22 11 011 Replacing left engine mount

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

Damage to battery terminal, the safety battery terminal or the intelligent battery sensor (IBS).

Damaged battery terminals can lead to malfunctions or vehicle electrical system faults.

- Pull off battery terminal from battery pole by carefully moving to and fro. Do not pry off using a tool.

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

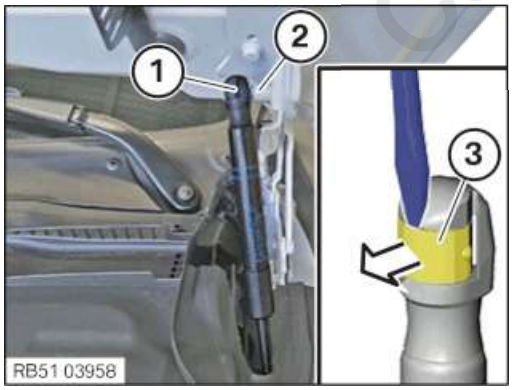
Engine compartment lid is open.

CAUTION

Shutting bonnet or tailgate.

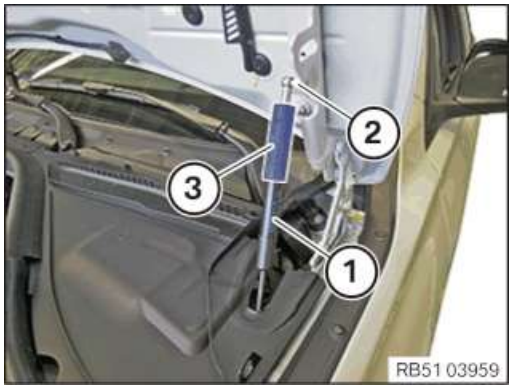
Danger of injury!

- 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.

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TECHNICAL INFORMATION

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

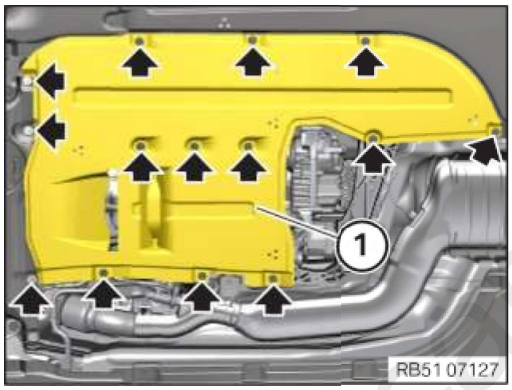
- Remove the bonnet support and open the bonnet further.
- Push special tool or (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

2 – Disconnecting all battery earth leads



- See additional information.

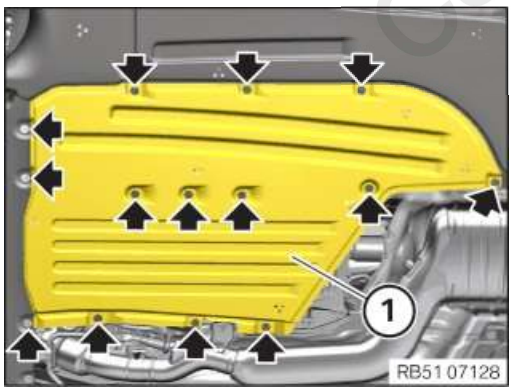
3 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



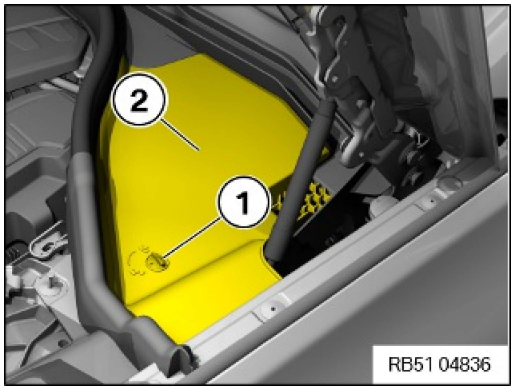
- **Version 2:**

  Remove screws (arrows).

  Guide out rear underbody protection (1) and remove it.

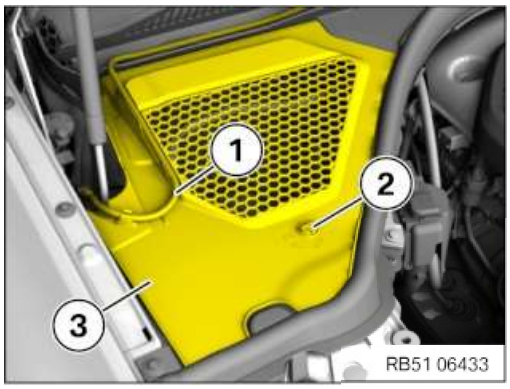
4 – Remove the cover of the engine compartment at the rear left

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- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

5 – Remove the cover of the rear right engine compartment

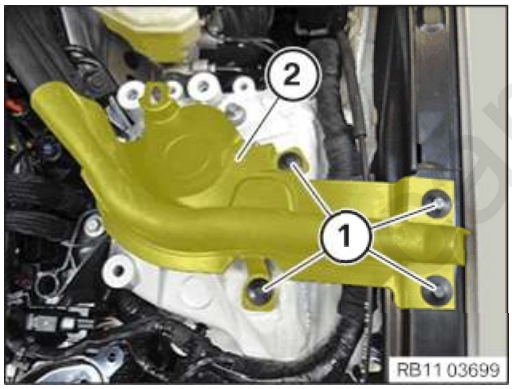


- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover of rear right engine compartment (3).

6 – Removing side bonnet gaskets

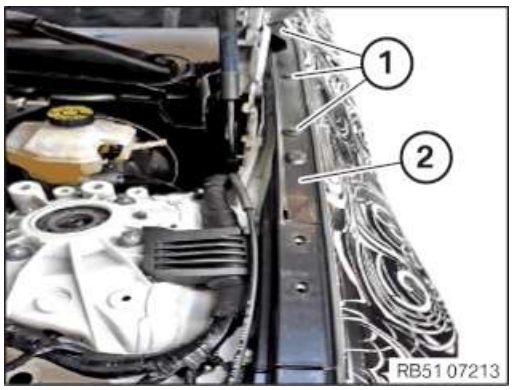
NOTICE

Perform the operations on the left and right side.



- Loosen the rivet (1).
- Remove side bonnet seal (2) from spring strut dome.

7 – Remove sealing of the side panel



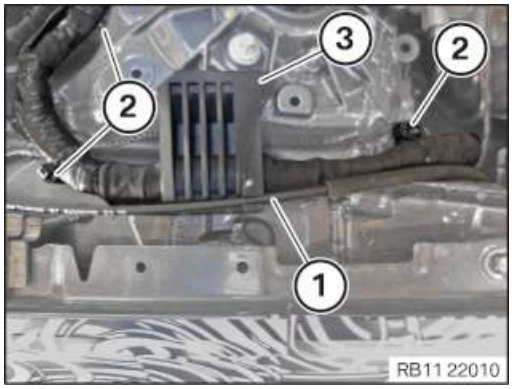
NOTICE

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

- Loosen the expanding rivet (1).
- Guide out seal (2) and remove.

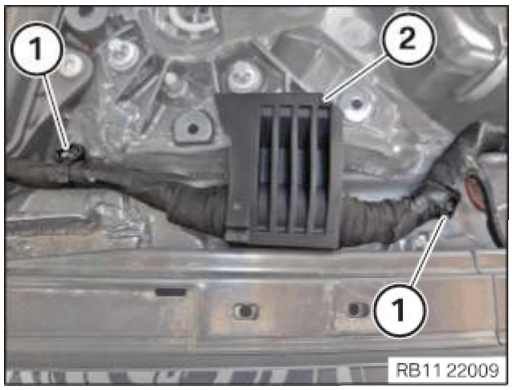
8 – Partially loosen the wiring harness section on the spring strut dome

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- Feed out the cable (1) of the front flap and set it aside.
- Loosen clamps (2).
- Feed out wiring harness section (3) on the spring strut dome on left and set it aside.

9 – Releasing the wiring harness section on the right spring strut dome



- Loosen clamps (1).
- Guide out wiring harness section (2) on the right spring strut dome and set it aside.

10 – 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.

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- Unclip the acoustic cover (1) from the holders in the **marked** areas towards the top.

11 – Removing the clean air pipe with the resonator

WARNING

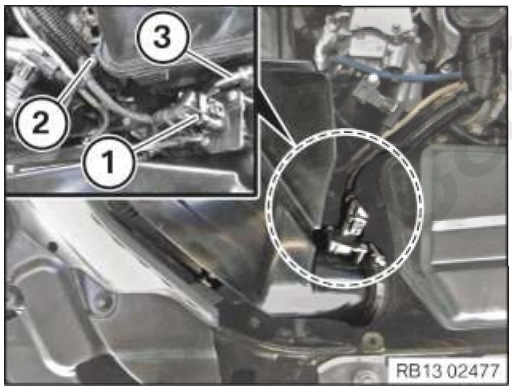
Hot surfaces.

Risk of burning!

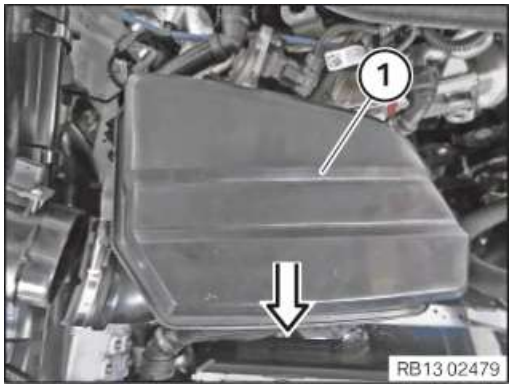
- Perform all work only on components that have cooled down.



- Unlock the locks (1).
- Feed the engine ventilation line (2) out and set it aside.

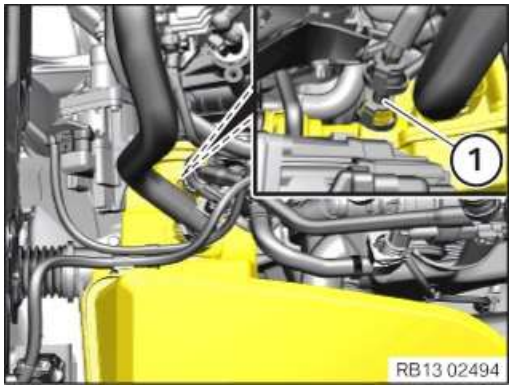


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

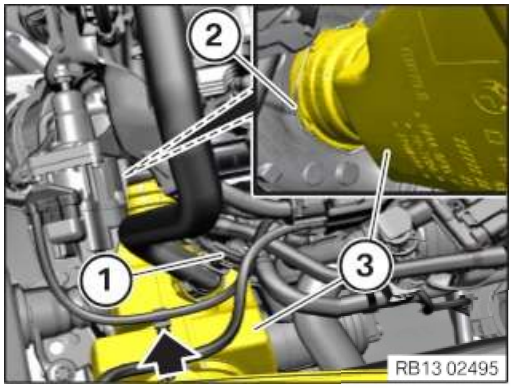


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

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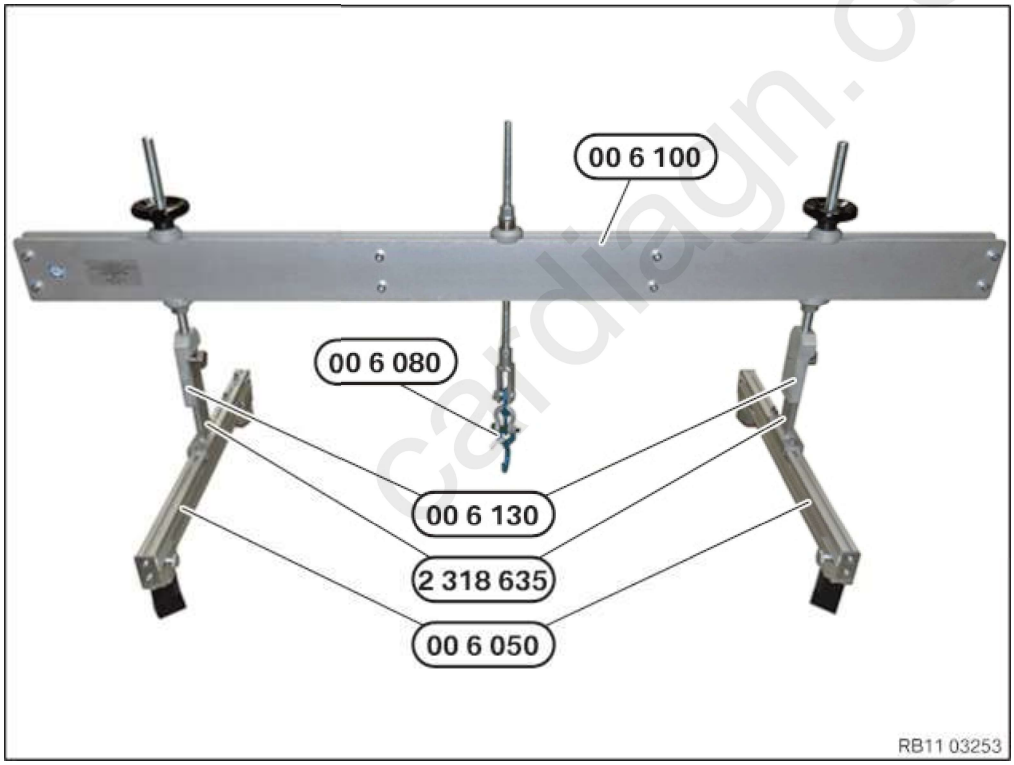
- Unlock and disconnect the tank ventilation line (1).



- Loosen the clamp (arrow).
- Unlock plug connection (1) and disconnect.
- Unlock the clamp (2).
- Feed out clean air pipe with resonator (3) and remove.

12 – Securing engine in installation position

Overview: Prepared engine bridge



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.

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- 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



- **Carefully** position engine bridge (1) with help from an auxiliary person.



- Make sure that special tool on the left is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , left, rests correctly on the spring strut dome.



- Make sure that special tool on the right is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , right, rests correctly on the spring strut dome.



- Align the engine bridge by moving it on the profile strips of the special tool above the engine mounting bracket (1) and screw it down.
- Align the hook above the engine mounting bracket (1).
- Connect the hook to the engine mounting bracket (1).

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- Check whether the special tool on the right is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , right, rests correctly on the spring strut dome.



- Check whether the special tool on the left is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , left, rests correctly on the spring strut dome.



- Release screw (1) on the left engine mount from the top with a commercially available tool.

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- Release screw (1) on the right engine mount from the top with a commercially available tool.



- Raise the engine by turning the special tool 2 361 506 (00 6 103) (spindle) by 10 mm.

13 – Removing the DME control unit

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.

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

In a warranty case, you must always provide a fault memory printout with the defective part, even if the fault memory does not contain an entry.

TECHNICAL INFORMATION

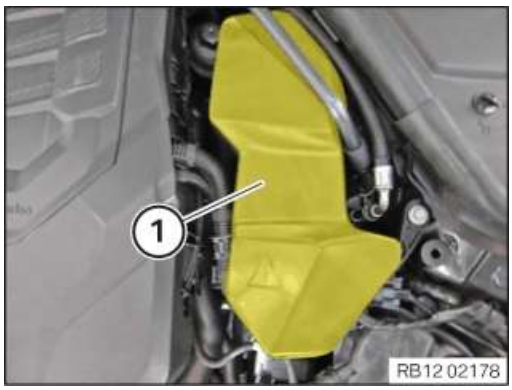
Control unit must be programmed after it is replaced.

For additional information see: 61 00 ... Programming/encoding control unit(s)

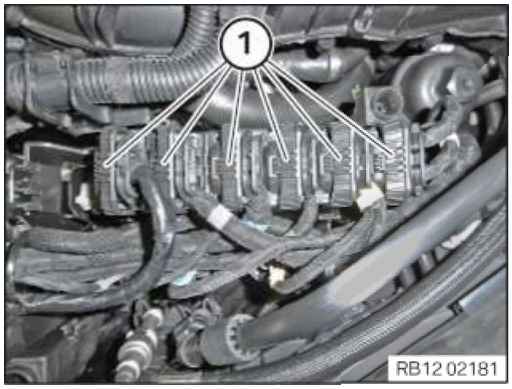
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TECHNICAL INFORMATION

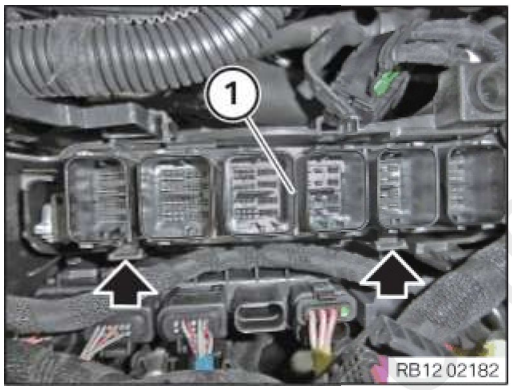
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Pull the cover (1) towards the top and feed out.



- Unlock and disconnect the plug connection (1).



- Unlock the locks (arrows).
- Guide out and remove DME control unit (1).

14 – Removing integrated supply module (PDM)

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

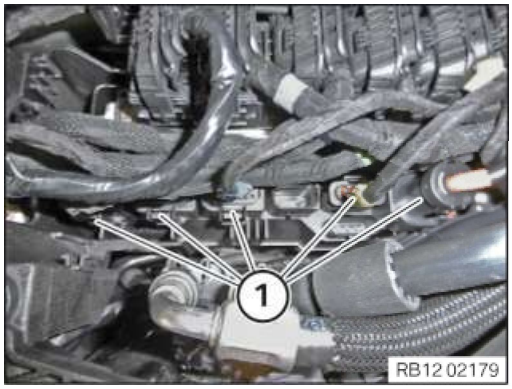
- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

RISK OF DAMAGE

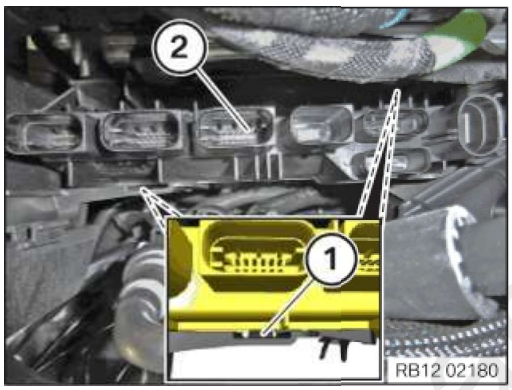
Electrostatic discharge.

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.

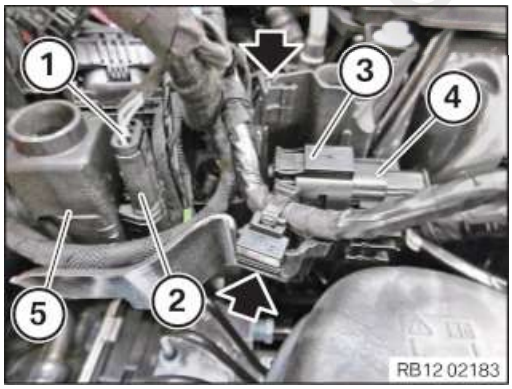


- Unlock and disconnect plug connections (1).



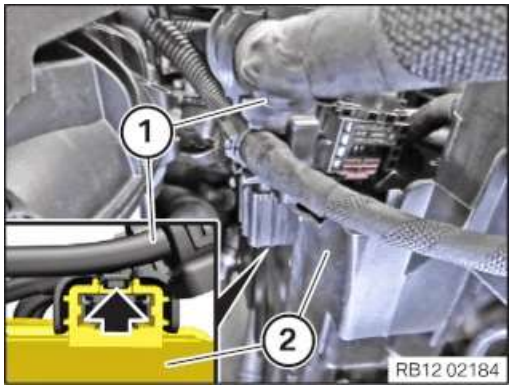
- Unlock the latch mechanisms (1).
- Guide out and remove integrated supply module (PDM) (2) upwards.

15 – Removing the control unit holder

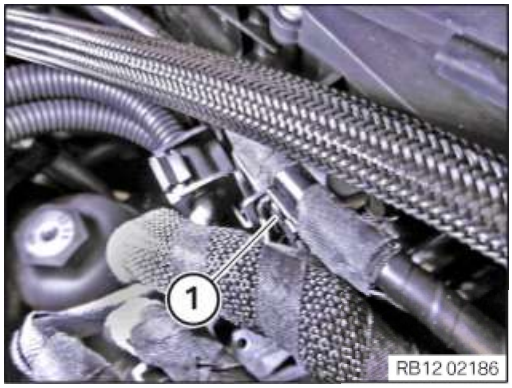


- Unlock plug connection (1) and disconnect.
- Unlock the connector (2) and disconnect from the starter (5).
- Unlock plug connection (3) and disconnect.
- Unlock the connector (4) and disconnect from the starter (5).
- Release the clamps (arrows).

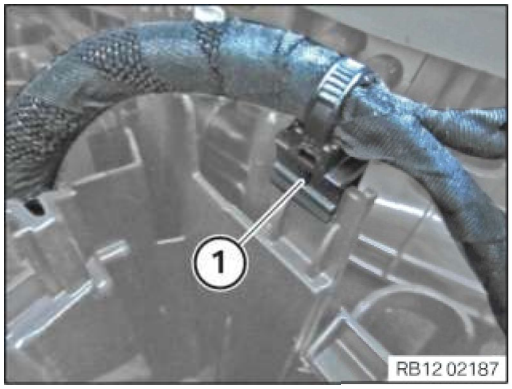
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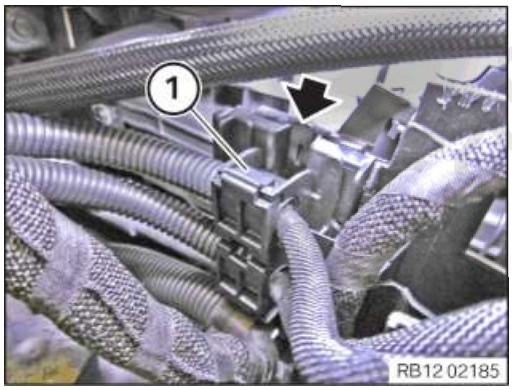
- Unlock the lock (arrow).
- Disconnect the cable plug (1) upwards from the control unit holder (2).



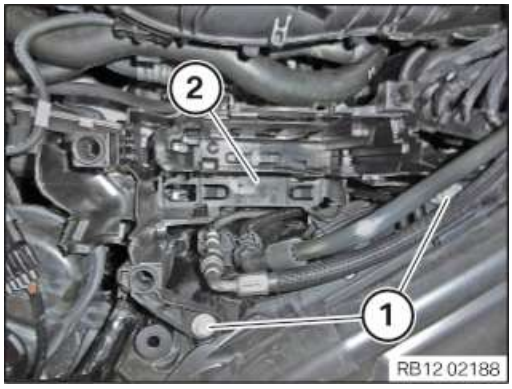
- Loosen clamp (1).



- Loosen clamp (1).



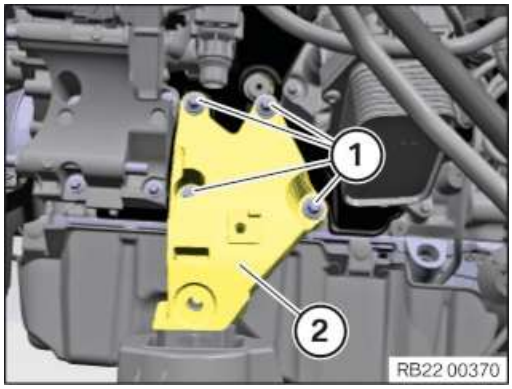
- Unlock the lock (arrow).
- Feed out the cable clip (1) upwards and set it aside.



- Loosen screws (1).
- Guide out and remove the control unit holder (2).

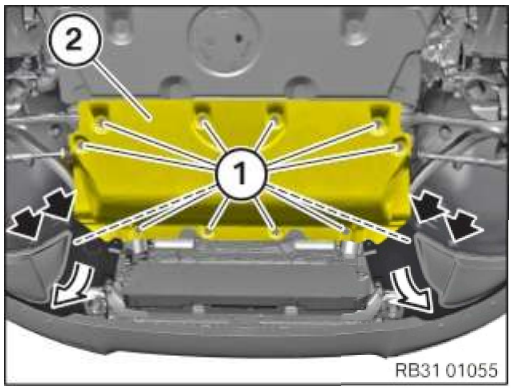
16 – Remove left engine support arm

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- Loosen screws (1).
- Remove the engine support arm (2).

17 – Remove the underbody protection of the steering gear



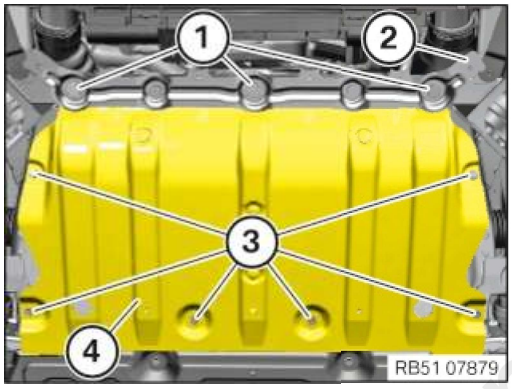
- **Version 1:**

  Unscrew the screws (arrows) of the wheel arch cover on wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

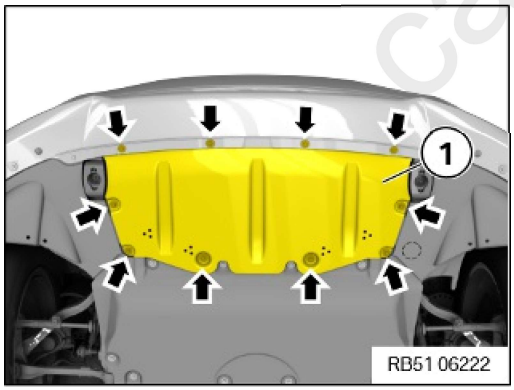
  Loosen screws (1).

  Remove the holder of the underride protection (2).

  Loosen screws (3).

  Slide the steering gear underbody protection (4) out and remove.

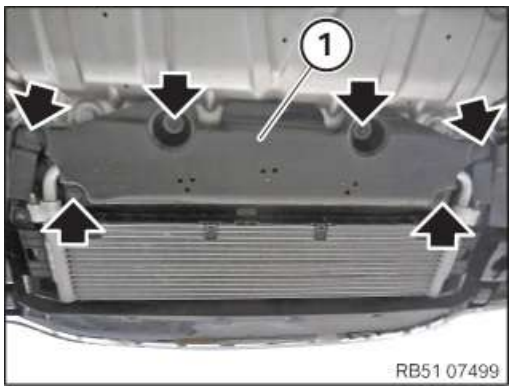
18 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed front underbody protection (1) backwards out of the bumper panel.

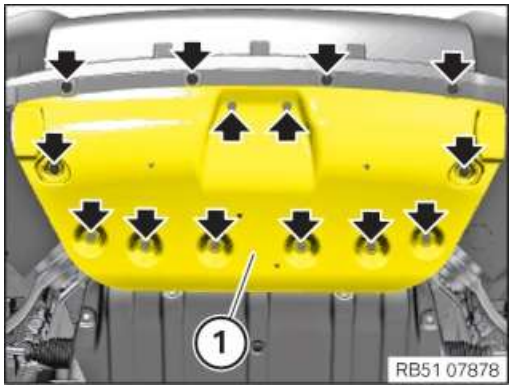


- **Version 2:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

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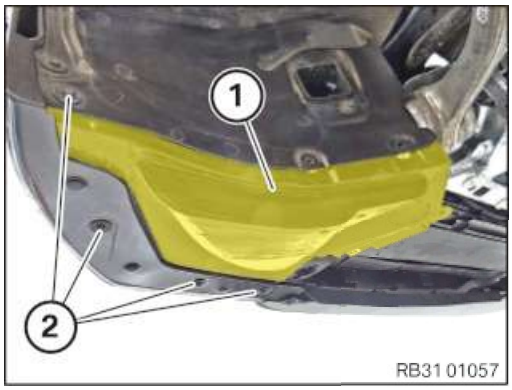


- **Version 3:**

  Remove screws (arrows).

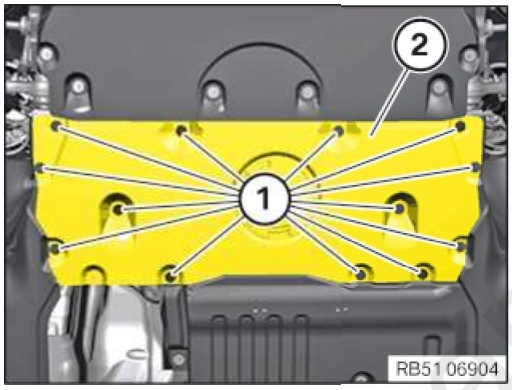
  Guide out front underbody protection (1) and remove it.

19 – Remove bottom wheel arch cover



- Loosen screws (2).
- Remove bottom wheel arch cover (1)

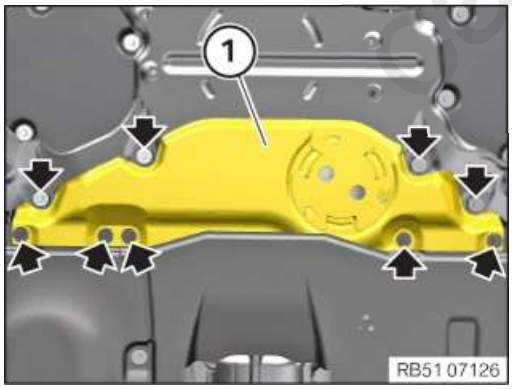
20 – Removing the centre underbody protection



- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .



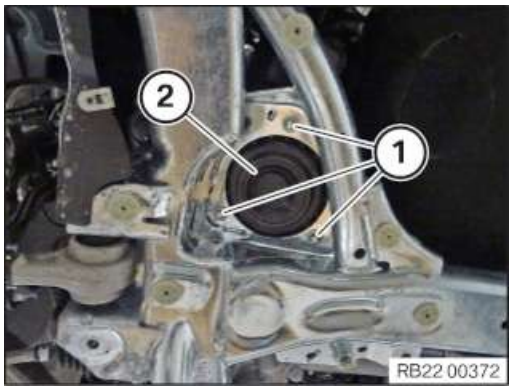
- **Version with all-wheel drive:**

  Remove screws (arrows).

  Feed out and remove the centre underbody protection (1).

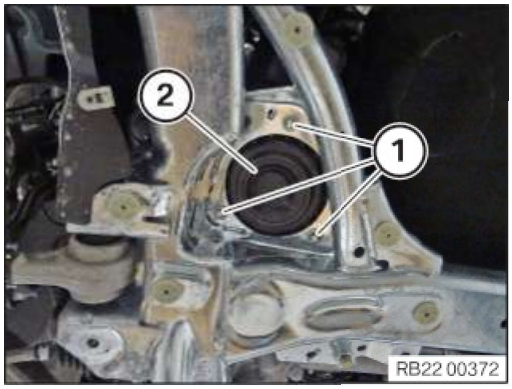
MAIN WORK

21 – Remove left engine mount



- Loosen screws (1).
- Remove engine mount (2).

22 – Installing the engine mount on the left



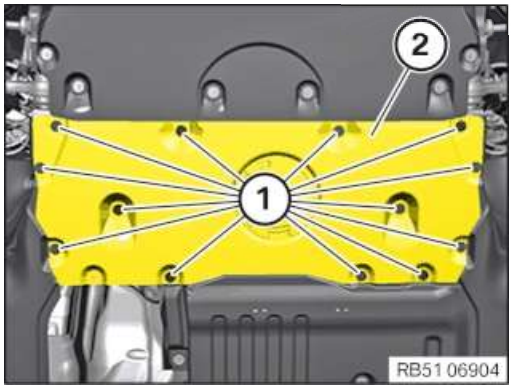
- Install the engine mount (2).
- Tighten the screws (1).

Engine mount to front axle support

M8		Tightening torque	19 Nm

POSTPROCESSES

23 – Installing the centre underbody protection



- **Version with rear-wheel drive:**

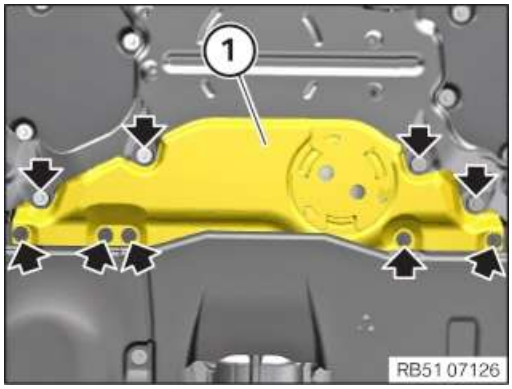
  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

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- **Version with all-wheel drive:**

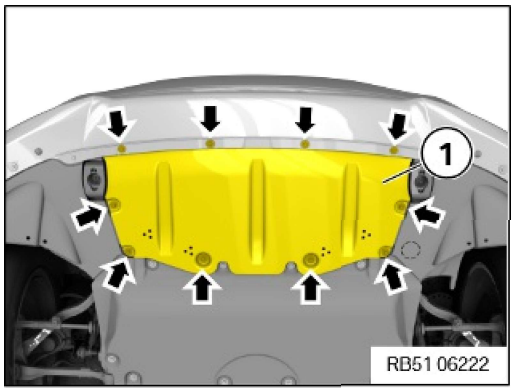
  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

24 – Installing the front underbody protection



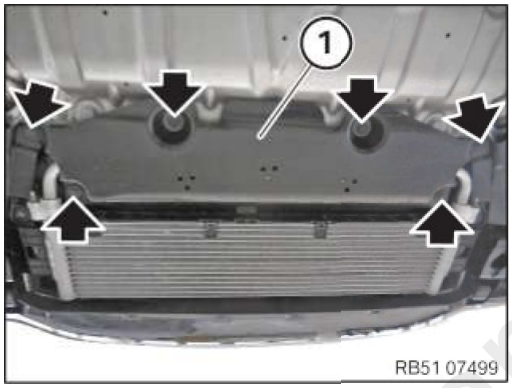
- **Version 1:**

  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



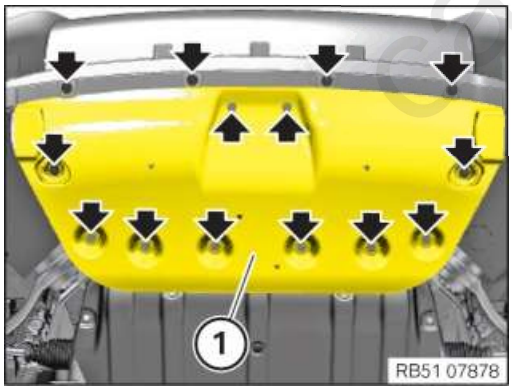
- **Version 2:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version 3:**

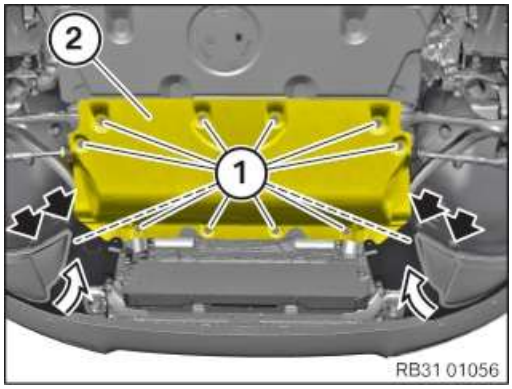
  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

25 – Install the underbody protection of the steering gear



- **Version 1:**
- Position the underbody protection of the steering gear (2).
- Tighten the screws (1).

