00 Safety information for working on vehicles with automatic engine start-stop function (MSA)

Warning!

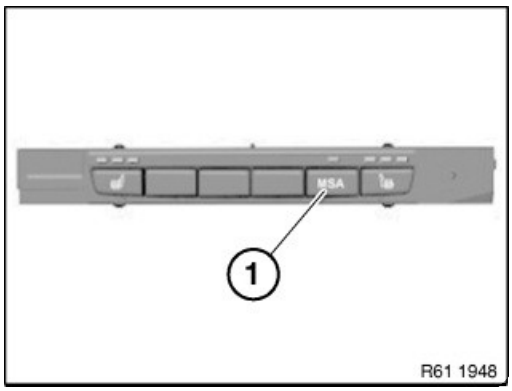
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

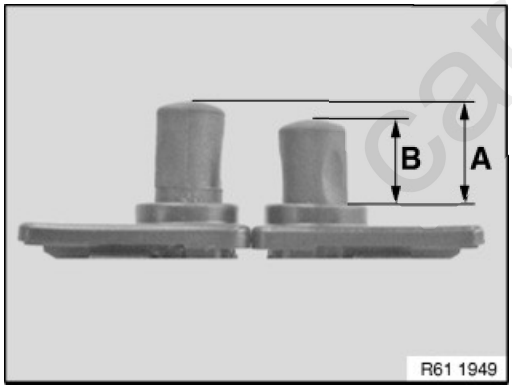
Observe safety precautions when working on MSA vehicles.

Before carrying out practical work on the engine, always ensure that the MSA functionality is deactivated so as to prevent automatic engine starting while work is being carried out in the engine compartment.

MSA function is deactivated by:



- Deactivate MSA by means of button (1) in passenger compartment
- Open seat belt buckle and driver's door



- Open engine bonnet/hood and ensure that engine hood/bonnet contact is not in workshop mode
  - Workshop mode

    A = 10 mm
  - Basic setting (engine hood/bonnet open)

    B = 7 mm

  To make sure that the engine hood/bonnet contact is at the basic setting, if necessary press the hood/bonnet contact up to the limit position before starting work and slowly release.

When working with diagnosis tools:

- Observe instructions in diagnosis tool

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Note:
For further information on automatic engine start-stop function (MSA):

- Refer to the Service Information (bulletin) (for manual transmissions) Service Information (bulletin) 61 01 07 335
- Refer to the Service Information (bulletin) (for automatic transmissions or twin-clutch gearboxes) Service Information (bulletin) 61 01 10 629

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13 31 028 Check fuel delivery pressure

WARNING

Hot surfaces.

Risk of burning!

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

TECHNICAL INFORMATION

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

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PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

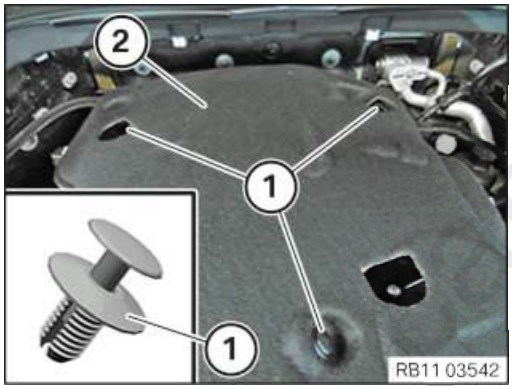
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

MAIN WORK

3 – Check fuel delivery pressure

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

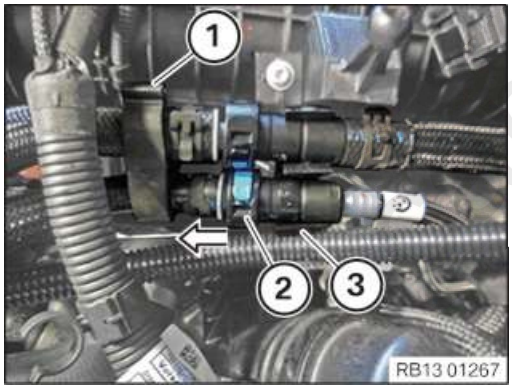
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

Contaminant or foreign body.

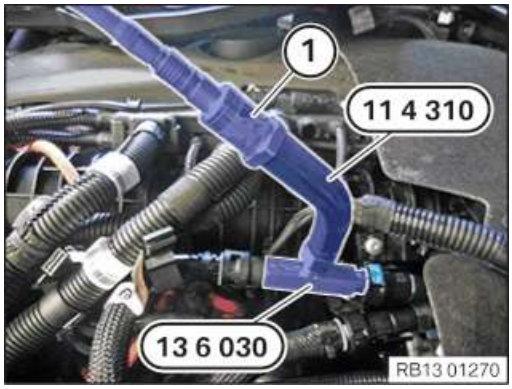
Contamination can result in malfunctions, operating failure or leaks.

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



- Unlock and loosen holder (1).
- Detach fuel feed line (2) from the holder (3).
- Unlock and release fuel delivery line (2) in the direction of arrow.
- Catch and dispose of escaping fuel with a suitable auxiliary material.

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- Insert the special tool into the disconnected fuel feed line.
- Screw onto special tool , the special tool 0 496 623 (11 4 310).
- Screw the pressure sensor onto the special tool 0 496 623 (11 4 310) 100 bar (IMIB) (1).

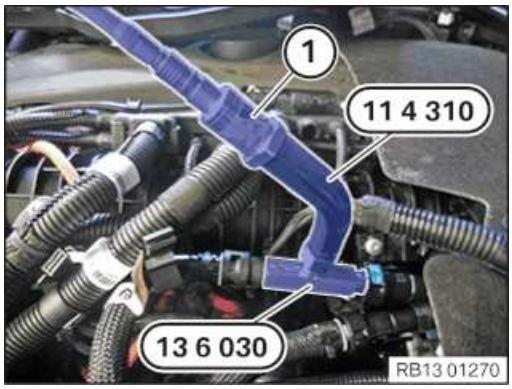
TECHNICAL INFORMATION

As an alternative to the **pressure sensor** with 100 bar **(IMIB)** , the **pressure sensor** with 25 bar may also be used.

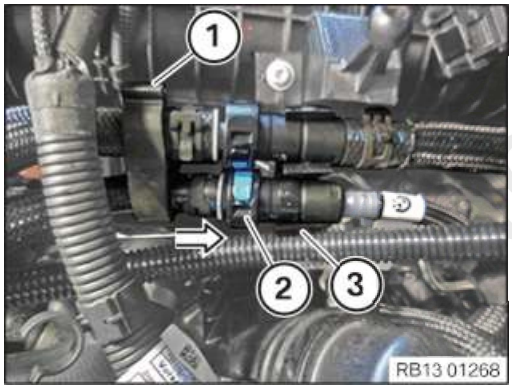
Version 1: Screw the special tool **11 5 364** onto the special tool **13 6 030** (instead of special tool **11 4 310**).

Version 2: Screw the pressure gauge from the set of special tools **13 3 060** directly onto the special tool **13 6 030** .

- Establish fuel delivery pressure. Read the fuel delivery pressure on the Integrated Measurement Interface Box (IMIB) and compare it with the values in the BMW diagnosis system.



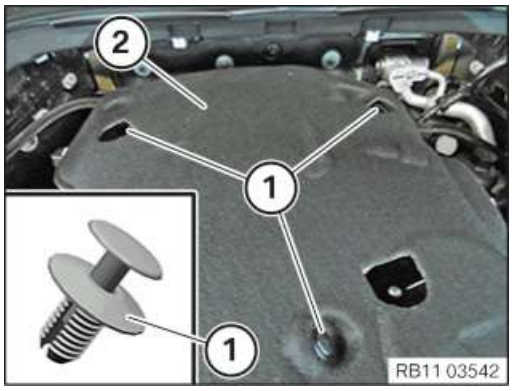
- After completing the measurement, disconnect and remove the special tool with the special tool 0 496 623 (11 4 310) and the pressure sensor (1) from the fuel feed line.
- Catch and dispose of escaping fuel with a suitable auxiliary material.



- Connect and lock fuel delivery line (2) in direction of arrow.

  The fuel feed line (2) must engage audibly.
- Secure fuel delivery line (2) in holder (3).
- Secure the holder (1).
- Check fuel system for tightness.

4 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

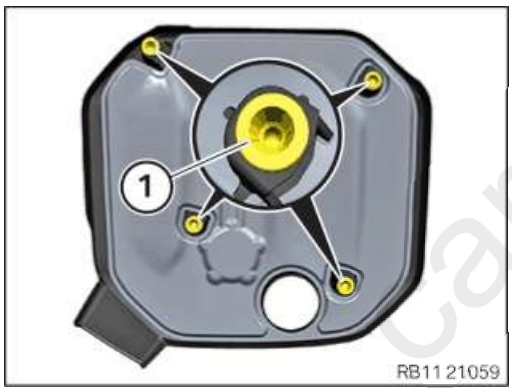
5 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



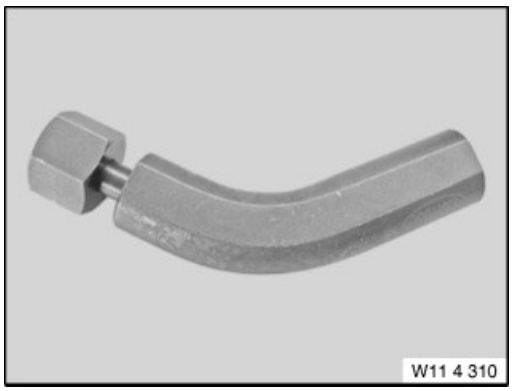
- Clip in the acoustic cover (1) into the holders in the indicated areas.

Additional Information

Overview of Special Tools

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0 496 623 (11 4 310) Adapter



Common Used in step 3

Usage	For fuel pressure check. For variable camshaft timing control VANOS with Integrated Measurement Interface Box IMIB (100 bar sensor in delivery specification). In connection with 11 5 360.
Included in the tool or work	
Storage location	B26
Replaced by	
In connection with	11 5 360 = 0495130
SI-Number	01 27 09 (598)

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13 31 025 Checking fuel return pressure

WARNING

Hot surfaces.

Risk of burning!

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

TECHNICAL INFORMATION

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

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PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

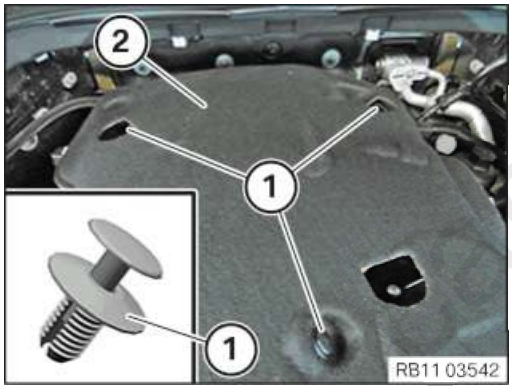
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

MAIN WORK

3 – Checking fuel return pressure

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

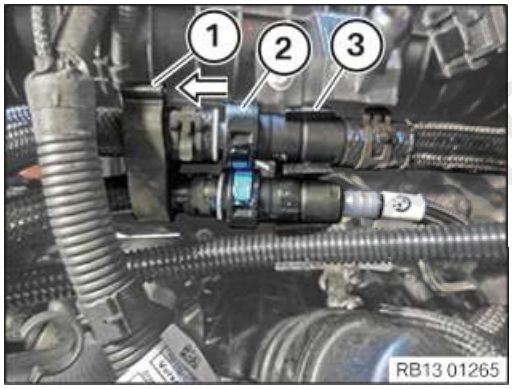
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

Contaminant or foreign body.

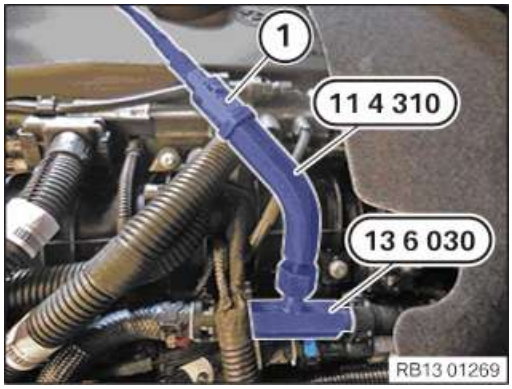
Contamination can result in malfunctions, operating failure or leaks.

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



- Unlock and loosen holder (1).
- Detach the fuel return line (2) from the holder (3).
- Unlock and release fuel return line (2) in the direction of arrow.
- Catch and dispose of escaping fuel.

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- Insert the special tool into the disconnected fuel return line.
- Screw special tool 0 496 623 (11 4 310) onto special tool .
- Screw the pressure sensor onto the special tool 0 496 623 (11 4 310) 100 bar (IMIB) (1).

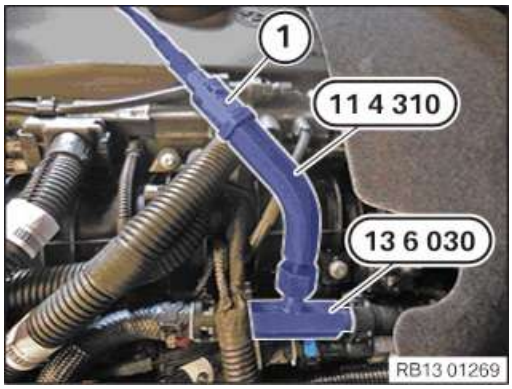
TECHNICAL INFORMATION

As an alternative to the **pressure sensor** with 100 bar **(IMIB)** , the **pressure sensor** with 25 bar may also be used.

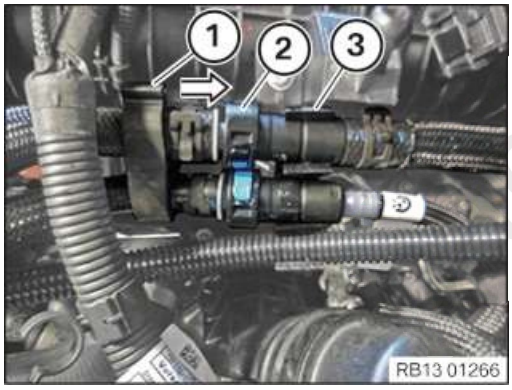
Version 1: Screw the special tool **11 5 364** onto the special tool **13 6 030** (instead of special tool **11 4 310**).

Version 2: Screw the pressure gauge from the set of special tools **13 3 060** directly onto the special tool **13 6 030** .

- Build up fuel return pressure. Read the fuel return pressure on the Integrated Measurement Interface Box (IMIB) and compare it to the values in the BMW diagnosis system.



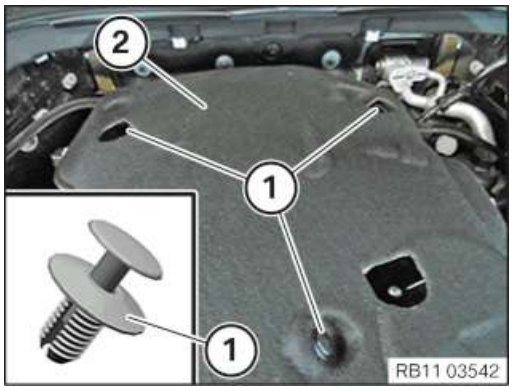
- After completing the measurement, disconnect and remove the special tool with the special tool 0 496 623 (11 4 310) and the pressure sensor (1) from the fuel return line.
- Catch and dispose of escaping fuel in a suitable container.



- Connect and lock fuel return line (2) in direction of arrow.

  The fuel return line (2) must audibly engage.
- Check the lock of the fuel return line for the correct fit by pulling it to the back.
- Secure fuel return line (2) on the holder (3).
- Secure the holder (1).
- Check fuel system for tightness.

4 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

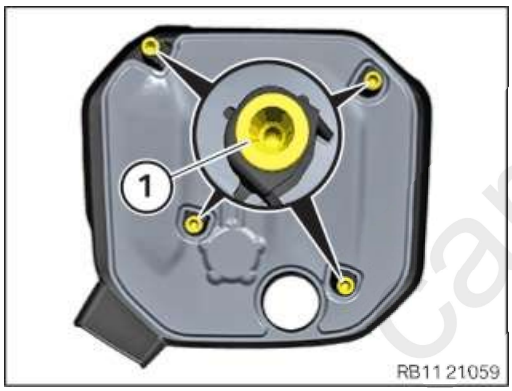
5 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



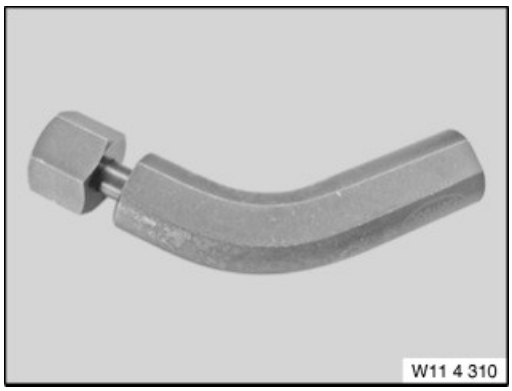
- Clip in the acoustic cover (1) into the holders in the indicated areas.

Additional Information

Overview of Special Tools

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0 496 623 (11 4 310) Adapter



Common Used in step 3

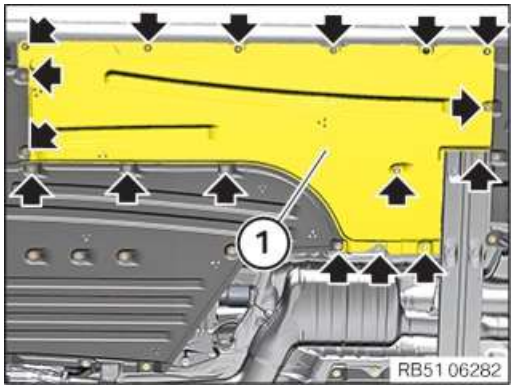
Usage	For fuel pressure check. For variable camshaft timing control VANOS with Integrated Measurement Interface Box IMIB (100 bar sensor in delivery specification). In connection with 11 5 360.
Included in the tool or work	
Storage location	B26
Replaced by	
In connection with	11 5 360 = 0495130
SI-Number	01 27 09 (598)

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13 32 051 Replacing the fuel filter

PRELIMINARY WORK

1 – Remove side underbody panelling



- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

MAIN WORK

2 – Removing the fuel filter

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

Contaminant or foreign body.

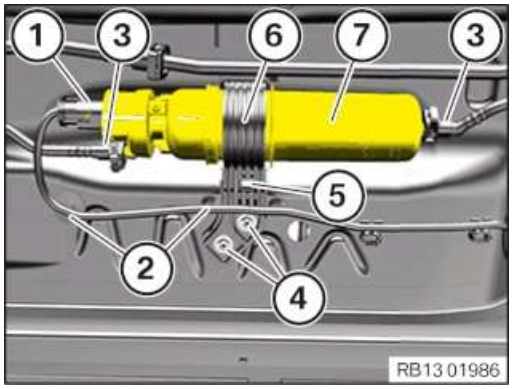
Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

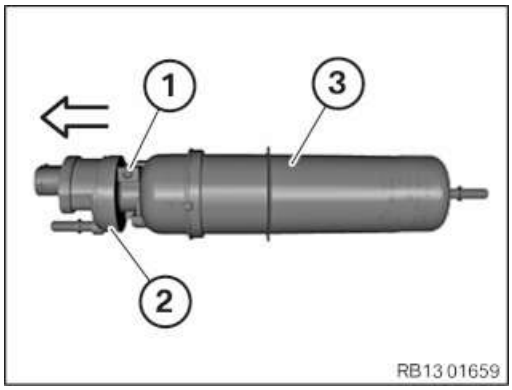
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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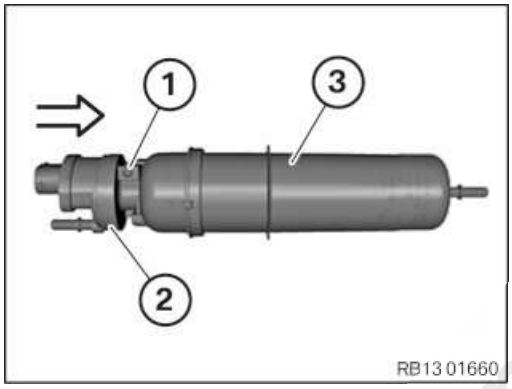
- Unlock plug connection (1) and disconnect.
- Release the line from the connector (1) from the clips (2) and expose it.
- Unlock and loosen fuel lines (3).
- Loosen nut (4).
- Unlock lock (5).
- Guide out and remove holder (6).
- Guide out and remove fuel filter (7).

3 – Replacing the fuel filter



- Loosen screw (1).
- Guide the fuel preheating (2) out of the fuel filter (3) in the direction of the arrow and remove.
- Renew fuel filter (3).

  Parts: Fuel filter

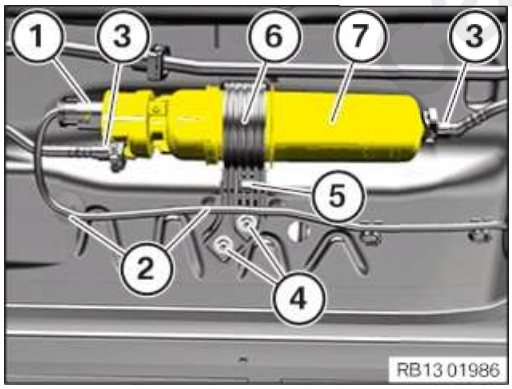


- Guide the fuel preheating (2) into the fuel filter (3) in the direction of the arrow and remove.
- Tighten down screw (1).

Fuel preheating on fuel filter

	Tightening torque	2 Nm

4 – Installing the fuel filter



- Insert and install the fuel filter (7).
- Insert and install the holder (6).

  The lock (5) must audibly engage.
- Tighten nut (4).

Fuel filter on vehicle underbody

M6	Renew nuts.	Tightening torque	6 Nm

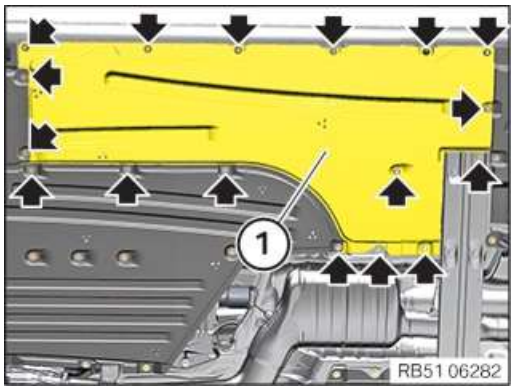
- Connect and lock fuel lines (3).

  The fuel lines (3) must audibly engage.
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure the line of connector (1) on the clips (2).
- Check fuel system for leak tightness.

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5 – Installing the underbody panelling on the sides



- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Additional Information

Overview of Tightening Torques

Fuel preheating on fuel filter — Used in step 3

		Tightening torque	2 Nm

Fuel filter on vehicle underbody — Used in step 4

M6	Renew nuts.	Tightening torque	6 Nm

Underbody panelling, side — Used in step 5

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

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13 53 318 Remove and install all injectors in the injection system

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

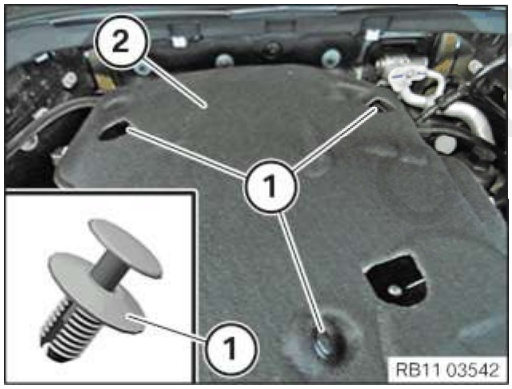
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

3 – Detaching the leakage oil line from the injectors

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

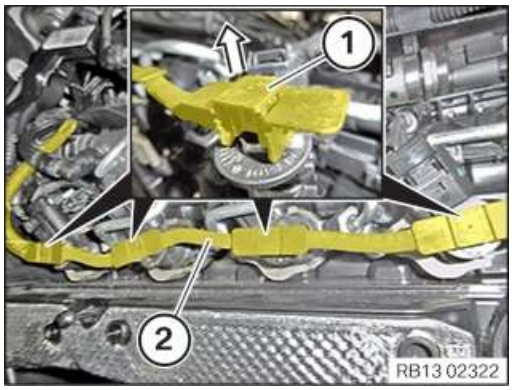
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

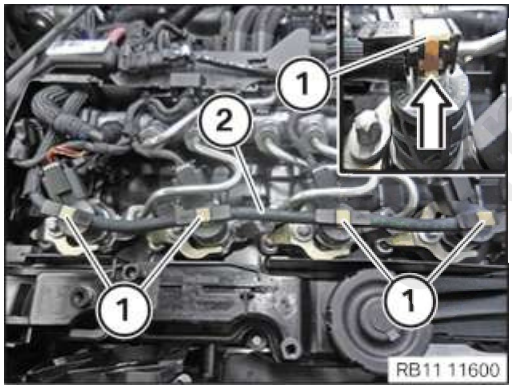


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

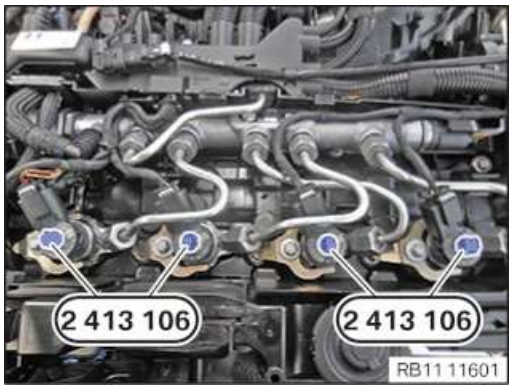


- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



- Seal open connections with special tools .

4 – Remove the high pressure lines between the injector and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

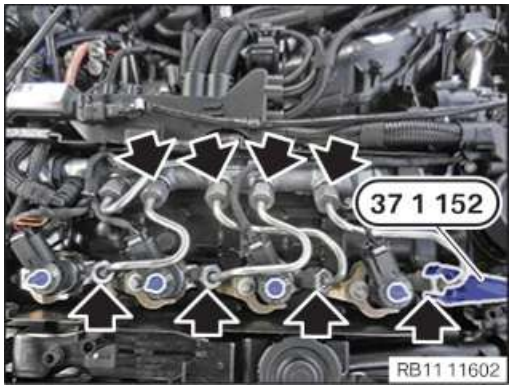
TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

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- Release the high pressure lines (arrows) with the special tool .
  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

MAIN WORK

5 – Remove all injection systems

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

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RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

RISK OF DAMAGE

Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

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

RISK OF DAMAGE

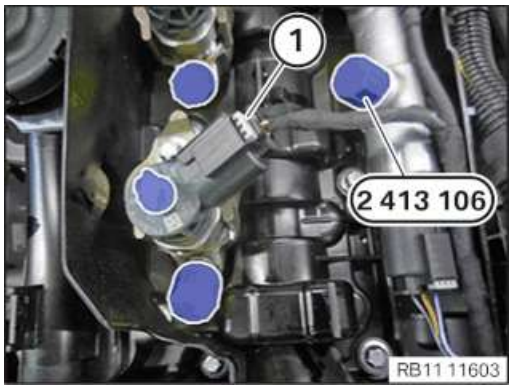
Electrostatic discharge.

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 ... Notes for ESD protection (electrostatic discharge)

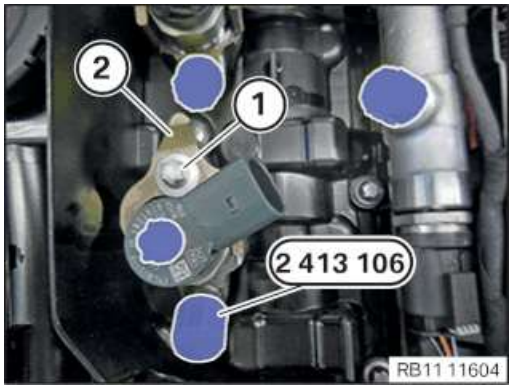
TECHNICAL INFORMATION

If several injectors are removed, ensure that each injector is installed at its original location (cylinder). Mark injectors.



- Unlock plug connection (1) and disconnect.

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- Loosen screw (1).
- Guide out and remove clamping claw (2).
- Feed out and remove the injector with slight rotational movements.

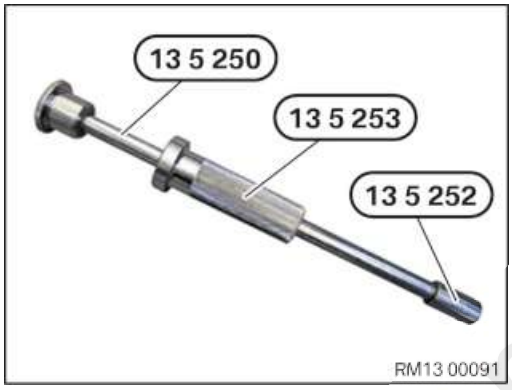
▸ **Loosen stuck injectors**

RISK OF DAMAGE

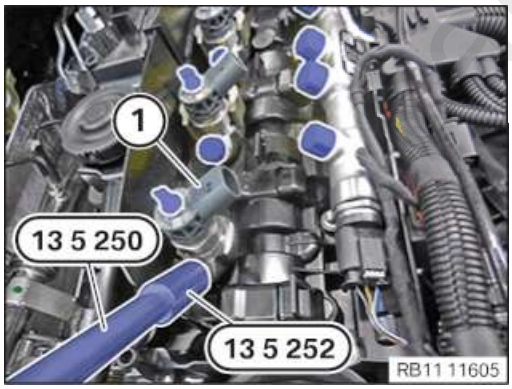
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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



- Unscrew special tool 0 493 339 (13 5 252) from special tool 0 493 321 (13 5 250) and remove special tool 0 493 340 (13 5 253).
- Screw special tool 0 493 339 (13 5 252) back onto special tool 0 493 321 (13 5 250).



- Screw special tool 0 493 321 (13 5 250) with special tool 0 493 339 (13 5 252) onto pressure line connection (1) of injector.
- Release injector (1) with special tools 0 493 321 (13 5 250) and 0 493 339 (13 5 252) by means of **short** back and forth movements and remove.

6 – Install all injectors

▸ **Cleaning the injector shafts**

CAUTION

Swirling dirt particles caused by compressed air.

Danger of injury!

- Collect dirt particles, e.g. when blowing out, use cloth to do so.

- Wear safety goggles.

RISK OF DAMAGE

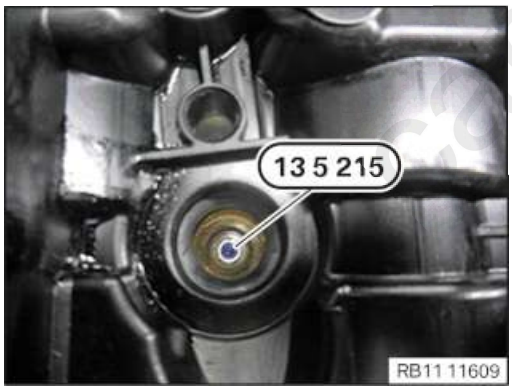
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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



- Check whether the sealing ring remained in the injector shaft and remove the sealing ring as needed.
- Insert the special tool 0 493 763 (13 5 215) with the special tool 0 493 762 (13 5 214) from the set of special tools 0 493 758 (13 5 210) into the injector shaft.
- Remove special tool 0 493 762 (13 5 214).



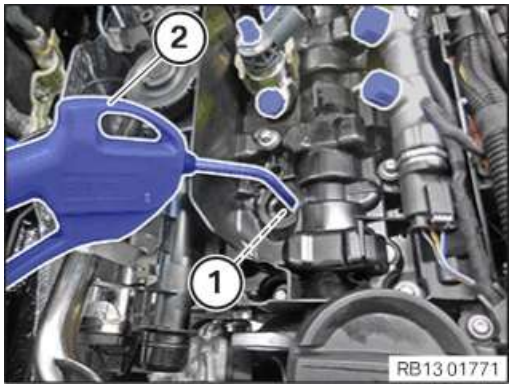
- After insertion, special tool 0 493 763 (13 5 215) must remain in the injector shaft after cleaning without fail.



- Insert special tool 0 496 150 (13 2 020) into the injector shaft.



- Move special tool 0 496 150 (13 2 020) up and down in the injector shaft with rotational movements in the direction of arrow.
- Feed out special tool 0 496 150 (13 2 020) from the injector shaft and remove.



- Blow out injector shaft (1) with air gun (2).



- Feed the special tool 0 493 762 (13 5 214) into the injector shaft and screw it in with the special tool 0 493 763 (13 5 215).
- Feed out special tool 0 493 762 (13 5 214) with special tool 0 493 763 (13 5 215) from the injector shaft and remove it.

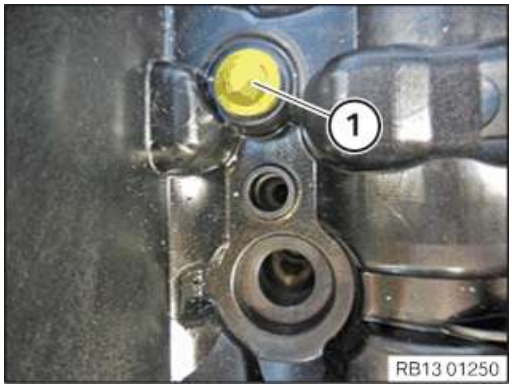
▸ **Check the placement of the clamping claw**

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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



- Tighten down screw (1).

  The clamping claw is positioned on the bolt (1).

Clamping claw facing to cylinder head cover

M6		Tightening torque	10 Nm

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▸ **Prepare the injector for installation**

RISK OF DAMAGE

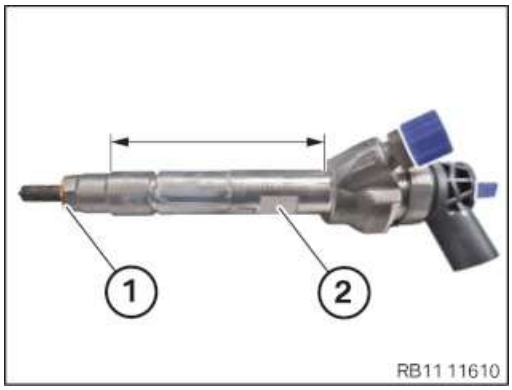
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

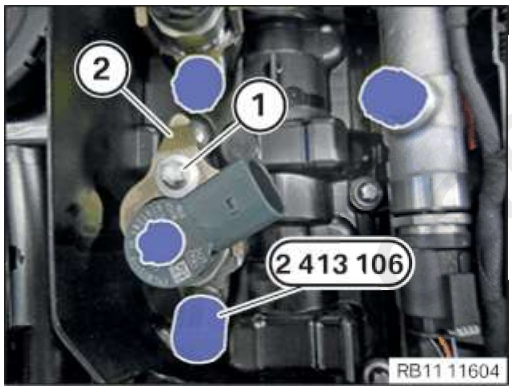
TECHNICAL INFORMATION

Lightly grease the injector shaft with high temperature-resistant grease.
For additional information see: 11 00 ... Overview of consumables in Electronic Parts Catalogue



- Renew the copper sealing ring (1) on the injector (2).

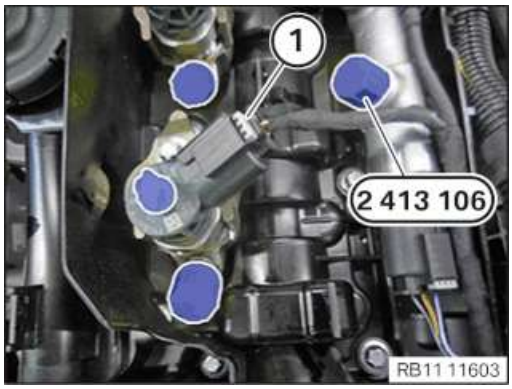
  Parts: Copper sealing ring
- Lightly grease the injector in the marked area with heat-resistant grease before installing the injector (2) in the injector shaft.



