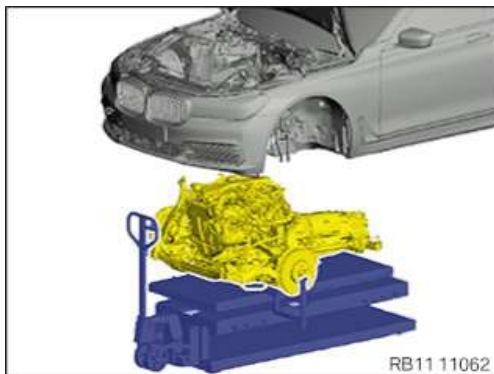


11 12 504 Disassemble and assemble cylinder head

PRELIMINARY WORK

1 – Remove the front axle completely with the engine and transmission



- See additional information.

2 – Removing starter motor



WARNING

Hot surfaces.

Risk of burning!

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



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

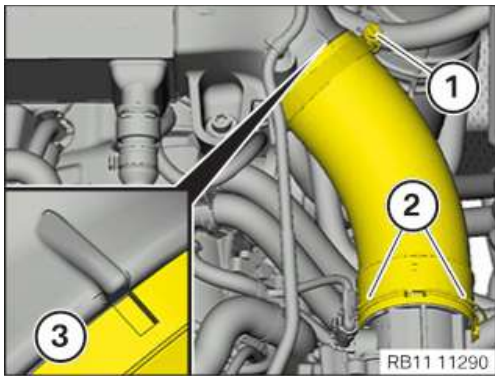


Electrostatic discharge.

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.





- Attach the pressure pipe to the charge air cooler so that the marks (3) are aligned.
- Connect the pressure pipe to the throttle body.
- Lock the lock (2) on both sides.



TECHNICAL INFORMATION

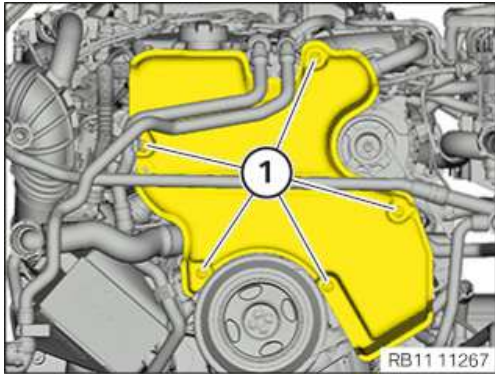


- Note the installation position of the component. The component may be installed in various installation positions.
- Position and tighten the clamp (1) as shown.

Clamp on charge air line

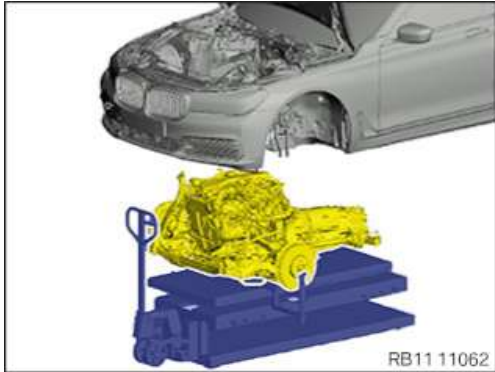
Clamp		Tightening torque	6 Nm
-------	--	-------------------	------

54 – Install the acoustic cover for the engine at the front



- Position the acoustic cover and secure the expanding rivets (1).

55 – Installing the complete front axle including engine and transmission



- See additional information.

Additional Information

Overview of Tightening Torques

Cylinder head cover to cylinder head			Used in step	28
M6x27		Tightening torque		10 Nm
Engine wiring harness to cylinder head cover			Used in step	28
TS5x20		Tightening torque		3,6 Nm
Camshaft sensor to cylinder head cover			Used in step	28
TS5x20		Tightening torque		3,5 Nm





RISK OF DAMAGE

Damage of components in the engine compartment.

When removing the transmission, tilting of the engine may damage components in the engine compartment.