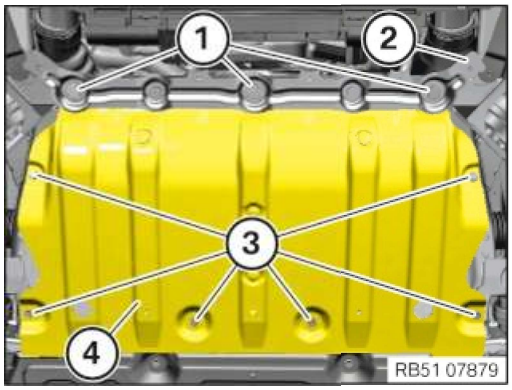
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.
- Tighten the screws (arrows) of the bottom wheel arch cover on the wheel arch cover.

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



- **Version 2:**
- Guide in the steering gear underbody protection (4) and install.
- Tighten the screws (3).

Underbody protection of the steering gear

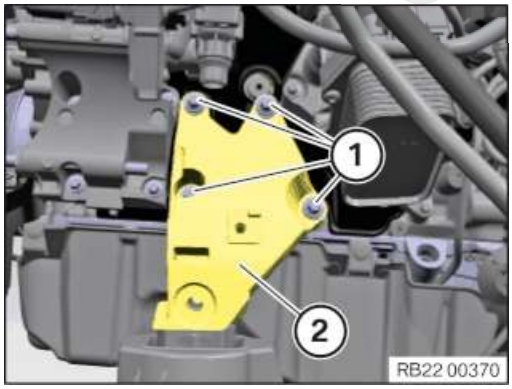
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position holder of underride protection (2).
- Tighten the screws (1).

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

26 – Install left engine support arm



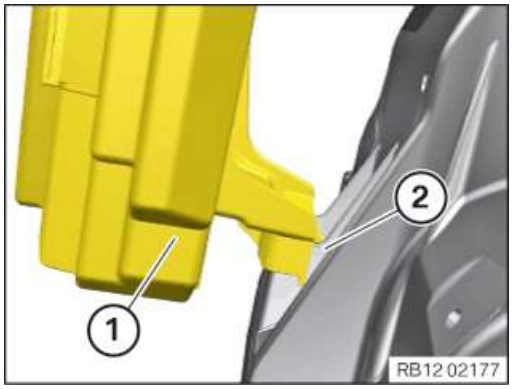
- Install the engine support arm (2).
- Tighten the screws (1).

Engine support arm to engine

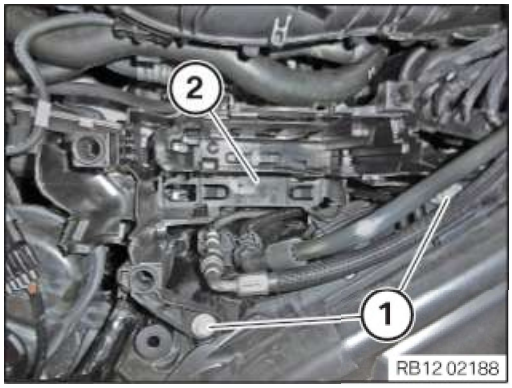
M10		Tightening torque	38 Nm

27 – Installing the control unit holder

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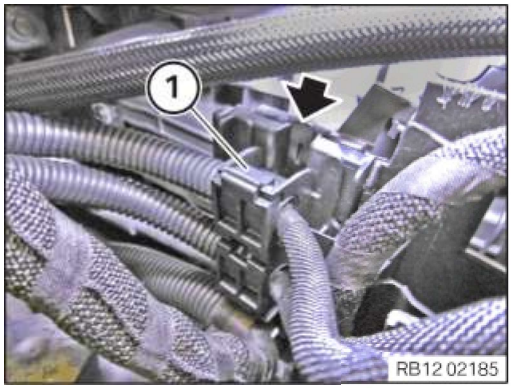
- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).



- Guide in and install control unit holder (2).
- Tighten the screws (1).

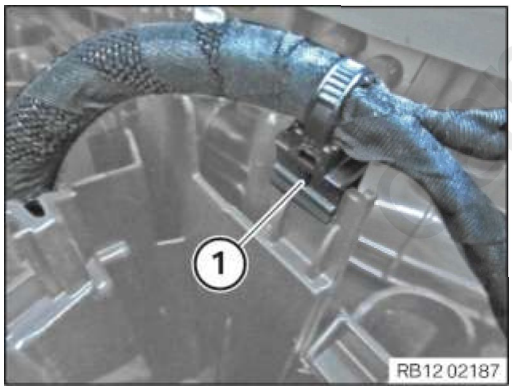
Control unit holder on spring strut dome

Hexagon screw		Tightening torque	8 Nm

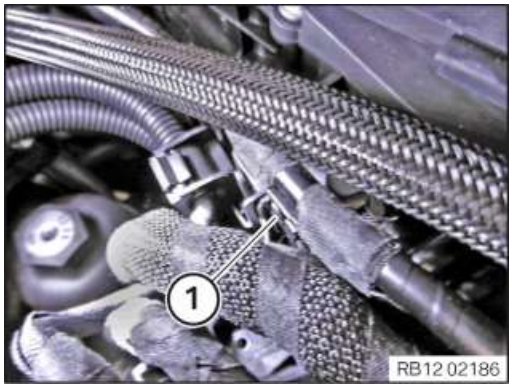


- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.

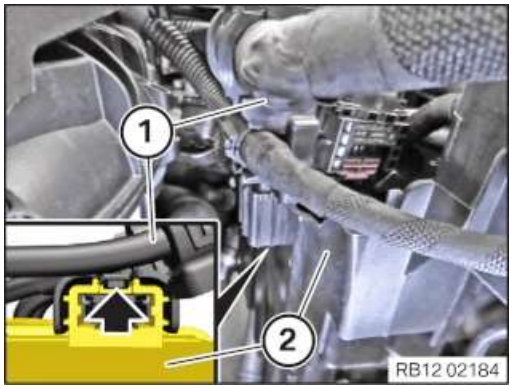


- Secure clamps (1).

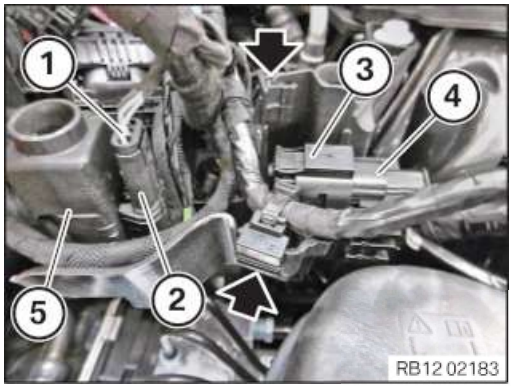


- Secure clamps (1).

bmwdiagn.com



- Connect the cable clip (1) with the control unit holder (2) and lock.
  Lock (arrow) must audibly engage.



- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.
  The connector (1) must engage audibly.
- Secure the clamps (arrows).

28 – Installing the integrated supply module (PDM)

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.

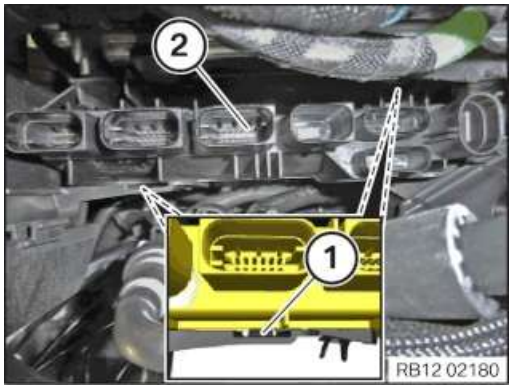
RISK OF DAMAGE

Electrostatic discharge.

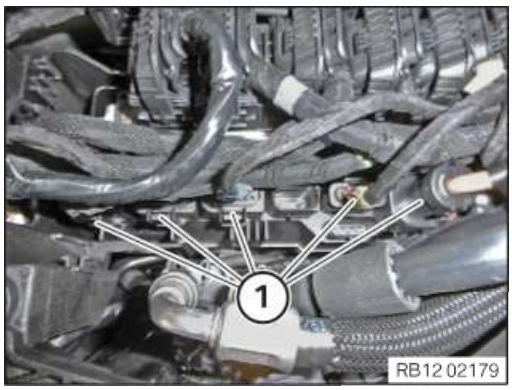
Damage to or destruction of electrical components.

- 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.

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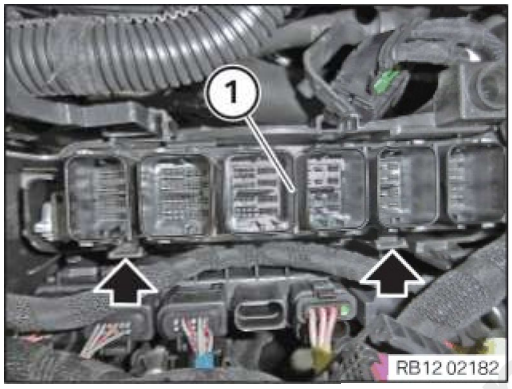


- Insert and install the integrated supply module (PDM) (2).
  The latch mechanisms (1) must engage audibly.
- Unlock the latch mechanisms (1).

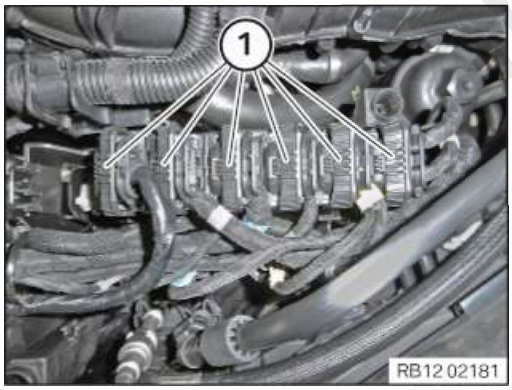


- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.

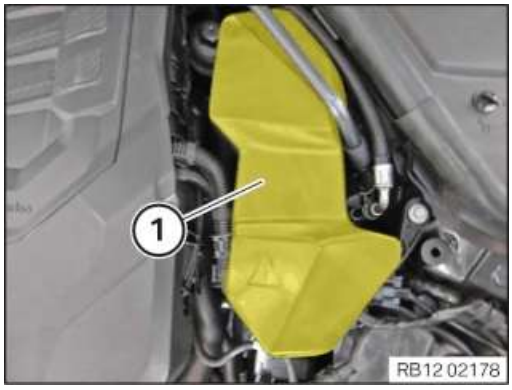
29 – Installing the DME control unit



- Feed in and install DME control unit (1).
  The locks (arrows) must engage audibly.



- Connect connectors (1) and lock.
  All connectors (1) must engage audibly.



- Insert and install cover (1) into guides.

30 – Loosen the attachment of the engine in installation position



- Lower engine by turning the spindle 2 361 506 (00 6 103) until the engine lies completely on the engine supports.



TECHNICAL INFORMATION

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

- Remove the engine bridge (1) with an auxiliary person.



- Tighten bolt (1) of the left engine mount from the bottom using a standard tool.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



- Tighten bolt (1) of the right engine mount from the top using a standard tool.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



- 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.

31 – Securing the wiring harness section to the left spring strut dome

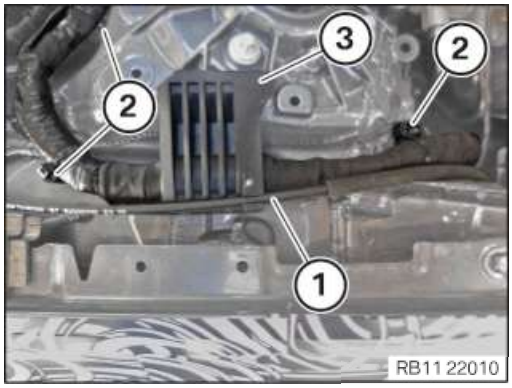
xtdiagn.com

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 position wiring harness section (3) on the left spring strut dome.
- Secure clamps (2).
- Guide in and install cable (1) of the front flap.

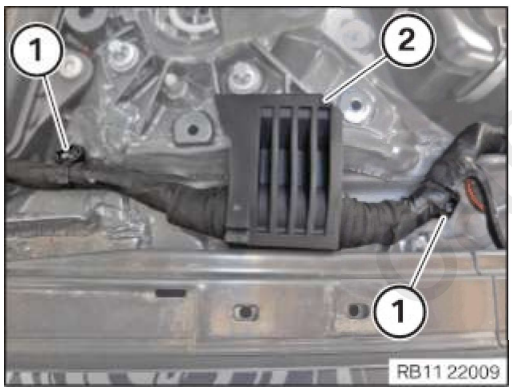
32 – Secure wiring harness section on right spring strut dome

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

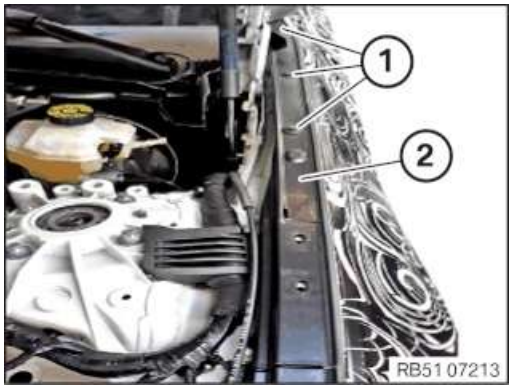
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

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



- Guide in and position the wiring harness section (2) of right spring strut dome.
- Secure clamps (1).

33 – Installation of side panel sealing.



NOTICE

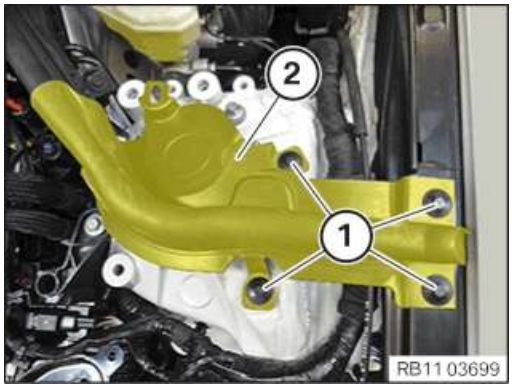
Description is for left component only. Procedure on the right side is identical.

- Guide the sealing (2) in and install it.
- Mount the expanding rivets (1).

34 – Install side bonnet seals

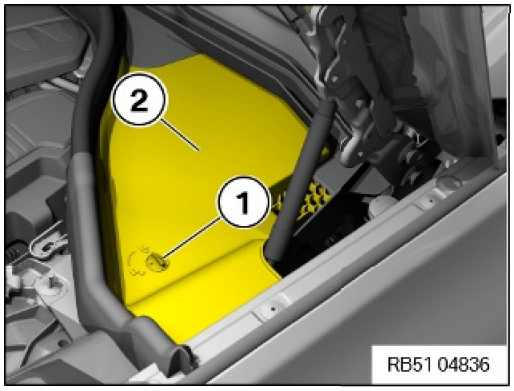
NOTICE

Perform the operations on the left and right side.



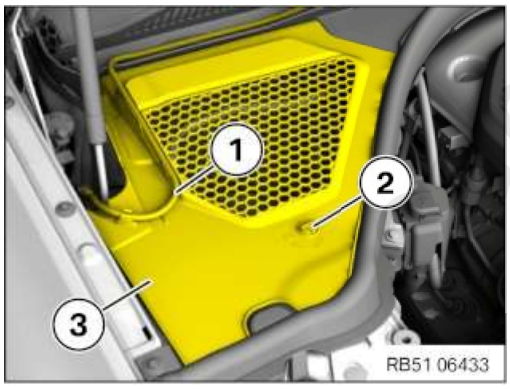
- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

35 – Install the cover of the engine compartment on the rear left



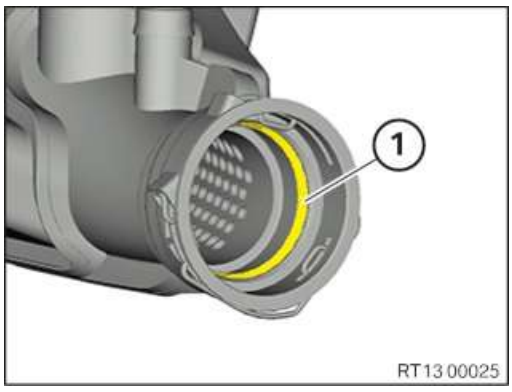
- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

36 – Install the rear right engine compartment cover



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

37 – Installing the clean air pipe with resonator



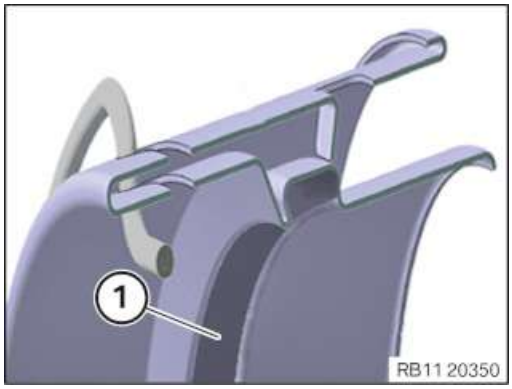
- Check the seal (1) for damages, replace if necessary.

▸ **Replace damaged gasket**

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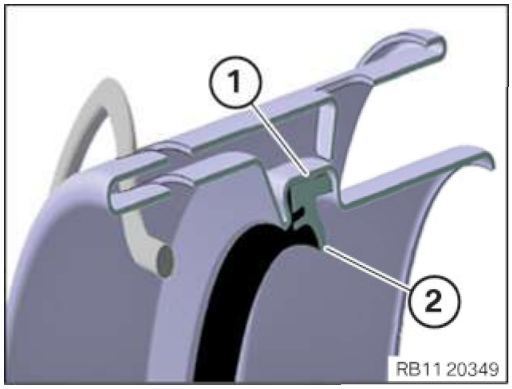
TECHNICAL INFORMATION

Do not use pointed or sharp-edged tools for the installation and/or removal.



- Remove damaged seal.
- Clean gasket groove (1) with a dry towel.

  The gasket groove (1) must be clean.



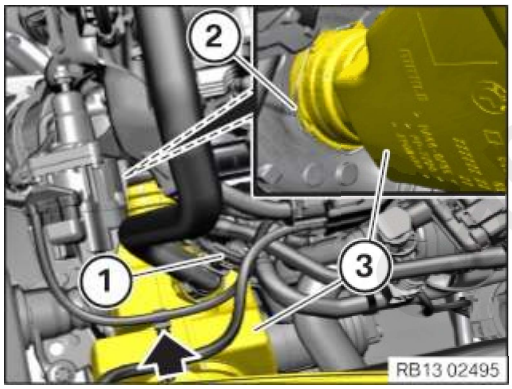
- Renew gasket.

  Parts: Gasket
- Install seal dry without lubricant or mounting agent.

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

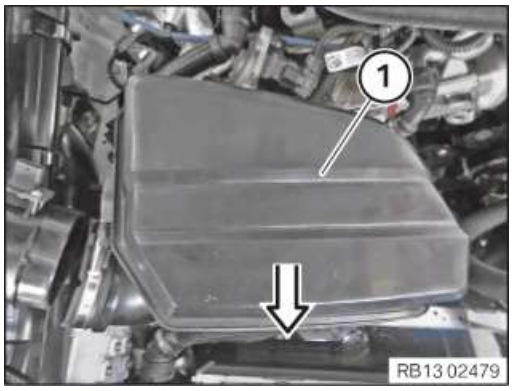
- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is pointing downwards (see figure).



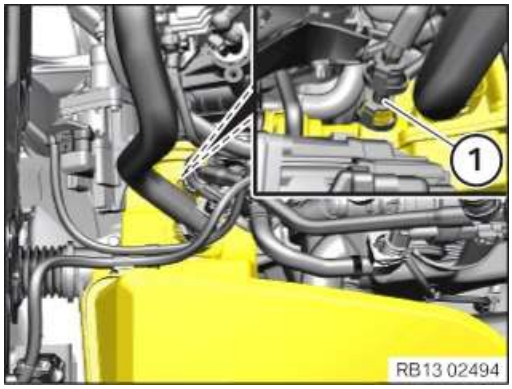
- Guide in and install the clean air pipe with resonator (3).
- Lock clamp (2).

  The clamp (2) must engage audibly.
- Connect connectors (1) and lock.

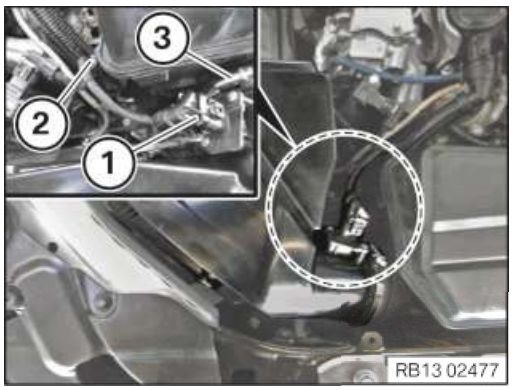
  The connector (1) must engage audibly.
- Secure clamp (arrow).



- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Connect and lock the tank ventilation line (1).



- Connect the clean air pipe with resonator to the intake filter housing.
- Tighten clamp (3).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Secure the clamp (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Insert and install the engine ventilation line (2).
- Ensure that the locks (1) engage audibly.

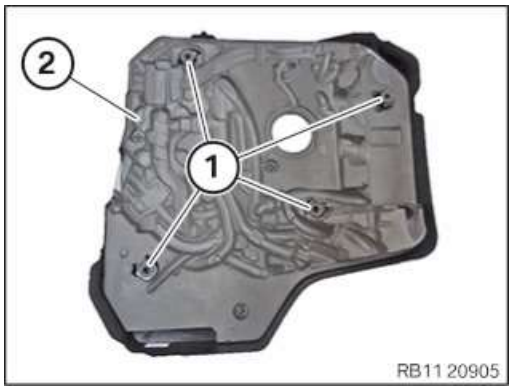
38 – Install acoustic cover

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.



- Check all rubber mounts (1) of acoustic cover (2) for correct seating.

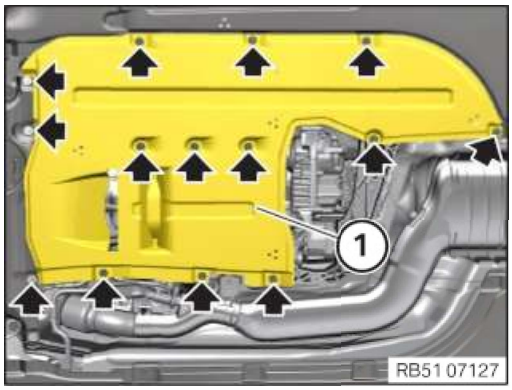
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- Clip in the acoustic cover (1) into the holders in the **marked** areas.

  The acoustic cover (1) must audibly engage into place.

39 – Installing underbody protection at rear



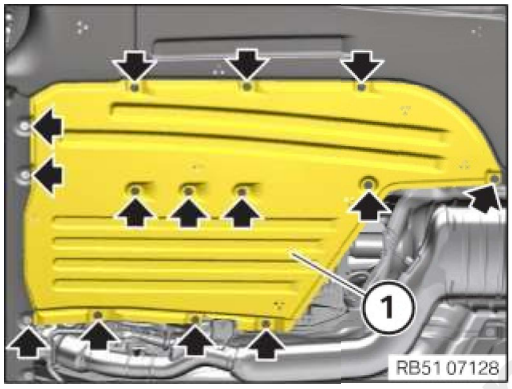
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

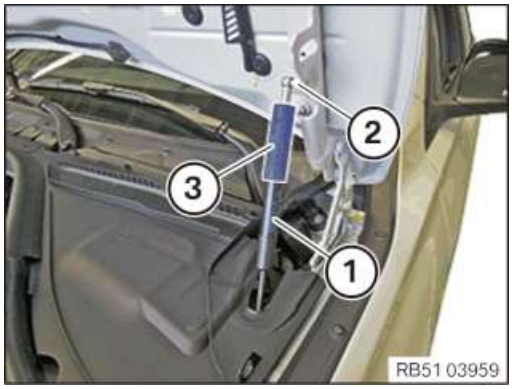
40 – Disconnecting all battery earth leads



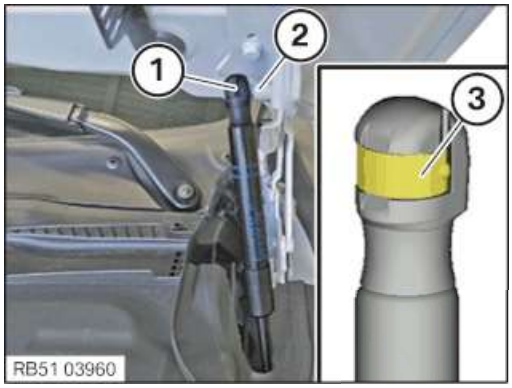
- See additional information.

41 – Take bonnet out of the service position

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- Support the bonnet by hand.
- Remove the special tool (3) from the ball pin (2).
- Pull off the special tool (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

Special tool to cylinder head			Used in step 12
M8		Tightening torque	21,5 Nm

Engine mount to front axle support			Used in step 22
M8		Tightening torque	19 Nm

Underbody protection			Used in step 2339
Hexagon screw		Tightening torque	3 Nm

Underbody protection front			Used in step 24
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 25
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Wheel arch cover (screws)			Used in step 25
Thermoplastic hexagon screw		Tightening torque	3 Nm

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Holder underride guard to front axle support			Used in step 25
M10		Tightening torque	56 Nm

Engine support arm to engine			Used in step 26
M10		Tightening torque	38 Nm

Control unit holder on spring strut dome			Used in step 27
Hexagon screw		Tightening torque	8 Nm

Engine mount to engine mounting bracket			Used in step 30
M12		Tightening torque	100 Nm

Clean air pipe to upper section of intake filter housing			Used in step 37
Clamp		Tightening torque	3 Nm

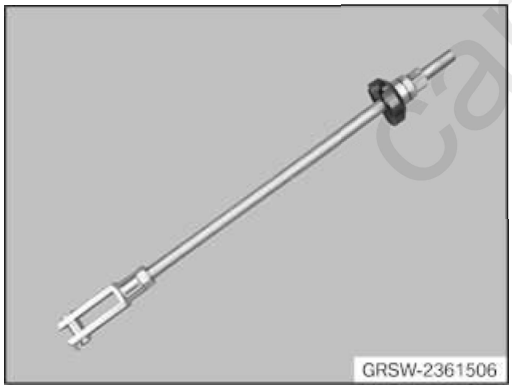
Overview of Special Tools

2 459 012 Holder



Common	Used in step 1230
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)

2 361 506 (00 6 103) Spindle



Common	Used in step 1230
Usage	Spindle (central spindle) for Traverse 00 6 100.
Included in the tool or work	0 496 852
Storage location	
Replaced by	
In connection with	
SI-Number	01 17 10 (659)

Links

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	1329

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	240
61 20 900 Disconnecting and connecting battery earth lead	240
61 20 900 Disconnecting and connecting battery earth lead	240
61 20 900 Disconnecting and connecting battery earth lead	240

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61 20 900 Disconnecting and connecting battery earth lead	240
61 20 900 Disconnecting and connecting battery earth lead	240
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	240
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	240
61 20 900 Disconnecting and connecting battery earth lead	240
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	240
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	240
61 20 900 Disconnecting and connecting battery earth lead	240
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	240
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61 20 900 Disconnecting and connecting battery earth lead	240
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61 20 900 Disconnecting and connecting battery earth lead	240
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61 35 ... Notes on ESD protection (Electro Static Discharge)	131428
61 00 730 Encode/program control unit(s) (after vehicle test)	29

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22 11 110 Replacing left engine support bracket

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

Damage to battery terminal, the safety battery terminal or the intelligent battery sensor (IBS).

Damaged battery terminals can lead to malfunctions or vehicle electrical system faults.

- Pull off battery terminal from battery pole by carefully moving to and fro. Do not pry off using a tool.

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

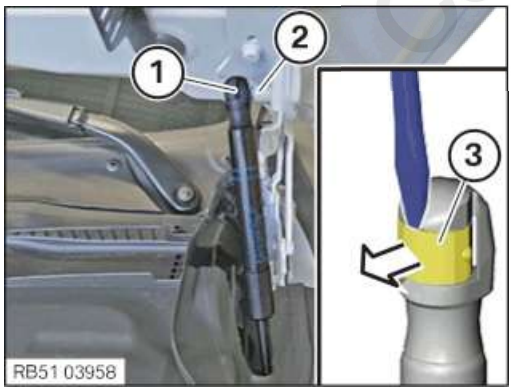
Engine compartment lid is open.

CAUTION

Shutting bonnet or tailgate.

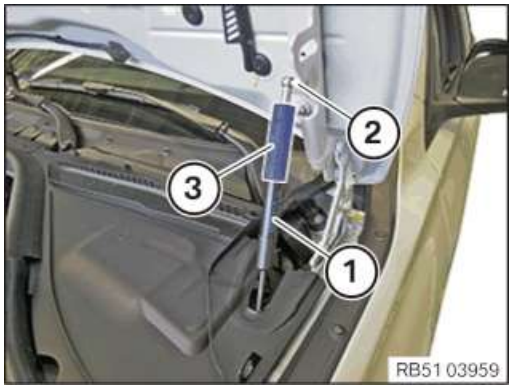
Danger of injury!

- 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.

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TECHNICAL INFORMATION

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

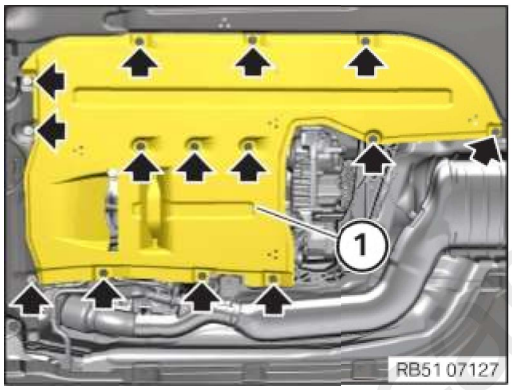
- Remove the bonnet support and open the bonnet further.
- Push special tool or (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

2 – Disconnecting all battery earth leads



- See additional information.

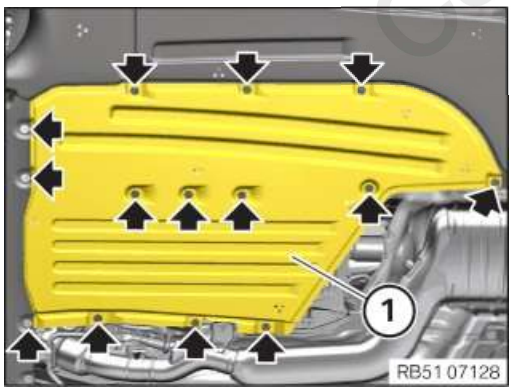
3 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



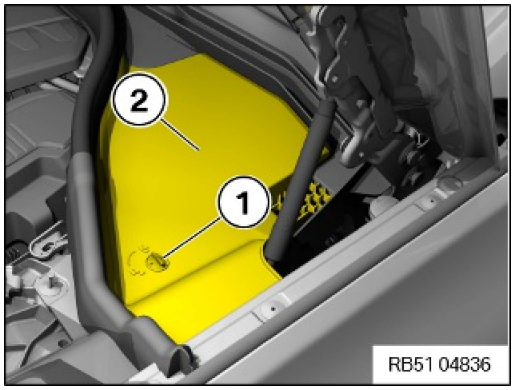
- **Version 2:**

  Remove screws (arrows).

  Guide out rear underbody protection (1) and remove it.

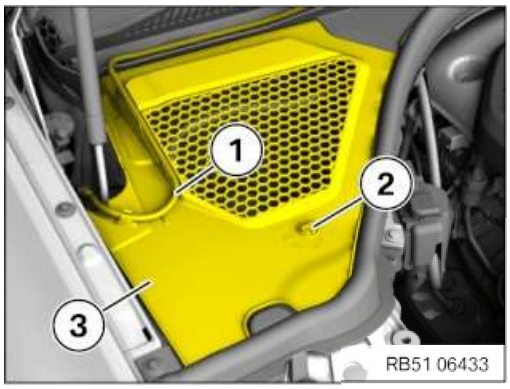
4 – Remove the cover of the engine compartment at the rear left

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- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

5 – Remove the cover of the rear right engine compartment

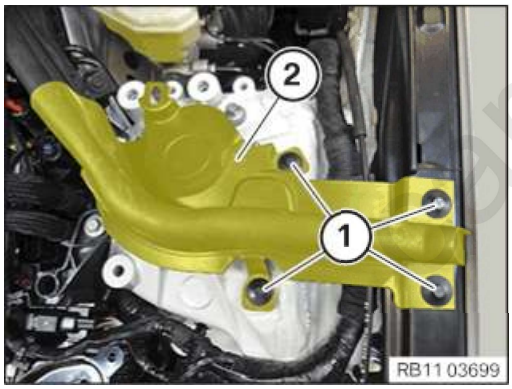


- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover of rear right engine compartment (3).

6 – Removing side bonnet gaskets

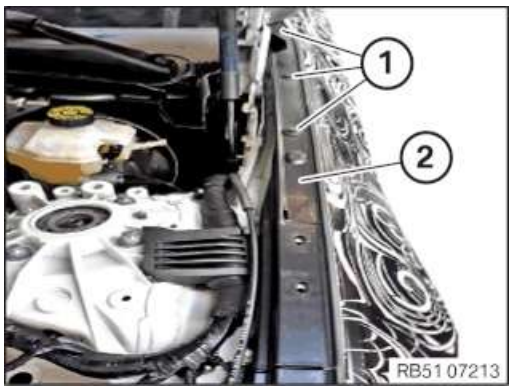
NOTICE

Perform the operations on the left and right side.



- Loosen the rivet (1).
- Remove side bonnet seal (2) from spring strut dome.

7 – Remove sealing of the side panel



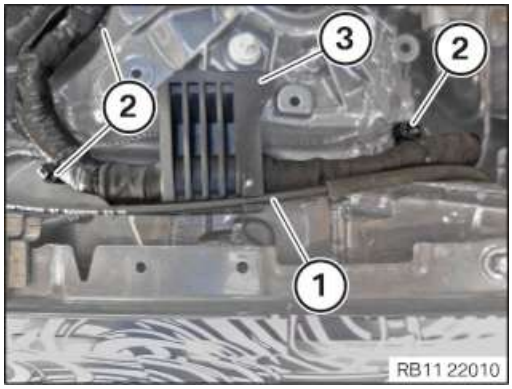
NOTICE

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

- Loosen the expanding rivet (1).
- Guide out seal (2) and remove.

