff valves**

**2 Filling hose**

**3 Fluid tank with coolant**

**4 Venturi nozzle**

**5 Compressed air connection (maximum 6 bar)**

**6 Out-going hose (lead out-going hose into a collecting vessel)**

**Prerequisite**

The coolant expansion tank for the cooling system must be empty. The fluid tank of the vacuum filler device must have a sufficient quantity

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of premixed coolant, 1 l to 2 l more than the specified capacity for the vehicle. The fluid tank of the vacuum filler device must be positioned at the same height as the coolant expansion tank. The compressed air connection must have a pressure of 6 bar. Ignition is switched off.

**TECHNICAL INFORMATION**

Follow notes for repair work on the cooling system.

For additional information see:

Main group 17

17 00 ... Notes for working on the cooling system

**TECHNICAL INFORMATION**

**Life-long fill of coolant!**

Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

**TECHNICAL INFORMATION**

Filling **without** the vacuum filler device (watering can filling) is **not permitted**.

Non-compliance will result in danger of component damage and/or engine damage.

Filling specification **absolutely must** be adhered to.

The operation of the vehicle is not permitted unless the filling procedure has been completed. Otherwise, functional limitations (degradation) and/or overheating may occur.

A bleeding procedure is required after a part has been exchanged in the cooling system and/or after refilling the cooling system.

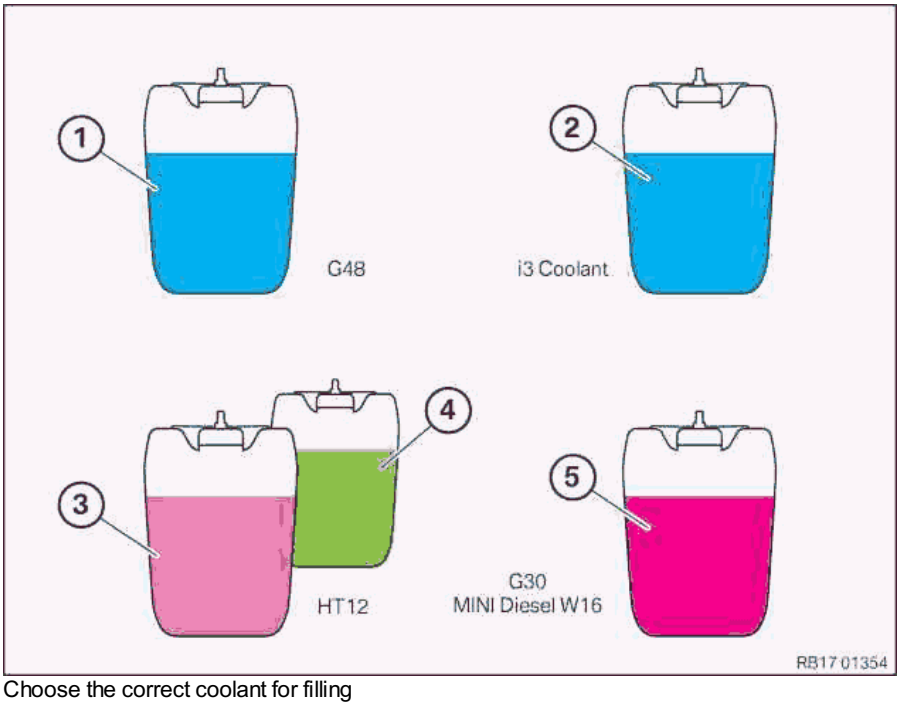
**TECHNICAL INFORMATION**

Make sure that the ignition (terminal 15) is switched off prior to creating the vacuum with the vacuum filler device.

▸ **Observe the coolant type**

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**Coolant in the vacuum filler device container**




Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

1. **G48 (Blue)** G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.
2. **i3 coolant (blue)** is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.
3. **HT12 (Pink)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
4. **HT12 (Green)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
5. **G30 (Pink)** must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

**RISK OF DAMAGE**

**Damage to the engine.**

**The use of an incorrect coolant may lead to corrosion or gelling in the engine.**

- Use only approved coolants for the specific vehicle.
- Fill the vehicle only with the coolant with which it was delivered ex works.
- Mix only compatible coolants. The colour does not allow any assessment about the compatibility of coolants.
- Selection of the correct coolant only by means of the part number.

- Select a suitable adapter (Y) from the set of special tools **0 494 417 (17 0 100)**:

| Type | Engine | Adapter (Y) from 17 0 100 |
|---|---|---|
| F39/F45/F46/F48 | B46/B48/B38/B47/B37 | 17 0 109 |

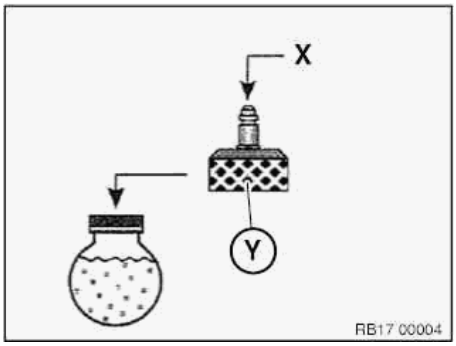
- The fluid tank of the vacuum filler device must be filled with 1 l to 2 l more than the specified capacity of coolant for the vehicle.

**Coolant capacity**

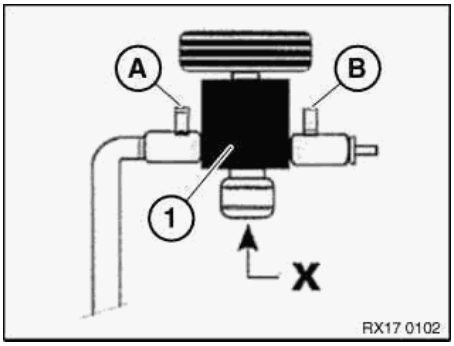
| | |
|---|---|
| B37C15/K/U1 | 6 l |

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

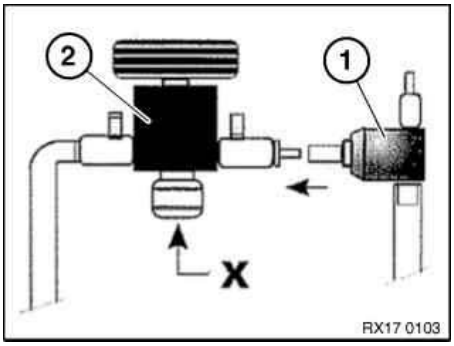
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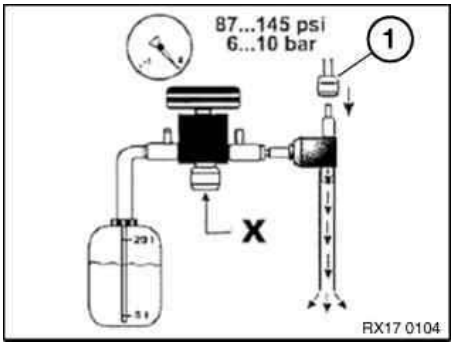

- Connect the selected adapter (Y) to the coolant expansion tank.
- Connect vacuum filler device to connection (X) of the adapter.



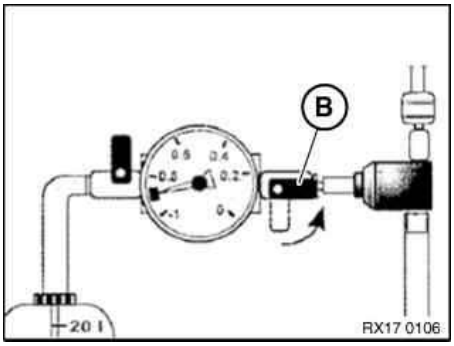

- Make sure that the shutoff valves (A) and (B)of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



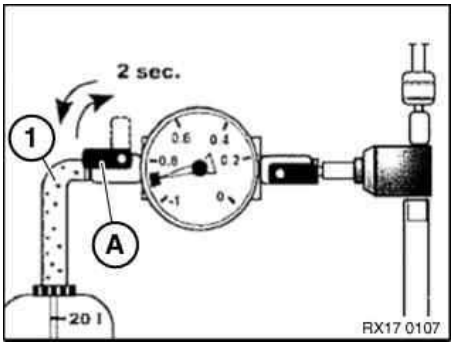

- Connect Venturi nozzle (1) to the vacuum filler device (2).
  (X)is the connection on the coolant expansion tank.




- Connect compressed air (1).
  (X) is the connection to the coolant expansion tank.



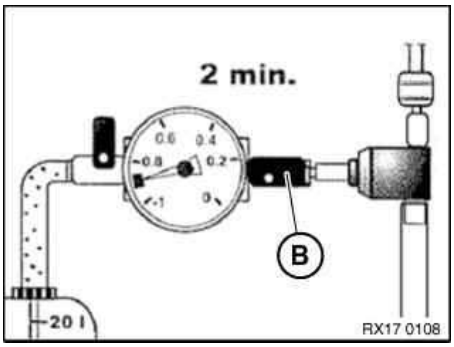

- Open shut-off valve (B).
  The venturi nozzle produces a flow noise.




- Open shutoff valve (A) until the fuel filling hose (1) is full without bubbles.
- Close shutoff valve (A) again.

» The filling hose (1) has now been bled.

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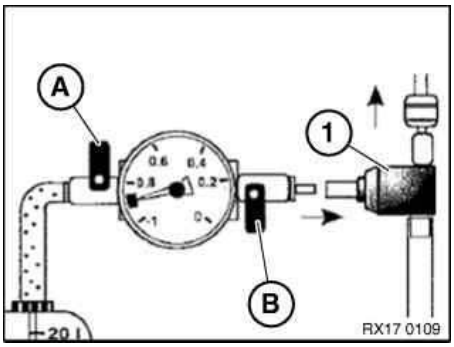



- Check the coolant hoses for porosity and renew porous coolant hoses as required.

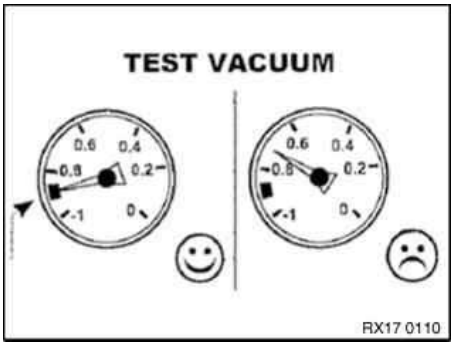
**TECHNICAL INFORMATION**

The coolant hoses contract during vacuum build-up.

- After a vacuum of -0.7 to -0.95 bar has been reached in the coolant circuit (duration approximately 2 minutes), close the shutoff valve (B).




- Check whether the shut-off valves (A) and (B) are closed.
- Disconnect the Venturi nozzle (1).




**Check**

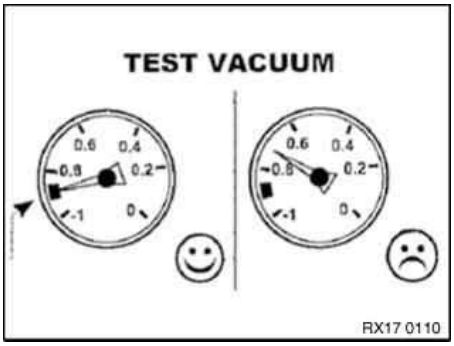
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

**Result**

» Vacuum drops.

**Measure**

- Look for the leak, repair it and start the filling procedure from the beginning.




**Check**

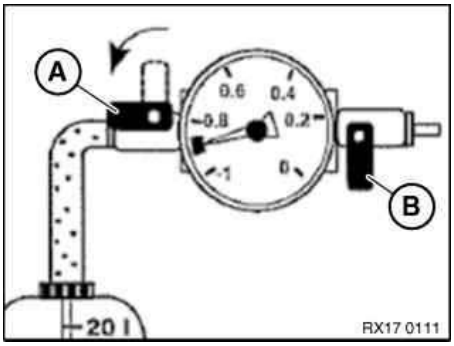
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

**Result**

» Vacuum remains constant.

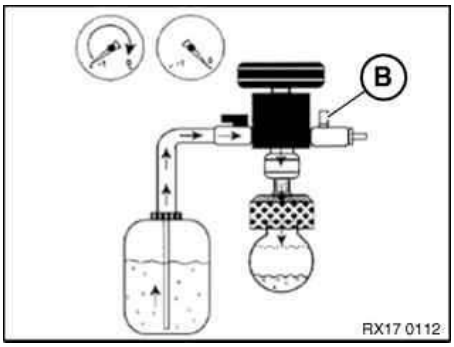
**Measure**

- Continue with filling.

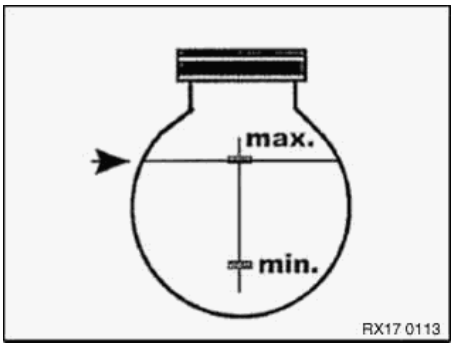



- Keep shutoff valve (B) closed during the filling process.
- To fill the cooling system, open the shutoff valve (A) to the fluid tank of the vacuum filler device.

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- Stop the filling procedure when the needle in the pressure measuring device is on 0 bar or it no longer drops.
- If necessary, reduce remaining vacuum. In order to do so, open shutoff valve (B).




- Remove the vacuum filler device with the adapter from the coolant expansion tank.
- Adjust the coolant level to 700 ml above the maximum mark.
- After filling the cooling system with the vacuum filler device perform the cooling system bleeding routine additionally.

**56 – Disconnecting all battery earth leads**




- See additional information.

**57 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

**58 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).




- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

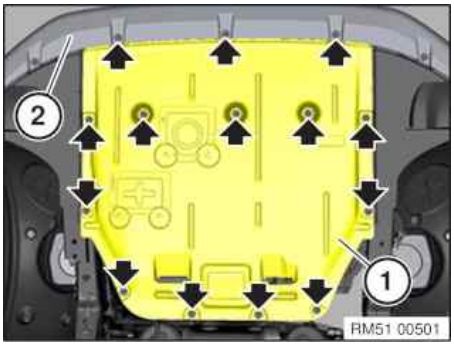
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 59 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

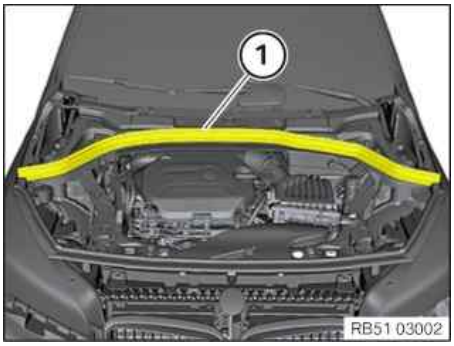
**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 60 – Install the seal for the bonnet

**NOTICE**

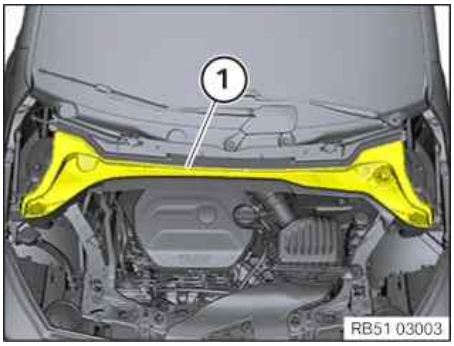
Schematic diagram is for example purposes. Some parts may differ in certain details.




- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

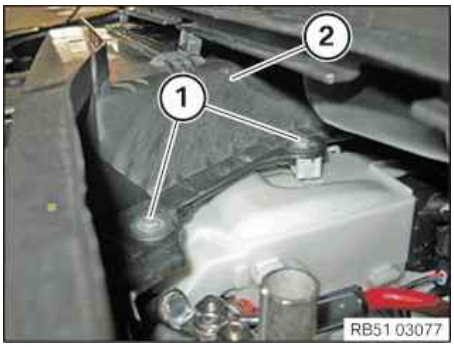
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### 61 – Installing front cowl panel cover




- Insert the cowl panel cover front (1) to the rear and install.
- Check cowl panel cover at front is correctly seated (1).

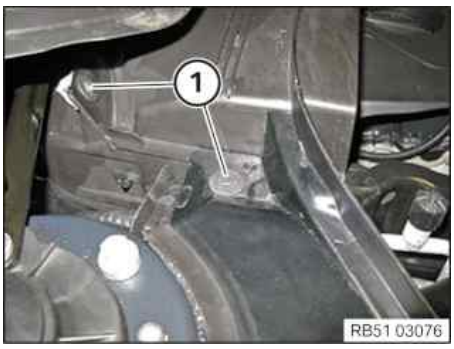
### 62 – Installing the upper bulkhead cover




- Feed in and install cover (2) of the bulkhead at the top.
- Tighten the screws (1).

**Bulkhead cover, top**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Tighten the screws (1).

**Bulkhead cover, top**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |




- Tighten the screws (1).

**Bulkhead cover, top**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

### 63 – Install acoustic cover

**RISK OF DAMAGE**

**Damage to the acoustic cover.**

**Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.**

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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- Check for correct installation of all rubber mounts in the acoustic cover (1).




- Clip in the acoustic cover into the holders in the indicated areas.
- Make sure that the acoustic cover engages audibly.

**64 – Encode/program control unit(s)**

**Prerequisite**

Replacement of the control unit.

**TECHNICAL INFORMATION**

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

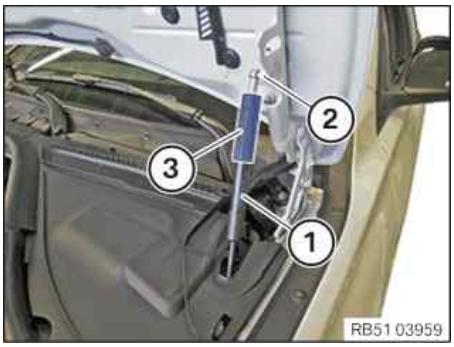
**TECHNICAL INFORMATION**

**No high-voltage switch off is required** in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.
**Exception:**
BMW I01: Note Product and Measures Management Aftersales measure 55176388.

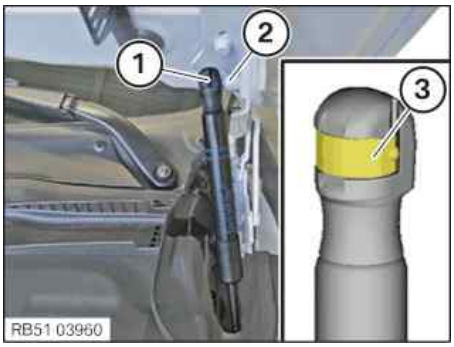
- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.

**65 – Take bonnet out of the service position**

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- Support the bonnet by hand.
- Remove the special tool **2 353 020**(3) from the ball pin (2).
- Pull off the special tool **2 353 020**(3) from the gas pressure spring (1).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.




**CAUTION**

**Shutting bonnet or tailgate.**

**Danger of injury!**

- Support bonnet/tailgate in fully open position with the aid of a suitable device.

- Check the clamp (3) is fitted correctly.
- Connect ball socket (1) to ball pin (2).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.

## Additional Information

### Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** — Used in step 13 57 58

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**Bracing strut to top cross connection** — Used in step 16

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

**Air duct to deformation element/cross connection** — Used in step 16

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

**Cross connection on support for cross connection** — Used in step 16 50

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

**Special tool to cylinder head** — Used in step 17

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 21,5 Nm |

**Clutch cover to transmission** — Used in step 34

| | | | |
|---|---|---|---|
| | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 5,5 Nm |

**Transmission to engine** — Used in step 35

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |
| M12 | | Tightening torque | 66 Nm |

**Standard screw connection M6** — Used in step 35

| | | | |
|---|---|---|---|
| M6 | | | 8 Nm |

**Transmission mounting** — Used in step 35

| | | | |
|---|---|---|---|
| M10 | Renew screws. | Jointing torque | 40 Nm |
| | | Angle of rotation | 90 ° |

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**Standard screw connection M8** — Used in step 35

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

**Battery holder to engine support** — Used in step 35

| | | | |
|---|---|---|---|
| Hexagon screw M8x30 | | Tightening torque | 19 Nm |

**Output shaft to wheel bearing** — Used in step 36 37

| | | | |
|---|---|---|---|
| M16 | Replace the collar bolt. | Jointing torque<br>Angle of rotation | 210 Nm<br>90 ° |

**Output shaft bearing to engine block** — Used in step 37

| | | | |
|---|---|---|---|
| M10 | | Tightening torque | 38 Nm |

**Rear end of front axle support to body** — Used in step 38

| | | | |
|---|---|---|---|
| M14 screw | Renew screw. | Tightening torque | 175 Nm |

**Front axle support, front to body** — Used in step 38

| | | | |
|---|---|---|---|
| M12 screw | Renew screw. | Tightening torque | 108 Nm |

**Underbody protection to body** — Used in step 38 45

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

**Track rod end to swivel bearing** — Used in step 38

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |

**Wishbone to swivel bearing** — Used in step 38

| | | | |
|---|---|---|---|
| M10 | Exclusively use the screw to tighten!<br>Renew screw and nut. | Tightening torque | 60 Nm |

**Holder, wishbone rubber mount, to body** — Used in step 39

| | | | |
|---|---|---|---|
| M10 screw | Renew screw. | Jointing torque<br>Angle of rotation | 56 Nm<br>90 ° |

**Holder with rubber mount to front axle support** — Used in step 39

| | | | |
|---|---|---|---|
| M12 screw | | | 100 Nm |

**Washer fluid reservoir holder to front axle support adapter plate** — Used in step 39

| | | | |
|---|---|---|---|
| | | Tightening torque | 10 Nm |

**Deformation element, bottom, to adapter plate, front axle carrier** — Used in step 39

| | | | |
|---|---|---|---|
| | | Tightening torque | 11,8 Nm |

**Holder to front axle support** — Used in step 40

| | | | |
|---|---|---|---|
| Oval-head screw TS5 x 16 | | Tightening torque | 2,6 Nm |

**Anti-roll bar link to anti-roll bar** — Used in step 42

| | | | |
|---|---|---|---|
| M10 | Renew nut. | Tightening torque | 56 Nm |

**Wheel arch cover to body** — Used in step 44

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body** — Used in step 44

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Brake disc to front wheel hub** — Used in step 46

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

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**Brake disc to rear wheel hub** — Used in step 46

| | | | |
|---|---|---|---|
| M8 | Renew screw. | | 16 Nm |

**Wheel bolts** — Used in step 46

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

**Starter motor to transmission** — Used in step 47

| | | | |
|---|---|---|---|
| M8x45 | | Tightening torque | 19 Nm |

**Battery positive lead to starter** — Used in step 47

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 13,5 Nm |

**Lower steering shaft to steering gear** — Used in step 49

| | | | |
|---|---|---|---|
| M10 | Clean screw thread and remove remains of screw locking agent.<br>Renew screw. | Tightening torque | 28 Nm |

**Steering column cover to bulkhead** — Used in step 49

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Battery terminal rail to battery tray** — Used in step 51

| | | | |
|---|---|---|---|
| M8 screw | | | 19 Nm |

**Positive battery terminal** — Used in step 51

| | | | |
|---|---|---|---|
| NutM6 | | | 5 Nm |

**Battery cover** — Used in step 51 52

| | | | |
|---|---|---|---|
| Screw | | | 2,8 Nm |

**Trailing link** — Used in step 51

| | | | |
|---|---|---|---|
| M8 screw | | | 19 Nm |

**Positive battery cable to battery terminal** — Used in step 51

| | | | |
|---|---|---|---|
| Nut M8 | | | 15,2 Nm |

**Negative battery terminal (with IBS)** — Used in step 51

| | | | |
|---|---|---|---|
| NutM6 | | | 5 Nm |

**Electronics box to battery tray** — Used in step 52

| | | | |
|---|---|---|---|
| M8X16 | | Tightening torque | 15 Nm |

**Wiring harness to cylinder head cover** — Used in step 52

| | | | |
|---|---|---|---|
| TS5x20 | | Tightening torque | 3,5 Nm |

**Cover to electronics box** — Used in step 52

| | | | |
|---|---|---|---|
| RF5x26.5 | | Tightening torque | 2,5 Nm |

**Positive battery terminal to battery** — Used in step 52

| | | | |
|---|---|---|---|
| NutM6 | | Tightening torque | 5 Nm |

**Tension strut to spring strut dome/battery tray** — Used in step 52

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 19 Nm |

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**Positive battery connection point cover to engine compartment partition wall** Used in step 52

| | | | |
|---|---|---|---|
| | | Tightening torque | 3 Nm |

**Intake silencer housing to lock bridge** Used in step 53

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** Used in step 53

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** Used in step 54

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** Used in step 59

| | | | |
|---|---|---|---|
| | | | 3 Nm |

**Bulkhead cover, top** Used in step 62

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 3 Nm |

## Overview of Special Tools

### 2 353 020 Support




**Common** Used in step 1 65

| | |
|---|---|
| Usage | For service position of engine compartment lid Associated contour-graphic silhouette foil can be ordered under: 83 30 2 356 848. Further information on the contour-graphic silhouette foil can be found in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A74 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 11 13 (960) |

### 2 459 012 Holder

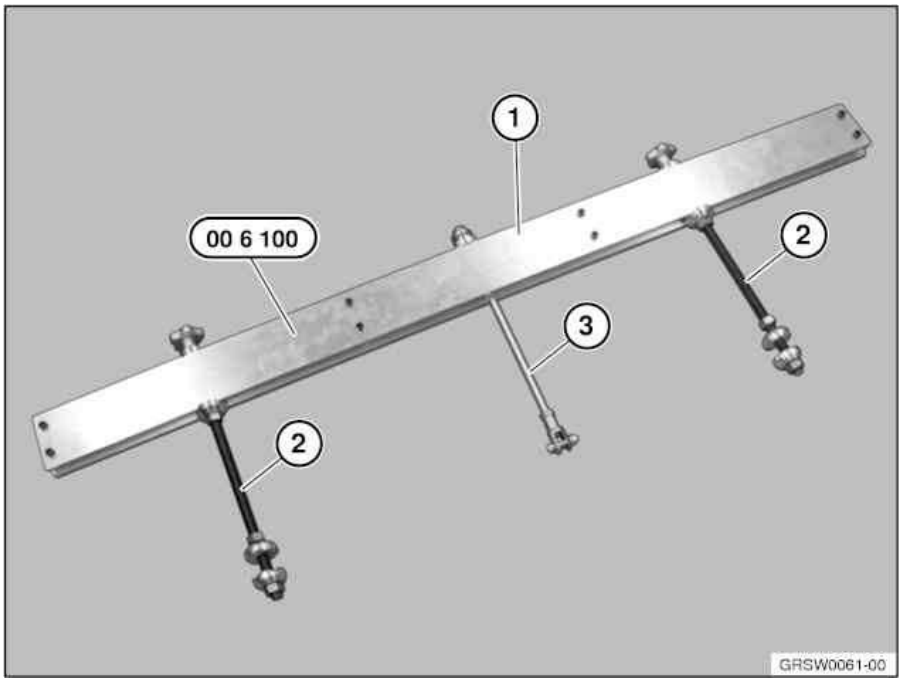



**Common** Used in step 17 50

| | |
|---|---|
| Usage | For removing and installing the cylinder head. Contour-graphic silhouette foil is included in the delivery specification. |
| Included in the tool or work | |
| Storage location | A58 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 07 17 (487) |

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**0 496 852 (00 6 100) Device**




**Common** Used in step 17

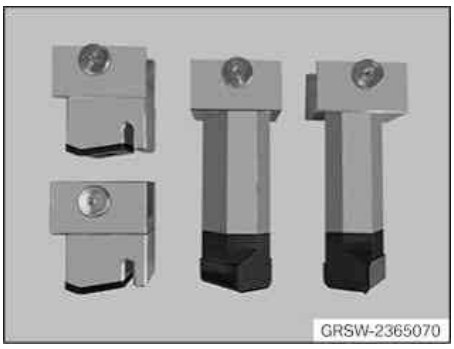
| | |
|---|---|
| Usage | Engine bridge (device) 006000 |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 17 10 (659) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 2 | 2 361 507 (00 6 102) | | **Spindle** Set (2 pieces) in connection with 00 6 100. | |
| 3 | 2 361 506 (00 6 103) | | **Spindle** Spindle (central spindle) for Traverse 00 6 100. | |

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**2 365 070 Upholstery**



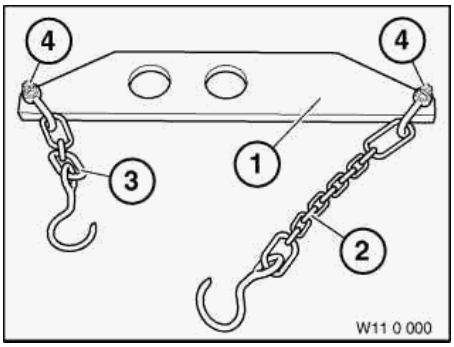

**Common** Used in step 17

| | |
|---|---|
| Usage | Washer for securing the engine support. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | Engine bridge 006100 - 0496852 Section 006051 - 0496436 Adapter 006130 - 2209122 Adapter 2318635 |
| SI-Number | 01 45 14 (186) |

**0 490 561 (11 0 000) Lifting gear**

Used in step 17

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**Common**

| | |
|---|---|
| Usage | (Hoisting gear) For removing and installing engines. As of 08/2011 only available as a complete set. Delivered with TÜV inspection certificate and operating instructions. No delivery of separate parts. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 13 94 (888) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 4 | 0 490 565 (11 0 009) | | **Shackle** (Shackle) 2 pieces. As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 1 | 0 490 562 (11 0 001) | | **Lifting gear** (Cross member) As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 2 | 0 490 563 (11 0 002) | | **Chain** (Chain) Version: long As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |
| 3 | 0 490 564 (11 0 003) | | **Chain** (Chain) Version: short As of 08/2001, only available as a complete set via 11 0 000 = 0490561. Delivered with TÜV inspection certificate and operating instructions. | |

**2 357 269 Shackle**

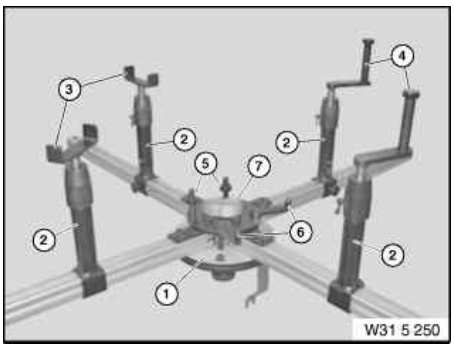



**Common** Used in step 17

| | |
|---|---|
| Usage | Set consisting of 4 pieces. Was valid as campaign for BMW i Aftersales High Voltage. During the course of the changeover from BMWi to iPerformance, a tool changeover also takes place from campaign to warehouse. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 19 13 (985) |

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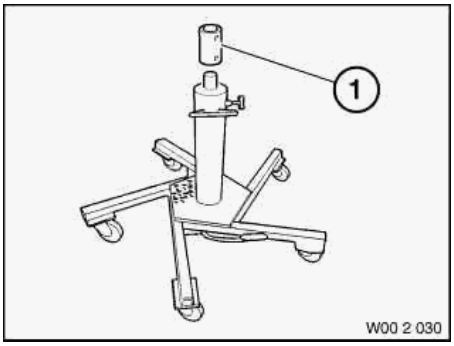
### 0 495 817 (31 5 251) Basic body




**Common** Used in step 29 38

| | |
|---|---|
| Usage | (Basic body) No longer available separately, only via special tool set 31 5 250 (83 30 0 495 567) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

### 0 490 133 (00 2 030) Device



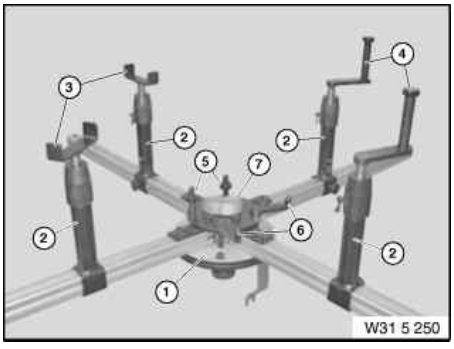

**Common** Used in step 29 32 35 38

| | |
|---|---|
| Usage | (universal hydraulic lifter base unit) Chassis and hydraulic lifter - For removing and installing rear axle supports and gearboxes. Also for soft top mounts. Is replaced by 81 22 2 219 012 |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 05 90 (207) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 490 134 (00 2 031) | | **Adapter** (adapter for gearbox holder) Model series: E30, E31, E32, E34, E36 | |