- Before removing the transmission: Support engine.
- Secure the engine against tilt movements.
- Follow the specifications of the repair instructions.



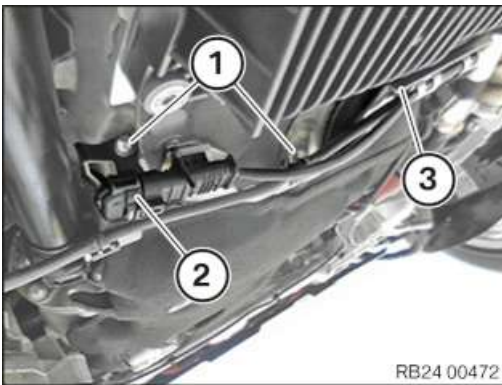
RISK OF DAMAGE

Damage to the transmission.

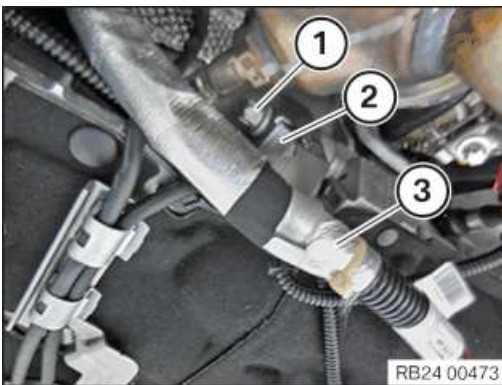
Damage to the transmission through unapproved transmission oil.

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

► Removing the holder

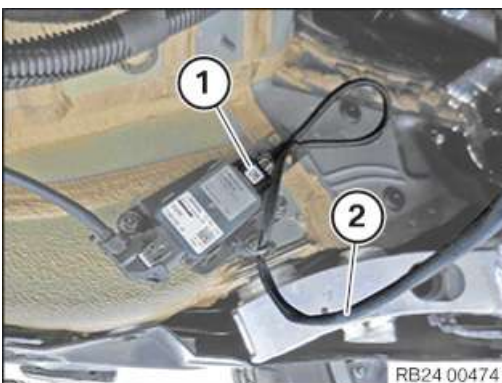


- Loosen screws (1).
- Disconnect the connector (2) .
- Remove holder (3).



- Detach the line (3) from the holder (2).
- Loosen screw (1).
- Remove holder (2).

► Disconnect plug connection



- Disconnect the connector (1) .
- Hang line (2) on one side.





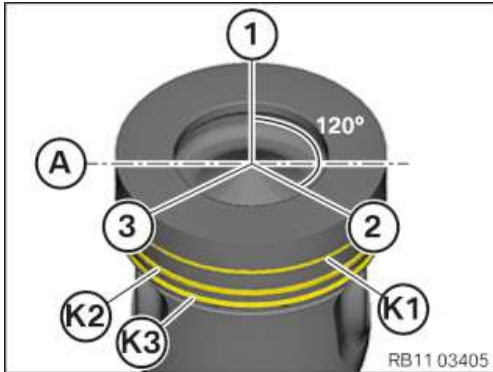
TECHNICAL INFORMATION

Piston, gudgeon pin, connecting rod and connecting rod bearing shells are matched to each other and balanced.

Always install the piston, gudgeon pin, connecting rod and connecting rod bearing shells in the cylinder from which they were removed.

- Insert the light connecting rod bearing shell (2) into the connecting rod bearing cap (1).
- Oil the connecting rod bearing shell (2).

62 – Aligning piston rings



•

Position number	Description
1	12 o'clock position
2	4 o'clock position
3	8 o'clock position
A	Axis of gudgeon pin
K1	1. Piston ring (plain rectangular compression ring)
K2	2. Piston ring (taper faced piston ring)
K3	3. Piston ring (oil scraper ring with spiral expander)

Align the contact points of all piston rings by 120 ° each.

Do not position contact points over axis of gudgeon pin (A).