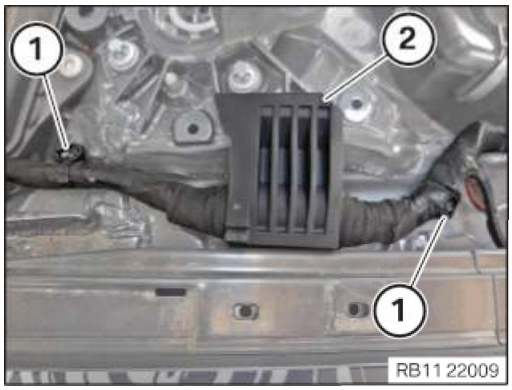
8 – Partially loosen the wiring harness section on the spring strut dome

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- Feed out the cable (1) of the front flap and set it aside.
- Loosen clamps (2).
- Feed out wiring harness section (3) on the spring strut dome on left and set it aside.

9 – Releasing the wiring harness section on the right spring strut dome



- Loosen clamps (1).
- Guide out wiring harness section (2) on the right spring strut dome and set it aside.

10 – 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.

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- Unclip the acoustic cover (1) from the holders in the **marked** areas towards the top.

11 – Removing the clean air pipe with the resonator

WARNING

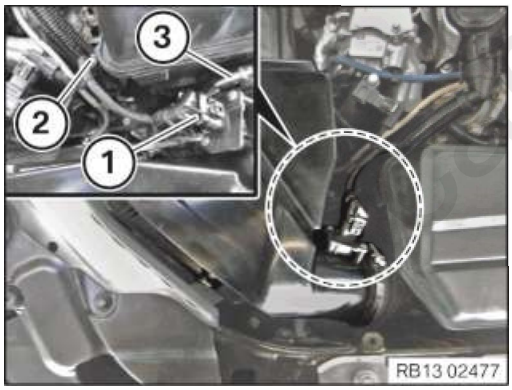
Hot surfaces.

Risk of burning!

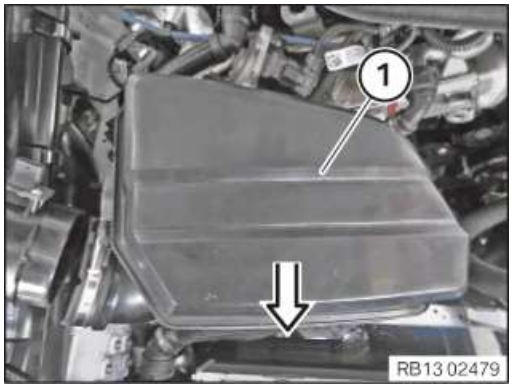
- Perform all work only on components that have cooled down.



- Unlock the locks (1).
- Feed the engine ventilation line (2) out and set it aside.

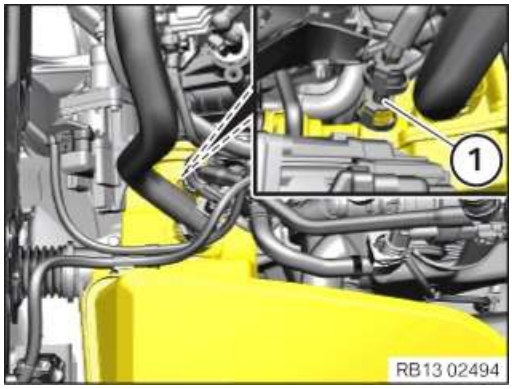


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

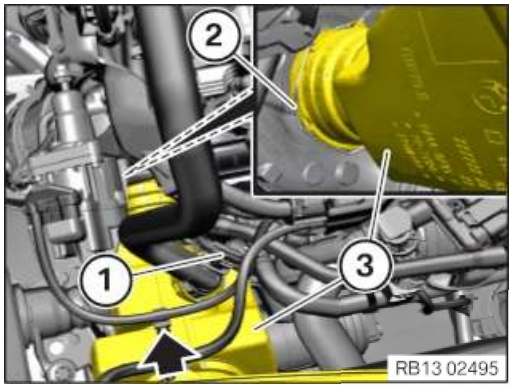


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

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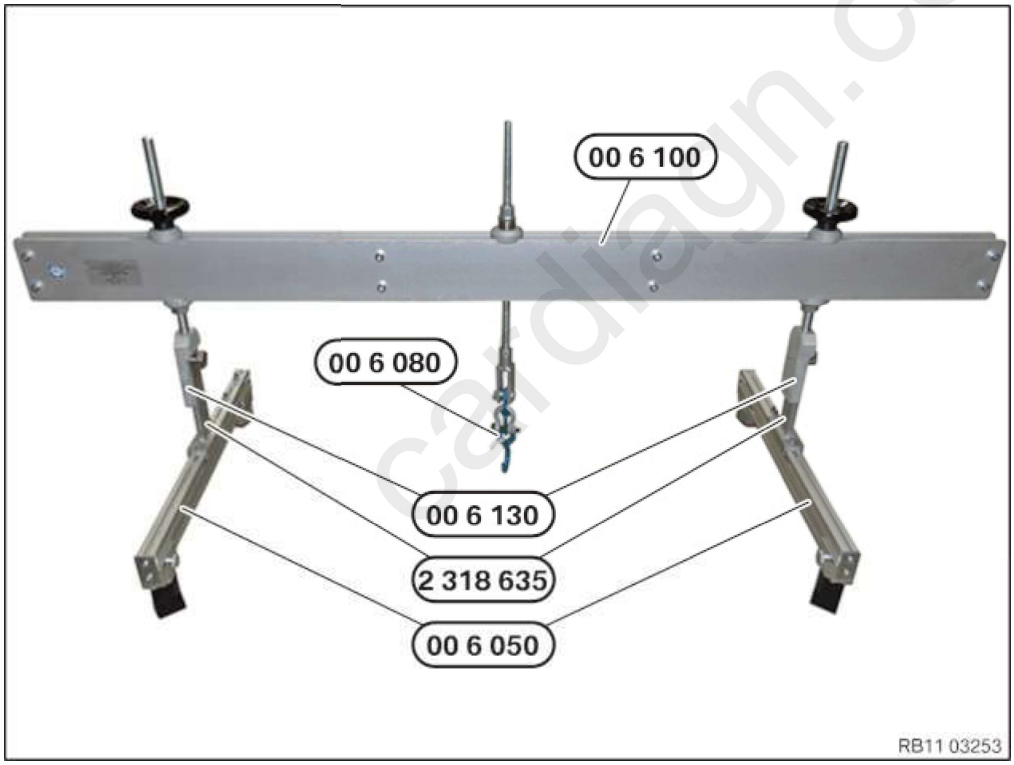
- Unlock and disconnect the tank ventilation line (1).



- Loosen the clamp (arrow).
- Unlock plug connection (1) and disconnect.
- Unlock the clamp (2).
- Feed out clean air pipe with resonator (3) and remove.

12 – Securing engine in installation position

Overview: Prepared engine bridge



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.

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- 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



- **Carefully** position engine bridge (1) with help from an auxiliary person.



- Make sure that special tool on the left is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , left, rests correctly on the spring strut dome.



- Make sure that special tool on the right is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , right, rests correctly on the spring strut dome.



- Align the engine bridge by moving it on the profile strips of the special tool above the engine mounting bracket (1) and screw it down.
- Align the hook above the engine mounting bracket (1).
- Connect the hook to the engine mounting bracket (1).

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- Check whether the special tool on the right is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , right, rests correctly on the spring strut dome.



- Check whether the special tool on the left is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , left, rests correctly on the spring strut dome.



- Release screw (1) on the left engine mount from the top with a commercially available tool.

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- Release screw (1) on the right engine mount from the top with a commercially available tool.



- Raise the engine by turning the special tool 2 361 506 (00 6 103) (spindle) by 10 mm.

13 – Removing the DME control unit

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.

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

In a warranty case, you must always provide a fault memory printout with the defective part, even if the fault memory does not contain an entry.

TECHNICAL INFORMATION

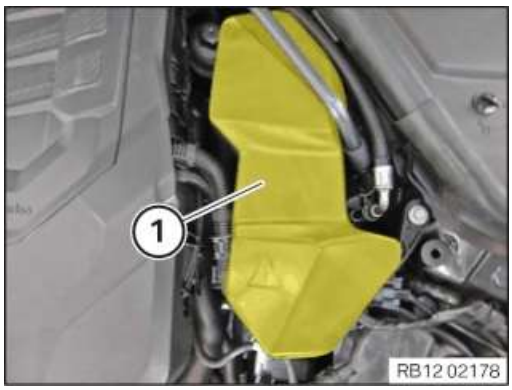
Control unit must be programmed after it is replaced.

For additional information see: 61 00 ... Programming/encoding control unit(s)

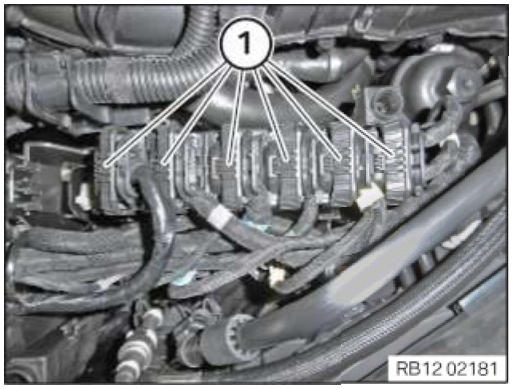
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TECHNICAL INFORMATION

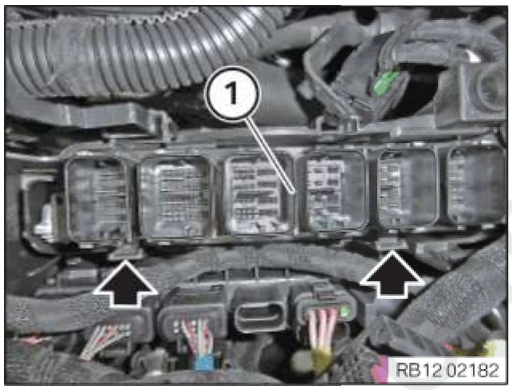
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Pull the cover (1) towards the top and feed out.



- Unlock and disconnect the plug connection (1).



- Unlock the locks (arrows).
- Guide out and remove DME control unit (1).

14 – Removing integrated supply module (PDM)

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

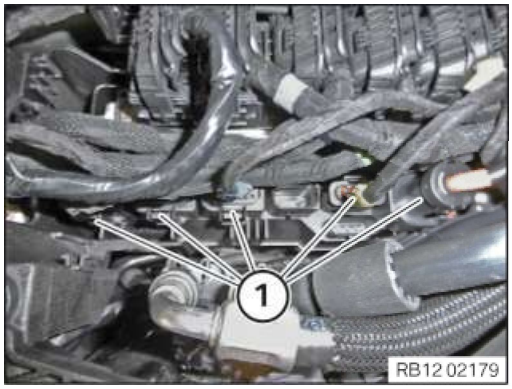
- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

RISK OF DAMAGE

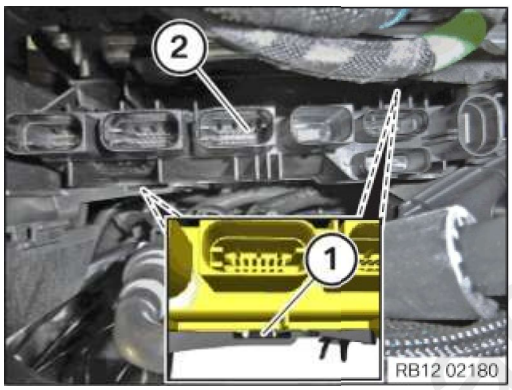
Electrostatic discharge.

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.

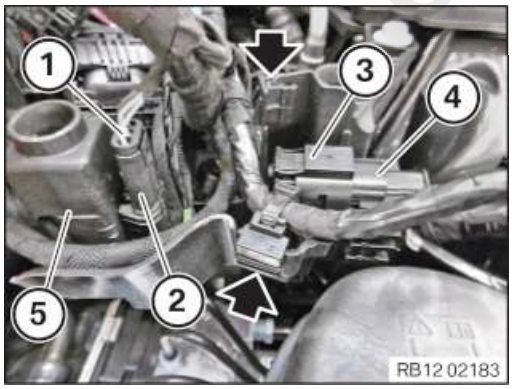


- Unlock and disconnect plug connections (1).



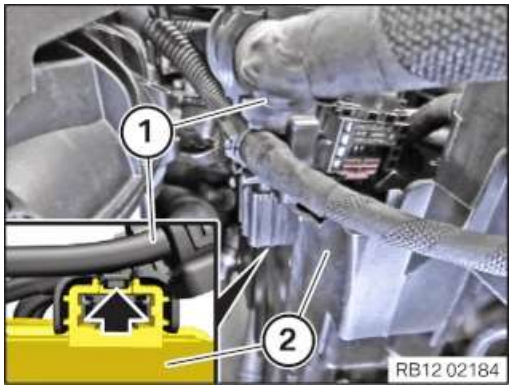
- Unlock the latch mechanisms (1).
- Guide out and remove integrated supply module (PDM) (2) upwards.

15 – Removing the control unit holder

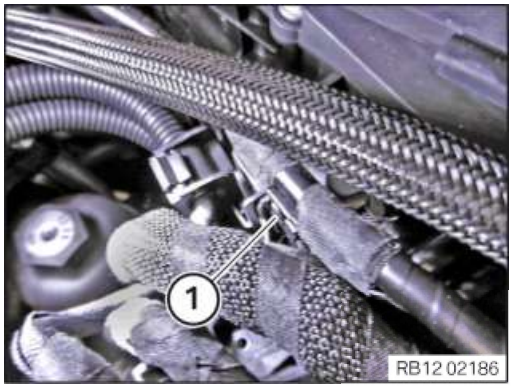


- Unlock plug connection (1) and disconnect.
- Unlock the connector (2) and disconnect from the starter (5).
- Unlock plug connection (3) and disconnect.
- Unlock the connector (4) and disconnect from the starter (5).
- Release the clamps (arrows).

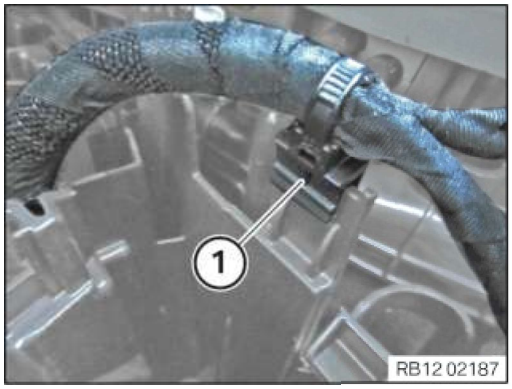
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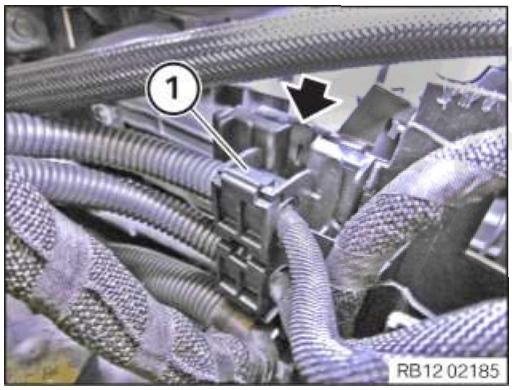
- Unlock the lock (arrow).
- Disconnect the cable plug (1) upwards from the control unit holder (2).



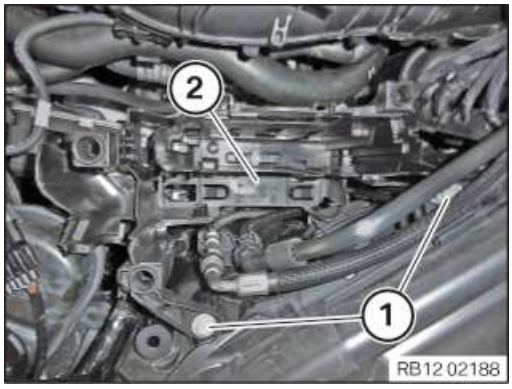
- Loosen clamp (1).



- Loosen clamp (1).



- Unlock the lock (arrow).
- Feed out the cable clip (1) upwards and set it aside.

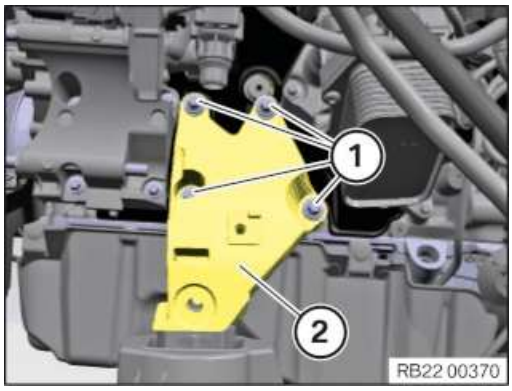


- Loosen screws (1).
- Guide out and remove the control unit holder (2).

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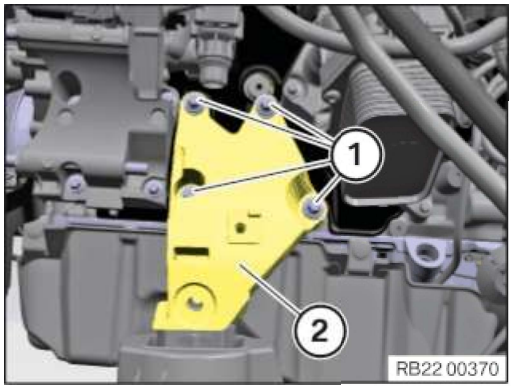
MAIN WORK

16 – Remove left engine support arm



- Loosen screws (1).
- Remove the engine support arm (2).

17 – Install left engine support arm



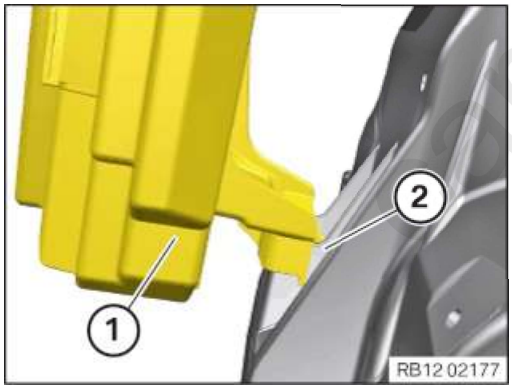
- Install the engine support arm (2).
- Tighten the screws (1).

Engine support arm to engine

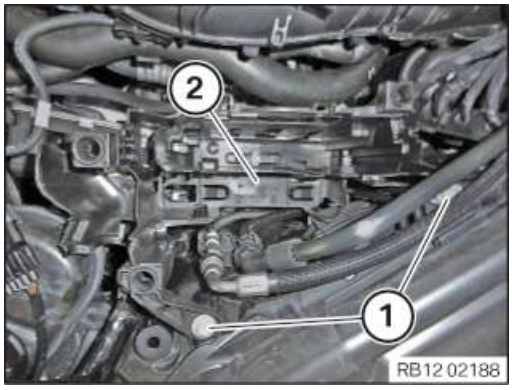
M10		Tightening torque	38 Nm

POSTPROCESSES

18 – Installing the control unit holder



- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).

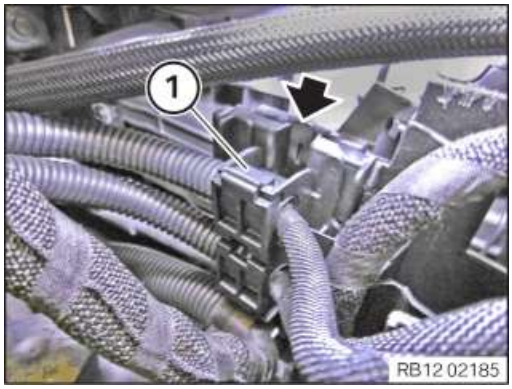


- Guide in and install control unit holder (2).
- Tighten the screws (1).

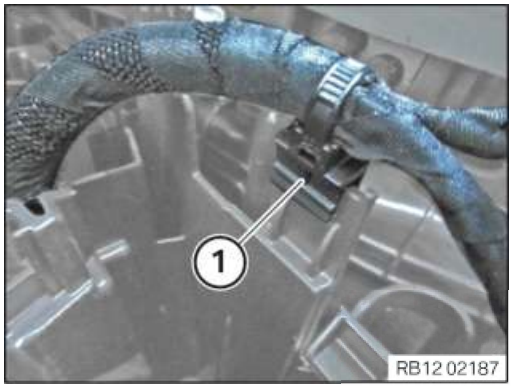
Control unit holder on spring strut dome

Hexagon screw		Tightening torque	8 Nm

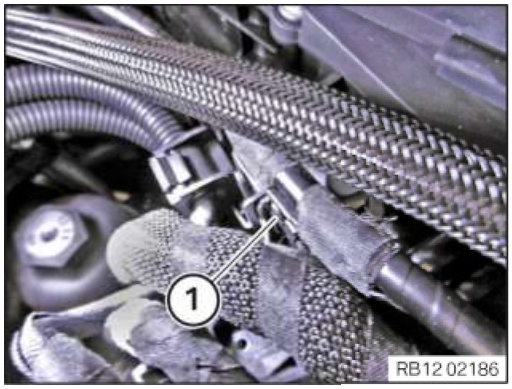
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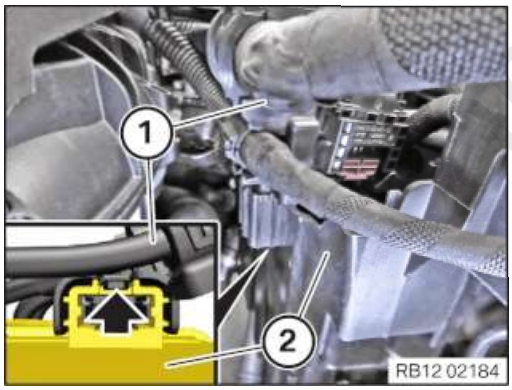
- Feed in and install the cable clip (1).
  Lock (arrow) must audibly engage.



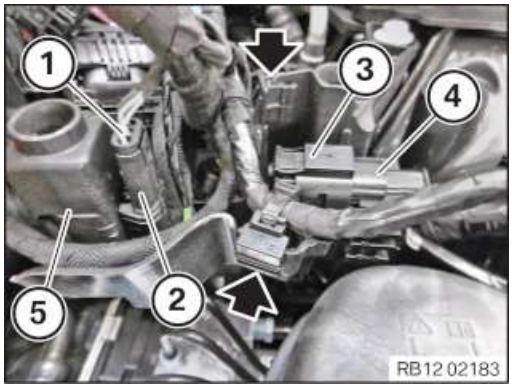
- Secure clamps (1).



- Secure clamps (1).



- Connect the cable clip (1) with the control unit holder (2) and lock.
  Lock (arrow) must audibly engage.



- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.
  The connector (1) must engage audibly.
- Secure the clamps (arrows).

19 – Installing the integrated supply module (PDM)

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

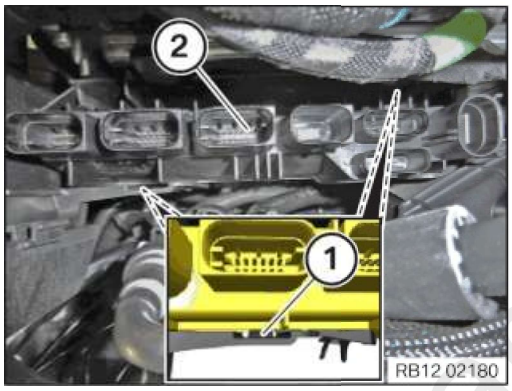
- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

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.



- Insert and install the integrated supply module (PDM) (2).

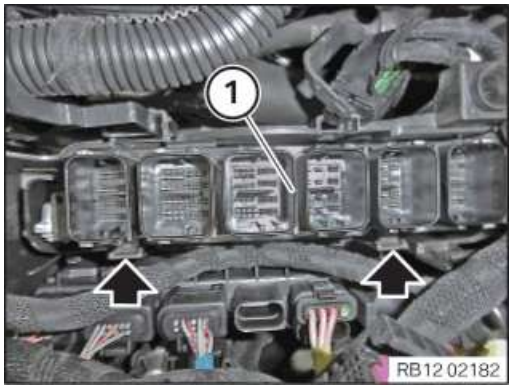
  The latch mechanisms (1) must engage audibly.
- Unlock the latch mechanisms (1).



- Connect connectors (1) and lock.

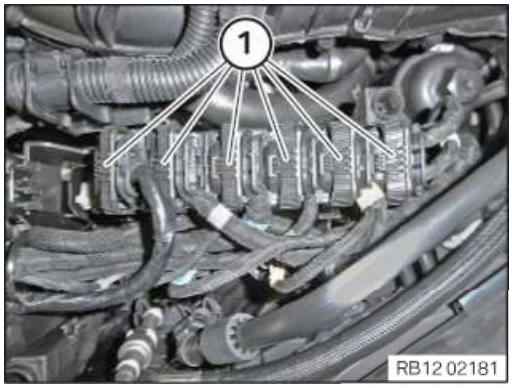
  The connectors (1) must engage audibly.

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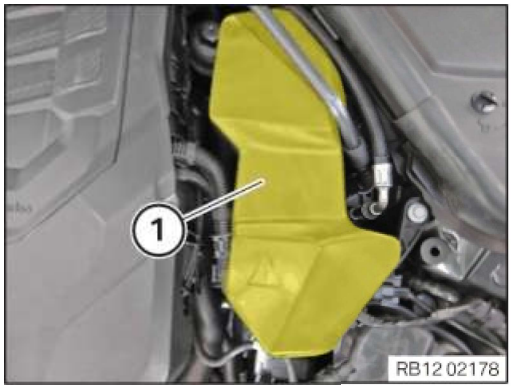
- Feed in and install DME control unit (1).

  The locks (arrows) must engage audibly.



- Connect connectors (1) and lock.

  All connectors (1) must engage audibly.



- Insert and install cover (1) into guides.

21 – Loosen the attachment of the engine in installation position



- Lower engine by turning the spindle 2 361 506 (00 6 103) until the engine lies completely on the engine supports.



TECHNICAL INFORMATION

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

- Remove the engine bridge (1) with an auxiliary person.

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- Tighten bolt (1) of the left engine mount from the bottom using a standard tool.

Engine mount to engine mounting bracket

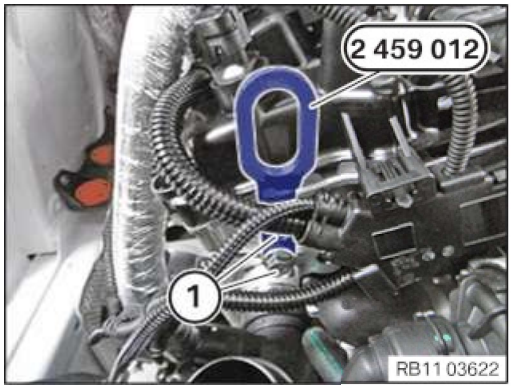
M12		Tightening torque	100 Nm



- Tighten bolt (1) of the right engine mount from the top using a standard tool.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



- 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.

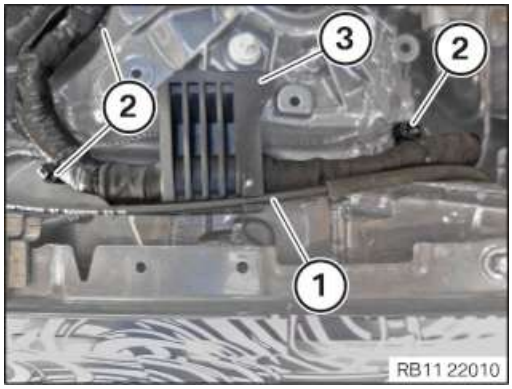
22 – Securing the wiring harness section to the left spring strut dome

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 position wiring harness section (3) on the left spring strut dome.
- Secure clamps (2).
- Guide in and install cable (1) of the front flap.

23 – Secure wiring harness section on right spring strut dome

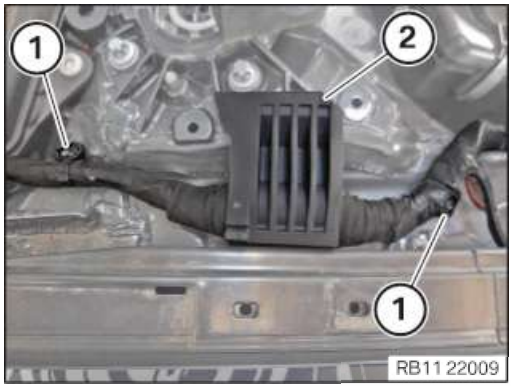
cardiagn.com

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

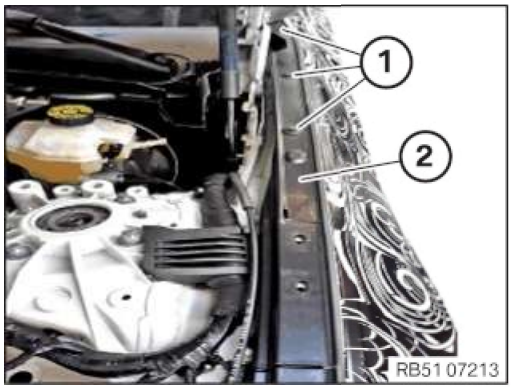
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

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



- Guide in and position the wiring harness section (2) of right spring strut dome.
- Secure clamps (1).

24 – Installation of side panel sealing.



NOTICE

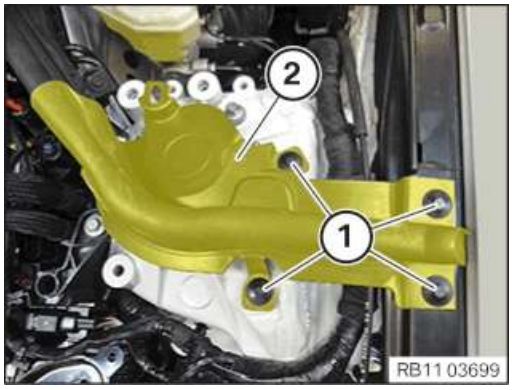
Description is for left component only. Procedure on the right side is identical.

- Guide the sealing (2) in and install it.
- Mount the expanding rivets (1).

25 – Install side bonnet seals

NOTICE

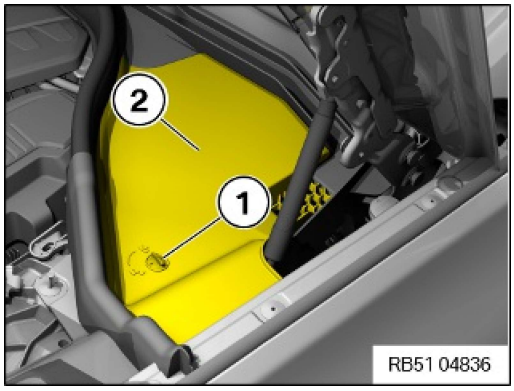
Perform the operations on the left and right side.



- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

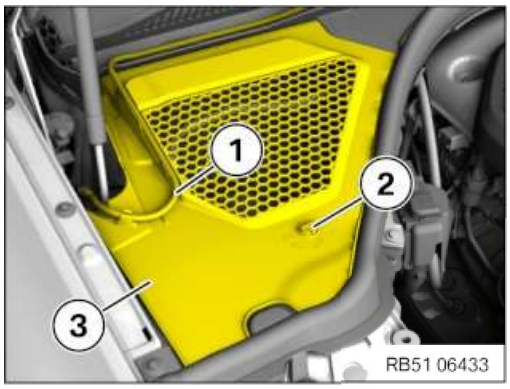
26 – Install the cover of the engine compartment on the rear left

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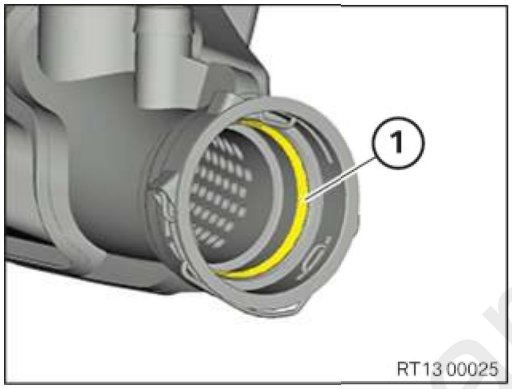
- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

27 – Install the rear right engine compartment cover



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

28 – Installing the clean air pipe with resonator

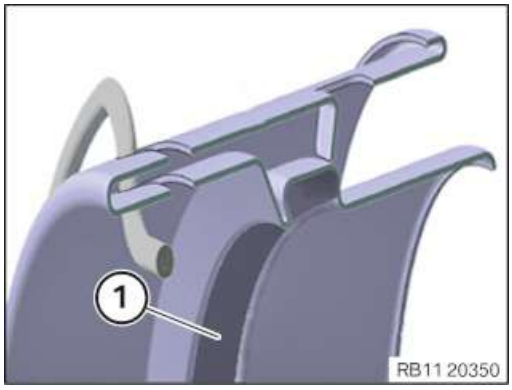


- Check the seal (1) for damages, replace if necessary.

▸ **Replace damaged gasket**

TECHNICAL INFORMATION

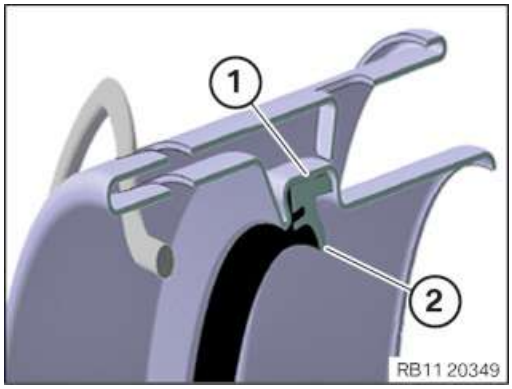
Do not use pointed or sharp-edged tools for the installation and/or removal.



- Remove damaged seal.
- Clean gasket groove (1) with a dry towel.

  The gasket groove (1) must be clean.

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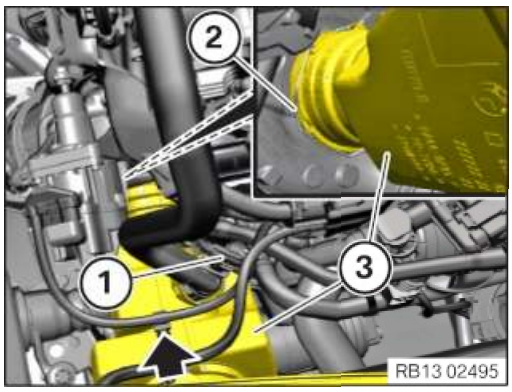
- Renew gasket.

  Parts: Gasket
- Install seal dry without lubricant or mounting agent.