- Insert and install the injector .
- Insert and install the clamping claw (2).
- Tighten down screw (1).

Injector to cylinder head cover

M8		Tightening torque	8 Nm
		Angle of rotation	120 °



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

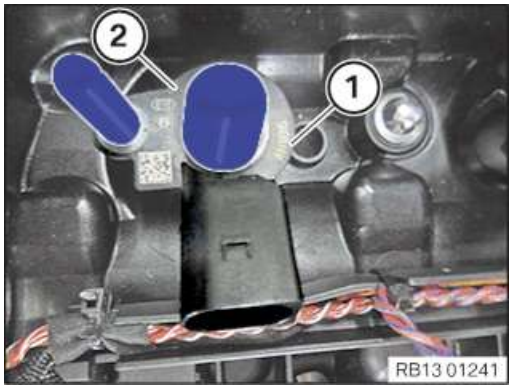
▸ **Replacement: Perform injection quantity compensation**

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

NOTICE

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



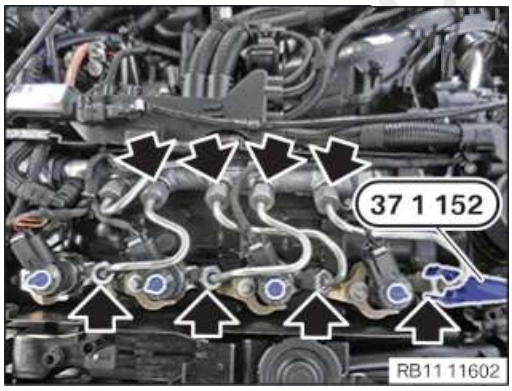
- Read off the adjustment value (1) on the new injector (2).



- Connect diagnosis system:
  - Vehicle identification
  - Function selection
  - Service functions
  - Digital diesel electronics (DDE)
  - Adjustment of injectors
  - Testing schedule
- Start service function with the right arrow button.

POSTPROCESSES

7 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the high pressure lines (arrows) with the special tool .

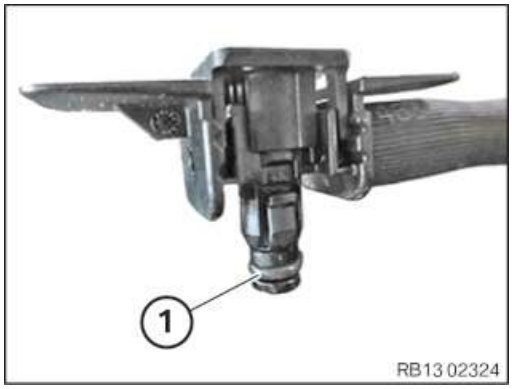
High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

8 – Attach the leakage oil line on the injectors

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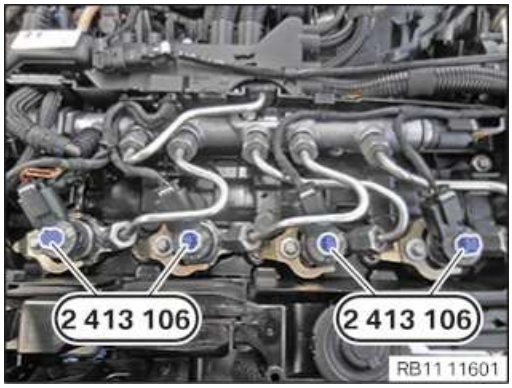


- **Version A:**

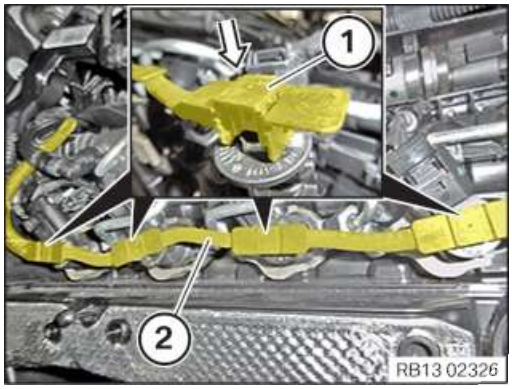
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

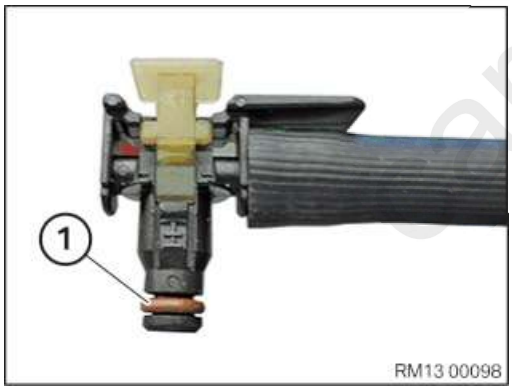
  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.



- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

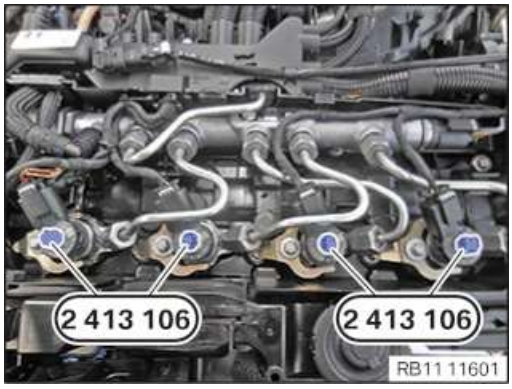


- **Version B**:

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

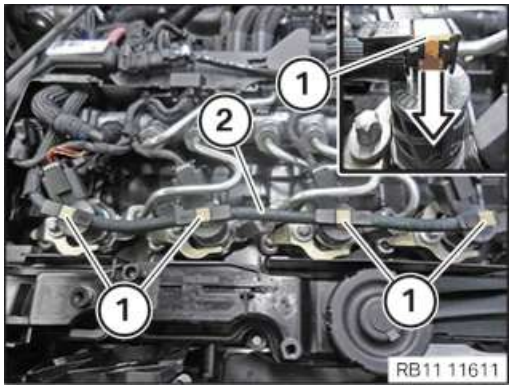
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.



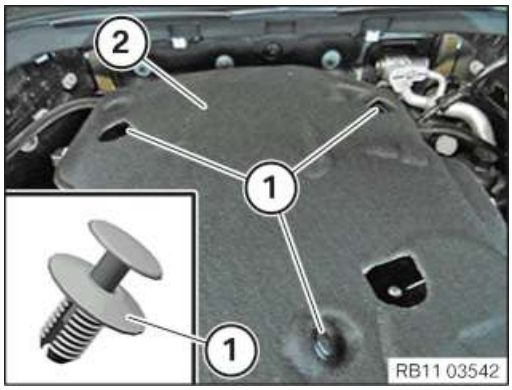
- Feed out the special tools and remove.

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- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

9 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

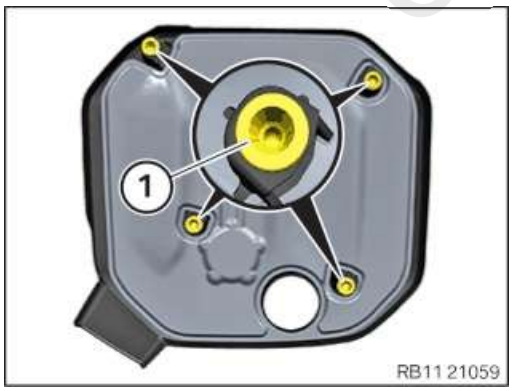
10 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).

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

Additional Information

Overview of Tightening Torques

Clamping claw facing to cylinder head cover — Used in step 6

M6		Tightening torque	10 Nm

Injector to cylinder head cover — Used in step 6

M8		Tightening torque	8 Nm
		Angle of rotation	120 °

High pressure lines between injector and rail — Used in step 7

High-pressure pipe		Tightening torque	24.5 Nm

Overview of Special Tools

0 493 339 (13 5 252) Bush

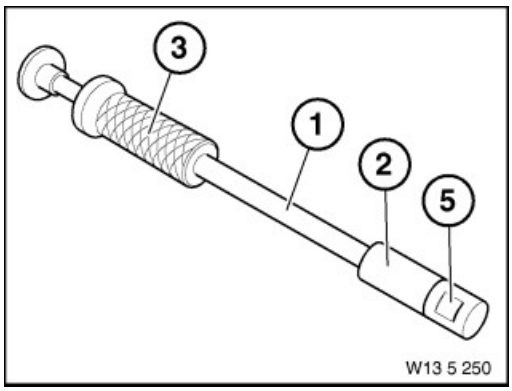


Common — Used in step 5

Usage	(Threaded bush)
Included in the tool or work	0 493 321
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 493 321 (13 5 250) Puller



Common Used in step 5

Usage	For removing injector nozzles or injectors from cylinder head
Included in the tool or work	
Storage location	A16
Replaced by	
In connection with	
SI-Number	01 06 98 (306)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 493 338 (13 5 251)		**Rod** (guide rod)	
2	0 493 339 (13 5 252)		**Bush** (Threaded bush)	
3	0 493 340 (13 5 253)		**Weight** (Weight)	
4	0 493 379 (13 5 254)		**Claw** (Clamping claw) For removal of injector nozzles / engine: M57	
5	0 495 579 (13 5 255)		**Adapter** For removing steering shaft on E85. Refer to SI 01 11 06 (265)	

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0 493 340 (13 5 253) Weight

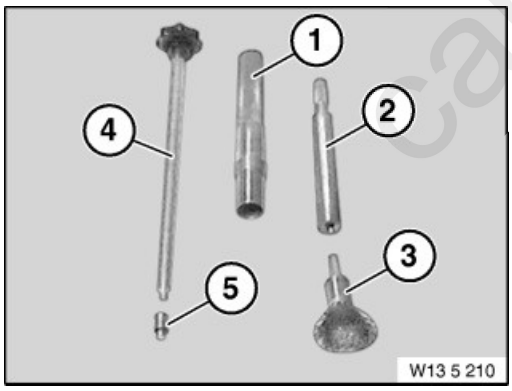


Common Used in step 5

Usage	(Weight)
Included in the tool or work	0 493 321
Storage location	
Replaced by	
In connection with	
SI-Number	

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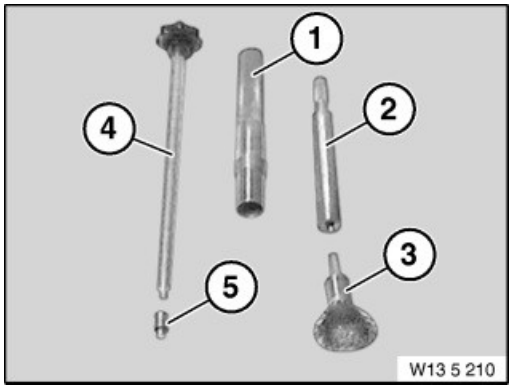
0 493 763 (13 5 215) Plug



Common Used in step 6

Usage	(Seal plug)
Included in the tool or work	0 493 758
Storage location	
Replaced by	
In connection with	
SI-Number	

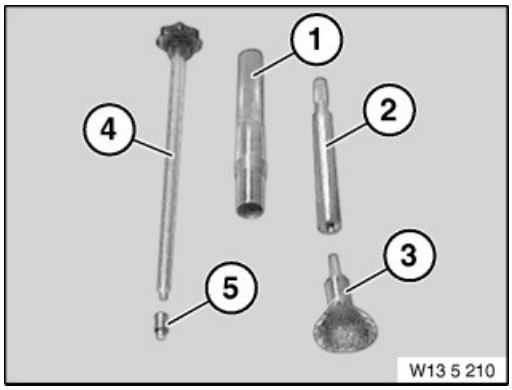
0 493 762 (13 5 214) Rod



Common Used in step 6

Usage	(Mounting rod) For the seal plug
Included in the tool or work	0 493 758
Storage location	
Replaced by	
In connection with	
SI-Number	

0 493 758 (13 5 210) Tool



Common Used in step 6

Usage	(Cleaning set) For injector channels
Included in the tool or work	
Storage location	B4
Replaced by	
In connection with	
SI-Number	01 05 00 (574)

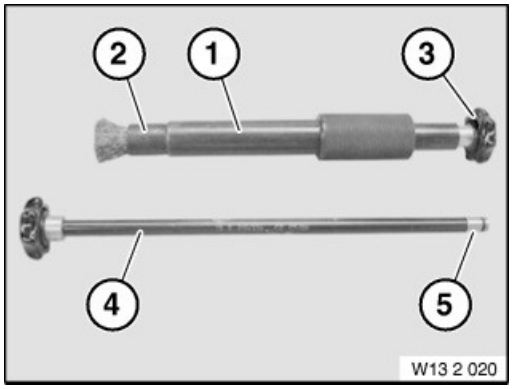
Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 493 759 (13 5 211)		**Holding sleeve** (Guide sleeve)	
2	0 493 760 (13 5 212)		**Holder** (Brush holder)	
3	0 493 761 (13 5 213)		**Brush head**	
4	0 493 762 (13 5 214)		**Rod** (Mounting rod) For the seal plug	
5	0 493 763 (13 5 215)		**Plug** (Seal plug)	

0 496 150 (13 2 020) Tool

Used in step 6

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Common

Usage	(Cleaning kit) For cleaning the injector shaft.
Included in the tool or work	
Storage location	A87
Replaced by	
In connection with	
SI-Number	01 07 07 (355)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 496 151 (13 2 021)		**Holding sleeve** (Guide sleeve) sale of existing inventories then discontinued and available as part of set of special tools 13 2 020 = 83 30 0 496 150 only	
2	0 496 152 (13 2 022)		**Holder** (Brush holder) sale of existing inventories then discontinued and available as part of set of special tools 13 2 020 = 83 30 0 496 150 only	
3	0 496 153 (13 2 023)		**Brush head** Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool 13 2 020 = 83 30 0 496 150 only	
4	0 496 154 (13 2 024)		**Rod** (Mounting rod) sale of existing inventories then discontinued and available as part of set of special tools 13 2 020 = 83 30 0 496 150 only	
5	0 496 155 (13 2 025)		**Plug** (Seal plug) Available as part of complete special tool 13 2 020 = 83 30 0 496 150 only.	

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Links

General repair instructions	Used in step
11 00 ... Overview of consumables (Electronic Parts Catalogue)	6

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	5

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13 53 351 Remove and install/replace engine compartment fuel line

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

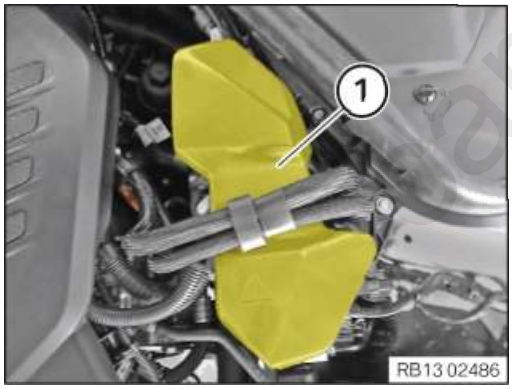
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the cover for the DDE control unit



- Pull off, guide out and remove cover (1) upwards.

MAIN WORK

3 – Removing the fuel lines in the engine compartment

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

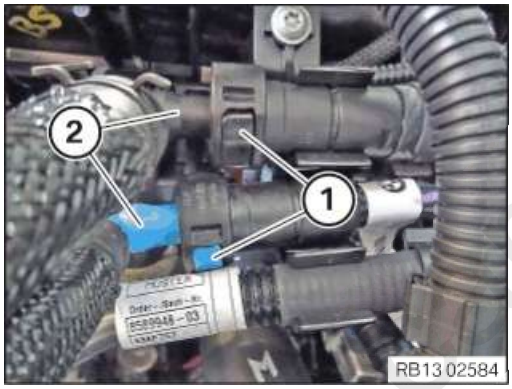
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

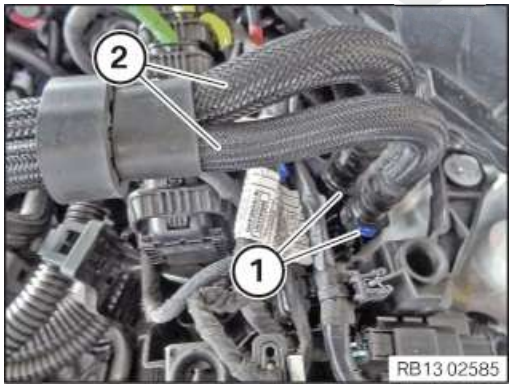
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

TECHNICAL INFORMATION

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

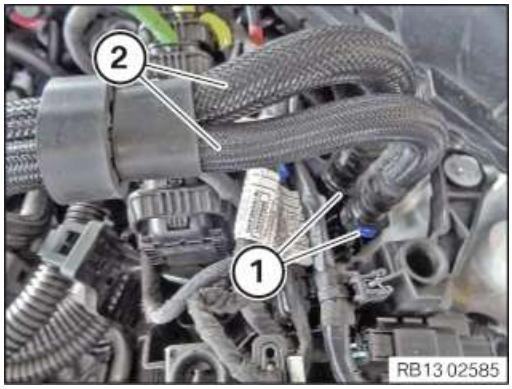


- Unlock locks (1) and disconnect.
- Catch and dispose of escaping fuel.
- Thread out fuel lines (2) and place to one side.



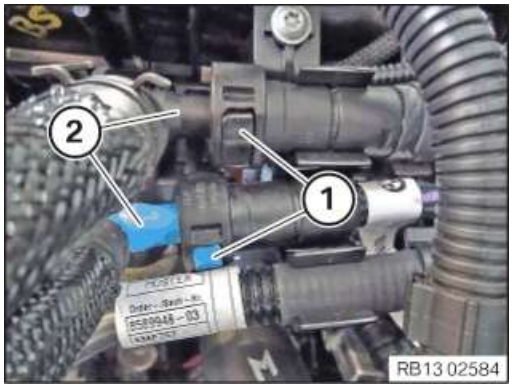
- Unlock locks (1) and disconnect.
- Catch and dispose of escaping fuel.
- Feed out and remove the fuel lines (2).

4 – Installing fuel lines in the engine compartment



- Feed in fuel lines (2) and install.
- Connect and lock retainers (1).

  The locks (1) must engage audibly.



- Feed in fuel lines (2) and install.
- Connect and lock retainers (1).

  The locks (1) must engage audibly.

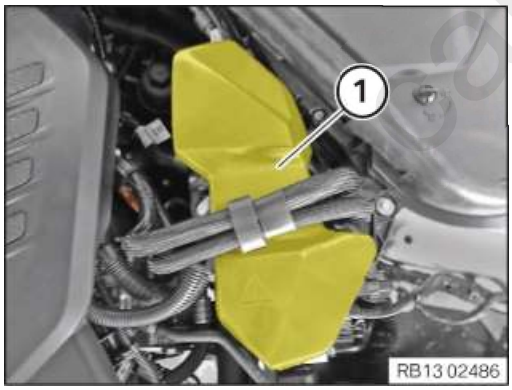
5 – Bleed fuel system



- Bleed fuel system:
  - Power train
  - DDE
  - Ventilation
  - Bleeding the fuel system

POSTPROCESSES

6 – Install the cover for the DDE control unit



- Insert and install cover (1) into guides.

7 – Install acoustic cover

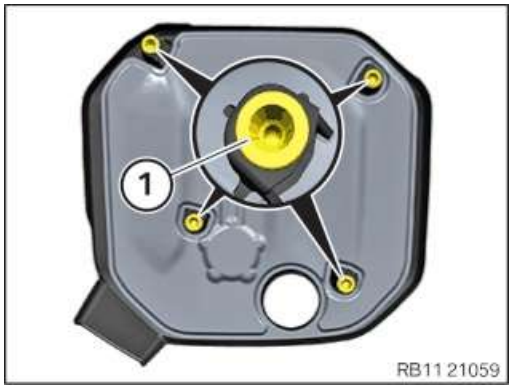
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RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



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

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13 53 560 Removing and installing/replacing pressure sensor on pressure accumulator of injection system

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

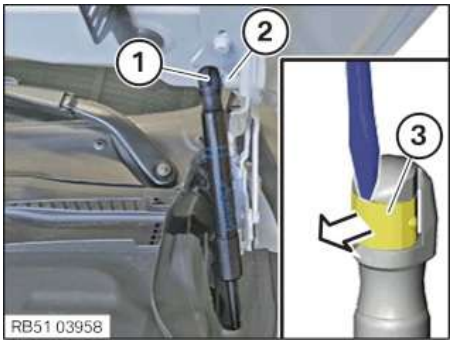
Engine compartment lid is open.

CAUTION

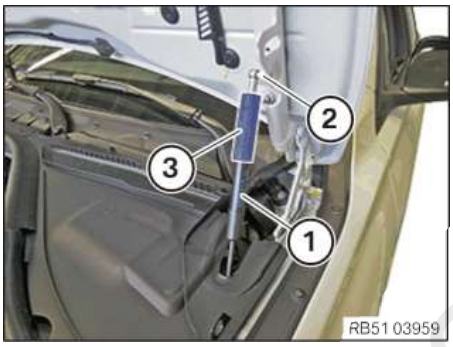
Shutting bonnet or tailgate.

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.
- Pull special tool or 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

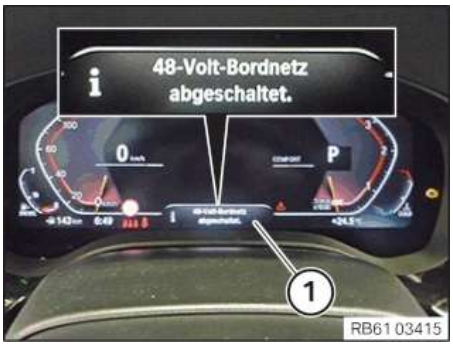
TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

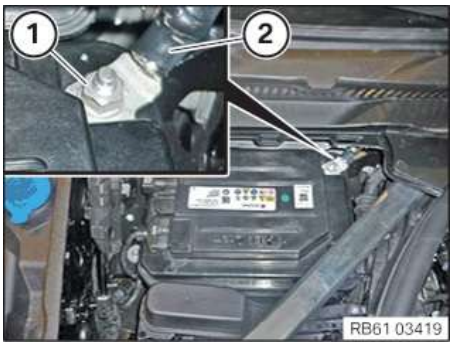
- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

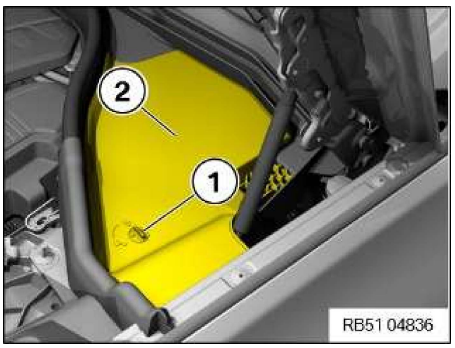
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

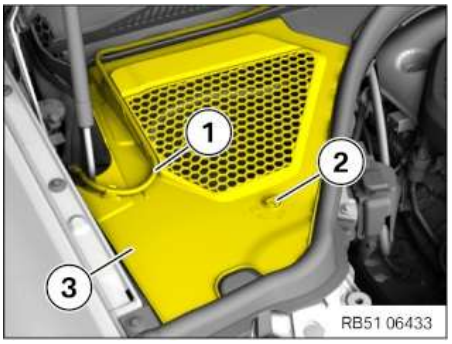
4 – Remove the cover of the engine compartment at the rear left



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

5 – 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 (3) of the rear right engine compartment.

6 – Removing the wiper arm on the left and right

NOTICE

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

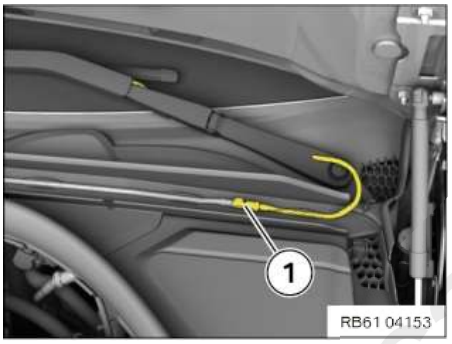
► **Remove the wiper arm**

RISK OF DAMAGE

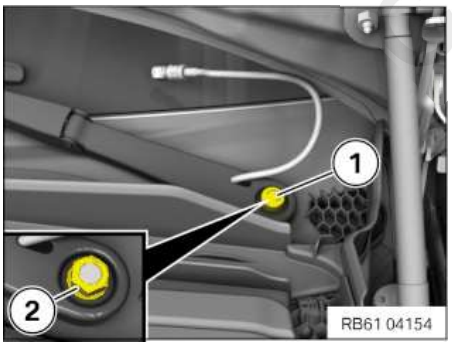
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

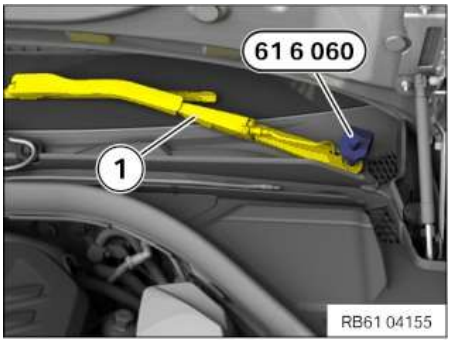
- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.



- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



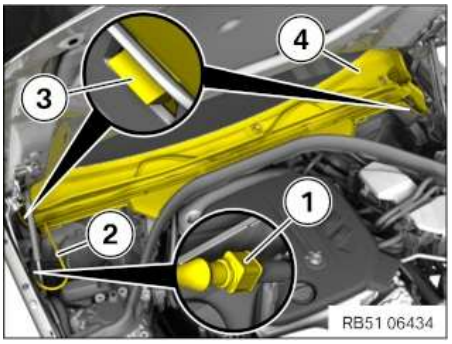
- Remove the protective cap (1).
- Loosen nut (2).



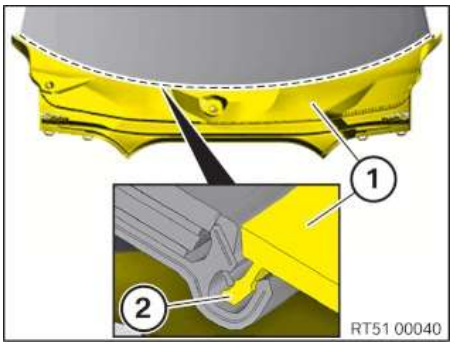
- Pull off the wiper arm (1) using special tool .

7 – Remove cowl panel cover

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- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

8 – Remove the seal for the rear bonnet

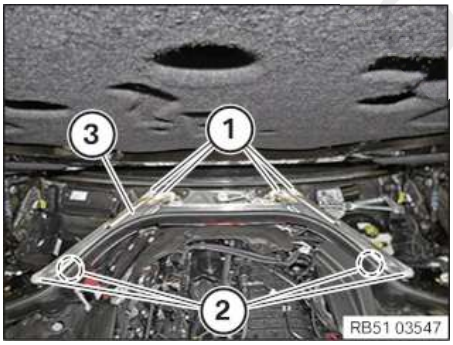


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

9 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

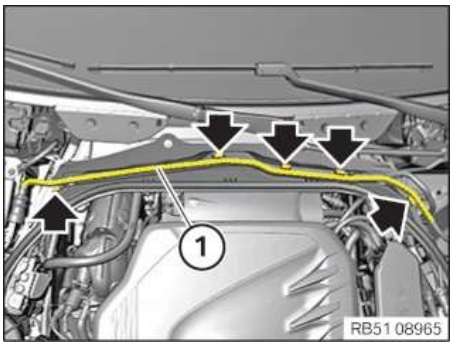
Driving without the strut brace/front-end strut or tension strut is not permitted.



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

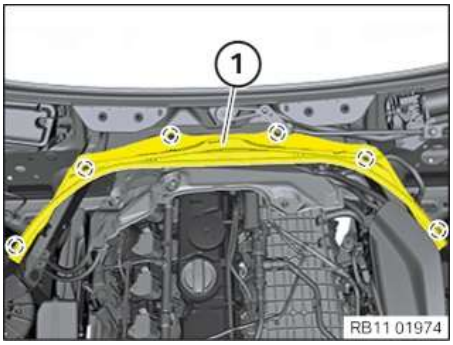
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.



- **Version with mild hybrid technology:**

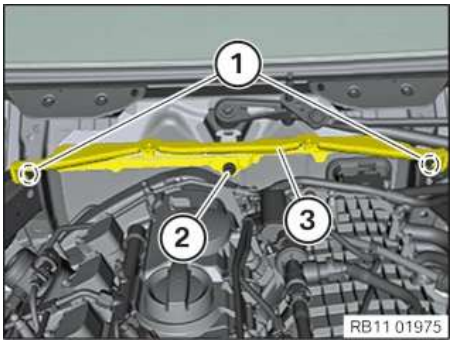
  Unclip the wire (1) at the holders (arrows).

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- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

10 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

11 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

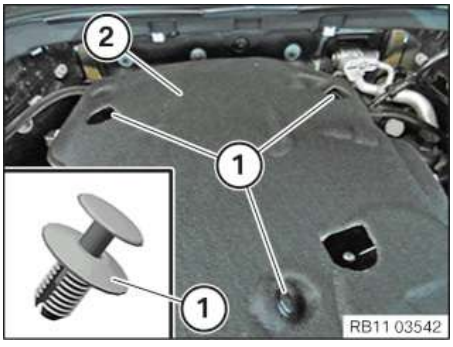
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

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



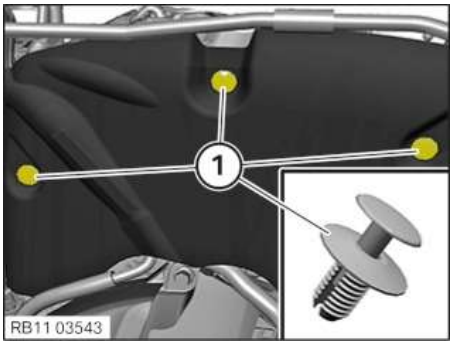
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

12 – Remove the acoustic cover for the injectors

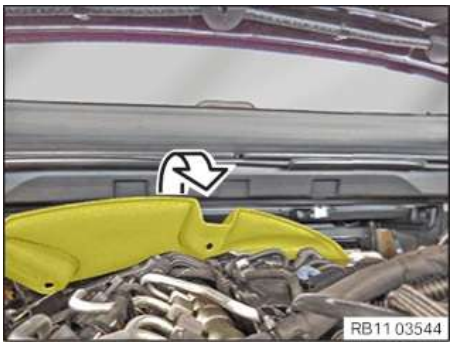


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

13 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

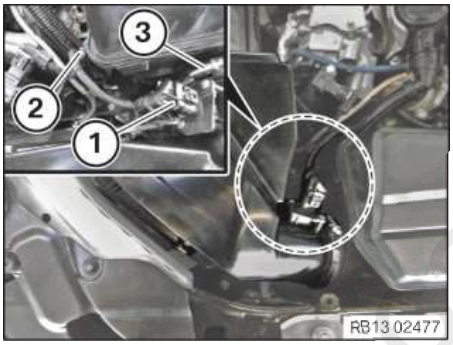
14 – Removing the clean air pipe with the resonator

WARNING

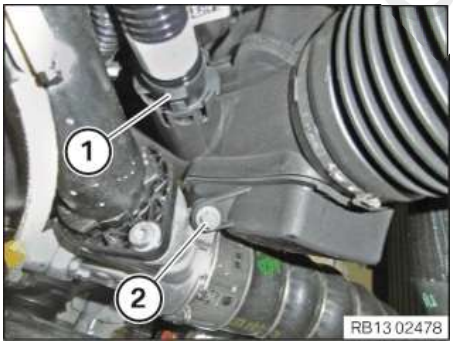
Hot surfaces.

Risk of burning!

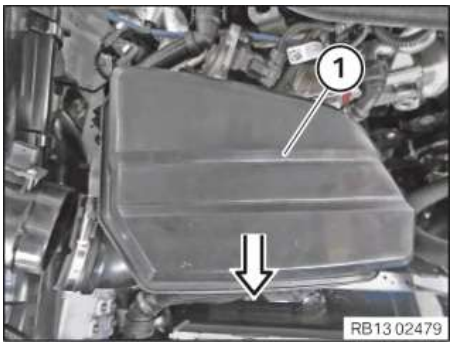
- Perform all work only on components that have cooled down.



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



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

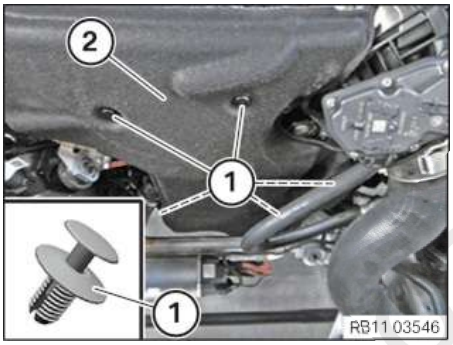
15 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

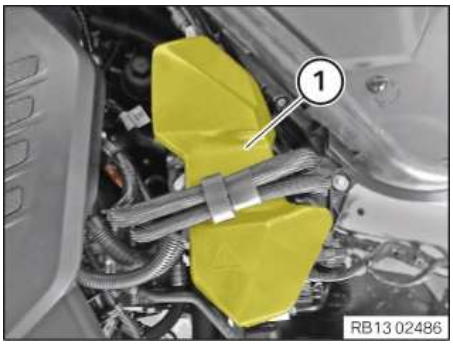
Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

16 – Remove the cover for the DDE control unit



- Pull off, guide out and remove cover (1) upwards.

17 – Partially releasing the wiring harness section on the intake plenum

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RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

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

RISK OF DAMAGE

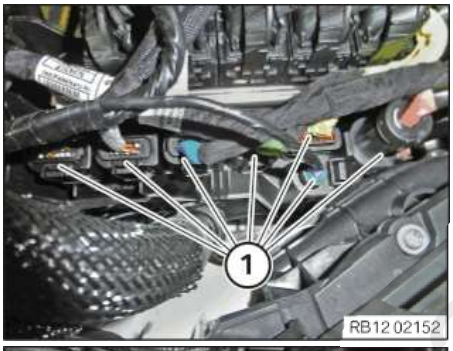
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

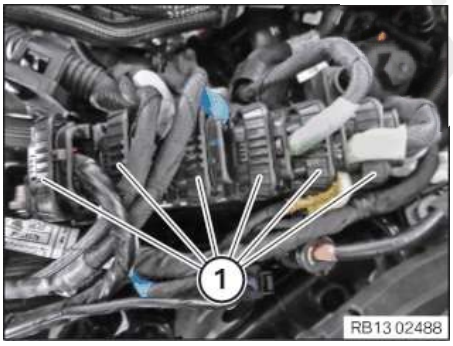
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

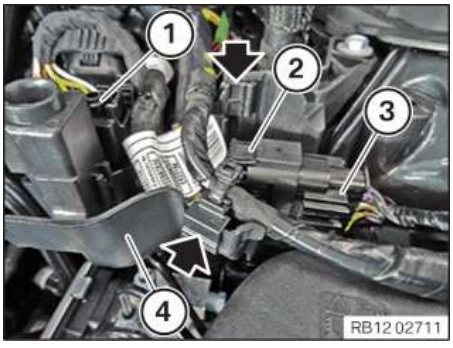
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Unlock and disconnect plug connections (1).

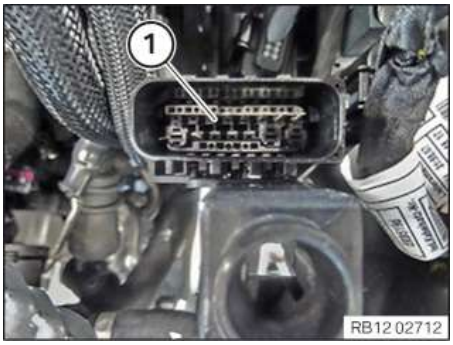


- Unlock and disconnect plug connections (1).