### 0 495 821 (31 5 255) Adapter

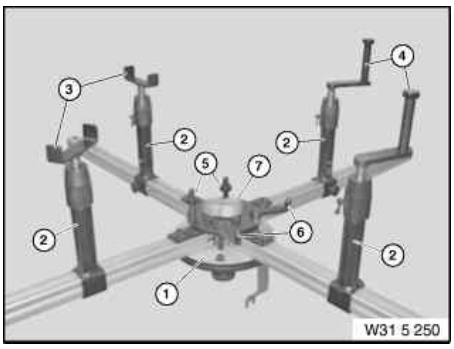



**Common** Used in step 29

| | |
|---|---|
| Usage | (take-up adapter for bore holes (2 x)) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

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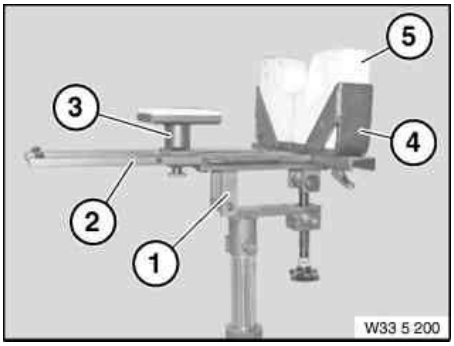
### 0 495 819 (31 5 253) Adapter




**Common** Used in step 29

| | |
|---|---|
| Usage | (take-up adapter U-section (2 x)) |
| Included in the tool or work | 0 495 567 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 01 24 06 (309) |

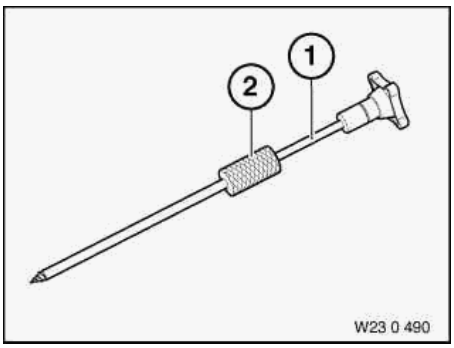
### 0 496 080 (33 5 206) Belt




**Common** Used in step 29 38

| | |
|---|---|
| Usage | (Tensioning strap) |
| Included in the tool or work | 0 496 009 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 491 454 (23 0 490) Puller




**Common** Used in step 30 31

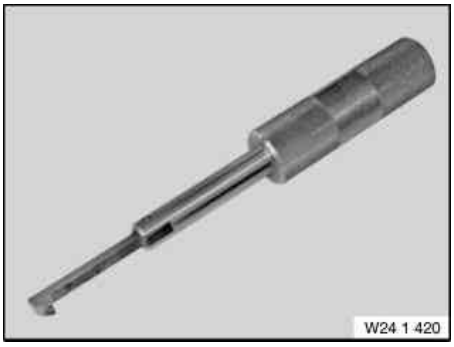
| | |
|---|---|
| Usage | For removing shaft seal |
| Included in the tool or work | |
| Storage location | A13 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 15 96 (106) |

**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 491 455 (23 0 491) | | **Rod** With self-tapping screw Deletion, only available via tool set | |
| 2 | 0 491 456 (23 0 492) | | **Weight** (Weight) | |

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**0 496 716 (24 1 420) Puller**




## Common

Used in step 33

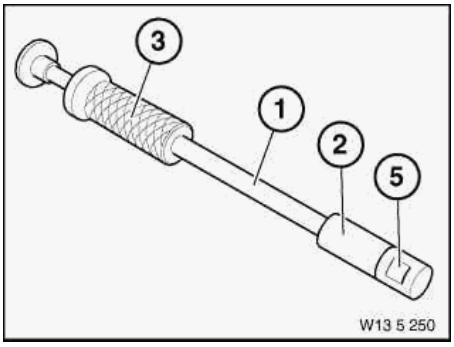
| | |
|---|---|
| Usage | Removing radial shaft seal from torque converter. |
| Included in the tool or work | |
| Storage location | B54 |
| Replaced by | |
| In connection with | 13 5 250 = 0493321 |
| SI-Number | 01 17 09 (577) |

## Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 2 209 493 (24 1 421) | | **Blade**<br>Replacement blades for 24 1 420 Only available as part of complete tool set 24 1 420 (83 30 0 496 716). | |

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**0 493 321 (13 5 250) Puller**




## Common

Used in step 33

| | |
|---|---|
| Usage | For removing injector nozzles or injectors from cylinder head |
| Included in the tool or work | |
| Storage location | A16 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 06 98 (306) |

## Consisting of

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 1 | 0 493 338 (13 5 251) | | **Rod** (guide rod) | |
| 2 | 0 493 339 (13 5 252) | | **Bush** (Threaded bush) | |
| 3 | 0 493 340 (13 5 253) | | **Weight** (Weight) | |
| 4 | 0 493 379 (13 5 254) | | **Claw** (Clamping claw) For removal of injector nozzles / engine: M57 | |
| 5 | 0 495 579 (13 5 255) | | **Adapter** For removing steering shaft on E85. Refer to SI 01 11 06 (265) | |

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### 2 457 907 Fitting aid




**Common** Used in step 34

| | |
|---|---|
| Usage | For installing the clutch cover. Contour-graphic silhouette foil is included in the delivery specification. Further information on the contour-graphic silhouette foil is included in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | B6 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 19 17 (511) |

### 2 409 230 Mandrel




**Common** Used in step 36 37

| | |
|---|---|
| Usage | For installing the rear-wheel drive of Transmission output shaft le./ri. silhouette foil is contained in delivery specification. Further information on the contour-graphic silhouette foil is included in service information 00 22 13 (969). |
| Included in the tool or work | |
| Storage location | A75 |
| Replaced by | |
| In connection with | |
| SI-Number | 01 56 14 (214) |

### 2 344 011 Tool



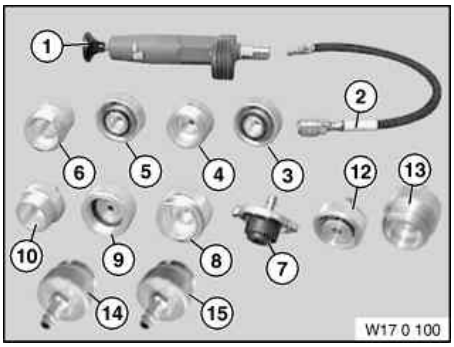

**Common** Used in step 46

| | |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

### 0 494 417 (17 0 100) Tester

Used in step 55

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**Common**

| | |
|---|---|
| Usage | For checking engine cooling system on watertightness. For checking radiator cap. |
| Included in the tool or work | |
| Storage location | Individual |
| Replaced by | |
| In connection with | |
| SI-Number | 01 07 02 (884) |

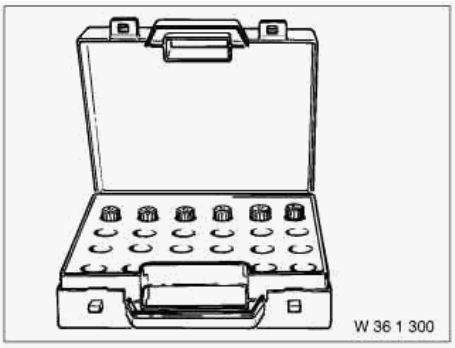
**Consisting of**

| Pos | BMW Order number | Replaced by | Designation | In Connection with |
|---|---|---|---|---|
| 5 | 0 494 422 (17 0 105) | | **Adapter** For radiator cap (sawtooth thread) | |
| 10 | 0 494 427 (17 0 111) | | **Adapter** For radiator cap R53/W11, R50/W17 adapter replaced 17 0 052. | |
| 1 | 0 494 418 (17 0 101) | | **Pump** | |
| 2 | 0 494 419 (17 0 102) | | **Hose** (hose with quick-release coupling) | |
| 3 | 0 494 420 (17 0 103) | | **Adapter** For radiator cap (normal thread) | |
| 4 | 0 494 421 (17 0 104) | | **Adapter** For radiator cap (normal thread) | |
| 6 | 0 494 423 (17 0 106) | | **Adapter** For radiator cap (sawtooth thread) | |
| 7 | 0 494 424 (17 0 107) | | **Adapter** For radiator cap R50 / W10 | |
| 8 | 0 494 425 (17 0 108) | | **Adapter** For radiator cap R50 / W10 | |
| 9 | 0 494 426 (17 0 109) | | **Adapter** For radiator connection R53/W11, R50/W17 adapter corresponds to 17 0 051 | |
| 11 | 0 494 428 (17 0 112) | | **Case** | |
| 12 | 0 494 642 (17 0 113) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 13 | 0 494 643 (17 0 114) | | **Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988) | |
| 14 | 0 495 889 (17 0 115) | | **Adapter** For radiator cap Model series: N12, N14 | |

**Replacement tools:**

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### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

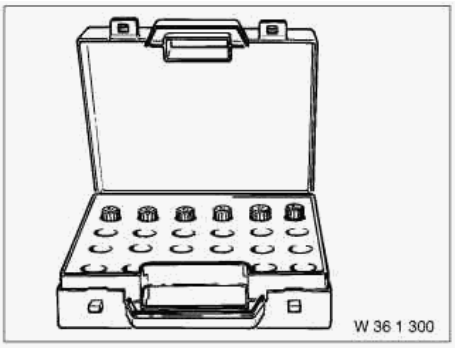
### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 227 (36 1 329) Wheel stud



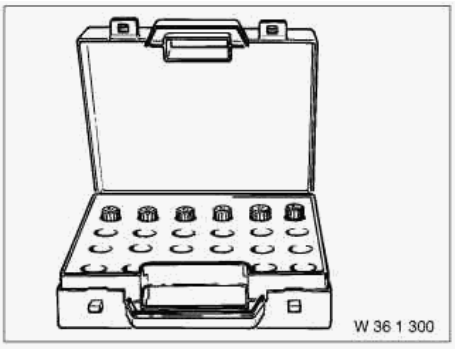

| Common | Used in step 21 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 228 (36 1 331) Wheel stud



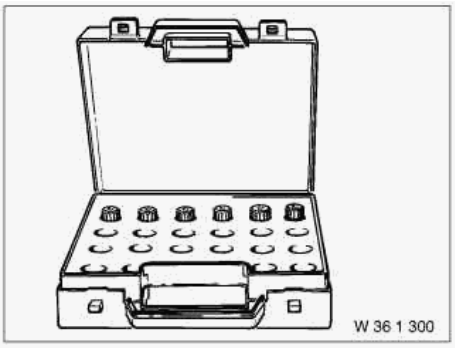

| Common | Used in step 21 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 21 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Overview Technical Data

| Coolant capacity | Used in step 55 |
|---|---|
| B37C15/K/U1 | 6 l |

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

## Links

| General repair instructions | Used in step |
|---|---|
| 61 20 ... Notes on AGM battery | 10 51 |

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| | |
|---|---|
| 61 12 ... Notes on intelligent battery sensor (IBS) | 10 51 |
| 61 00 ... Notes for disconnecting and connecting battery | 10 51 |

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 56 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 56 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 20 900 Disconnecting and connecting battery earth lead | 2 56 |
| 61 35 ... Notes on ESD protection (Electro Static Discharge) | 9 |
| 17 00 ... Notes for working on cooling system. | 55 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 13 57 58 |
| 2.0 Grease for wheel centring | 46 |

| Operating materials | Used in step |
|---|---|
| Main group 17 | 55 |

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# 28 60 040 Removing and installing/replacing control unit for double-clutch transmission (DKG) (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

**TECHNICAL INFORMATION**

After completing work:
Perform service function "Renewing EGS" with diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

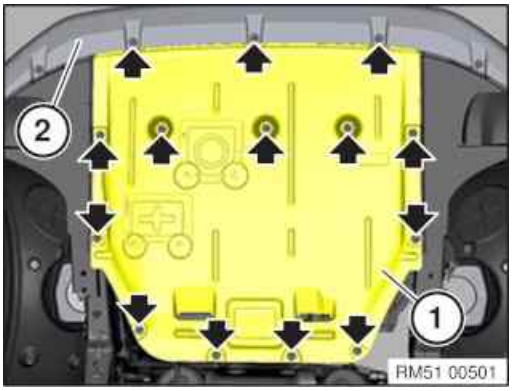
## PRELIMINARY WORK

### 1 – Disconnecting all battery earth leads




- See additional information.

### 2 – Removing the front underbody protection

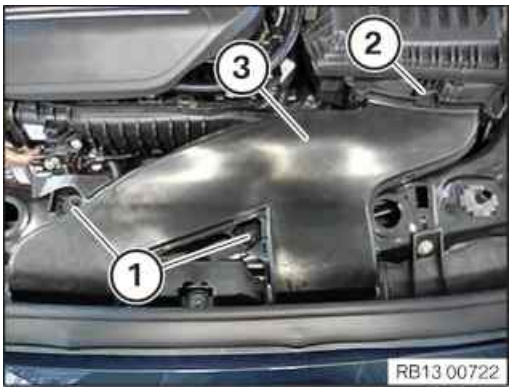



- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 3 – Remove the intake neck for intake silencer housing

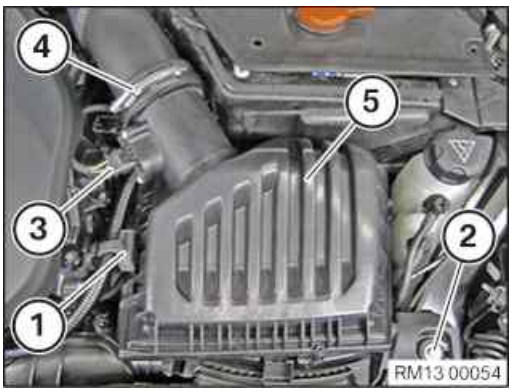
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**3 – Remove the intake neck for intake silencer housing**




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**4 – Removing intake silencer housing**




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

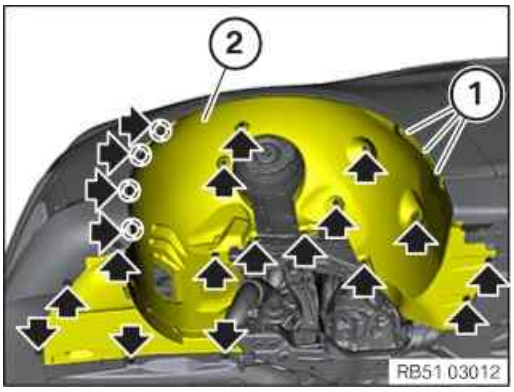
**5 – Removing the wheel**




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**6 – Remove front wheel arch cover**




- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

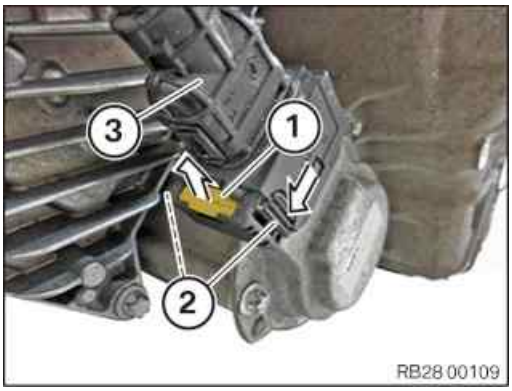
**MAIN WORK**

**7 – Removing the control unit (7DCT300)**

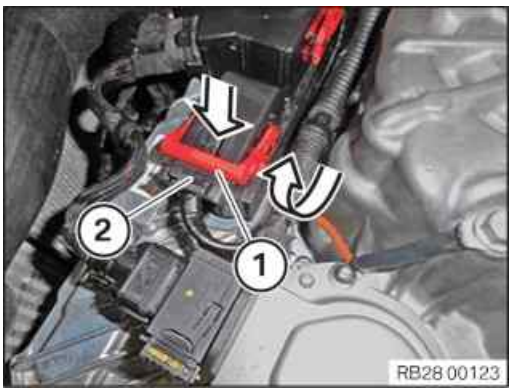
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## TECHNICAL INFORMATION

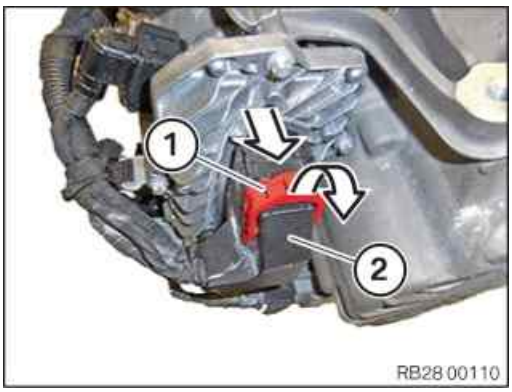
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.



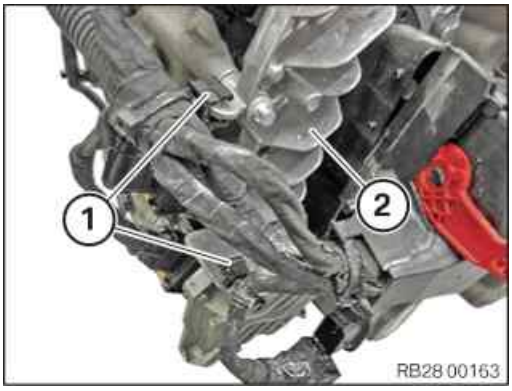

- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock lock (2) left/right in the direction of the arrow.
- Pull off the connectors (3).




- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).




- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).

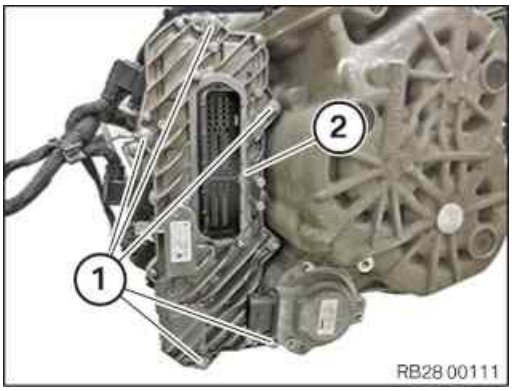



- Release clamps (1) from control unit (2).

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- Loosen screw (1).
- Remove bracket (2).




- Loosen screws (1).
- Remove control unit (2).

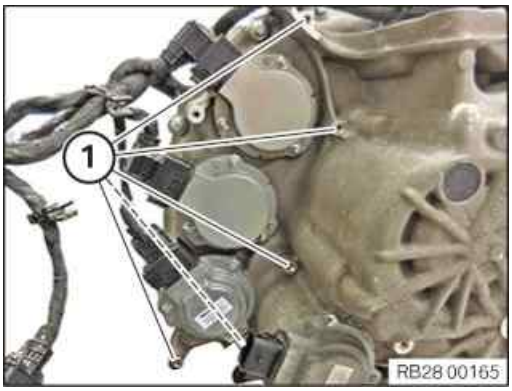
**8 – Install the control unit**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

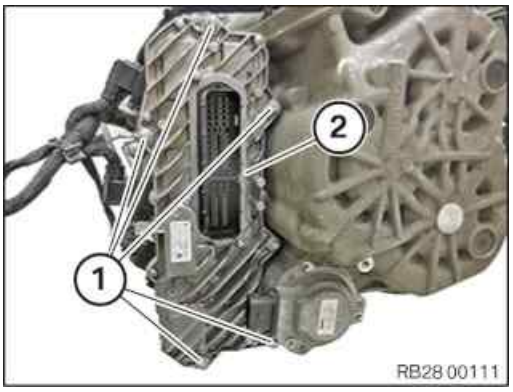
**TECHNICAL INFORMATION**

After completing work:
Perform service function "Renewing EGS" with diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Get rid of adhesive residue in threaded holes (1) using a thread cutter M6 and vacuum.

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- Install control unit (2).
- Renew screws (1).

  **Parts:** Screw
- Tighten the screws (1).

**Control unit of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

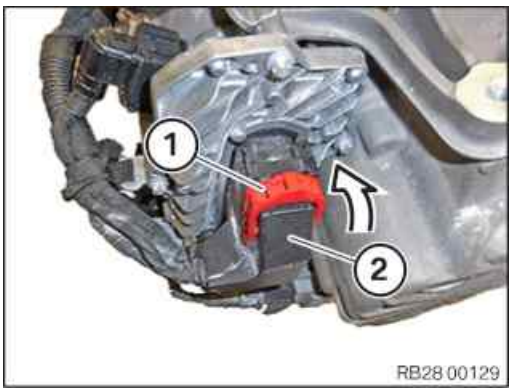



- Install holder (2).
- Renew the screw (1).

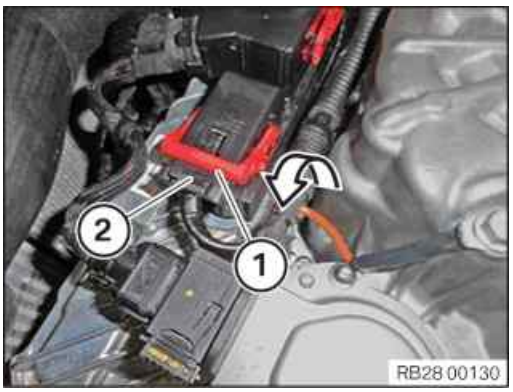
  **Parts:** Screw
- Tighten down screw (1).

**Control unit of double-clutch transmission (DKG)**

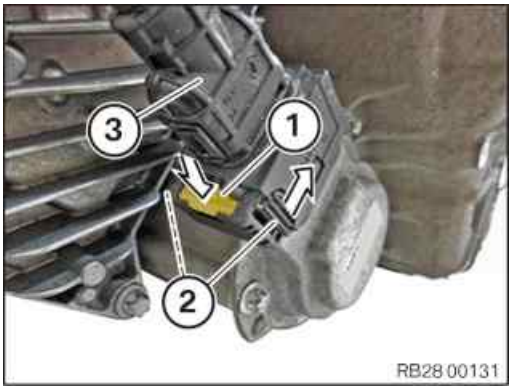
| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |




- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.

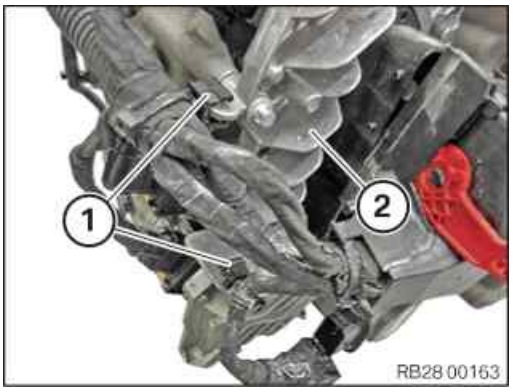



- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.




- Install the connector (3).
- Press lock (2) in the direction of the arrow left/right until the connector (3) snaps completely into place.
- Press the interlock (1) in the direction of the arrow until it snaps into place.

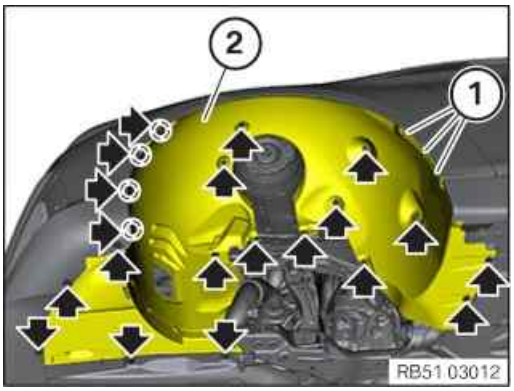
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- Connect the clamps (1) to the control unit (2).

## POSTPROCESSES

### 9 – Installing the front wheel arch cover




- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

### 10 – Mounting the wheel

▸ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

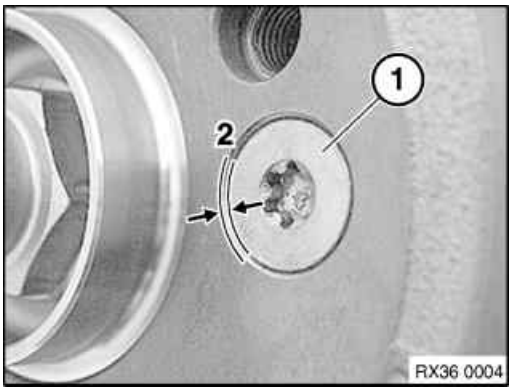
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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- Renew mounting bolt (1).

  **Parts:** Mounting bolt

- Check that the mounting bolt (1) for the brake disc is securely seated.

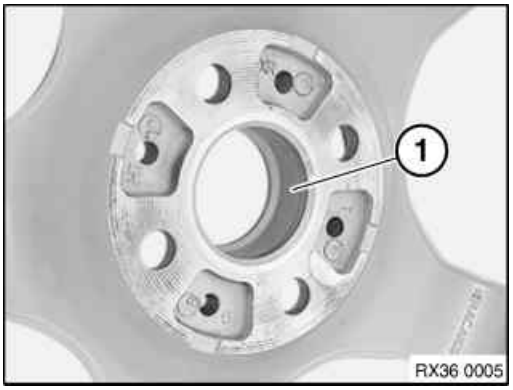
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).




**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  **Parts:** Wheel bolts

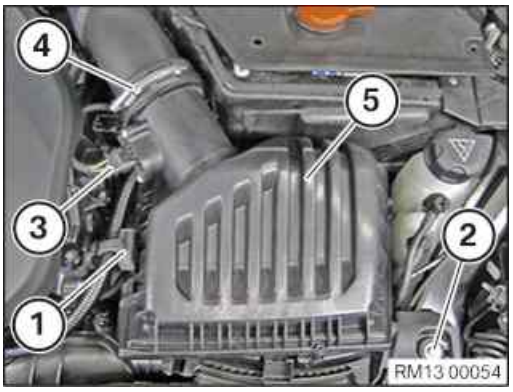
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

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### 11 – Installing intake silencer housing




- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

- Tighten clamp (4).

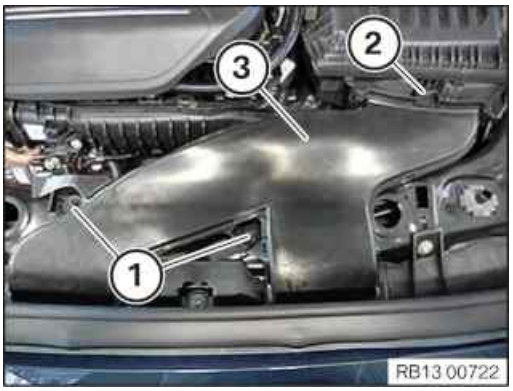
**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 12 – Install the intake neck for the intake filter housing



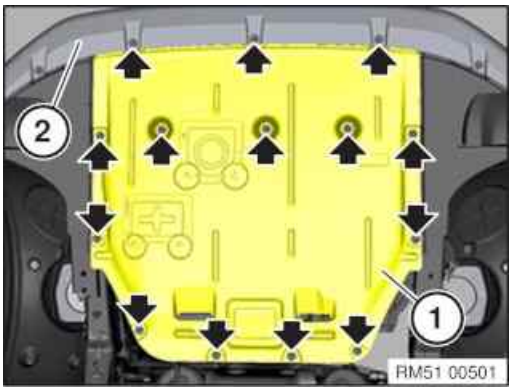

- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 13 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 14 – Disconnecting all battery earth leads




- See additional information.

## Additional Information

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## Overview of Tightening Torques

### Control unit of double-clutch transmission (DKG)

Used in step 8

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

### Wheel arch cover to body

Used in step 9

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

### Wheel arch cover to body

Used in step 9

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

### Brake disc to rear wheel hub

Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

### Brake disc to front wheel hub

Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

### Wheel bolts

Used in step 10

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

### Intake silencer housing to lock bridge

Used in step 11

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

### Clean air pipe to intake silencer housing

Used in step 11

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

### Intake neck to cross connection

Used in step 12

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### Underbody protection front

Used in step 13

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

### 2 344 011 Tool




#### Common

Used in step 10

| | |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

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## Replacement tools:

### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

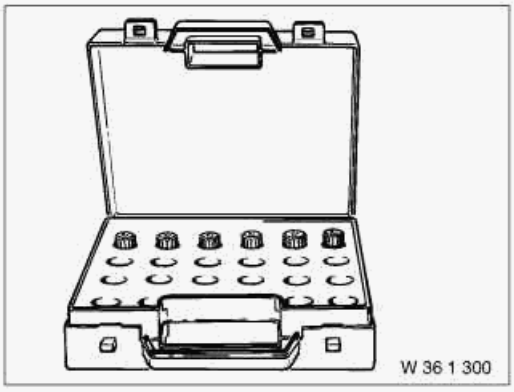
### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

| Operating materials | Used in step |
|---|---|
| 2.0 Grease for wheel centring | 10 |

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# 28 60 060 Removing and installing/replacing electric motor for clutch actuator (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

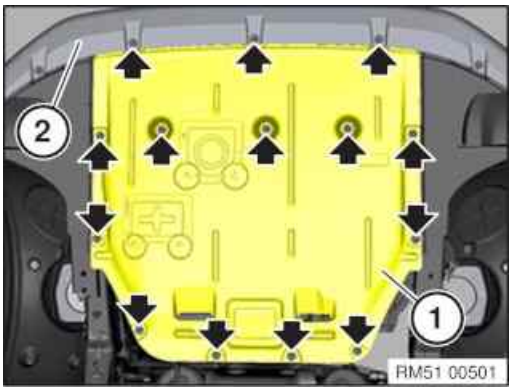
### 1 – Disconnecting all battery earth leads

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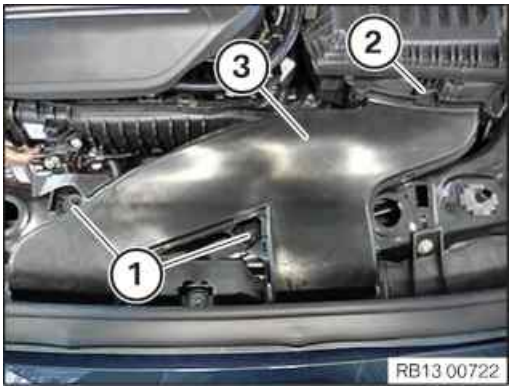

- See additional information.

**2 – Removing the front underbody protection**



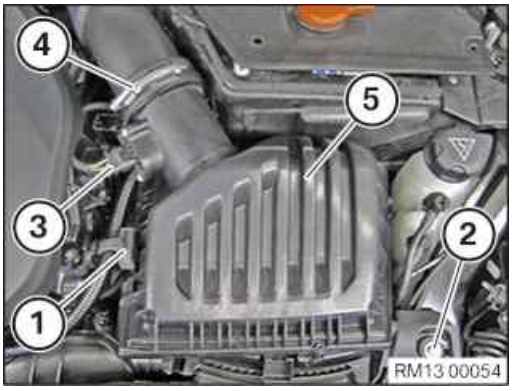

- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

**3 – Remove the intake neck for intake silencer housing**




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

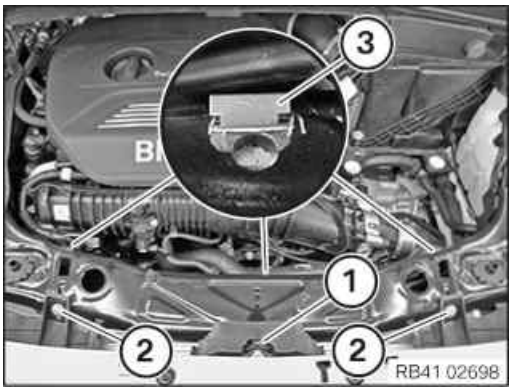
**4 – Removing intake silencer housing**



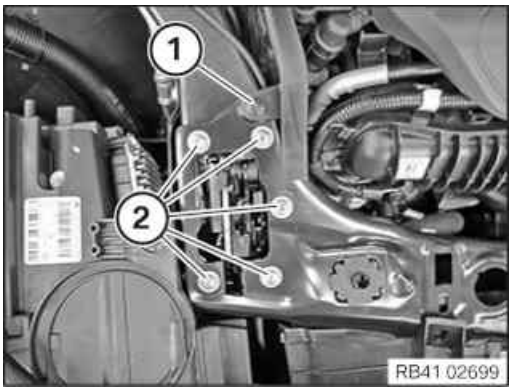

- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

**5 – Remove cross connection**

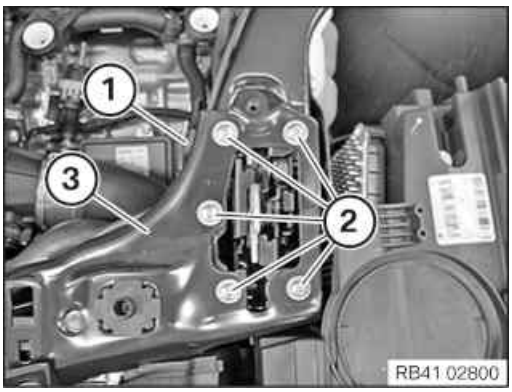
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- Loosen screws (1) and (2).
- Detach clamps (3) for bonnet lock Bowden cable.