Piston ring	Align at the following position
Plain rectangular compression ring (K1)	Align at the 12 o'clock position (1)
Taper faced piston ring (K2)	Align at the 4 o'clock position (2)
Oil scraper ring with spiral expander (K3)	Align at the 8 o'clock position (3)

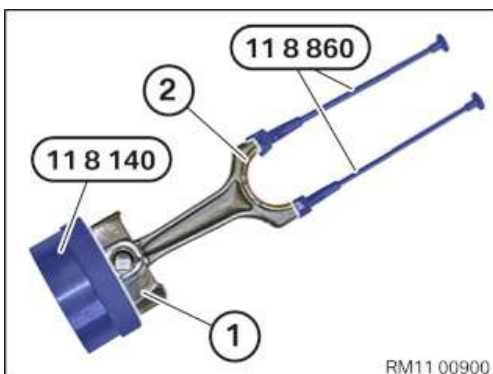
63 – Installing piston with connecting rod



TECHNICAL INFORMATION

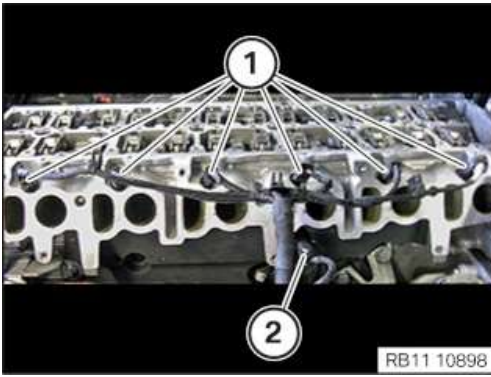
Piston, gudgeon pin, connecting rod and connecting rod bearing shells are matched to each other and balanced.

Always install the piston, gudgeon pin, connecting rod and connecting rod bearing shells in the cylinder from which they were removed.



- Coat the pistons (1) and piston rings lightly with oil.
- Mount the special tool on the piston (1).
- Screw the special tool in on the large connecting rod eye (2).





- Connect the connector (1) to the glow elements.
- Connect the connector (2) to the combustion chamber pressure sensor.

74 – Installing the hydraulic valve clearance compensating element



RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.



- Install the hydraulic valve clearance compensating element (1) in the direction of the arrow.
- Repeat the process on all hydraulic valve clearance compensating elements.

75 – Install the roller cam followers



RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.



0 496 733 (00 6 080) Hook

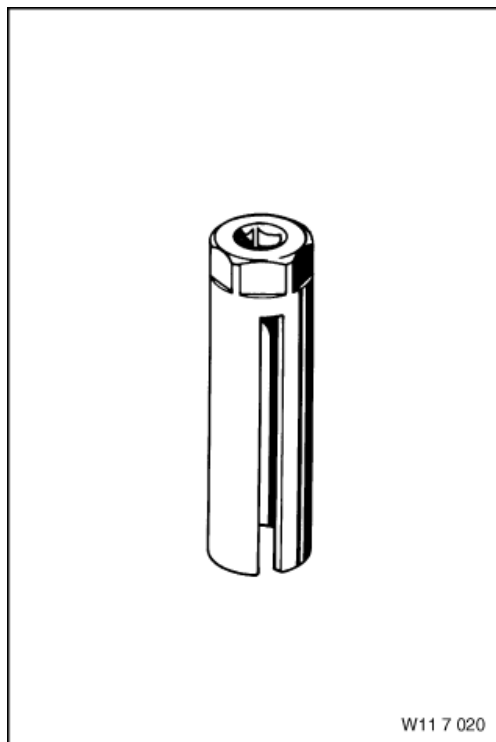


Common

Used in step 1696

Usage	Hook with chain (carrying capacity 440 kg). For fixing the engine to the front suspension lug on the engine.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	00 6 100 = 0496852
SI-Number	01 16 09 (572)