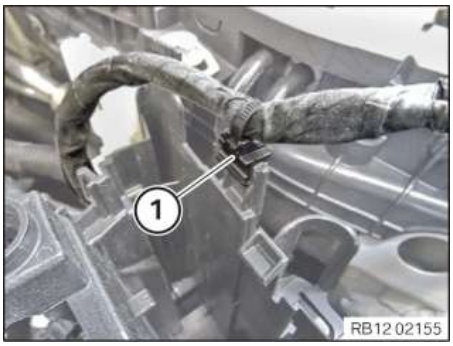


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Release the connector (3) and disconnect from the control unit holder (4).
- Release the clamps (arrows).

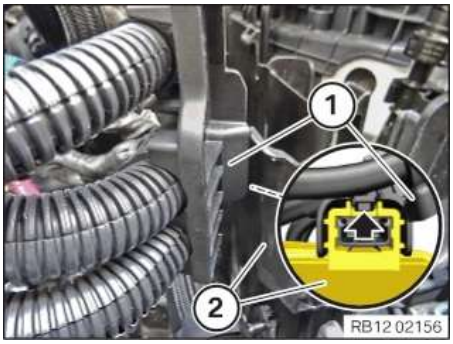
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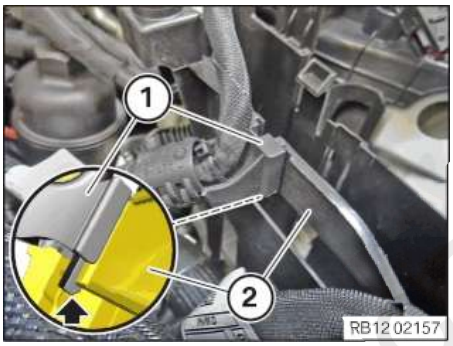
- Unlock plug connection (1) and disconnect.



- Loosen clamp (1).



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



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

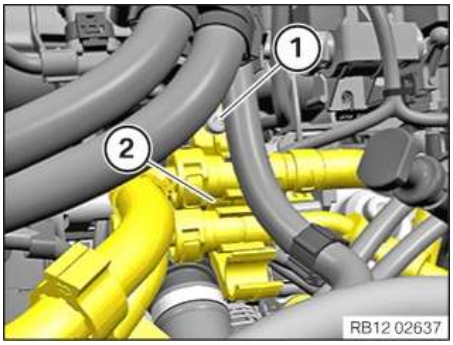


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

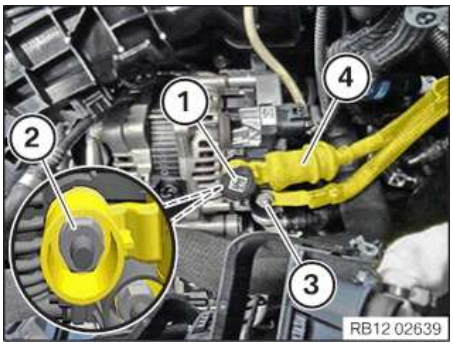


- Unlock holder (1) and feed out coolant line (2) and place it aside.

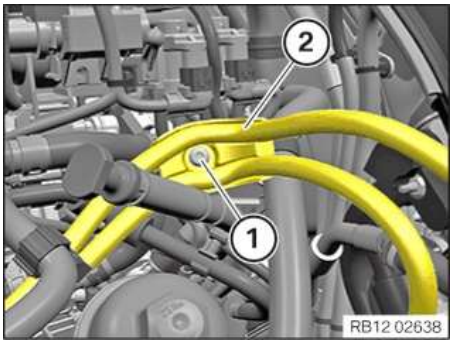
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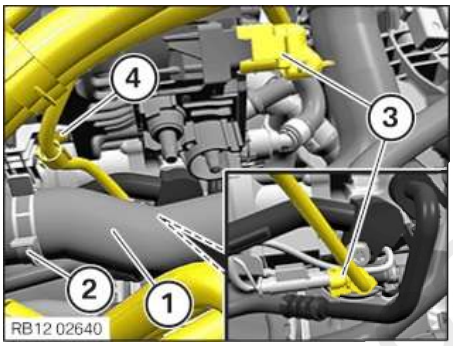
- Release the screw (1).
- Guide out fuel lines (2) and set them aside.



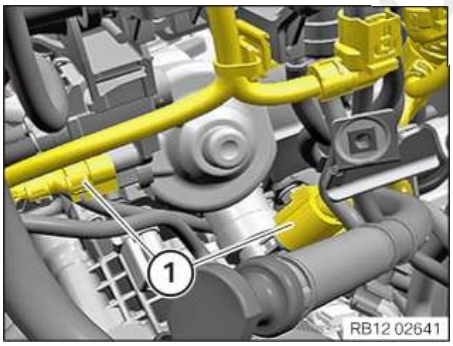
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.



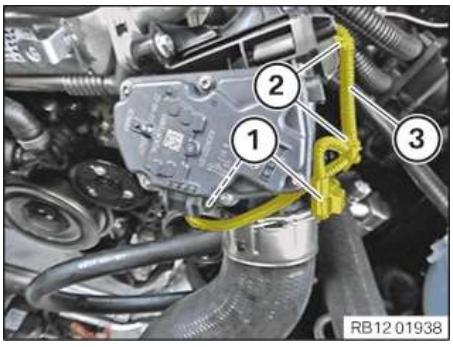
- Release the screw (1).
- Guide out the positive battery cables (2) and set them aside.



- Release the coolant line (1) from the holder (2) .
- Unlock plug connections (3) and disconnect.
- Loosen clamp (4).



- Unlock and disconnect plug connections (1).



- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.

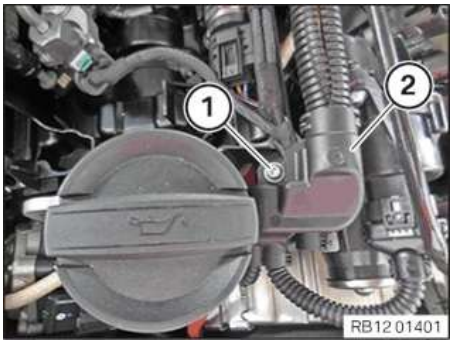
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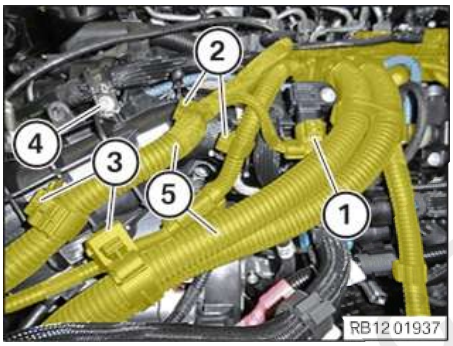
- Unlock and loosen connector (1).



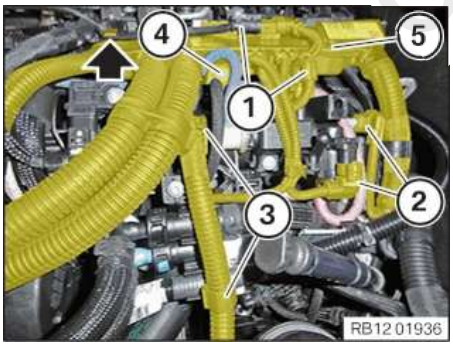
- Unlock plug connection (1) and disconnect.



- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

18 – Removing the intake plenum

TECHNICAL INFORMATION

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

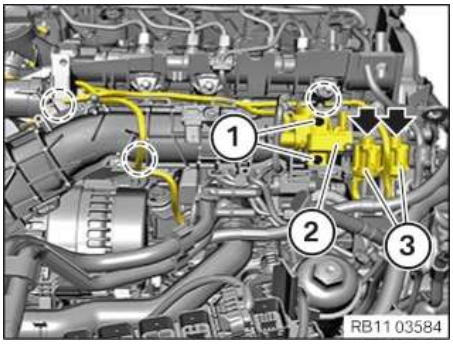
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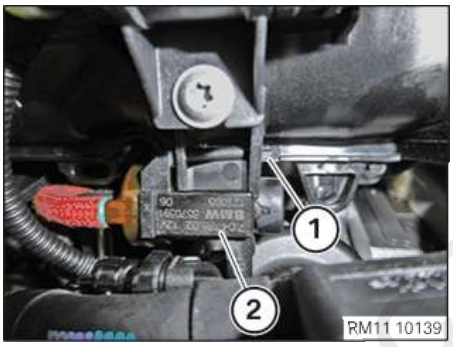
- Unlock clamp (1) and engage in this position.



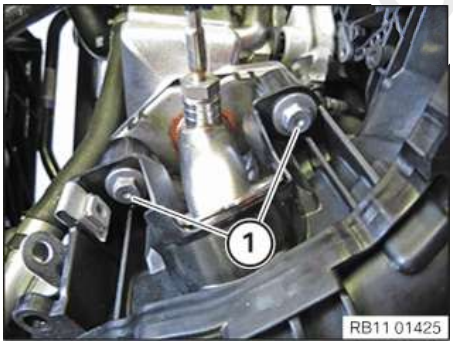
- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.



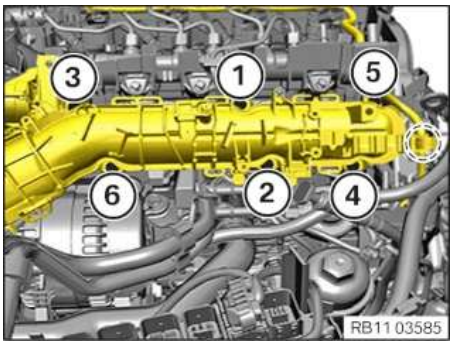
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.

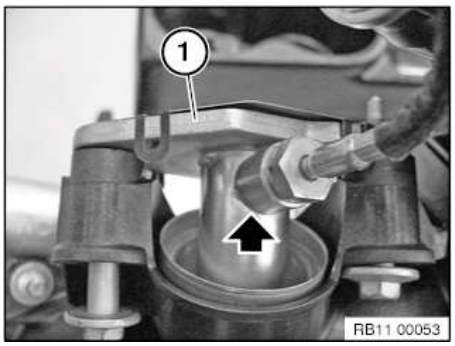


- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.

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- Remove the exhaust-gas recirculation pipe (1) (arrow).

19 – Detaching the leakage oil line from the injectors

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

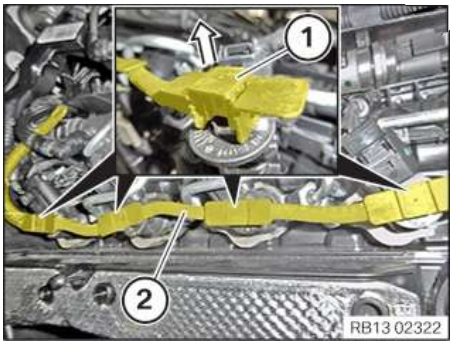
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

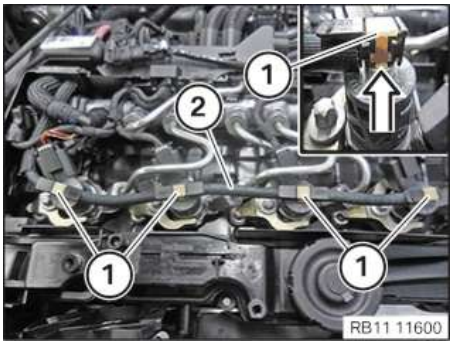


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



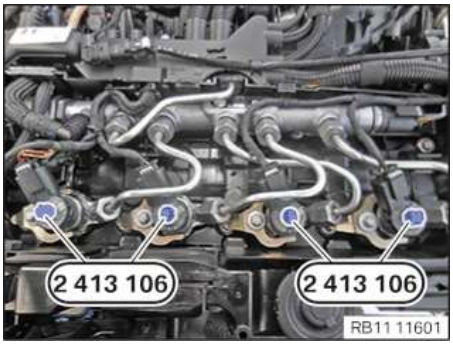
- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

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- Seal open connections with special tools .

20 – Remove the high pressure lines between the injector and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

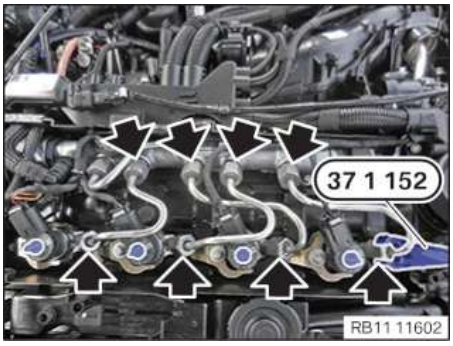
TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

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TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.



- Release the high pressure lines (arrows) with the special tool .
  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

21 – Remove the high pressure line between the high pressure pump and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

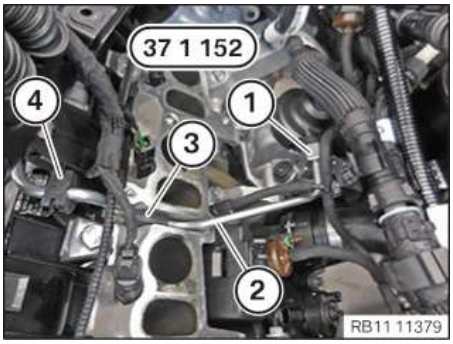
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TECHNICAL INFORMATION

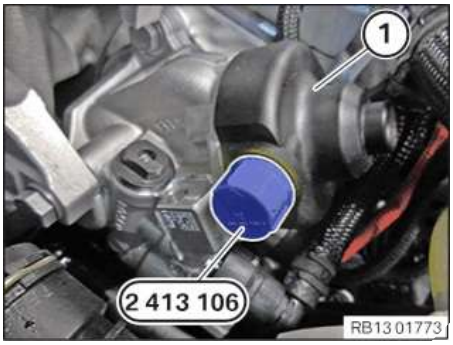
Reset special tool in early to avoid bending pressure lines.



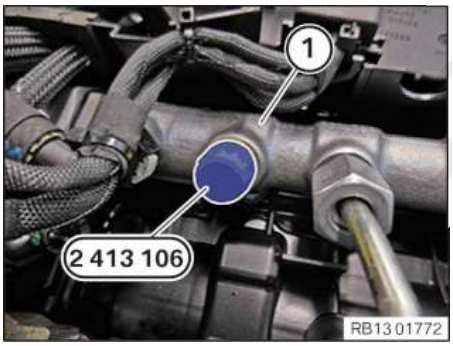
- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.



- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

22 – Remove high-pressure rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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RISK OF DAMAGE

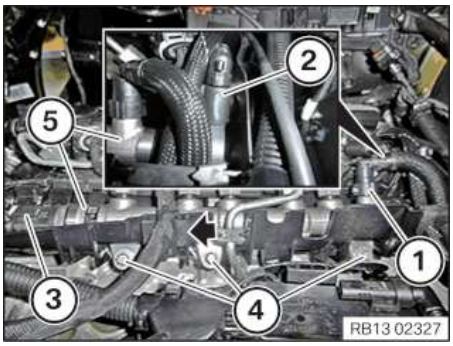
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

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



- Unlock and disconnect the fuel return line (1).
- Guide the fuel return line (1) out and set it aside.
- Unlock and disconnect the plug connection (2) on the rail pressure regulating valve.
- Unlock and disconnect the plug connection (3) on the rail pressure sensor.
- Unlock cable clip (Arrow), feed out and place aside.
- Loosen screws (4).
- Thread out and remove the rail (5).

MAIN WORK

23 – Remove the rail pressure sensor on the rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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 ... Notes for ESD protection (electrostatic discharge)

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RISK OF DAMAGE

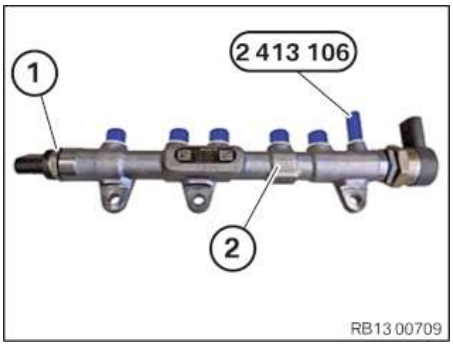
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

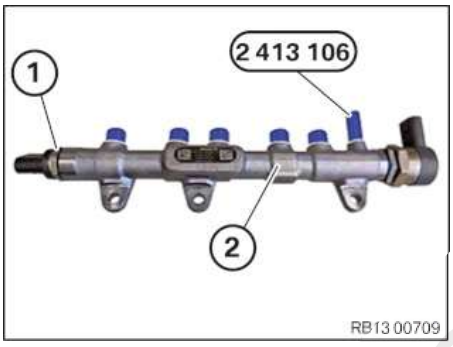
TECHNICAL INFORMATION

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



- Grip the removed rail (2) on the flattened area.
- When removing the rail pressure sensor (1), counter support at the rail (2).
- Loosen the rail pressure sensor (1) and remove.
- Catch and dispose of escaping fuel.

24 – Install the rail pressure sensor on the rail



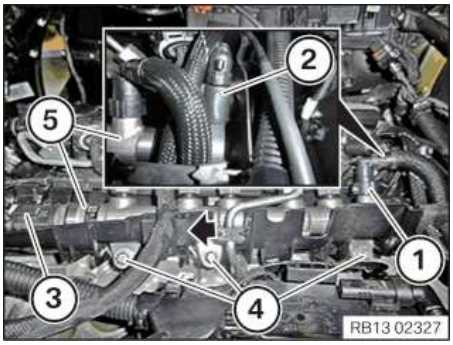
- Check the thread and sealing surface of the rail pressure sensor (1) for damage and renew the rail pressure sensor where required.
- Check the thread and sealing surface of the rail (2) for damage and renew the rail where required.
- Lightly grease the thread on the rail pressure sensor (1).
- Screw in the rail pressure sensor (1) by hand.
- Hold the rail (2) for counter support and tighten the rail pressure sensor (1).

Rail pressure sensor to rail

	Grease thread lightly.	Tightening torque	70 Nm

POSTPROCESSES

25 – Installing the rail



- Insert and install the rail (5).
- Tighten the screws (4).

Rail to cylinder head cover

M8		Tightening torque	19 Nm

- Install and lock cable clip (arrow).

  The cable clip (arrow) must engage audibly.
- Connect and lock the connector (3) at the rail pressure sensor.

  The connector (3) must engage audibly.
- Connect and lock the connector (2) at the rail pressure regulating valve.

  The connector (2) must engage audibly.
- Feed in fuel return line (1) and install.

  The fuel return line (1) must audibly engage.

26 – Installing high pressure line between rail and high pressure pump

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

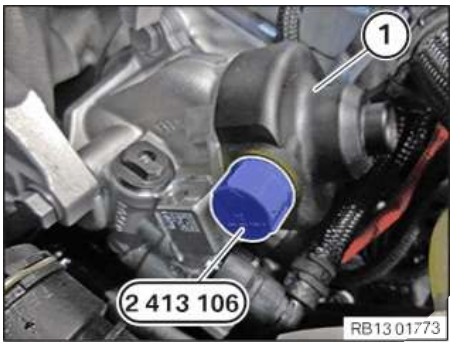
On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

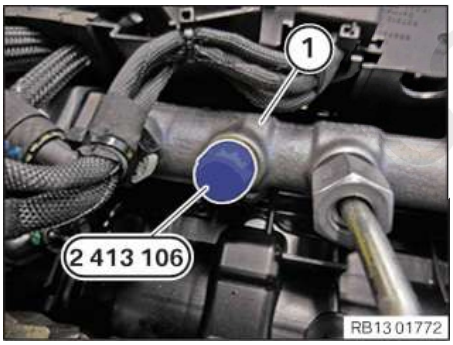
- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

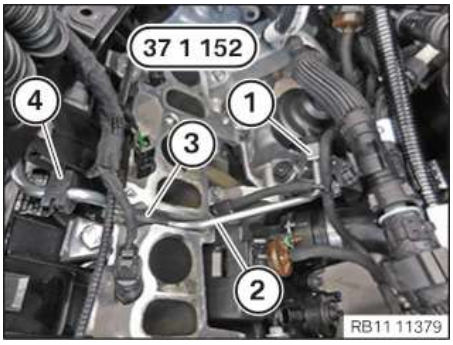
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.

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- Hand-tighten the union nut (1) on the rail.

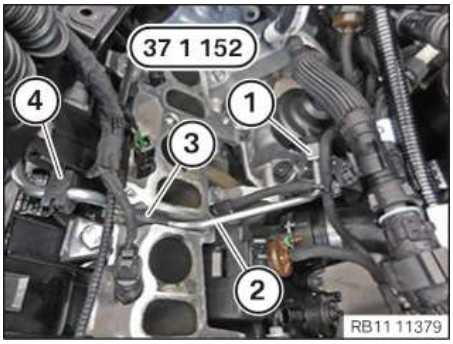
TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm



- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

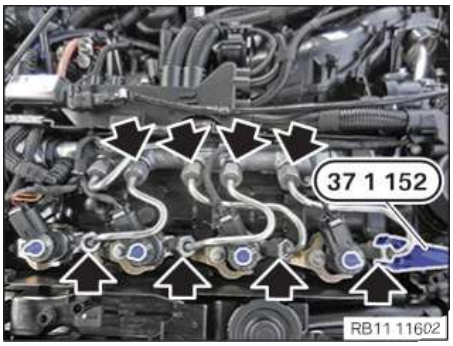
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten union nut (1) on the high pressure pump with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

27 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

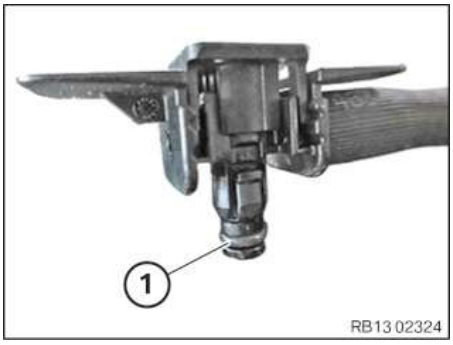
- Tighten the high pressure lines (arrows) with the special tool .

High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

28 – Attach the leakage oil line on the injectors



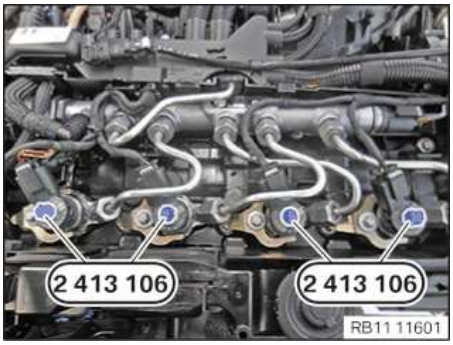
- **Version A:**

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

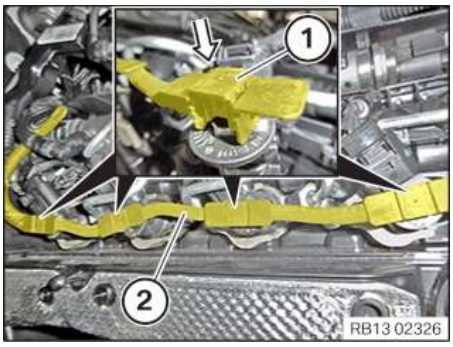
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

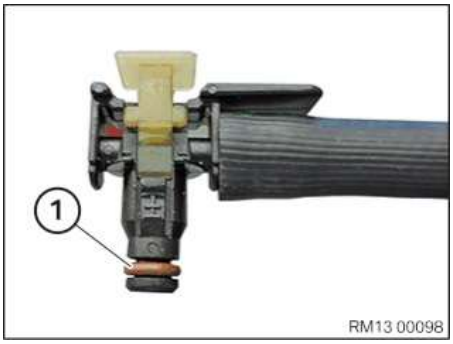
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- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.



- **Version B**:

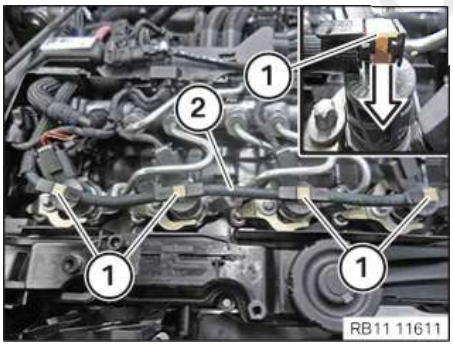
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.



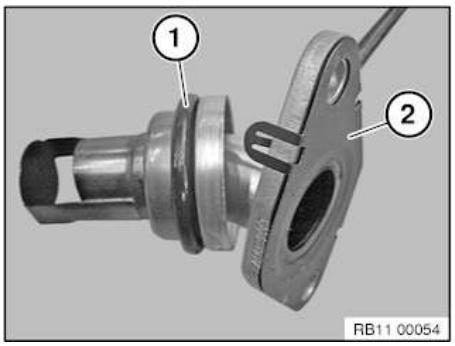
- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

29 – Installing the intake plenum

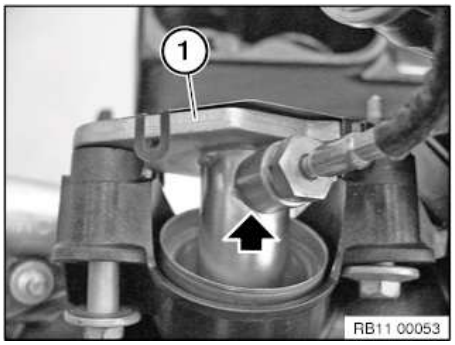
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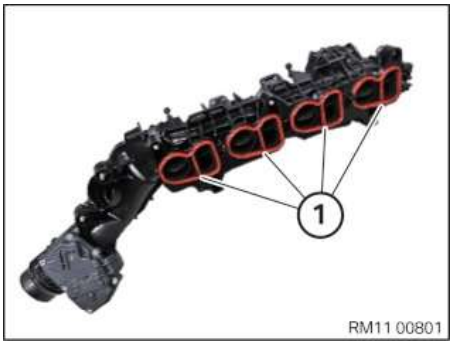
- Renew O-ring (1).

  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

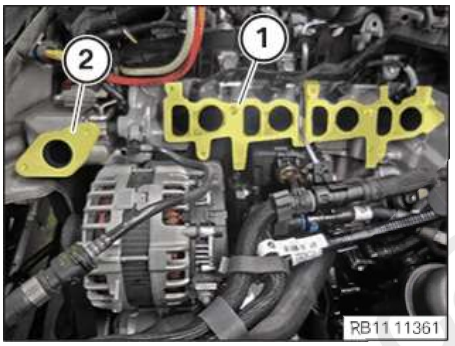


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

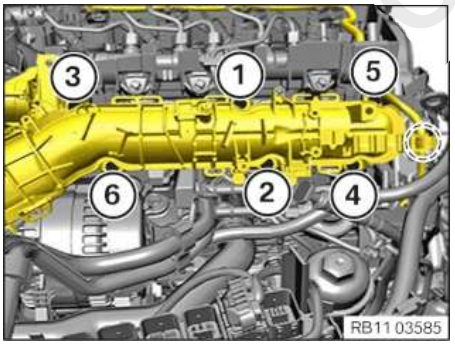


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

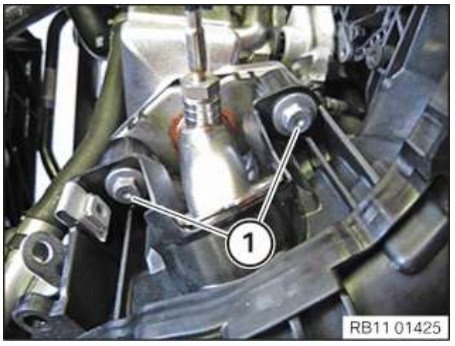


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

- Attach the wiring harness and fuel lines in the marked area on the intake plenum.

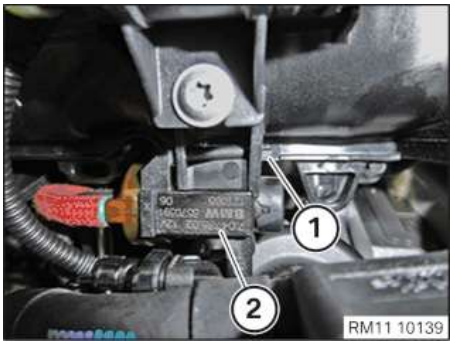


- Tighten the screws (1).

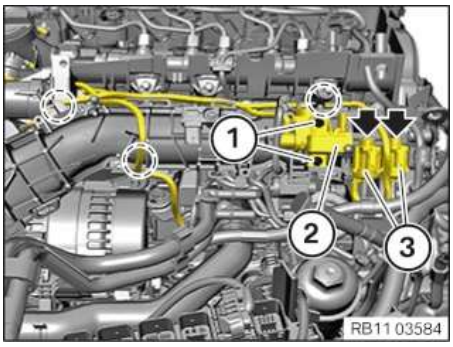
Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm

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- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.
  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

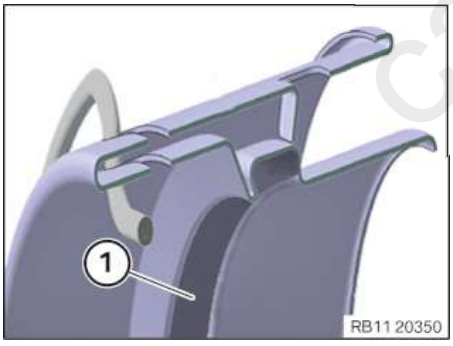


- Check the seal (1) for damage, and renew if necessary.

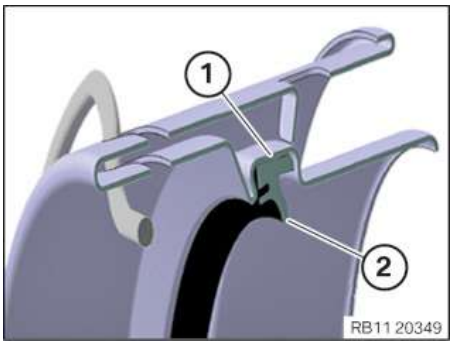
▸ **Replacing damaged seal**

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

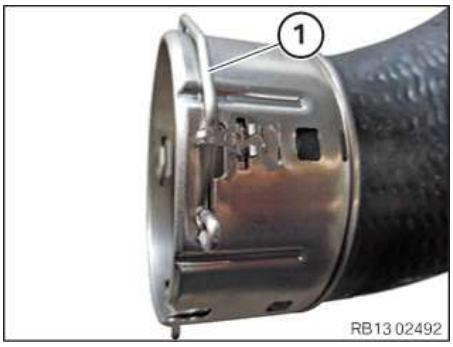
Incorrect assembly is possible. Ensure correct installation position.

- 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 directed inwards as shown.

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- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

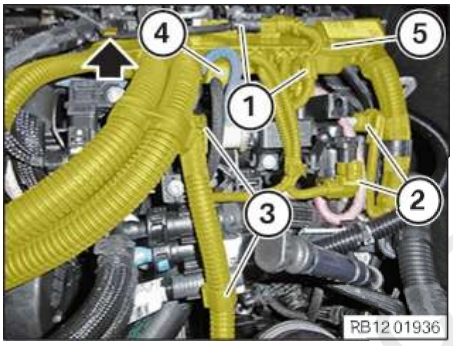
30 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

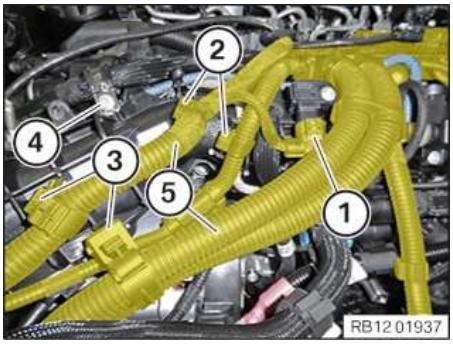
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

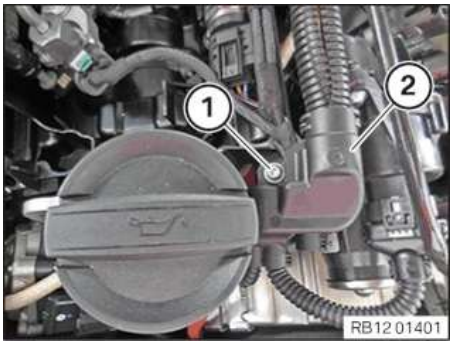
Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



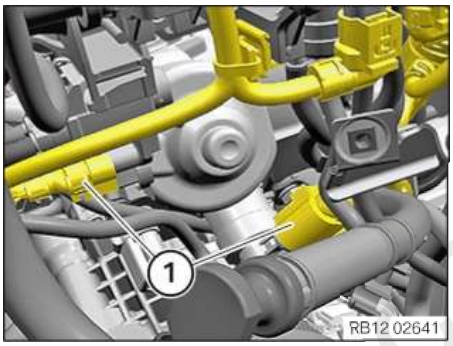
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



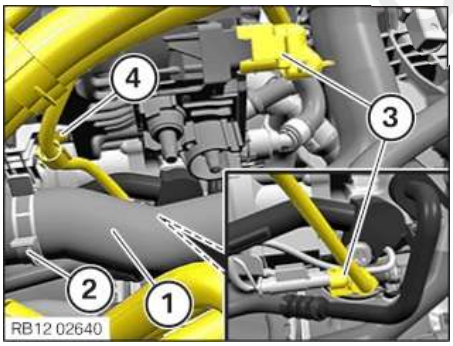
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



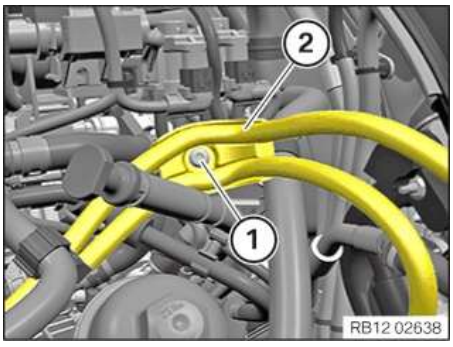
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Secure the clamp (4).
- Connect connectors (3) and lock.

  The connectors (3) must engage audibly.
- Feed the coolant line (1) into the holder (2) and install it.



- Feed in and position the positive battery cables (2) .
- Tighten down screw (1).

Standard screw connection M6

M6		Tightening torque	8 Nm

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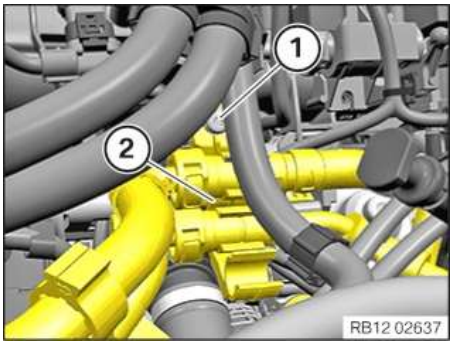
- Feed in and install the positive battery cable (4).
- Feed in and position the positive battery cables (4) .
- Renew the nuts (3) and (2).

  Parts: Nuts
- Tighten nuts (3) and (2).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm

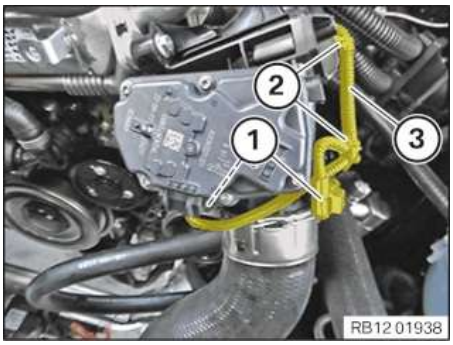
- Guide in and install the lid (1).



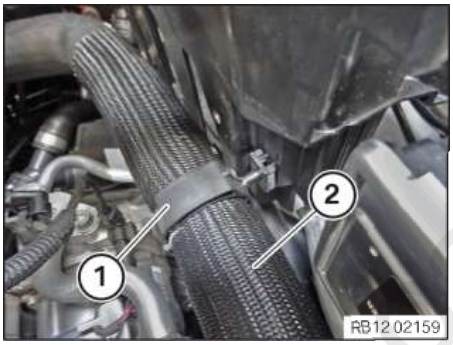
- Insert and install the holder (2).
- Tighten down screw (1).