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

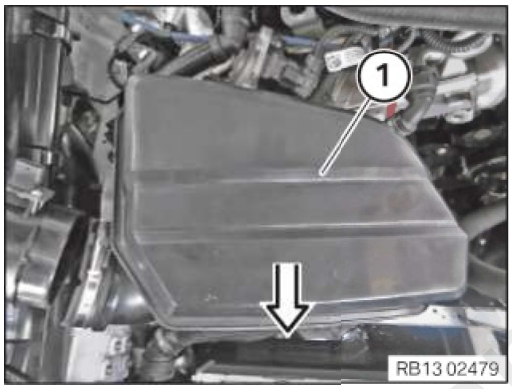
- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is pointing downwards (see figure).



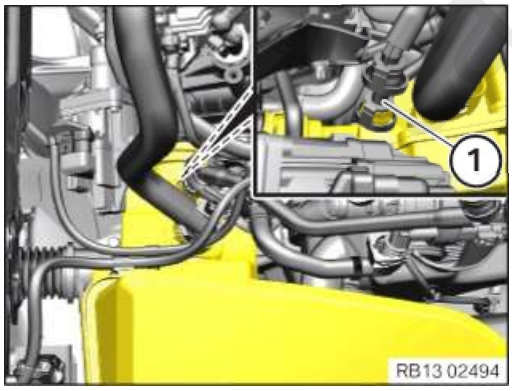
- Guide in and install the clean air pipe with resonator (3).
- Lock clamp (2).

  The clamp (2) must engage audibly.
- Connect connectors (1) and lock.

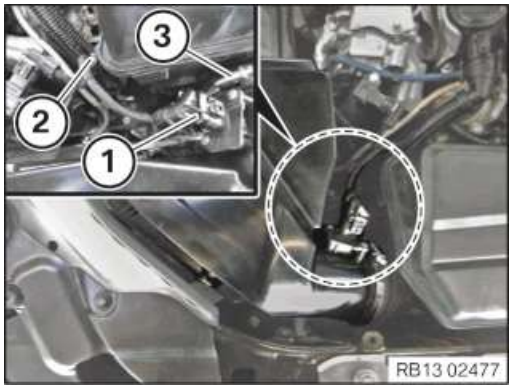
  The connector (1) must engage audibly.
- Secure clamp (arrow).



- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Connect and lock the tank ventilation line (1).



- Connect the clean air pipe with resonator to the intake filter housing.
- Tighten clamp (3).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Secure the clamp (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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- Insert and install the engine ventilation line (2).
- Ensure that the locks (1) engage audibly.

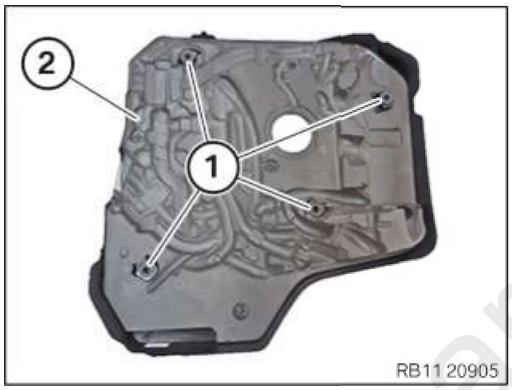
29 – Install acoustic cover

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.



- Check all rubber mounts (1) of acoustic cover (2) for correct seating.

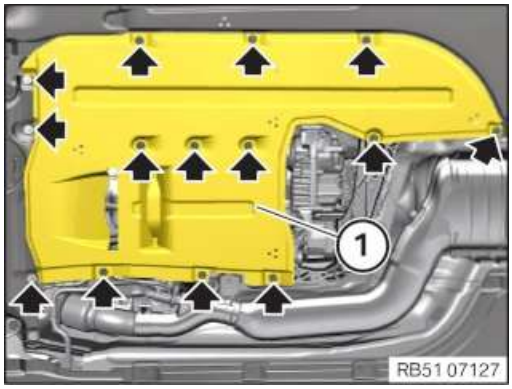


- Clip in the acoustic cover (1) into the holders in the **marked** areas.

  The acoustic cover (1) must audibly engage into place.

30 – Installing underbody protection at rear

ardiagn.com



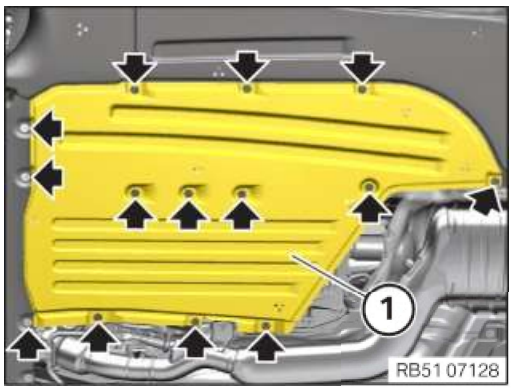
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

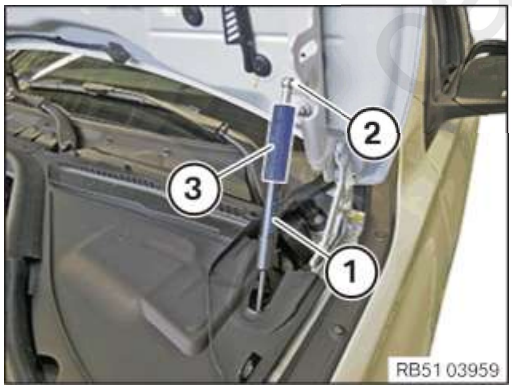
Hexagon screw		Tightening torque	3 Nm

31 – Disconnecting all battery earth leads



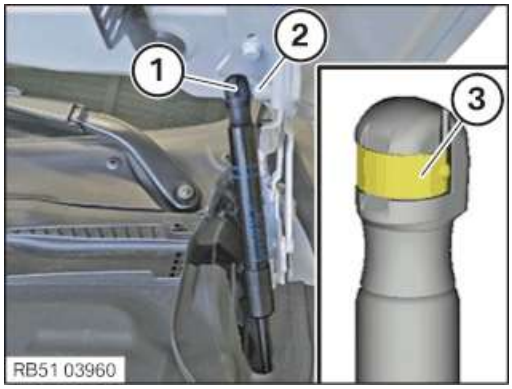
- See additional information.

32 – Take bonnet out of the service position



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

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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

Special tool to cylinder head			Used in step 12
M8		Tightening torque	21,5 Nm

Engine support arm to engine			Used in step 17
M10		Tightening torque	38 Nm

Control unit holder on spring strut dome			Used in step 18
Hexagon screw		Tightening torque	8 Nm

Engine mount to engine mounting bracket			Used in step 21
M12		Tightening torque	100 Nm

Clean air pipe to upper section of intake filter housing			Used in step 28
Clamp		Tightening torque	3 Nm

Underbody protection			Used in step 30
Hexagon screw		Tightening torque	3 Nm

Overview of Special Tools

2 459 012 Holder



Common	Used in step 1221
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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2 361 506 (00 6 103) Spindle



Common	Used in step 1221
Usage	Spindle (central spindle) for Traverse 00 6 100.
Included in the tool or work	0 496 852
Storage location	
Replaced by	
In connection with	
SI-Number	01 17 10 (659)

Links

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	1320

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231

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61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 35 ... Notes on ESD protection (Electro Static Discharge)	131419
61 00 730 Encode/program control unit(s) (after vehicle test)	20

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22 11 001 Replacing right engine mount

WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

- Before lowering or removing the front axle: Secure the engine in mounting orientation.
- For additional information see: 11 00 670 Securing engine in installation position.

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

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.

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.

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PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

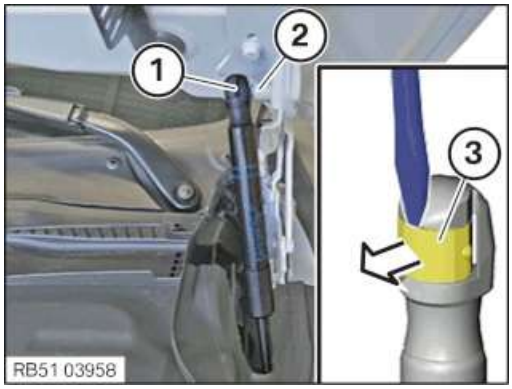
Engine compartment lid is open.

CAUTION

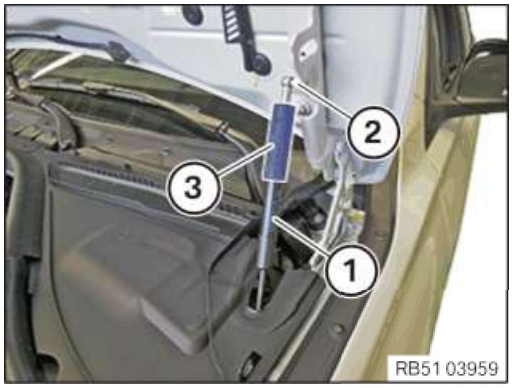
Shutting bonnet or tailgate.

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.

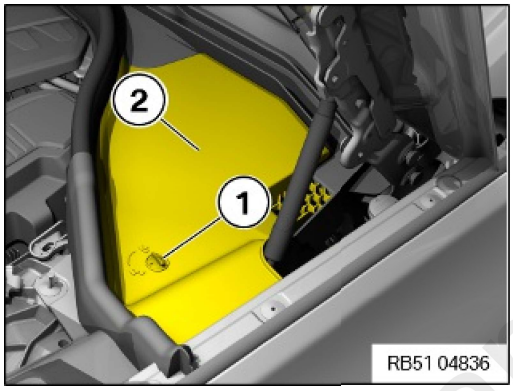


TECHNICAL INFORMATION

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

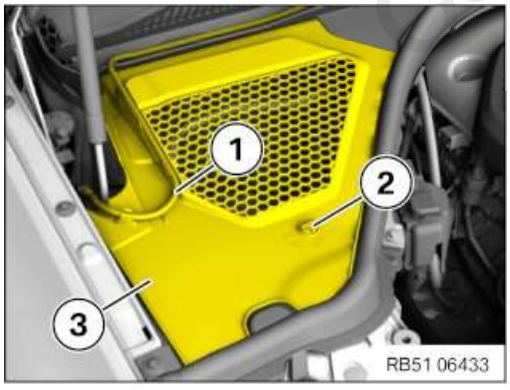
- Remove the bonnet support and open the bonnet further.
- Push special tool or (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

2 – Remove the cover of the engine compartment at the rear left



- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

3 – Remove the cover of the rear right engine compartment



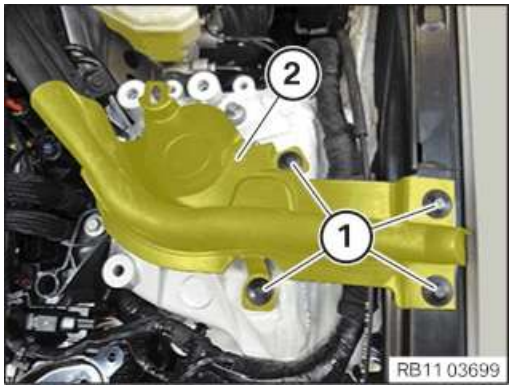
- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover of rear right engine compartment (3).

4 – Removing side bonnet gaskets

NOTICE

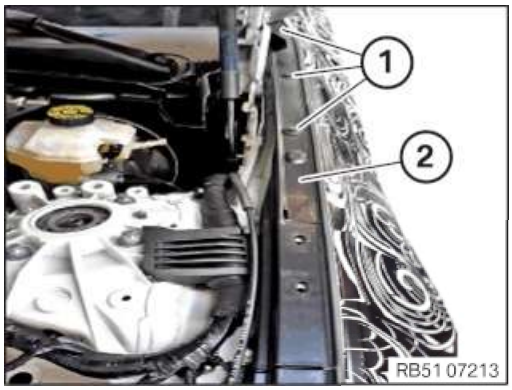
Perform the operations on the left and right side.

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- Loosen the rivet (1).
- Remove side bonnet seal (2) from spring strut dome.

5 – Remove sealing of the side panel

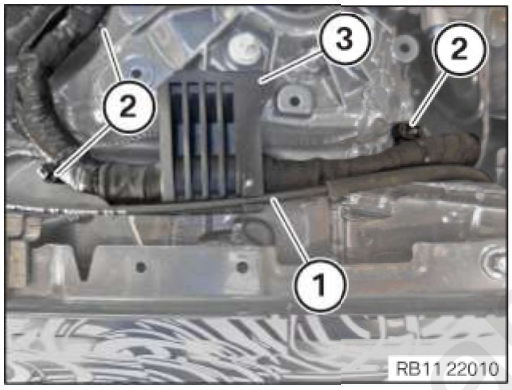


NOTICE

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

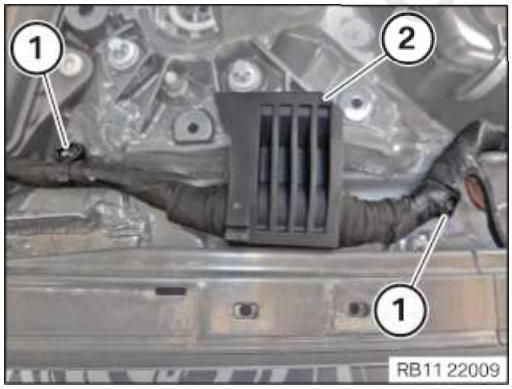
- Loosen the expanding rivet (1).
- Guide out seal (2) and remove.

6 – Partially loosen the wiring harness section on the spring strut dome



- Feed out the cable (1) of the front flap and set it aside.
- Loosen clamps (2).
- Feed out wiring harness section (3) on the spring strut dome on left and set it aside.

7 – Releasing the wiring harness section on the right spring strut dome



- Loosen clamps (1).
- Guide out wiring harness section (2) on the right spring strut dome and set it aside.

8 – 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 (1) from the holders in the **marked** areas towards the top.

9 – Removing the clean air pipe with the resonator

WARNING

Hot surfaces.

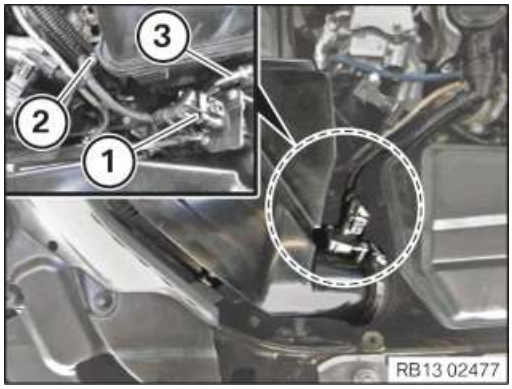
Risk of burning!

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

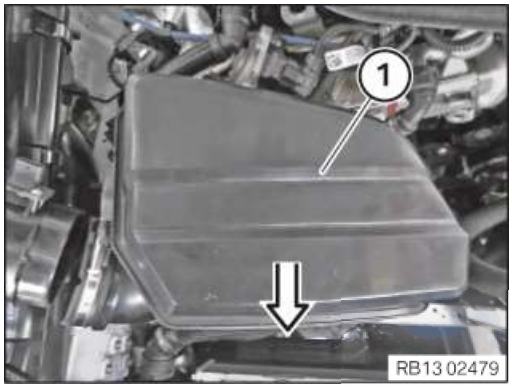


- Unlock the locks (1).
- Feed the engine ventilation line (2) out and set it aside.

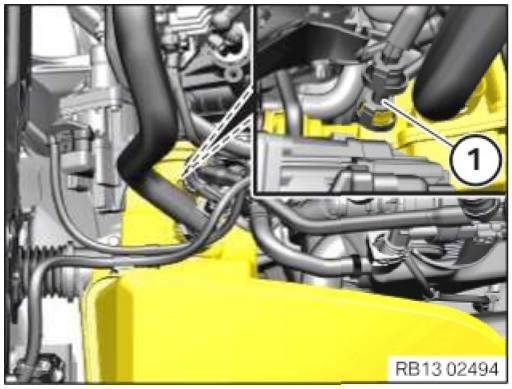
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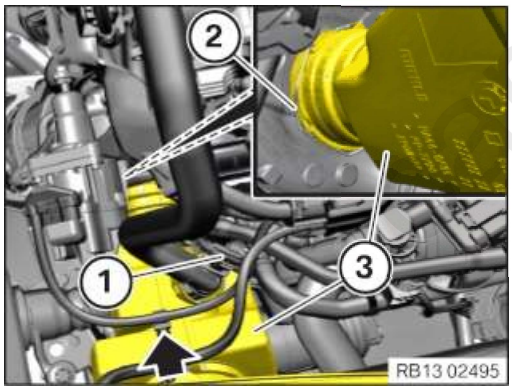
- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

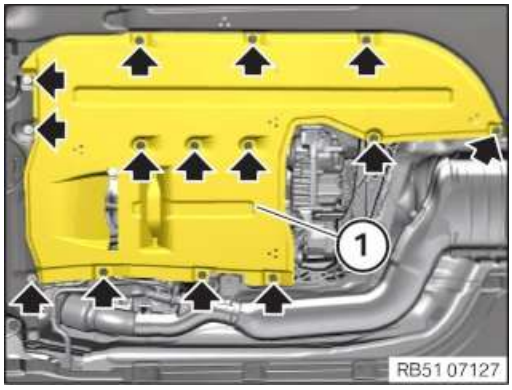


- Unlock and disconnect the tank ventilation line (1).



- Loosen the clamp (arrow).
- Unlock plug connection (1) and disconnect.
- Unlock the clamp (2).
- Feed out clean air pipe with resonator (3) and remove.

10 – Remove rear underbody protection

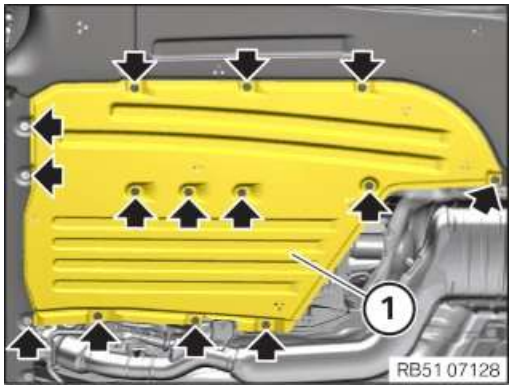


- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

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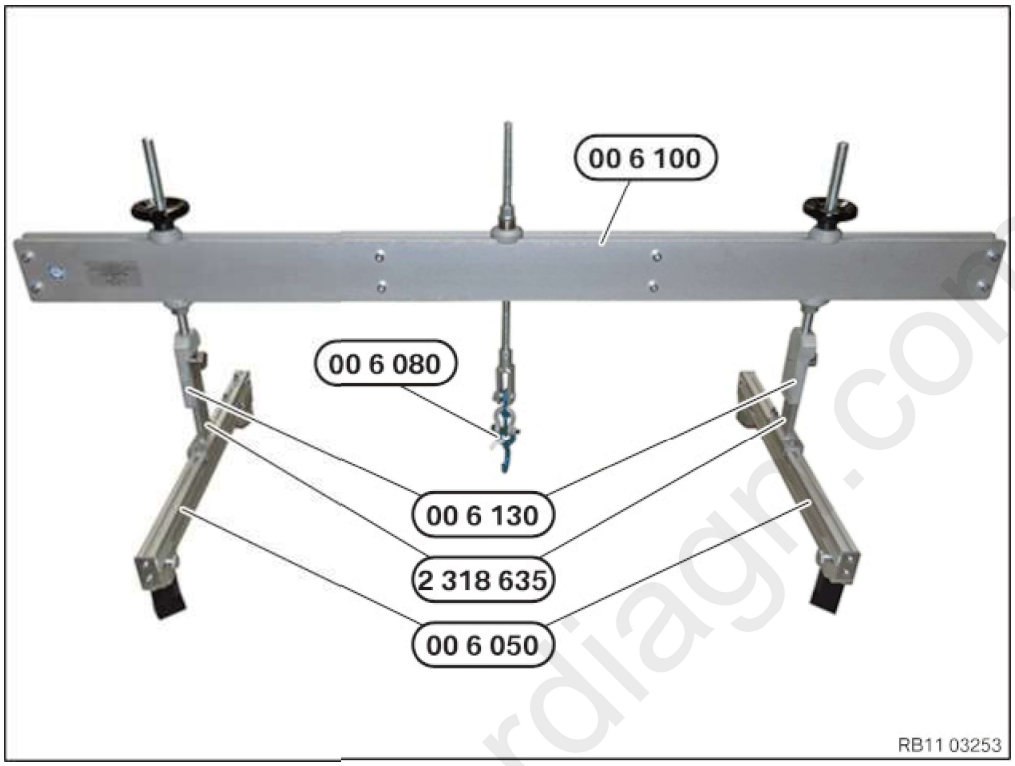
- **Version 2:**

  Remove screws (arrows).

  Guide out rear underbody protection (1) and remove it.

11 – Securing engine in installation position

Overview: Prepared engine bridge



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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- **Carefully** position engine bridge (1) with help from an auxiliary person.



- Make sure that special tool on the left is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , left, rests correctly on the spring strut dome.



- Make sure that special tool on the right is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , right, rests correctly on the spring strut dome.



- Align the engine bridge by moving it on the profile strips of the special tool above the engine mounting bracket (1) and screw it down.
- Align the hook above the engine mounting bracket (1).
- Connect the hook to the engine mounting bracket (1).



- Check whether the special tool on the right is correctly positioned on the lock support.

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- Check whether the special tool from the special tool kit , right, rests correctly on the spring strut dome.



- Check whether the special tool on the left is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , left, rests correctly on the spring strut dome.



- Release screw (1) on the left engine mount from the top with a commercially available tool.



- Release screw (1) on the right engine mount from the top with a commercially available tool.

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- Raise the engine by turning the special tool 2 361 506 (00 6 103) (spindle) by 10 mm.

12 – Disconnecting all battery earth leads



- See additional information.

13 – Removing both front wheels

▸ **Removing the wheel**



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

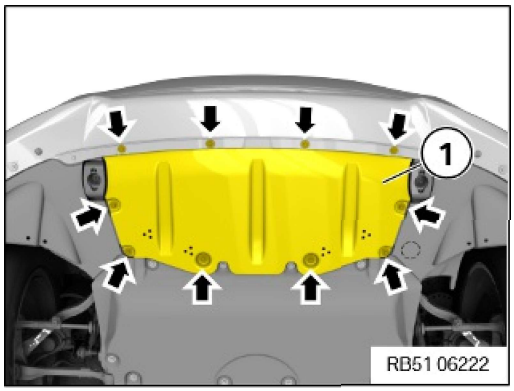
  This process is intended to prevent damage to the brake disc.

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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.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter from the tool set .

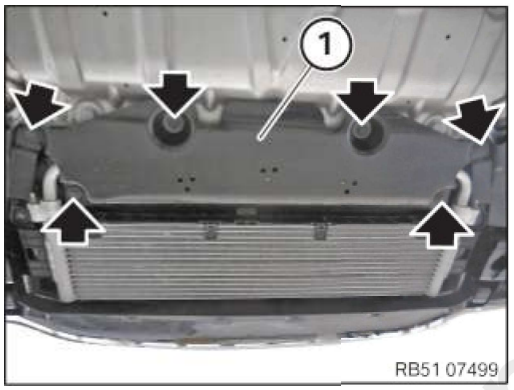
14 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

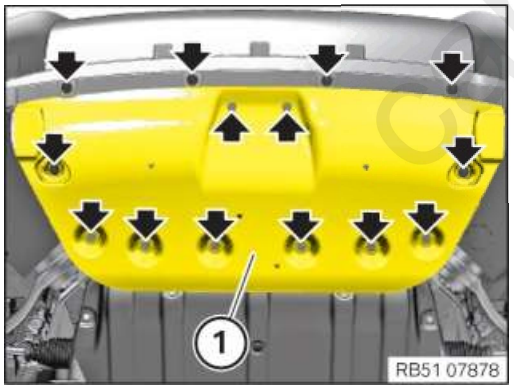
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

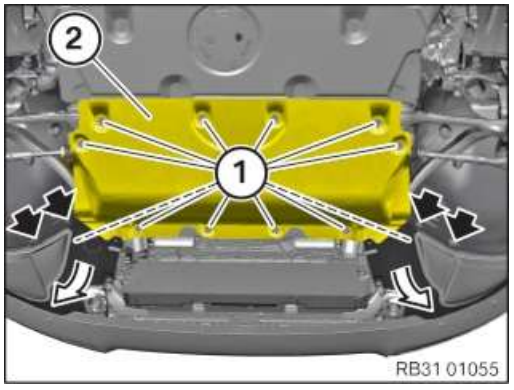


- **Version 3:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

15 – Remove the underbody protection of the steering gear



- **Version 1:**

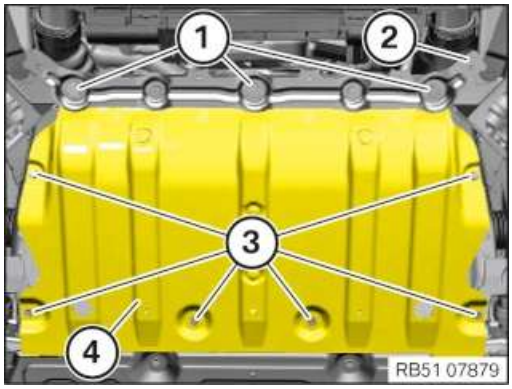
  Unscrew the screws (arrows) of the wheel arch cover on wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).

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- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

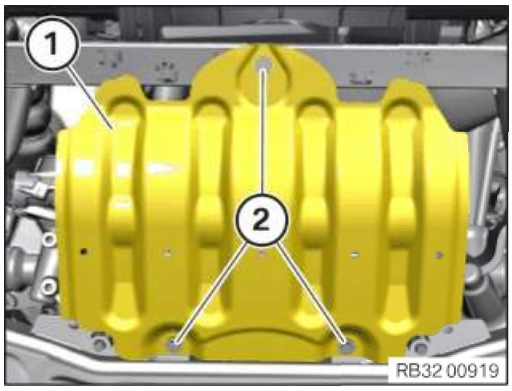
  Loosen screws (3).

  Slide the steering gear underbody protection (4) out and remove.

16 – If installed: Removing the steering start protection

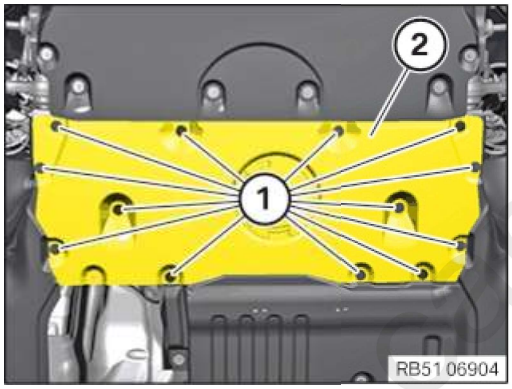
Prerequisite

The front underbody protection is removed.



- Loosen screws (2).
- Remove guard (1).

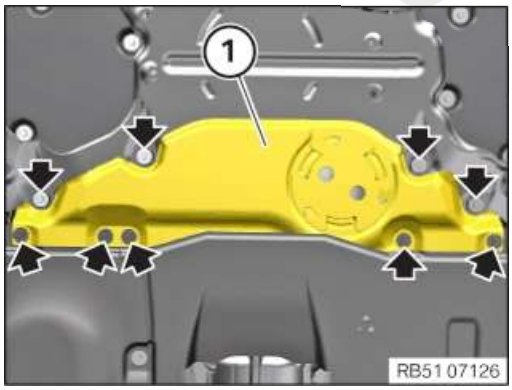
17 – Removing the centre underbody protection



- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .



- **Version with all-wheel drive:**

  Remove screws (arrows).

  Feed out and remove the centre underbody protection (1).

18 – Remove the cover of the steering assembly on the left and right

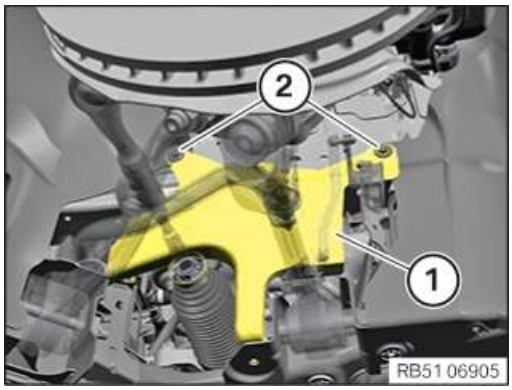
NOTICE

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

▸ **Remove the cover of the steering assembly**

Prerequisite

Underbody protection of the steering gear is removed.



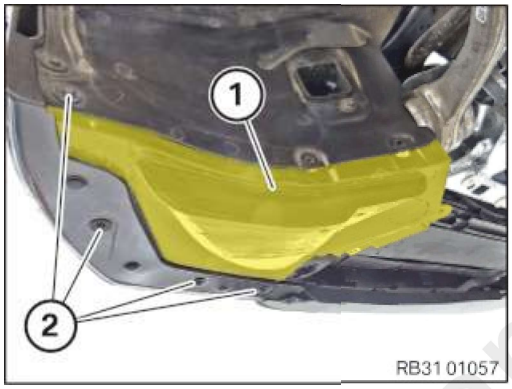
- Loosen screws (2).
- Remove the cover (1).

19 – Removing the bottom left and right wheel arch cover

NOTICE

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

▸ **Remove bottom wheel arch cover**

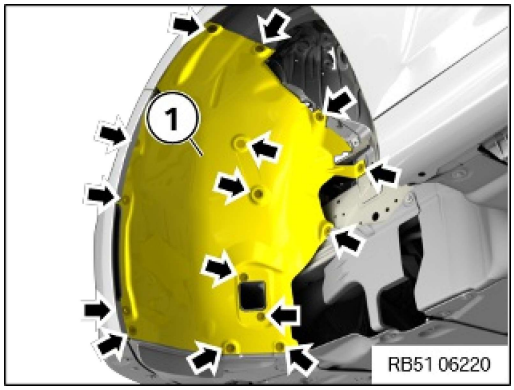


- Loosen screws (2).
- Remove bottom wheel arch cover (1)

20 – Removing the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



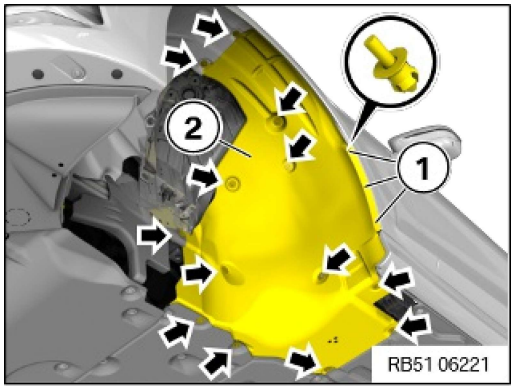
- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

21 – Removing the rear section of the front wheel arch cover front

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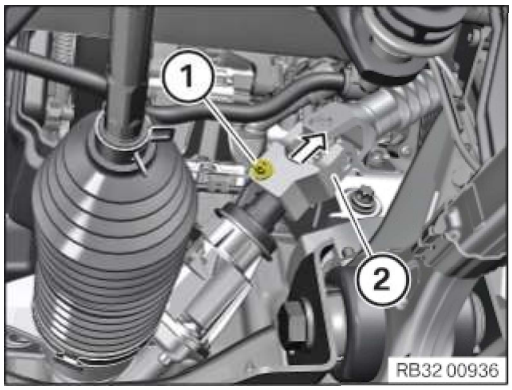
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



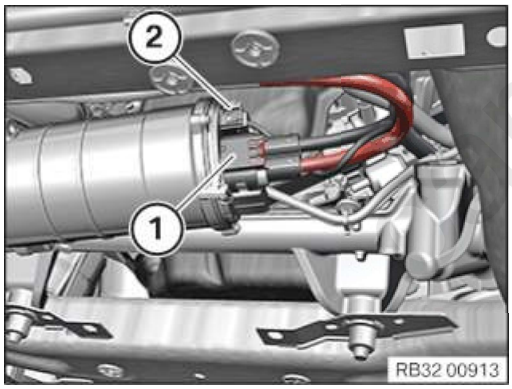
- Loosen the expanding rivet (1).
- Remove screws (arrows).
- Remove the rear section of the front wheel arch cover (2).

22 – Releasing lower steering shaft from steering gear

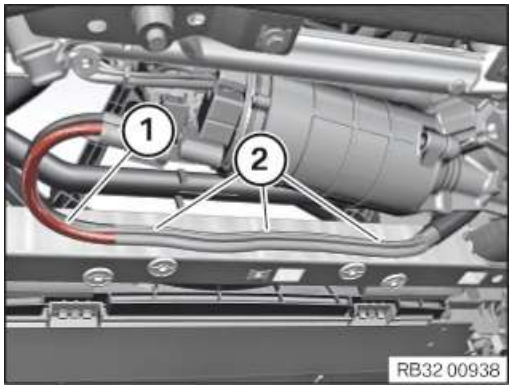


- Loosen screw (1).
- Pull off lower steering shaft (2) from steering gear in direction of arrow.

23 – Detach the wiring harness of the EPS from the front axle support

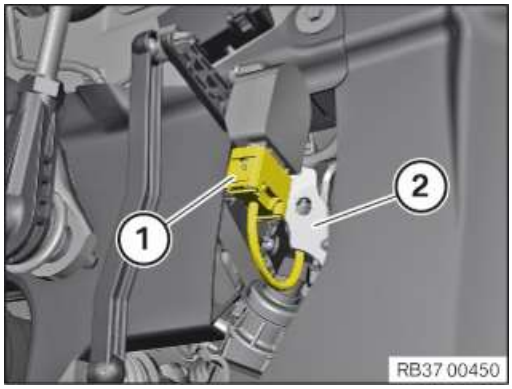


- Unlock and disconnect the plug connections (1) and (2).



- Loosen the holder (2).
- Place wiring harness (1) to one side.

24 – Detach the line connection of the ride height sensor



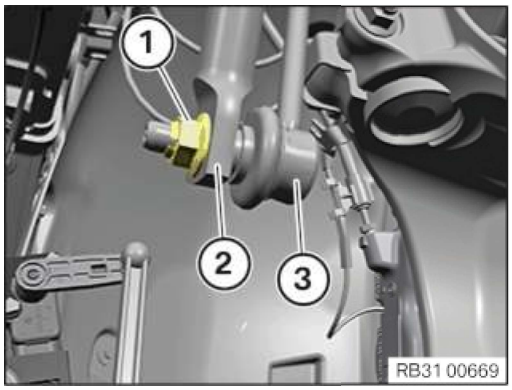
- Unlock plug connection (1) and disconnect.
- Unclip the line from holder (2).

25 – Release the left and right anti-roll bar link from the anti-roll bar

NOTICE

Perform the operations on the left and right side.

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



- Loosen nut (1).

Note: Use the Torx socket for counter support.