0 491 074 (11 7 020) Socket wrench insert

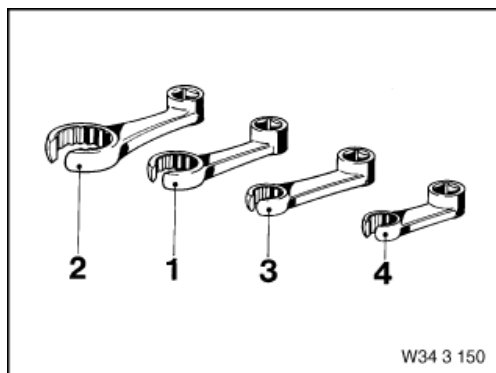


Common

Used in step 2488

Usage	(Socket wrench insert 22 mm) For loosening and tightening the oxygen sensor
Included in the tool or work	
Storage location	A9
Replaced by	
In connection with	
SI-Number	

0 492 479 (34 3 153) Ring spanner



Common

Used in step 2488

Usage	(Ring spanner 14 mm)
Included in the tool or work	0 492 476
Storage location	B42
Replaced by	
In connection with	
SI-Number	

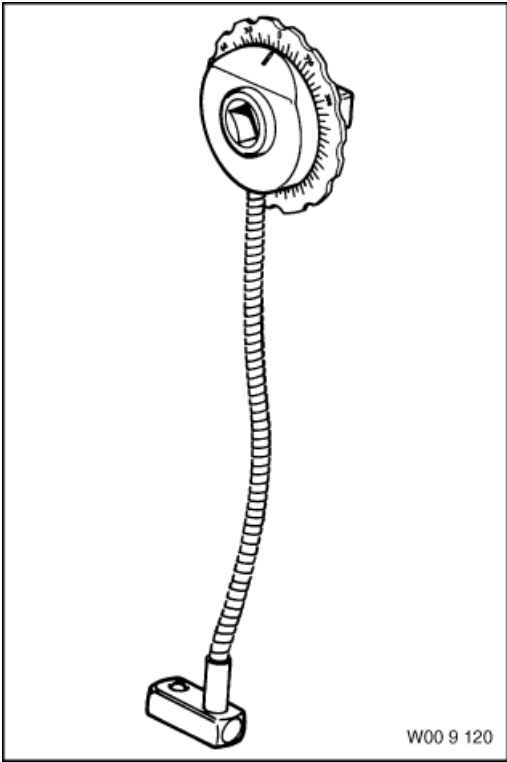


0 496 733 (00 6 080) Hook



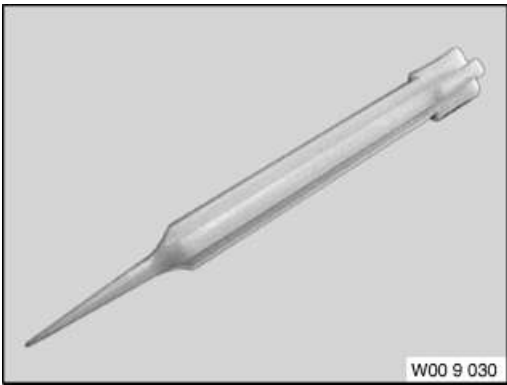
Common		Used in step	1429
Usage	Hook with chain (carrying capacity 440 kg). For fixing the engine to the front suspension lug on the engine.		
Included in the tool or work			
Storage location	Individual		
Replaced by			
In connection with	00 6 100 = 0496852		
SI-Number	01 16 09 (572)		

0 490 504 (00 9 120) Torque angle measuring dial



Common		Used in step	2224
Usage	For torsion angle adjustment of cylinder head bolts (all engines) And reinforcement plate front axle support E46		
Included in the tool or work			
Storage location	A4		
Replaced by			
In connection with			
SI-Number			

0 496 714 (00 9 030) Wedge



Common		Used in step	23242627283032374041
Usage	For dismantling O-rings, gaskets and trim panels. This special tool replaces special tool 00 9 316.		
Included in the tool or work			
Storage location	A50		
Replaced by			
In connection with			
SI-Number	01 20 09 (581)		

Links

Functional descriptions	Used in step
Exhaust-gas recirculation control	538
Low-pressure exhaust-gas recirculation	538
Cooling circuit	538

11 61 350 Removing and installing/replacing pressure pipe

PRELIMINARY WORK

1 – Removing the 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 $>20^{\circ}\text{C}$.
- Use only distilled water as an auxiliary material during installation, no lubricants.