Holder on intake plenum

TS6X20		Tightening torque	5 Nm



- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.



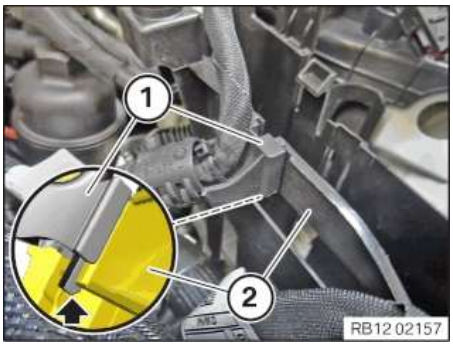
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



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

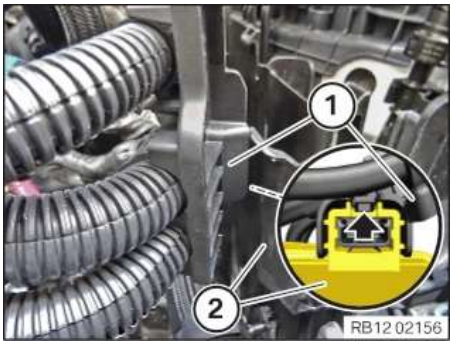
  Lock (arrow) must audibly engage.



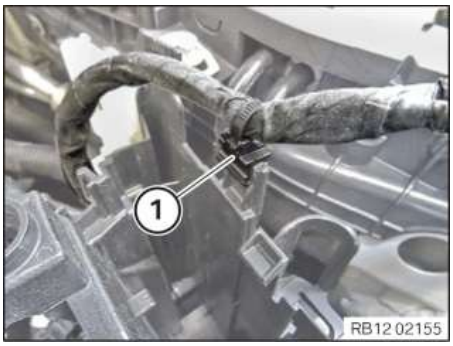
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.

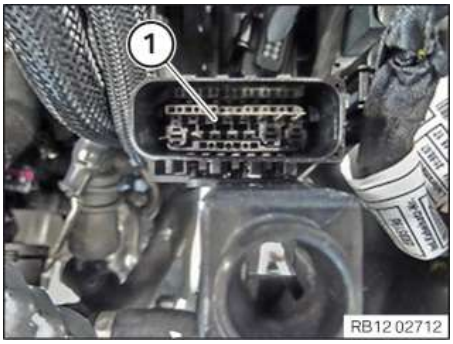
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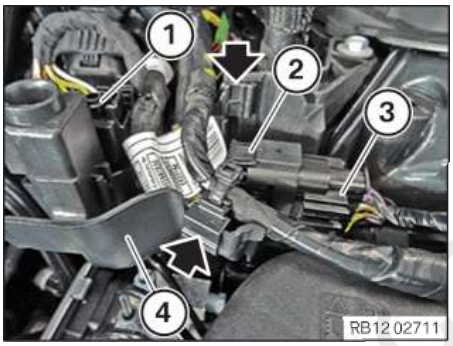
- Connect the cable clip (1) with the control unit holder (2) and lock it.
  Lock (arrow) must audibly engage.



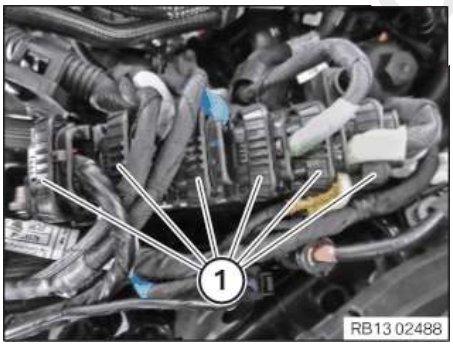
- Secure clamps (1).



- Feed in and install the connector (1).
  The connector (1) must engage audibly.



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



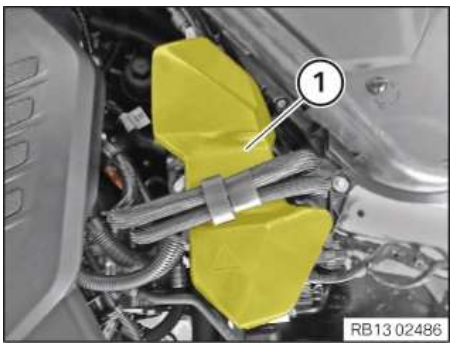
- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.



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

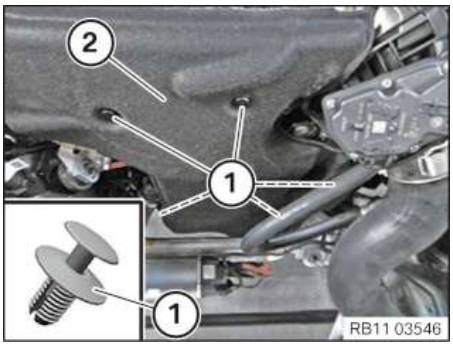
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31 – Install the cover for the DDE control unit



- Insert and install cover (1) into guides.

32 – Install acoustic cover for the engine, front

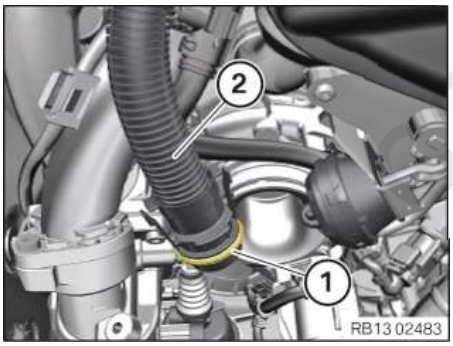


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

33 – Installing the clean air pipe with resonator



- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.

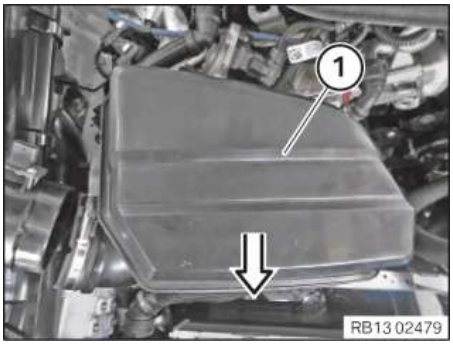


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

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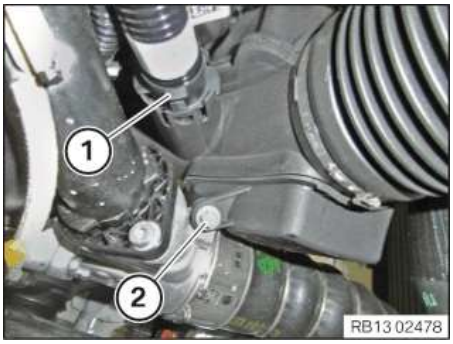


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

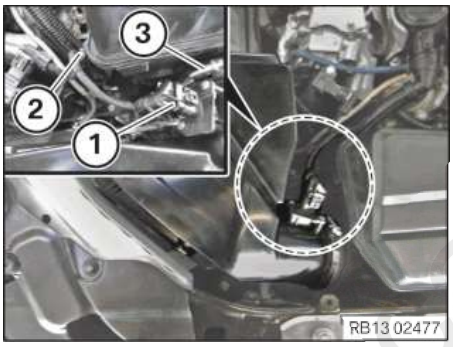
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



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

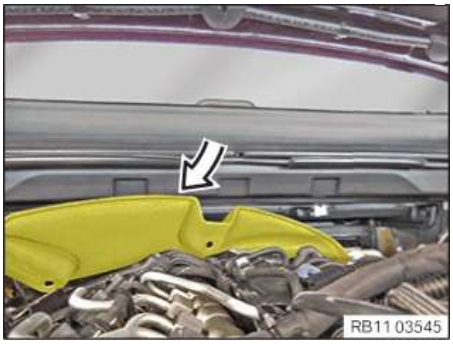
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

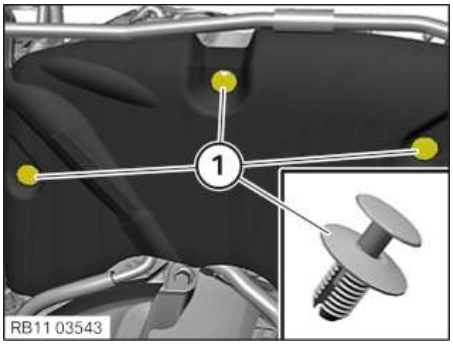
  The connector (1) must engage audibly.

34 – Installing acoustic cover at rear



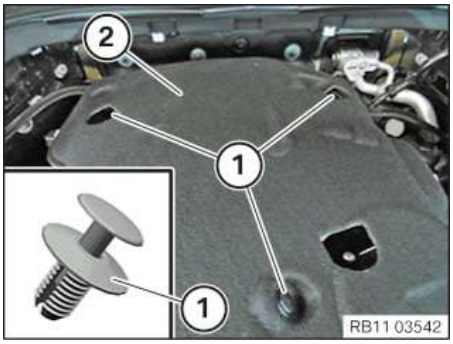
- Guide in the acoustic cover in the direction of the arrow and install it.

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- Secure acoustic cover with the expanding rivets (1).

35 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

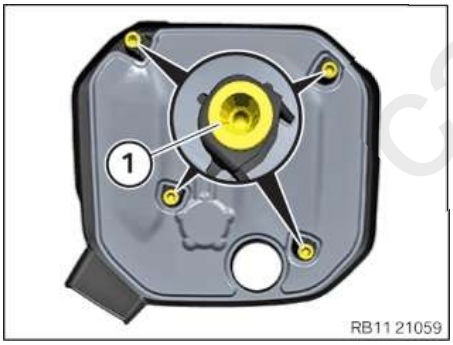
36 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



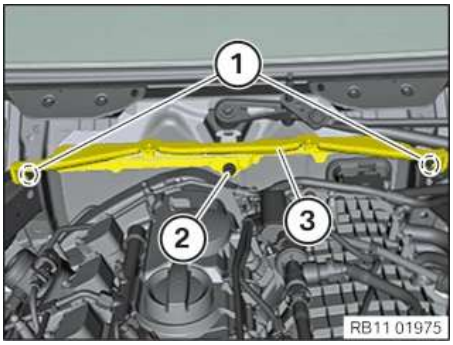
- Check the acoustic cover for correct fit of the rubber mounts (1).



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

37 – Installing centre bulkhead lower section

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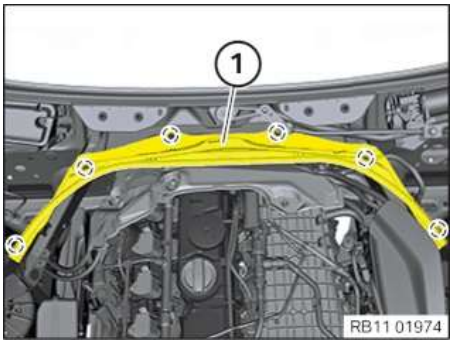


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

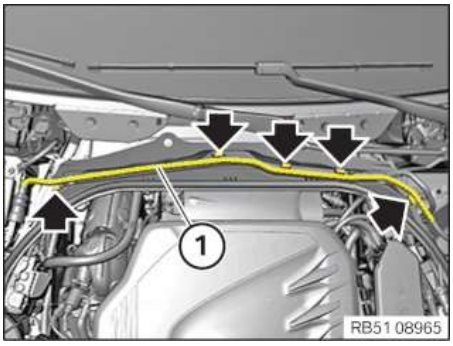
38 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

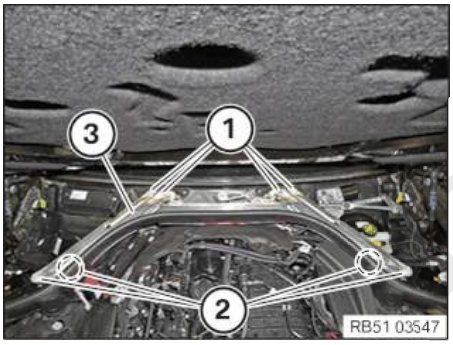
Bulkhead upper part to bottom bulkhead

		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

39 – Install the seal for the bonnet

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- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

40 – Installing cowl panel cover

RISK OF DAMAGE

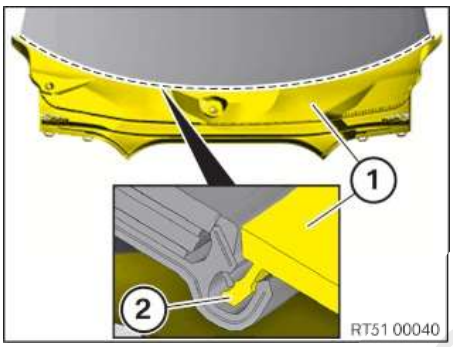
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

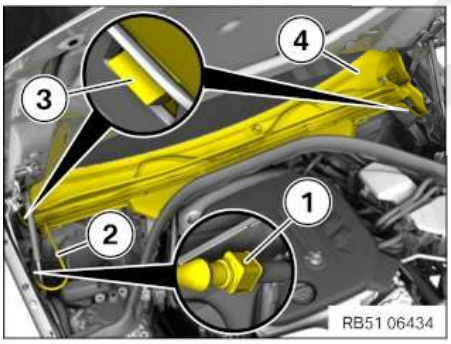
- Ensure correct installation of the components.
- Only use undamaged components.

TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

41 – Install left and right wiper arm

NOTICE

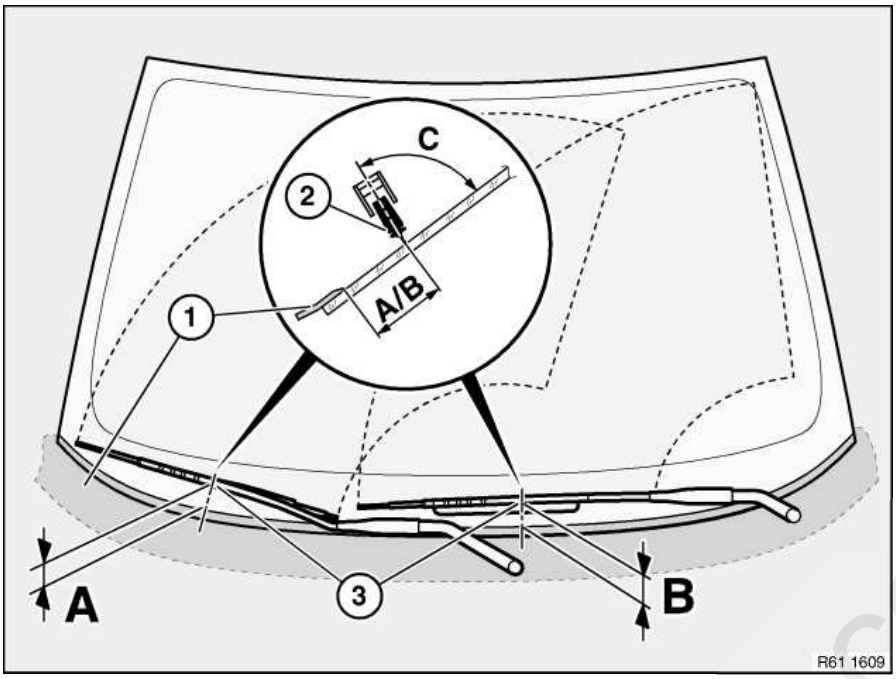
Description is for left component only. Procedure on the right side is identical.

▸ **Installing left and right wiper arm**

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TECHNICAL INFORMATION

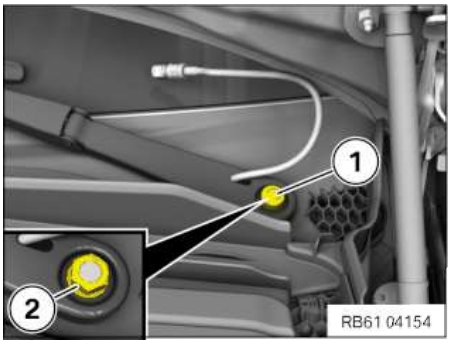
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

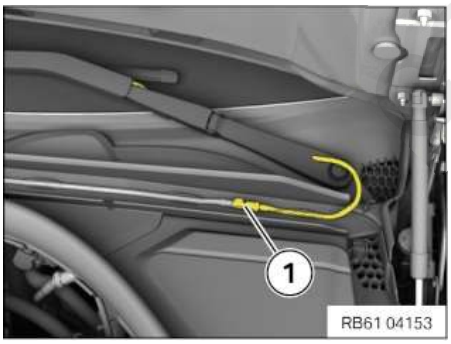


- Tighten nut (2).

Windscreen wiper arm

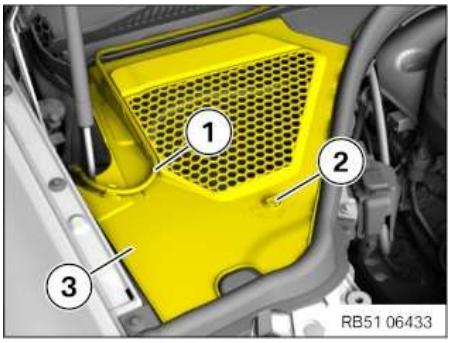
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

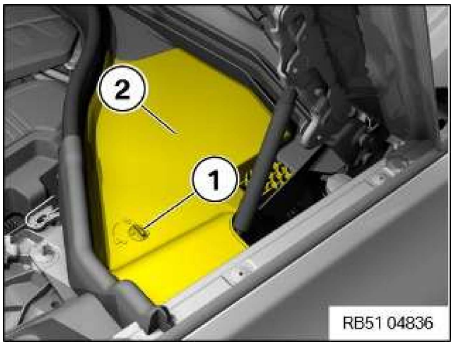
42 – Install the rear right engine compartment cover



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

43 – 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).

44 – Connecting all battery earth leads



- See additional information.

45 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

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- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

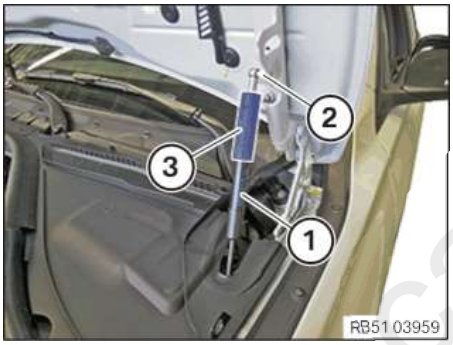
46 – Take bonnet out of the service position

CAUTION

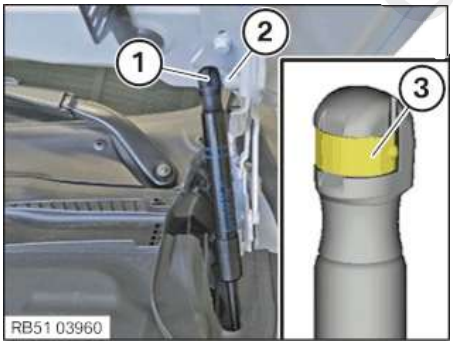
Shutting bonnet or tailgate.

Danger of injury!

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



- 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.



- 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

Rail pressure sensor to rail — Used in step 24

	Grease thread lightly.	Tightening torque	70 Nm

Rail to cylinder head cover — Used in step 25

M8		Tightening torque	19 Nm

High pressure lines between high pressure pump and rail			Used in step 26
High-pressure pipe		Tightening torque	24.5 Nm

High pressure lines between injector and rail			Used in step 27
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 29
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 29
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 29
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 30
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 30
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 30
TS5x20		Tightening torque	3,6 Nm

Standard screw connection M6			Used in step 30
M6		Tightening torque	8 Nm

Battery positive lead on the starter motor generator			Used in step 30
M8		Tightening torque	19 Nm

Holder on intake plenum			Used in step 30
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 33
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 33
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 37
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 38
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 38
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 38
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 41
Combination hexagon nut		Tightening torque	35 Nm

Negative battery cable to 48-V battery			Used in step 45
Nut M8		Tightening torque	19 Nm

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Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 41
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	245

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
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61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	344
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
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61 20 900 Disconnecting and connecting battery earth lead 344
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61 20 900 Disconnecting and connecting battery earth lead 344
61 20 900 Disconnecting and connecting battery earth lead 344
61 20 900 Disconnecting and connecting battery earth lead 344
61 35 ... Notes on ESD protection (Electro Static Discharge) 1723
61 35 ... Notes on ESD protection (Electro Static Discharge) 172324

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13 53 560 Removing and installing/replacing pressure sensor on pressure accumulator of injection system

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

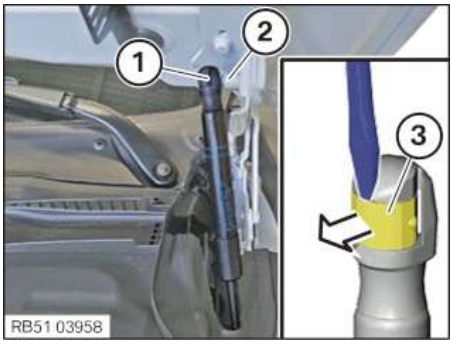
Engine compartment lid is open.

CAUTION

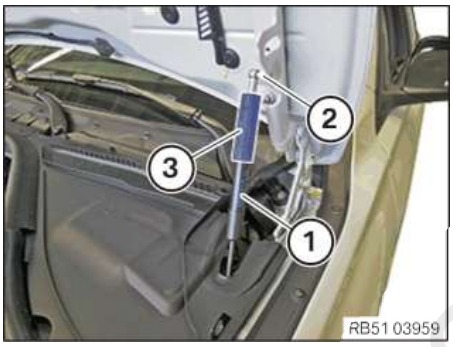
Shutting bonnet or tailgate.

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.
- Pull special tool or 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.

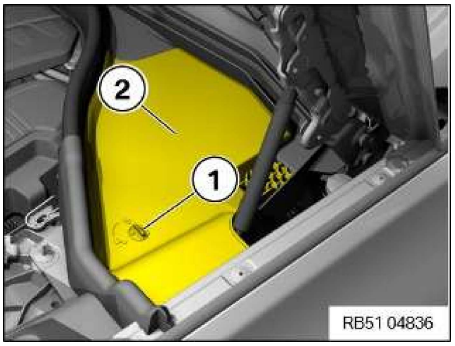
2 – Disconnecting all battery earth leads



- See additional information.

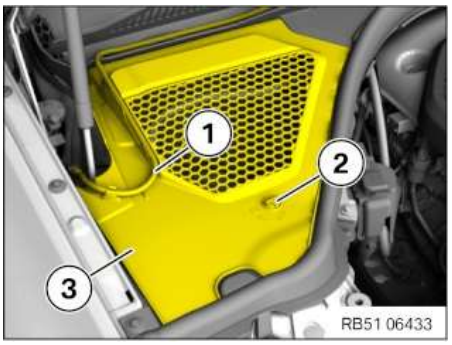
3 – Remove the cover of the engine compartment at the rear left

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

4 – Remove the cover of the rear right engine compartment



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

5 – Removing the wiper arm on the left and right

NOTICE

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

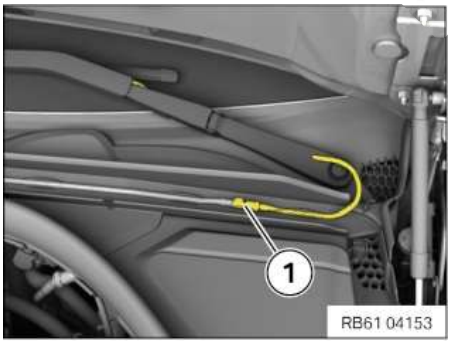
▸ **Remove the wiper arm**

RISK OF DAMAGE

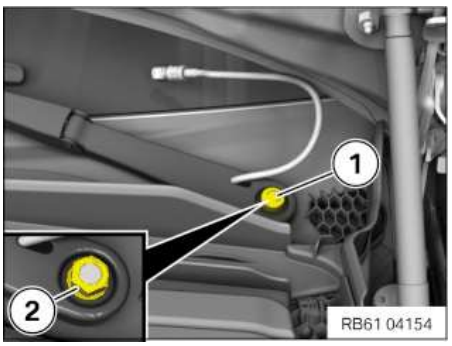
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.

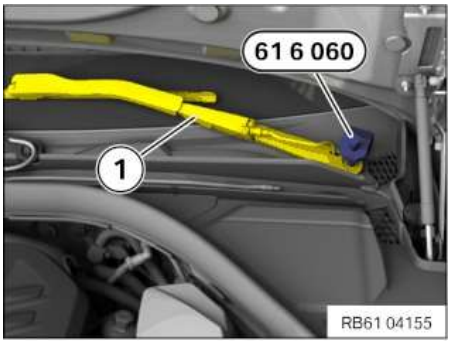


- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



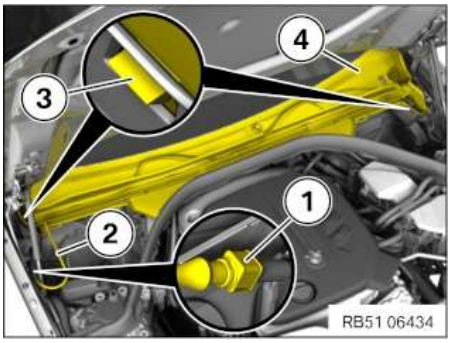
- Remove the protective cap (1).
- Loosen nut (2).

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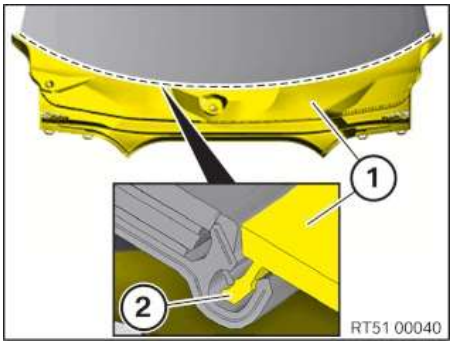


- Pull off the wiper arm (1) using special tool .

6 – Remove cowl panel cover



- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

7 – Remove the seal for the rear bonnet

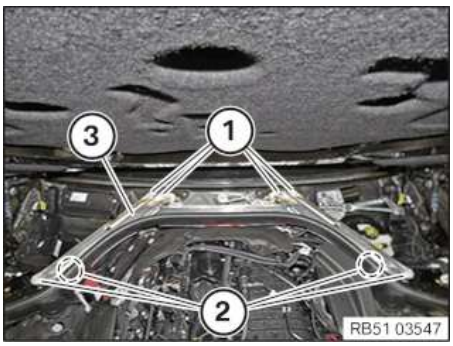


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

8 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.

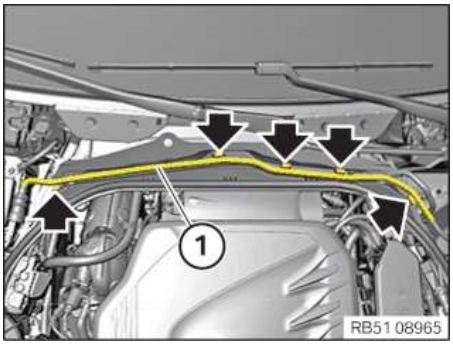


NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

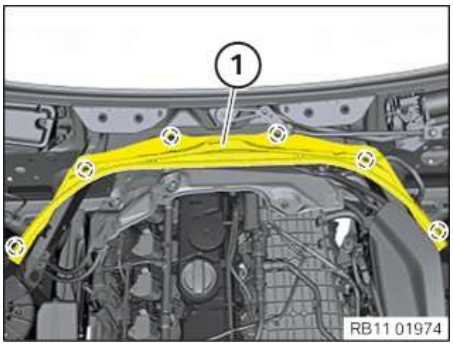
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.

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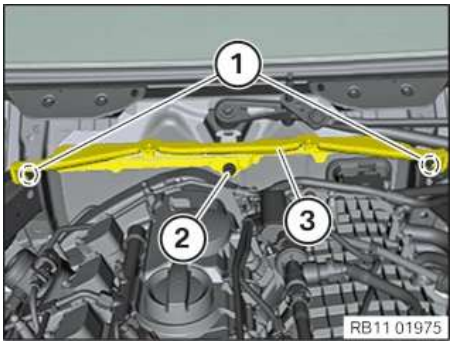
- **Version with mild hybrid technology:**

  Unclip the wire (1) at the holders (arrows).



- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

9 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

10 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

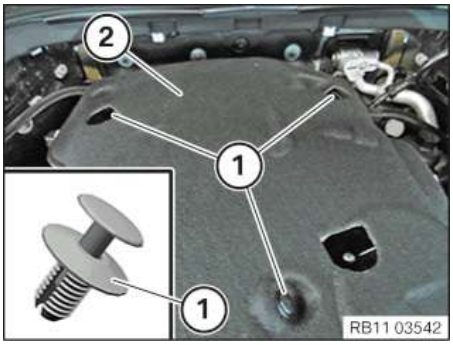
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation,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



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

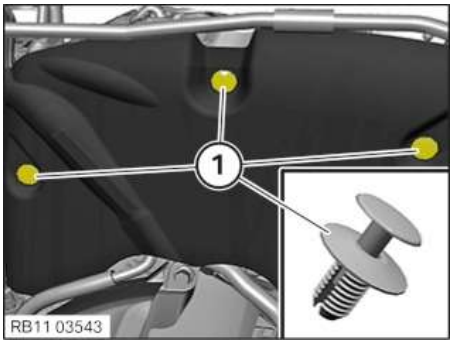
11 – Remove the acoustic cover for the injectors

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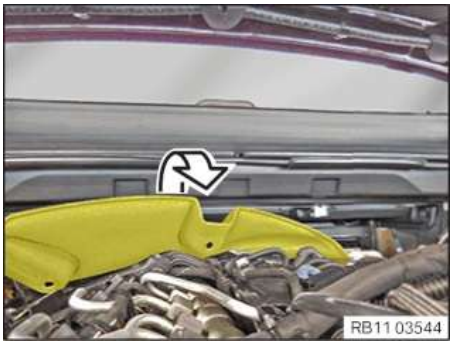


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

12 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

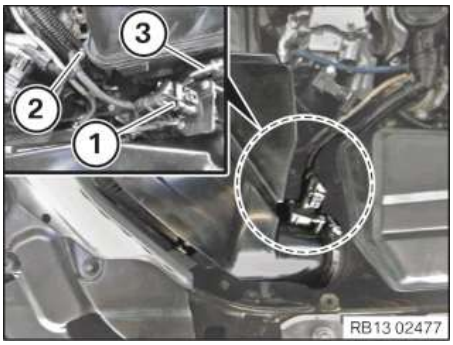
13 – Removing the clean air pipe with the resonator

WARNING

Hot surfaces.

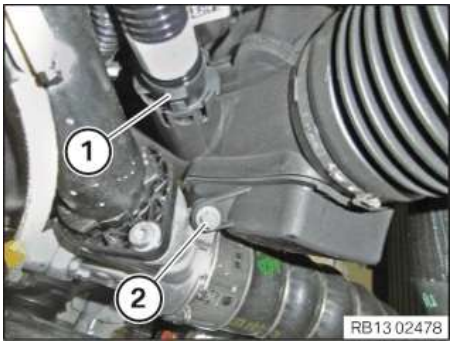
Risk of burning!

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

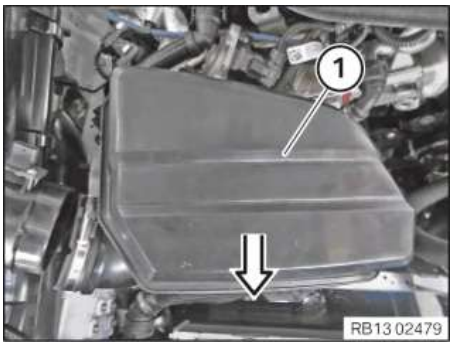


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

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- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

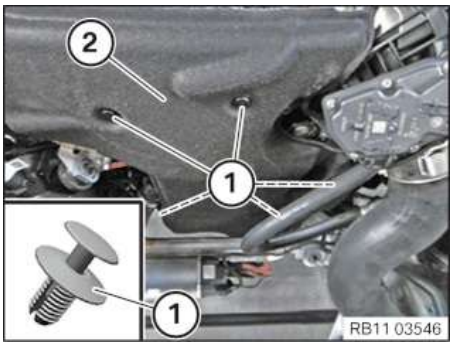
14 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

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15 – Partially releasing the wiring harness section on the intake plenum

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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

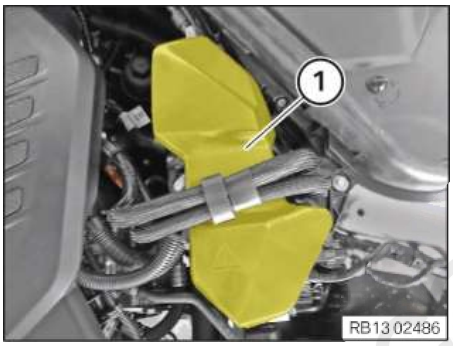
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

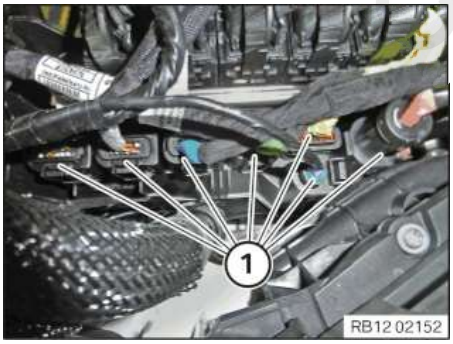
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

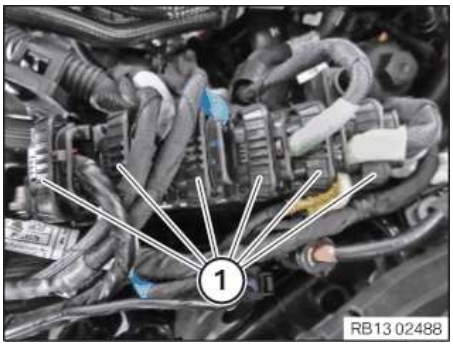
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Pull off cover (1) upwards, feed out and remove.

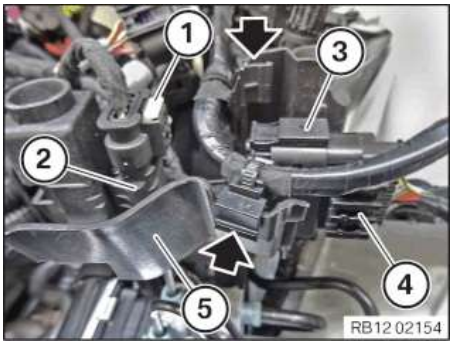


- Unlock and disconnect plug connections (1).

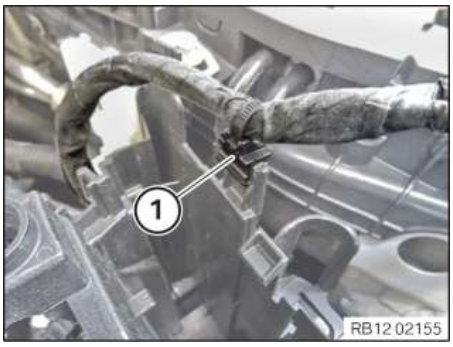


- Unlock and disconnect plug connections (1).

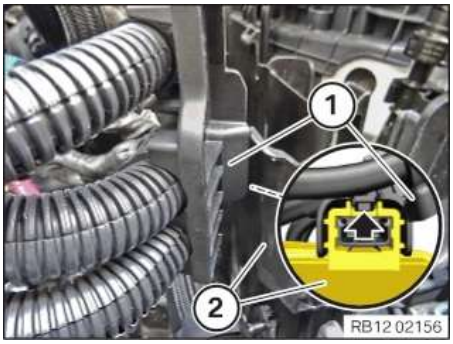
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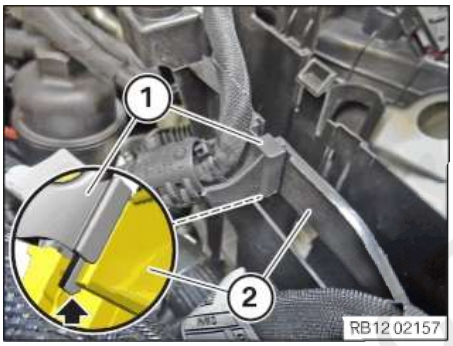
- Unlock plug connection (1) and disconnect.
- Unlock the plug (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock the plug (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).