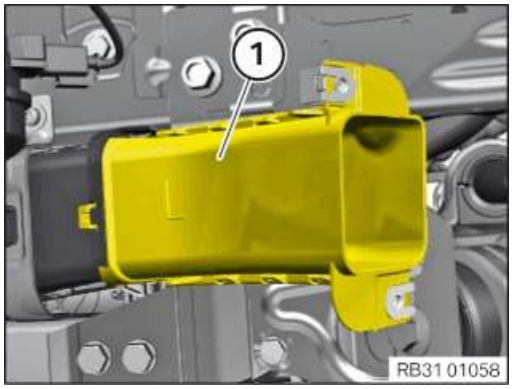
- Loosen the anti-roll bar link (3) from the anti-roll bar (2).

26 – Removing the left and right brake air duct partially

NOTICE

Perform the operations on the left and right side.

▸ **Removing brake air duct partially**



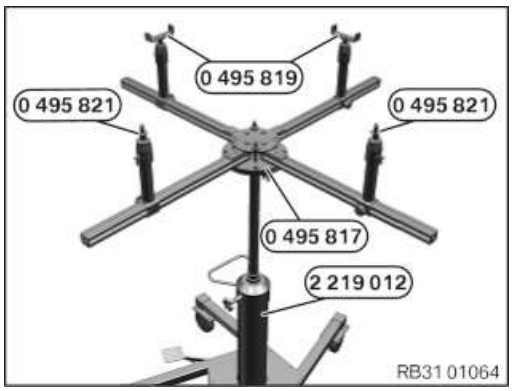
- Unclip and remove air duct (1).

27 – Preparing the special tool

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TECHNICAL INFORMATION

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



- Fit the special tool completely on the universal jack 2 219 012 with the help of an auxiliary person.
- Insert special tools in telescopic supports of a profile rail pair.
- Insert special tools in telescopic supports of other profile rail pair.

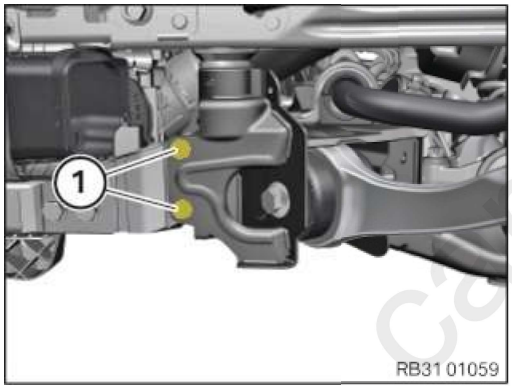
28 – Lower front axle support

WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

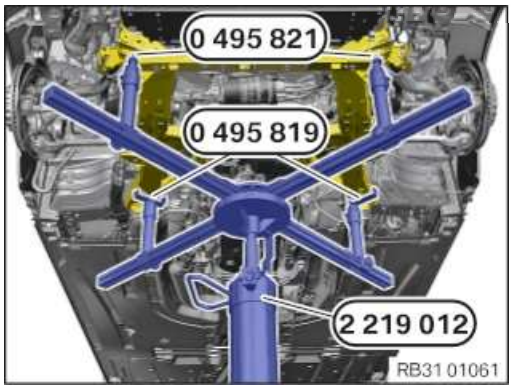
- Before lowering or removing the front axle: Secure the engine in mounting orientation.
- For additional information see: 11 00 670 Securing engine in installation position.



NOTICE

Perform the operations on the left and right side.

- Loosen screws (1).

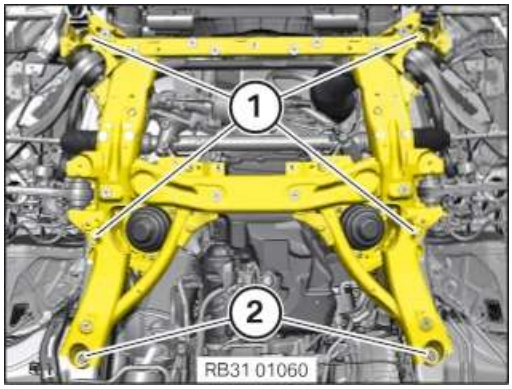


- Position the universal jack 2 219 012 with the special tools and on the front axle support.

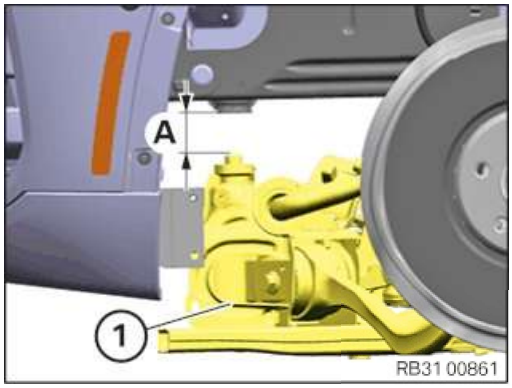
  The centre of gravity of the front axle must be centred over the universal jack 2 219 012 !

- Support the front axle support with the universal jack 2 219 012.

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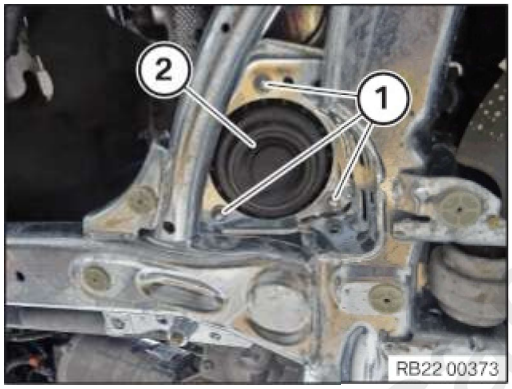
- Loosen screws (1) and (2).



- Lower the front axle support (1) with the universal jack by dimension (A).
  Dimensions (A) = maximum 15 cm

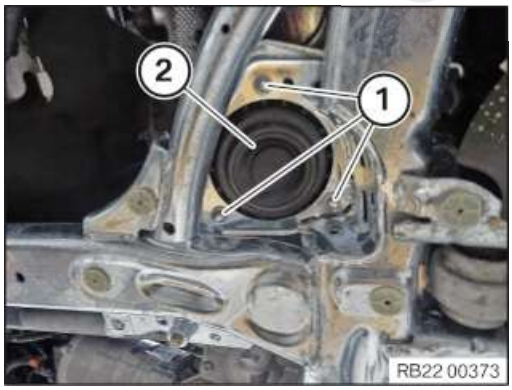
MAIN WORK

29 – Remove right engine mount



- Loosen screws (1).
- Remove engine mount (2).

30 – Installing the right engine mount



- Install the engine mount (2).
- Tighten the screws (1).

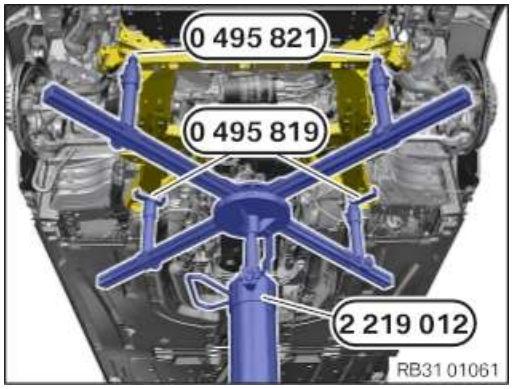
Engine mount to front axle support

M8		Tightening torque	19 Nm

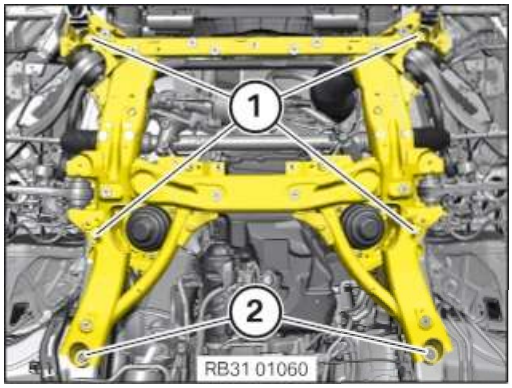
POSTPROCESSES

31 – Lift front axle support and fasten.

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- Carefully lift the front axle support with the universal jack 2 219 012 and position on the body.



- Replace the screws (1).

  Parts: Bolts

- Tighten the screws (1).

Front axle support to front/centre of body

M12	Renew screws.	Jointing torque	108 Nm

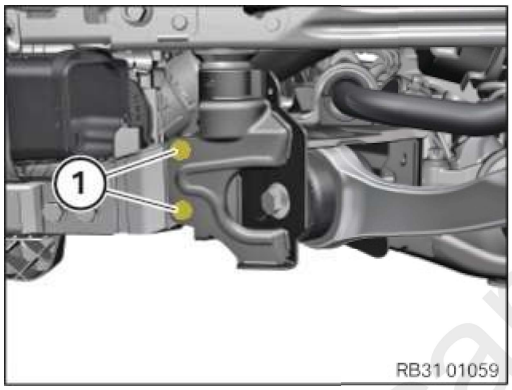
- Replace the screws (2).

  Parts: Bolts

- Tighten the screws (2).

Front axle carrier to body, rear

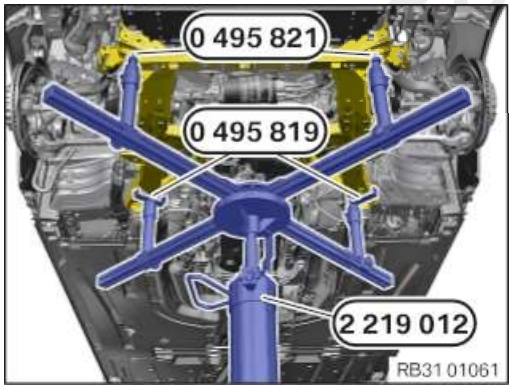
M14	Renew screws.	Tightening torque	175 Nm



- Position the adapter for the front axle support on the front axle support .
- Tighten the screws (1).

Adapter, front axle support to front axle support

M8x70		Tightening torque	19 Nm



- Lower the universal jack 2 219 012 and place to one side.

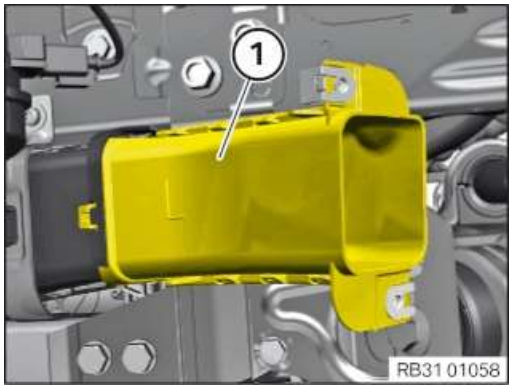
32 – Partially installing the left and right brake air duct

NOTICE

Perform the operations on the left and right side.

▸ **Installing the brake air duct partially**

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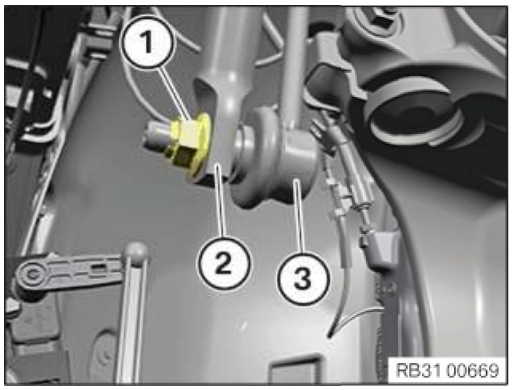


- Position and clip in air duct (1).

33 – Securing the anti-roll bar link to the left and right anti-roll bar

NOTICE

Perform the operations on the left and right side.



▸ **Securing the anti-roll bar link to the anti-roll bar**

- Position the anti-roll bar link (3) on the anti-roll bar (2).
- Renew nut (1).

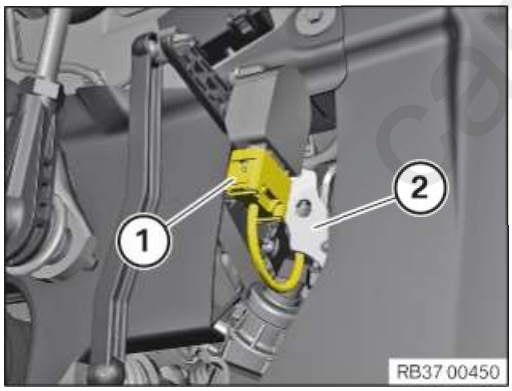
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Front anti-roll bar link to anti-roll bar/spring strut

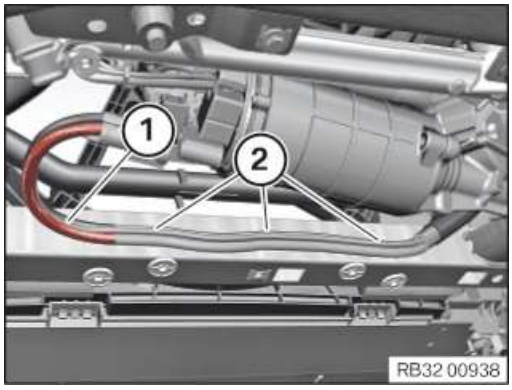
M10	Renew nut.	Tightening torque	56 Nm

34 – Attach the line connection of the ride height sensor



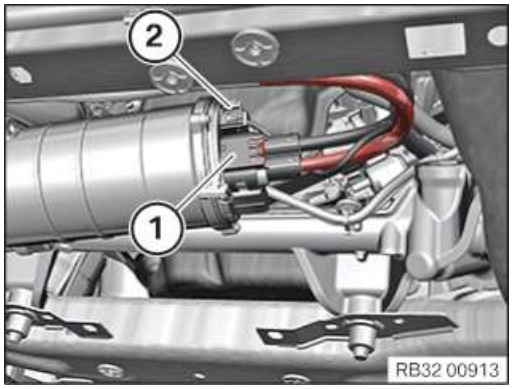
- Position the line .
- Clip in line on holder (2) .
- Connect connectors (1) and lock.

35 – Secure the wiring harness for the EPS on the front axle support



- Position the EPS wiring harness (1) from the front axle support.
- Secure the holder (2).

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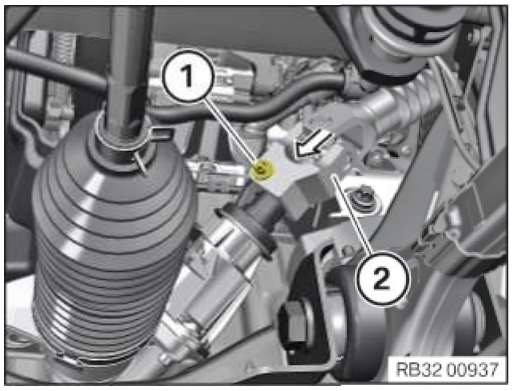


- Connect connectors (1) and (2) lock.

36 – Securing the steering shaft at the bottom on the steering gear

TECHNICAL INFORMATION

The universal joint can only be installed in one position.
The universal joint and the bottom steering gear and/or steering shaft are encoded with each other.
The clamping bolt must e positioned in the groove of the steering gear groove or the steering shaft.



- Clean the screw threads to remove all remnants of screw locking adhesive.
- Slide the lower steering shaft (2) onto the steering gear in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

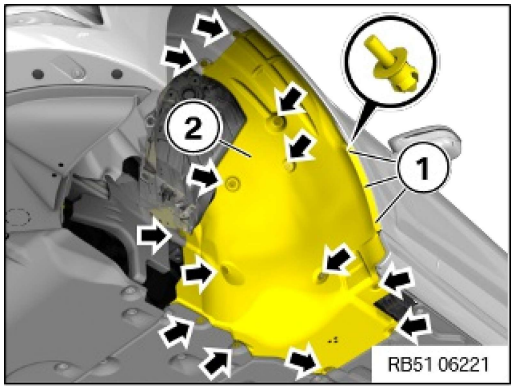
Universal joint to steering box

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

37 – Install the rear section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the rear section of the front wheel arch cover(2) .
- Tighten screws (arrows).

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

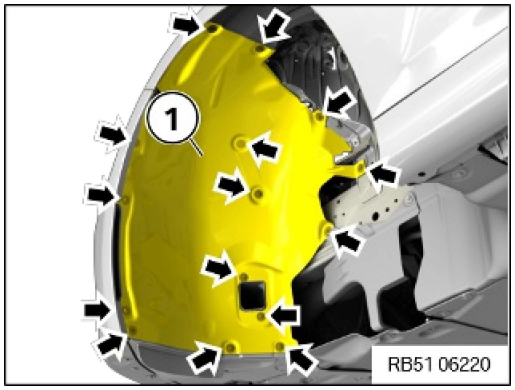
- Secure expanding rivet (1).

38 – Install the front section of the front wheel arch cover

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NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

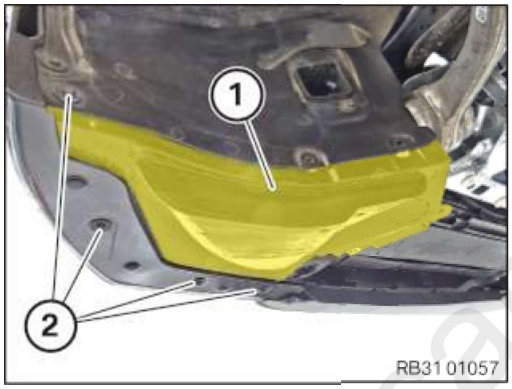
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

39 – Installing the bottom left and right wheel arch cover

NOTICE

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

▸ **Installing the bottom wheel arch cover**



- Position the bottom wheel arch cover (1).
- Tighten the screws (2).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

40 – Install the cover of the steering assembly on the left and right

NOTICE

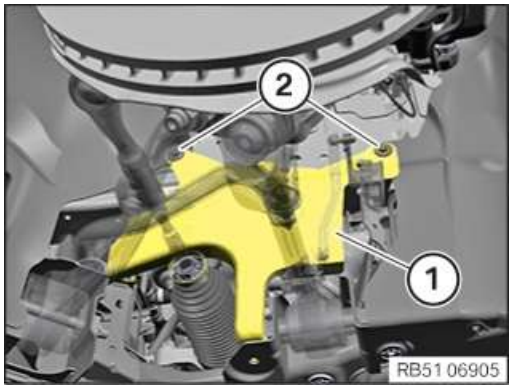
Description is for left component only. Procedure on the right side is identical.

▸ **Install the cover of the steering assembly**

Prerequisite

The underbody protection of the steering gear is removed.

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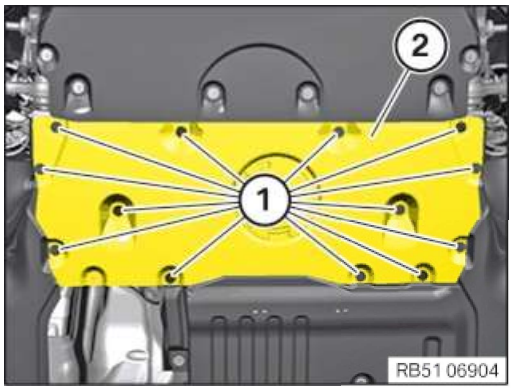


- Position the cover (1).
- Tighten the screws (2).

Cover, steering unit

Screw		Tightening torque	3 Nm

41 – Installing the centre underbody protection



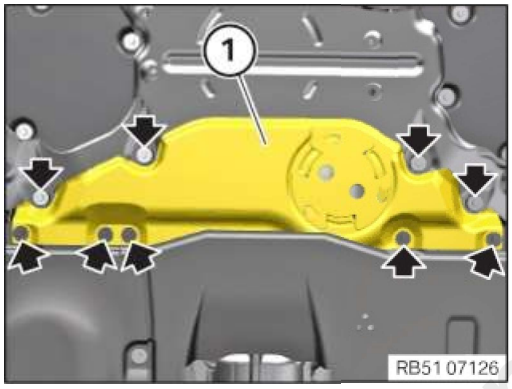
- **Version with rear-wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version with all-wheel drive:**

  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

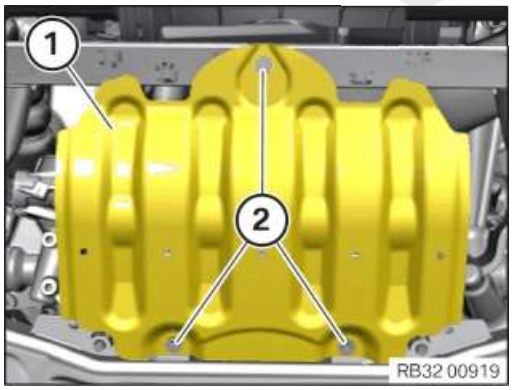
Underbody protection

Hexagon screw		Tightening torque	3 Nm

42 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.



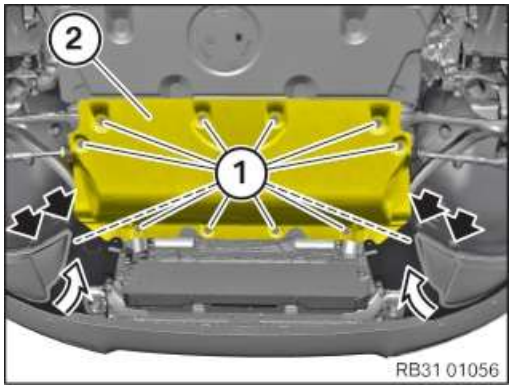
- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

43 – Install the underbody protection of the steering gear

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- **Version 1:**
- Position the underbody protection of the steering gear (2).
- Tighten the screws (1).

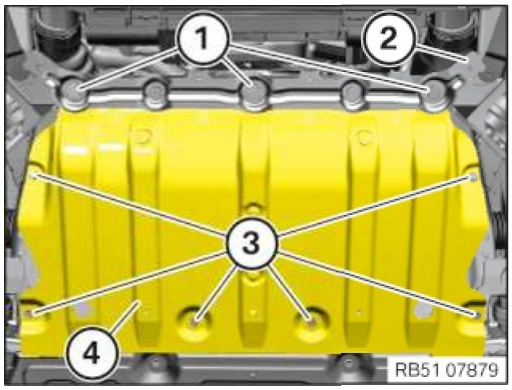
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.
- Tighten the screws (arrows) of the bottom wheel arch cover on the wheel arch cover.

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



- **Version 2:**
- Guide in the steering gear underbody protection (4) and install.
- Tighten the screws (3).

Underbody protection of the steering gear

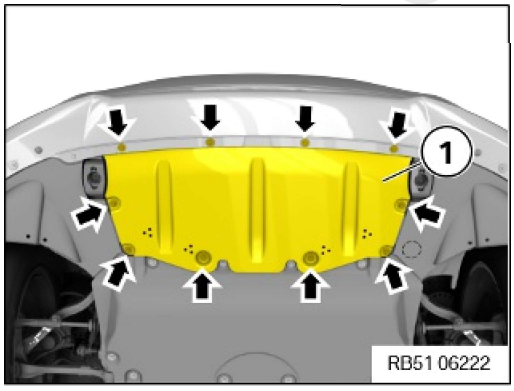
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position holder of underride protection (2).
- Tighten the screws (1).

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

44 – Installing the front underbody protection



- **Version 1:**

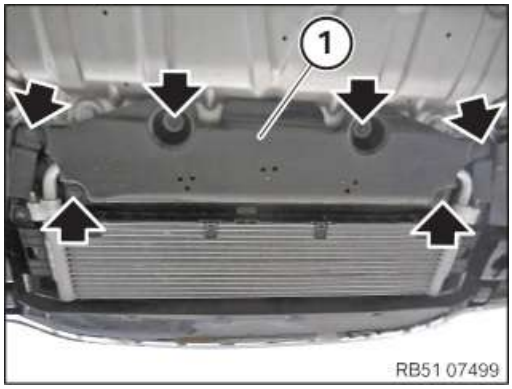
  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

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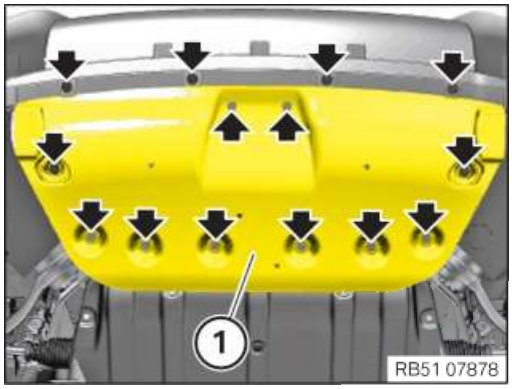
- **Version 2:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

45 – Installing both front wheels

▸ **Mounting the wheel**



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.

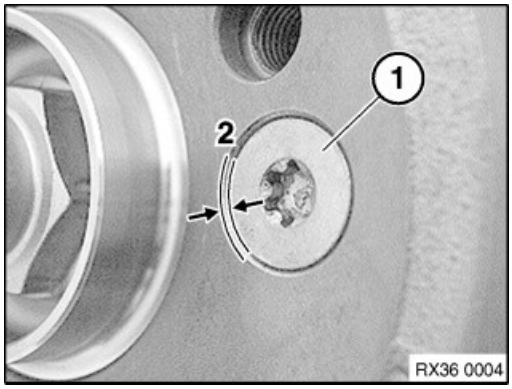
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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).

carlogic.com



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

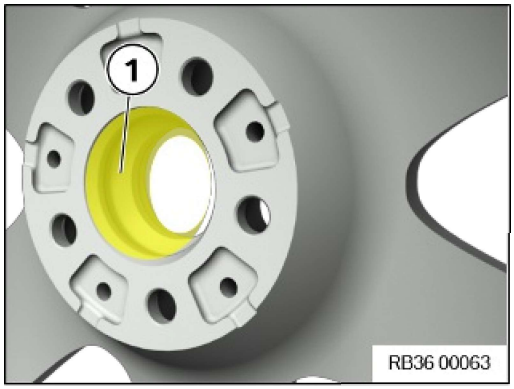
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

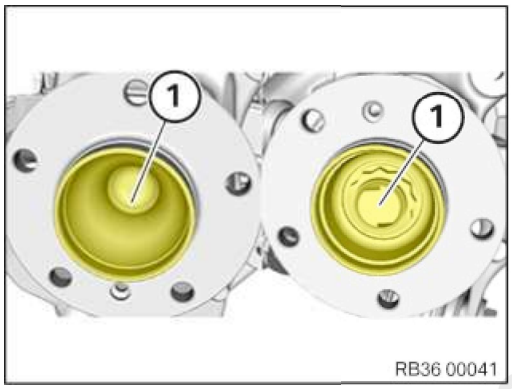
M8	Renew screw.	Tightening torque	16 Nm



- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

  This process is intended to prevent damage to the brake disc.

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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 and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

46 – Disconnecting all battery earth leads



- See additional information.

47 – Loosen the attachment of the engine in installation position

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- Lower engine by turning the spindle 2 361 506 (00 6 103) until the engine lies completely on the engine supports.



TECHNICAL INFORMATION

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

- Remove the engine bridge (1) with an auxiliary person.



- Tighten bolt (1) of the left engine mount from the bottom using a standard tool.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



- Tighten bolt (1) of the right engine mount from the top using a standard tool.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



- 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.

48 – Securing the wiring harness section to the left spring strut dome

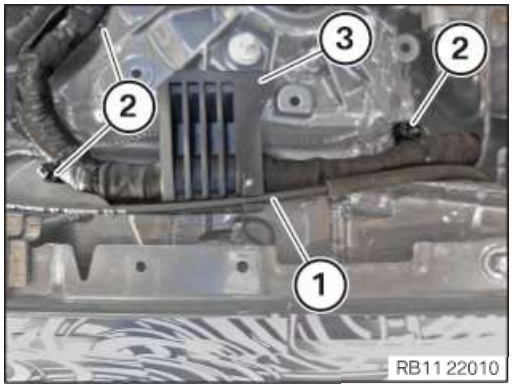
mdiagn.com

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 position wiring harness section (3) on the left spring strut dome.
- Secure clamps (2).
- Guide in and install cable (1) of the front flap.

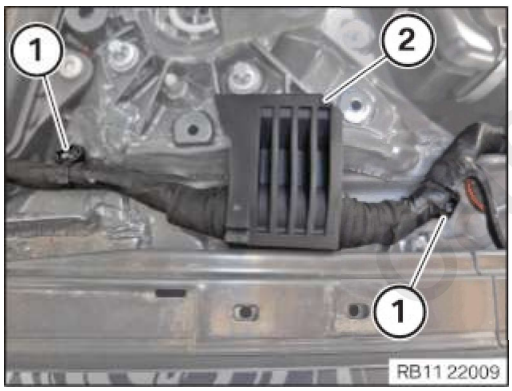
49 – Secure wiring harness section on right spring strut dome

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

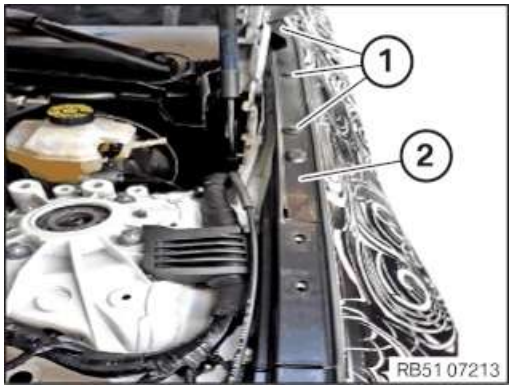
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

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



- Guide in and position the wiring harness section (2) of right spring strut dome.
- Secure clamps (1).

50 – Installation of side panel sealing.



NOTICE

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

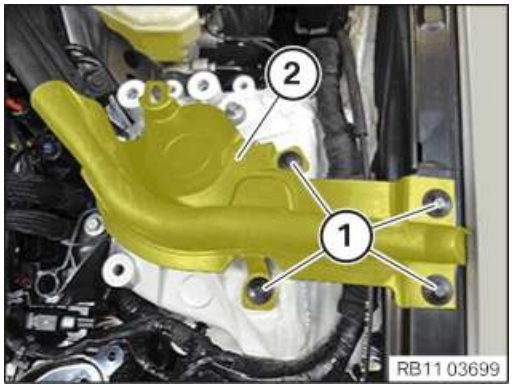
- Guide the sealing (2) in and install it.
- Mount the expanding rivets (1).

51 – Install side bonnet seals

eTrdiagn.com

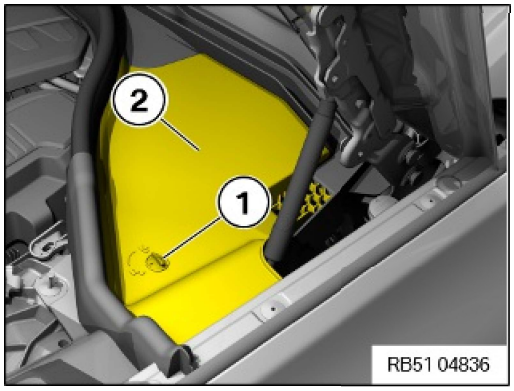
NOTICE

Perform the operations on the left and right side.



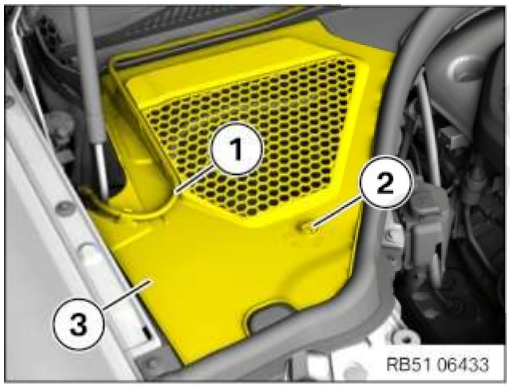
- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

52 – Install the cover of the engine compartment on the rear left



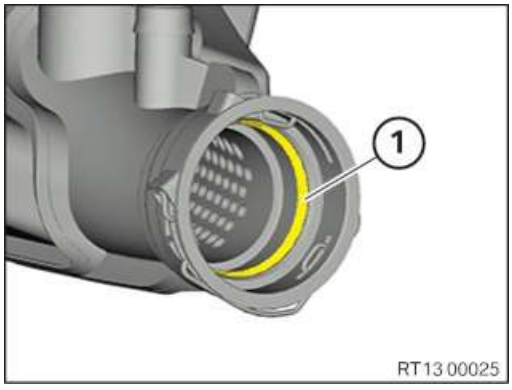
- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

53 – Install the rear right engine compartment cover



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

54 – Installing the clean air pipe with resonator



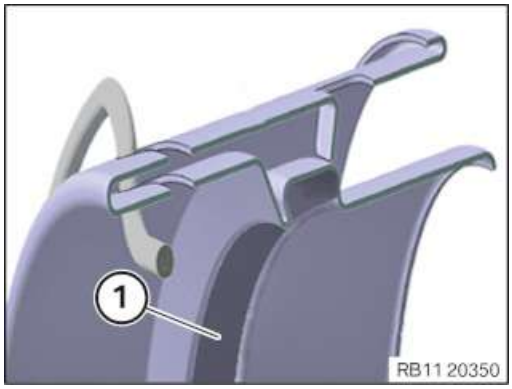
- Check the seal (1) for damages, replace if necessary.

▸ **Replace damaged gasket**

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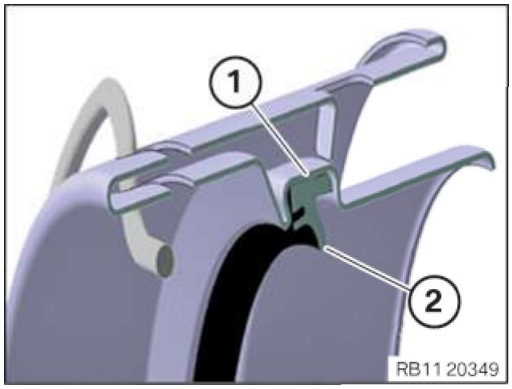
TECHNICAL INFORMATION

Do not use pointed or sharp-edged tools for the installation and/or removal.



- Remove damaged seal.
- Clean gasket groove (1) with a dry towel.

  The gasket groove (1) must be clean.



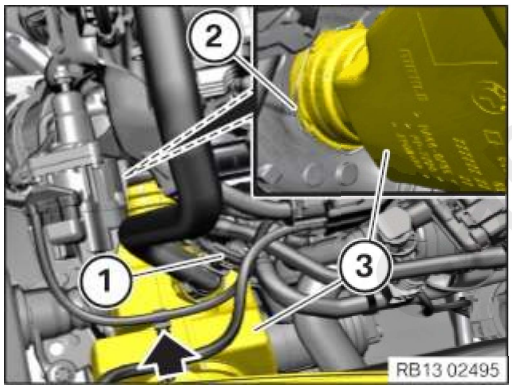
- Renew gasket.

  Parts: Gasket
- Install seal dry without lubricant or mounting agent.

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

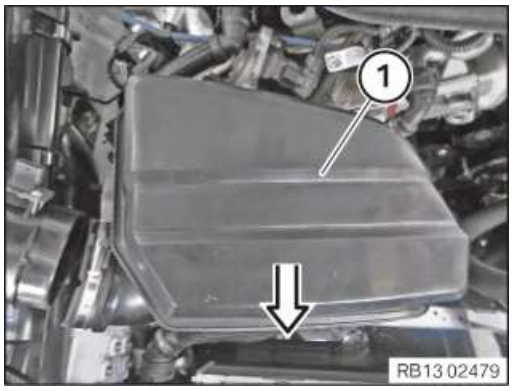
- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is pointing downwards (see figure).