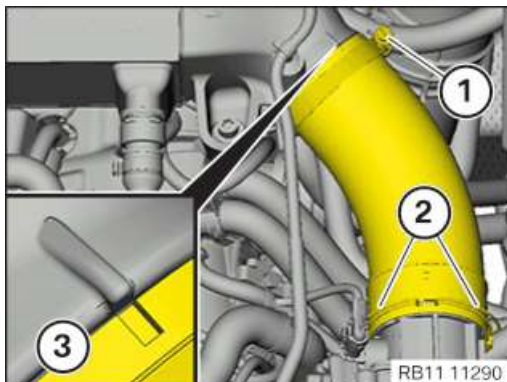
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

MAIN WORK

2 – Remove the pressure pipe between the throttle body and the charge air cooler



- Unlock the pressure pipe (arrow).
You must be able to hear the lock (1) engage when unlocking.



- Slacken the clamp (1).
- Unlock lock (2) on both sides.
- Pull the pressure pipe off the throttle body and the charge-air cooler and remove.

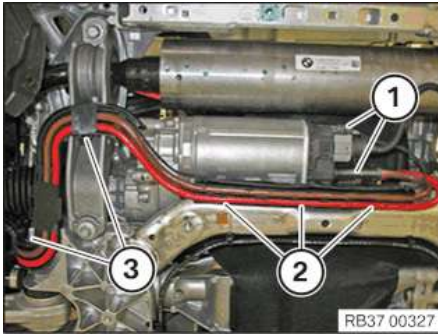
3 – Installing pressure pipe between throttle body and charge air cooler



42 – Detach the wiring harness of the Electronic Power Steering (EPS) from the front axle support

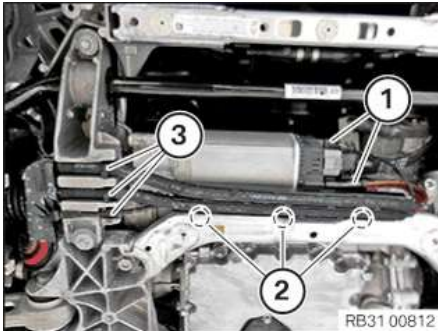
► Version A of right retaining bracket: Release wiring harness

- Unlock and disconnect plug connections (1).
- Release the vehicle wiring harness from the front axle support in area (2).
- Release the vehicle wiring harness in the area (3).
- Place wiring harness to one side.

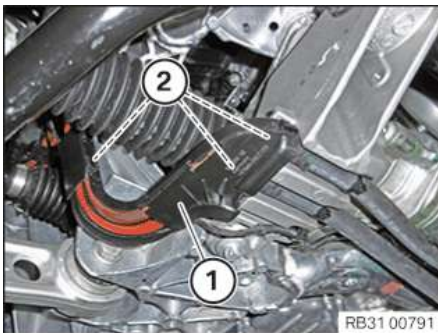


► Variant B of the right retaining bracket: Release wiring harness

- Unlock and disconnect plug connections (1).
- Detach the wiring harness in area (2) from the front axle support.
- Disconnect wiring harness (3) from retaining bracket.



- Detach wiring harness (1) in area (2).
- Place wiring harness (1) to one side.



43 – If installed: Disconnect the vacuum hose of the engine mount on the front axle support

- Loosen the vacuum hose (1) from the T-piece of the vacuum line.