- Lever out expanding rivet (1).
- Loosen screws (2).




- Lever out expanding rivet (1).
- Loosen the screws (2) and remove the cross connection (3).

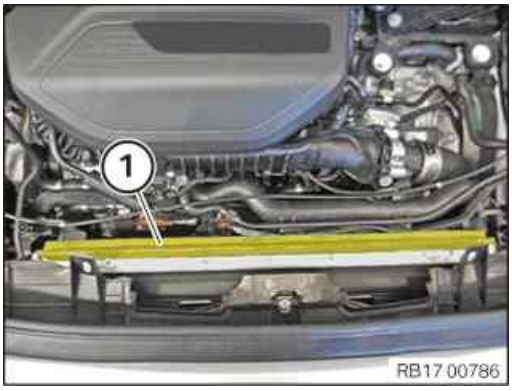
**6 – Removing the fan cowl with electric fan**

**WARNING**

**Hot surfaces.**

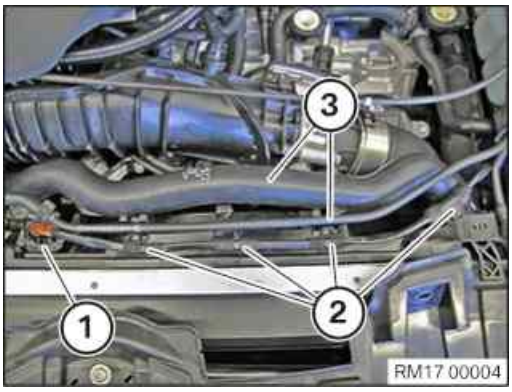
**Risk of burning!**

- Perform all work only on components that have cooled down.

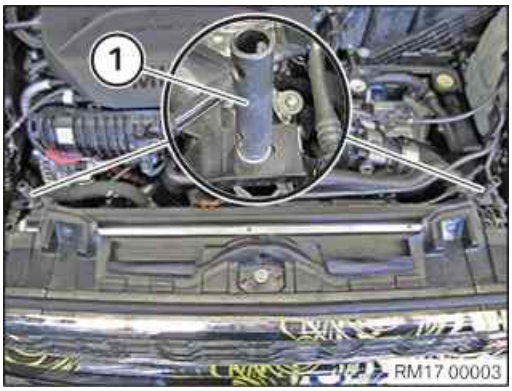



- Feed out and remove the sealing (1) from the radiator.

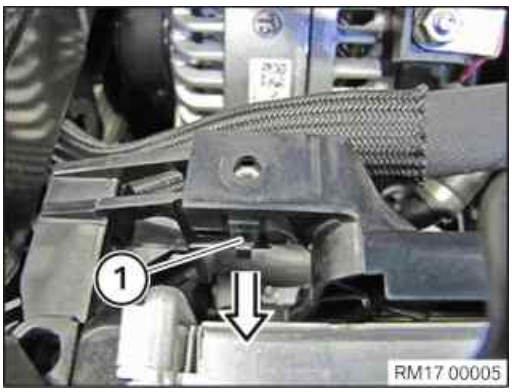
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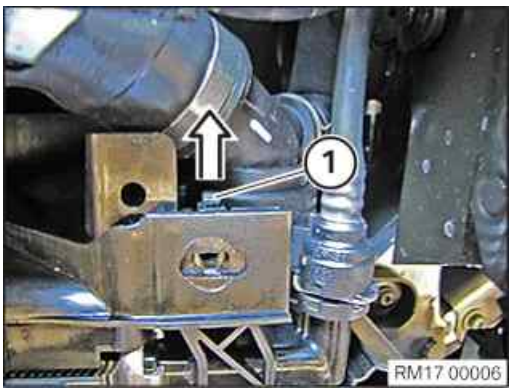

- Unlock plug connection (1) and disconnect.
- Unlock and loosen the clamps (2).
- Feed out connector (1) and place to one side.
- Thread off coolant line (3) and place to the side.



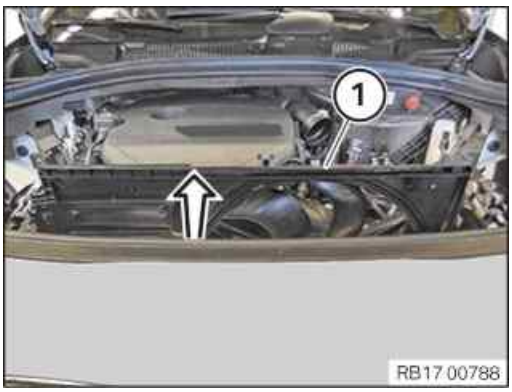

- Loosen screws (1).




- Unlock the right lock (1) on the fan cowl in the direction of the arrow.




- Unlock the left lock (1) on the fan cowl in the direction of the arrow.




- Guide out fan cowl (1) in direction of arrow and remove.

**7 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)**

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

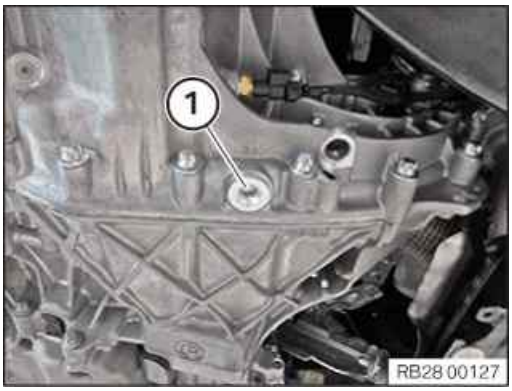
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

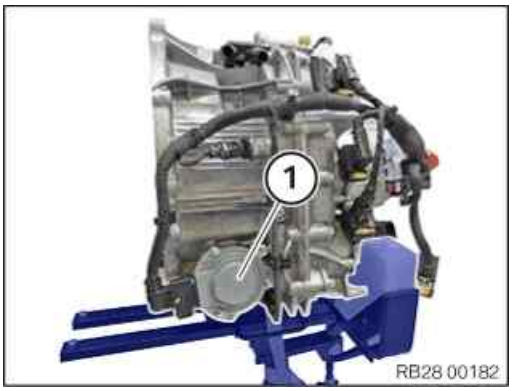
**MAIN WORK**

**8 – Remove electric motor for clutch actuator (7DCT300)**

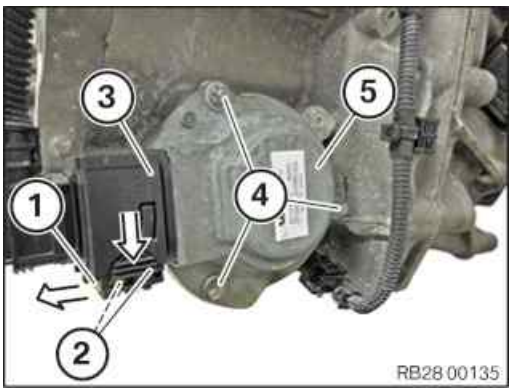
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**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.




- Electric motor for clutch actuator (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connectors (3).
- Loosen screws (4).
- Remove electric motor (5).

**9 – Install electric motor for clutch actuator (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

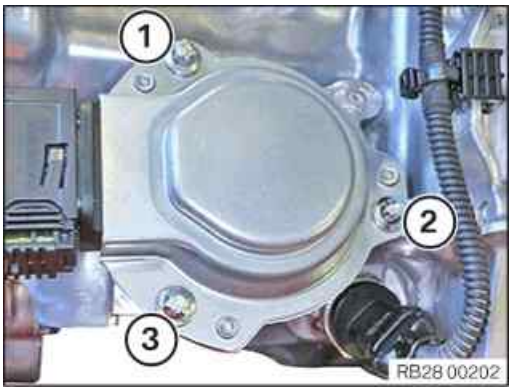



- Replace sealing ring (2) at the electric motor (1).

  **Parts:** Sealing ring
- **Slide on the sealing ring**(2) **, do not roll it!**

**Note: Ensure correct fit! The sealing ring must not be twisted!**

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- Install electric motor.
- Renew screws (1) to (3).

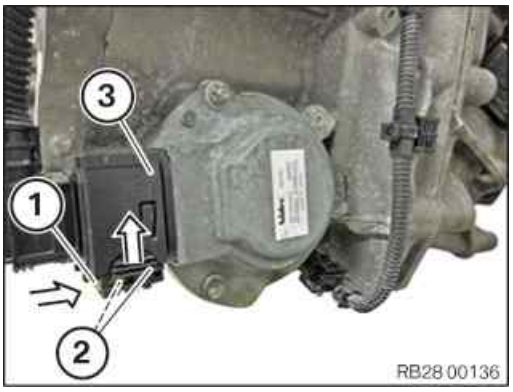
  **Parts:** Bolts

**Note: It is imperative to observe the screwing sequence (3) - (1) - (2)!**

- Connect the screws in the sequence (3) - (1) - (2) with **2 Nm**.
- Then tighten the screws in the sequence (3) - (1) - (2).

**E-motor to transmission**

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |



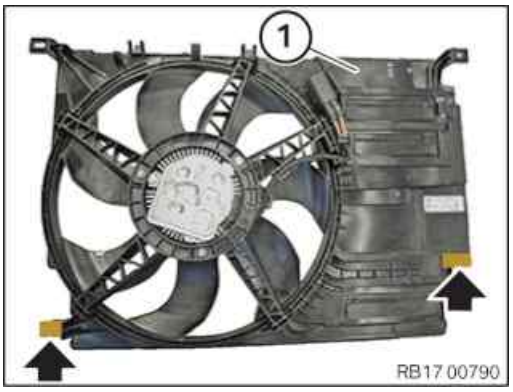

- Install the connector (3).
- Press connector fastener (2) to the right in the direction of the arrow until the connector (3) engages completely.
- Press connector fastener (1) in direction of arrow till it engages.

## POSTPROCESSES

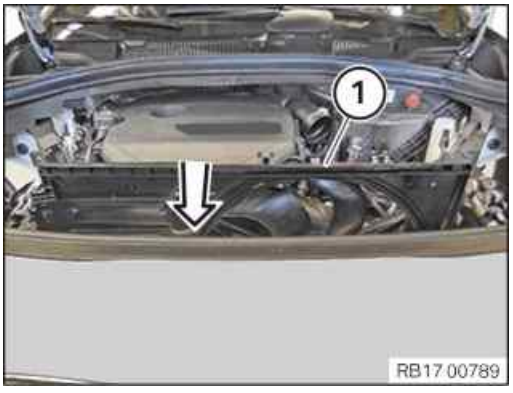
### 10 – Installing fan cowl with electric fan

**TECHNICAL INFORMATION**

Make sure that the connections are locked correctly. The locks must engage audibly.




- Feed the guides (arrows) of the fan cowl (1) into the charge air cooler.

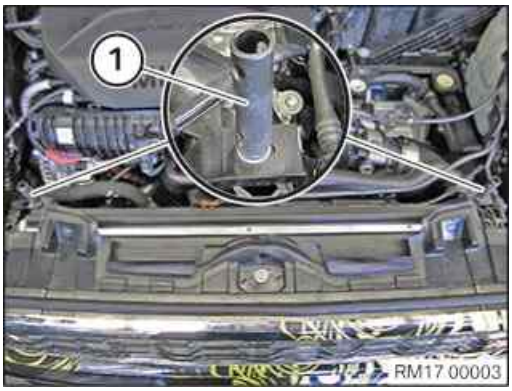



- Feed in and install the fan cowl (1) in the direction of the arrow.

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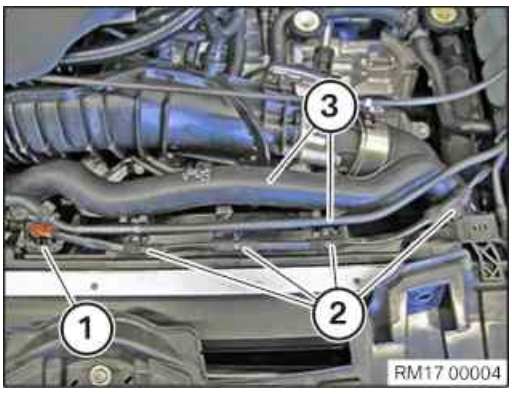

- Lock the left and right locks (arrows).




- Tighten the screws (1).

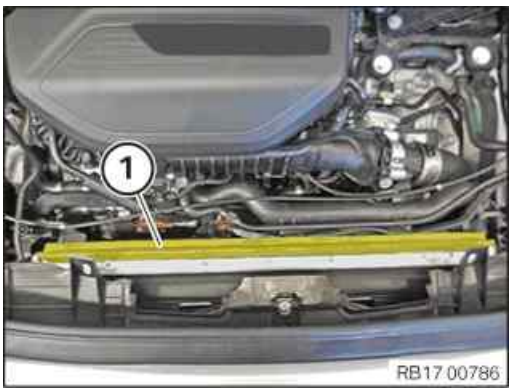
**Fan cowl on radiator**

| | | | |
|---|---|---|---|
| M6X12 | | Tightening torque | 6 Nm |



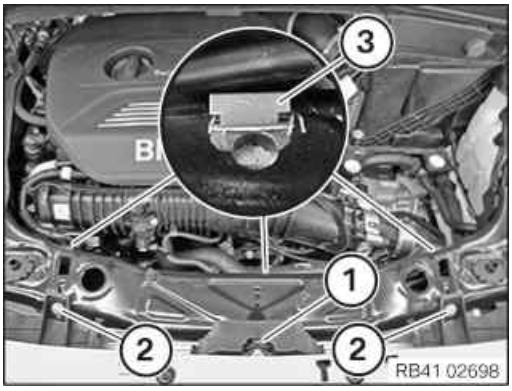

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure clamps (2).
- Thread in and install coolant line (3).




- Guide the sealing (1) on the radiator in and install it.

### 11 – Install cross connection




- Install cross connection.
- Position all screws.
- Tighten down screw (1).

**Bracing strut to top cross connection**

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

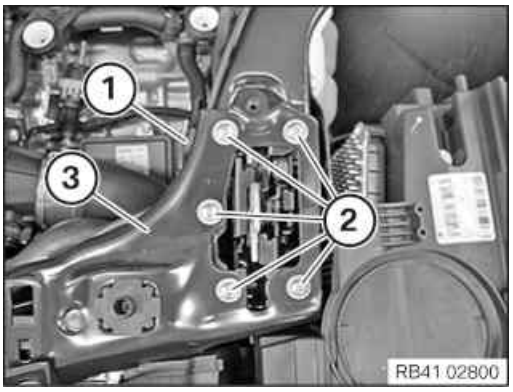
- Tighten down screws (2).

**Air duct to deformation element/cross connection**

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

- Fasten clamps (3) for bonnet lock Bowden cable to cross connection.

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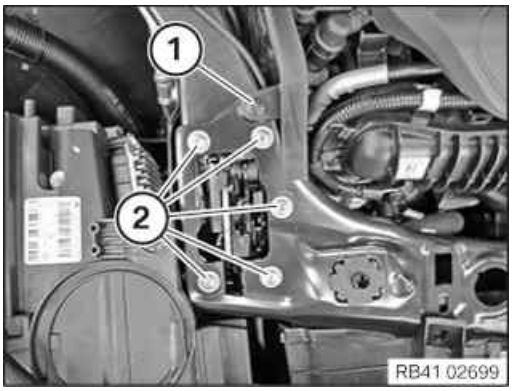



- Tighten screws (2) of cross connection (3).

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).



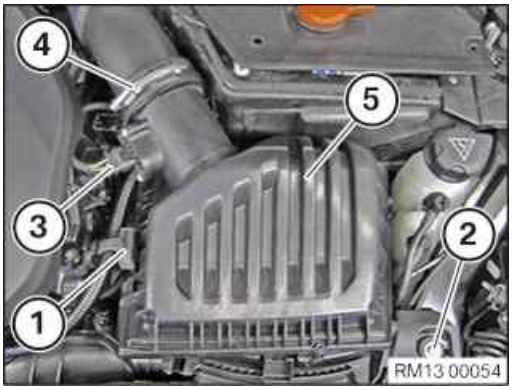

- Tighten down screws (2).

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).

### 12 – Installing intake silencer housing




- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

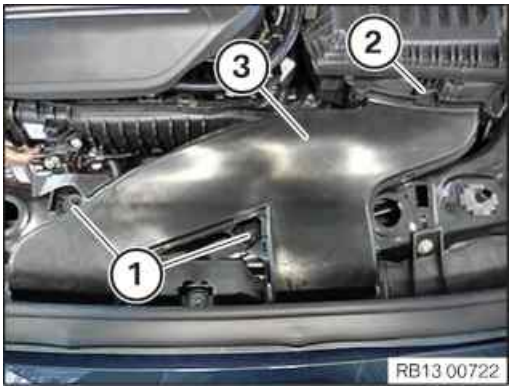
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 13 – Install the intake neck for the intake filter housing




- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 14 – Disconnecting all battery earth leads

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- See additional information.

**15 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.

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- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

## 16 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).

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- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

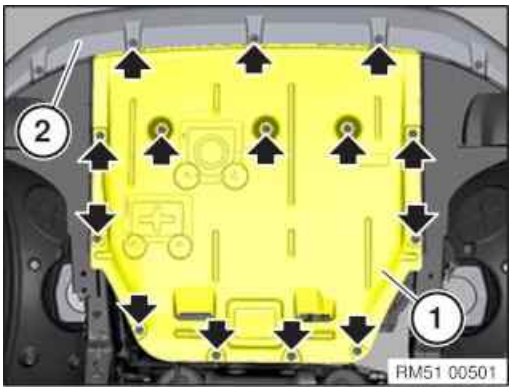
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 17 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Additional Information

## Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** — Used in step 7 15 16

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**E-motor to transmission** — Used in step 9

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

**Fan cowl on radiator** — Used in step 10

| | | | |
|---|---|---|---|
| M6X12 | | Tightening torque | 6 Nm |

**Bracing strut to top cross connection** — Used in step 11

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

**Air duct to deformation element/cross connection** — Used in step 11

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

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| Cross connection on support for cross connection | | | Used in step 11 |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

| Intake silencer housing to lock bridge | | | Used in step 12 |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

| Clean air pipe to intake silencer housing | | | Used in step 12 |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

| Intake neck to cross connection | | | Used in step 13 |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

| Underbody protection front | | | Used in step 17 |
|---|---|---|---|
| | | | 3 Nm |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 7 15 16 |

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# 28 60 065 Removing and installing/replacing electric motor for clutch actuator 2 (7DCT300) (Side)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

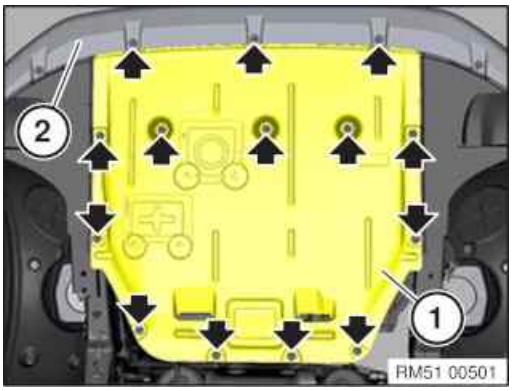
### 1 – Disconnecting all battery earth leads

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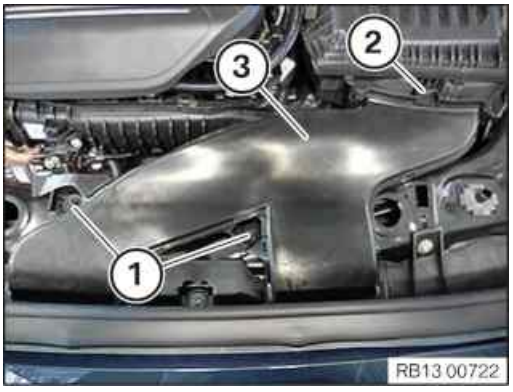

- See additional information.

**2 – Removing the front underbody protection**



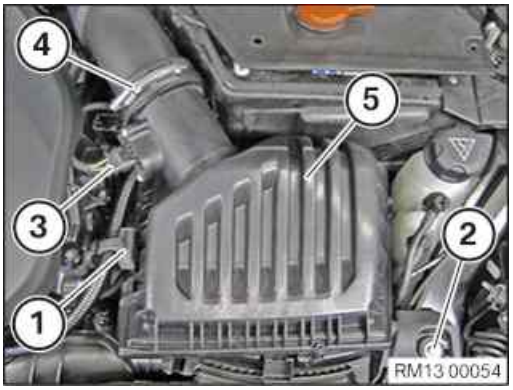

- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

**3 – Remove the intake neck for intake silencer housing**




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**4 – Removing intake silencer housing**




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

**5 – Removing the wheel**

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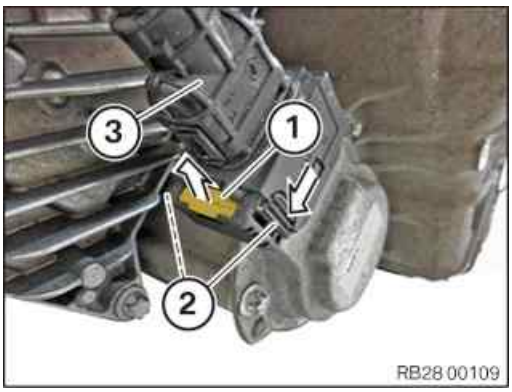

- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

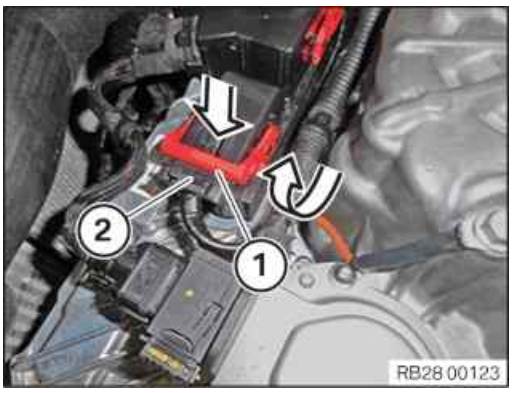
### 6 – Removing the control unit (7DCT300)

**TECHNICAL INFORMATION**

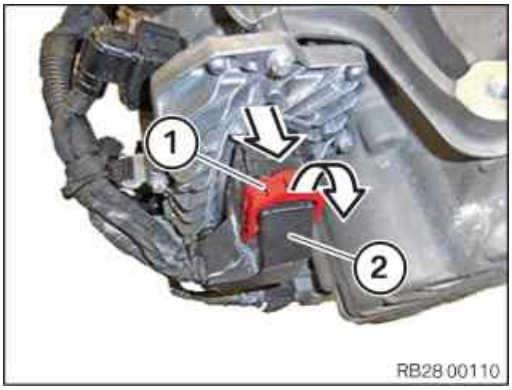
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.




- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock lock (2) left/right in the direction of the arrow.
- Pull off the connectors (3).

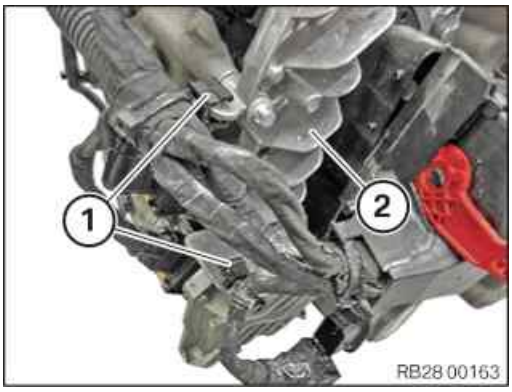



- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).




- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).

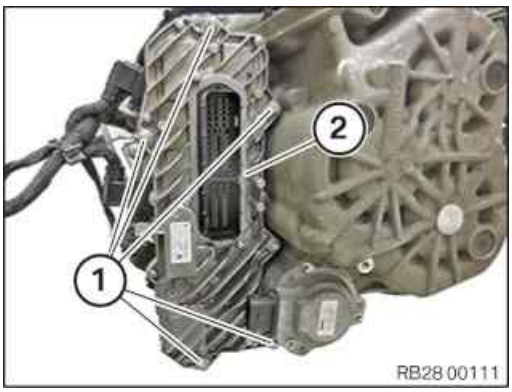
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- Release clamps (1) from control unit (2).




- Loosen screw (1).
- Remove bracket (2).




- Loosen screws (1).
- Remove control unit (2).

**7 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

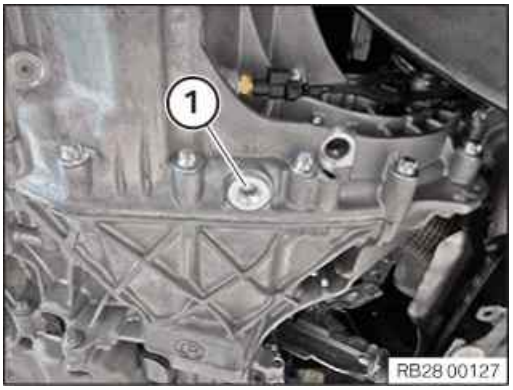
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

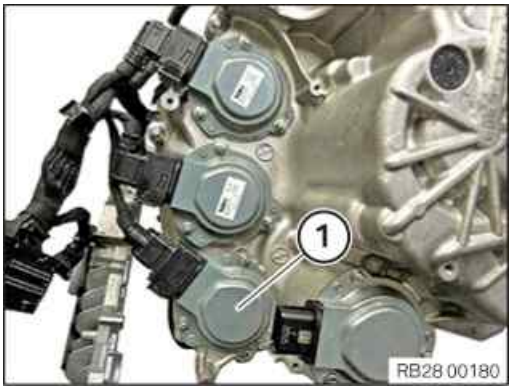
| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

## MAIN WORK

### 8 – Remove electric motor for clutch actuator 2 (7DCT300)

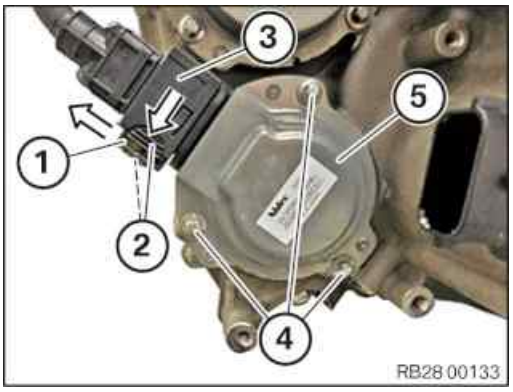
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.




- Electric motor for clutch actuator 2 (1).

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- Unlock the connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connectors (3).
- Loosen screws (4).
- Remove electric motor (5).

**9 – Install electric motor for clutch actuator 2 (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

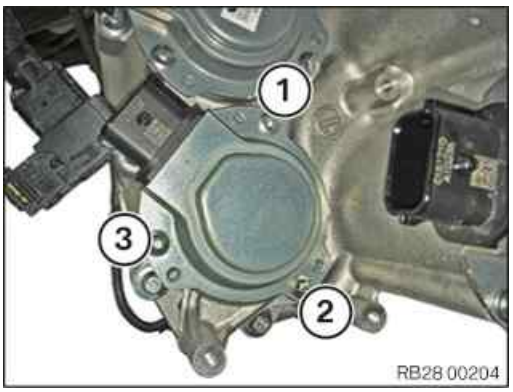
**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Renew sealing ring (2) on the electric motor (1).
  **Parts:** Sealing ring
- Push **sealing ring** (2) **, do not roll!**

**Note: Ensure correct fit! The sealing ring must not be twisted!**




- Install electric motor.
- Renew screws (1) to (3).
  **Parts:** Bolts

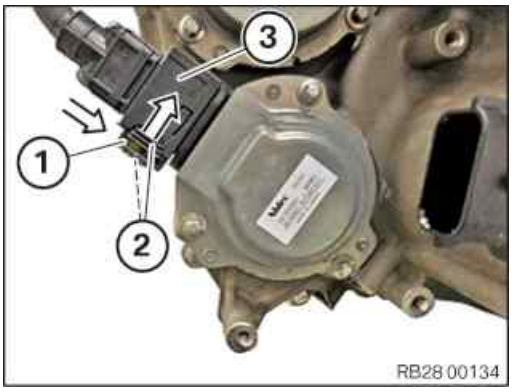
**Note: It is imperative to observe the screwing sequence (3) - (1) - (2)!**

- Connect the screws in the sequence (3) - (1) - (2) with **2 Nm**.
- Then tighten the screws in the sequence (3) - (1) - (2).

**E-motor to transmission**

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

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- Install the connector (3).
- Press connector fastener (2) to the right in the direction of the arrow until the connector (3) engages completely.
- Press connector fastener (1) in the direction of the arrow till it engages.

## POSTPROCESSES

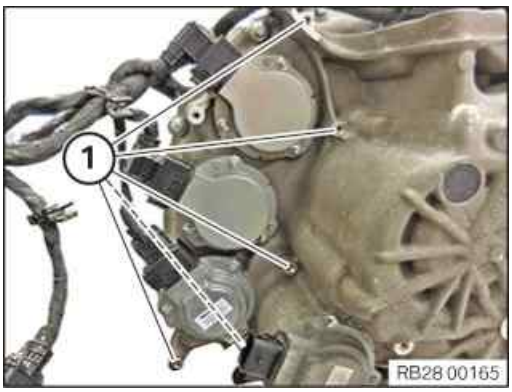
### 10 – Install the control unit

**TECHNICAL INFORMATION**

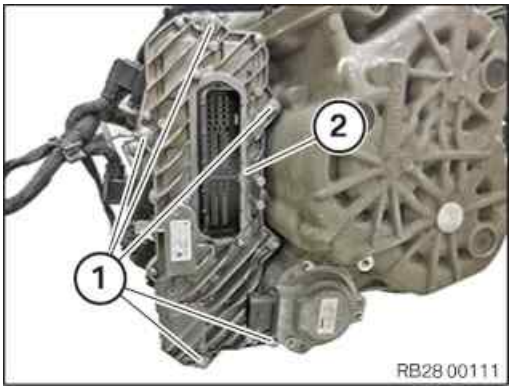
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

**TECHNICAL INFORMATION**

After completing work:
Perform service function "Renewing EGS" with diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Get rid of adhesive residue in threaded holes (1) using a thread cutter M6 and vacuum.




- Install control unit (2).
- Renew screws (1).

  **Parts:** Screw
- Tighten the screws (1).

**Control unit of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

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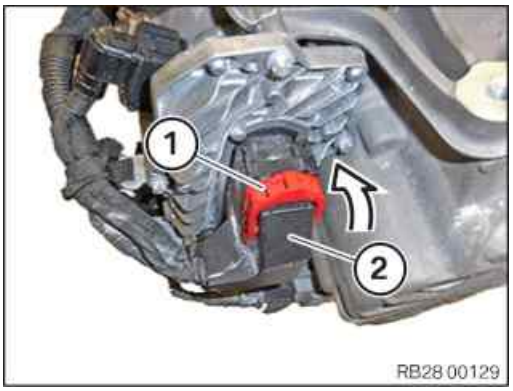



- Install holder (2).
- Renew the screw (1).