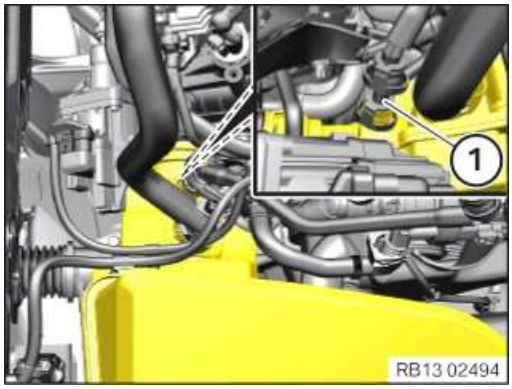
- Guide in and install the clean air pipe with resonator (3).
- Lock clamp (2).

  The clamp (2) must engage audibly.
- Connect connectors (1) and lock.

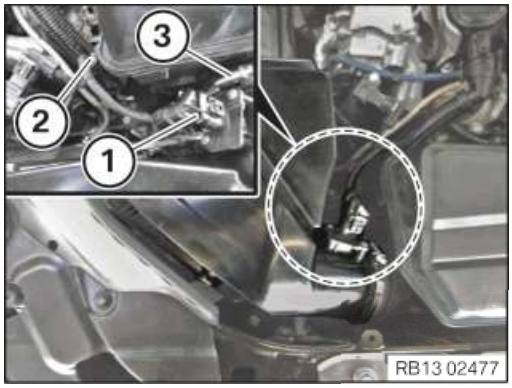
  The connector (1) must engage audibly.
- Secure clamp (arrow).



- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Connect and lock the tank ventilation line (1).



- Connect the clean air pipe with resonator to the intake filter housing.
- Tighten clamp (3).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Secure the clamp (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Insert and install the engine ventilation line (2).
- Ensure that the locks (1) engage audibly.

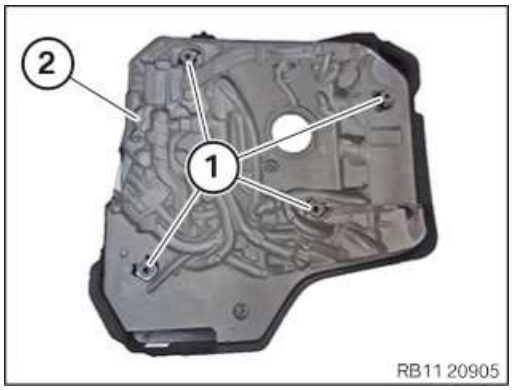
55 – Install acoustic cover

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.



- Check all rubber mounts (1) of acoustic cover (2) for correct seating.

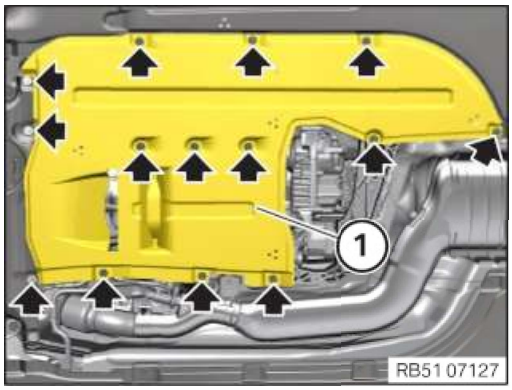
cardiagn.com



- Clip in the acoustic cover (1) into the holders in the **marked** areas.

  The acoustic cover (1) must audibly engage into place.

56 – Installing underbody protection at rear



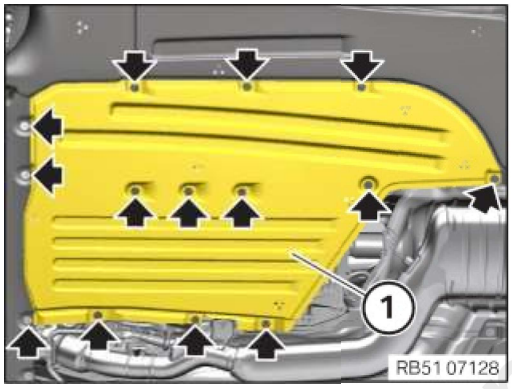
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

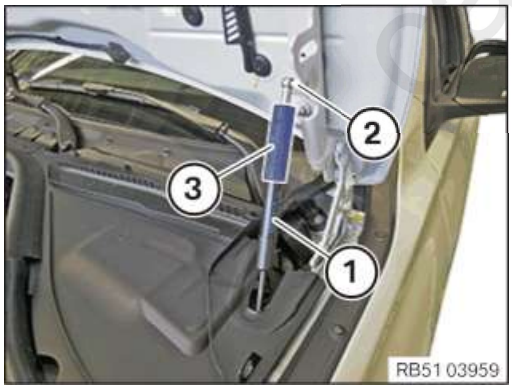
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

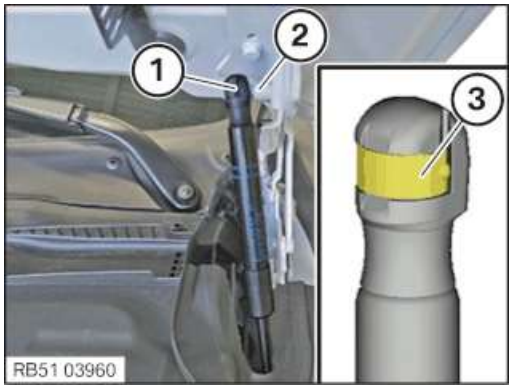
Hexagon screw		Tightening torque	3 Nm

57 – Take bonnet out of the service position



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

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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

Special tool to cylinder head — Used in step 11

M8		Tightening torque	21,5 Nm

Engine mount to front axle support — Used in step 30

M8		Tightening torque	19 Nm

Front axle support to front/centre of body — Used in step 31

M12	Renew screws.	Jointing torque	108 Nm

Front axle carrier to body, rear — Used in step 31

M14	Renew screws.	Tightening torque	175 Nm

Adapter, front axle support to front axle support — Used in step 31

M8x70		Tightening torque	19 Nm

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 33

M10	Renew nut.	Tightening torque	56 Nm

Universal joint to steering box — Used in step 36

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Wheel arch trim panel, front — Used in step 3738

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Cover, front bottom on side — Used in step 39

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Cover, steering unit — Used in step 40

Screw		Tightening torque	3 Nm

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Underbody protection — Used in step 4156

Hexagon screw		Tightening torque	3 Nm

Bumper buffer device steering on front axle support — Used in step 42

M10		Tightening torque	56 Nm

Underbody protection of the steering gear — Used in step 43

Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Wheel arch cover (screws) — Used in step 43

Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support — Used in step 43

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 44

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Brake disc to front wheel hub — Used in step 45

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 45

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 45

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Engine mount to engine mounting bracket — Used in step 47

M12		Tightening torque	100 Nm

Clean air pipe to upper section of intake filter housing — Used in step 54

Clamp		Tightening torque	3 Nm

Overview of Special Tools

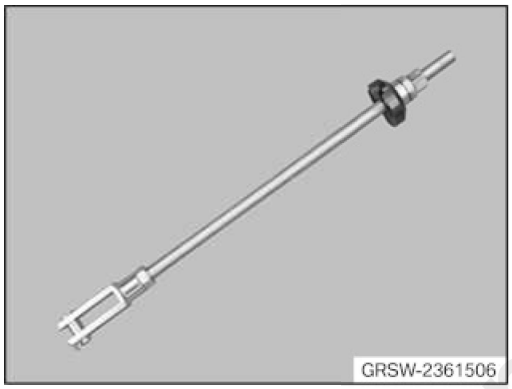
cardiagn.com

2 459 012 Holder



Common	Used in step 1147
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)

2 361 506 (00 6 103) Spindle



Common	Used in step 1147
Usage	Spindle (central spindle) for Traverse 00 6 100.
Included in the tool or work	0 496 852
Storage location	
Replaced by	
In connection with	
SI-Number	01 17 10 (659)

2 219 012 Hydraulic lifter



Common	Used in step 272831
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

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2 344 011 Tool



Common	Used in step 45
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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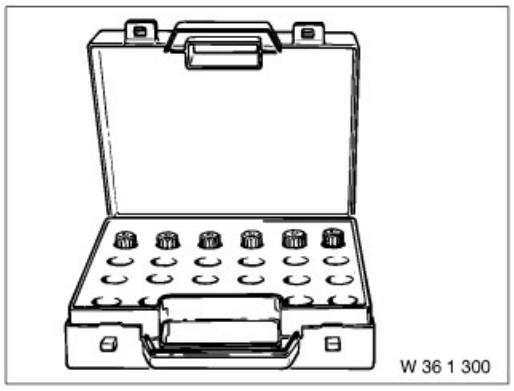
Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 13
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



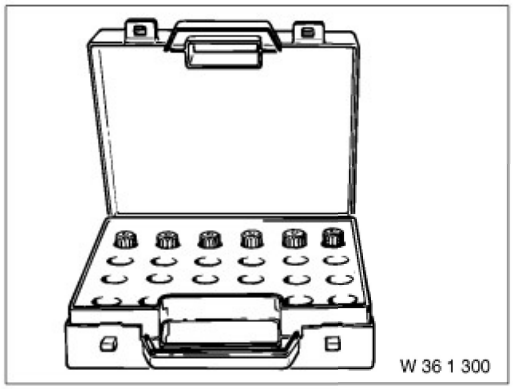
Common	Used in step 13
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



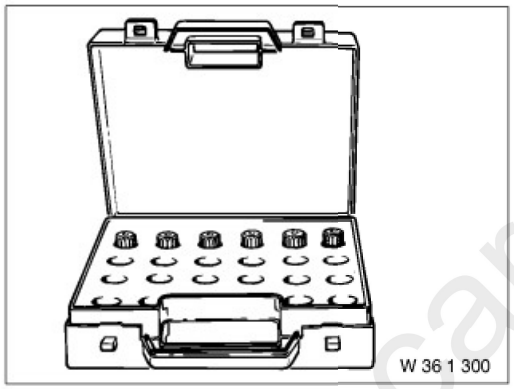
Common	Used in step 13
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



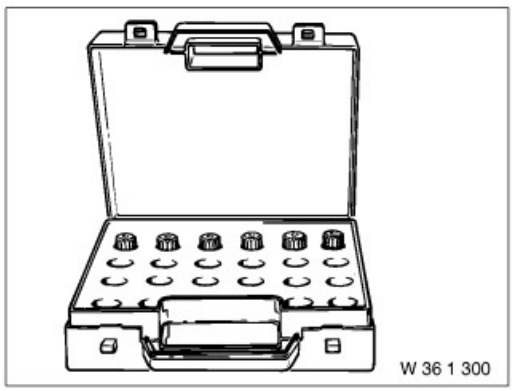
Common	Used in step 13
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 13
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 13
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	

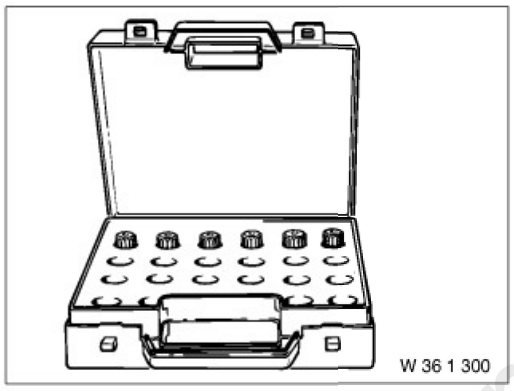
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0 495 229 (36 1 332) Wheel stud



Common	Used in step 13
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 13
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	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1246
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1246
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting battery earth lead	1246
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61 20 900 Disconnecting and connecting battery earth lead	1246
61 20 900 Disconnecting and connecting battery earth lead	1246

00 .. ... Raising the vehicle using a vehicle hoist

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22 11 100 Replacing right engine mounting bracket

WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

- Before lowering or removing the front axle: Secure the engine in mounting orientation.
- For additional information see: 11 00 670 Securing engine in installation position.

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

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.

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.

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PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

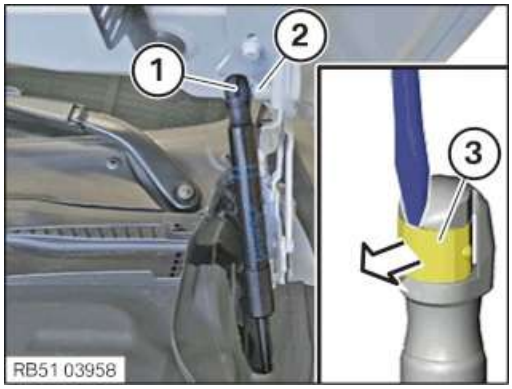
Engine compartment lid is open.

CAUTION

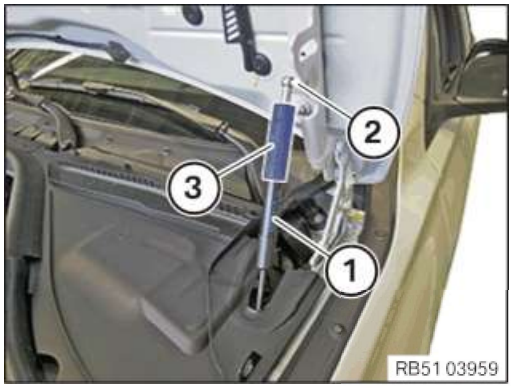
Shutting bonnet or tailgate.

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.

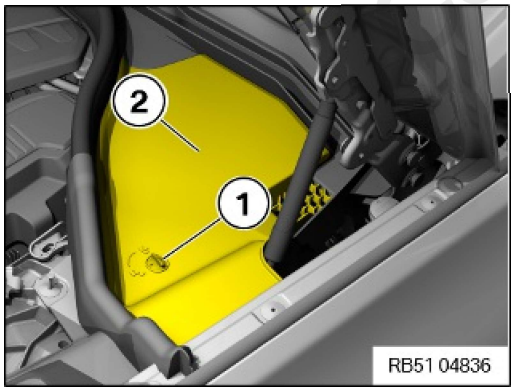
- Remove the bonnet support and open the bonnet further.
- Push special tool or (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

2 – Disconnecting all battery earth leads



- See additional information.

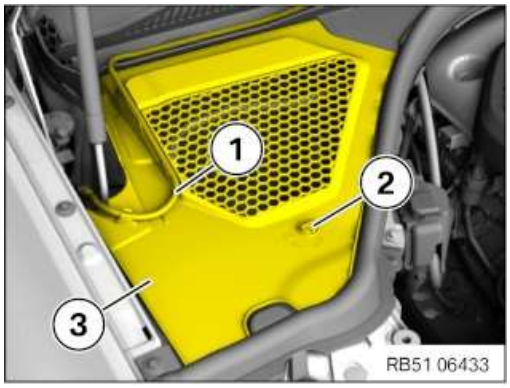
3 – Remove the cover of the engine compartment at the rear left



- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

4 – Remove the cover of the rear right engine compartment

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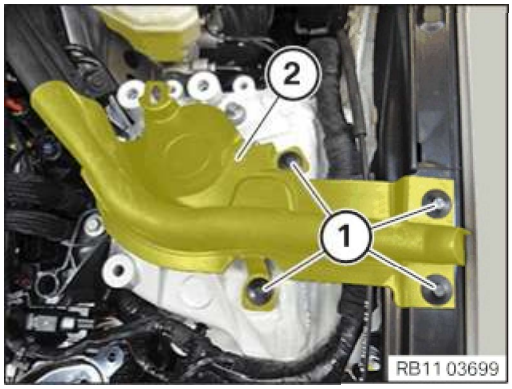


- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover of rear right engine compartment (3).

5 – Removing side bonnet gaskets

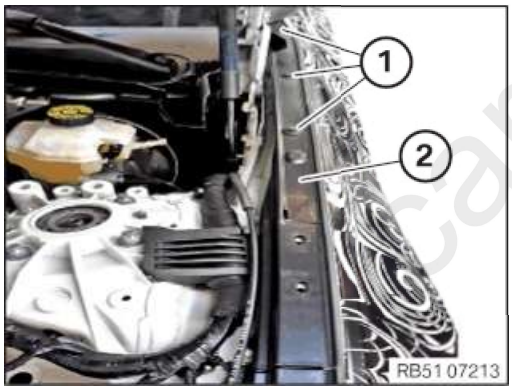
NOTICE

Perform the operations on the left and right side.



- Loosen the rivet (1).
- Remove side bonnet seal (2) from spring strut dome.

6 – Remove sealing of the side panel

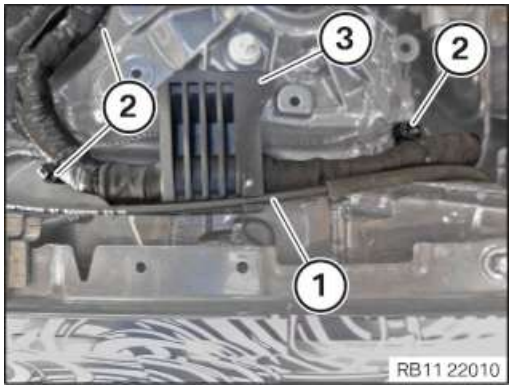


NOTICE

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

- Loosen the expanding rivet (1).
- Guide out seal (2) and remove.

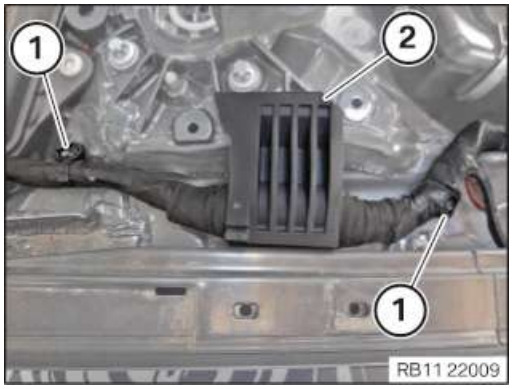
7 – Partially loosen the wiring harness section on the spring strut dome



- Feed out the cable (1) of the front flap and set it aside.
- Loosen clamps (2).
- Feed out wiring harness section (3) on the spring strut dome on left and set it aside.

8 – Releasing the wiring harness section on the right spring strut dome

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- Loosen clamps (1).
- Guide out wiring harness section (2) on the right spring strut dome and set it aside.

9 – 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 (1) from the holders in the **marked** areas towards the top.

10 – Removing the clean air pipe with the resonator

WARNING

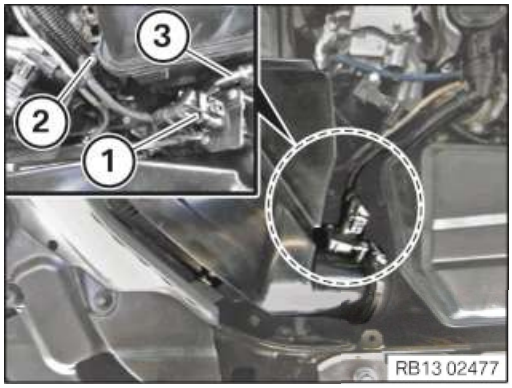
Hot surfaces.

Risk of burning!

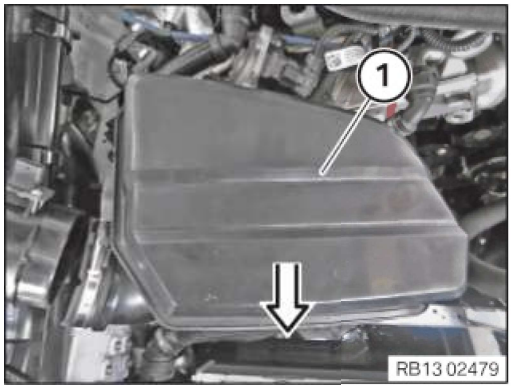
- Perform all work only on components that have cooled down.



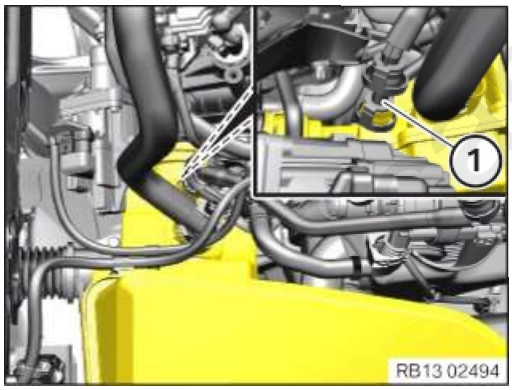
- Unlock the locks (1).
- Feed the engine ventilation line (2) out and set it aside.



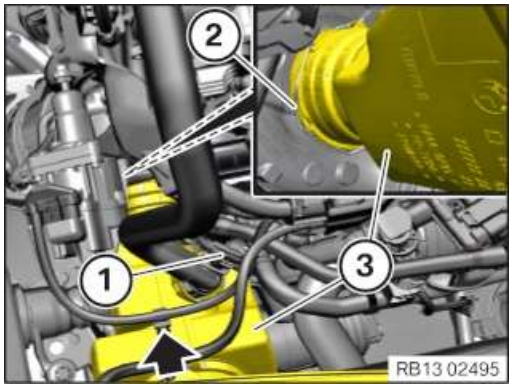
- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



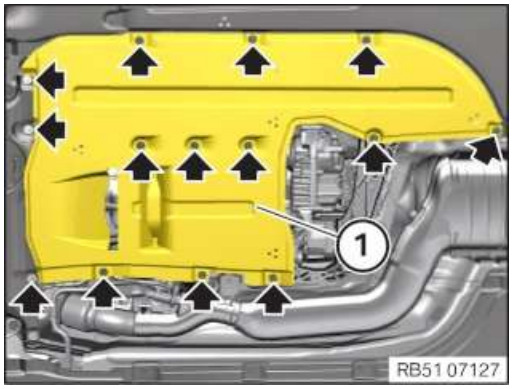
- Unlock and disconnect the tank ventilation line (1).



- Loosen the clamp (arrow).
- Unlock plug connection (1) and disconnect.
- Unlock the clamp (2).
- Feed out clean air pipe with resonator (3) and remove.

11 – Remove rear underbody protection

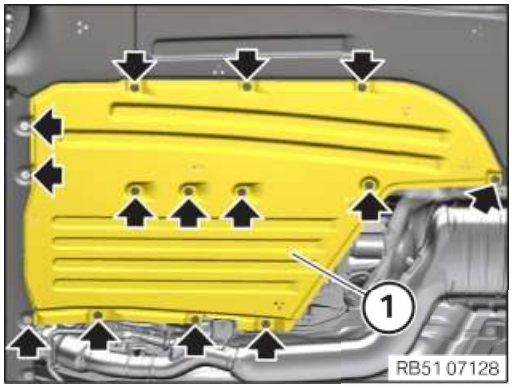
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- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



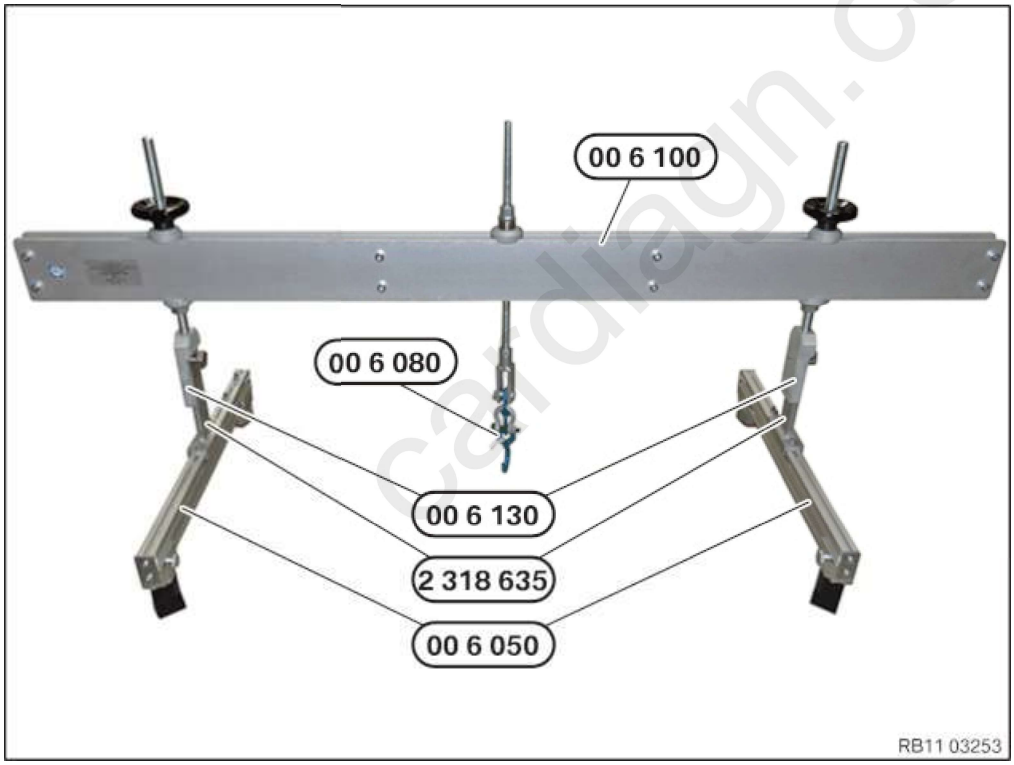
- **Version 2:**

  Remove screws (arrows).

  Guide out rear underbody protection (1) and remove it.

12 – Securing engine in installation position

Overview: Prepared engine bridge



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.

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- 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



- **Carefully** position engine bridge (1) with help from an auxiliary person.



- Make sure that special tool on the left is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , left, rests correctly on the spring strut dome.



- Make sure that special tool on the right is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , right, rests correctly on the spring strut dome.



- Align the engine bridge by moving it on the profile strips of the special tool above the engine mounting bracket (1) and screw it down.
- Align the hook above the engine mounting bracket (1).
- Connect the hook to the engine mounting bracket (1).

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- Check whether the special tool on the right is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , right, rests correctly on the spring strut dome.



- Check whether the special tool on the left is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , left, rests correctly on the spring strut dome.



- Release screw (1) on the left engine mount from the top with a commercially available tool.

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- Release screw (1) on the right engine mount from the top with a commercially available tool.



- Raise the engine by turning the special tool 2 361 506 (00 6 103) (spindle) by 10 mm.

13 – Removing both front wheels

▸ **Removing the wheel**



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

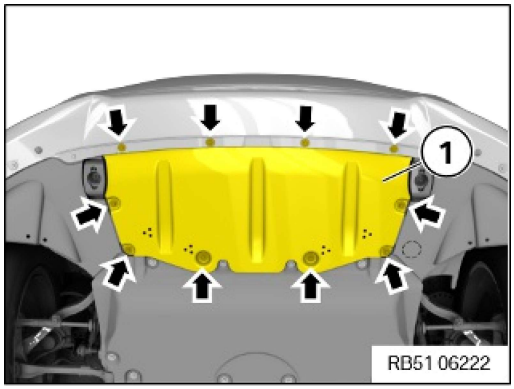
  This process is intended to prevent damage to the brake disc.



- 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.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter from the tool set .

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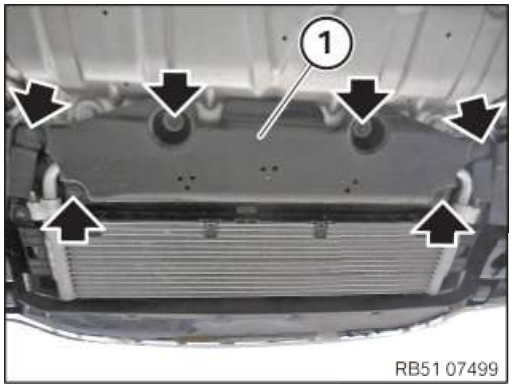
14 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

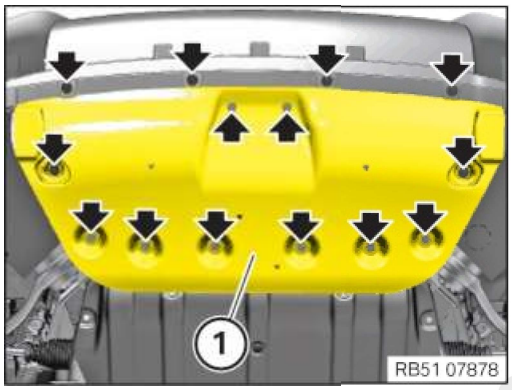
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

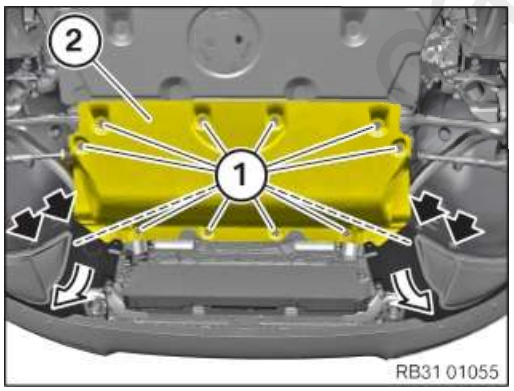


- **Version 3:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

15 – Remove the underbody protection of the steering gear



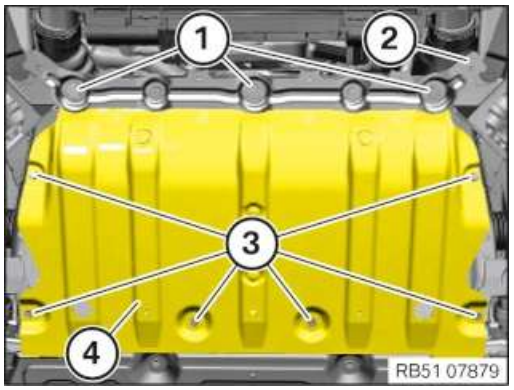
- **Version 1:**

  Unscrew the screws (arrows) of the wheel arch cover on wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

  Loosen screws (3).

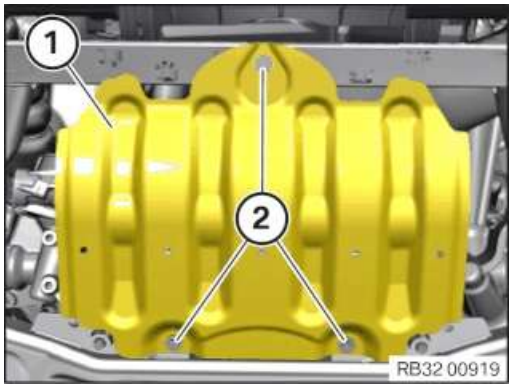
  Slide the steering gear underbody protection (4) out and remove.

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16 – If installed: Removing the steering start protection

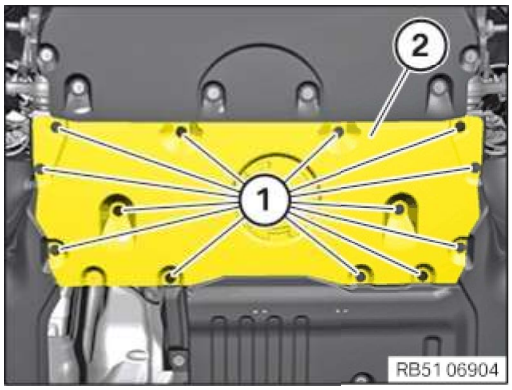
Prerequisite

The front underbody protection is removed.



- Loosen screws (2).
- Remove guard (1).

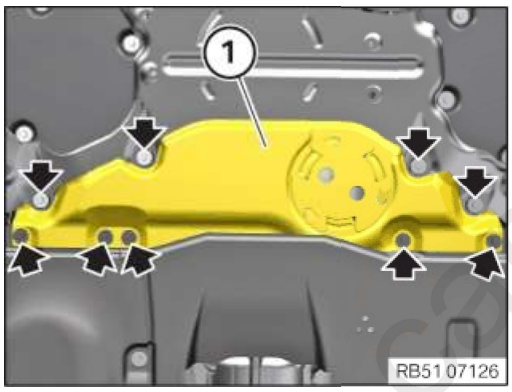
17 – Removing the centre underbody protection



- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .



- **Version with all-wheel drive:**

  Remove screws (arrows).

  Feed out and remove the centre underbody protection (1).

18 – Remove the cover of the steering assembly on the left and right

NOTICE

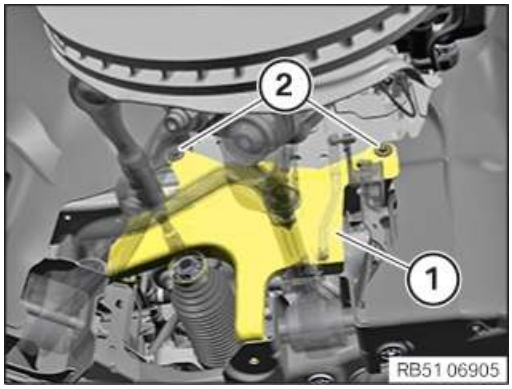
Description is for left component only. Procedure on the right side is identical.

▸ **Remove the cover of the steering assembly**

Prerequisite

Underbody protection of the steering gear is removed.

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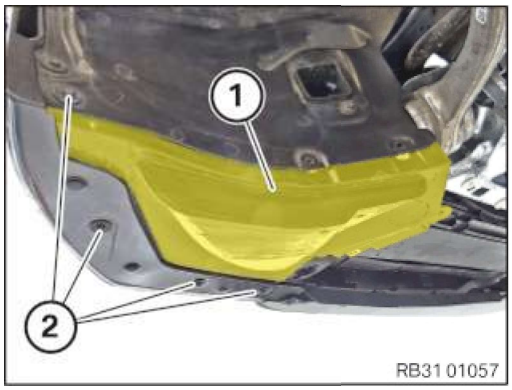
- Loosen screws (2).
- Remove the cover (1).

19 – Removing the bottom left and right wheel arch cover

NOTICE

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

▸ **Remove bottom wheel arch cover**

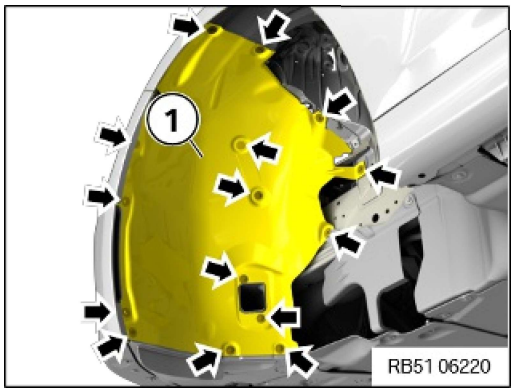


- Loosen screws (2).
- Remove bottom wheel arch cover (1)

20 – Removing the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



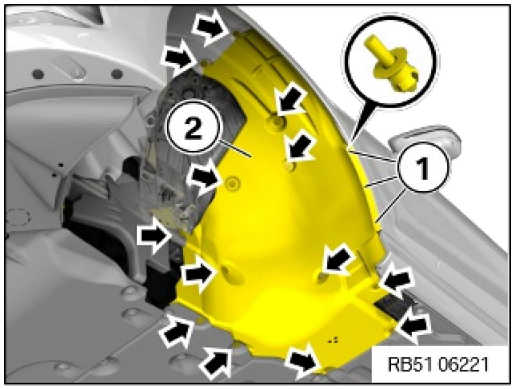
- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

21 – Removing the rear section of the front wheel arch cover front

NOTICE

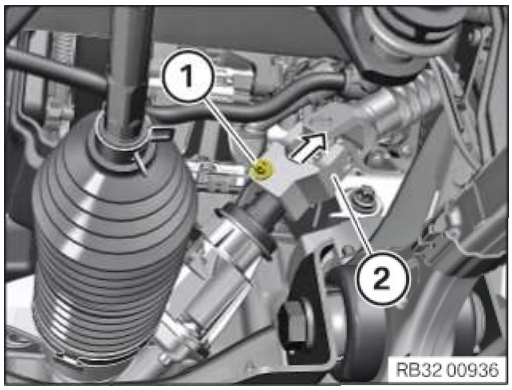
To provide a better overview: Schematic diagram with partially hidden components.