44 – Remove the bracing strut from the engine mount on the left and right

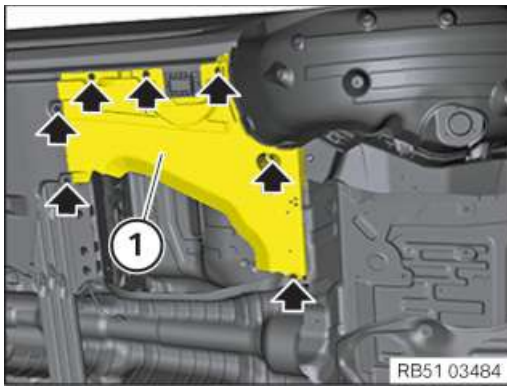


NOTICE

Description is for left component only. Procedure on the right side is identical.

► Remove the bracing strut for the engine mount





NOTICE

Description is for left component only. Procedure on the right side is identical.

- Insert and install tank cover (1).
- Tighten screws (arrows).

Underbody panelling

Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

► For dual-flow exhaust system: Install the left-hand torsion strut

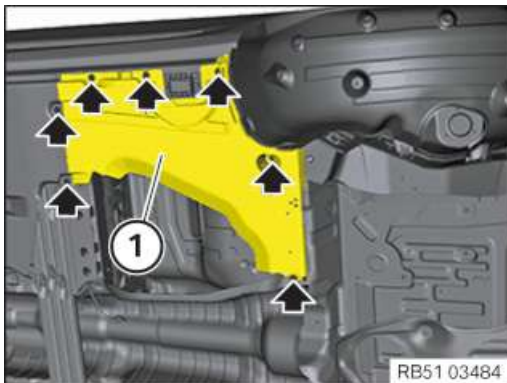
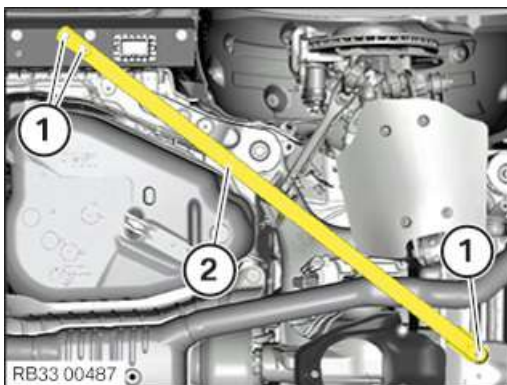
- Guide in and install torsion strut (2).
- Renew screws (1).

Parts: Bolts

- Tighten the screws (1).

Torsion struts on mounting

M12	Renew screws.	Tightening torque	100 Nm
		Angle of rotation	90 °

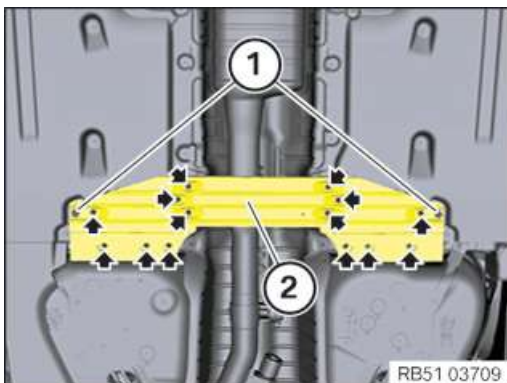


- Insert and install tank cover (1).
- Tighten screws (arrows).

Underbody panelling

Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

19 – Install the connecting supports on the tunnel



• Version 1:

Install the connecting support (2) on the tunnel.

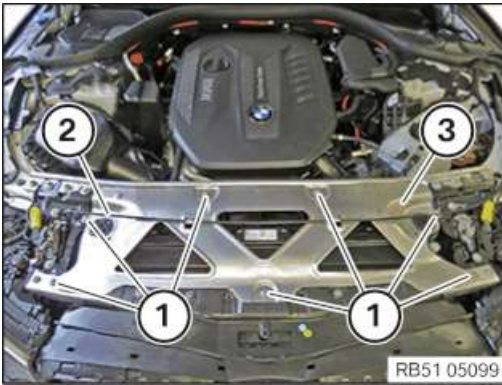
Tighten screws (arrows).