- Loosen clamp (1).



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



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

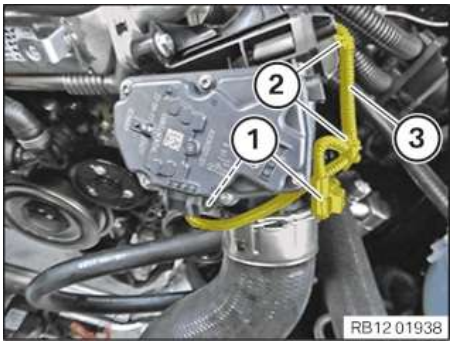


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

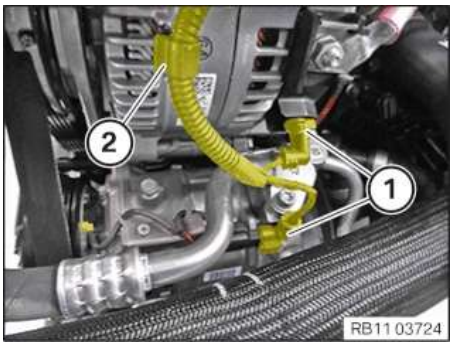


- Unlock holder (1) and feed out coolant line (2) and place it aside.

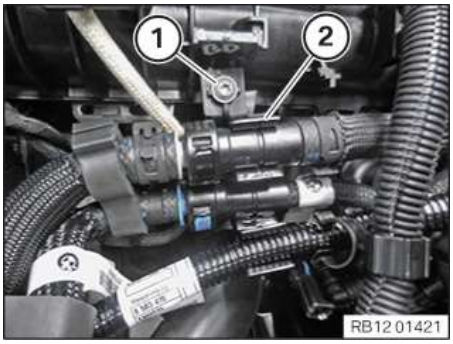
gardiagn.com



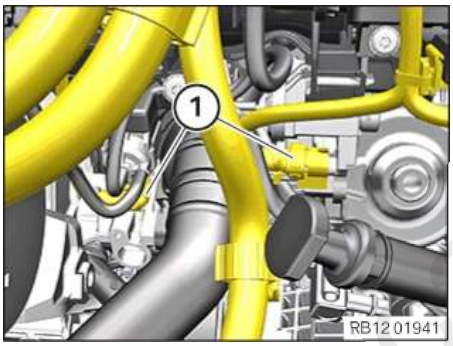
- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.



- Unlock and separate plug connections (1).
- Release the holder (2) from the alternator .



- Loosen screw (1).
- Thread out holder (2) and set aside.



- Unlock and disconnect plug connections (1).

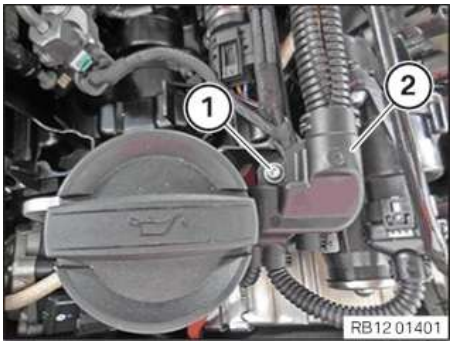


- Unlock and loosen connector (1).

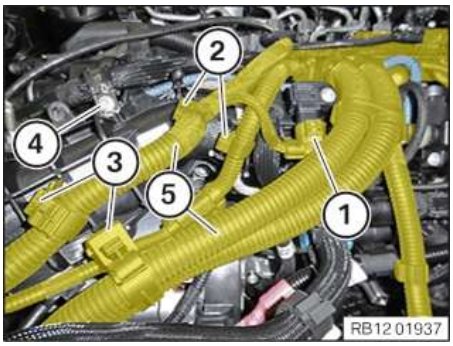


- Unlock plug connection (1) and disconnect.

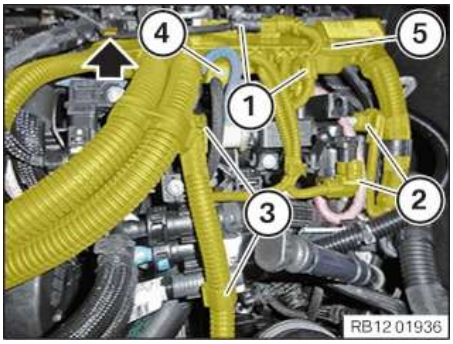
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- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

16 – Removing the intake plenum

TECHNICAL INFORMATION

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

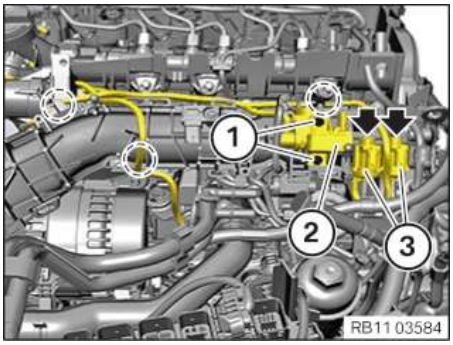


- Unlock clamp (1) and engage in this position.

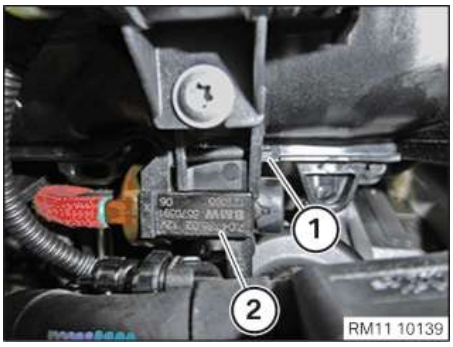


- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.

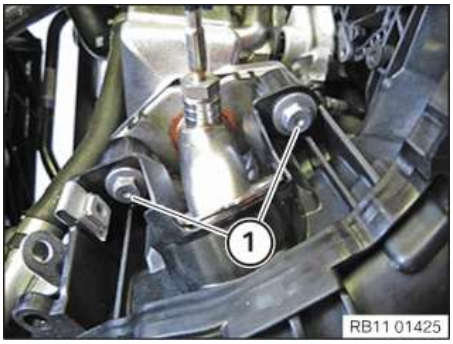
cardiagn.com



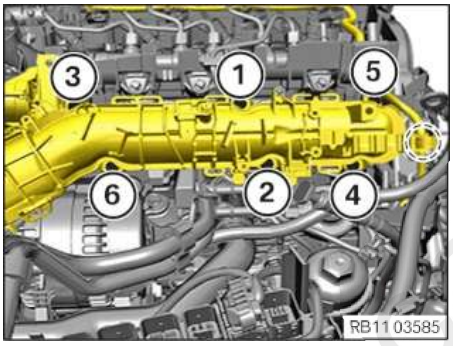
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



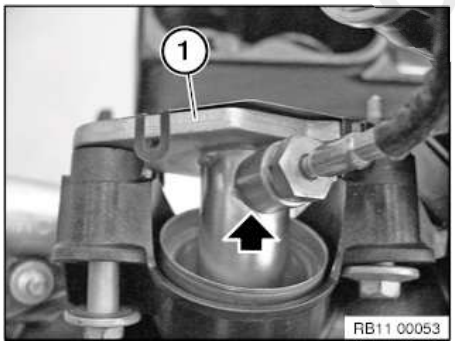
- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.



- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.



- Remove the exhaust-gas recirculation pipe (1) (arrow).

17 – Detaching the leakage oil line from the injectors

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

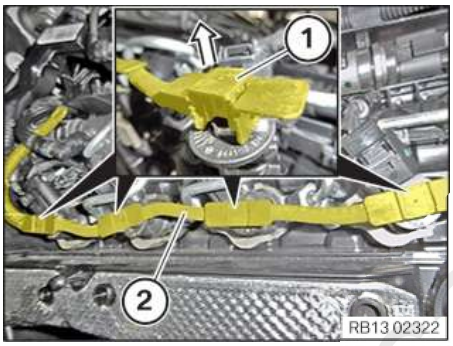
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

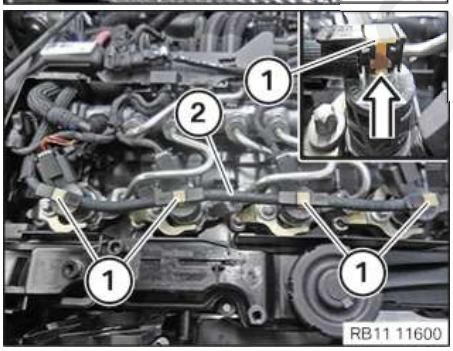


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

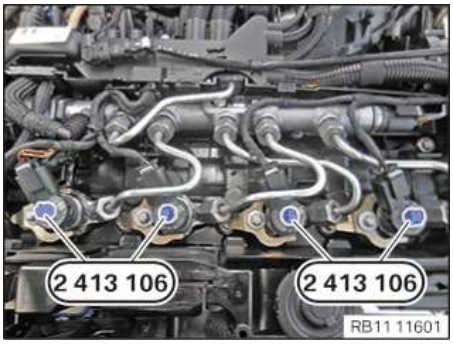


- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



- Seal open connections with special tools .

18 – Remove the high pressure lines between the injector and the rail

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WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

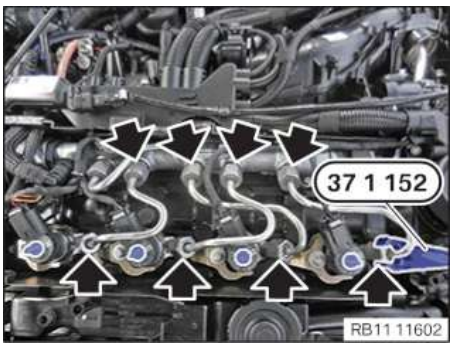
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.



- Release the high pressure lines (arrows) with the special tool .
  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

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19 – Remove the high pressure line between the high pressure pump and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

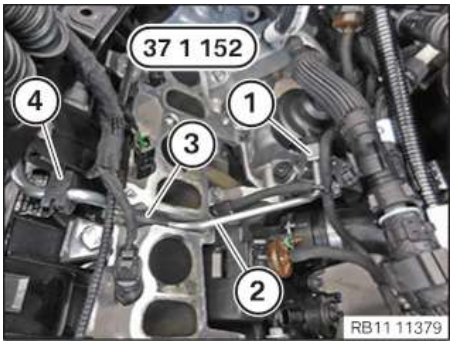
TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

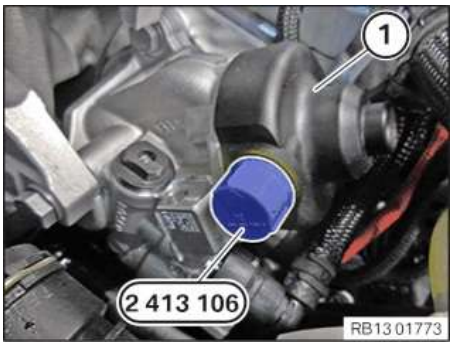


- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.

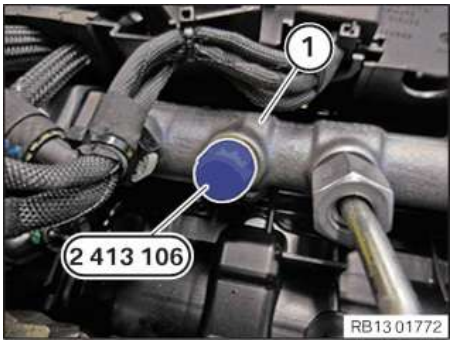
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- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

20 – Remove high-pressure rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

Contaminant or foreign body.

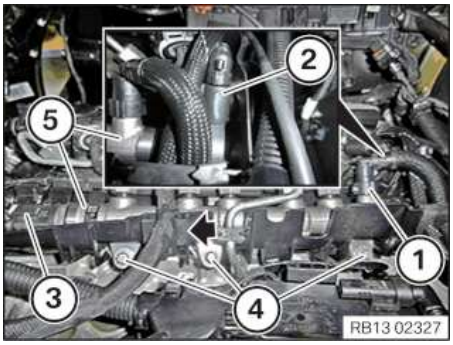
Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

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

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- Unlock and disconnect the fuel return line (1).
- Guide the fuel return line (1) out and set it aside.
- Unlock and disconnect the plug connection (2) on the rail pressure regulating valve.
- Unlock and disconnect the plug connection (3) on the rail pressure sensor.
- Unlock cable clip (Arrow), feed out and place aside.
- Loosen screws (4).
- Thread out and remove the rail (5).

MAIN WORK

21 – Remove the rail pressure sensor on the rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

Contaminant or foreign body.

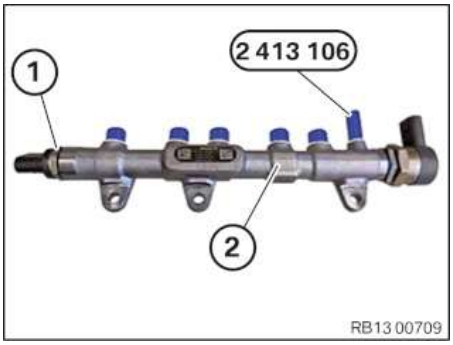
Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

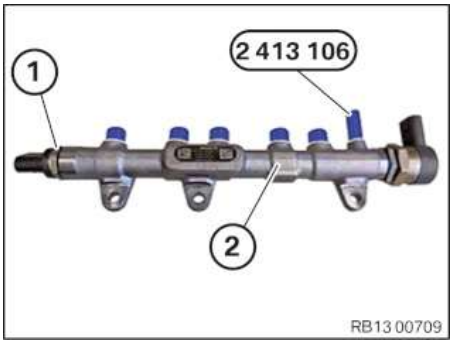
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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- Grip the removed rail (2) on the flattened area.
- When removing the rail pressure sensor (1), counter support at the rail (2).
- Loosen the rail pressure sensor (1) and remove.
- Catch and dispose of escaping fuel.

22 – Install the rail pressure sensor on the rail



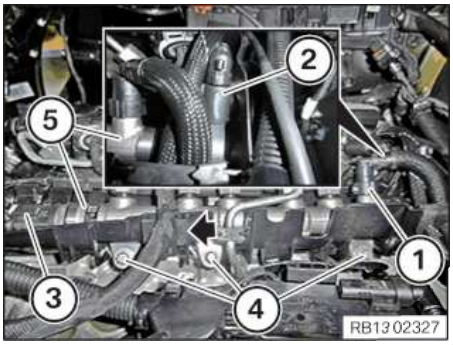
- Check the thread and sealing surface of the rail pressure sensor (1) for damage and renew the rail pressure sensor where required.
- Check the thread and sealing surface of the rail (2) for damage and renew the rail where required.
- Lightly grease the thread on the rail pressure sensor (1).
- Screw in the rail pressure sensor (1) by hand.
- Hold the rail (2) for counter support and tighten the rail pressure sensor (1).

Rail pressure sensor to rail

	Grease thread lightly.	Tightening torque	70 Nm

POSTPROCESSES

23 – Installing the rail



- Insert and install the rail (5).
- Tighten the screws (4).

Rail to cylinder head cover

M8		Tightening torque	19 Nm

- Install and lock cable clip (arrow).

  The cable clip (arrow) must engage audibly.
- Connect and lock the connector (3) at the rail pressure sensor.

  The connector (3) must engage audibly.
- Connect and lock the connector (2) at the rail pressure regulating valve.

  The connector (2) must engage audibly.
- Feed in fuel return line (1) and install.

  The fuel return line (1) must audibly engage.

24 – Installing high pressure line between rail and high pressure pump

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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CAUTION

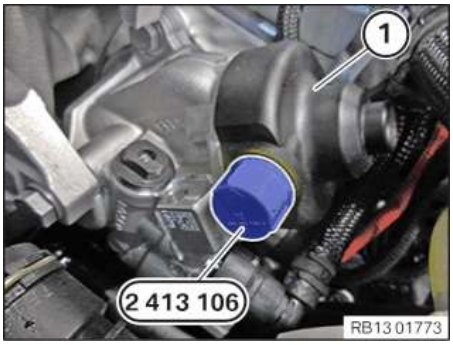
On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

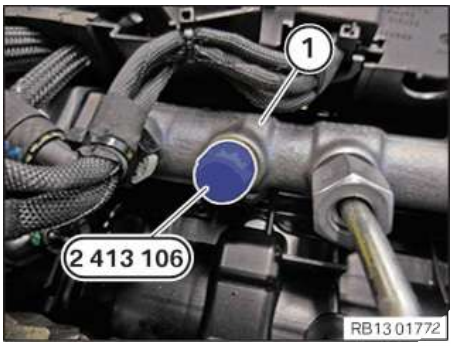
- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

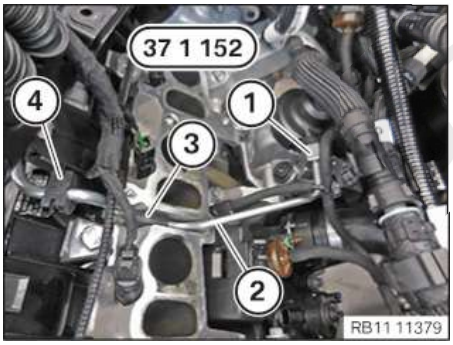
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.



- Hand-tighten the union nut (1) on the rail.

TECHNICAL INFORMATION

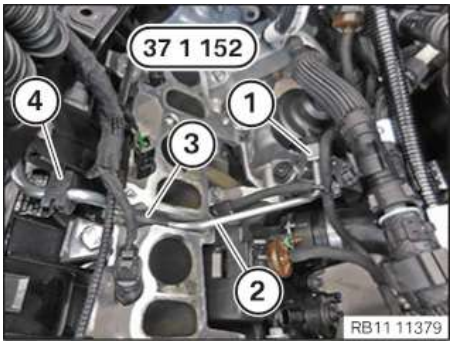
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

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- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

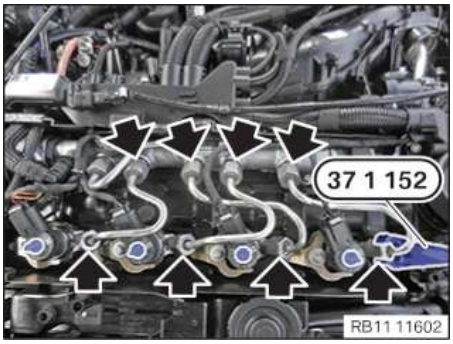
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten union nut (1) on the high pressure pump with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

25 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

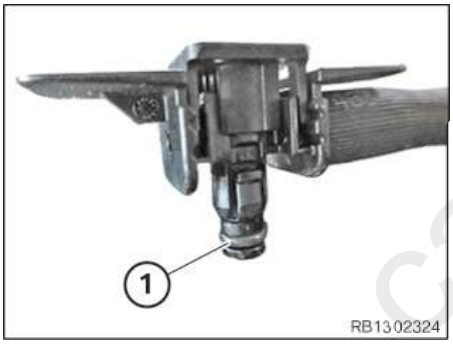
- Tighten the high pressure lines (arrows) with the special tool .

High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

26 – Attach the leakage oil line on the injectors

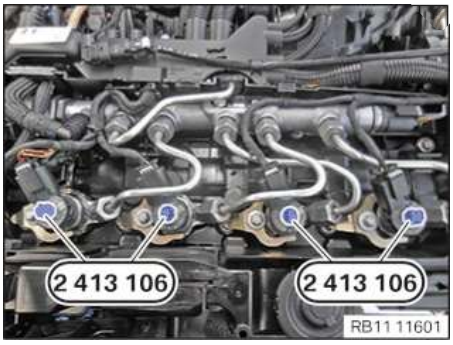


- **Version A:**

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

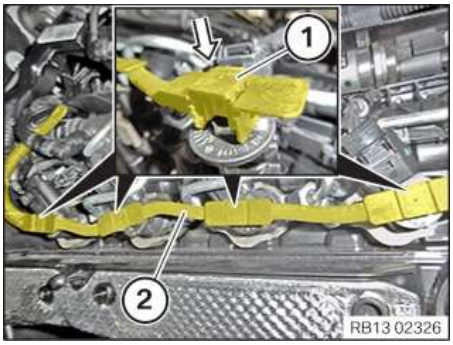
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

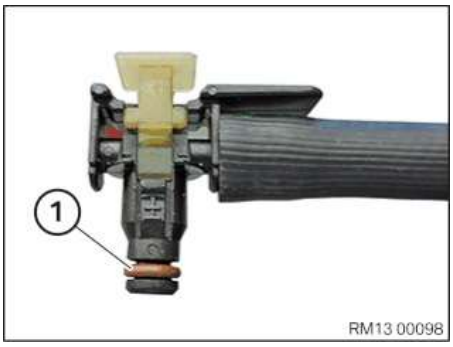


- Feed out the special tools and remove.

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- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

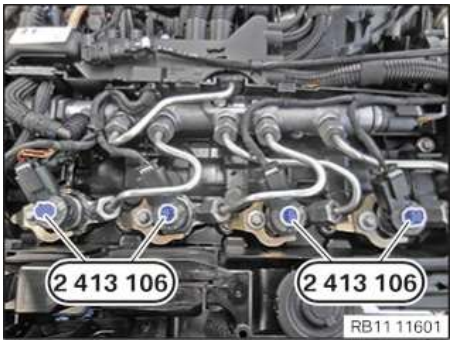


- **Version B**:

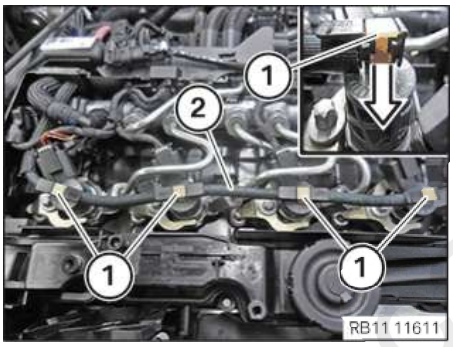
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

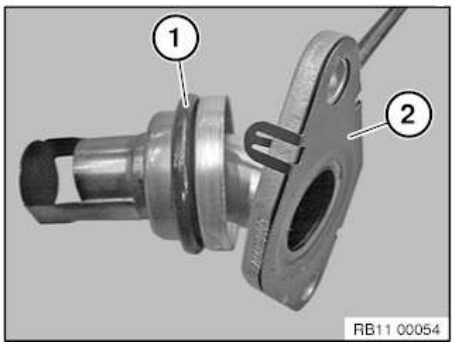


- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

27 – Installing the intake plenum

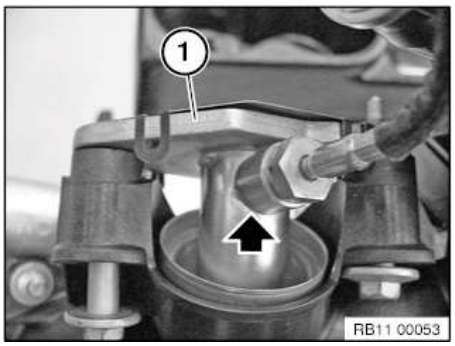


- Renew O-ring (1).

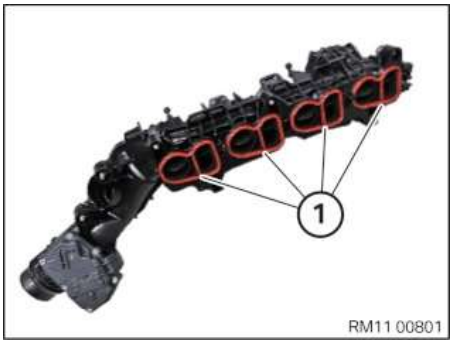
  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

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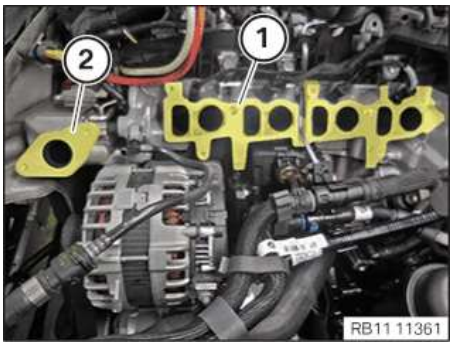


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

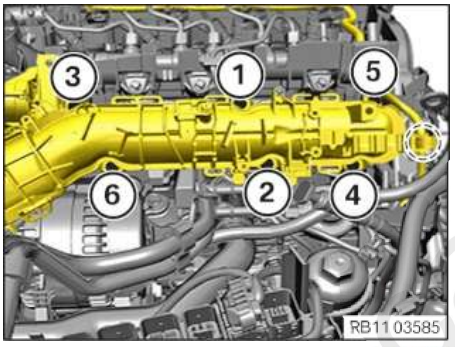


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

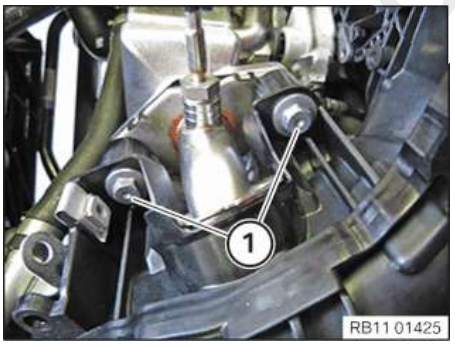


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

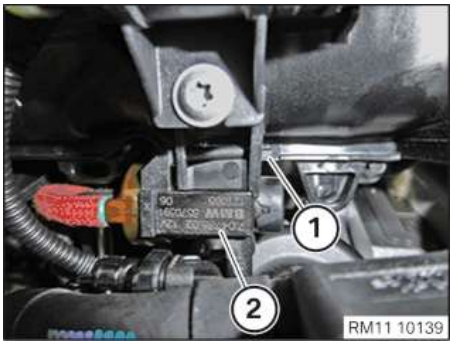
- Attach the wiring harness and fuel lines in the marked area on the intake plenum.



- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

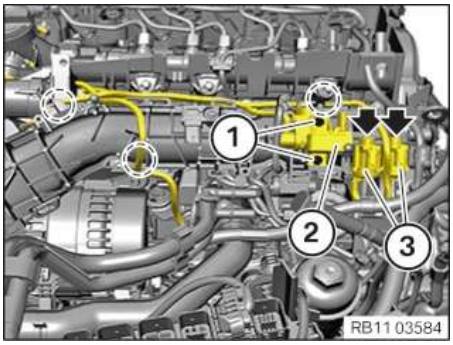
		Tightening torque	10 Nm



- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.

  The lock (1) must audibly engage.

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- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

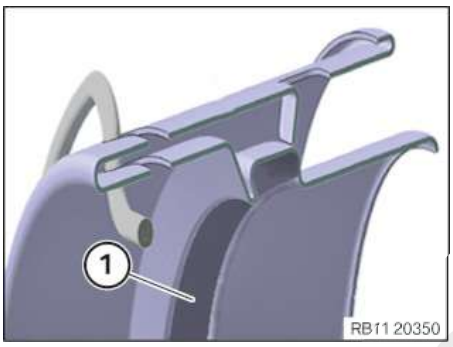


- Check the seal (1) for damage, and renew if necessary.

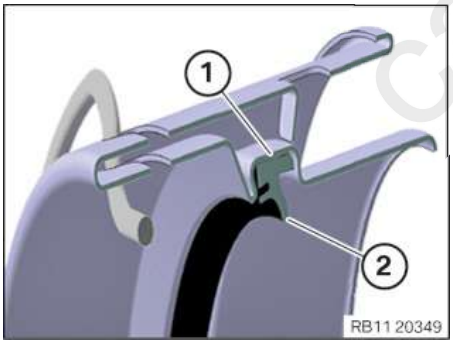
▸ **Replacing damaged seal**

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 directed inwards as shown.



- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.

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- Check that the locks (1) are correctly seated on the pressure pipe.

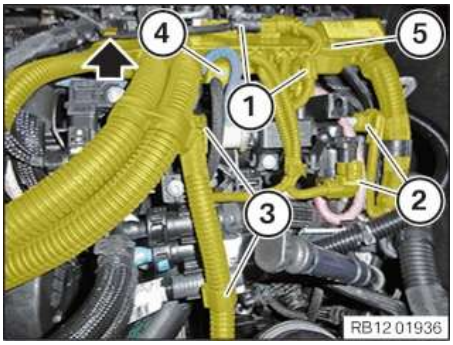
28 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

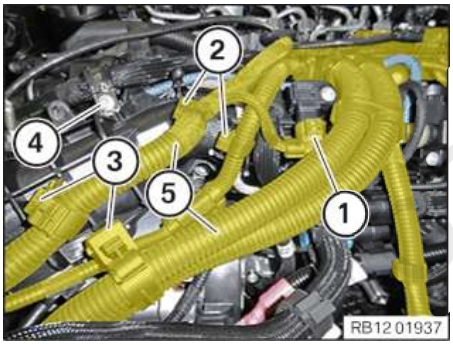
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



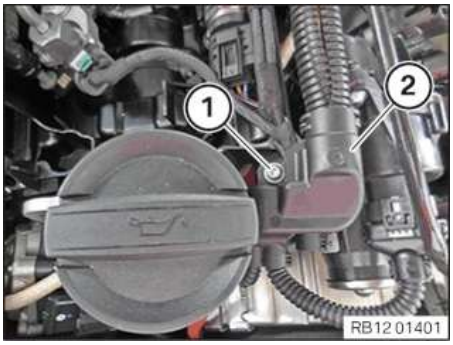
- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



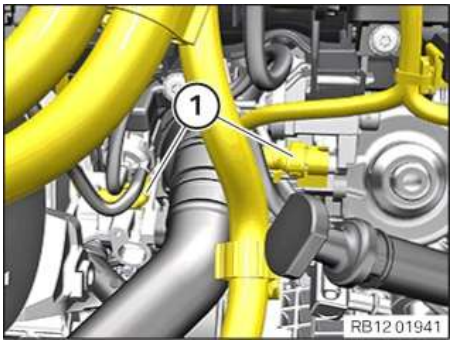
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



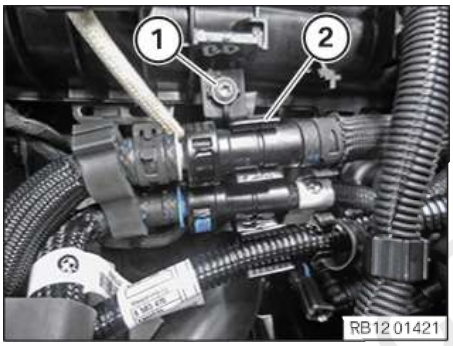
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



- Connect connectors (1) and lock.

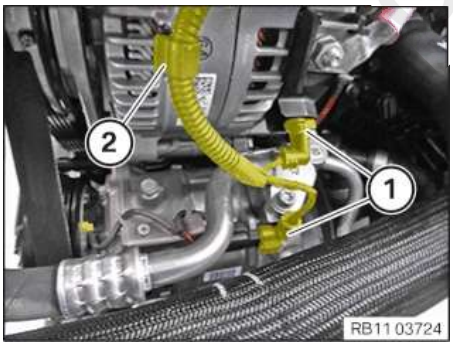
  The connectors (1) must engage audibly.



- Insert and install the holder (2).
- Tighten down screw (1).

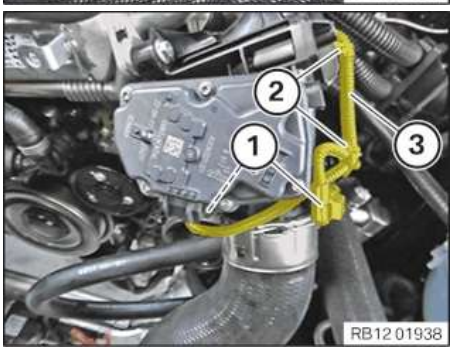
Holder on intake plenum

TS6X20		Tighten torque	5 Nm



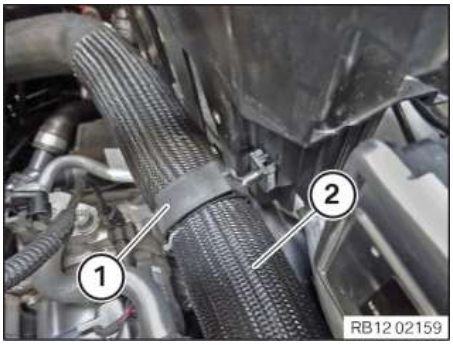
- Connect the connector (1) and lock it.

  The connectors (1) must engage audibly.
- Secure holder (2) to alternator.



- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.

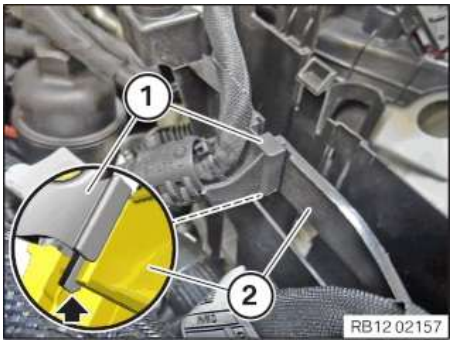
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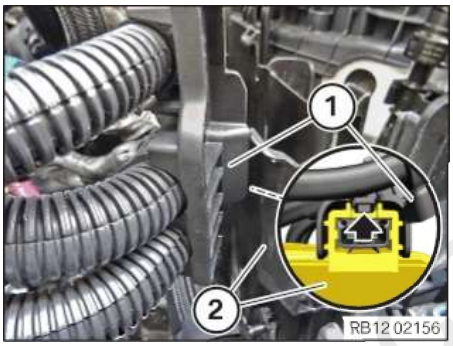
- Feed in and install coolant line (2).
- Lock holder (1).
  The holder (1) must engage audibly.



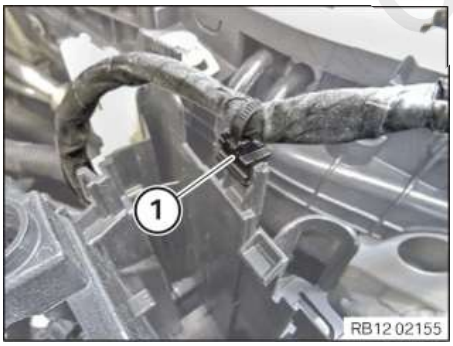
- Feed in and install the cable clip (1).
  Lock (arrow) must audibly engage.



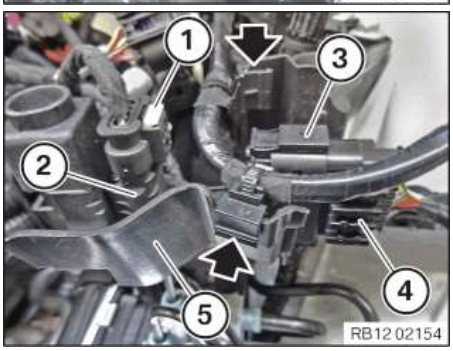
- Connect the cable clip (1) with the control unit holder (2) and lock it.
  Lock (arrow) must audibly engage.



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

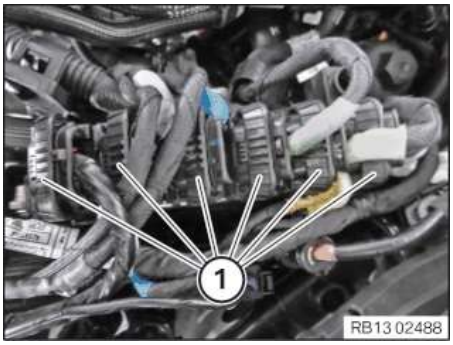


- Secure clamps (1).