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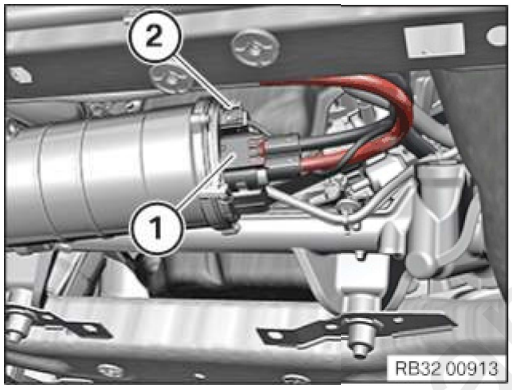
- Loosen the expanding rivet (1).
- Remove screws (arrows).
- Remove the rear section of the front wheel arch cover (2).

22 – Releasing lower steering shaft from steering gear

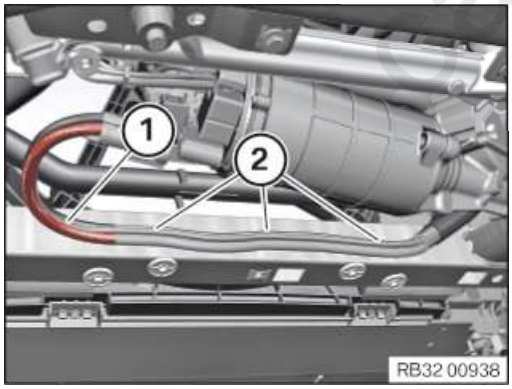


- Loosen screw (1).
- Pull off lower steering shaft (2) from steering gear in direction of arrow.

23 – Detach the wiring harness of the EPS from the front axle support

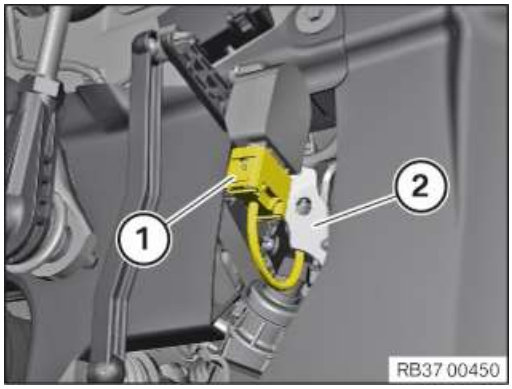


- Unlock and disconnect the plug connections (1) and (2).



- Loosen the holder (2).
- Place wiring harness (1) to one side.

24 – Detach the line connection of the ride height sensor



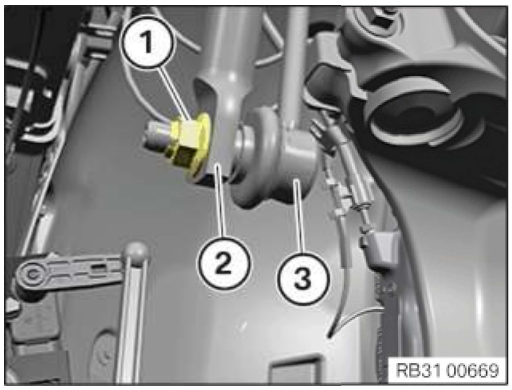
- Unlock plug connection (1) and disconnect.
- Unclip the line from holder (2).

25 – Release the left and right anti-roll bar link from the anti-roll bar

NOTICE

Perform the operations on the left and right side.

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



- Loosen nut (1).

Note: Use the Torx socket for counter support.

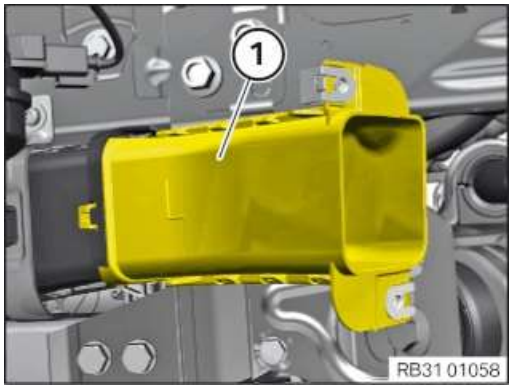
- Loosen the anti-roll bar link (3) from the anti-roll bar (2).

26 – Removing the left and right brake air duct partially

NOTICE

Perform the operations on the left and right side.

▸ **Removing brake air duct partially**



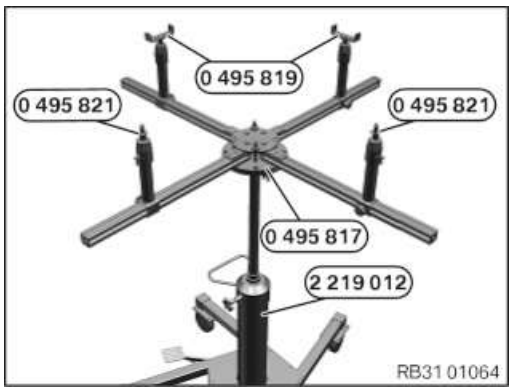
- Unclip and remove air duct (1).

27 – Preparing the special tool

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TECHNICAL INFORMATION

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



- Fit the special tool completely on the universal jack 2 219 012 with the help of an auxiliary person.
- Insert special tools in telescopic supports of a profile rail pair.
- Insert special tools in telescopic supports of other profile rail pair.

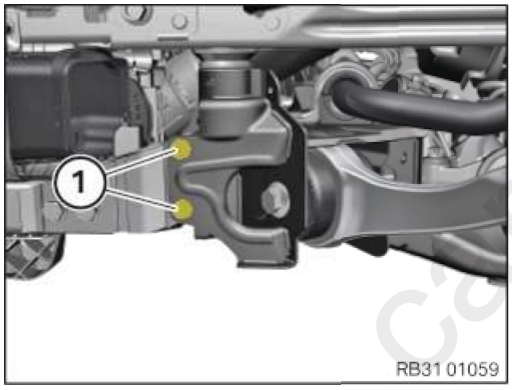
28 – Lower front axle support

WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

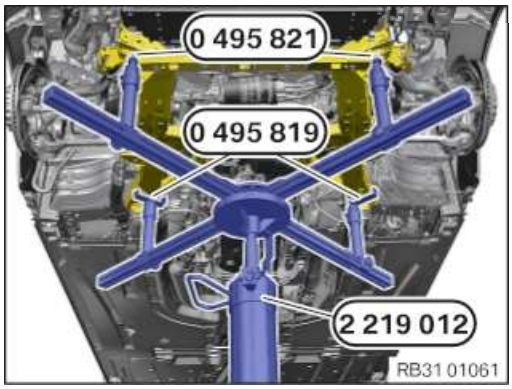
- Before lowering or removing the front axle: Secure the engine in mounting orientation.
- For additional information see: 11 00 670 Securing engine in installation position.



NOTICE

Perform the operations on the left and right side.

- Loosen screws (1).

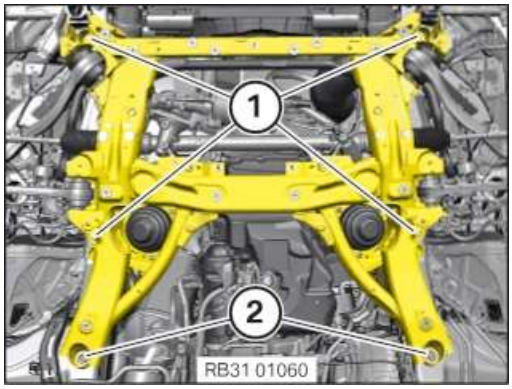


- Position the universal jack 2 219 012 with the special tools and on the front axle support.

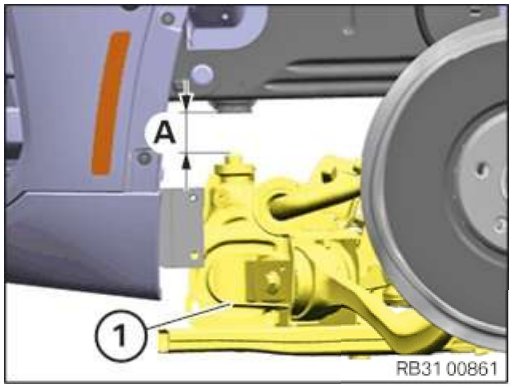
  The centre of gravity of the front axle must be centred over the universal jack 2 219 012 !

- Support the front axle support with the universal jack 2 219 012.

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- Loosen screws (1) and (2).

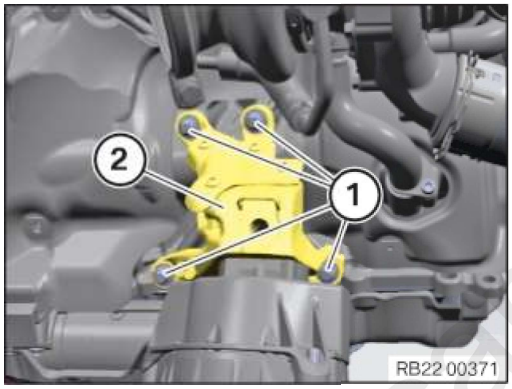


- Lower the front axle support (1) with the universal jack by dimension (A).

  Dimensions (A) = maximum 15 cm

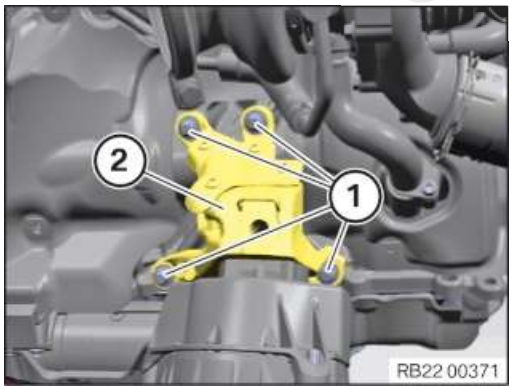
MAIN WORK

29 – Remove right engine support arm



- Loosen screws (1).
- Remove the engine support arm (2).

30 – Install right engine support arm



- Install the engine support arm (2).
- Tighten the screws (1).

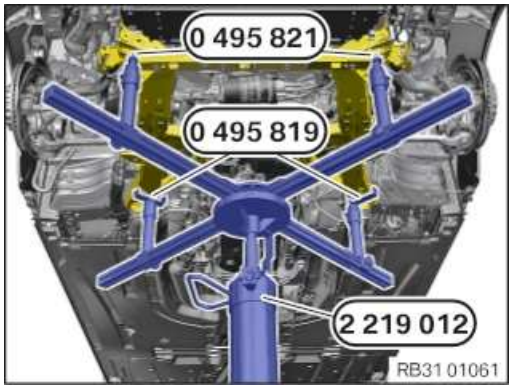
Engine support arm to engine

M10		Tightening torque	38 Nm

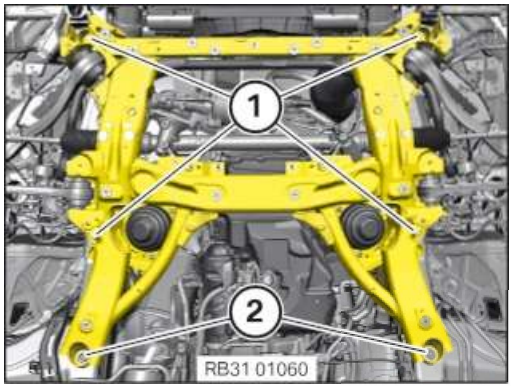
POSTPROCESSES

31 – Lift front axle support and fasten.

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- Carefully lift the front axle support with the universal jack 2 219 012 and position on the body.



- Replace the screws (1).

  Parts: Bolts

- Tighten the screws (1).

Front axle support to front/centre of body

M12	Renew screws.	Jointing torque	108 Nm

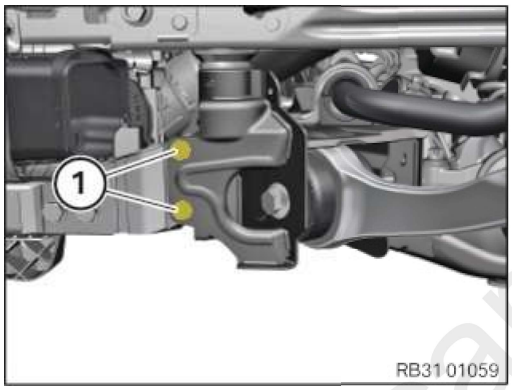
- Replace the screws (2).

  Parts: Bolts

- Tighten the screws (2).

Front axle carrier to body, rear

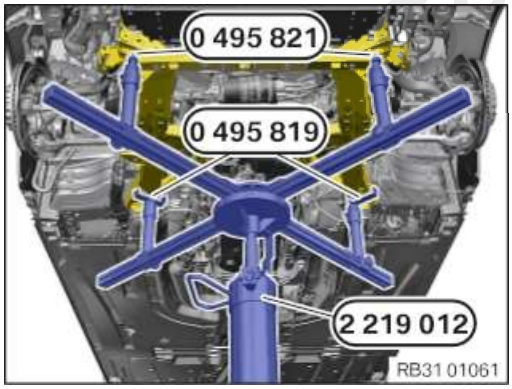
M14	Renew screws.	Tightening torque	175 Nm



- Position the adapter for the front axle support on the front axle support .
- Tighten the screws (1).

Adapter, front axle support to front axle support

M8x70		Tightening torque	19 Nm



- Lower the universal jack 2 219 012 and place to one side.

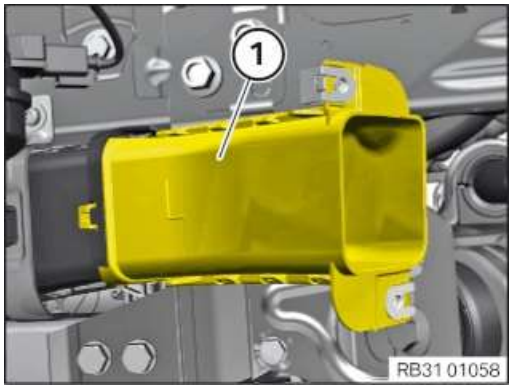
32 – Partially installing the left and right brake air duct

NOTICE

Perform the operations on the left and right side.

▸ **Installing the brake air duct partially**

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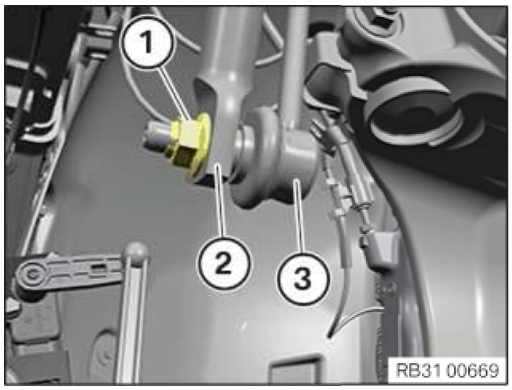


- Position and clip in air duct (1).

33 – Securing the anti-roll bar link to the left and right anti-roll bar

NOTICE

Perform the operations on the left and right side.



▸ **Securing the anti-roll bar link to the anti-roll bar**

- Position the anti-roll bar link (3) on the anti-roll bar (2).
- Renew nut (1).

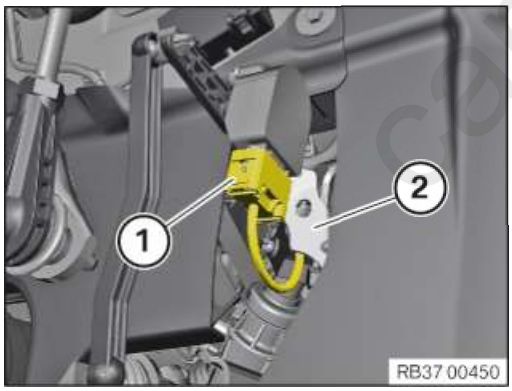
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Front anti-roll bar link to anti-roll bar/spring strut

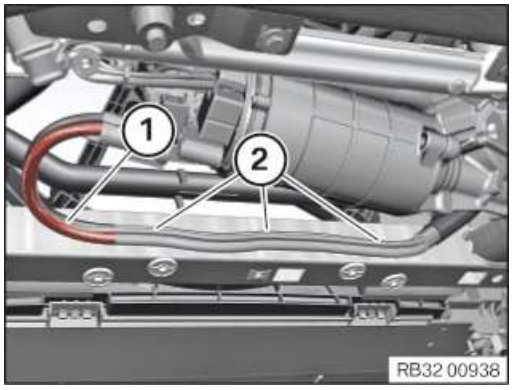
M10	Renew nut.	Tightening torque	56 Nm

34 – Attach the line connection of the ride height sensor



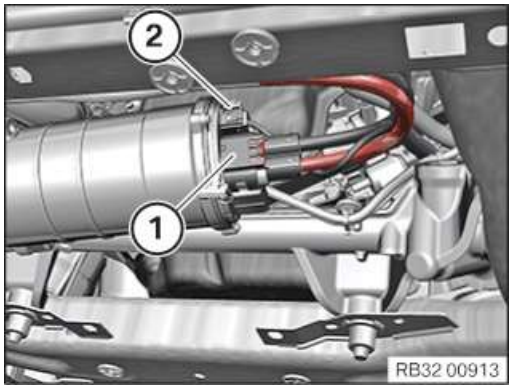
- Position the line .
- Clip in line on holder (2) .
- Connect connectors (1) and lock.

35 – Secure the wiring harness for the EPS on the front axle support



- Position the EPS wiring harness (1) from the front axle support.
- Secure the holder (2).

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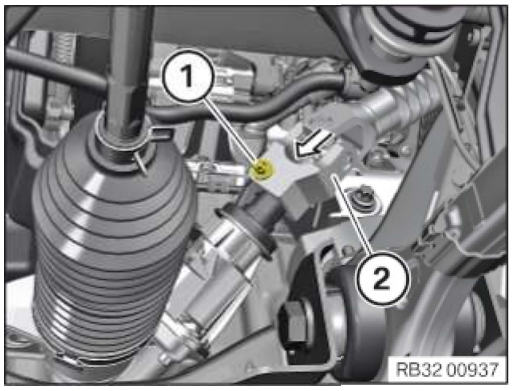


- Connect connectors (1) and (2) lock.

36 – Securing the steering shaft at the bottom on the steering gear

TECHNICAL INFORMATION

The universal joint can only be installed in one position.
The universal joint and the bottom steering gear and/or steering shaft are encoded with each other.
The clamping bolt must e positioned in the groove of the steering gear groove or the steering shaft.



- Clean the screw threads to remove all remnants of screw locking adhesive.
- Slide the lower steering shaft (2) onto the steering gear in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

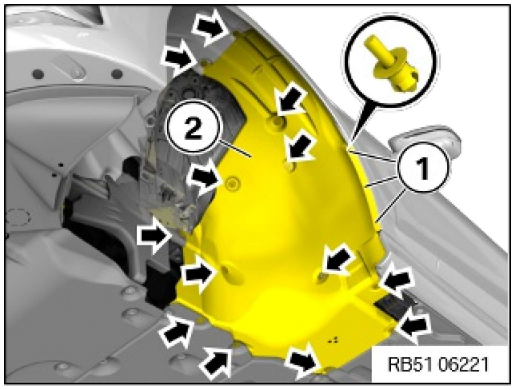
Universal joint to steering box

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

37 – Install the rear section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the rear section of the front wheel arch cover(2) .
- Tighten screws (arrows).

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

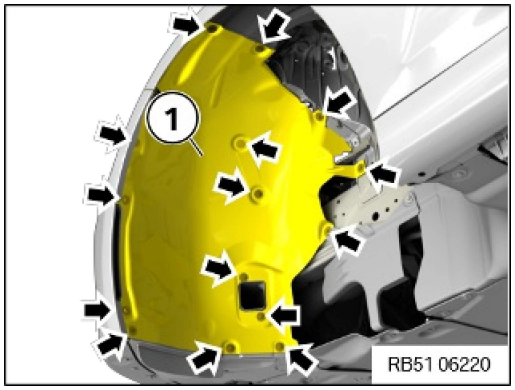
- Secure expanding rivet (1).

38 – Install the front section of the front wheel arch cover

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NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

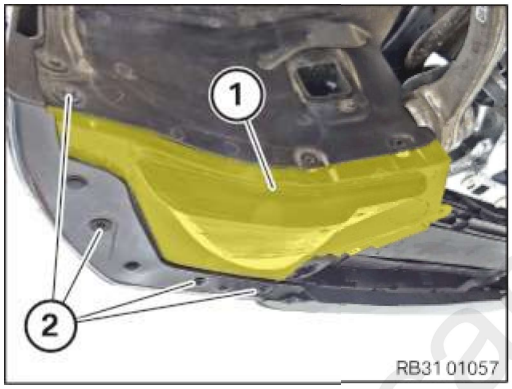
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

39 – Installing the bottom left and right wheel arch cover

NOTICE

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

▸ **Installing the bottom wheel arch cover**



- Position the bottom wheel arch cover (1).
- Tighten the screws (2).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

40 – Install the cover of the steering assembly on the left and right

NOTICE

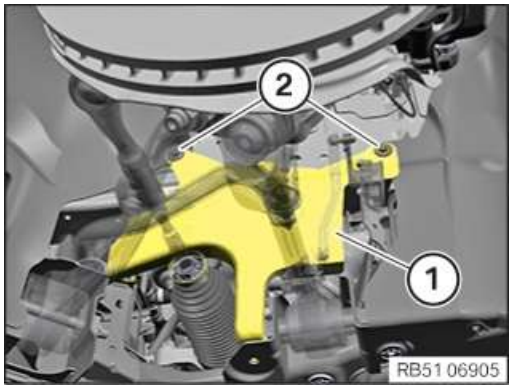
Description is for left component only. Procedure on the right side is identical.

▸ **Install the cover of the steering assembly**

Prerequisite

The underbody protection of the steering gear is removed.

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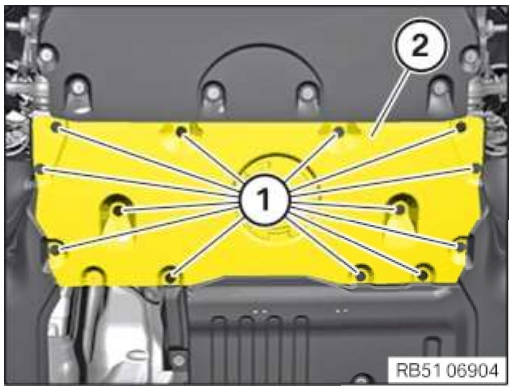


- Position the cover (1).
- Tighten the screws (2).

Cover, steering unit

Screw		Tightening torque	3 Nm

41 – Installing the centre underbody protection



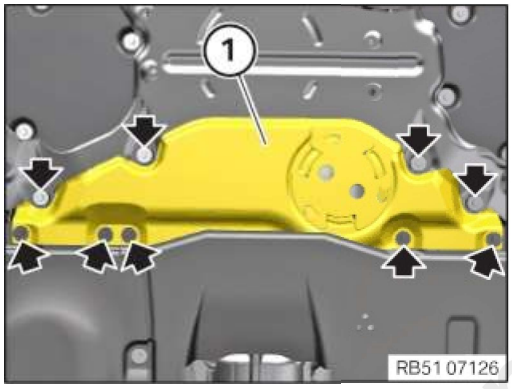
- **Version with rear-wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version with all-wheel drive:**

  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

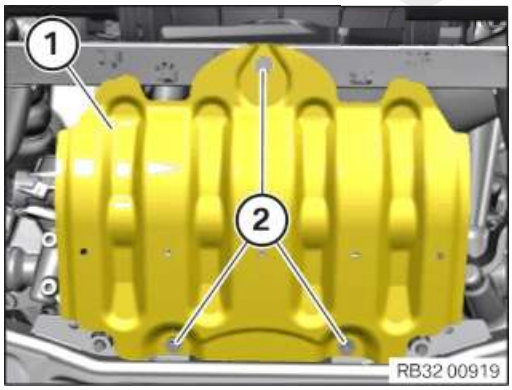
Underbody protection

Hexagon screw		Tightening torque	3 Nm

42 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.



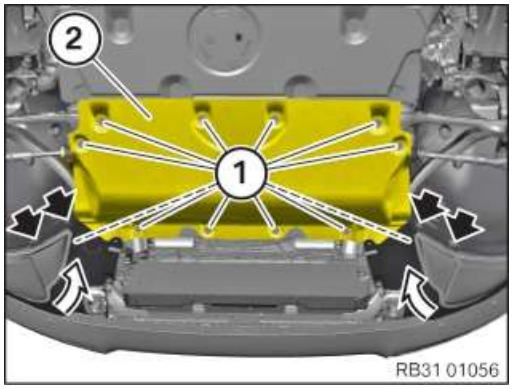
- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

43 – Install the underbody protection of the steering gear

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- **Version 1:**
- Position the underbody protection of the steering gear (2).
- Tighten the screws (1).

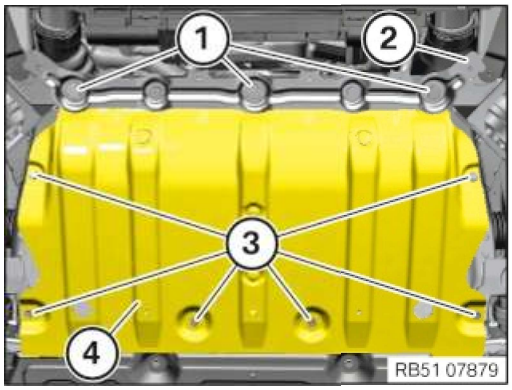
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.
- Tighten the screws (arrows) of the bottom wheel arch cover on the wheel arch cover.

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



- **Version 2:**
- Guide in the steering gear underbody protection (4) and install.
- Tighten the screws (3).

Underbody protection of the steering gear

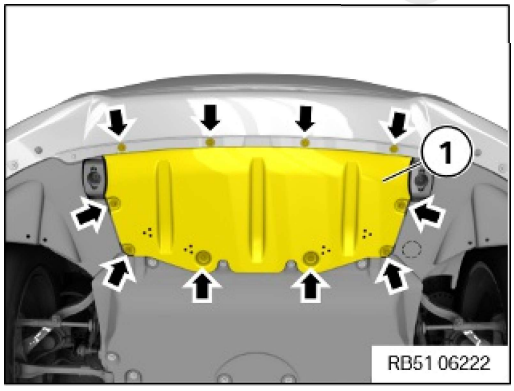
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position holder of underride protection (2).
- Tighten the screws (1).

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

44 – Installing the front underbody protection



- **Version 1:**

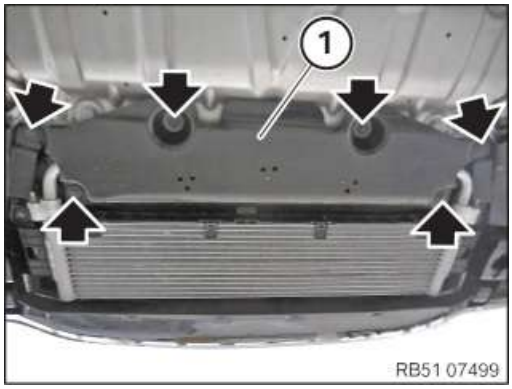
  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

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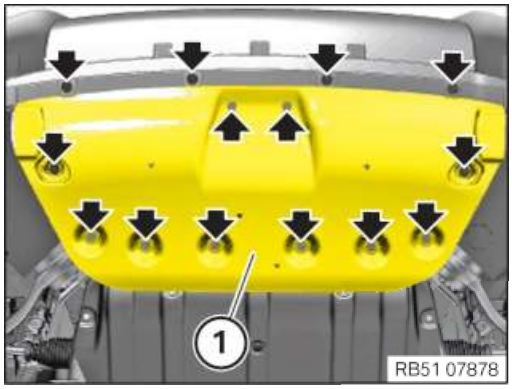
- **Version 2:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

45 – Installing both front wheels

▸ **Mounting the wheel**



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.

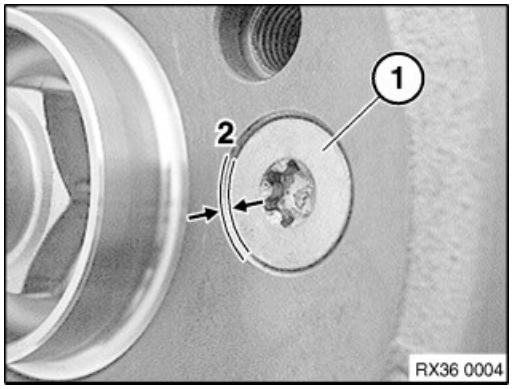
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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).

carlogic.com



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

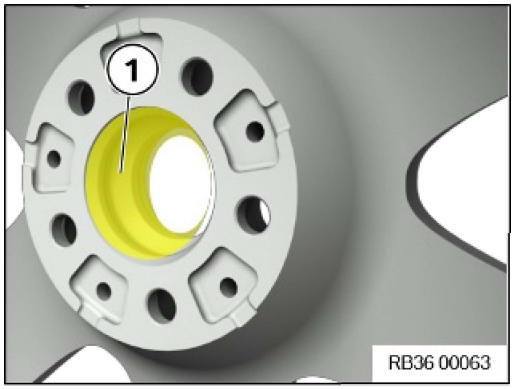
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

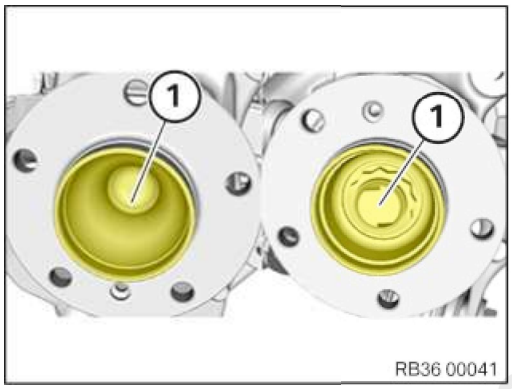
M8	Renew screw.	Tightening torque	16 Nm



- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

  This process is intended to prevent damage to the brake disc.

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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 and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

46 – Loosen the attachment of the engine in installation position



- Lower engine by turning the spindle 2 361 506 (00 6 103) until the engine lies completely on the engine supports.

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TECHNICAL INFORMATION

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

- Remove the engine bridge (1) with an auxiliary person.



- Tighten bolt (1) of the left engine mount from the bottom using a standard tool.

Engine mount to engine mounting bracket

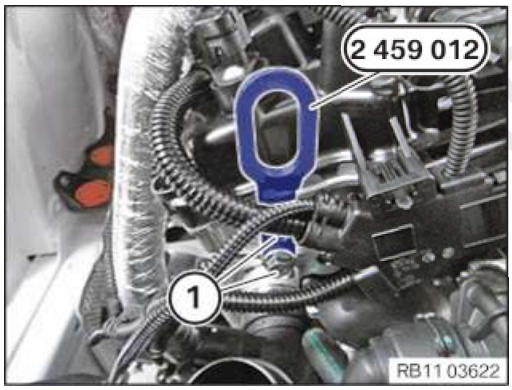
M12		Tightening torque	100 Nm



- Tighten bolt (1) of the right engine mount from the top using a standard tool.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



- 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.

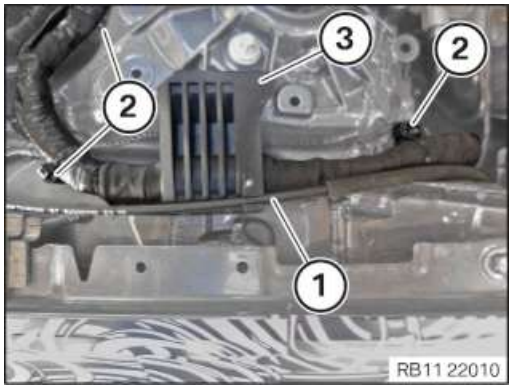
47 – Securing the wiring harness section to the left spring strut dome

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 position wiring harness section (3) on the left spring strut dome.
- Secure clamps (2).
- Guide in and install cable (1) of the front flap.

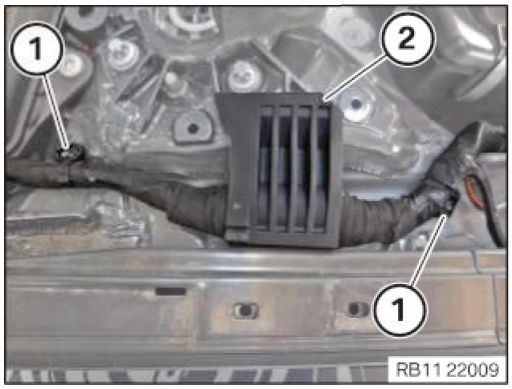
48 – Secure wiring harness section on right spring strut dome

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

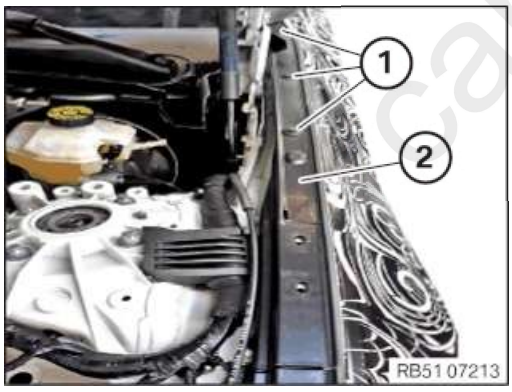
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

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



- Guide in and position the wiring harness section (2) of right spring strut dome.
- Secure clamps (1).

49 – Installation of side panel sealing.



NOTICE

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

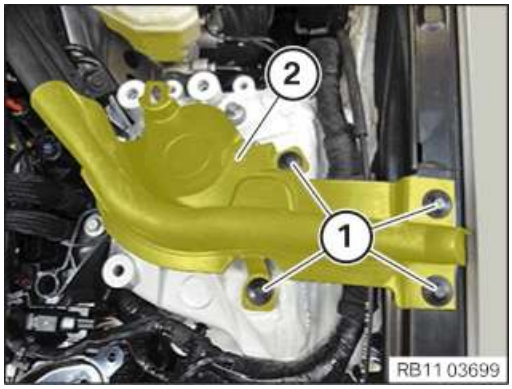
- Guide the sealing (2) in and install it.
- Mount the expanding rivets (1).