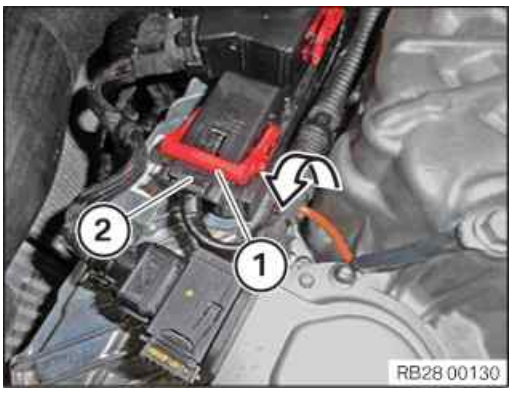
  **Parts:** Screw
- Tighten down screw (1).

**Control unit of double-clutch transmission (DKG)**

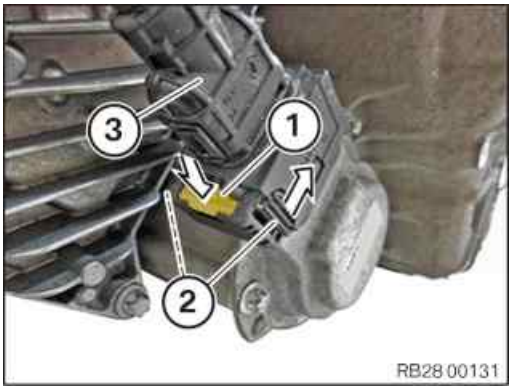
| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |



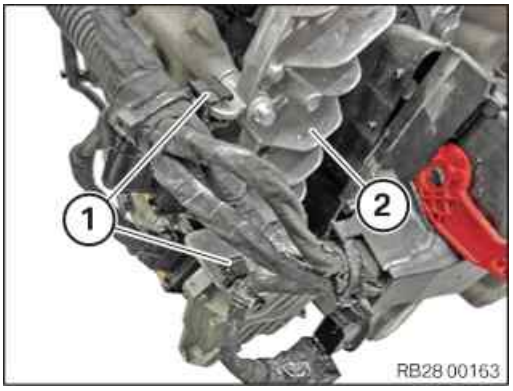

- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.




- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.




- Install the connector (3).
- Press lock (2) in the direction of the arrow left/right until the connector (3) snaps completely into place.
- Press the interlock (1) in the direction of the arrow until it snaps into place.




- Connect the clamps (1) to the control unit (2).

**11 – Mounting the wheel**

- **Clean the contact surfaces between the brake disc and the wheel rim**

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**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

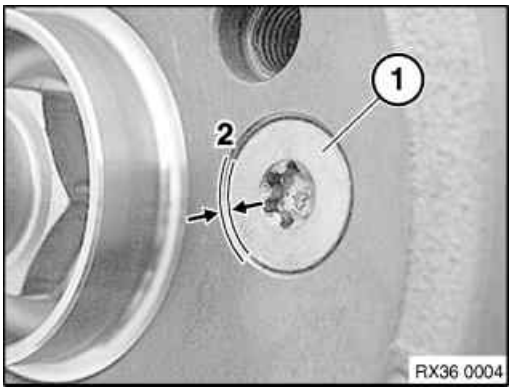
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

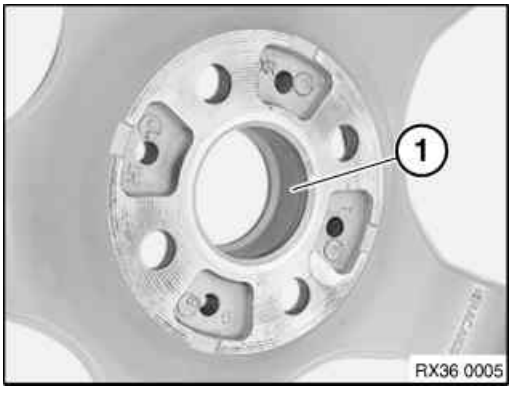
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

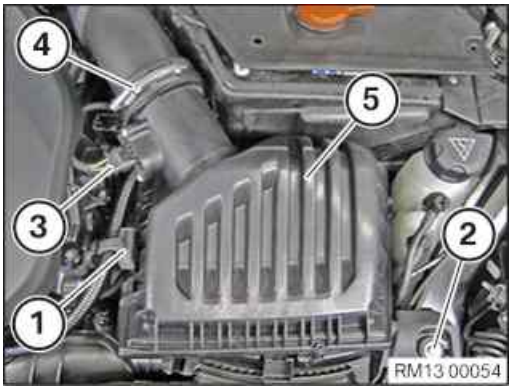
- Renew corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

## 12 – Installing intake silencer housing




- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

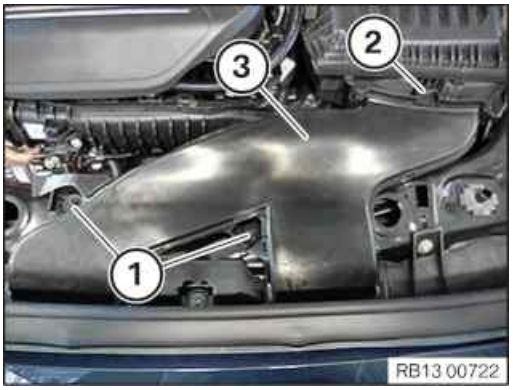
| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

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### 13 – Install the intake neck for the intake filter housing




- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 14 – Disconnecting all battery earth leads




- See additional information.

### 15 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

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**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

**16 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).




- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

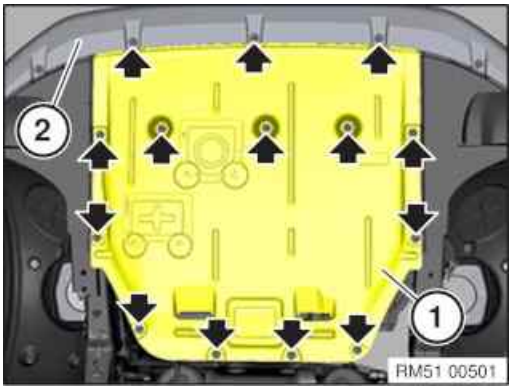
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 17 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Additional Information

## Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** Used in step 7 15 16

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

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**E-motor to transmission** — Used in step 9

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

**Control unit of double-clutch transmission (DKG)** — Used in step 10

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

**Brake disc to rear wheel hub** — Used in step 11

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub** — Used in step 11

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Wheel bolts** — Used in step 11

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

**Intake silencer housing to lock bridge** — Used in step 12

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** — Used in step 12

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 13

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 17

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

### 2 344 011 Tool



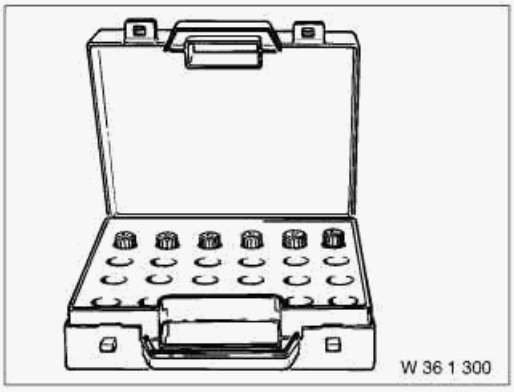

**Common** — Used in step 11

| | |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

## Replacement tools:

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### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

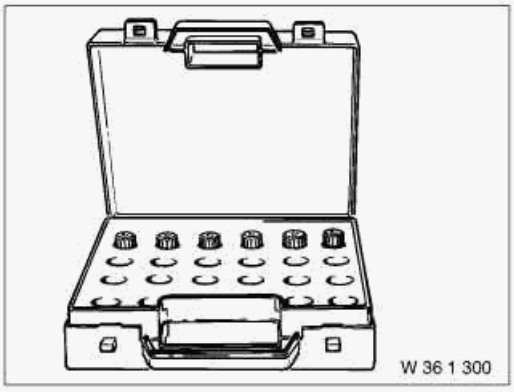
### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

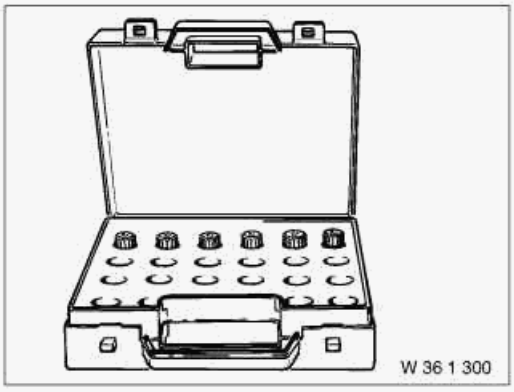
### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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**0 495 230 (36 1 333) Wheel stud**




| Common | Used in step 5 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 7 15 16 |
| 2.0 Grease for wheel centring | 11 |

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# 28 60 080 Removing and installing/replacing electric motor for coolant pump (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

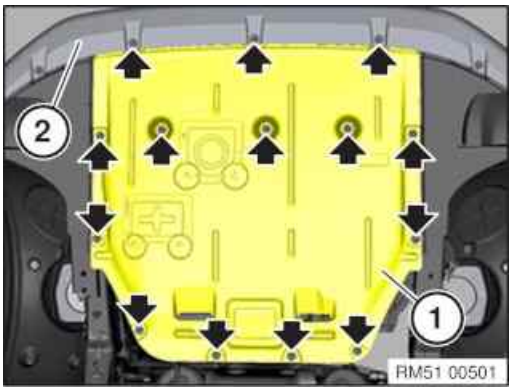
### 1 – Disconnecting all battery earth leads

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- See additional information.

### 2 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 3 – Removing the wheel



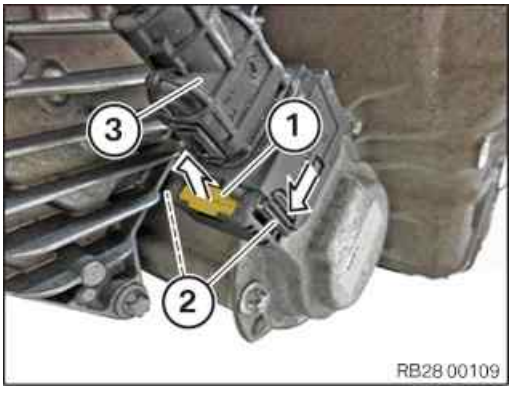

- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set  (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

### 4 – Removing the control unit (7DCT300)

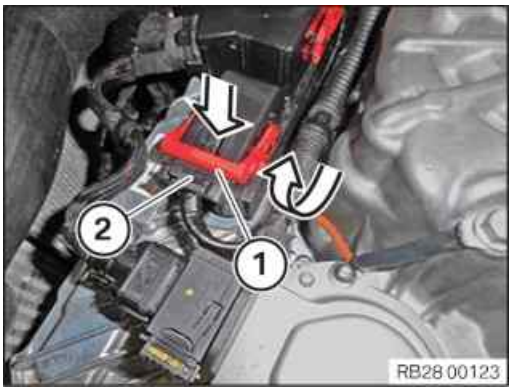
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

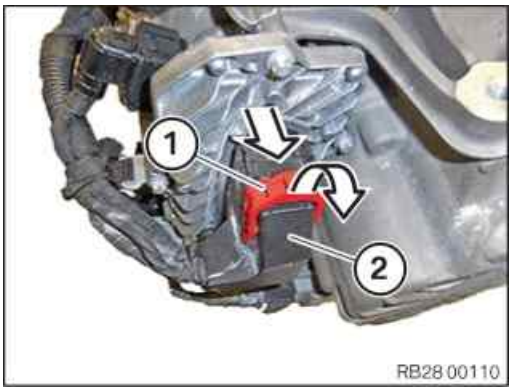



- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock lock (2) left/right in the direction of the arrow.
- Pull off the connectors (3).

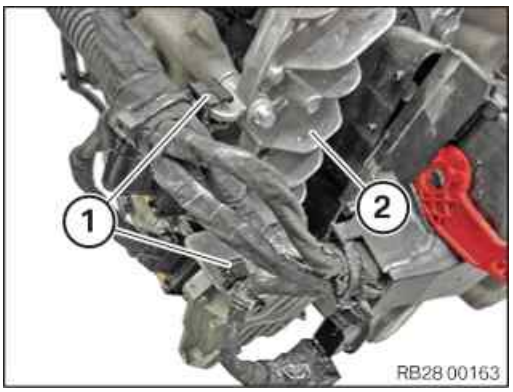
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- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).



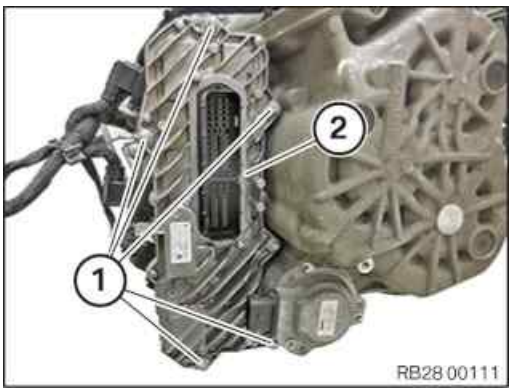

- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).




- Release clamps (1) from control unit (2).




- Loosen screw (1).
- Remove bracket (2).




- Loosen screws (1).
- Remove control unit (2).

**5 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)**

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

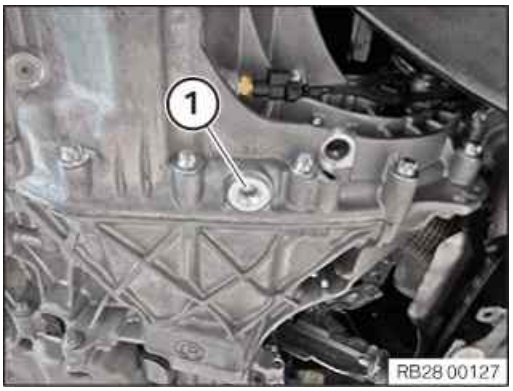
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

## MAIN WORK

### 6 – Remove electric motor for coolant pump (7DCT300)

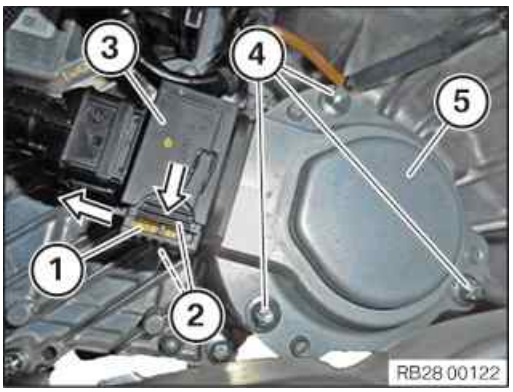
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**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.




- Electric motor (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connectors (3).
- Loosen screws (4).
- Remove electric motor (5).

**7 – Install electric motor for clutch actuator 2 (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

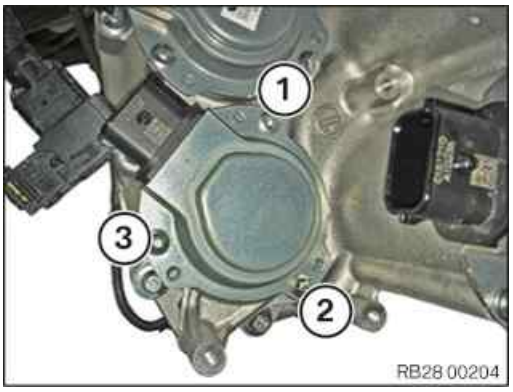



- Renew sealing ring (2) on the electric motor (1).

  **Parts:** Sealing ring
- Push **sealing ring** (2) **, do not roll!**

**Note: Ensure correct fit! The sealing ring must not be twisted!**

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- Install electric motor.
- Renew screws (1) to (3).

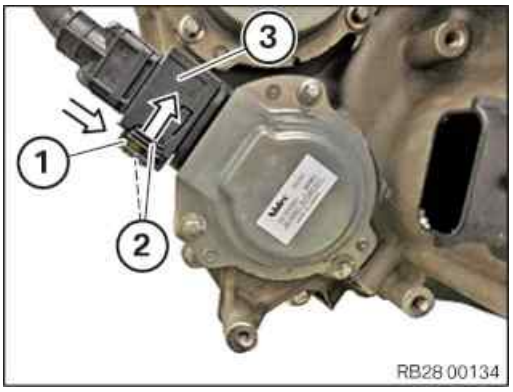
  **Parts:** Bolts

**Note: It is imperative to observe the screwing sequence (3) - (1) - (2)!**

- Connect the screws in the sequence (3) - (1) - (2) with **2 Nm**.
- Then tighten the screws in the sequence (3) - (1) - (2).

**E-motor to transmission**

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |




- Install the connector (3).
- Press connector fastener (2) to the right in the direction of the arrow until the connector (3) engages completely.
- Press connector fastener (1) in the direction of the arrow till it engages.

## POSTPROCESSES

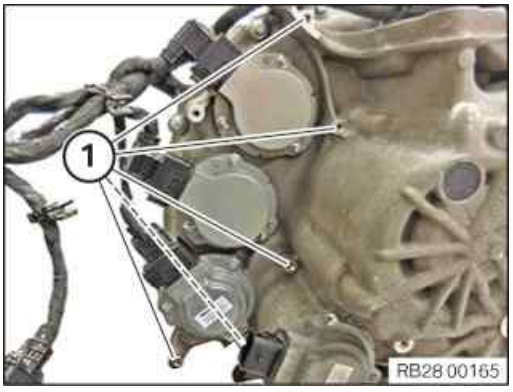
### 8 – Install the control unit

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

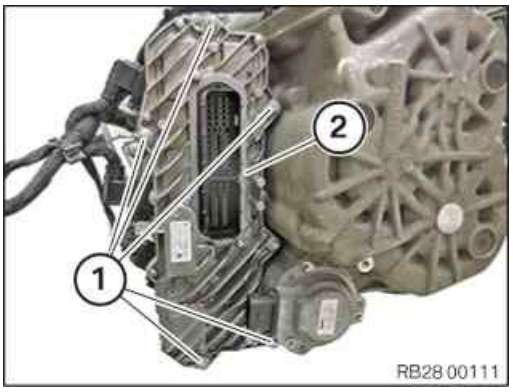
**TECHNICAL INFORMATION**

After completing work:
Perform service function "Renewing EGS" with diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Get rid of adhesive residue in threaded holes (1) using a thread cutter M6 and vacuum.

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- Install control unit (2).
- Renew screws (1).

  **Parts:** Screw
- Tighten the screws (1).

**Control unit of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

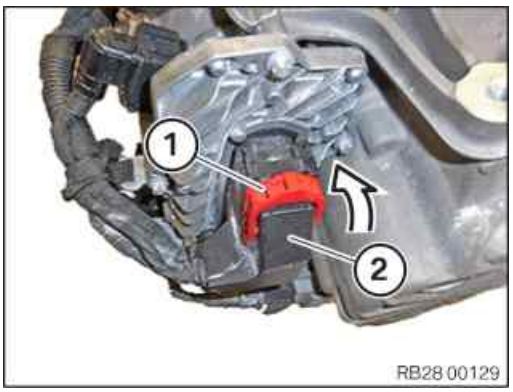



- Install holder (2).
- Renew the screw (1).

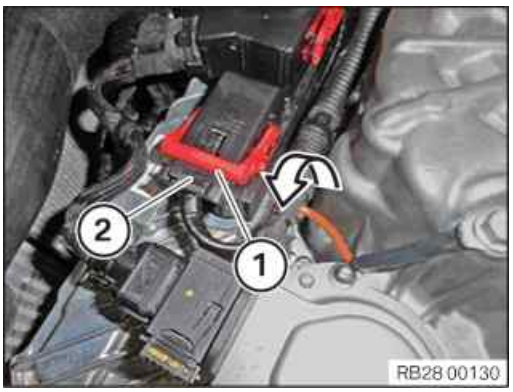
  **Parts:** Screw
- Tighten down screw (1).

**Control unit of double-clutch transmission (DKG)**

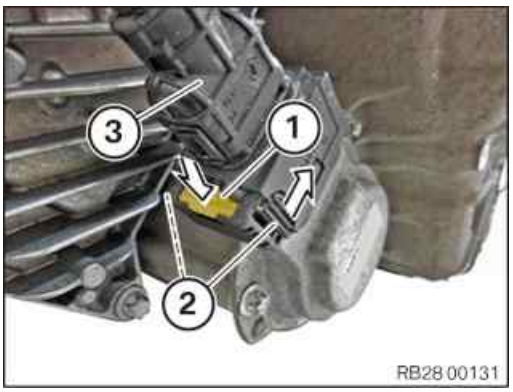
| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |




- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.

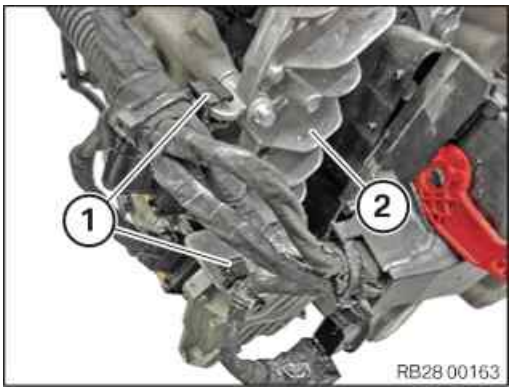



- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.




- Install the connector (3).
- Press lock (2) in the direction of the arrow left/right until the connector (3) snaps completely into place.
- Press the interlock (1) in the direction of the arrow until it snaps into place.

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- Connect the clamps (1) to the control unit (2).

## 9 – Mounting the wheel

▸ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

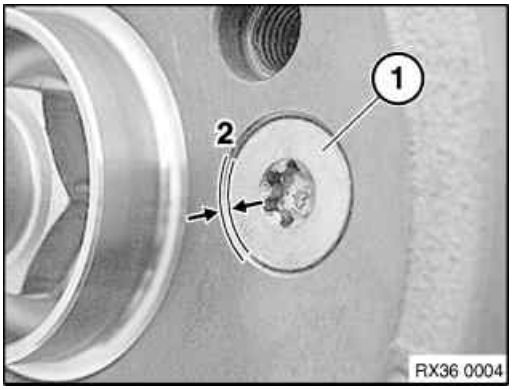
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

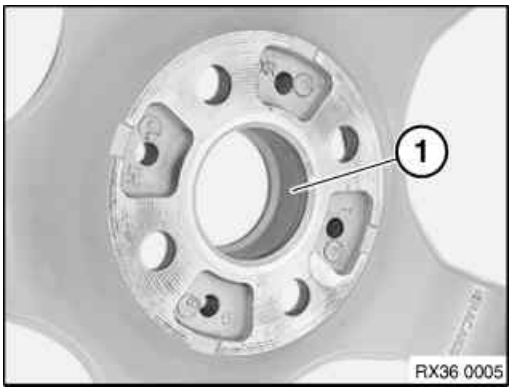
**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

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- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).




**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

### 10 – Disconnecting all battery earth leads




- See additional information.

### 11 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.

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- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

## 12 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).

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- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

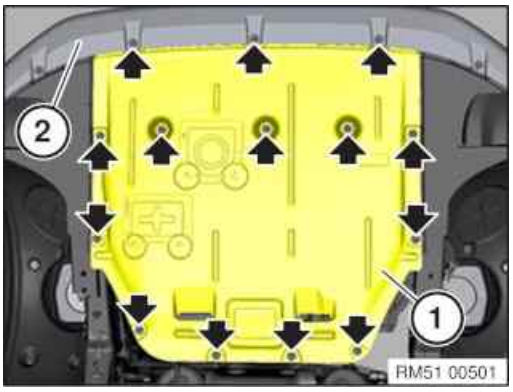
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 13 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Additional Information

## Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** Used in step 5 11 12

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**E-motor to transmission** Used in step 7

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

**Control unit of double-clutch transmission (DKG)** Used in step 8

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

**Brake disc to rear wheel hub** Used in step 9

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub** Used in step 9

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

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| Wheel bolts | | | Used in step 9 |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

| Underbody protection front | | | Used in step 13 |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

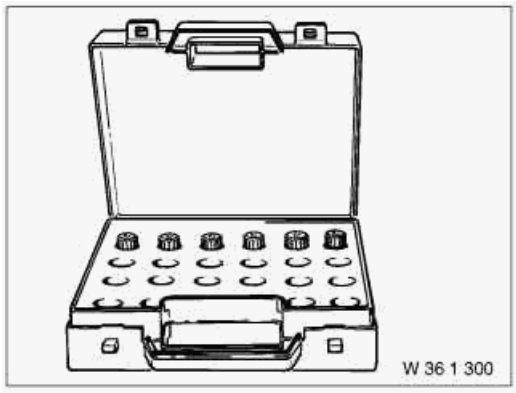
### 2 344 011 Tool




| Common | Used in step 9 |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

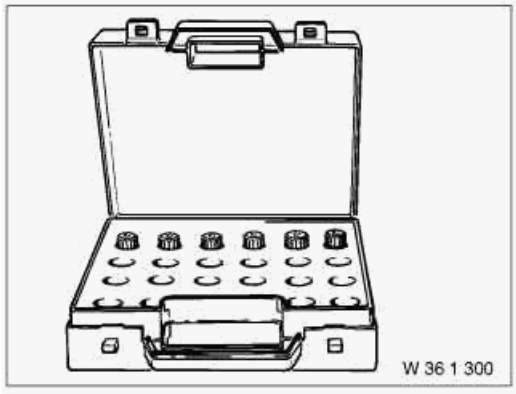
## Replacement tools:

### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

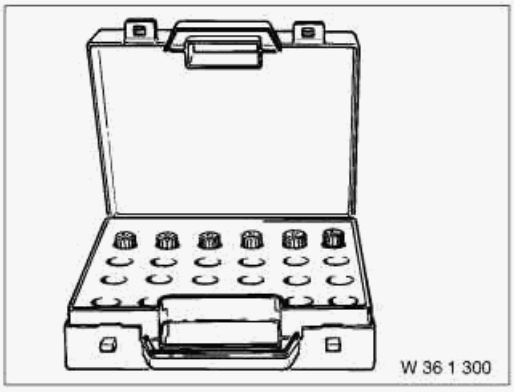
### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 5 11 12 |
| 2.0 Grease for wheel centring | 9 |

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# 28 60 100 Removing and installing/replacing electric motor for shift drum (7DCT300) (bottom)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Carry out the "Teach shift drum" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

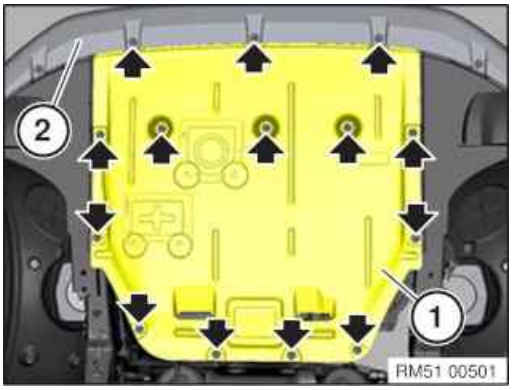
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### 1 – Disconnecting all battery earth leads



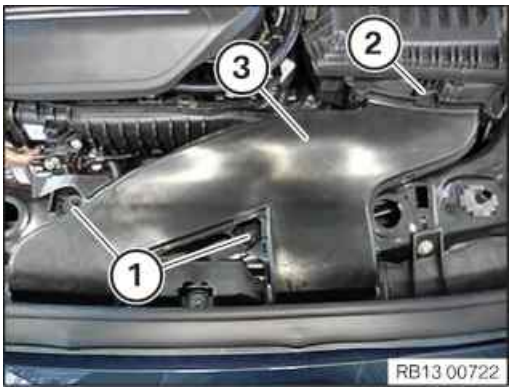

- See additional information.

### 2 – Removing the front underbody protection



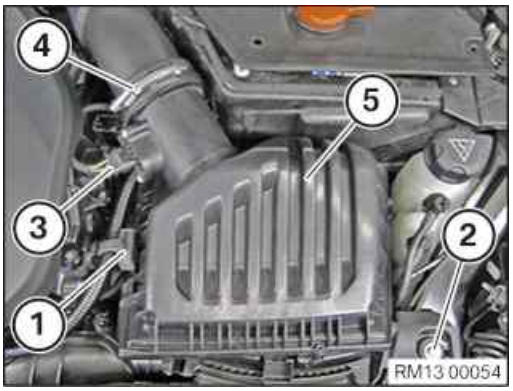

- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 3 – Remove the intake neck for intake silencer housing




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

### 4 – Removing intake silencer housing




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

### 5 – Removing the wheel

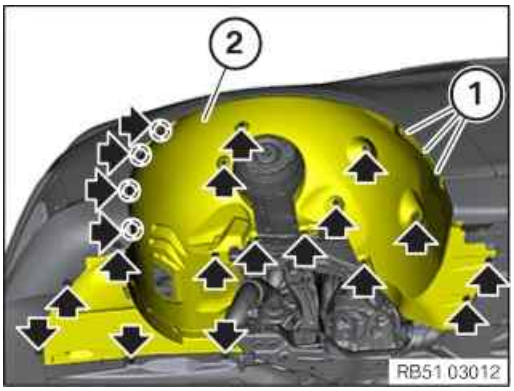
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- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**6 – Remove front wheel arch cover**

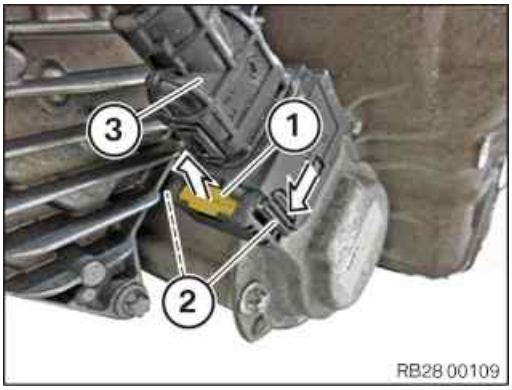



- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

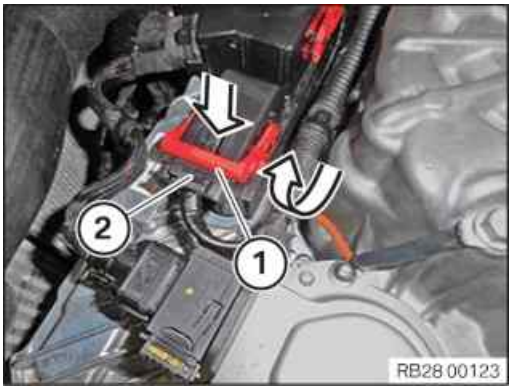
**7 – Removing the control unit (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

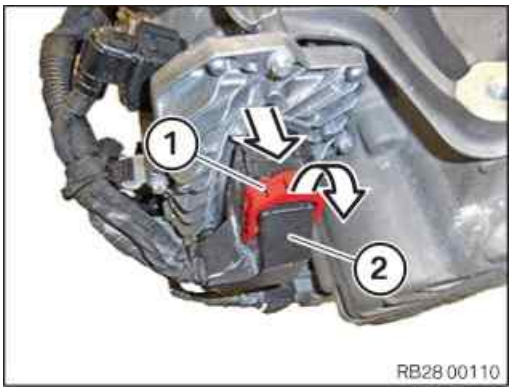



- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock lock (2) left/right in the direction of the arrow.
- Pull off the connectors (3).

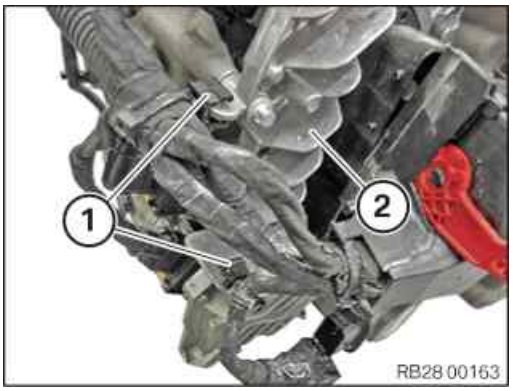



- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).