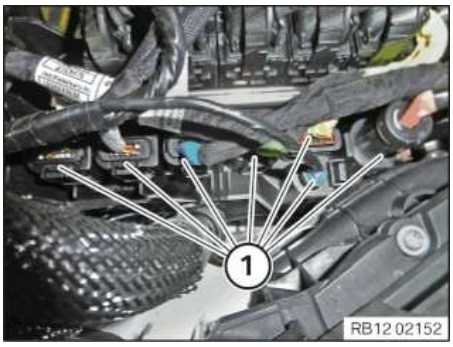
- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
-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

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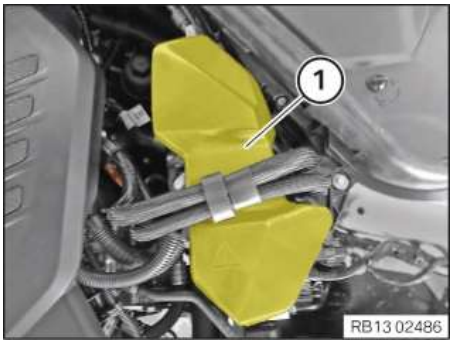
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



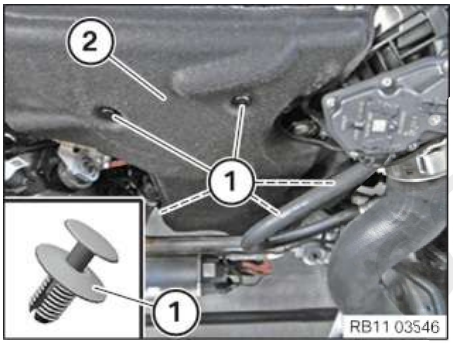
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Insert and install cover (1) into guides.

29 – Install acoustic cover for the engine, front



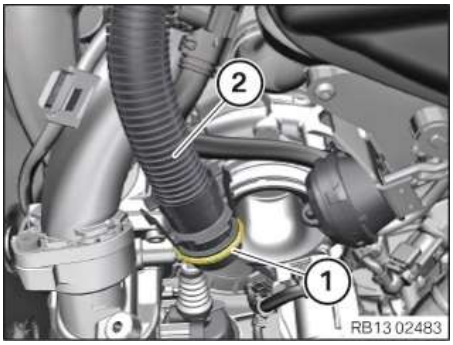
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

30 – Installing the clean air pipe with resonator



- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.

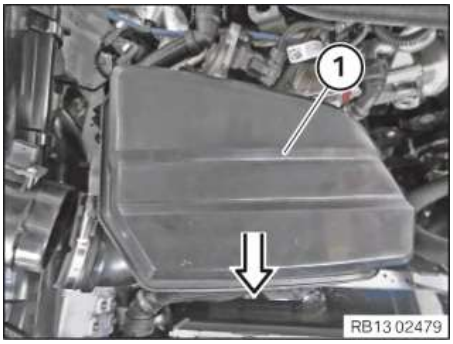
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- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

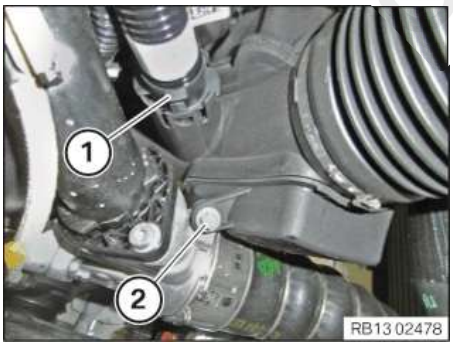


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

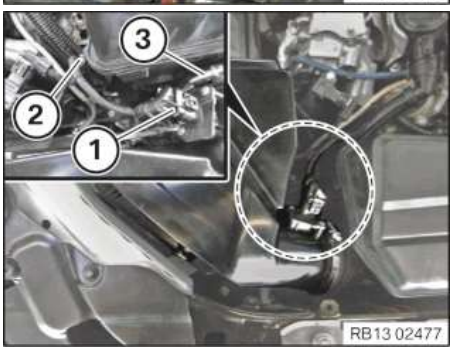
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



- 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

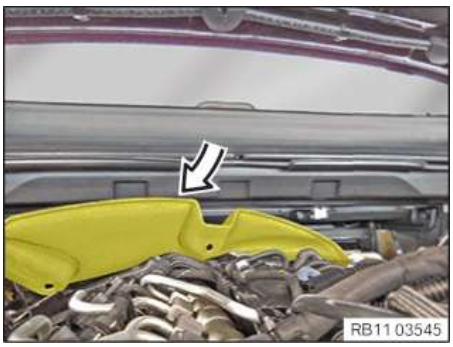
Clamp		Tightening torque	3 Nm

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

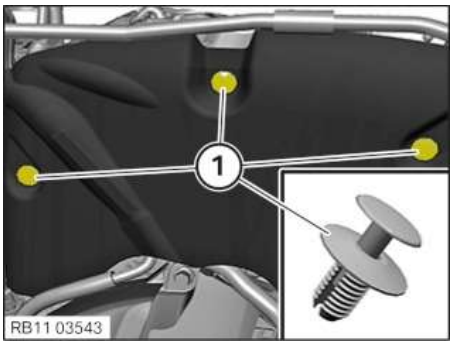
  The connector (1) must engage audibly.

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31 – Installing acoustic cover at rear

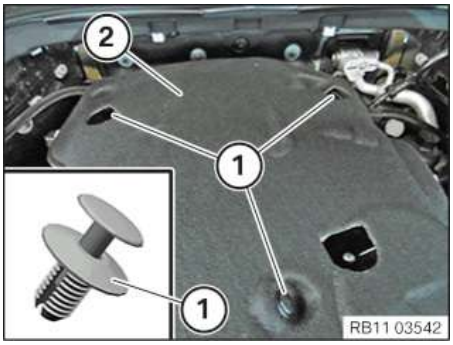


- Guide in the acoustic cover in the direction of the arrow and install it.



- Secure acoustic cover with the expanding rivets (1).

32 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

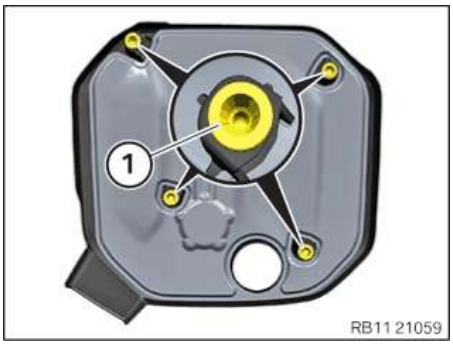
33 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



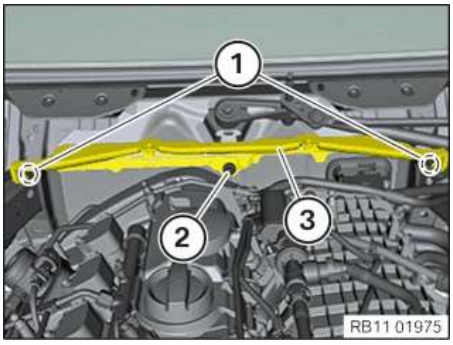
- Check the acoustic cover for correct fit of the rubber mounts (1).

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

34 – Installing centre bulkhead lower section

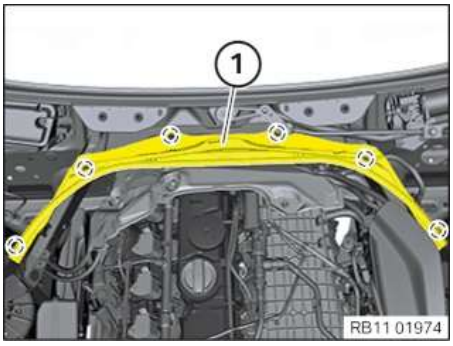


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

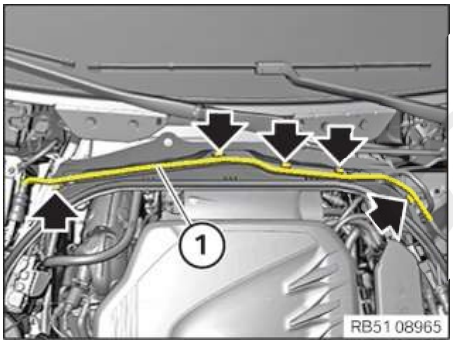
35 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

Bulkhead upper part to bottom bulkhead

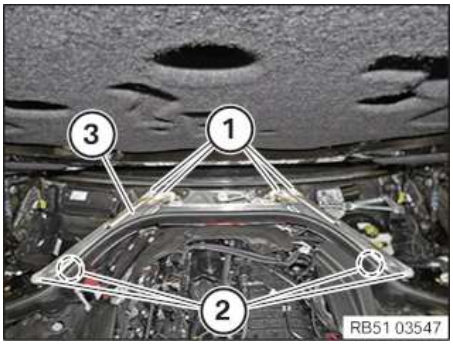
		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

36 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

37 – Installing cowl panel cover

RISK OF DAMAGE

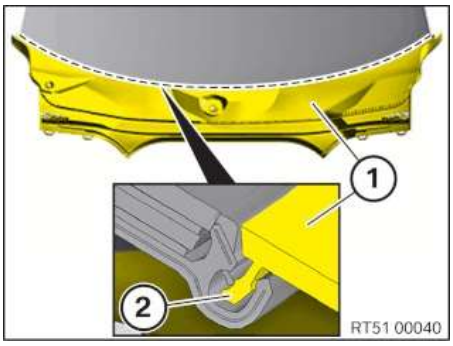
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

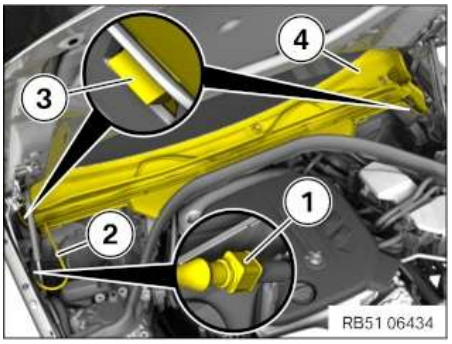
TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.

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- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

38 – Install left and right wiper arm

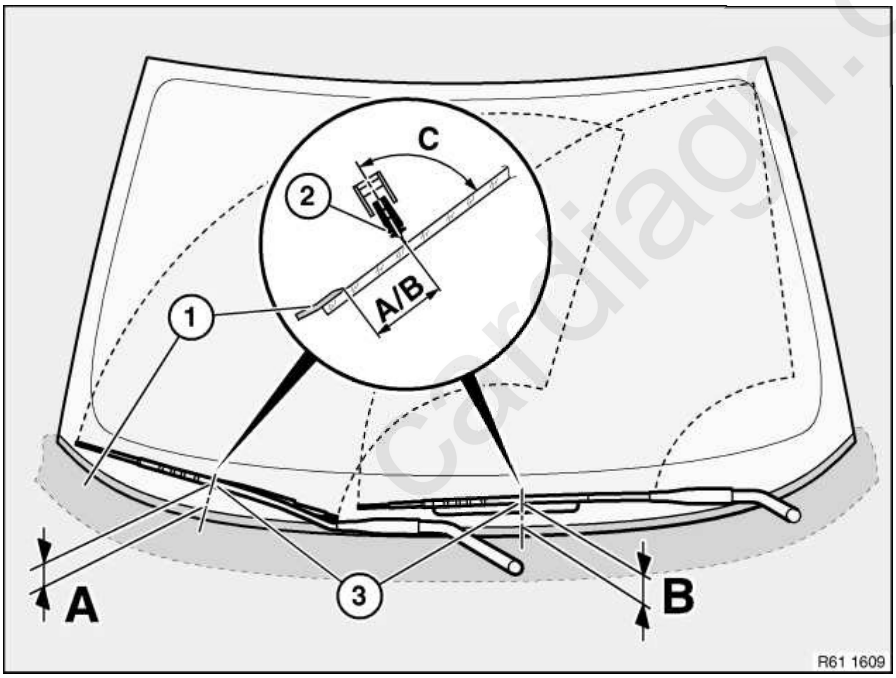
NOTICE

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

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

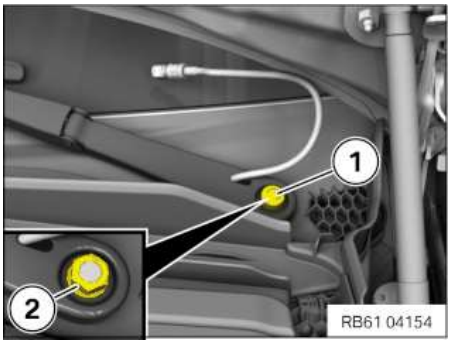
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm



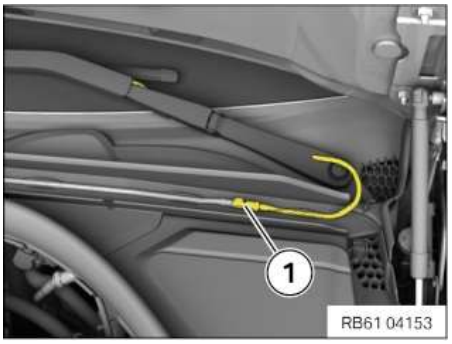
- Tighten nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

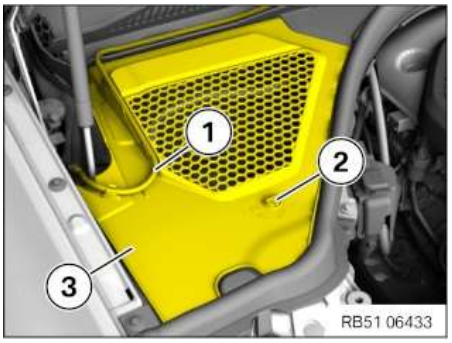
- Connect the protective cap (1).

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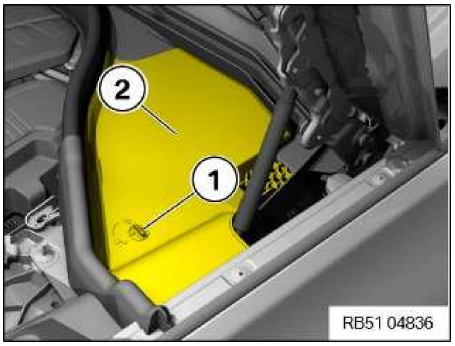
- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

39 – 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.

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



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

41 – Connecting all battery earth leads



- See additional information.

42 – Take bonnet out of the service position

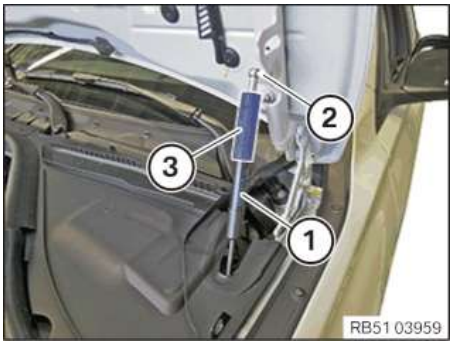
CAUTION

Shutting bonnet or tailgate.

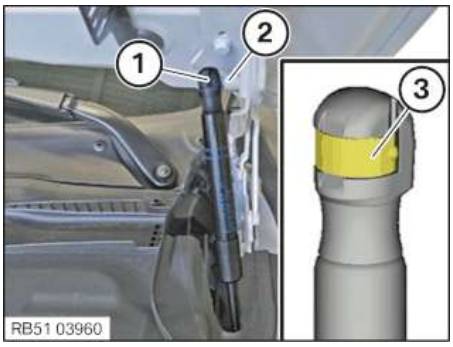
Danger of injury!

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

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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.



- 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

Rail pressure sensor to rail			Used in step 22
	Grease thread lightly.	Tightening torque	70 Nm

Rail to cylinder head cover			Used in step 23
M8		Tightening torque	19 Nm

High pressure lines between high pressure pump and rail			Used in step 24
High-pressure pipe		Tightening torque	24.5 Nm

High pressure lines between injector and rail			Used in step 25
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 27
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 27
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 27
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 28
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 28
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 28
TS5x20		Tightening torque	3,6 Nm

Holder on intake plenum			Used in step 28
TS6X20		Tightening torque	5 Nm

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Clean air pipe to exhaust turbocharger			Used in step 30
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 30
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 34
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 35
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 35
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 35
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 38
Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 38
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
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61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 35 ... Notes on ESD protection (Electro Static Discharge)	1521
61 35 ... Notes on ESD protection (Electro Static Discharge)	152122

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13 53 158 Removing and installing/replacing rail

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

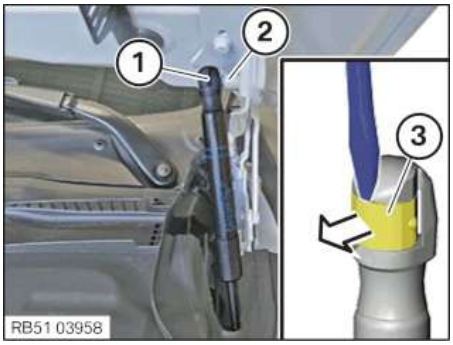
Engine compartment lid is open.

CAUTION

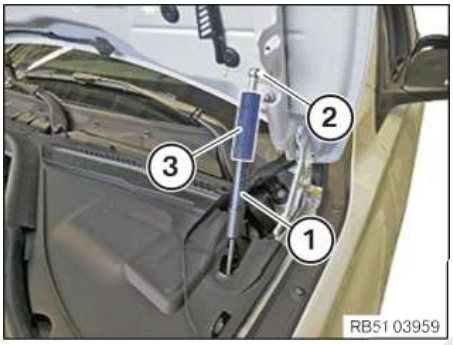
Shutting bonnet or tailgate.

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.
- Pull special tool or 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

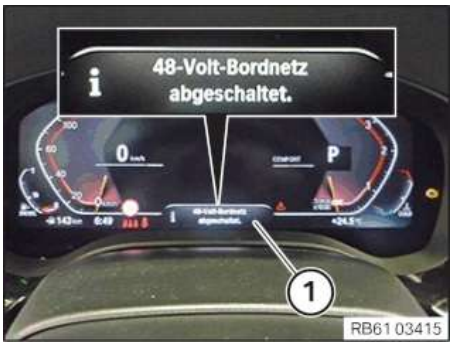
TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

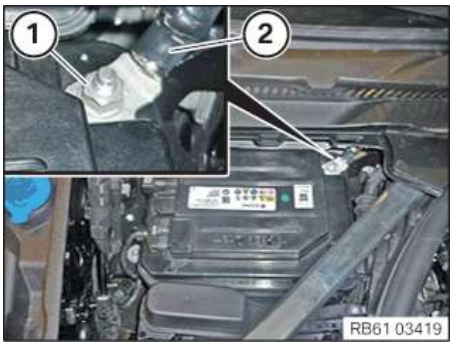
- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

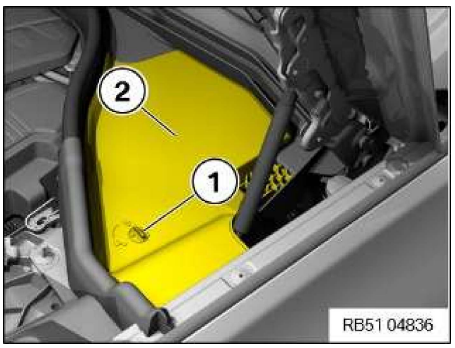
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

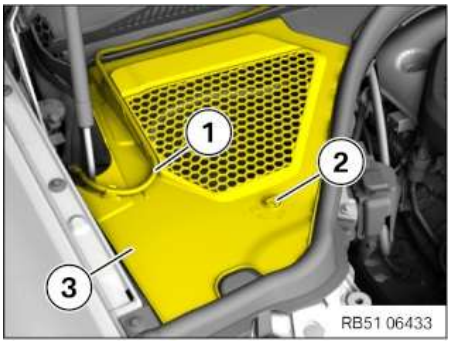
4 – Remove the cover of the engine compartment at the rear left



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

5 – 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 (3) of the rear right engine compartment.

6 – Removing the wiper arm on the left and right

NOTICE

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

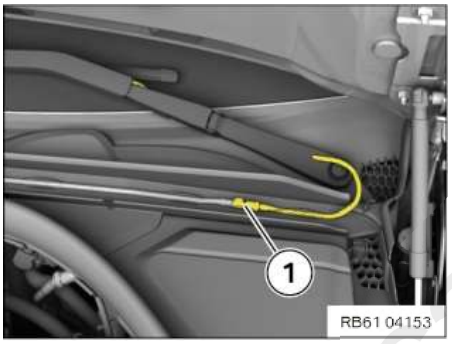
► **Remove the wiper arm**

RISK OF DAMAGE

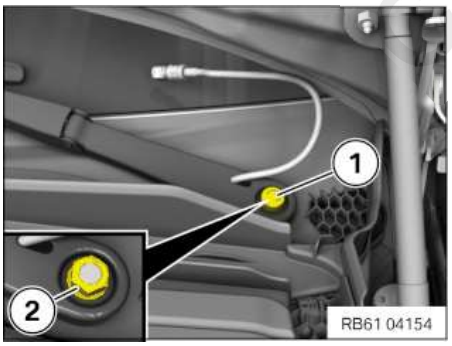
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

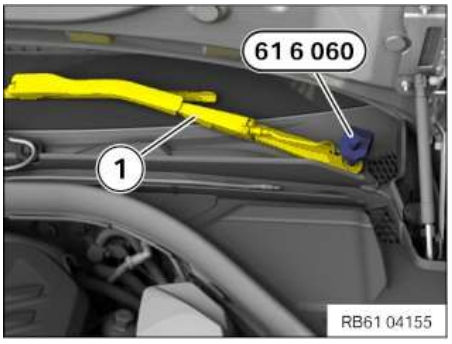
- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.



- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



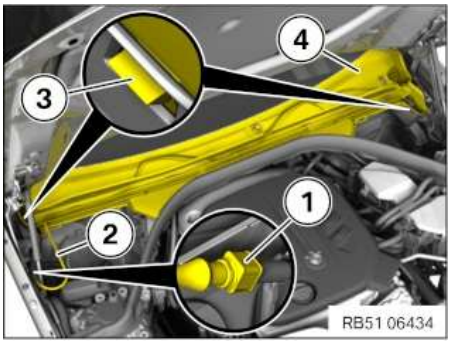
- Remove the protective cap (1).
- Loosen nut (2).



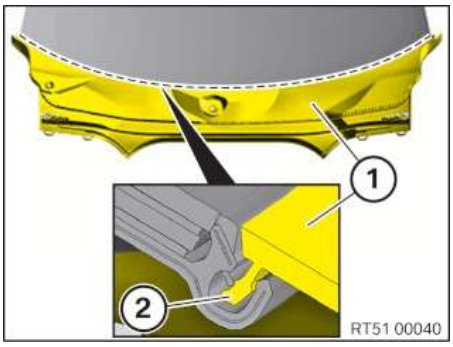
- Pull off the wiper arm (1) using special tool .

7 – Remove cowl panel cover

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- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

8 – Remove the seal for the rear bonnet

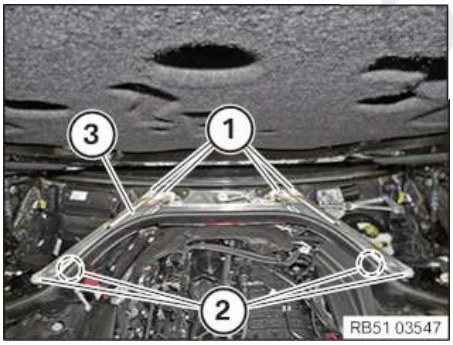


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

9 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

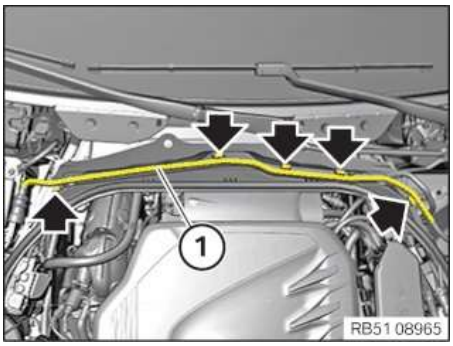
Driving without the strut brace/front-end strut or tension strut is not permitted.



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

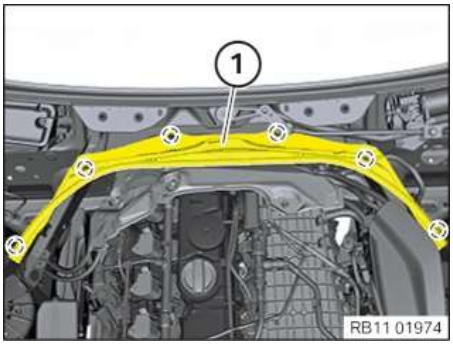
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.



- **Version with mild hybrid technology:**

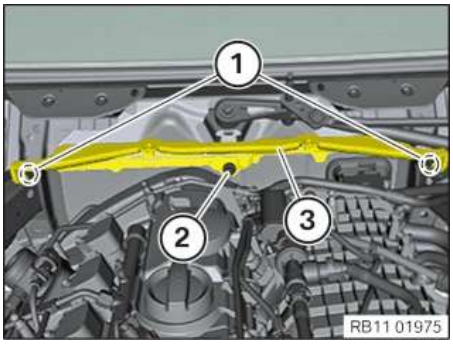
  Unclip the wire (1) at the holders (arrows).

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- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

10 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

11 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

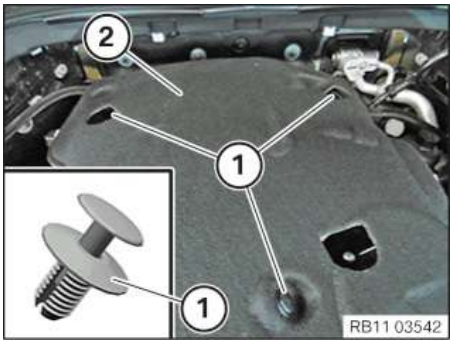
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

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



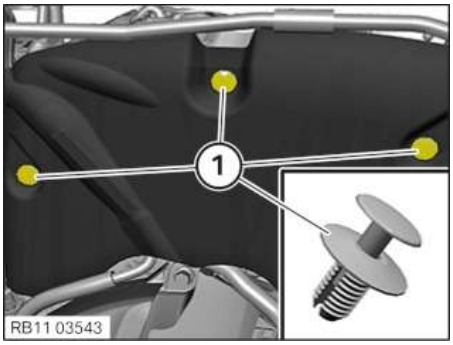
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

12 – Remove the acoustic cover for the injectors

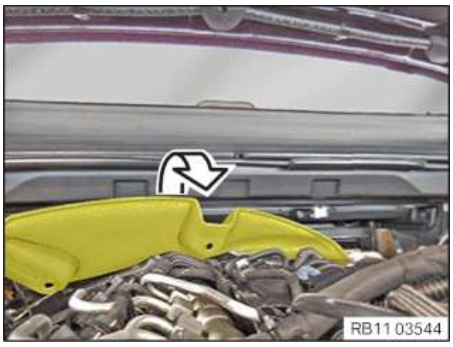


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

13 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

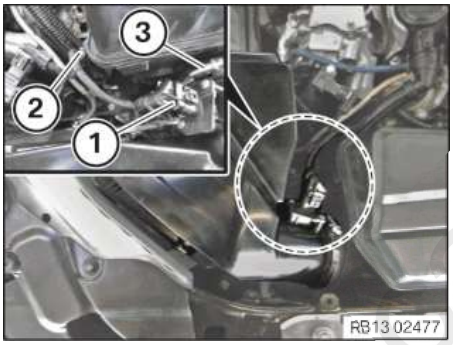
14 – Removing the clean air pipe with the resonator

WARNING

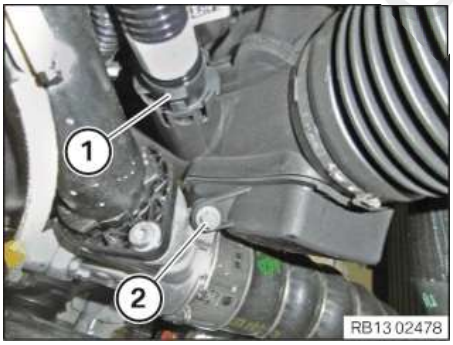
Hot surfaces.

Risk of burning!

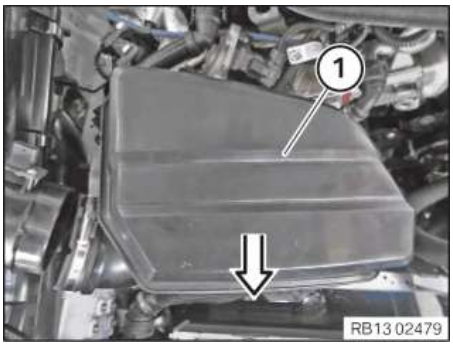
- Perform all work only on components that have cooled down.



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



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

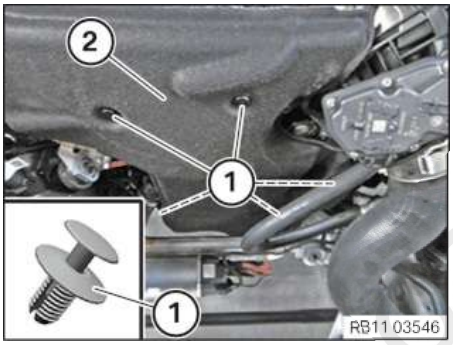
15 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

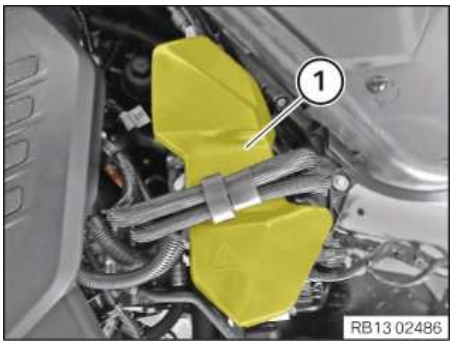
Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

16 – Remove the cover for the DDE control unit



- Pull off, guide out and remove cover (1) upwards.

17 – Partially releasing the wiring harness section on the intake plenum

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RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

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

RISK OF DAMAGE

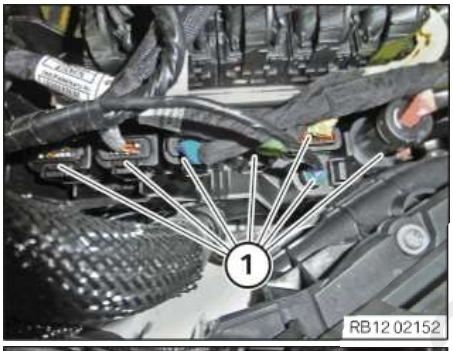
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

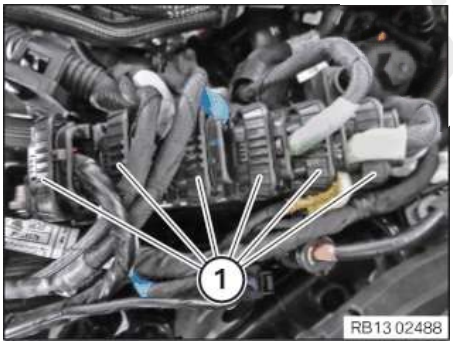
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

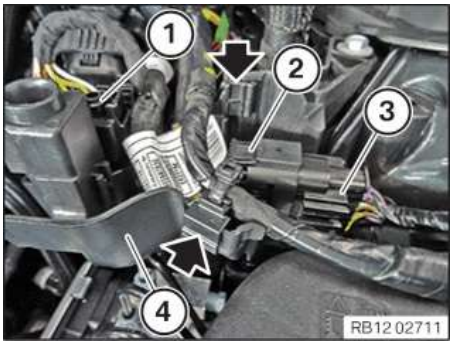
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Unlock and disconnect plug connections (1).

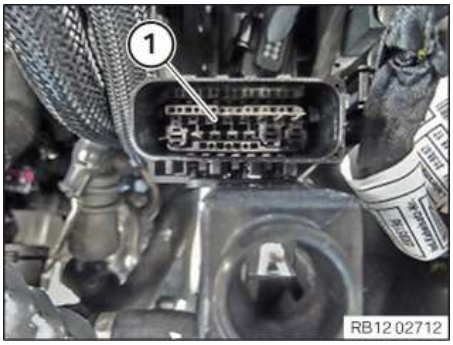


- Unlock and disconnect plug connections (1).

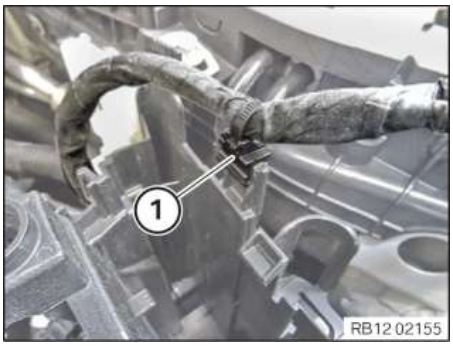


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Release the connector (3) and disconnect from the control unit holder (4).
- Release the clamps (arrows).

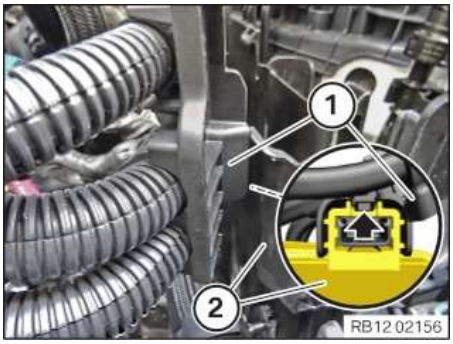
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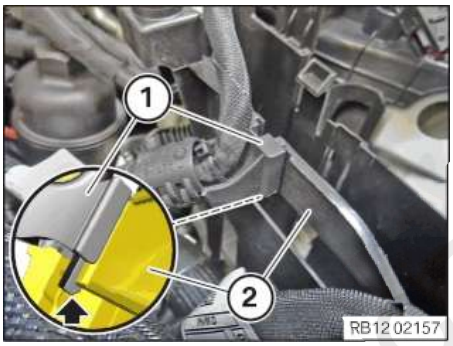
- Unlock plug connection (1) and disconnect.



- Loosen clamp (1).



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



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

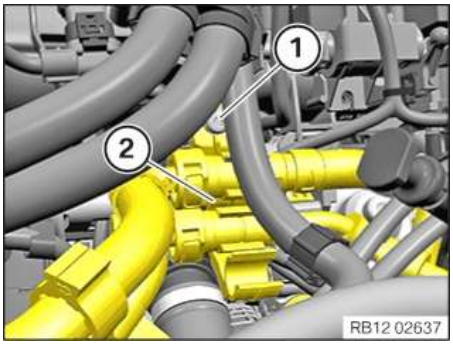


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

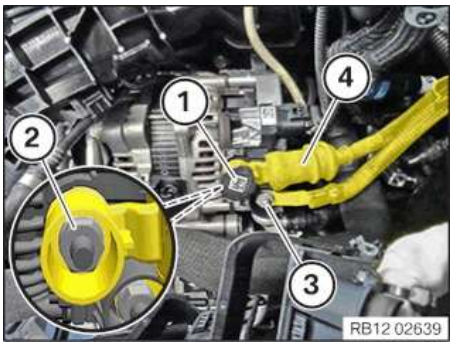


- Unlock holder (1) and feed out coolant line (2) and place it aside.