Tighten the screws (1).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm





- Loosen screws (1).
- Detach the cable (2).
- Feed out the front cross connection (3) toward the top.

► Remove the rear top cross connection

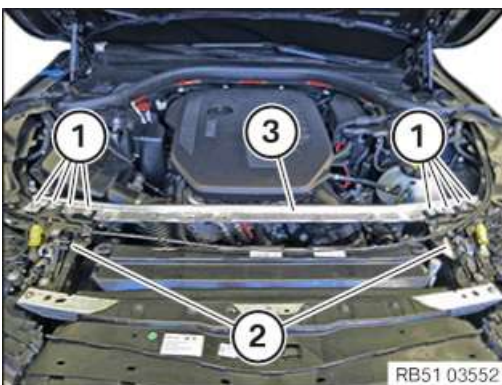


RISK OF DAMAGE

Scratches.

Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.



- Loosen screws (1).
- Lift the support (2) of the left bonnet lock slightly and feed out the rear cross connection (3) to the rear.
- Lift the support (2) of the right bonnet lock slightly and feed out the rear top cross connection (3) to the rear and remove.

► Removing the fan cowl with electric fan

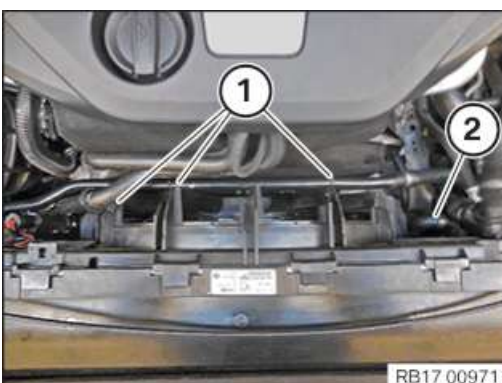


WARNING

Hot surfaces.

Risk of burning!

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



- Release coolant lines (1) and place to one side.
- Feed out coolant line (2) and place to one side.



Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	177
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	177
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
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61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
61 20 900 Disconnecting and connecting battery earth lead	177
00 ... Raising the vehicle using a vehicle hoist	

Operating materials	Used in step
Main group 31	49

Parts

Parts required

Designation	Used in step
Propeller shaft bolts to front axle differential	42
Front axle support bolts to body	44
Bolts	68



0 495 229 (36 1 332) Wheel stud



Common		Used in step	1
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

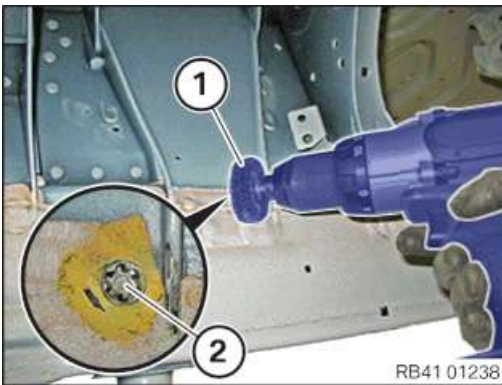


Common		Used in step	1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344		
Included in the tool or work	0 492 518		
Storage location			
Replaced by			
In connection with			
SI-Number			

Links

Overview: Technical data	Used in step
3300 Overview of Technical Data	4
Repair instructions	Used in step
00 ... Raising the vehicle using a vehicle hoist	





- Remove the sealant with a wire brush attachment (1).
- Completely remove the sealant from the screw head (2).



- Vertically position the battery-powered drill (1) using special tool [2 411 349](#) on the self-tapping screw and release the self-tapping screw.

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3 – Removing damaged self-tapping screws

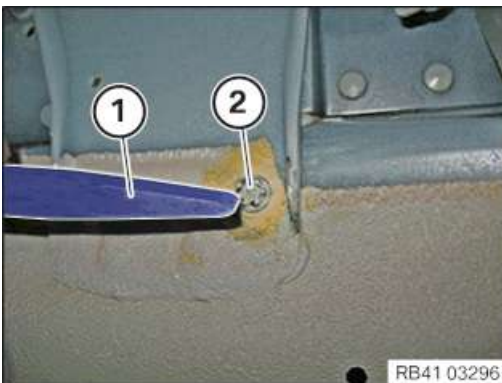
Prerequisite

Sealant has been removed from the screw head.