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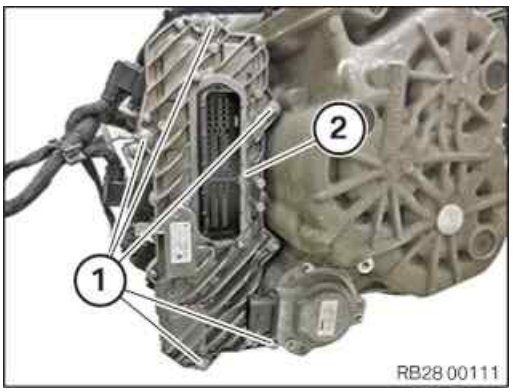

- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).




- Release clamps (1) from control unit (2).




- Loosen screw (1).
- Remove bracket (2).




- Loosen screws (1).
- Remove control unit (2).

**8 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

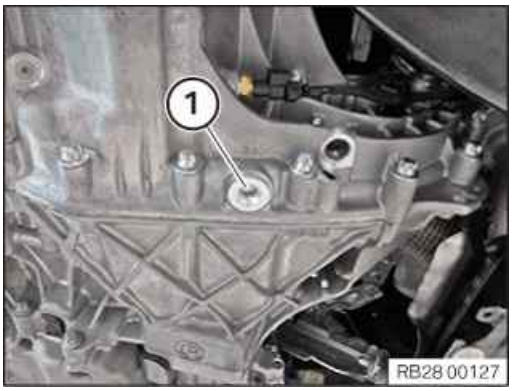
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

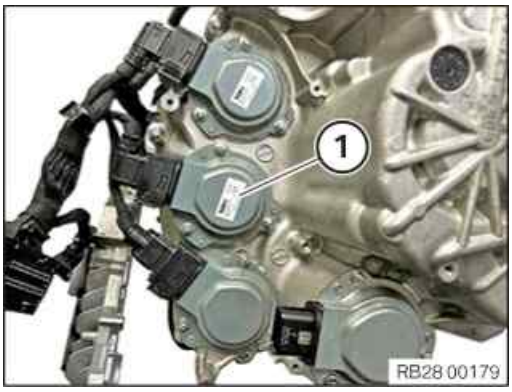
## MAIN WORK

### 9 – Remove electric motor for shift drum (7DCT300)

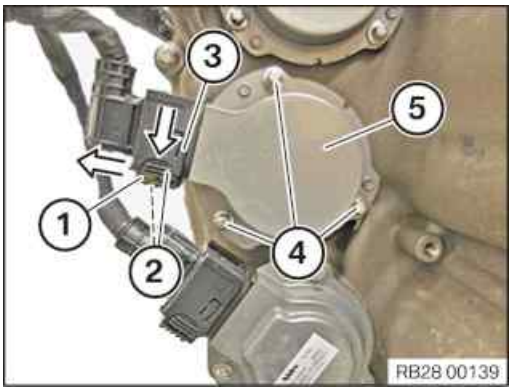
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

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- Electric motor (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connectors (3).
- Loosen screws (4).
- Remove electric motor (5).

**10 – Install electric motor for shift drum (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Carry out the "Teach shift drum" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

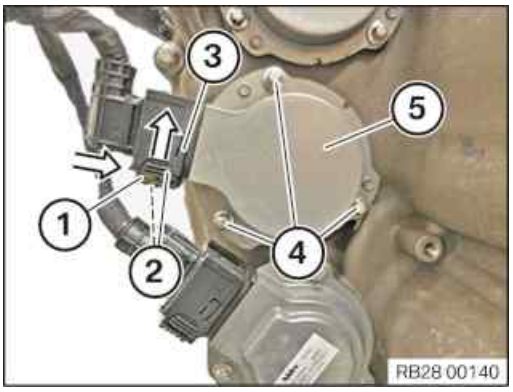



- Renew sealing ring (2) on the electric motor (1).

  **Parts:** Sealing ring
- Push **sealing ring** (2) **, do not roll!**

**Note: Ensure correct fit! The sealing ring must not be twisted!**

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- Install electric motor (5).
- Renew screws (4).

  **Parts:** Bolts
- Tighten the screws (4).

**E-motor to transmission**

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

- Install the connector (3).
- Push connector lock (2) left/right in the direction of the arrow until the connector (3) is fully engaged.
- Press connector fastener (1) in direction of arrow till it engages.

## POSTPROCESSES

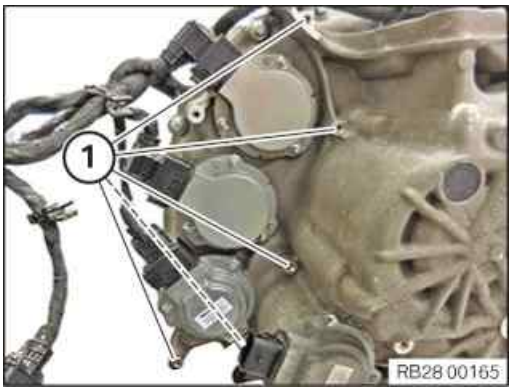
### 11 – Install the control unit

**TECHNICAL INFORMATION**

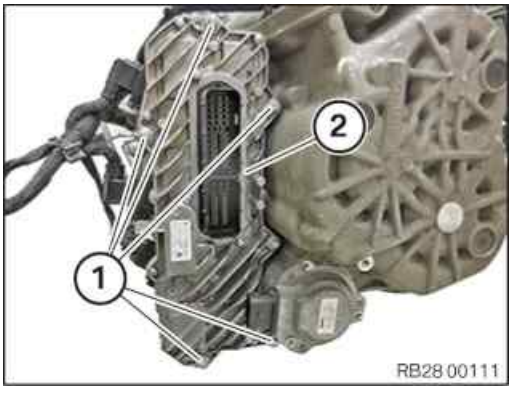
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

**TECHNICAL INFORMATION**

After completing work:
Perform service function "Renewing EGS" with diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Get rid of adhesive residue in threaded holes (1) using a thread cutter M6 and vacuum.




- Install control unit (2).
- Renew screws (1).

  **Parts:** Screw
- Tighten the screws (1).

**Control unit of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

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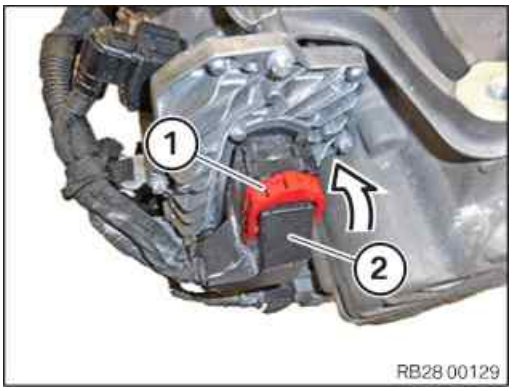



- Install holder (2).
- Renew the screw (1).

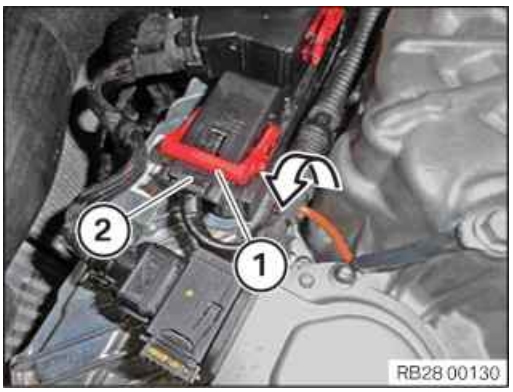
  **Parts:** Screw
- Tighten down screw (1).

**Control unit of double-clutch transmission (DKG)**

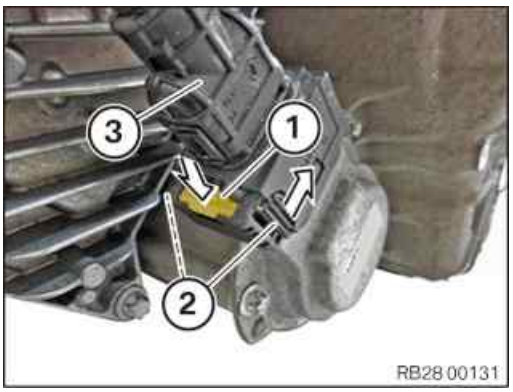
| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |



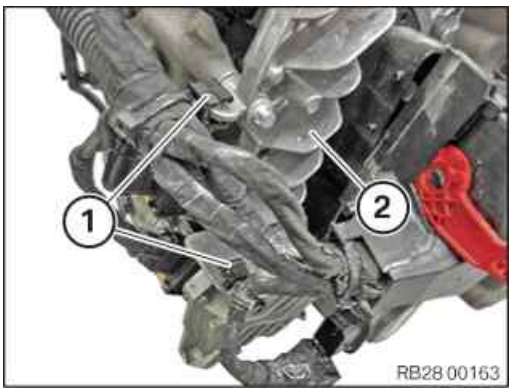

- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.




- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.



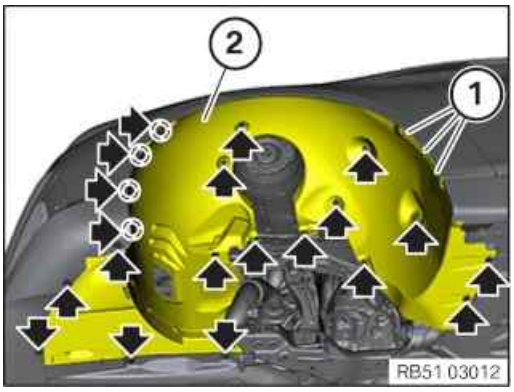

- Install the connector (3).
- Press lock (2) in the direction of the arrow left/right until the connector (3) snaps completely into place.
- Press the interlock (1) in the direction of the arrow until it snaps into place.




- Connect the clamps (1) to the control unit (2).

**12 – Installing the front wheel arch cover**

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- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

## 13 – Mounting the wheel

▸ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

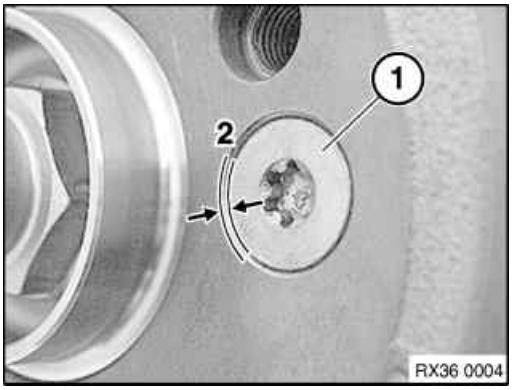
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

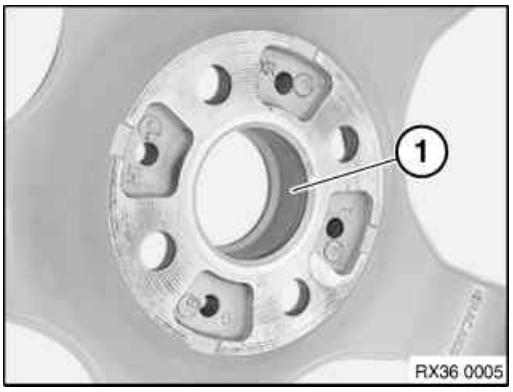
**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

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- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).




**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

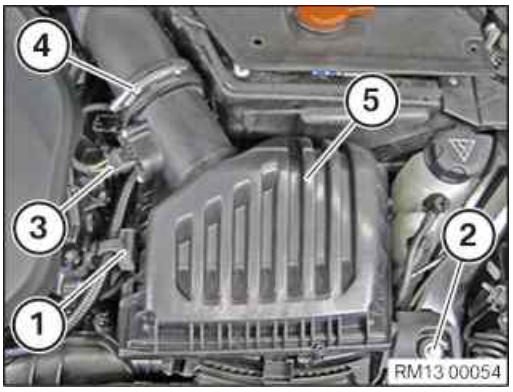
  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

## 14 – Installing intake silencer housing

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

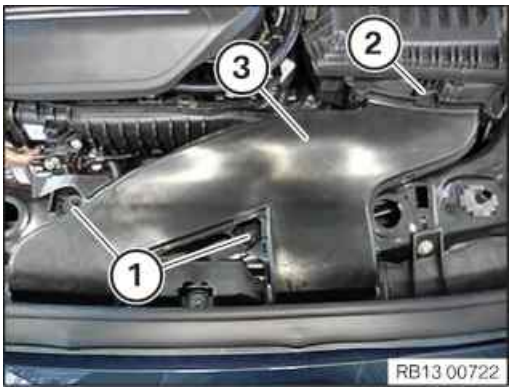
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 15 – Install the intake neck for the intake filter housing




- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 16 – Disconnecting all battery earth leads




- See additional information.

### 17 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).
  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

**18 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)**

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).




- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

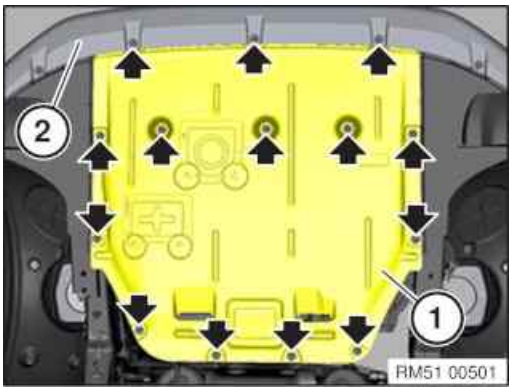
| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**19 – Installing the front underbody protection**

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- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Additional Information

### Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** — Used in step 8 17 18

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**E-motor to transmission** — Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

**Control unit of double-clutch transmission (DKG)** — Used in step 11

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

**Wheel arch cover to body** — Used in step 12

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body** — Used in step 12

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Brake disc to rear wheel hub** — Used in step 13

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub** — Used in step 13

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Wheel bolts** — Used in step 13

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

**Intake silencer housing to lock bridge** — Used in step 14

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

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**Clean air pipe to intake silencer housing** — Used in step 14

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 15

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 19

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

### 2 344 011 Tool




**Common** — Used in step 13

| | |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

## Replacement tools:

### 0 495 221 (36 1 323) Wheel stud




**Common** — Used in step 5

| | |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 224 (36 1 326) Wheel stud

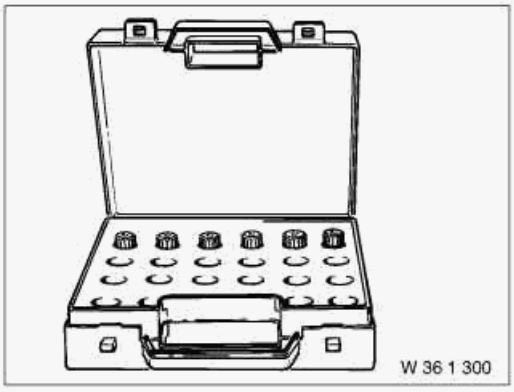



**Common** — Used in step 5

| | |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

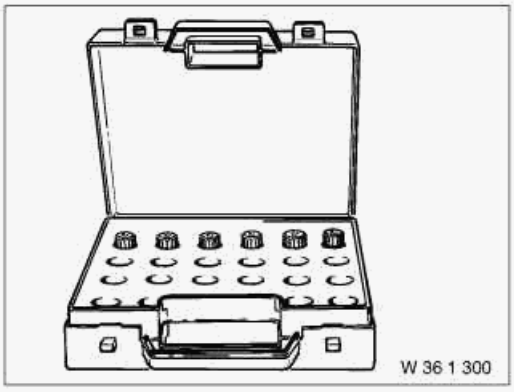
### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

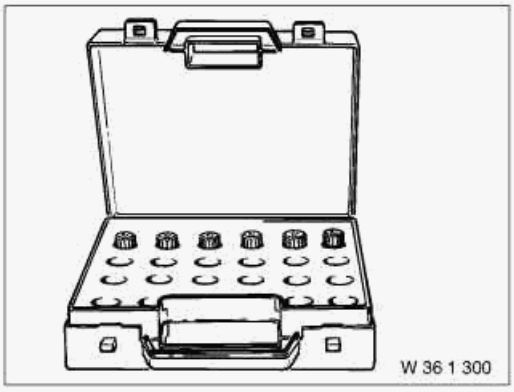
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### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 16 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 16 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
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| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 16 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 16 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 8 17 18 |
| 2.0 Grease for wheel centring | 13 |

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# 28 60 090 Removing and installing/replacing electric motor for shift drum 2 (7DCT300) (Top)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Carry out the "Teach shift drum" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

## PRELIMINARY WORK

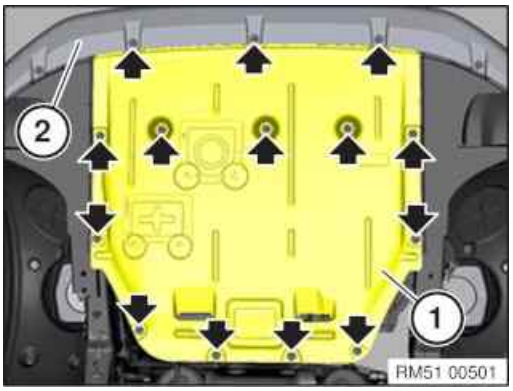
### 1 – Disconnecting all battery earth leads

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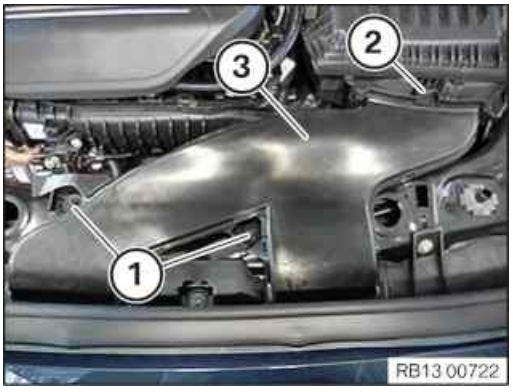

- See additional information.

**2 – Removing the front underbody protection**



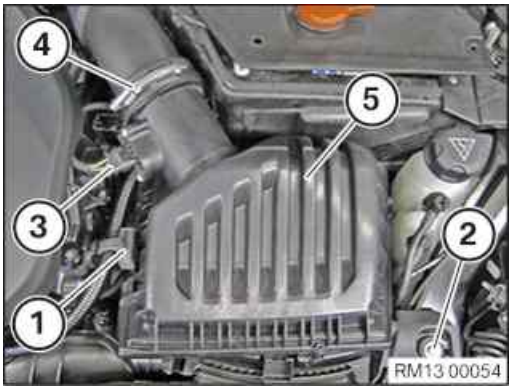

- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

**3 – Remove the intake neck for intake silencer housing**




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**4 – Removing intake silencer housing**




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

**5 – Removing the wheel**

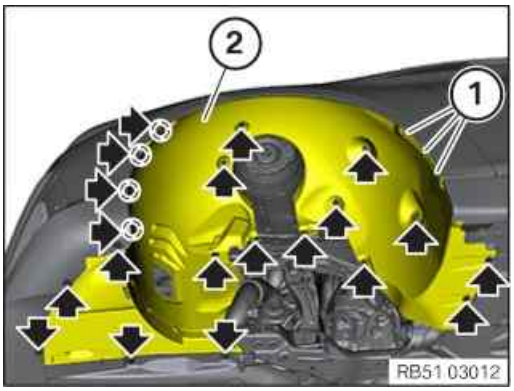
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- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**6 – Remove front wheel arch cover**

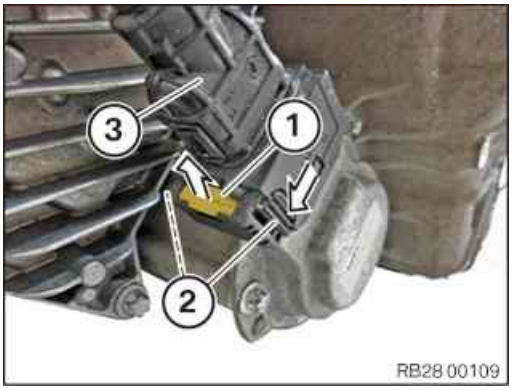



- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

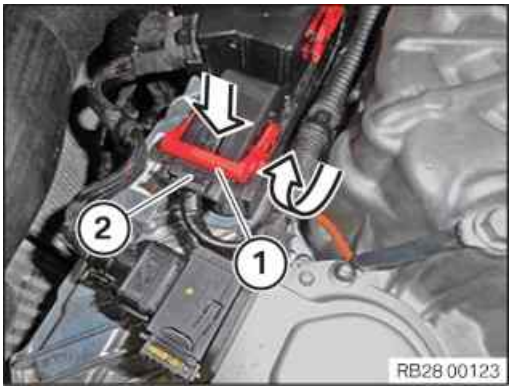
**7 – Removing the control unit (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

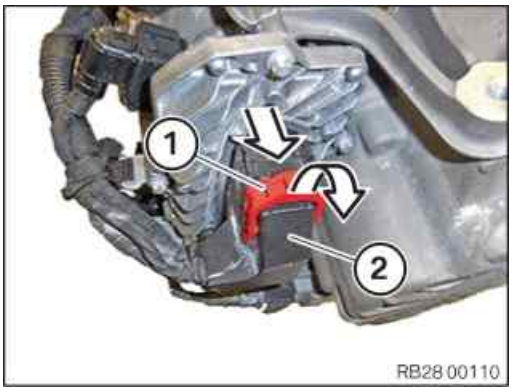



- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock lock (2) left/right in the direction of the arrow.
- Pull off the connectors (3).

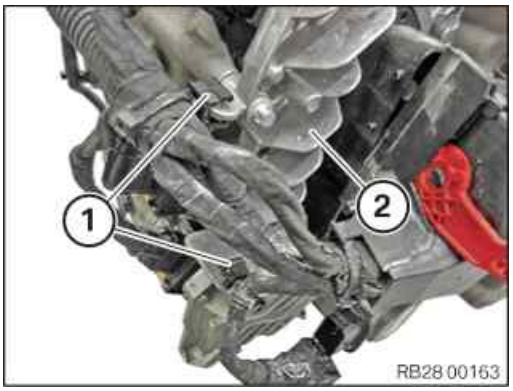



- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).

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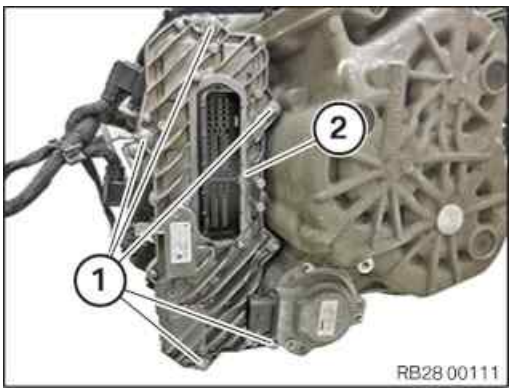

- Fold down the red lever (1) in the direction of the arrow and pull off connector (2).




- Release clamps (1) from control unit (2).




- Loosen screw (1).
- Remove bracket (2).




- Loosen screws (1).
- Remove control unit (2).

**8 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

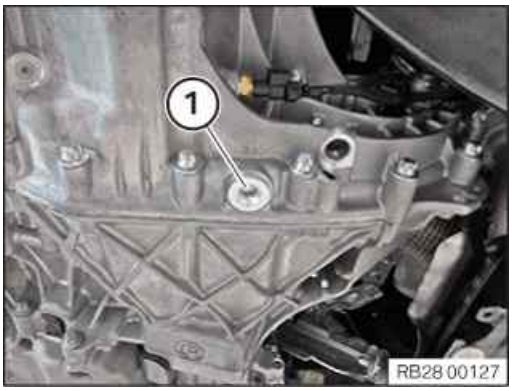
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

## MAIN WORK

### 9 – Remove electric motor for shift drum 2 (7DCT300)

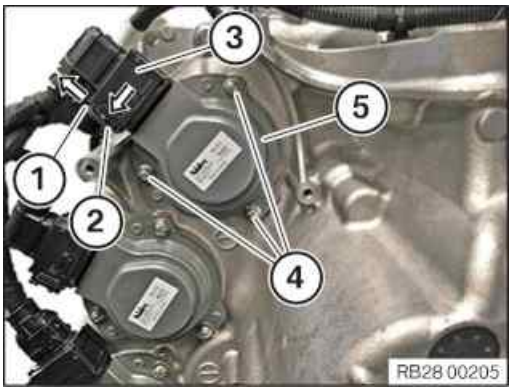
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

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- Electric motor (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connectors (3).
- Loosen screws (4).
- Remove electric motor (5).

**10 – Install electric motor for shift drum 2 (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the electric motor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Carry out the "Teach shift drum" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

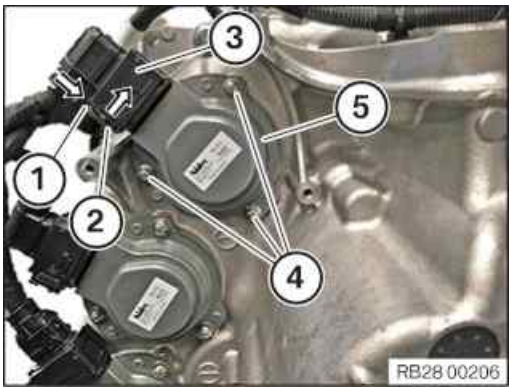



- Replace sealing ring (2) on the electric motor (1).

  **Parts:** Sealing ring
- Slide **sealing ring** (2) **, do not roll!**

**Note: Ensure correct fit! The sealing ring must not be twisted!**

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- Install electric motor (5).
- Renew screws (4).

  **Parts:** Bolts
- Tighten the screws (4).

**E-motor to transmission**

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

- Install the connector (3).
- Press connector lock (2) left/right in the direction of the arrow until the connector (3) snaps completely into place.
- Press connector fastener (1) in direction of arrow till it engages.

## POSTPROCESSES

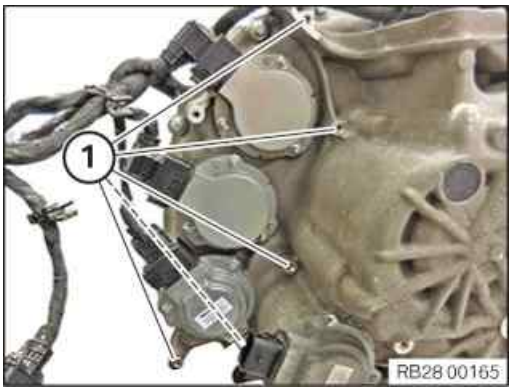
### 11 – Install the control unit

**TECHNICAL INFORMATION**

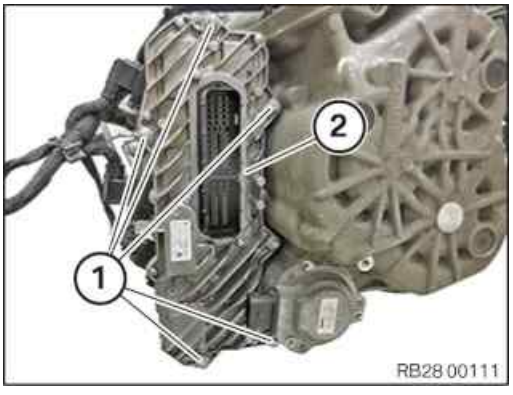
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the control unit.

**TECHNICAL INFORMATION**

After completing work:
Perform service function "Renewing EGS" with diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).




- Get rid of adhesive residue in threaded holes (1) using a thread cutter M6 and vacuum.




- Install control unit (2).
- Renew screws (1).

  **Parts:** Screw
- Tighten the screws (1).

**Control unit of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

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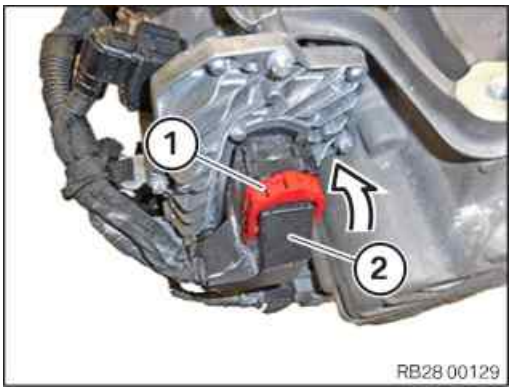



- Install holder (2).
- Renew the screw (1).

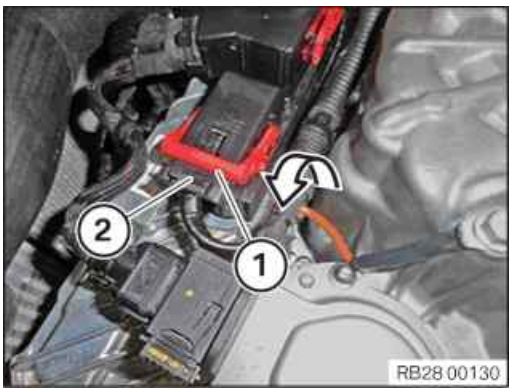
  **Parts:** Screw
- Tighten down screw (1).

**Control unit of double-clutch transmission (DKG)**

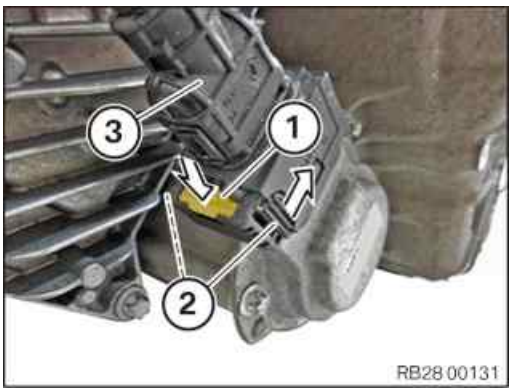
| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |



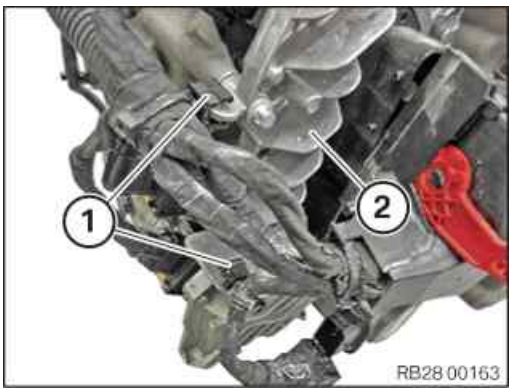

- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.




- Install connector (2) and fold red lever (1) down in the direction of the arrow until it stops.



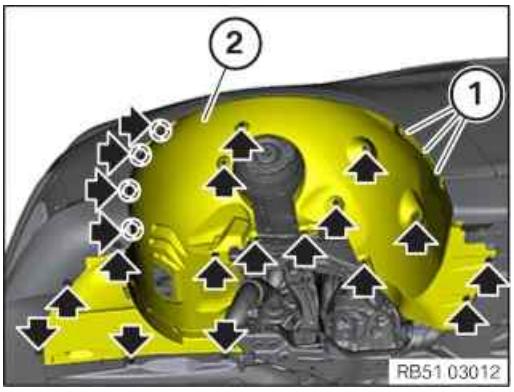

- Install the connector (3).
- Press lock (2) in the direction of the arrow left/right until the connector (3) snaps completely into place.
- Press the interlock (1) in the direction of the arrow until it snaps into place.




- Connect the clamps (1) to the control unit (2).

**12 – Installing the front wheel arch cover**

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- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

## 13 – Mounting the wheel

▸ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

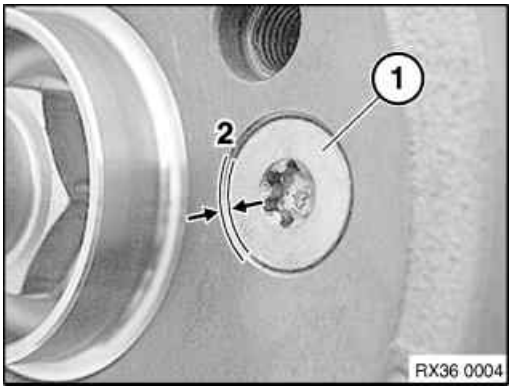
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

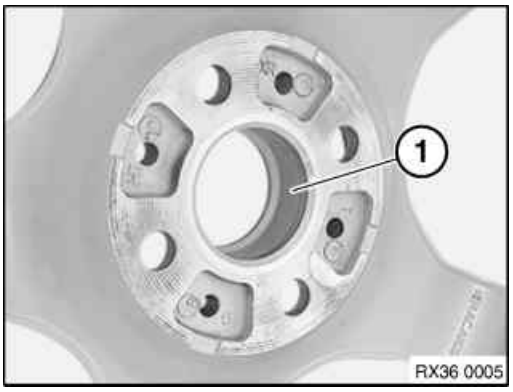
**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

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- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).