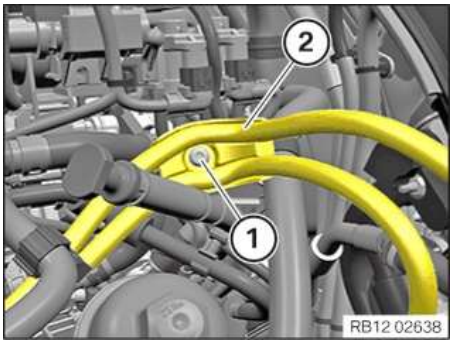
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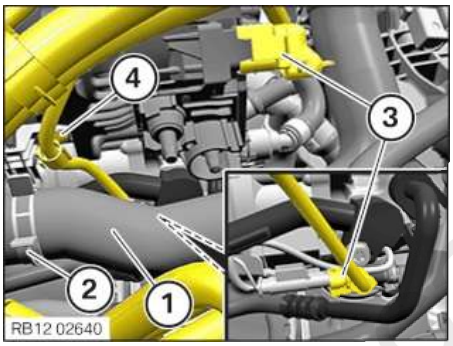
- Release the screw (1).
- Guide out fuel lines (2) and set them aside.



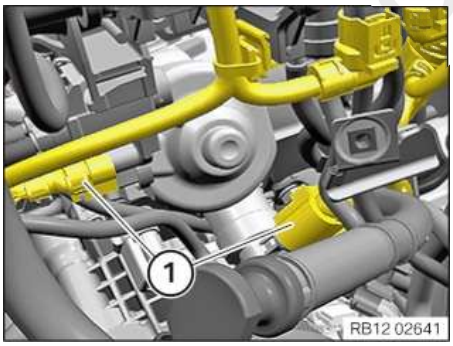
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.



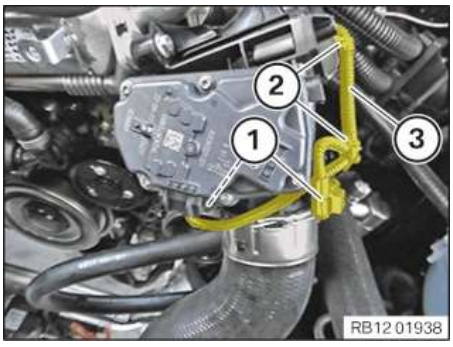
- Release the screw (1).
- Guide out the positive battery cables (2) and set them aside.



- Release the coolant line (1) from the holder (2) .
- Unlock plug connections (3) and disconnect.
- Loosen clamp (4).



- Unlock and disconnect plug connections (1).



- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.

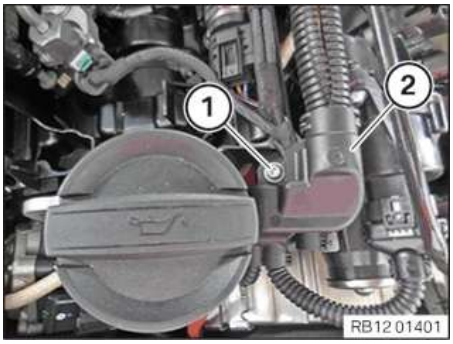
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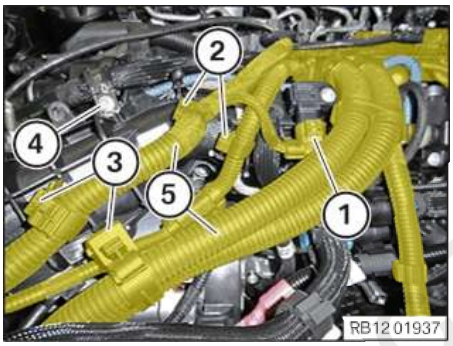
- Unlock and loosen connector (1).



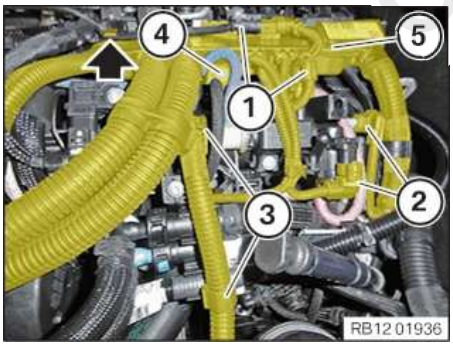
- Unlock plug connection (1) and disconnect.



- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

18 – Removing the intake plenum

TECHNICAL INFORMATION

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

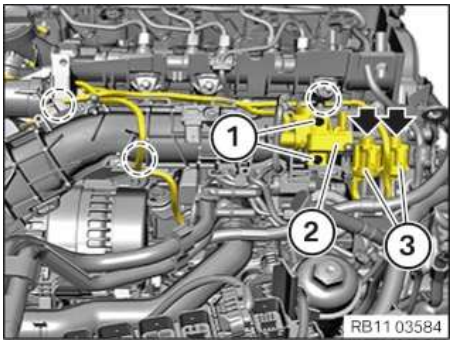
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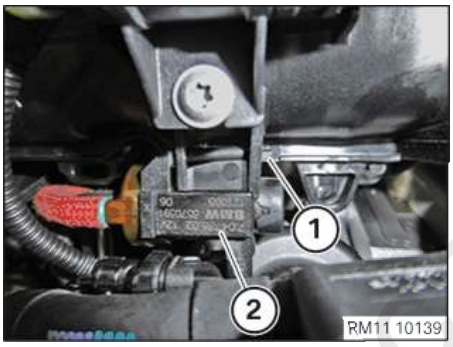
- Unlock clamp (1) and engage in this position.



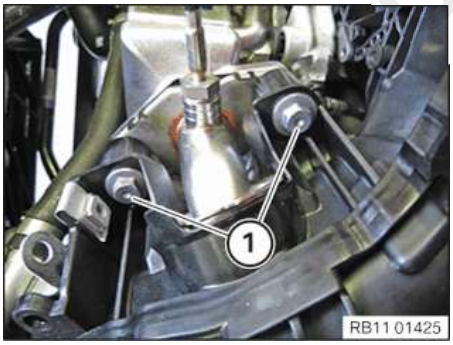
- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.



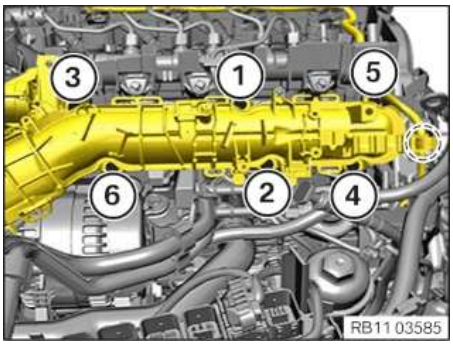
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.

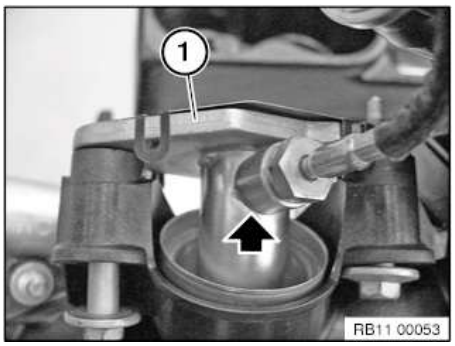


- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.

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- Remove the exhaust-gas recirculation pipe (1) (arrow).

19 – Detaching the leakage oil line from the injectors

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

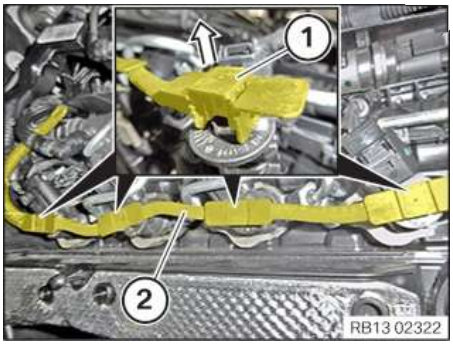
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

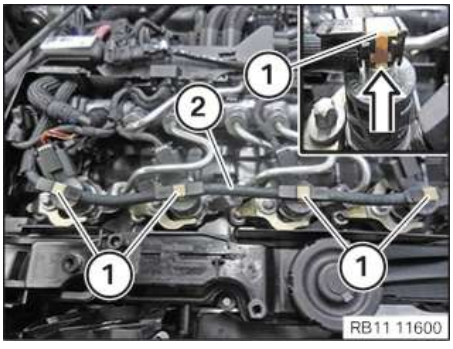


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



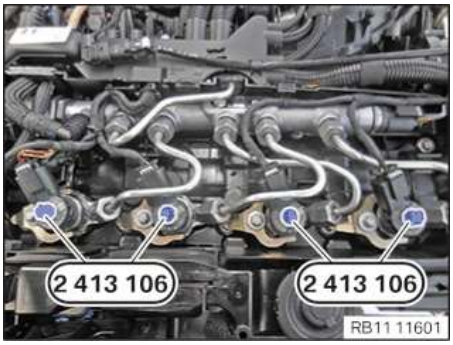
- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

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- Seal open connections with special tools .

20 – Remove the high pressure lines between the injector and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

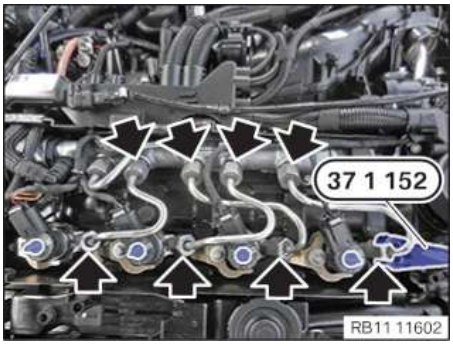
TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

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TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.



- Release the high pressure lines (arrows) with the special tool .
  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

21 – Remove the high pressure line between the high pressure pump and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

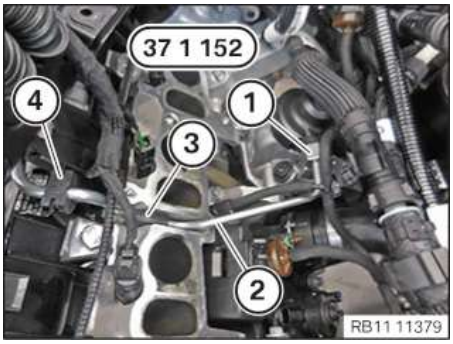
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TECHNICAL INFORMATION

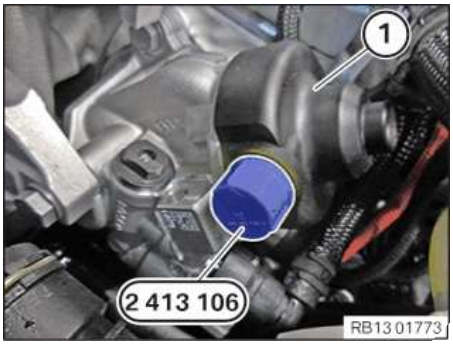
Reset special tool in early to avoid bending pressure lines.



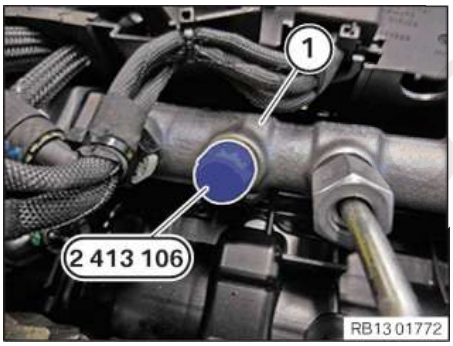
- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.



- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

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22 – Remove high-pressure rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

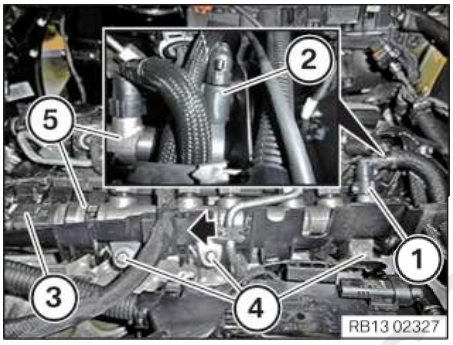
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

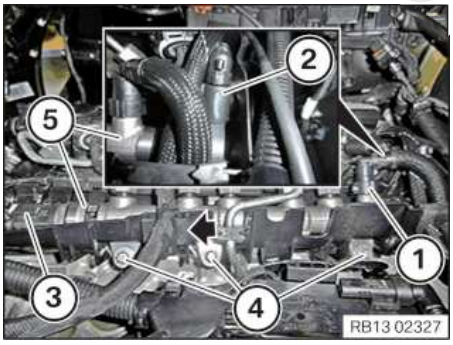
TECHNICAL INFORMATION

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



- Unlock and disconnect the fuel return line (1).
- Guide the fuel return line (1) out and set it aside.
- Unlock and disconnect the plug connection (2) on the rail pressure regulating valve.
- Unlock and disconnect the plug connection (3) on the rail pressure sensor.
- Unlock cable clip (Arrow), feed out and place aside.
- Loosen screws (4).
- Thread out and remove the rail (5).

23 – Installing the rail



- Insert and install the rail (5).
- Tighten the screws (4).

Rail to cylinder head cover

M8		Tightening torque	19 Nm

- Install and lock cable clip (arrow).
  The cable clip (arrow) must engage audibly.
- Connect and lock the connector (3) at the rail pressure sensor.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) at the rail pressure regulating valve.
  The connector (2) must engage audibly.
- Feed in fuel return line (1) and install.
  The fuel return line (1) must audibly engage.

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24 – Installing high pressure line between rail and high pressure pump

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

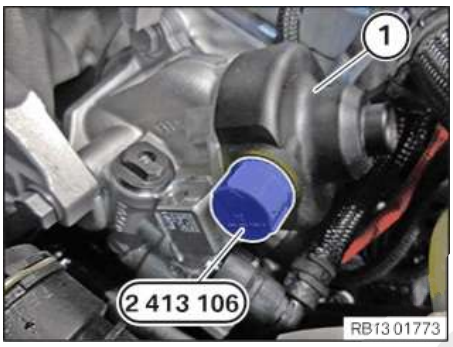
On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

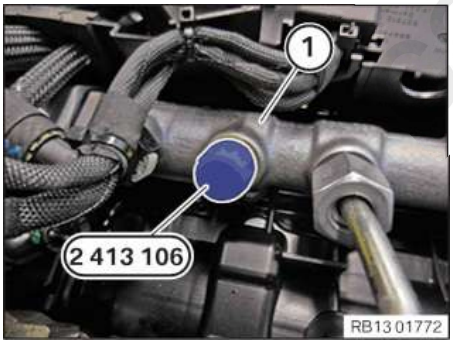
- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

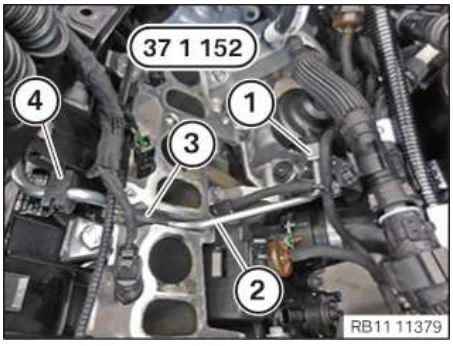
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.

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- Hand-tighten the union nut (1) on the rail.

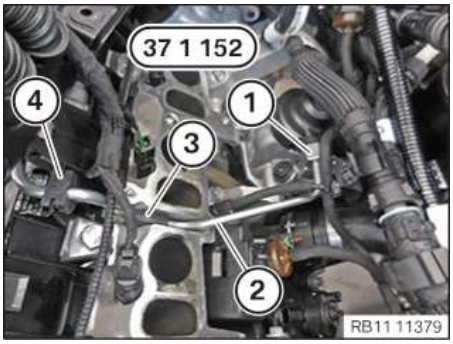
TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm



- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

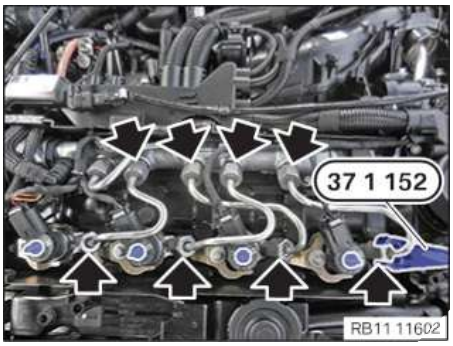
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten union nut (1) on the high pressure pump with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

25 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

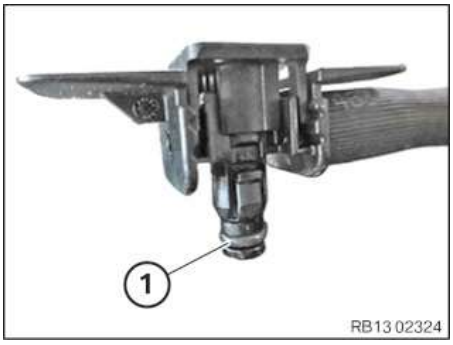
- Tighten the high pressure lines (arrows) with the special tool .

High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

26 – Attach the leakage oil line on the injectors



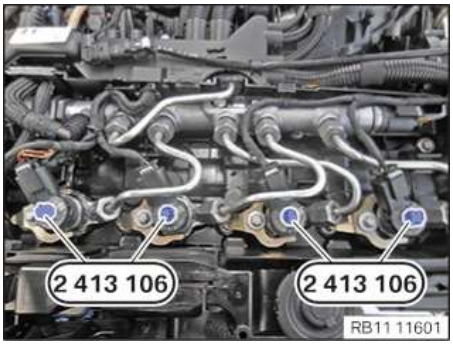
- **Version A:**

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

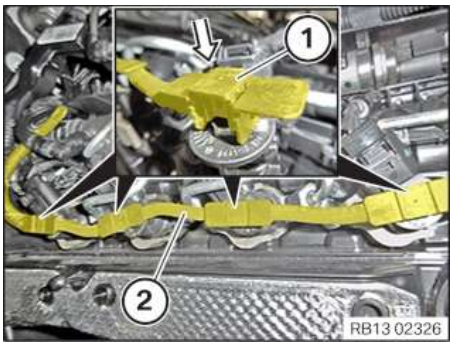
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

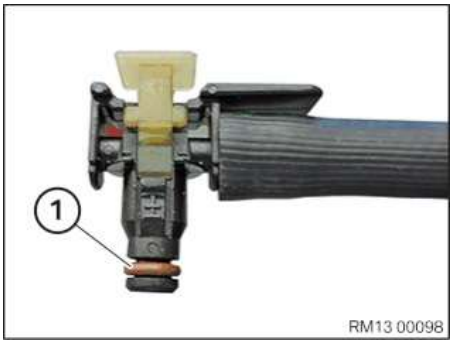
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- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.



- **Version B**:

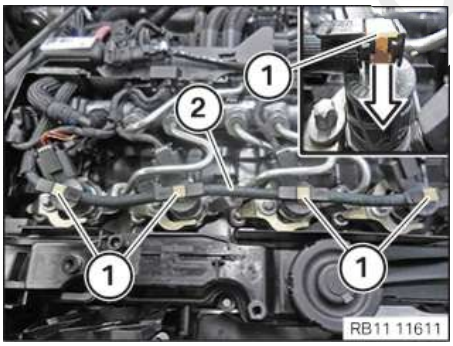
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.



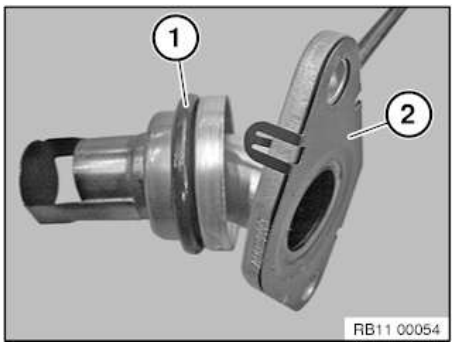
- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

27 – Installing the intake plenum

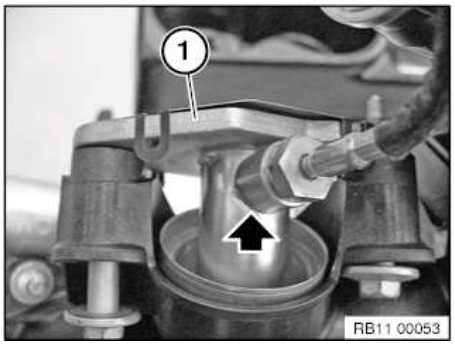
cardiagn.com



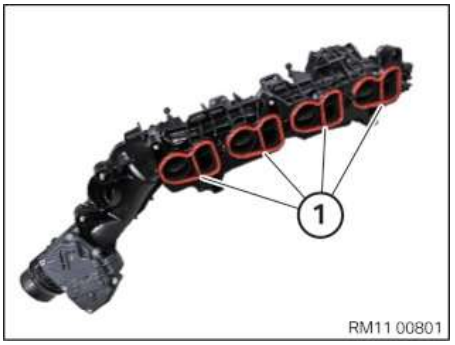
- Renew O-ring (1).

  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

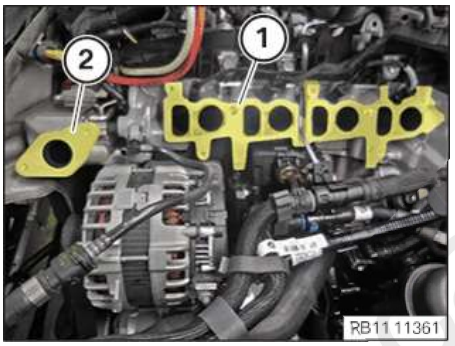


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

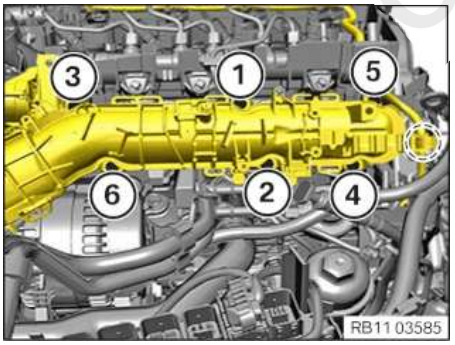


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

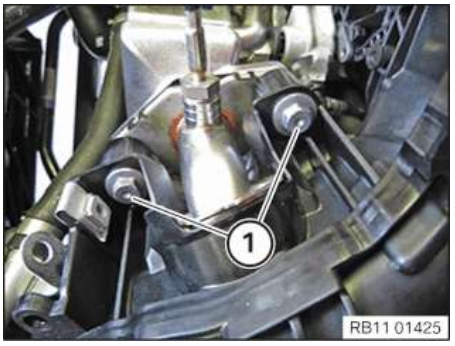


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

- Attach the wiring harness and fuel lines in the marked area on the intake plenum.

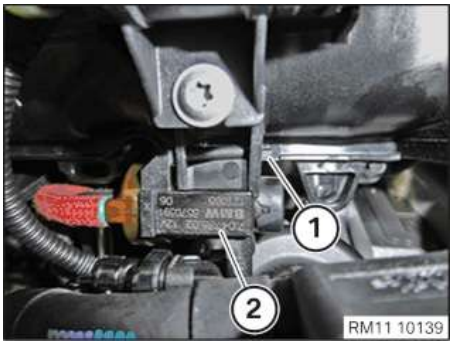


- Tighten the screws (1).

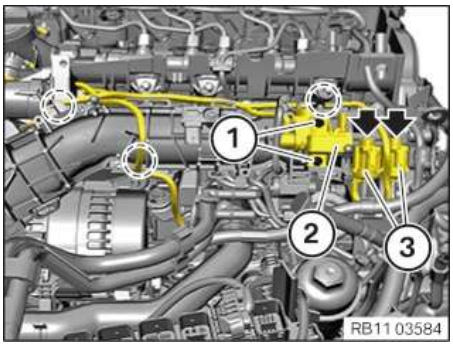
Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm

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- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.
  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

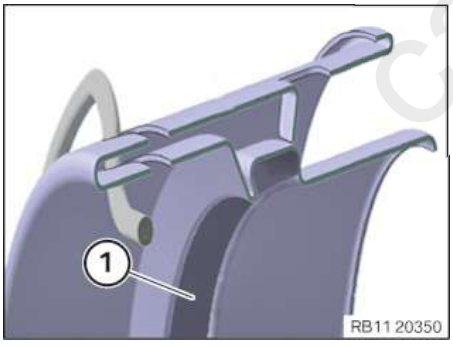


- Check the seal (1) for damage, and renew if necessary.

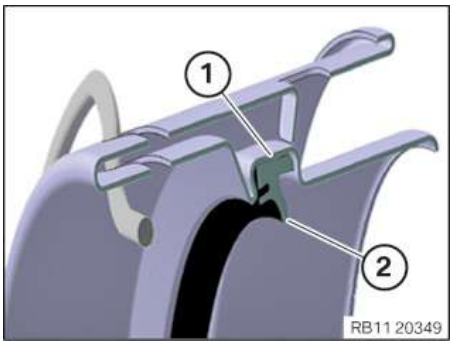
▸ **Replacing damaged seal**

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

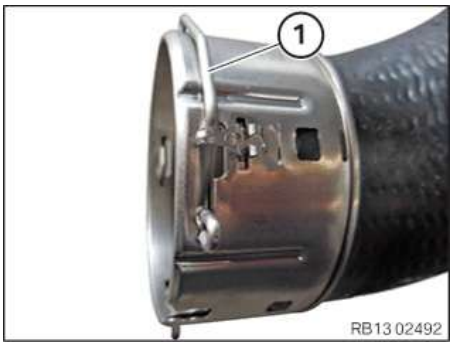
Incorrect assembly is possible. Ensure correct installation position.

- 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 directed inwards as shown.

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- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

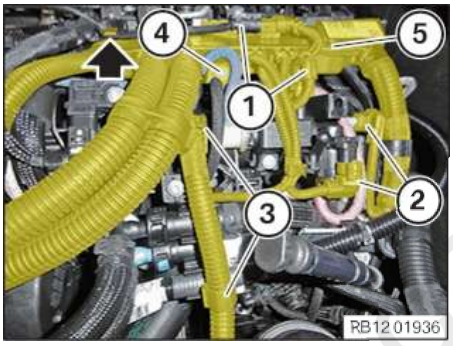
28 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

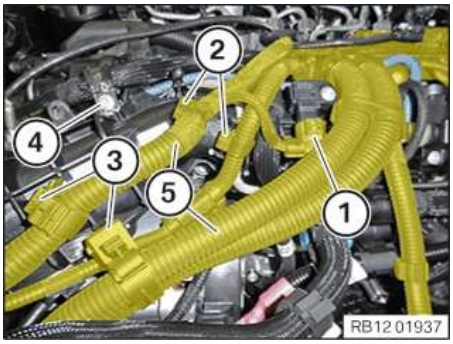
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

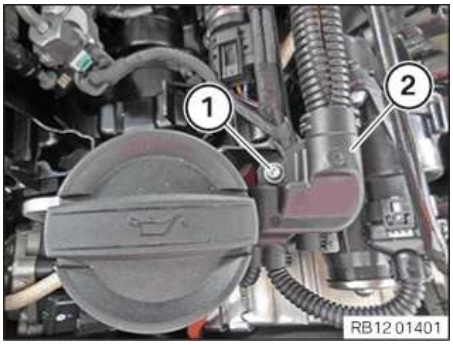
Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



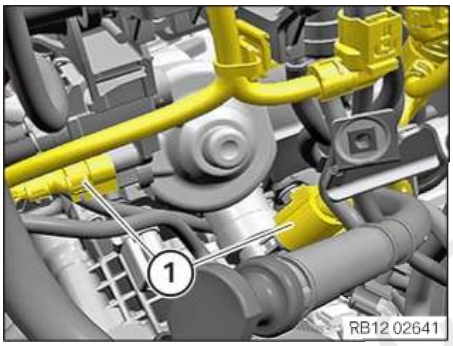
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



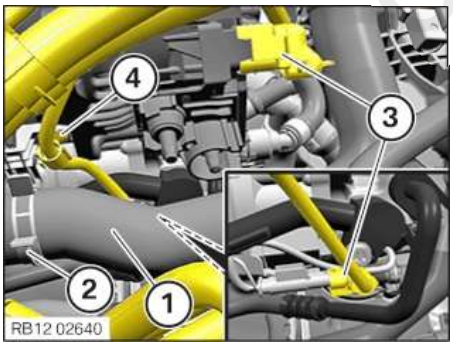
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



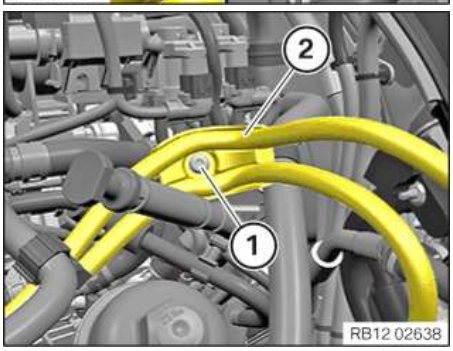
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Secure the clamp (4).
- Connect connectors (3) and lock.

  The connectors (3) must engage audibly.
- Feed the coolant line (1) into the holder (2) and install it.



- Feed in and position the positive battery cables (2) .
- Tighten down screw (1).

Standard screw connection M6

M6		Tightening torque	8 Nm

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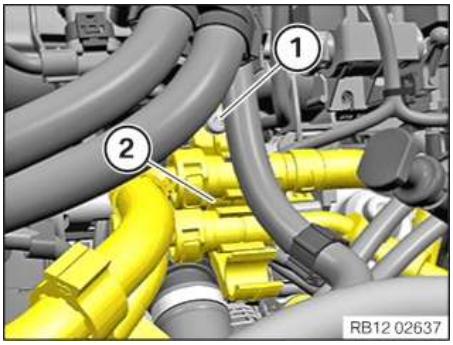
- Feed in and install the positive battery cable (4).
- Feed in and position the positive battery cables (4) .
- Renew the nuts (3) and (2).

  Parts: Nuts
- Tighten nuts (3) and (2).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm

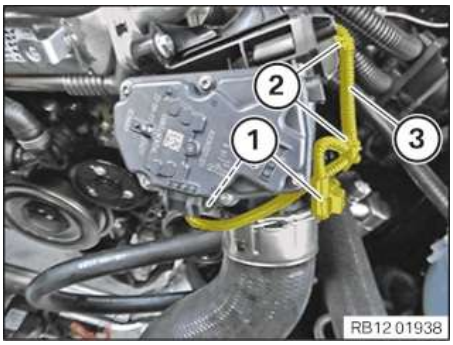
- Guide in and install the lid (1).



- Insert and install the holder (2).
- Tighten down screw (1).

Holder on intake plenum

TS6X20		Tightening torque	5 Nm



- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.



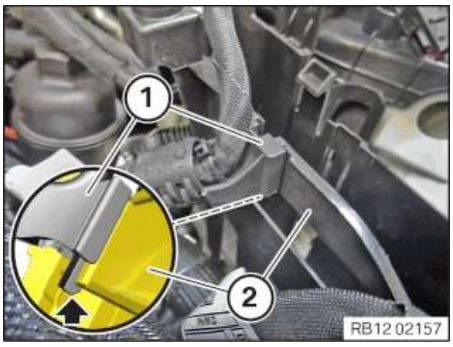
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



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

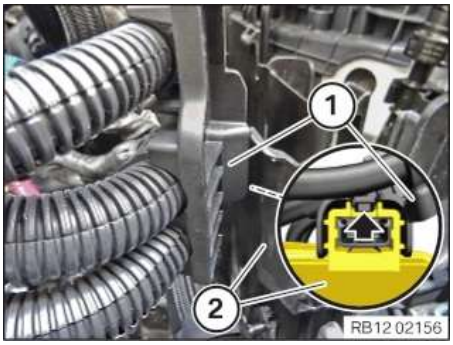
  Lock (arrow) must audibly engage.



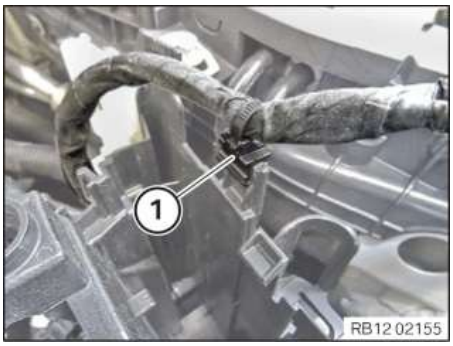
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.

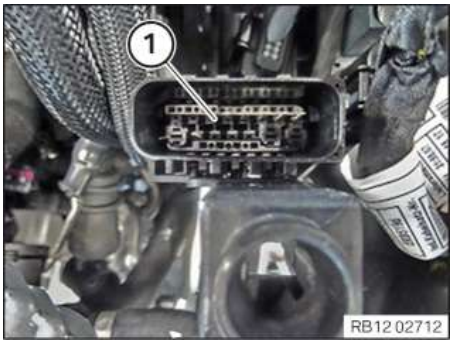
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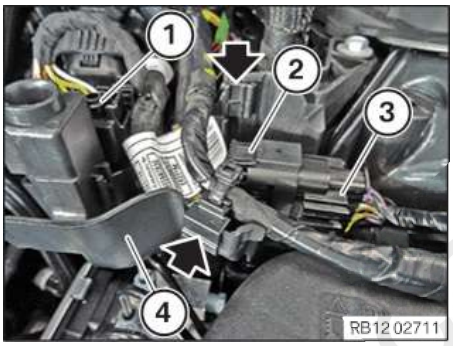
- Connect the cable clip (1) with the control unit holder (2) and lock it.
  Lock (arrow) must audibly engage.



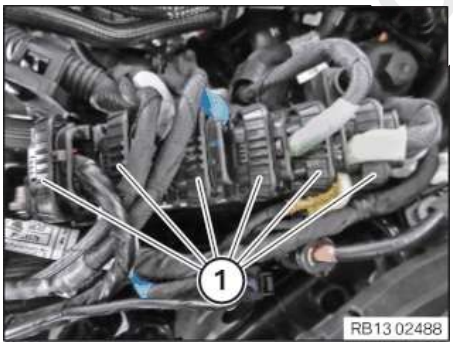
- Secure clamps (1).



- Feed in and install the connector (1).
  The connector (1) must engage audibly.



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



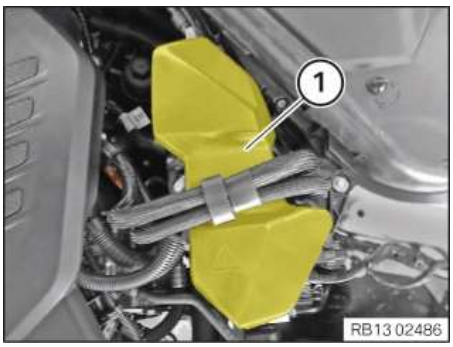
- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.



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

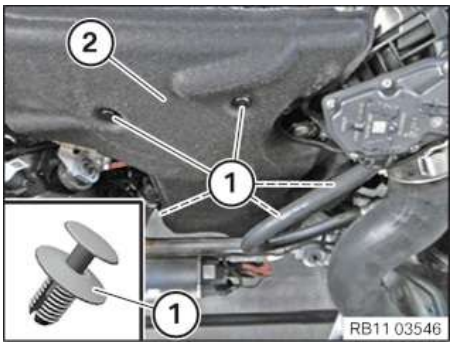
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29 – Install the cover for the DDE control unit



- Insert and install cover (1) into guides.

30 – Install acoustic cover for the engine, front

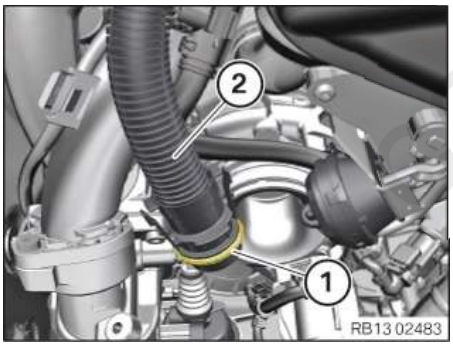


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

31 – Installing the clean air pipe with resonator



- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.