50 – Install side bonnet seals

NOTICE

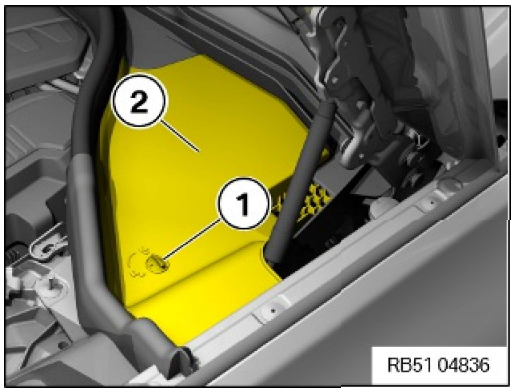
Perform the operations on the left and right side.

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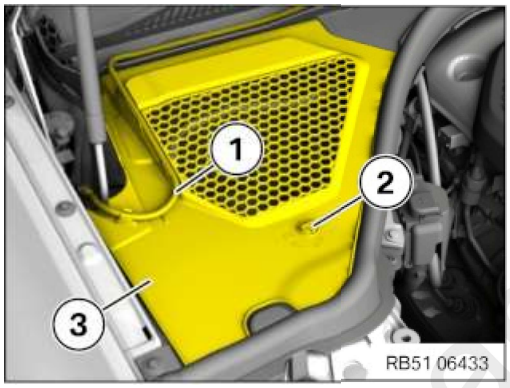
- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

51 – Install the cover of the engine compartment on the rear left



- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

52 – Install the rear right engine compartment cover



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

53 – Installing the clean air pipe with resonator



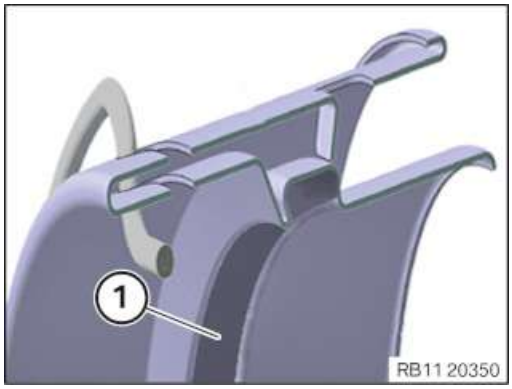
- Check the seal (1) for damages, replace if necessary.

▸ **Replace damaged gasket**

TECHNICAL INFORMATION

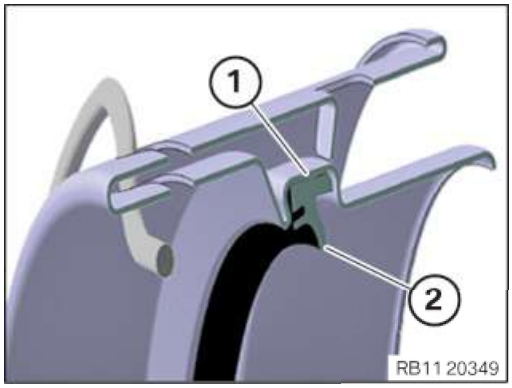
Do not use pointed or sharp-edged tools for the installation and/or removal.

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- Remove damaged seal.
- Clean gasket groove (1) with a dry towel.

  The gasket groove (1) must be clean.



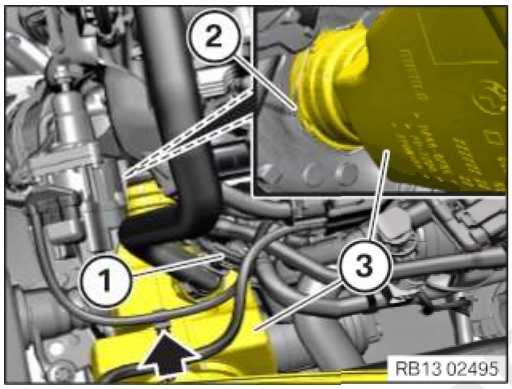
- Renew gasket.

  Parts: Gasket
- Install seal dry without lubricant or mounting agent.

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

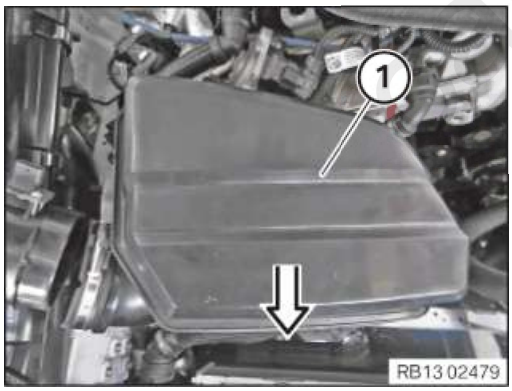
- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is pointing downwards (see figure).



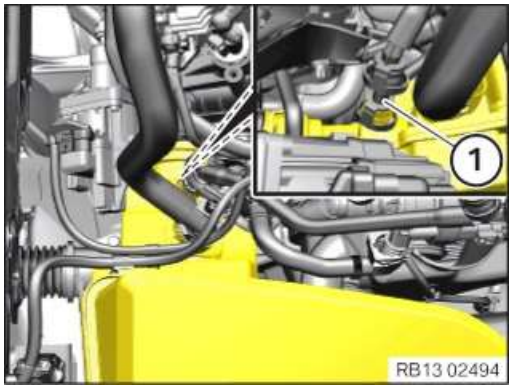
- Guide in and install the clean air pipe with resonator (3).
- Lock clamp (2).

  The clamp (2) must engage audibly.
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure clamp (arrow).

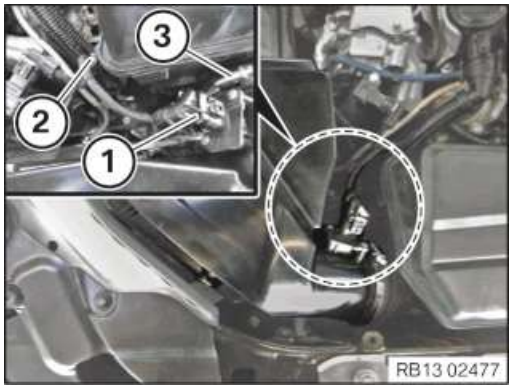


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Connect and lock the tank ventilation line (1).

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- Connect the clean air pipe with resonator to the intake filter housing.
- Tighten clamp (3).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Secure the clamp (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Insert and install the engine ventilation line (2).
- Ensure that the locks (1) engage audibly.

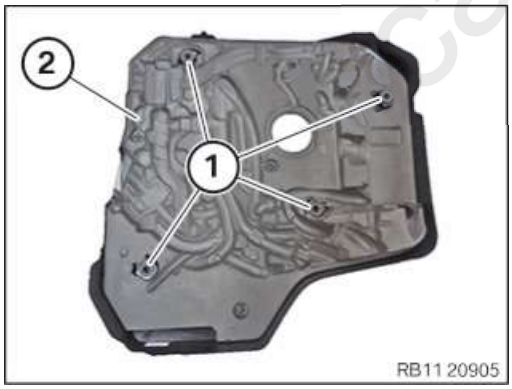
54 – Install acoustic cover

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.



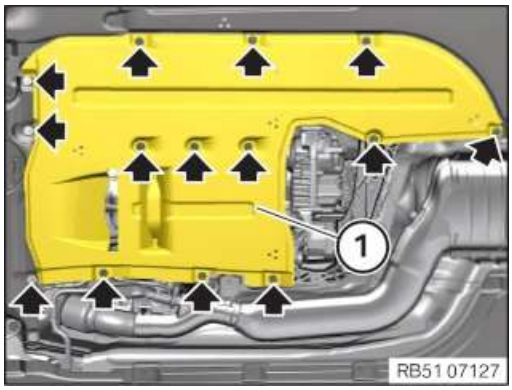
- Check all rubber mounts (1) of acoustic cover (2) for correct seating.



- Clip in the acoustic cover (1) into the holders in the **marked** areas.

  The acoustic cover (1) must audibly engage into place.

55 – Installing underbody protection at rear



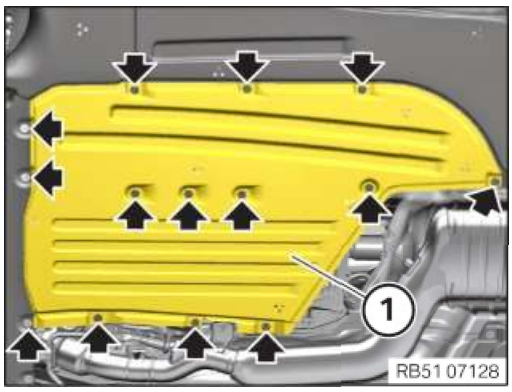
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

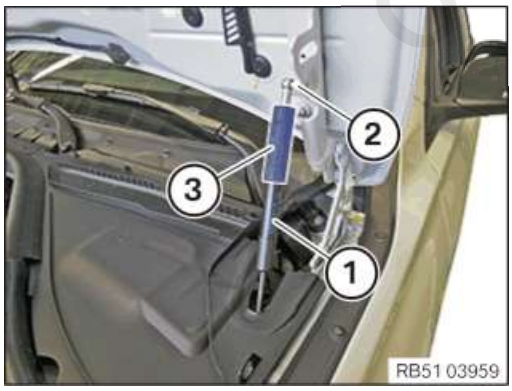
Hexagon screw		Tightening torque	3 Nm

56 – Disconnecting all battery earth leads



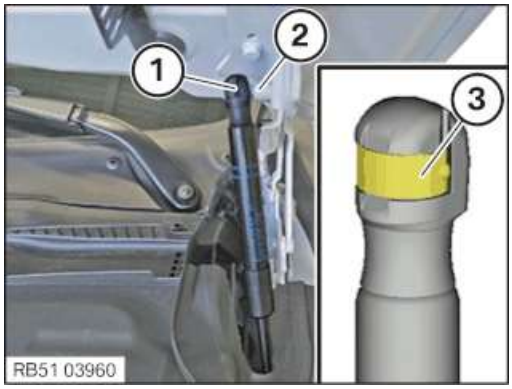
- See additional information.

57 – Take bonnet out of the service position



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

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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

Special tool to cylinder head — Used in step 12

M8		Tightening torque	21,5 Nm

Engine support arm to engine — Used in step 30

M10		Tightening torque	38 Nm

Front axle support to front/centre of body — Used in step 31

M12	Renew screws.	Jointing torque	108 Nm

Front axle carrier to body, rear — Used in step 31

M14	Renew screws.	Tightening torque	175 Nm

Adapter, front axle support to front axle support — Used in step 31

M8x70		Tightening torque	19 Nm

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 33

M10	Renew nut.	Tightening torque	56 Nm

Universal joint to steering box — Used in step 36

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Wheel arch trim panel, front — Used in step 3738

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Cover, front bottom on side — Used in step 39

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Cover, steering unit — Used in step 40

Screw		Tightening torque	3 Nm

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Underbody protection — Used in step 4155

Hexagon screw		Tightening torque	3 Nm

Bumper buffer device steering on front axle support — Used in step 42

M10		Tightening torque	56 Nm

Underbody protection of the steering gear — Used in step 43

Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Wheel arch cover (screws) — Used in step 43

Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support — Used in step 43

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 44

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Brake disc to front wheel hub — Used in step 45

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 45

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 45

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Engine mount to engine mounting bracket — Used in step 46

M12		Tightening torque	100 Nm

Clean air pipe to upper section of intake filter housing — Used in step 53

Clamp		Tightening torque	3 Nm

Overview of Special Tools

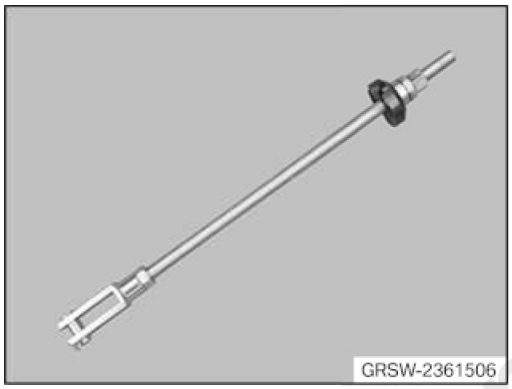
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2 459 012 Holder



Common	Used in step 1246
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)

2 361 506 (00 6 103) Spindle



Common	Used in step 1246
Usage	Spindle (central spindle) for Traverse 00 6 100.
Included in the tool or work	0 496 852
Storage location	
Replaced by	
In connection with	
SI-Number	01 17 10 (659)

2 219 012 Hydraulic lifter



Common	Used in step 272831
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

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2 344 011 Tool



Common	Used in step 45
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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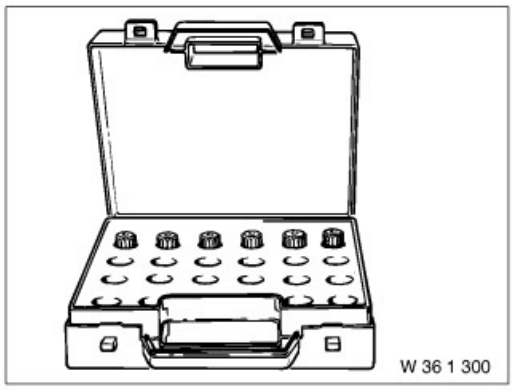
Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 13
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



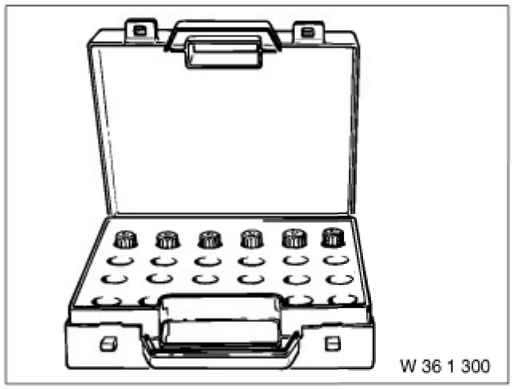
Common	Used in step 13
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



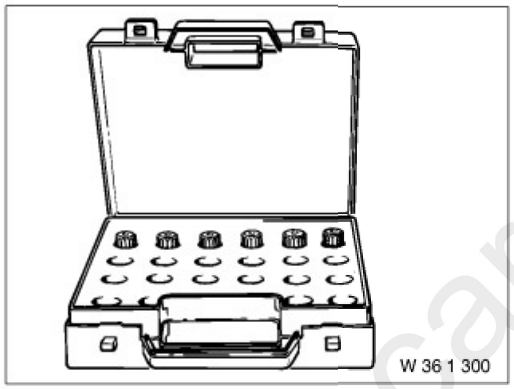
Common	Used in step 13
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



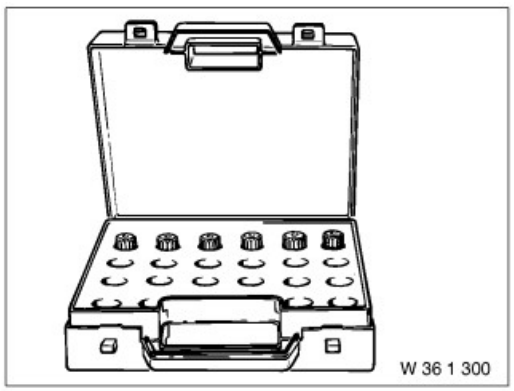
Common	Used in step 13
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 13
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 13
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	

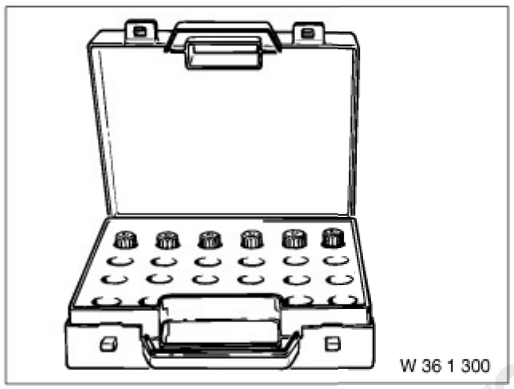
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0 495 229 (36 1 332) Wheel stud



Common	Used in step 13
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 13
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	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	256
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	256
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting battery earth lead	256
61 20 900 Disconnecting and connecting battery earth lead	256

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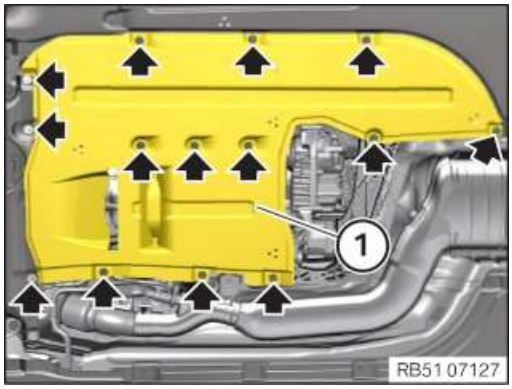
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
61 20 900 Disconnecting and connecting battery earth lead 256
00 .. ... Raising the vehicle using a vehicle hoist

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22 32 055 Removing and installing/replacing transmission bearing block

PRELIMINARY WORK

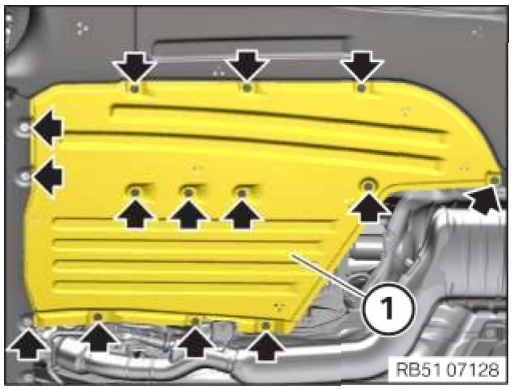
1 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

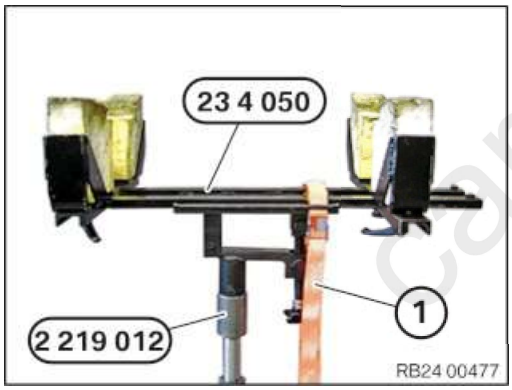


- **Version 2:**

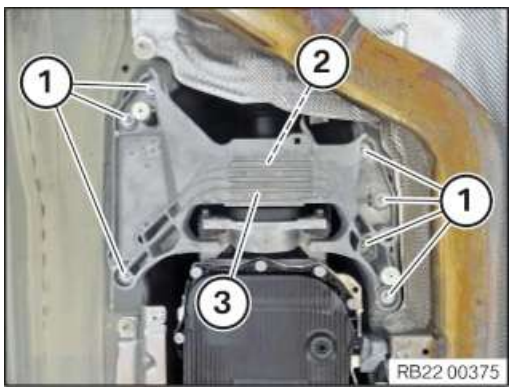
  Remove screws (arrows).

  Guide out rear underbody protection (1) and remove it.

2 – Remove transmission cross member.



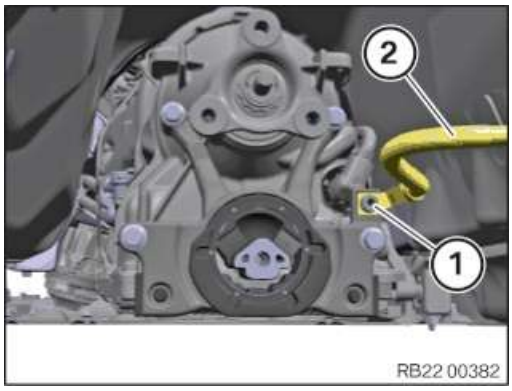
- Support the transmission using special tools 0 495 498 (23 4 050) and 2 219 012.
- Secure the transmission with the tensioning strap (1).



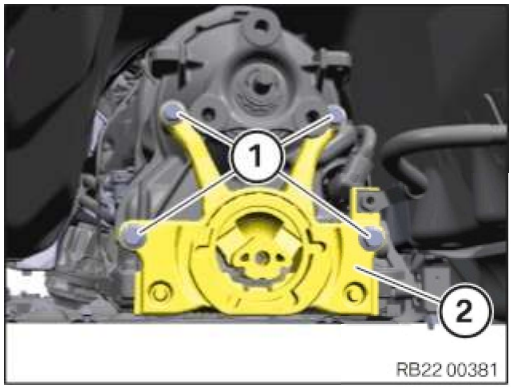
- Loosen screws (1).
- Loosen screw (2).
- Remove transmission cross member (3) and lower the transmission slightly.

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3 – Remove transmission bearing block

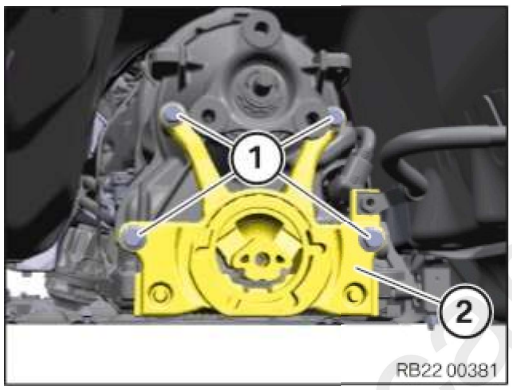


- Loosen the screw(1) from the ground strap (2).



- Loosen screws (1).
- Remove transmission mounting bracket (2).

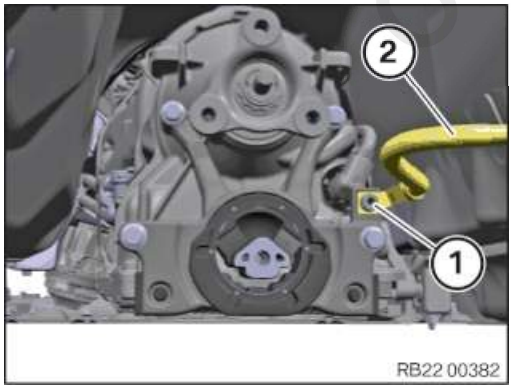
4 – Install the transmission mounting bracket



- Install transmission mounting bracket (2).
- Tighten the screws (1).

Transmission mounting bracket to transmission

M10		Tightening torque	48 Nm



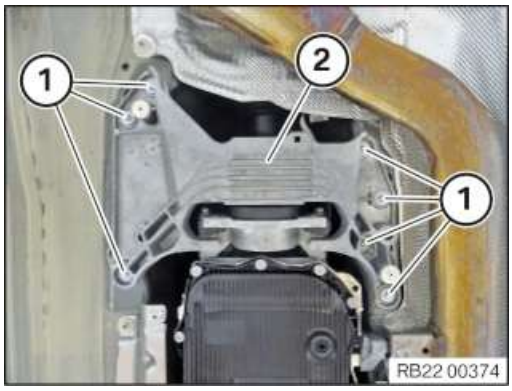
- Install the ground strap (2).
- Tighten down screw (1).

Ground strap to transmission or body

M8		Tightening torque	19 Nm

-

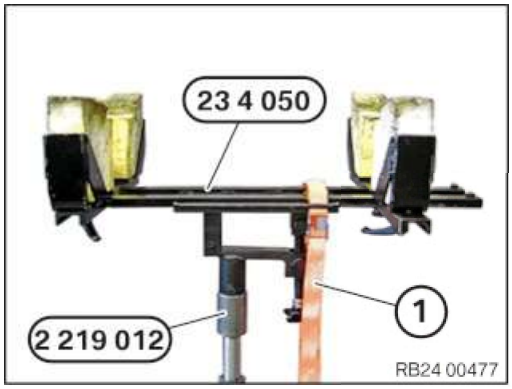
5 – Install transmission cross member.



- Install the transmission cross member (2).
- Tighten the screws (1).

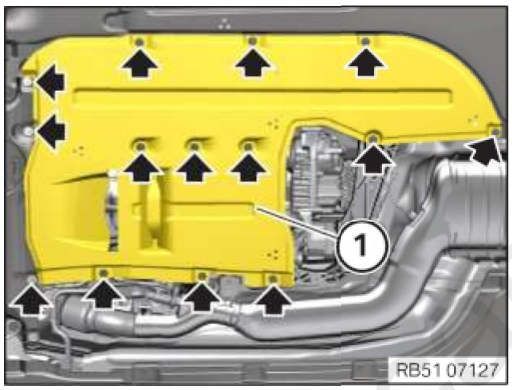
Transmission cross member to body

M8	Renew screws.	Tightening torque	19 Nm



- Loosen the tensioning strap (1) from the transmission.
- Remove the special tools 0 495 498 (23 4 050) and 2 219 012 from the transmission.

6 – Installing underbody protection at rear



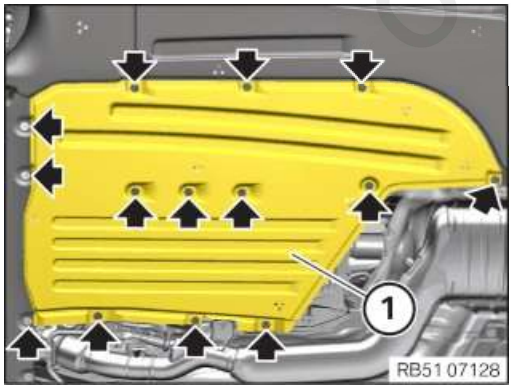
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

Additional Information

Overview of Tightening Torques

Transmission mounting bracket to transmission Used in step 4

M10		Tightening torque	48 Nm

Ground strap to transmission or body Used in step 4

M8		Tightening torque	19 Nm

Transmission cross member to body Used in step 5

M8	Renew screws.	Tightening torque	19 Nm

Underbody protection Used in step 6

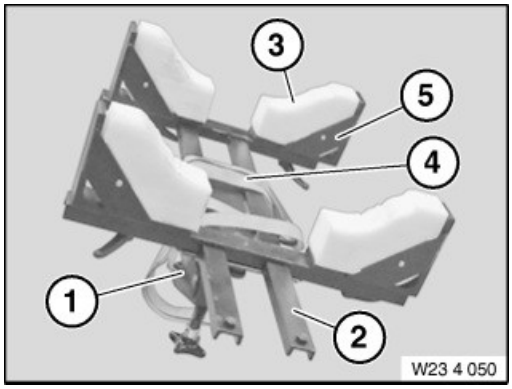
Hexagon screw		Tightening torque	3 Nm

Overview of Special Tools

0 495 498 (23 4 050) Support

Used in step 25

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Common

Usage	(universal gearbox holder) Support for removing and installing manual gearboxes and automatic transmissions for BMW & RR.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 06 (256)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
3	0 495 549 (23 4 053)		**Insert** (Foam material insert (1 set = 4 pieces)) deleted, can be ordered only via tool set	
1	0 495 547 (23 4 051)		**Joint** Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	
2	0 495 548 (23 4 052)		**Frame** (Basic frame) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	
4	0 495 550 (23 4 054)		**Belt** (Tensioning strap) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	
5	0 496 018 (23 4 055)		**Support** (Fixture for foam insert) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	

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2 219 012 Hydraulic lifter



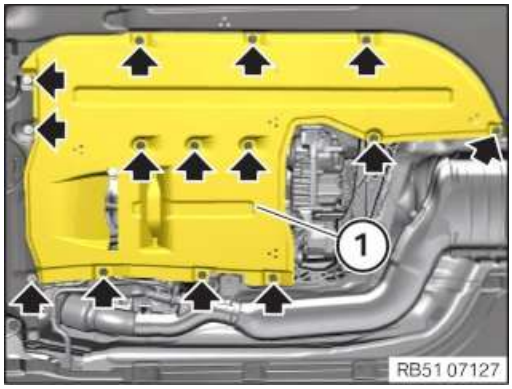
Common	Used in step 25
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

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22 32 050 Replacing cross member for transmission mounting

PRELIMINARY WORK

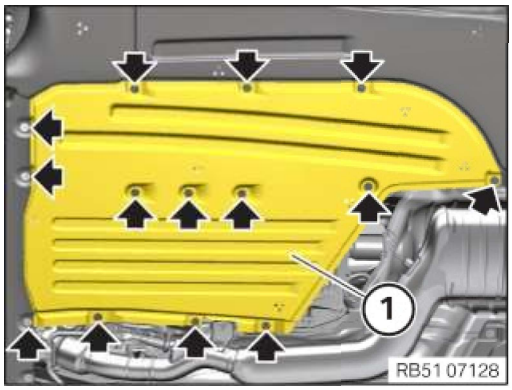
1 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



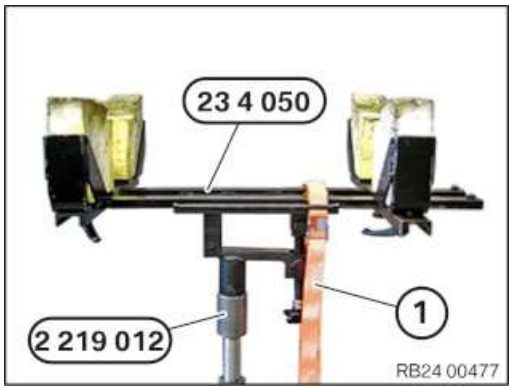
- **Version 2:**

  Remove screws (arrows).

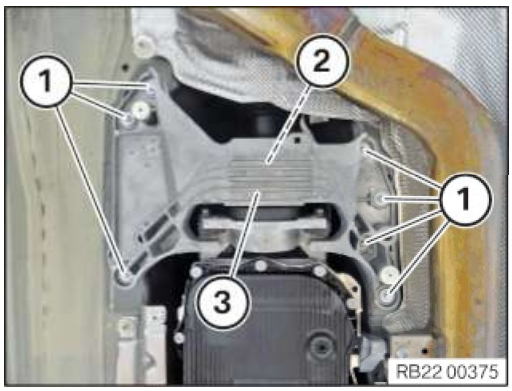
  Guide out rear underbody protection (1) and remove it.

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2 – Remove transmission cross member.

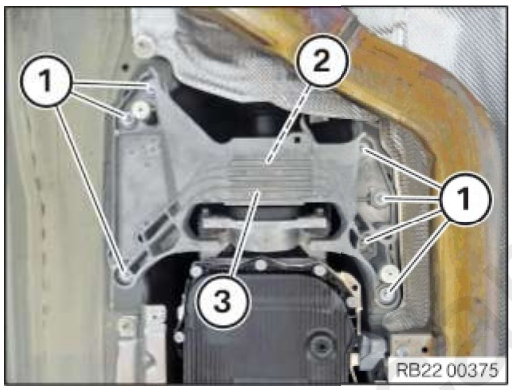


- Support the transmission using special tools 0 495 498 (23 4 050) and 2 219 012.
- Secure the transmission with the tensioning strap (1).



- Loosen screws (1).
- Loosen screw (2).
- Remove transmission cross member (3) and lower the transmission slightly.

3 – Install transmission cross member.



- Install the transmission cross member (3).
- Insert screw (2) and tighten until hand-tight.
- Tighten the screws (1).

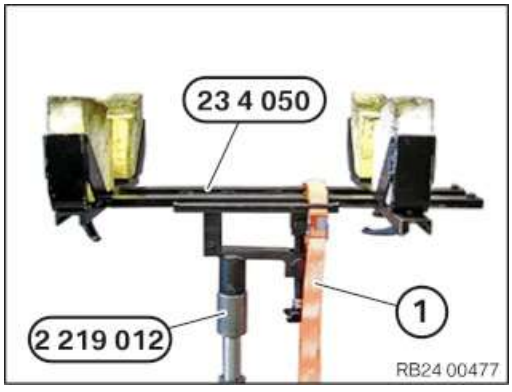
Transmission cross member to body

M8	Renew screws.	Tightening torque	19 Nm

- Tighten down screw (2).

Transmission cross member to rubber mounts

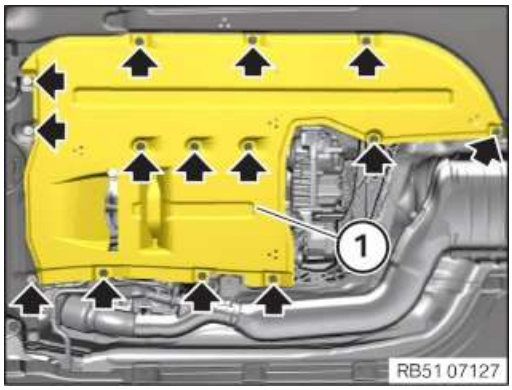
M12		Tightening torque	100 Nm



- Loosen the tensioning strap (1) from the transmission.
- Remove the special tools 0 495 498 (23 4 050) and 2 219 012 from the transmission.

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4 – Installing underbody protection at rear



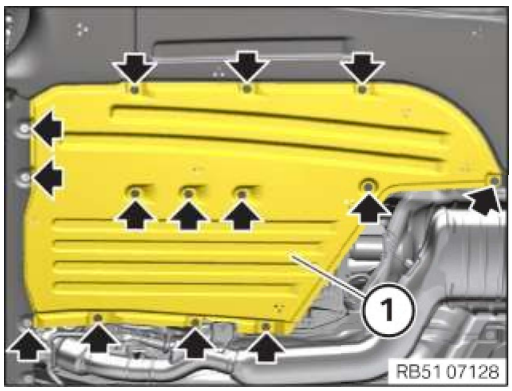
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

Additional Information

Overview of Tightening Torques

Transmission cross member to body — Used in step 3

M8	Renew screws.	Tightening torque	19 Nm

Transmission cross member to rubber mounts — Used in step 3

M12		Tightening torque	100 Nm

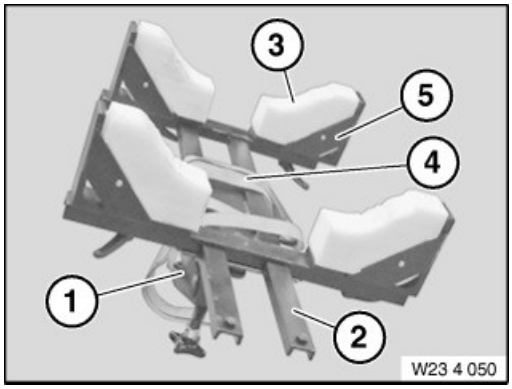
Underbody protection — Used in step 4

Hexagon screw		Tightening torque	3 Nm

Overview of Special Tools

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0 495 498 (23 4 050) Support



Common

Used in step 23

Usage	(universal gearbox holder) Support for removing and installing manual gearboxes and automatic transmissions for BMW & RR.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 06 (256)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
3	0 495 549 (23 4 053)		**Insert** (Foam material insert (1 set = 4 pieces)) deleted, can be ordered only via tool set	
1	0 495 547 (23 4 051)		**Joint** Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	
2	0 495 548 (23 4 052)		**Frame** (Basic frame) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	
4	0 495 550 (23 4 054)		**Belt** (Tensioning strap) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	
5	0 496 018 (23 4 055)		**Support** (Fixture for foam insert) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	

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2 219 012 Hydraulic lifter



Common	Used in step 23
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

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