**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

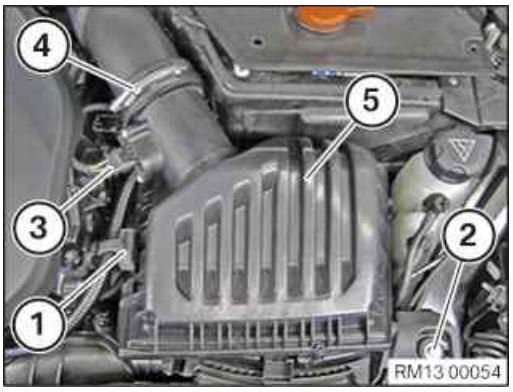
  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

## 14 – Installing intake silencer housing

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 15 – Disconnecting all battery earth leads




- See additional information.

### 16 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

**17 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).




- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

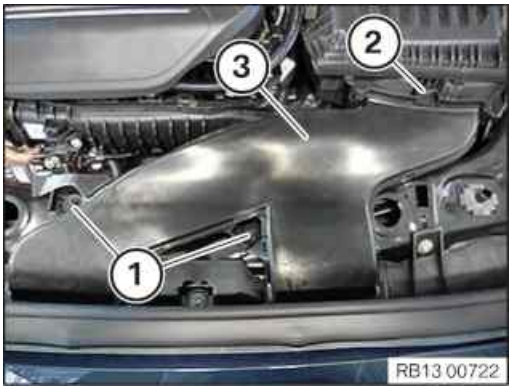
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 18 – Install the intake neck for the intake filter housing




- Insert and install the intake neck (3).

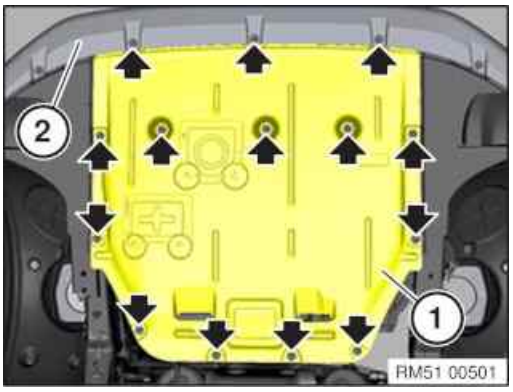
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

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### 19 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Additional Information

## Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** — Used in step 8 16 17

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**E-motor to transmission** — Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Jointing torque | 2 Nm |
| | | Tightening torque | 6 Nm |

**Control unit of double-clutch transmission (DKG)** — Used in step 11

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 9 Nm |

**Wheel arch cover to body** — Used in step 12

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body** — Used in step 12

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Brake disc to rear wheel hub** — Used in step 13

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub** — Used in step 13

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Wheel bolts** — Used in step 13

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

**Intake silencer housing to lock bridge** — Used in step 14

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

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| Clean air pipe to intake silencer housing | | | Used in step 14 |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

| Intake neck to cross connection | | | Used in step 18 |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

| Underbody protection front | | | Used in step 19 |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

### 2 344 011 Tool




| Common | Used in step 13 |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

## Replacement tools:

### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

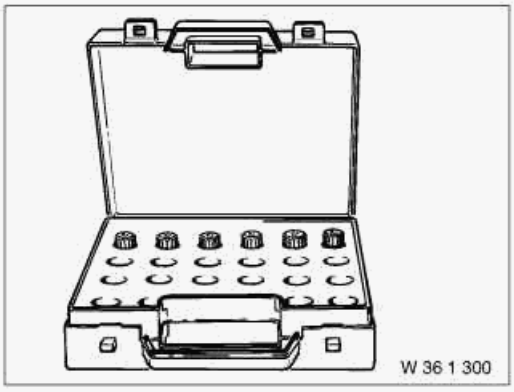
### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

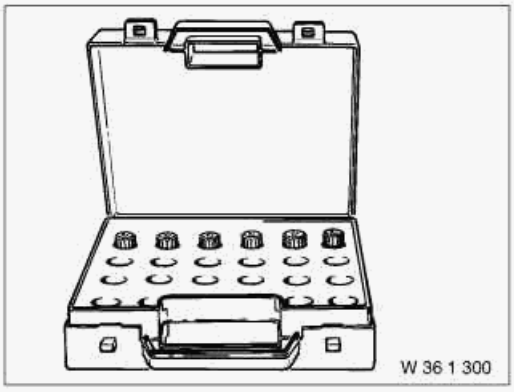
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### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

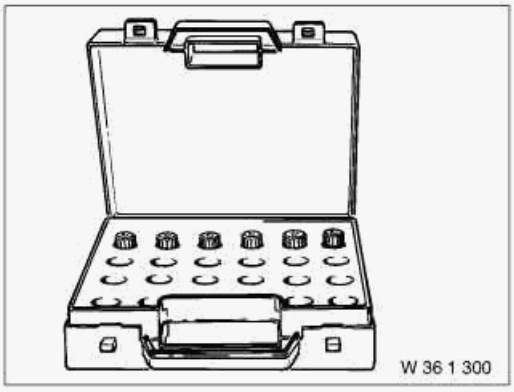
### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 15 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 15 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 15 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 15 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 8 16 17 |
| 2.0 Grease for wheel centring | 13 |

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# 28 60 110 Removing and installing/replacing gearbox input-speed sensor (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.

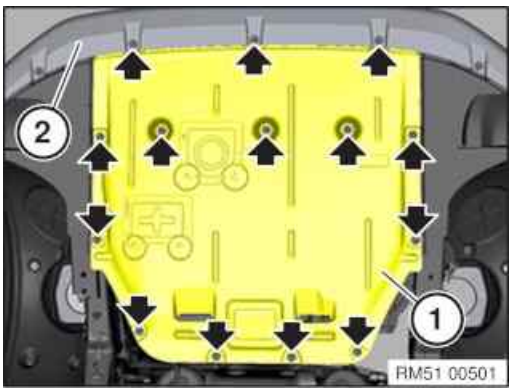
## PRELIMINARY WORK

### 1 – Disconnecting all battery earth leads




- See additional information.

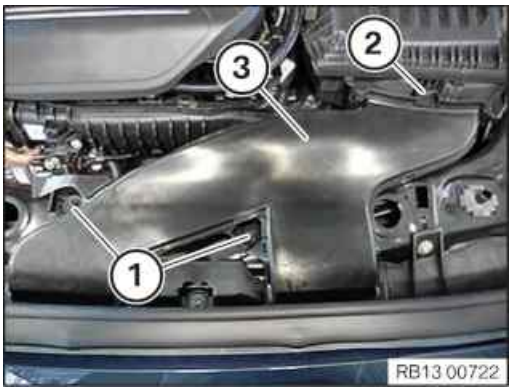
### 2 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

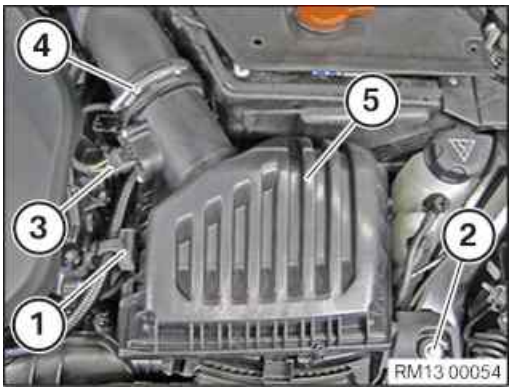
### 3 – Remove the intake neck for intake silencer housing

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- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**4 – Removing intake silencer housing**




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

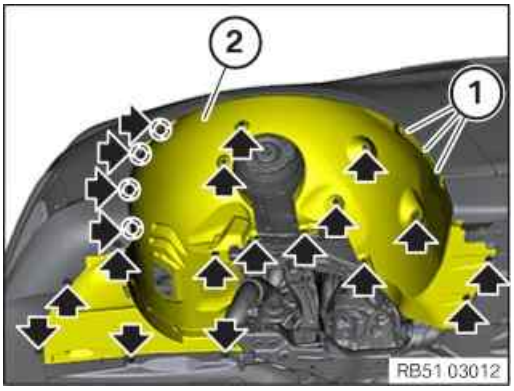
**5 – Removing the wheel**




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

**6 – Remove front wheel arch cover**




- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

**MAIN WORK**

**7 – Removing gearbox input-speed sensor**

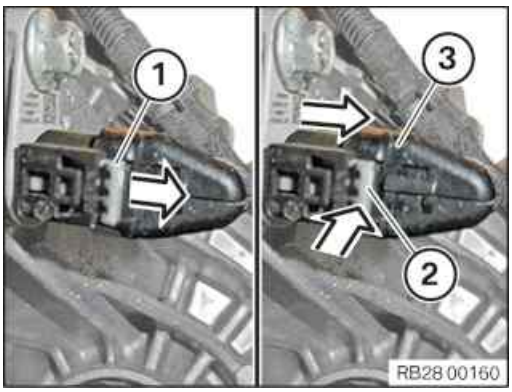
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**TECHNICAL INFORMATION**

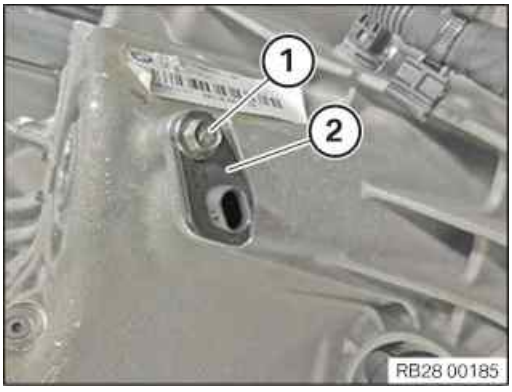
It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.




- Gearbox input-speed sensor (1).




- Unlock the connector fastener (1) in the direction of arrow.
- Press connector fastener (2) in the direction of arrow and unlock.
- Pull off the connectors (3).



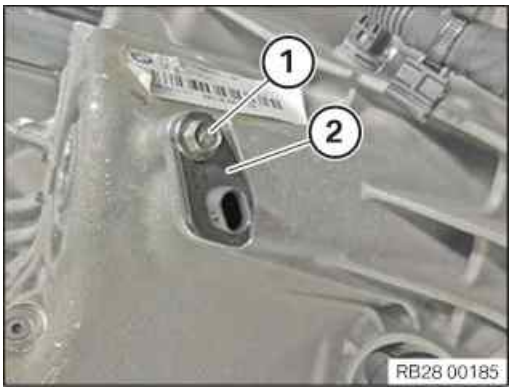

- Loosen screw (1).
- Remove gearbox input-speed sensor (2).

**8 – Installing the gearbox input-speed sensor (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.

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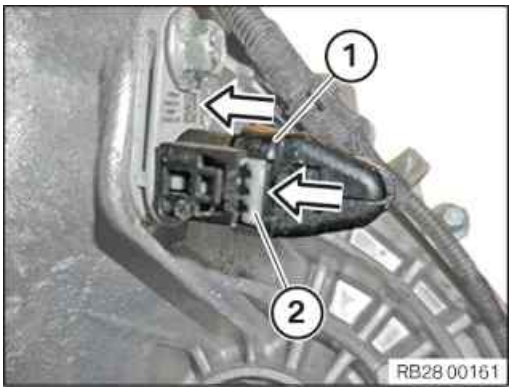



- Install the gearbox input-speed sensor (2).
- Renew the screw (1).

  **Parts:** Screw
- Tighten down screw (1).

**Gearbox input-speed sensor**

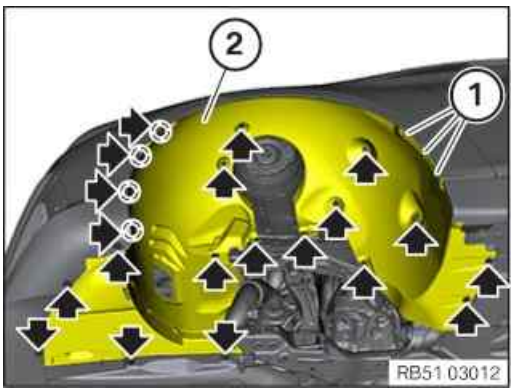
| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 10 Nm |




- Install the connector (1).
- Press the connector fastener (2) in the direction of arrow until it engages audibly.

## POSTPROCESSES

### 9 – Installing the front wheel arch cover




- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

### 10 – Mounting the wheel

▸ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

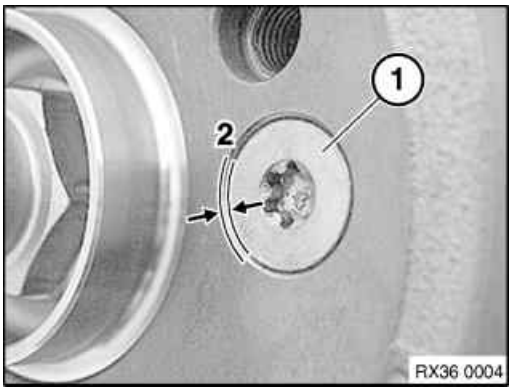
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

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- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

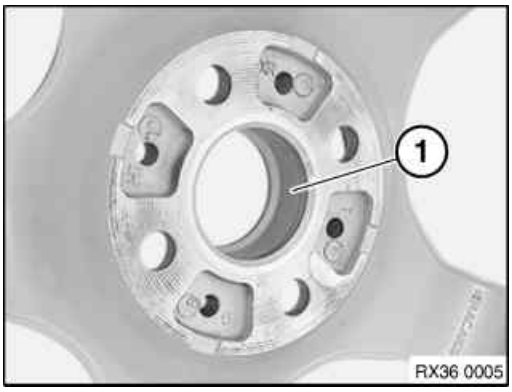
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

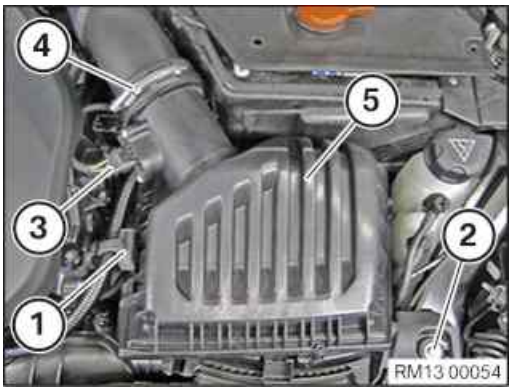
- Renew corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. | Tightening torque | 140 Nm |
| | Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. | Check | 140 Nm |
| | Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | | |

## 11 – Installing intake silencer housing




- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

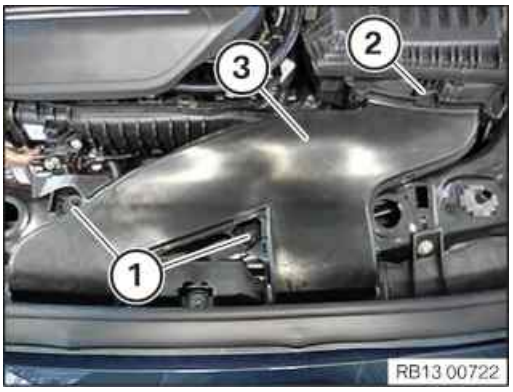
| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

## 12 – Install the intake neck for the intake filter housing

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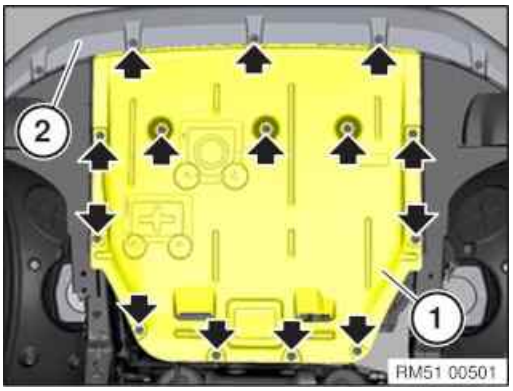

- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 13 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 14 – Disconnecting all battery earth leads




- See additional information.

## Additional Information

## Overview of Tightening Torques

**Gearbox input-speed sensor** Used in step 8

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 10 Nm |

**Wheel arch cover to body** Used in step 9

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body** Used in step 9

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Brake disc to rear wheel hub** Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

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**Brake disc to front wheel hub** — Used in step 10

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Wheel bolts** — Used in step 10

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

**Intake silencer housing to lock bridge** — Used in step 11

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** — Used in step 11

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 12

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 13

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Overview of Special Tools

### 2 344 011 Tool




**Common** — Used in step 10

| | |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

## Replacement tools:

### 0 495 221 (36 1 323) Wheel stud

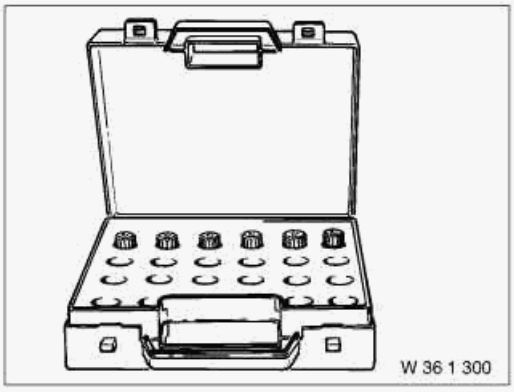



**Common** — Used in step 5

| | |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

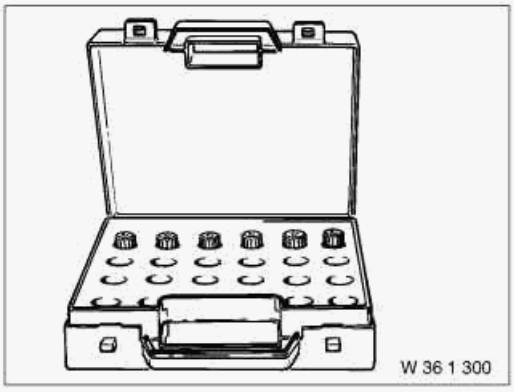
### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 5 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 14 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

| Operating materials | Used in step |
|---|---|
| 2.0 Grease for wheel centring | 10 |

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# 28 60 109 Removing and installing/replacing temperature sensor (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the temperature sensor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

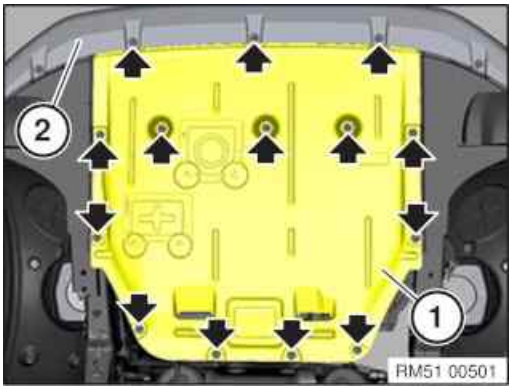
## PRELIMINARY WORK

### 1 – Disconnecting all battery earth leads




- See additional information.

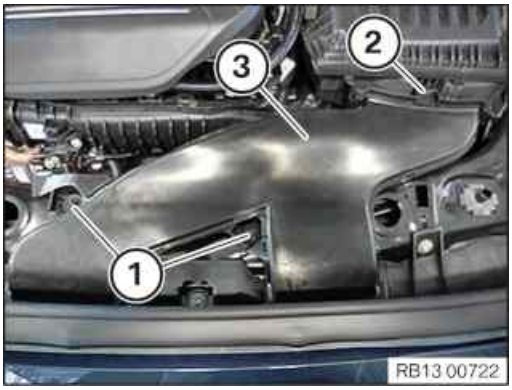
### 2 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

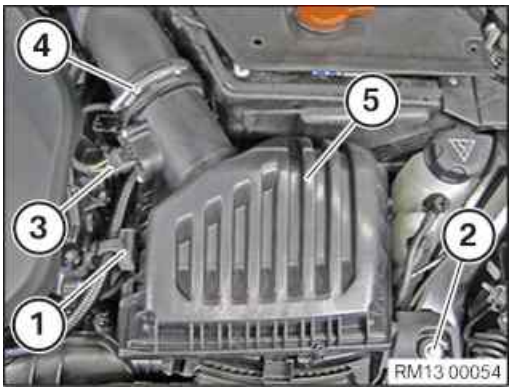
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### 3 – Remove the intake neck for intake silencer housing




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

### 4 – Removing intake silencer housing




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

### 5 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

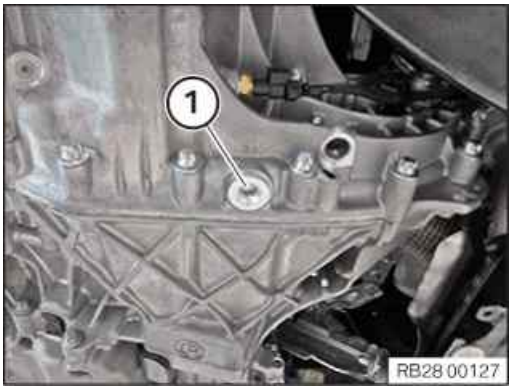
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**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

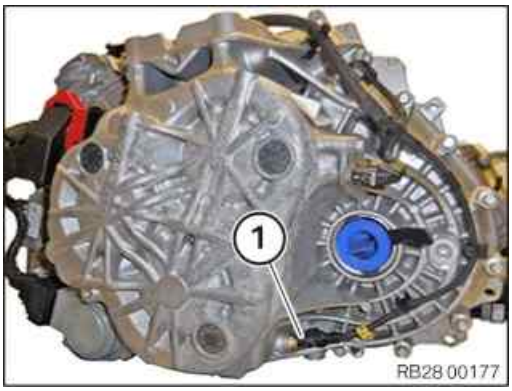
| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

## MAIN WORK

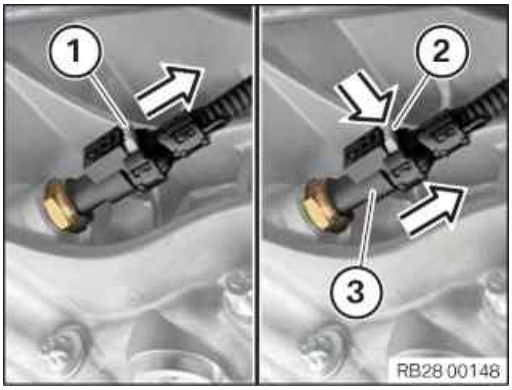
### 6 – Remove temperature sensor (7DCT300)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the temperature sensor.




- Temperature sensor (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press the connector fastener (2) in the direction of the arrow and unlock.
- Pull off the connectors (3).

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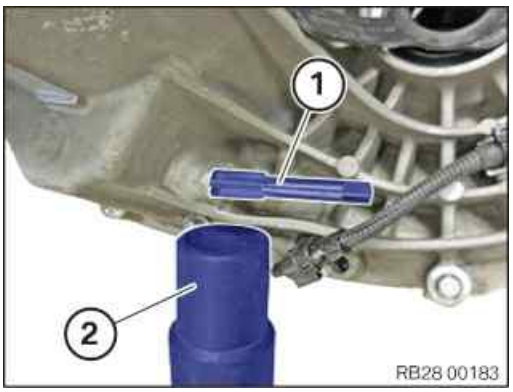



- Unscrew temperature sensor (1).

**7 – Install temperature sensor (7DCT300)**

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the temperature sensor.



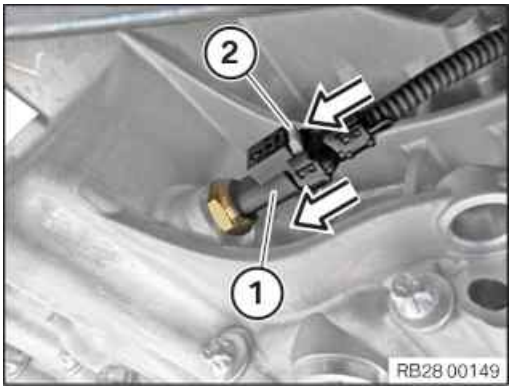

- Free threaded hole of glue residues using the thread cutter (1) **M12 x 1.5** and clean with a vacuum cleaner (2).




- Install and tighten the temperature sensor (1).

**Temperature sensor**

| | | | |
|---|---|---|---|
| M12 | | Tightening torque | 15 Nm |

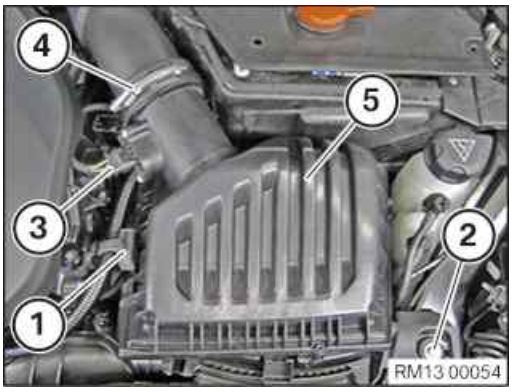



- Install the connector (1).
- Press the connector fastener (2) in the direction of arrow until it engages audibly.

**POSTPROCESSES**

**8 – Installing intake silencer housing**

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

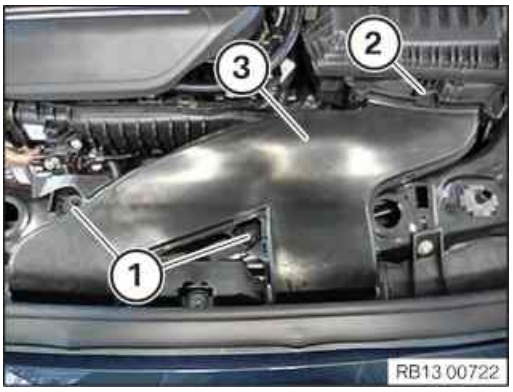
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 9 – Install the intake neck for the intake filter housing




- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 10 – Disconnecting all battery earth leads




- See additional information.

### 11 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).
  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

**12 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)**

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**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).




- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

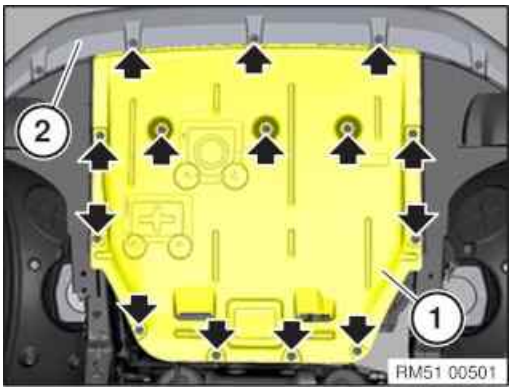
| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 ,<br>Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**13 – Installing the front underbody protection**

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- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Additional Information

### Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** — Used in step 5 11 12

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**Temperature sensor** — Used in step 7

| | | | |
|---|---|---|---|
| M12 | | Tightening torque | 15 Nm |

**Intake silencer housing to lock bridge** — Used in step 8

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** — Used in step 8

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 9

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 13

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 5 11 12 |

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# 28 60 112 Removing and installing/replacing transmission oil pressure sensor (7DCT300) (bottom)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

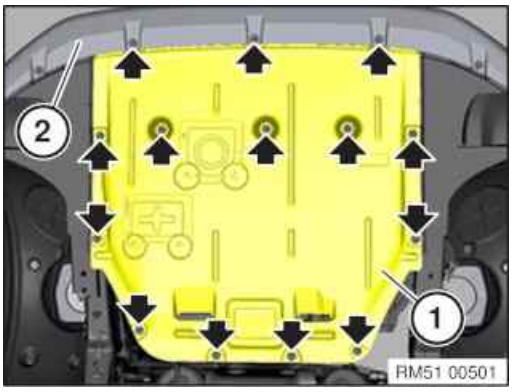
### 1 – Disconnecting all battery earth leads




- See additional information.

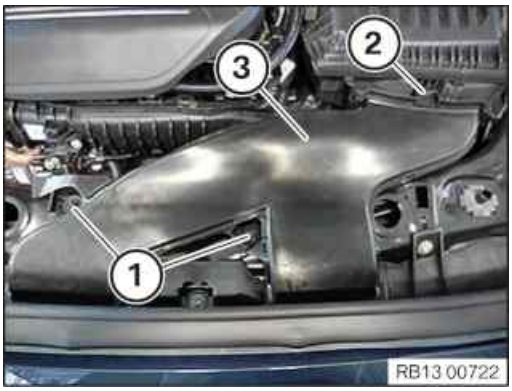
### 2 – Removing the front underbody protection

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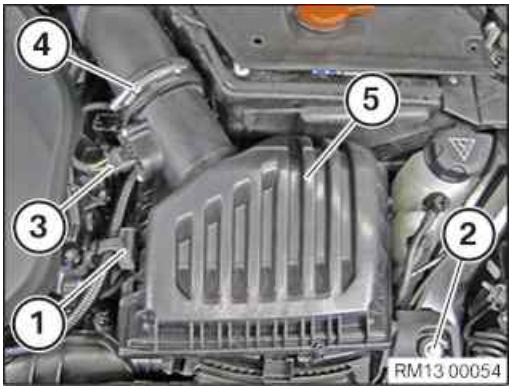

- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

**3 – Remove the intake neck for intake silencer housing**




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**4 – Removing intake silencer housing**




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

**5 – Draining the transmission oil in the double-clutch transmission (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

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**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

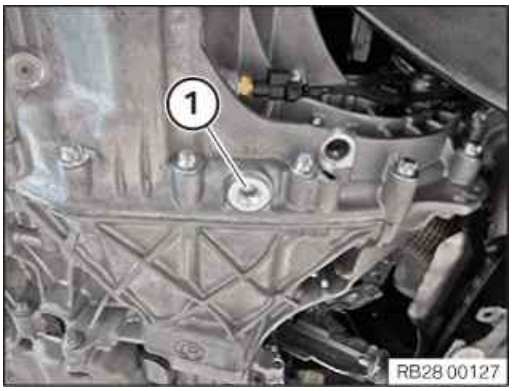
- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.




- **Draining transmission oil:**
- Unscrew oil drain plug (1) and allow oil to drain completely.
- Renew the oil drain plug (1).

  **Parts:** Oil drain plug
- Tighten oil drain plug (1).

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

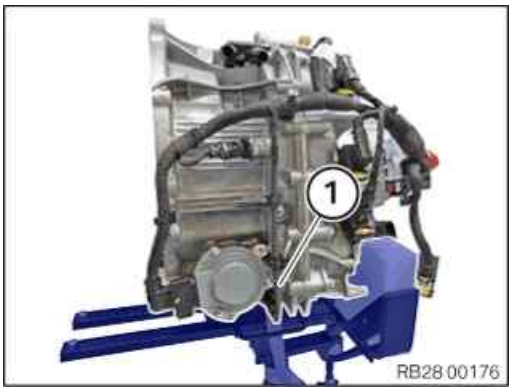
## MAIN WORK

### 6 – Remove transmission oil pressure sensor (7DCT300)

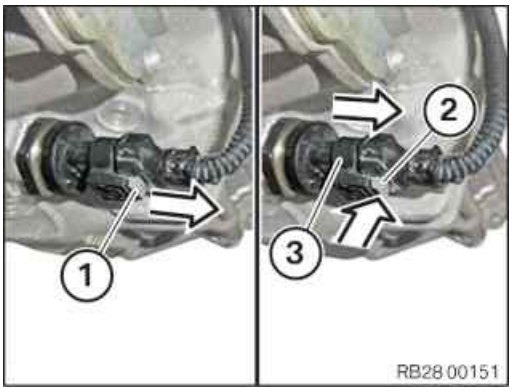
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the transmission oil pressure sensor.

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- Transmission oil pressure sensor (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press the connector fastener (2) in the direction of the arrow and unlock.
- Pull off the connectors (3).




- Remove transmission oil pressure sensor (1).