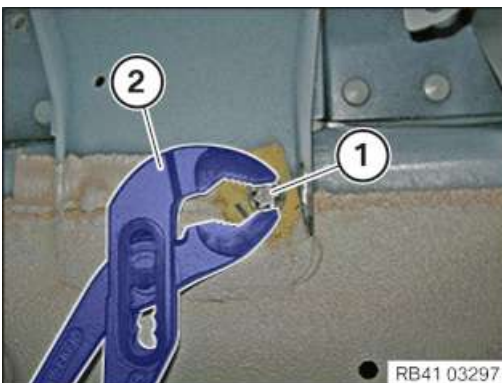


NOTICE

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



- Position the chisel (1) on the side of the screw head.
- Loosen the screw (2) by hitting it with a hammer.
- Repeat the process until the screw (2) has turned by approximately 90°.

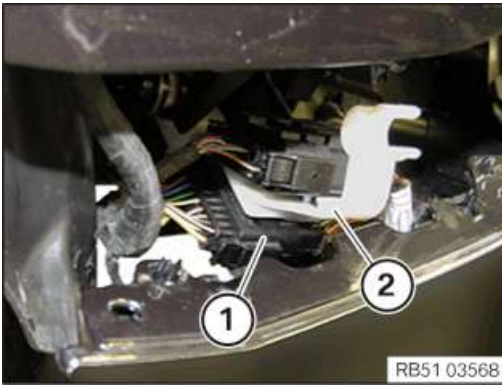


- Remove the screw (1) using pliers (2).

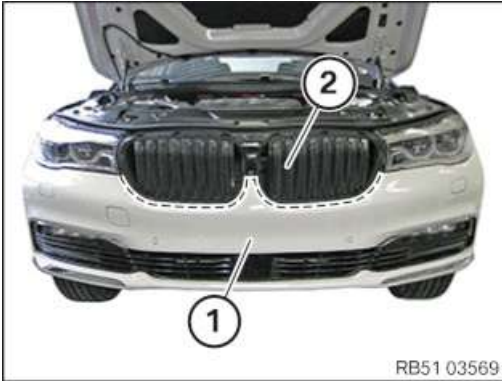
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4 – Remove wheel arch





- Unlock plug connection (1) on the right and disconnect.
 - Detach the plug (1) from holder (2).
 - Unlock and disconnect the hose for the headlight cleaning system.
 - Place the hose to the top and fix.
- This will prevent washer fluid from exiting.



- Undo the bumper panel (1) in the area of the active air-flap control (2) from the mountings.
- Pull the bumper panel (1) slightly forward and disconnect any other plug connections as needed.
- Remove bumper panel (1) towards front.

4 – Install bumper panel, front

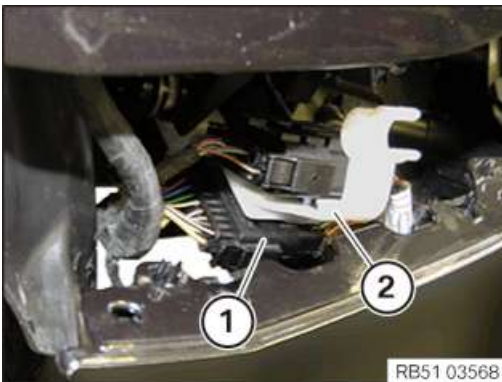


NOTICE

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



- Install the bumper panel (1).
- Engage the bumper panel (1) in the area of the upper active air-flap control (2) in the mountings.



- Connect the connector (1) on the right side.
- Attach plug connection (1) in holder (2).
- Connect the hose for the headlight cleaning system.