**7 – Installing the transmission oil pressure sensor (7DCT300)**

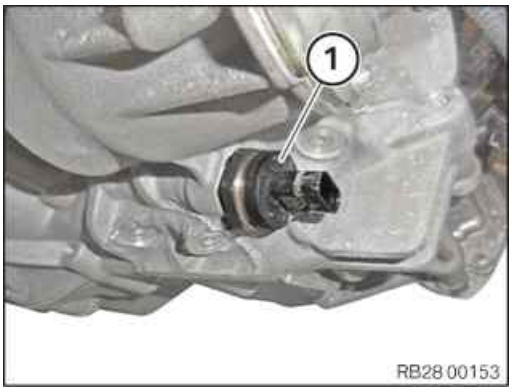
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the transmission oil pressure sensor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

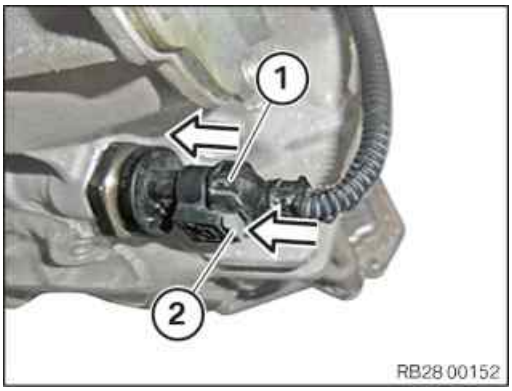
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- Install transmission oil pressure sensor (1) and tighten.

**Transmission oil pressure sensor**

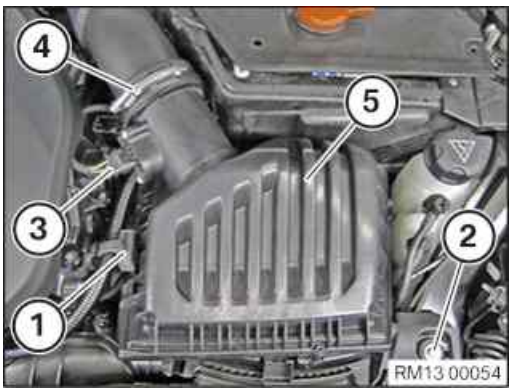
| | | | |
|---|---|---|---|
| | | Tightening torque | 22 Nm |




- Install the connector (1).
- Press the connector fastener (2) in the direction of arrow until it engages audibly.

## POSTPROCESSES

### 8 – Installing intake silencer housing




- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

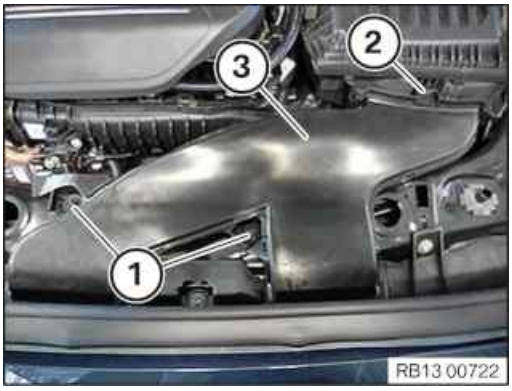
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 9 – Install the intake neck for the intake filter housing




- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 10 – Disconnecting all battery earth leads

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- See additional information.

**11 – Topping up transmission oil in the twin-clutch gearbox (DKG) (7DCT300)**

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**RISK OF DAMAGE**

**Damage to the transmission.**

**Damage to the transmission through unapproved transmission oil.**

- Use only the approved transmission oil.
- After completion of repair work, check transmission oil level.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

After completing work:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.

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- **Adding transmission oil:**
- Unscrew oil filler plug (1) and fill the transmission until the oil overflows.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

- Remove excess, escaped oil at the transmission/vehicle wiring harness!

## 12 – Checking/topping up oil level in the double-clutch transmission (DKG) (7DCT300)

**CAUTION**

**Acid burns may result from skin contact with oil or inhaling oil vapours.**

**Risk of acid burns from contact with oil!**

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

**TECHNICAL INFORMATION**

Transmission oil temperature 20 °C up to a maximum 40 °C!
Carry out the "Transmission oil adjustment" service function with the diagnosis system.
The double clutch also needs to be replaced if you exceed the oil change interval by more than 3000 km!
Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).

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- **Check / top up the oil level (transmission oil temperature must be between 20 °C and 40 °C):**
- Open the oil filler plug (1).
- If oil escapes, seal off again immediately.
- If no oil escapes, add oil until it flows over.
- Drain off excess oil (up to lower edge of filler hole).
- Replace the oil filler plug (1).

  **Parts:** Oil filler plug
- Tighten the oil filler plug (1).

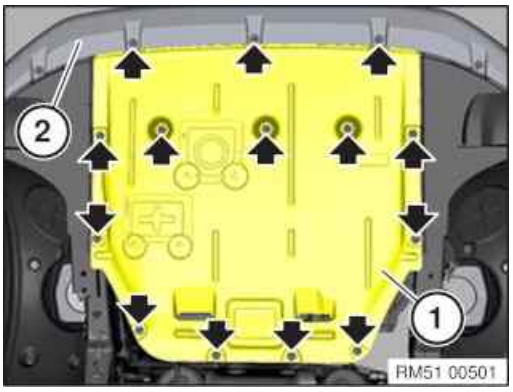
**Expendable materials**

| | | |
|---|---|---|
| Twin-clutch gearbox oil BMW DCTF-2 | 1 , Bottle | 83 22 2 433 157 |

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)**

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

### 13 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Additional Information

## Overview of Tightening Torques

**Oil drain plug/oil filler plug of double-clutch transmission (DKG)** Used in step 5 11 12

| | | | |
|---|---|---|---|
| M18 | Renew screw. | Tightening torque | 43 Nm |

**Transmission oil pressure sensor** Used in step 7

| | | | |
|---|---|---|---|
| | | Tightening torque | 22 Nm |

**Intake silencer housing to lock bridge** Used in step 8

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** Used in step 8

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** Used in step 9

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** Used in step 13

| | | | |
|---|---|---|---|
| | | | 3 Nm |

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## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

| Operating materials | Used in step |
|---|---|
| 14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z | 5 11 12 |

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# 28 60 113 Removing and installing/replacing transmission oil pressure sensor 2 (7DCT300) (Top)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

## PRELIMINARY WORK

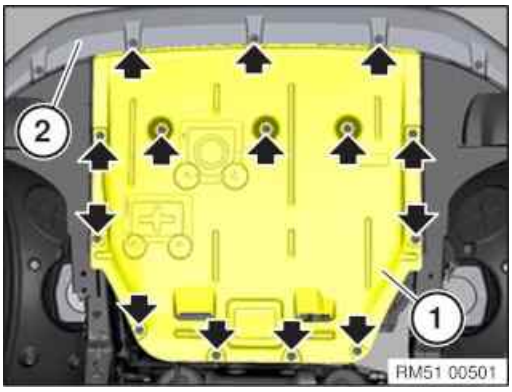
### 1 – Disconnecting all battery earth leads




- See additional information.

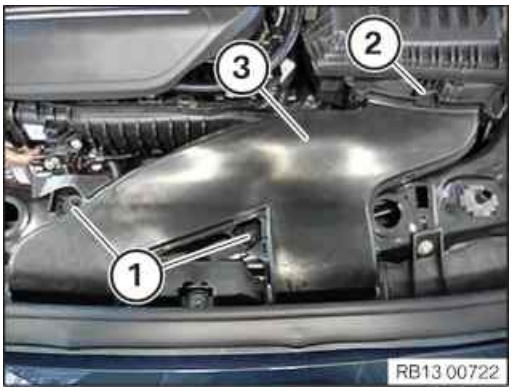
### 2 – Removing the front underbody protection

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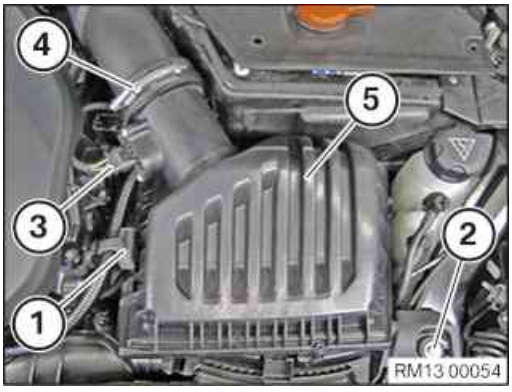

- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 3 – Remove the intake neck for intake silencer housing




- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

### 4 – Removing intake silencer housing




- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

## MAIN WORK

### 5 – Remove transmission oil pressure sensor (7DCT300)

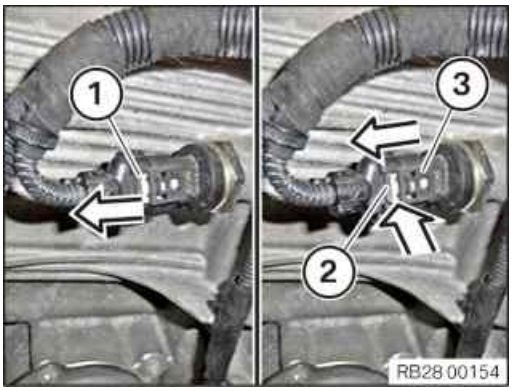
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the transmission oil pressure sensor.

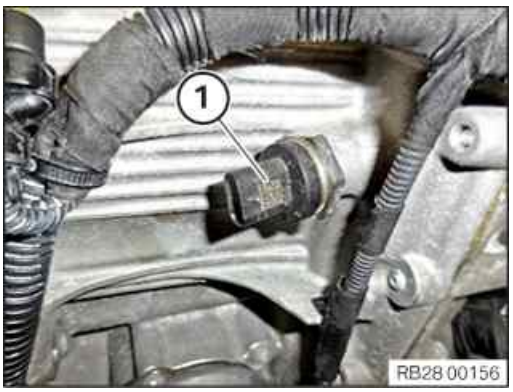
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- Transmission oil pressure sensor 2 (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press the connector fastener (2) in the direction of the arrow and unlock.
- Pull off the connectors (3).




- Remove transmission oil pressure sensor (1).

**6 – Installing the transmission oil pressure sensor (7DCT300)**

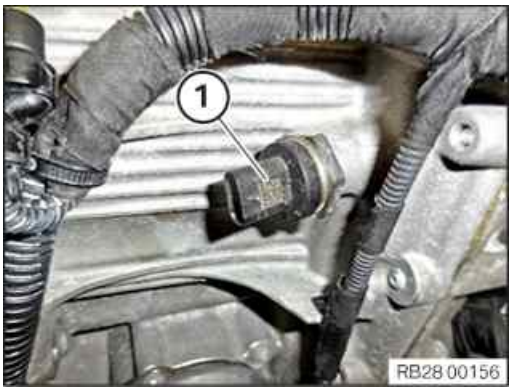
**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the transmission oil pressure sensor.

**TECHNICAL INFORMATION**

After completing work:
Check transmission oil level and only use the approved transmission oil.
While refilling/renewing the transmission oil:
Carry out the "Reset transmission oil wear values" service function with the diagnosis system.
Failure to comply with this instruction will result in serious damage to the double-clutch transmission (DKG).

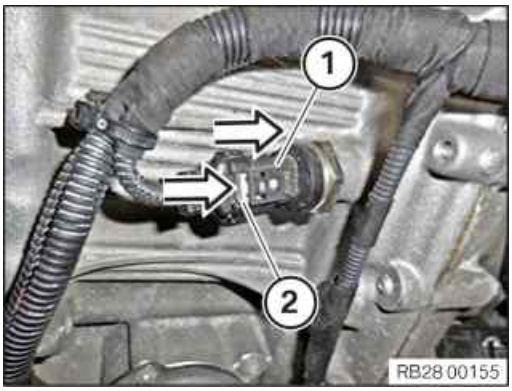
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- Install transmission oil pressure sensor (1) and tighten.

**Transmission oil pressure sensor**

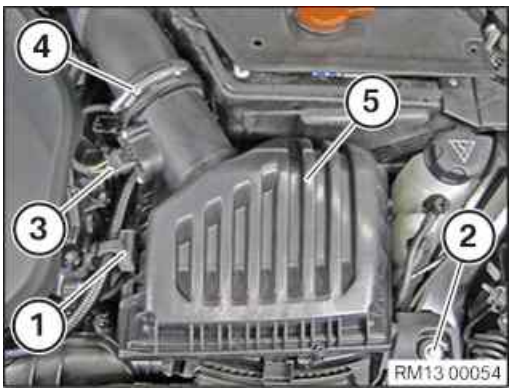
| | | | |
|---|---|---|---|
| | | Tightening torque | 22 Nm |




- Install the connector (1).
- Press the connector fastener (2) in the direction of arrow until it engages audibly.

## POSTPROCESSES

### 7 – Installing intake silencer housing




- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

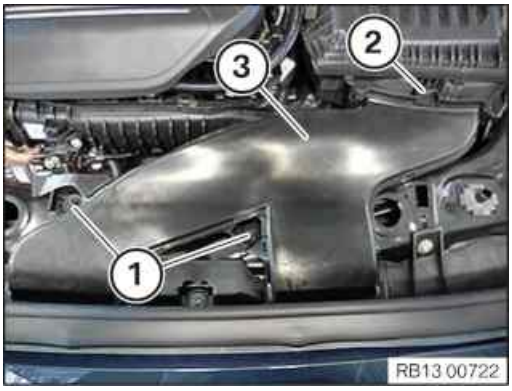
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 8 – Install the intake neck for the intake filter housing



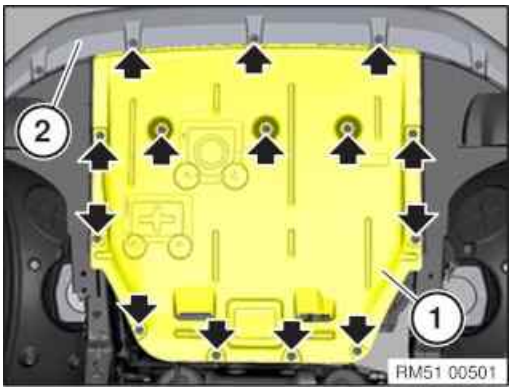

- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 9 – Installing the front underbody protection

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- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

**10 – Disconnecting all battery earth leads**




- See additional information.

## Additional Information

### Overview of Tightening Torques

**Transmission oil pressure sensor** — Used in step 6

| | | | |
|---|---|---|---|
| | | Tightening torque | 22 Nm |

**Intake silencer housing to lock bridge** — Used in step 7

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** — Used in step 7

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 8

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 9

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

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| | | |
|---|---|---|
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 10 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 10 |


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# 28 60 111 Removing/installing/replacing gearbox input speed sensor 2 (7DCT300)

**CAUTION**

**Materials harmful to health.**

**Contact with fluids harmful to health!**

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.

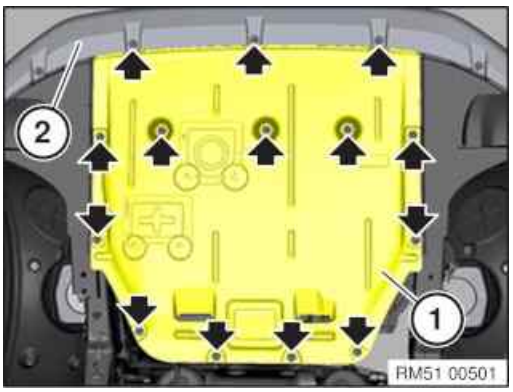
## PRELIMINARY WORK

### 1 – Disconnecting all battery earth leads




- See additional information.

### 2 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 3 – Removing the wheel

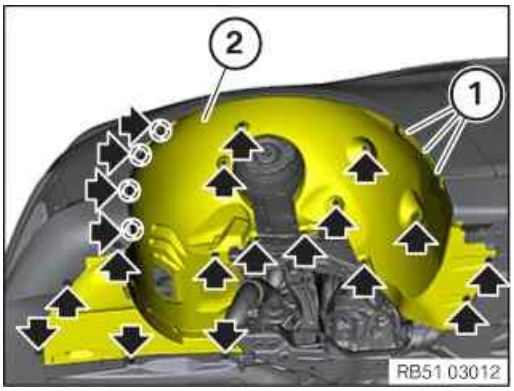
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- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

### 4 – Remove front wheel arch cover




- Loosen the expanding rivet (1).
- Unscrew all bolts and nuts (arrows).
- Feed out front wheel arch cover (2).

## MAIN WORK

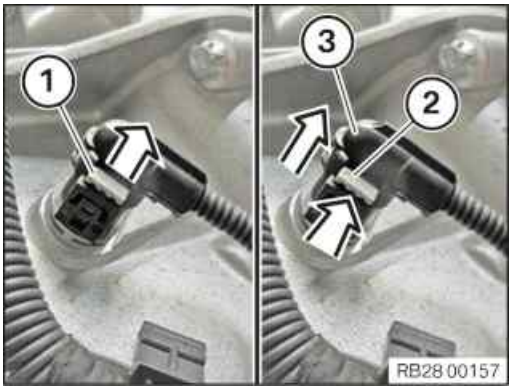
### 5 – Remove gearbox input-speed sensor (7DCT300)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.

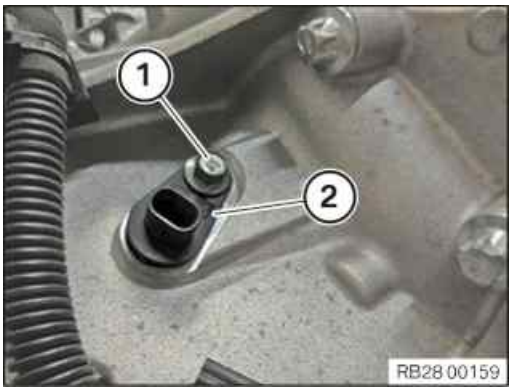



- Gearbox input-speed sensor 2 (1).




- Unlock the connector fastener (1) in the direction of the arrow.
- Press the connector fastener (2) in the direction of the arrow and unlock.
- Pull off the connectors (3).

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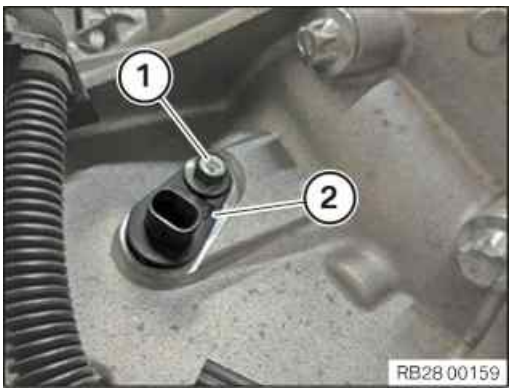



- Loosen screw (1).
- Remove gearbox input-speed sensor (2).

### 6 – Installing the gearbox input-speed sensor (7DCT300)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any contaminated parts must be cleaned before removing the gearbox input-speed sensor.

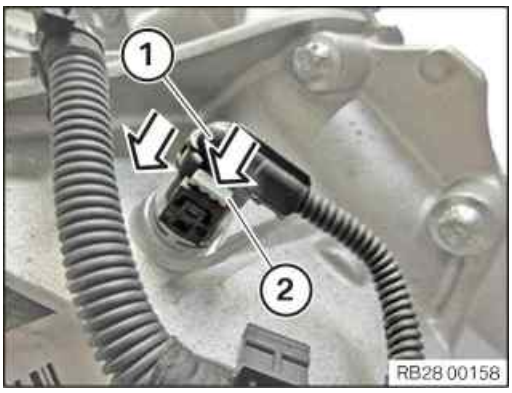



- Install gearbox input-speed sensor (2).
- Renew the screw (1).

  **Parts:** Screw
- Tighten down screw (1).

**Gearbox input-speed sensor**

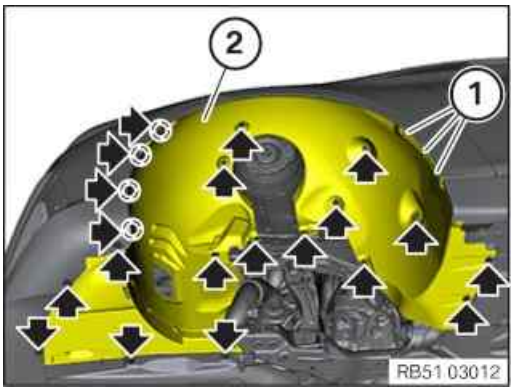
| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 10 Nm |




- Install the connector (1).
- Press the connector fastener (2) in the direction of the arrow until it engages audibly.

## POSTPROCESSES

### 7 – Installing the front wheel arch cover




- Guide the wheel arch cover (2) in.
- Tighten all bolts and nuts (arrows).

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body**

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

- Secure expanding rivet (1).

### 8 – Mounting the wheel

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▸ **Clean the contact surfaces between the brake disc and the wheel rim**




**TECHNICAL INFORMATION**

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

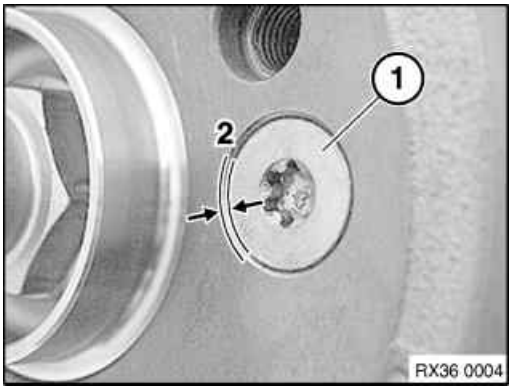
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.




- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).




- Renew mounting bolt (1).

  **Parts:** Mounting bolt
- Check that the mounting bolt (1) for the brake disc is securely seated.

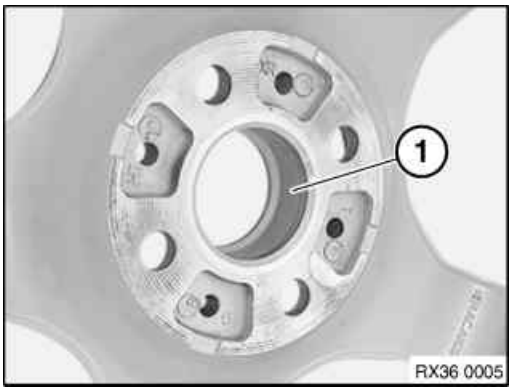
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to rear wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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**TECHNICAL INFORMATION**

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

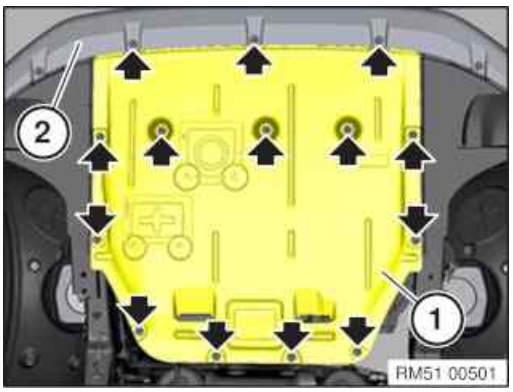
  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

**Wheel bolts**

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

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## 9 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## 10 – Disconnecting all battery earth leads




- See additional information.

## Additional Information

### Overview of Tightening Torques

**Gearbox input-speed sensor** — Used in step 6

| | | | |
|---|---|---|---|
| | Renew screw. | Tightening torque | 10 Nm |

**Wheel arch cover to body** — Used in step 7

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

**Wheel arch cover to body** — Used in step 7

| | | | |
|---|---|---|---|
| Plastic nut | | Tightening torque | 3 Nm |

**Brake disc to rear wheel hub** — Used in step 8

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to front wheel hub** — Used in step 8

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Wheel bolts** — Used in step 8

| | | | |
|---|---|---|---|
| M 14/AF 17 | Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

**Underbody protection front** — Used in step 9

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### Overview of Special Tools

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### 2 344 011 Tool




| Common | Used in step 8 |
|---|---|
| Usage | Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub. |
| Included in the tool or work | |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | 08 08 12 (872) |

## Replacement tools:

### 0 495 221 (36 1 323) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

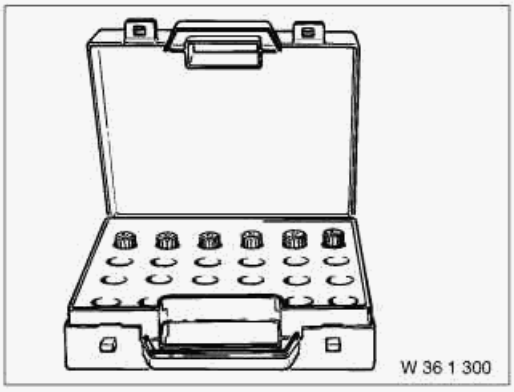
### 0 495 224 (36 1 326) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 225 (36 1 327) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 226 (36 1 328) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 227 (36 1 329) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

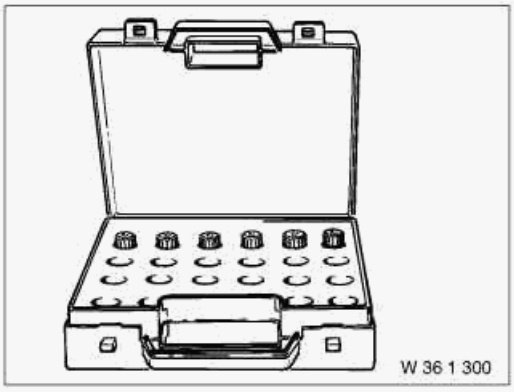
### 0 495 228 (36 1 331) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

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### 0 495 229 (36 1 332) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 230 (36 1 333) Wheel stud




| Common | Used in step 3 |
|---|---|
| Usage | (Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

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| | |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 10 |

| Operating materials | Used in step |
|---|---|
| 2.0 Grease for wheel centring | 8 |

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# 28 60 022 Replacing wiring harness (7DCT300)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the wiring harness.

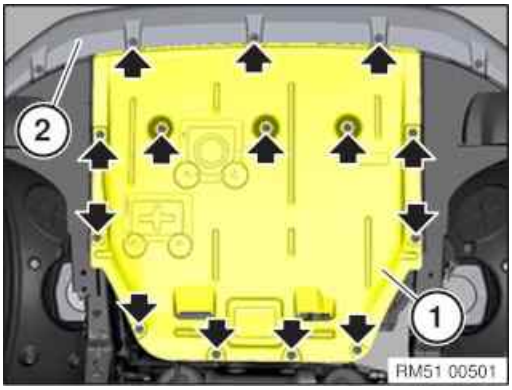
## PRELIMINARY WORK

### 1 – Disconnecting all battery earth leads




- See additional information.

### 2 – Removing the front underbody protection




- Remove screws (arrows).
- Pull out and remove front underbody protection (1) under the bumper panel (2).

### 3 – Removing the fan cowl with electric fan

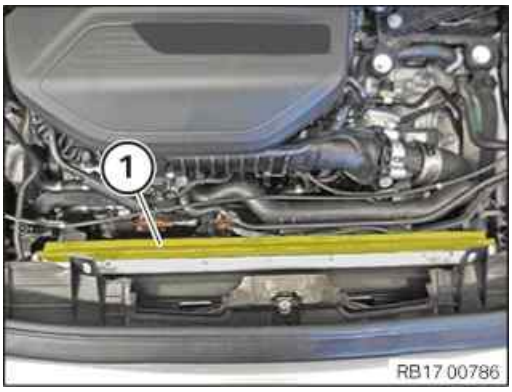
**WARNING**

**Hot surfaces.**

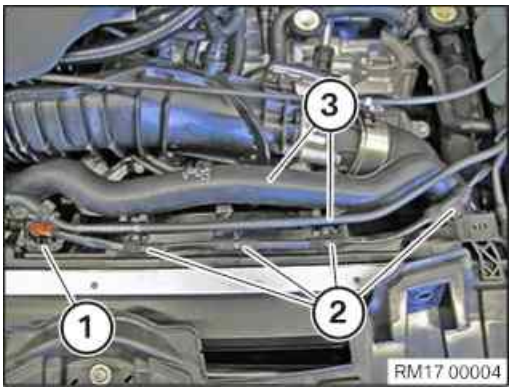
**Risk of burning!**

- Perform all work only on components that have cooled down.

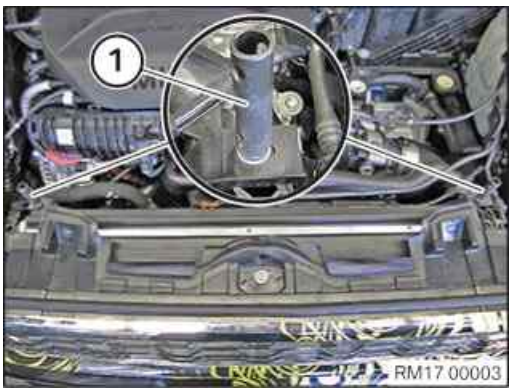
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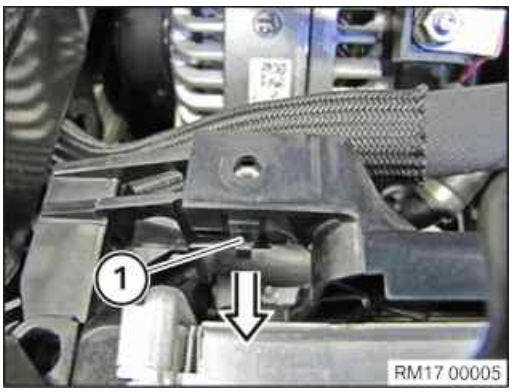

- Feed out and remove the sealing (1) from the radiator.



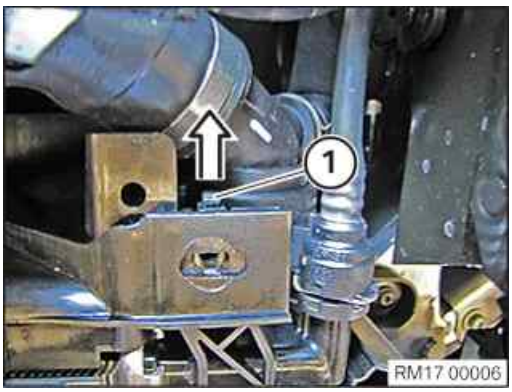

- Unlock plug connection (1) and disconnect.
- Unlock and loosen the clamps (2).
- Feed out connector (1) and place to one side.
- Thread off coolant line (3) and place to the side.




- Loosen screws (1).

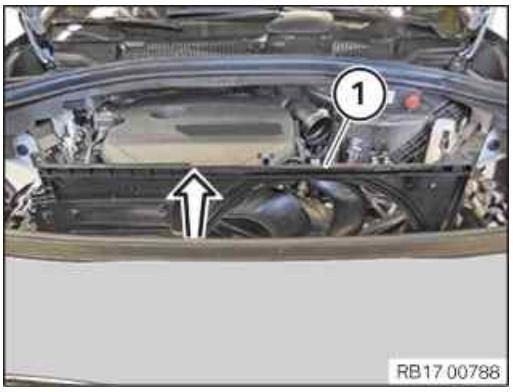



- Unlock the right lock (1) on the fan cowl in the direction of the arrow.



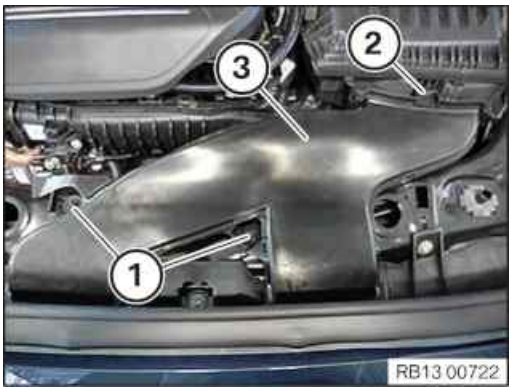

- Unlock the left lock (1) on the fan cowl in the direction of the arrow.

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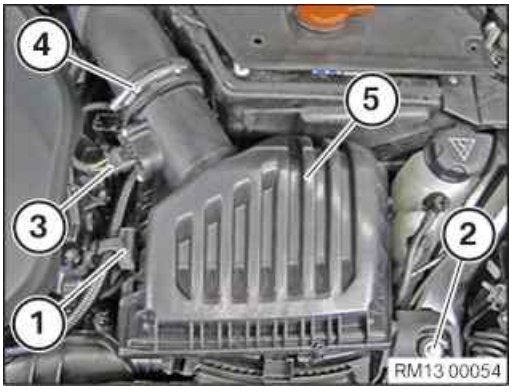

- Guide out fan cowl (1) in direction of arrow and remove.

**4 – Remove the intake neck for intake silencer housing**



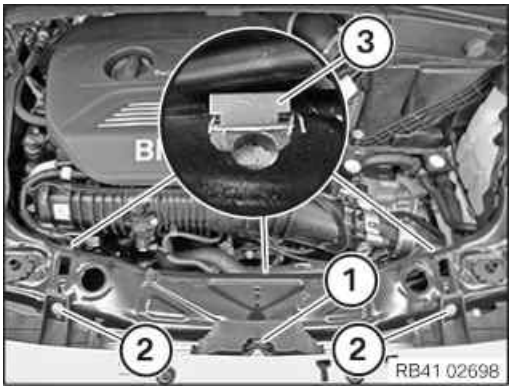

- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

**5 – Removing intake silencer housing**



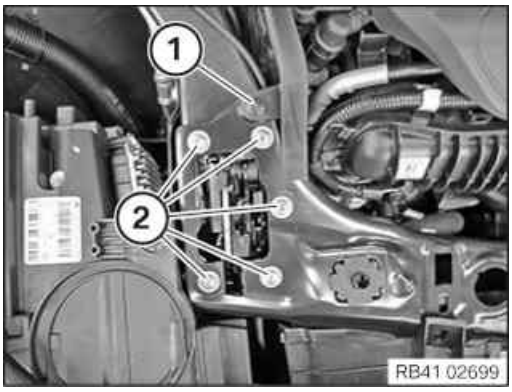

- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

**6 – Remove cross connection**

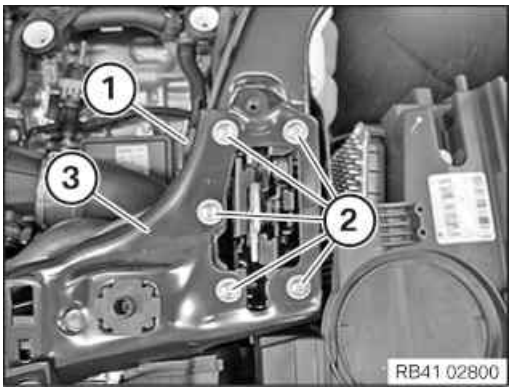



- Loosen screws (1) and (2).
- Detach clamps (3) for bonnet lock Bowden cable.

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- Lever out expanding rivet (1).
- Loosen screws (2).



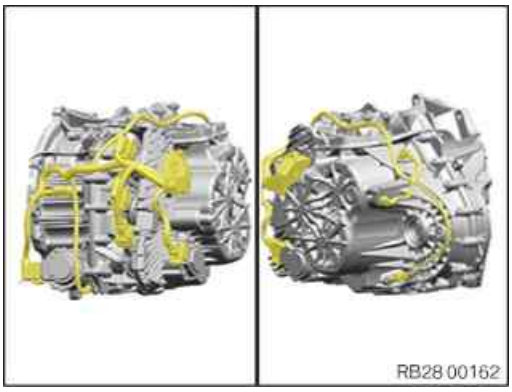

- Lever out expanding rivet (1).
- Loosen the screws (2) and remove the cross connection (3).

## MAIN WORK

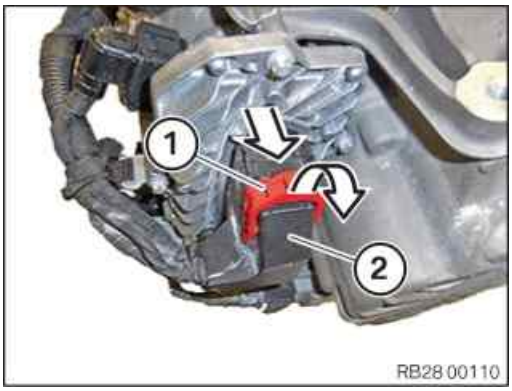
### 7 – Removing the wiring harness (7DCT300)

**TECHNICAL INFORMATION**

It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the wiring harness.

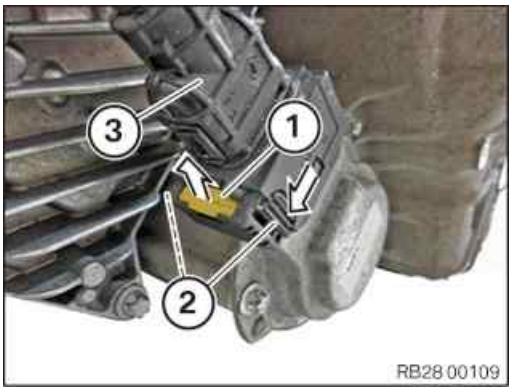



- Wiring harness

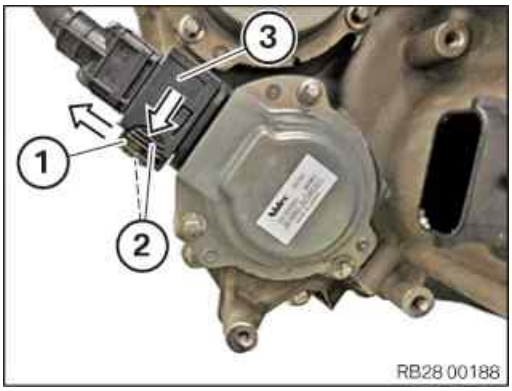



- Fold down the red lever (1) in the direction of the arrow and pull off the connector from the TCU control unit (2).

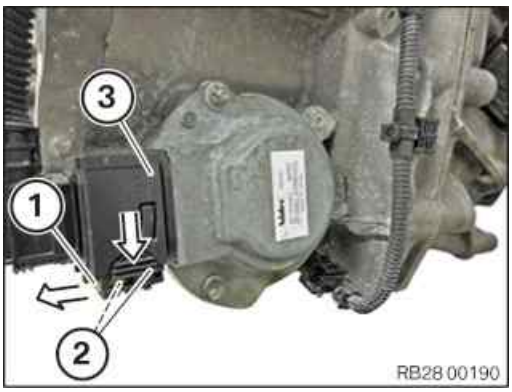
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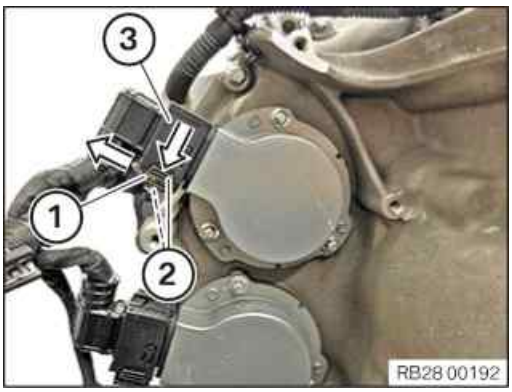

- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connector from the e-motor for cooling pump (3).



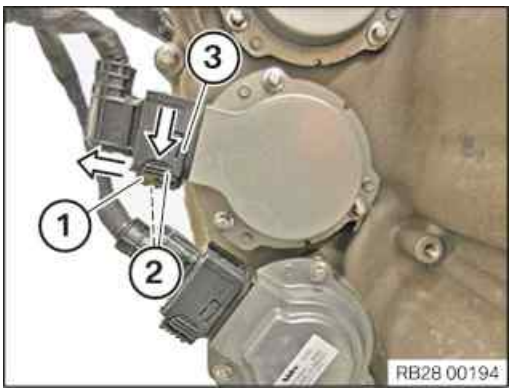

- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off connector (3) from the e-motor for clutch actuator 2.




- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off connector (3) from the e-motor for clutch actuator 1.

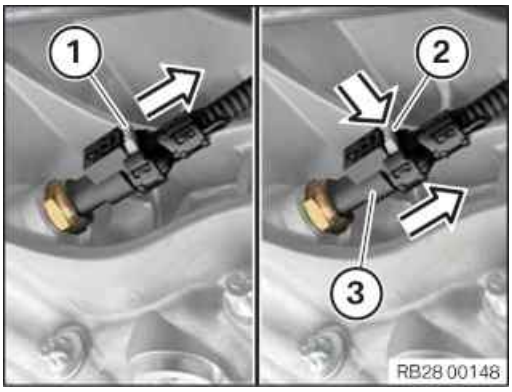



- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connector from the e-motor for shift drum (3).

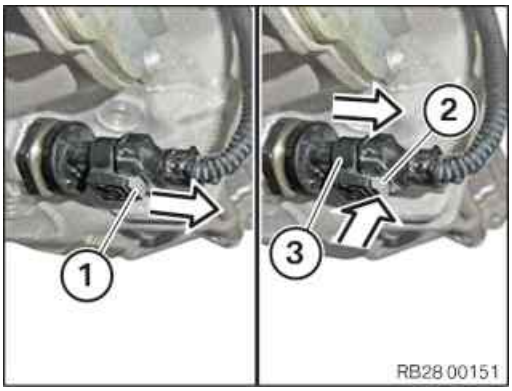



- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) left/right in the direction of the arrow.
- Pull off the connector from the e-motor for shift drum 1 (3).

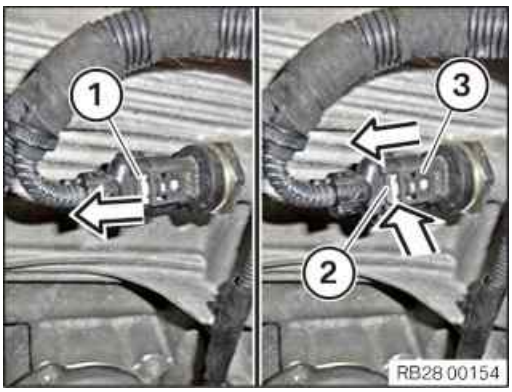
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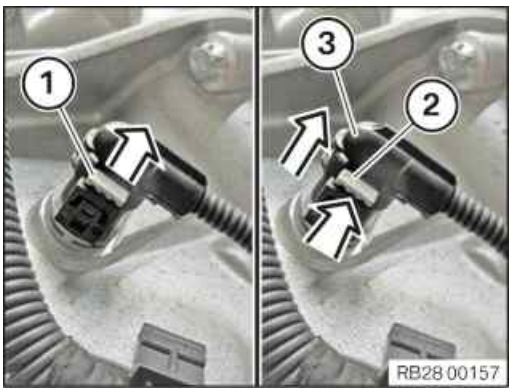

- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) in the direction of the arrow.
- Pull off the connector from temperature sensor (3).



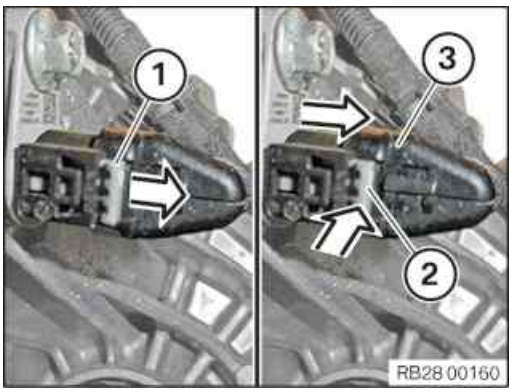

- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) in the direction of the arrow.
- Pull off the connector from pressure sensor (3).




- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) in the direction of the arrow.
- Pull off the connector from pressure sensor (3).

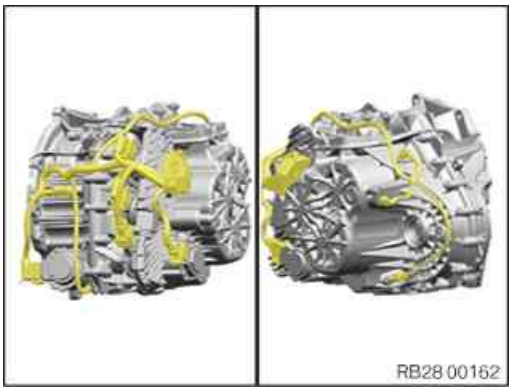



- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) in the direction of the arrow.
- Pull off connector (3) from output speed sensor 2.




- Unlock connector fastener (1) in the direction of the arrow.
- Press and unlock connector fastener (2) in the direction of the arrow.
- Pull off connector (3) from output speed sensor 1.

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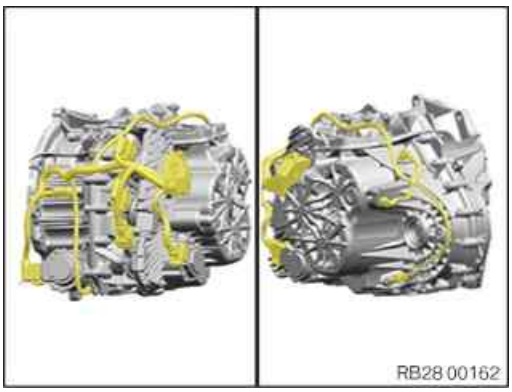



- Remove vehicle wiring harness with plug connections and retaining clips.

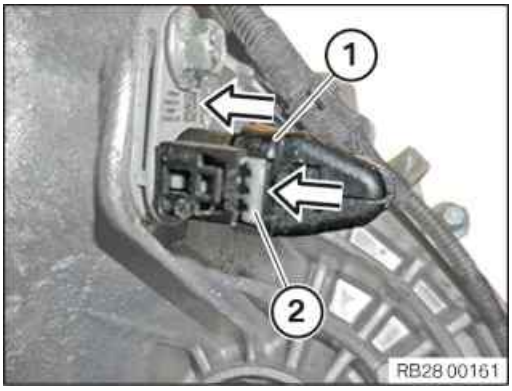
**8 – Installing wiring harness (7DCT300)**

**TECHNICAL INFORMATION**

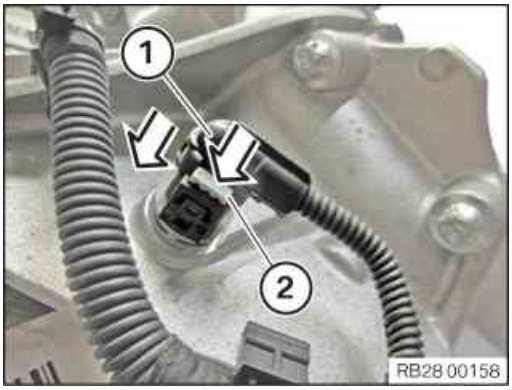
It is essential to adhere to conditions of absolute cleanliness.
Any dirty parts must be cleaned before removing the wiring harness.




- Remove vehicle wiring harness with plug connections and retaining clips.

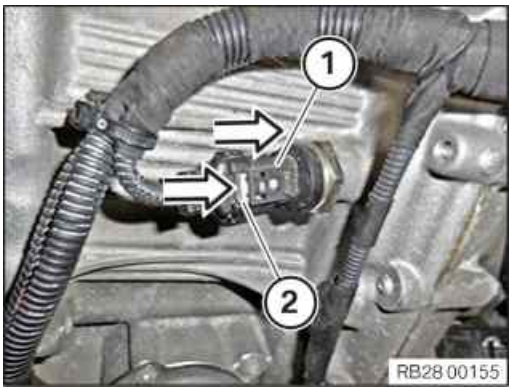



- Install connector from output speed sensor 1 (1).
- Press connector fastener (2) in direction of arrow till it engages.

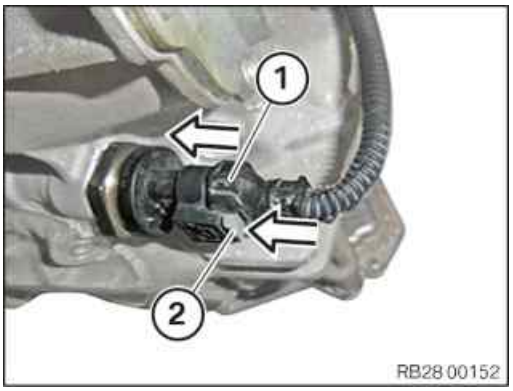



- Install connector from output speed sensor 2 (1).
- Press connector fastener (2) in direction of arrow till it engages.

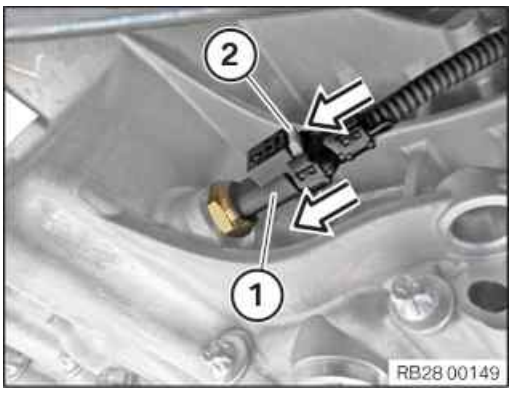
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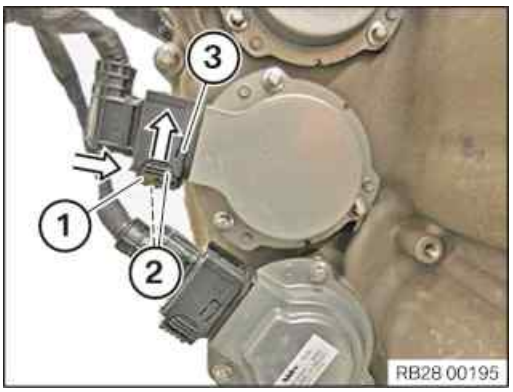

- Install connector from pressure sensor 2 (1).
- Press connector fastener (2) in direction of arrow till it engages.



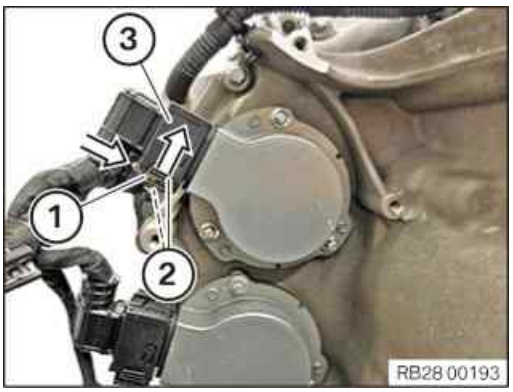

- Install connector from pressure sensor 1 (1).
- Press connector fastener (2) in direction of arrow till it engages.




- Install connector from temperature sensor (1).
- Press connector fastener (2) in direction of arrow till it engages.

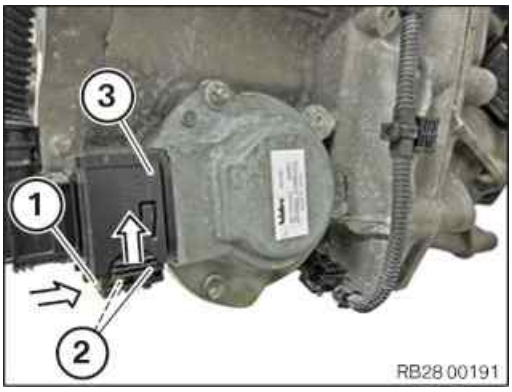



- Install connector from the electric motor for shift drum 1 (3).
- Press connector fastener (2) on the left/right in direction of arrow until the connector (3) engages completely.
- Press connector fastener (1) in direction of arrow till it engages.

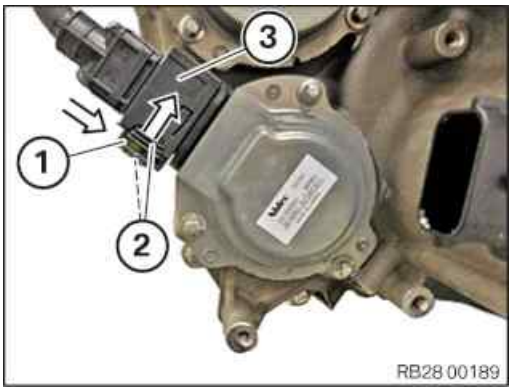



- Install connector from the electric motor for shift drum (3).
- Press connector fastener (2) on the left and right in direction of arrow and unlock.
- Press connector fastener (2) on the left/right in direction of arrow until the connector (3) engages completely.

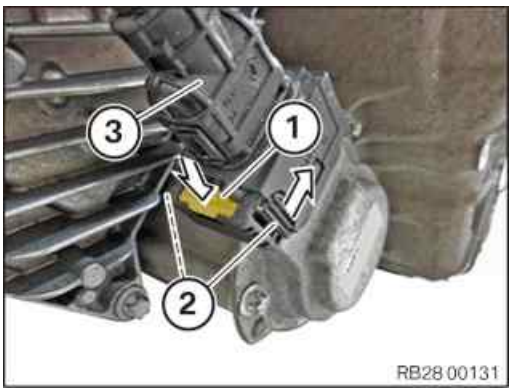
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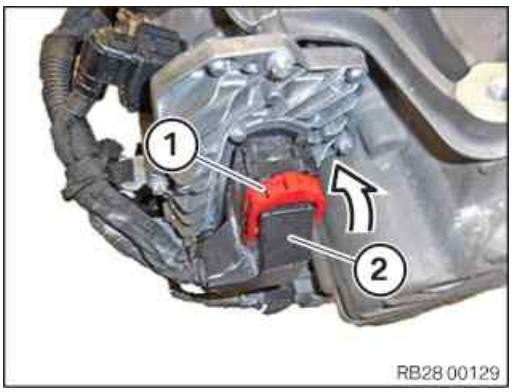

- Install connector of the electric motor for clutch actuator (3).
- Press connector fastener (2) on the left/right in direction of arrow until the connector fastener (3) engages completely.
- Press connector fastener (1) in direction of arrow till it engages.




- Install connector of the electric motor for clutch actuator 1 (3).
- Press connector fastener (2) on the left/right in direction of arrow until the connector (3) engages completely.
- Press connector fastener (1) in direction of arrow till it engages.




- Install connector of the electric motor for cooling pump (3).
- Press connector fastener (2) on the left/right in direction of arrow until the connector (3) engages completely.
- Press connector fastener (1) in direction of arrow till it engages.




- Install connector for the TCU control unit (2) and fold the red lever (1) down to the limit position in direction of arrow.

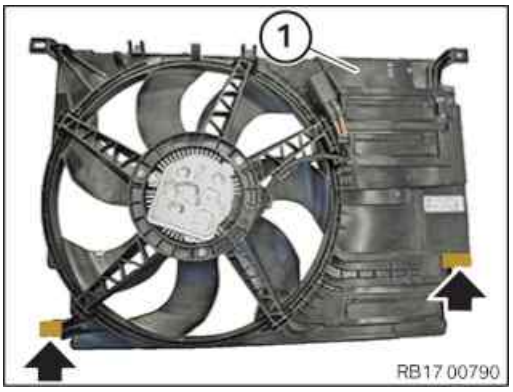
## POSTPROCESSES

### 9 – Installing fan cowl with electric fan

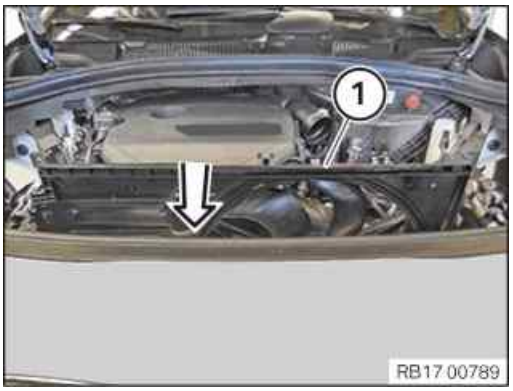
**TECHNICAL INFORMATION**

Make sure that the connections are locked correctly. The locks must engage audibly.

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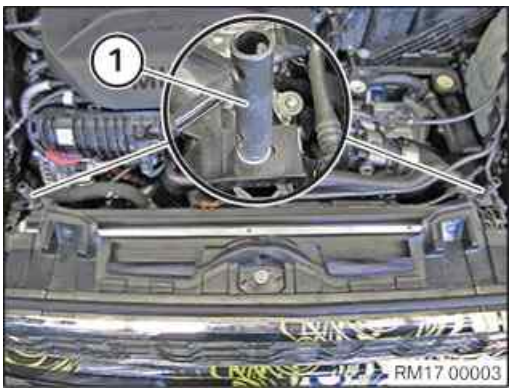

- Feed the guides (arrows) of the fan cowl (1) into the charge air cooler.




- Feed in and install the fan cowl (1) in the direction of the arrow.



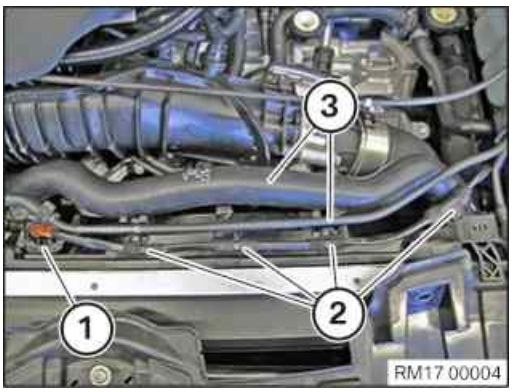

- Lock the left and right locks (arrows).




- Tighten the screws (1).

**Fan cowl on radiator**

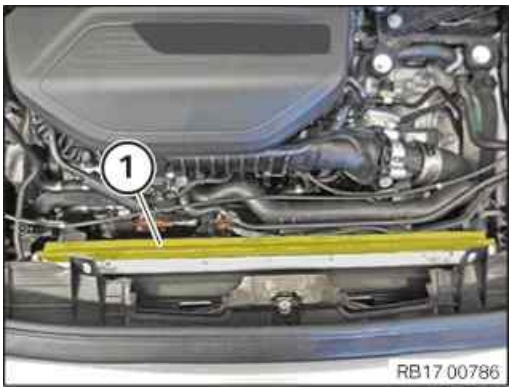
| | | | |
|---|---|---|---|
| M6X12 | | Tightening torque | 6 Nm |




- Connect connectors (1) and lock.

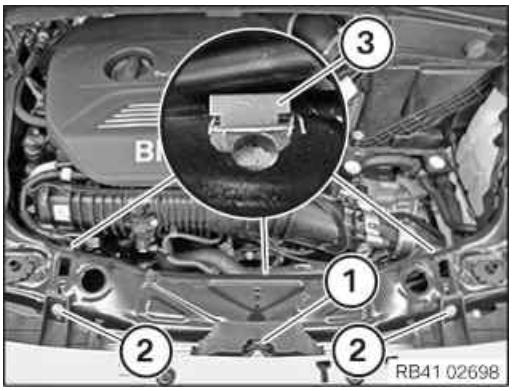
  The connector (1) must engage audibly.
- Secure clamps (2).
- Thread in and install coolant line (3).

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- Guide the sealing (1) on the radiator in and install it.

**10 – Install cross connection**




- Install cross connection.
- Position all screws.
- Tighten down screw (1).

**Bracing strut to top cross connection**

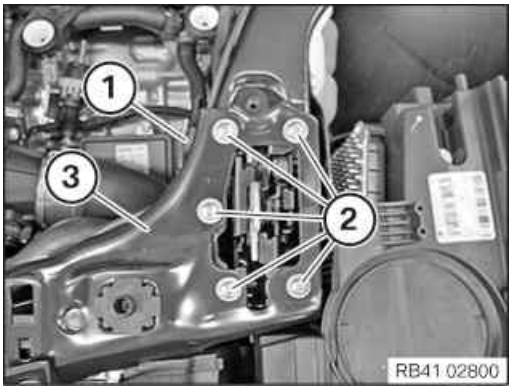
| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

- Tighten down screws (2).

**Air duct to deformation element/cross connection**

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

- Fasten clamps (3) for bonnet lock Bowden cable to cross connection.

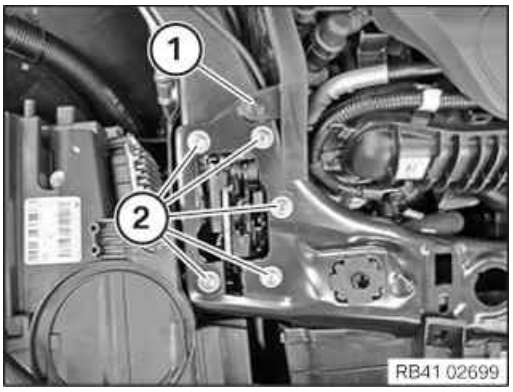



- Tighten screws (2) of cross connection (3).

**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).




- Tighten down screws (2).

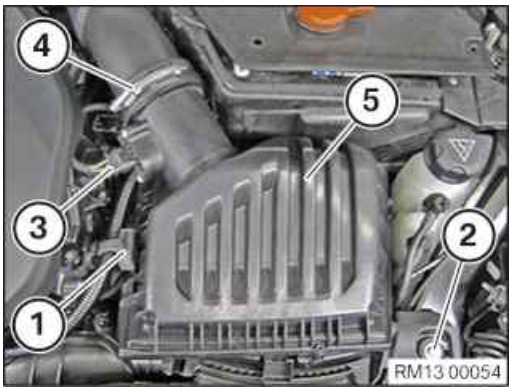
**Cross connection on support for cross connection**

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

- Fasten expanding rivet (1).

**11 – Installing intake silencer housing**

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

**Intake silencer housing to lock bridge**

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

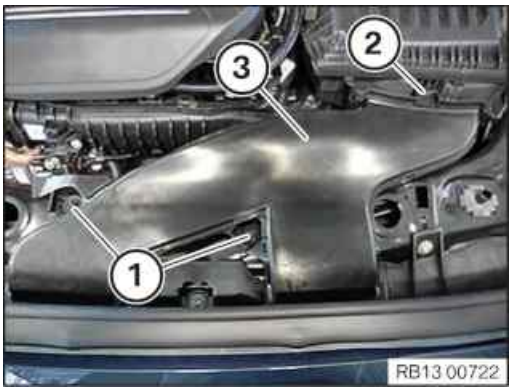
- Tighten clamp (4).

**Clean air pipe to intake silencer housing**

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

### 12 – Install the intake neck for the intake filter housing

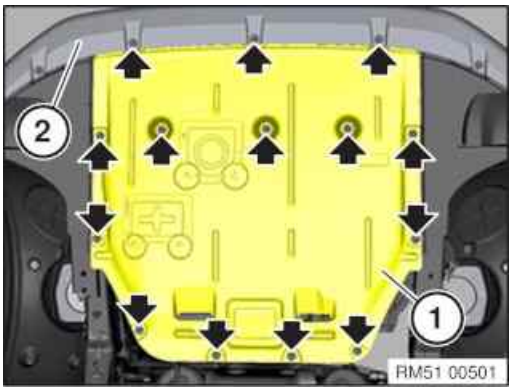



- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

**Intake neck to cross connection**

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

### 13 – Installing the front underbody protection




- Guide the front underbody protection (1) in under the bumper panel (2) and position it at the screw points.
- Tighten screws (arrows).

**Underbody protection front**

| | | | |
|---|---|---|---|
| | | | 3 Nm |

### 14 – Disconnecting all battery earth leads




- See additional information.

## Additional Information

### Overview of Tightening Torques

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**Fan cowl on radiator** — Used in step 9

| | | | |
|---|---|---|---|
| M6X12 | | Tightening torque | 6 Nm |

**Bracing strut to top cross connection** — Used in step 10

| | | | |
|---|---|---|---|
| M8 | | Tightening torque | 25 Nm |

**Air duct to deformation element/cross connection** — Used in step 10

| | | | |
|---|---|---|---|
| M6x20 screw | | Tightening torque | 6 Nm |

**Cross connection on support for cross connection** — Used in step 10

| | | | |
|---|---|---|---|
| M6x20 | | Tightening torque | 12 Nm |

**Intake silencer housing to lock bridge** — Used in step 11

| | | | |
|---|---|---|---|
| M6X30 | | Tightening torque | 8 Nm |

**Clean air pipe to intake silencer housing** — Used in step 11

| | | | |
|---|---|---|---|
| Clamp | | Tightening torque | 3 Nm |

**Intake neck to cross connection** — Used in step 12

| | | | |
|---|---|---|---|
| M6 | | Tightening torque | 8 Nm |

**Underbody protection front** — Used in step 13

| | | | |
|---|---|---|---|
| | | | 3 Nm |

## Links

| Repair instructions | Used in step |
|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 14 |
| 61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
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| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 14 |

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| | | |
|---|---|---|
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |
| 61 20 900 Disconnecting and connecting battery earth lead | 1 | 14 |


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