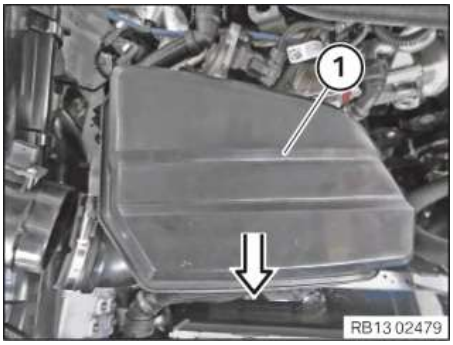


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

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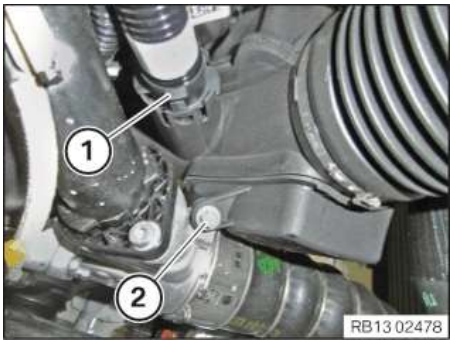


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

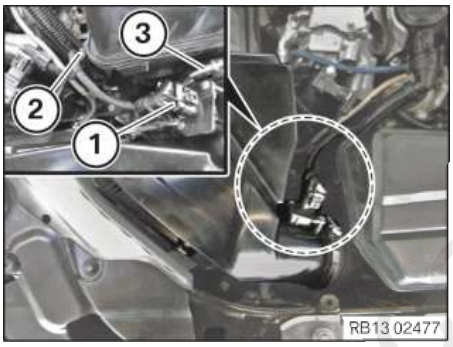
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



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

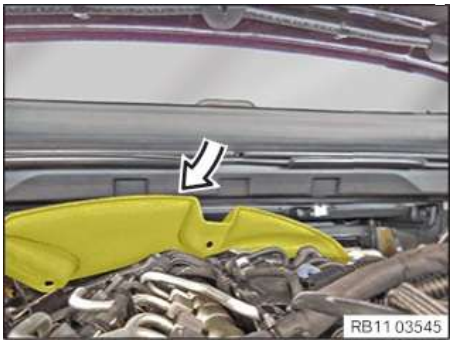
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

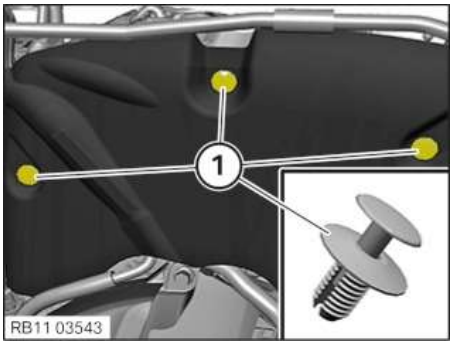
  The connector (1) must engage audibly.

32 – Installing acoustic cover at rear



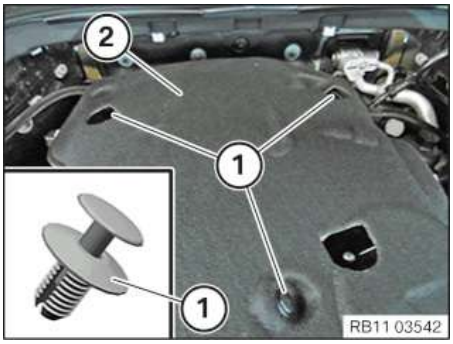
- Guide in the acoustic cover in the direction of the arrow and install it.

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- Secure acoustic cover with the expanding rivets (1).

33 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

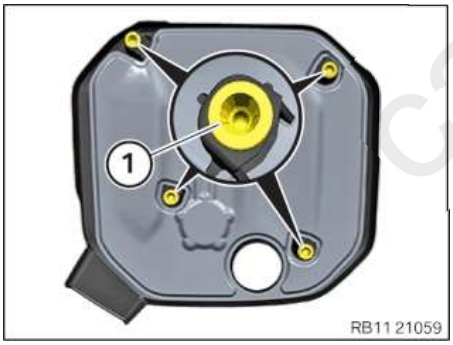
34 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



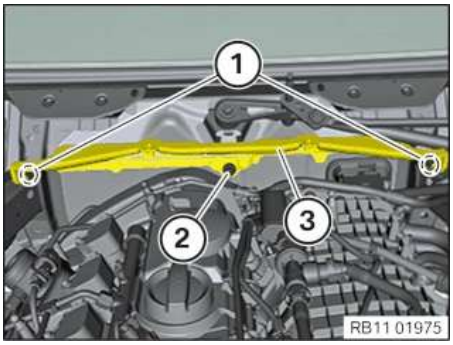
- Check the acoustic cover for correct fit of the rubber mounts (1).



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

35 – Installing centre bulkhead lower section

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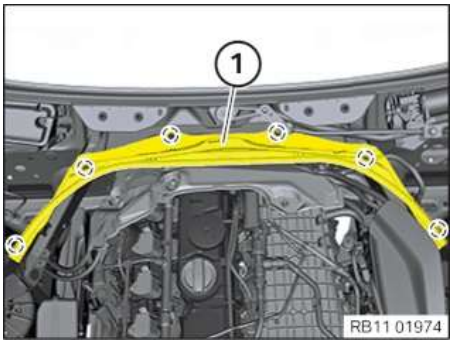


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

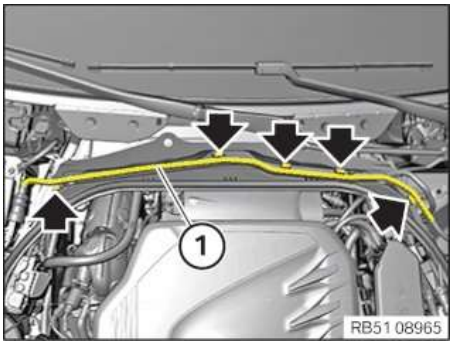
36 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

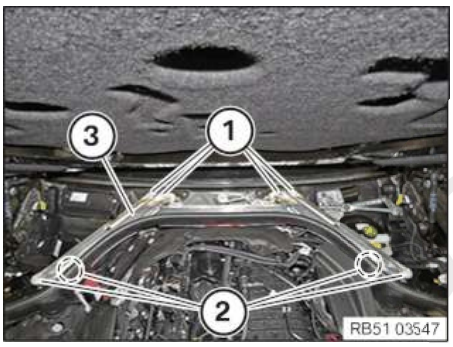
Bulkhead upper part to bottom bulkhead

		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

37 – Install the seal for the bonnet

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- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

38 – Installing cowl panel cover

RISK OF DAMAGE

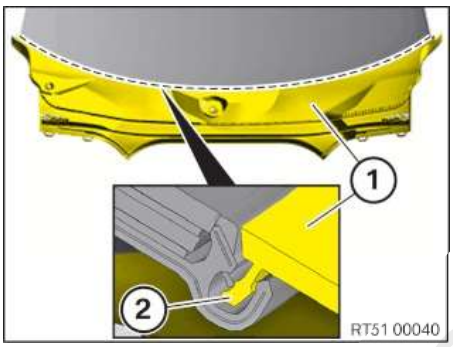
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

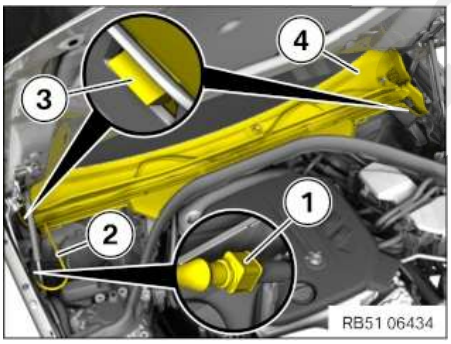
- Ensure correct installation of the components.
- Only use undamaged components.

TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

39 – Install left and right wiper arm

NOTICE

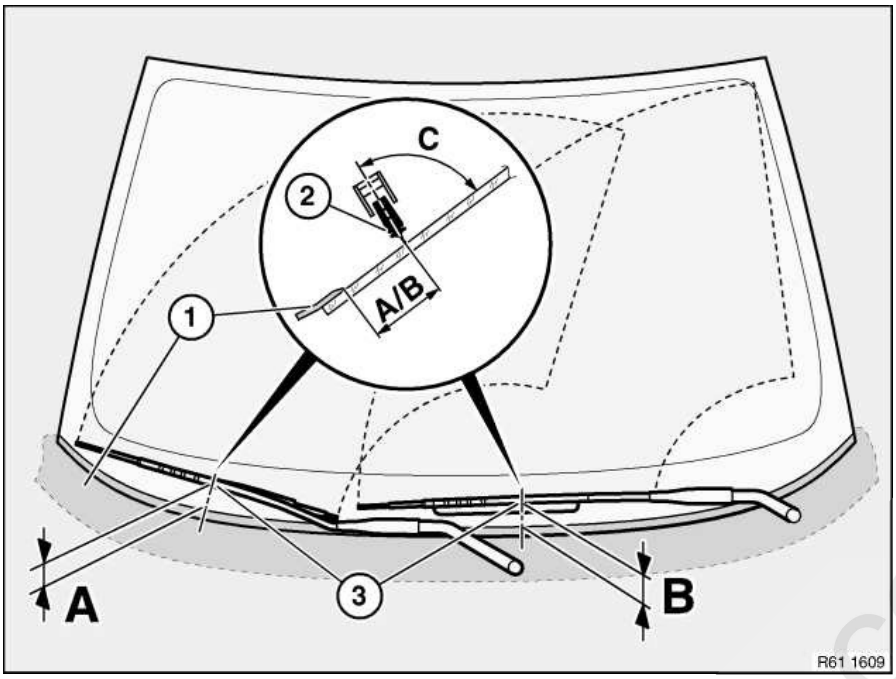
Description is for left component only. Procedure on the right side is identical.

▸ **Installing left and right wiper arm**

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TECHNICAL INFORMATION

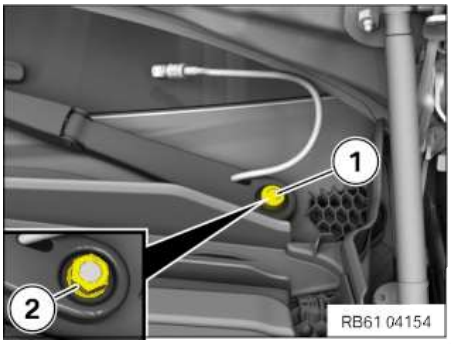
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

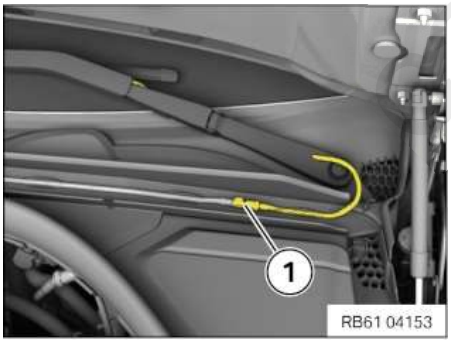


- Tighten nut (2).

Windscreen wiper arm

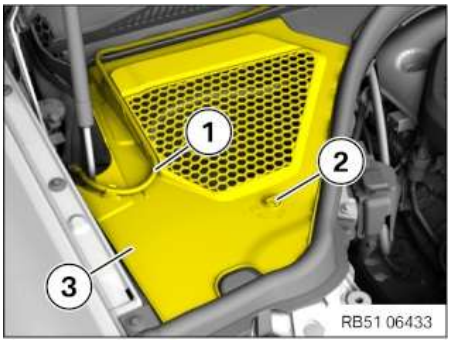
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

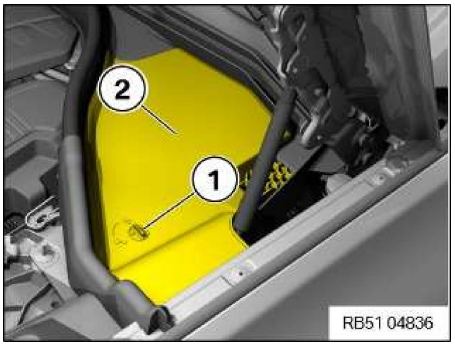
40 – Install the rear right engine compartment cover



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

41 – 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).

42 – Connecting all battery earth leads



- See additional information.

43 – Activating the 48 V electrical system

Prerequisite

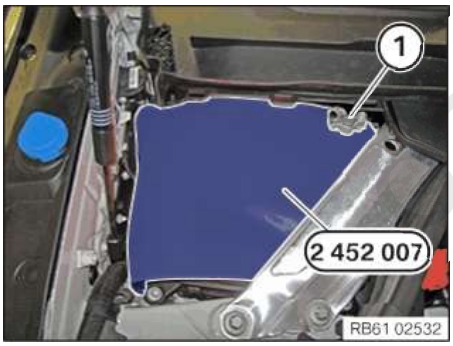
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

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- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

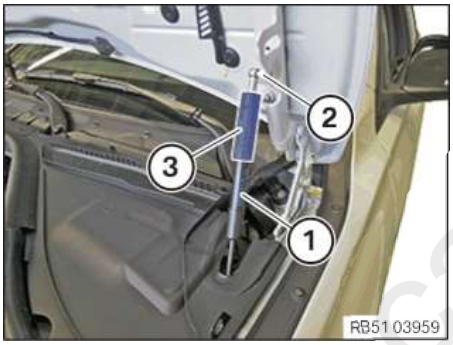
44 – Take bonnet out of the service position

CAUTION

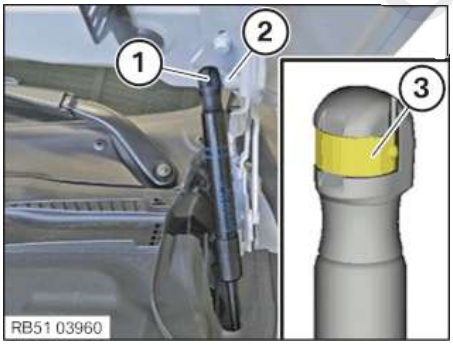
Shutting bonnet or tailgate.

Danger of injury!

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



- 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.



- 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

Rail to cylinder head cover — Used in step 23

M8		Tightening torque	19 Nm

High pressure lines between high pressure pump and rail — Used in step 24

High-pressure pipe		Tightening torque	24.5 Nm

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High pressure lines between injector and rail			Used in step 25
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 27
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 27
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 27
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 28
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 28
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 28
TS5x20		Tightening torque	3,6 Nm

Standard screw connection M6			Used in step 28
M6		Tightening torque	8 Nm

Battery positive lead on the starter motor generator			Used in step 28
M8		Tightening torque	19 Nm

Holder on intake plenum			Used in step 28
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 31
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 31
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 35
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 36
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 36
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 36
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 39
Combination hexagon nut		Tightening torque	35 Nm

Negative battery cable to 48-V battery			Used in step 43
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

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Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 39
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	243

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
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61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	342
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	342
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
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61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 20 900 Disconnecting and connecting battery earth lead	342
61 35 ... Notes on ESD protection (Electro Static Discharge)	17
61 35 ... Notes on ESD protection (Electro Static Discharge)	17

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13 53 158 Removing and installing/replacing rail

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

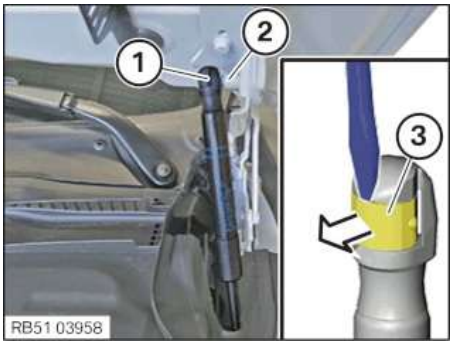
Engine compartment lid is open.

CAUTION

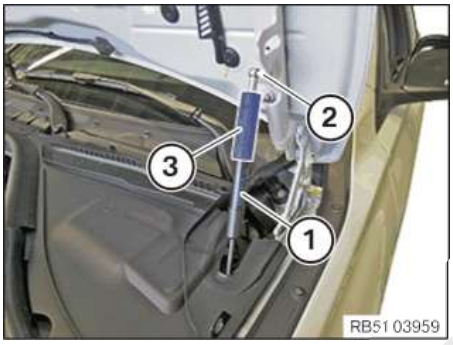
Shutting bonnet or tailgate.

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.
- Pull special tool or 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.

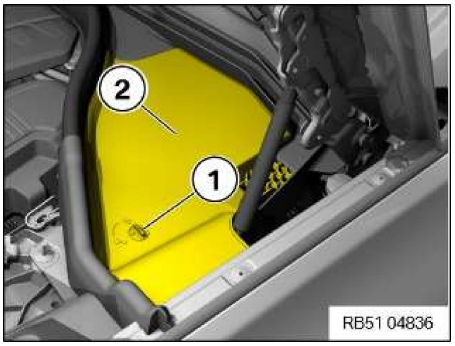
2 – Disconnecting all battery earth leads



- See additional information.

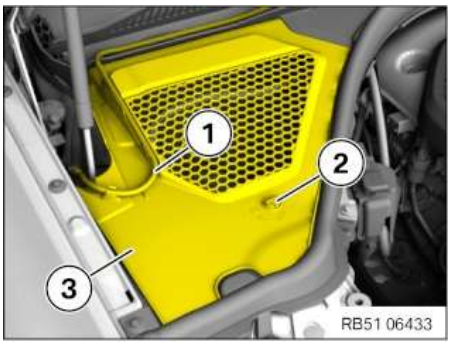
3 – Remove the cover of the engine compartment at the rear left

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

4 – Remove the cover of the rear right engine compartment



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

5 – Removing the wiper arm on the left and right

NOTICE

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

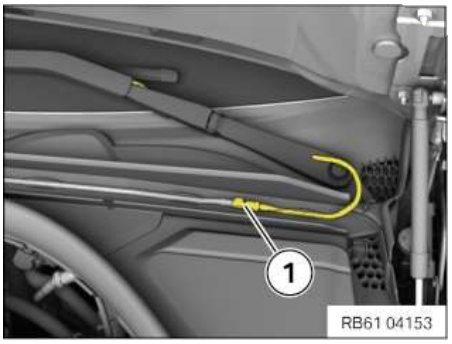
▸ **Remove the wiper arm**

RISK OF DAMAGE

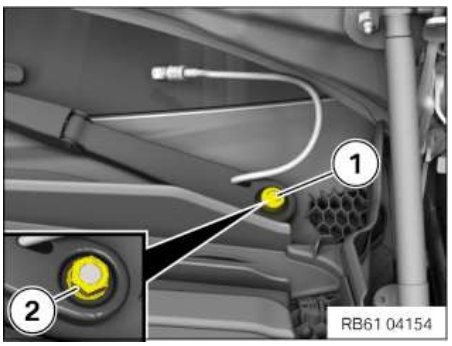
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.

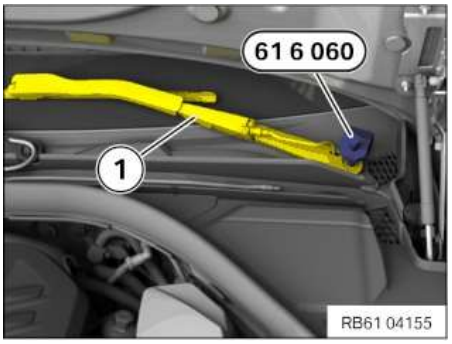


- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



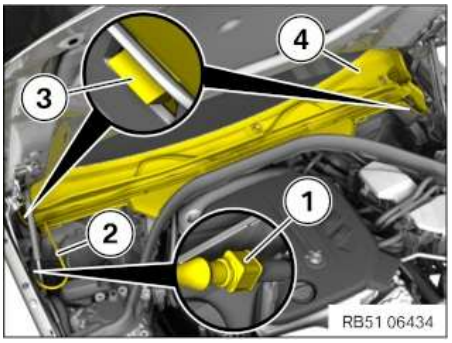
- Remove the protective cap (1).
- Loosen nut (2).

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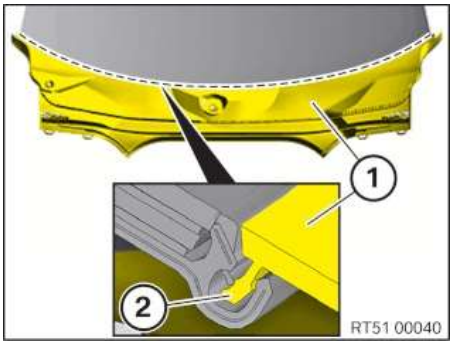


- Pull off the wiper arm (1) using special tool .

6 – Remove cowl panel cover



- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

7 – Remove the seal for the rear bonnet

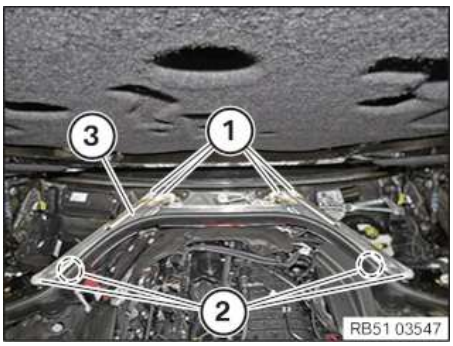


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

8 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.

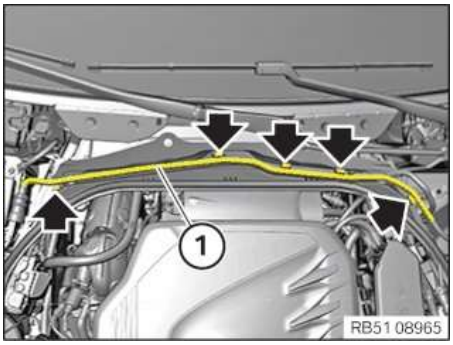


NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

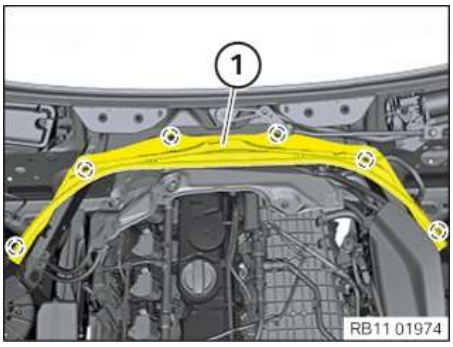
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.

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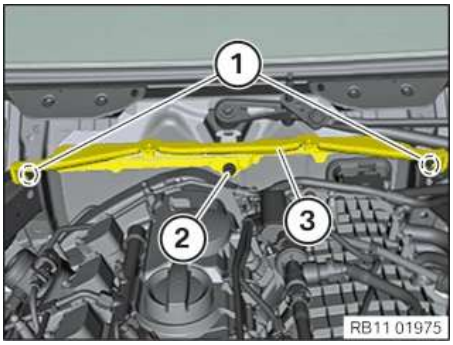
- **Version with mild hybrid technology:**

  Unclip the wire (1) at the holders (arrows).



- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

9 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

10 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

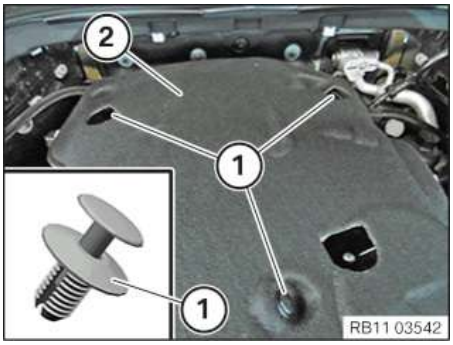
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation,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



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

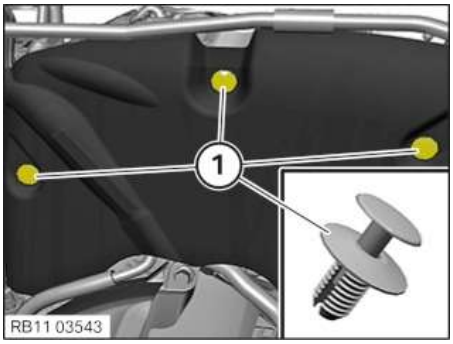
11 – Remove the acoustic cover for the injectors

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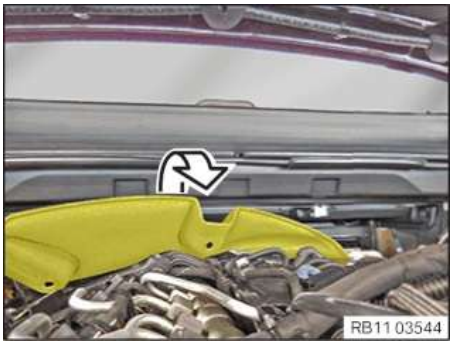


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

12 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

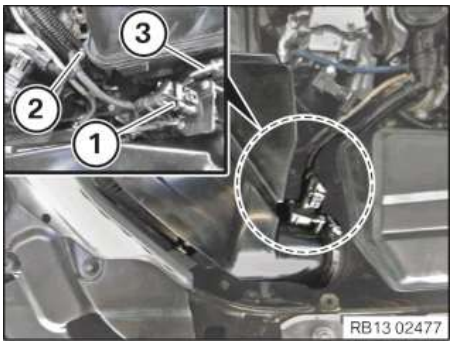
13 – Removing the clean air pipe with the resonator

WARNING

Hot surfaces.

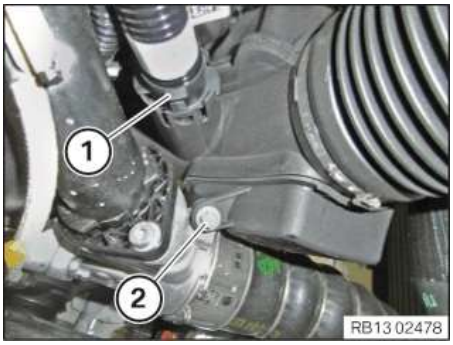
Risk of burning!

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

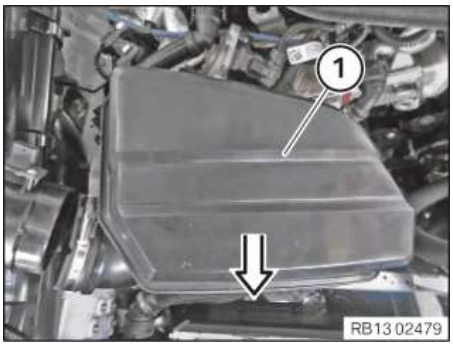


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

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- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

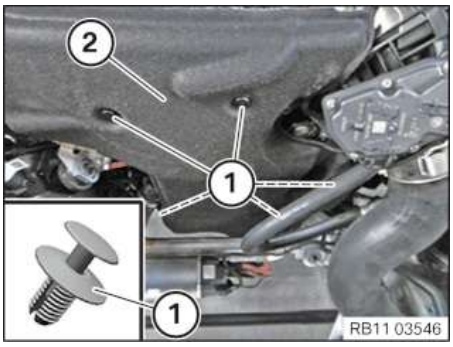
14 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

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15 – Partially releasing the wiring harness section on the intake plenum

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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

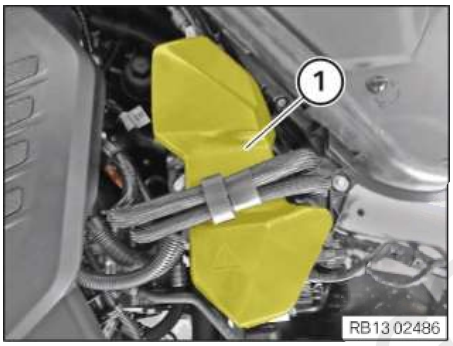
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

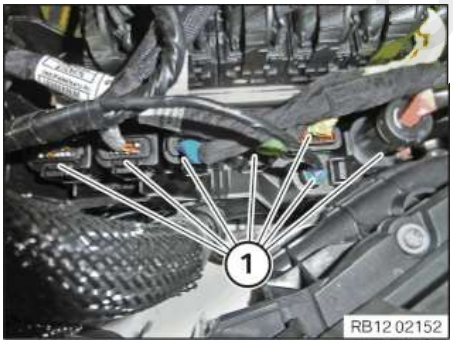
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

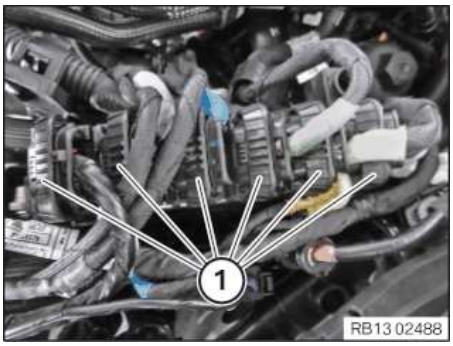
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Pull off cover (1) upwards, feed out and remove.

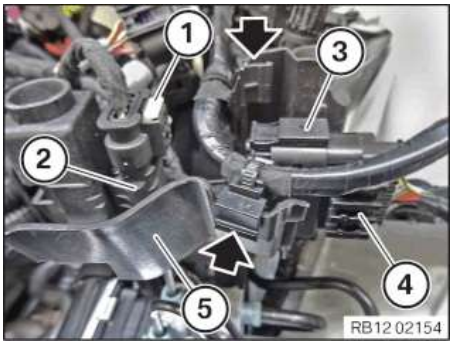


- Unlock and disconnect plug connections (1).

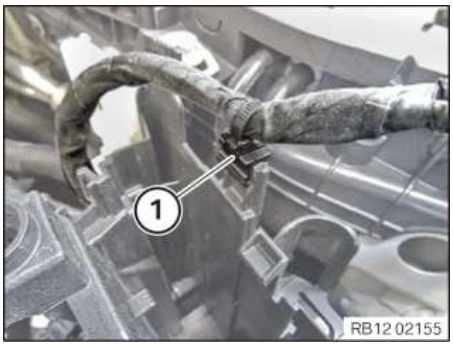


- Unlock and disconnect plug connections (1).

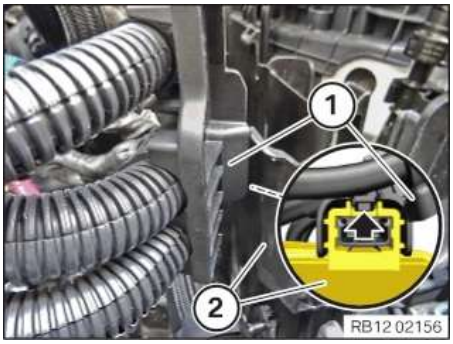
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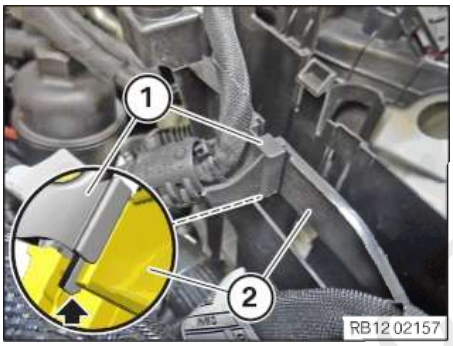
- Unlock plug connection (1) and disconnect.
- Unlock the plug (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock the plug (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).



- Loosen clamp (1).



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



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

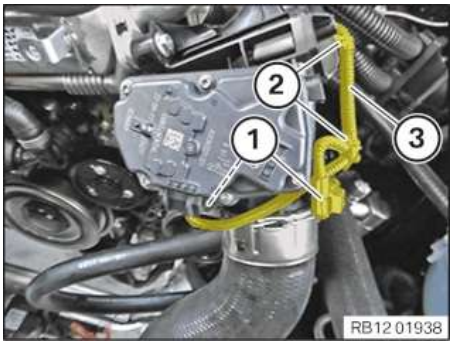


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

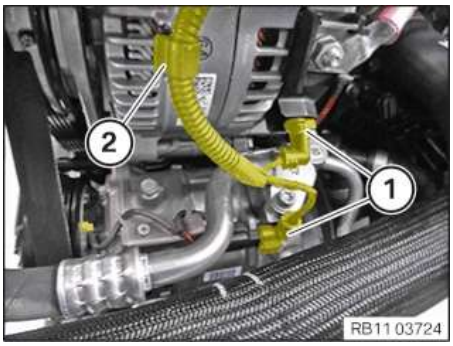


- Unlock holder (1) and feed out coolant line (2) and place it aside.

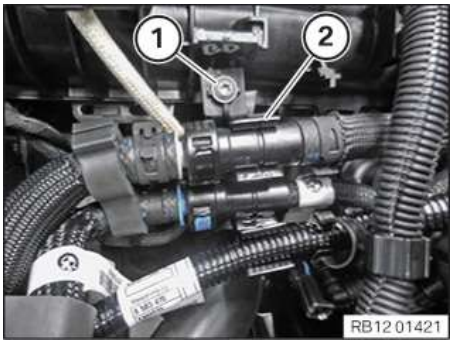
gardiagn.com



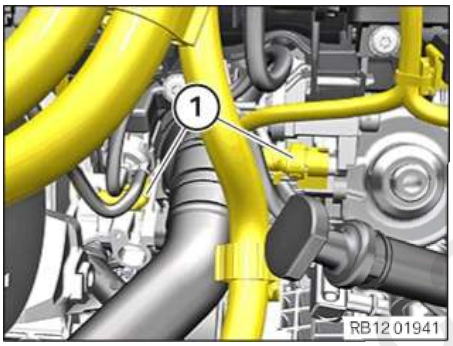
- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.



- Unlock and separate plug connections (1).
- Release the holder (2) from the alternator .



- Loosen screw (1).
- Thread out holder (2) and set aside.



- Unlock and disconnect plug connections (1).

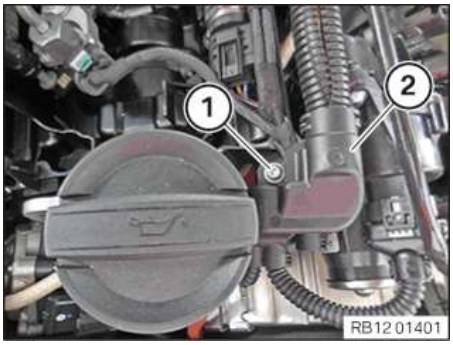


- Unlock and loosen connector (1).

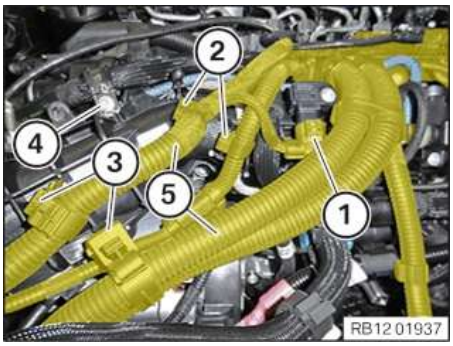


- Unlock plug connection (1) and disconnect.

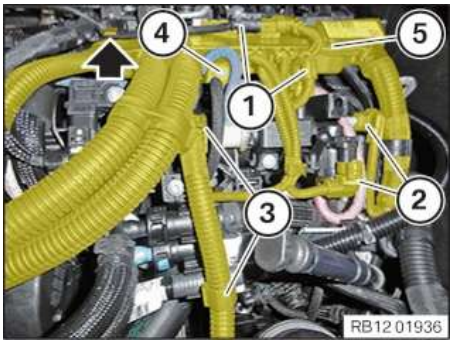
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- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

16 – Removing the intake plenum

TECHNICAL INFORMATION

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

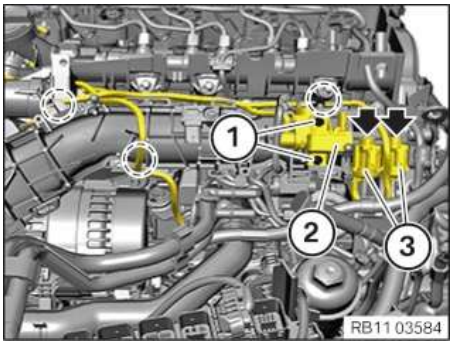


- Unlock clamp (1) and engage in this position.

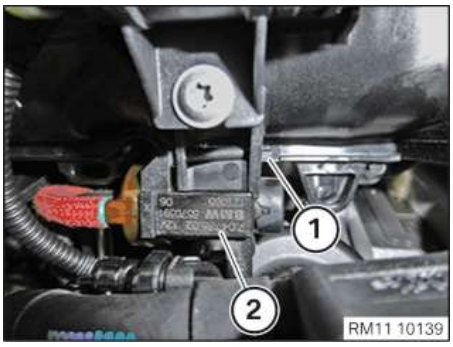


- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.

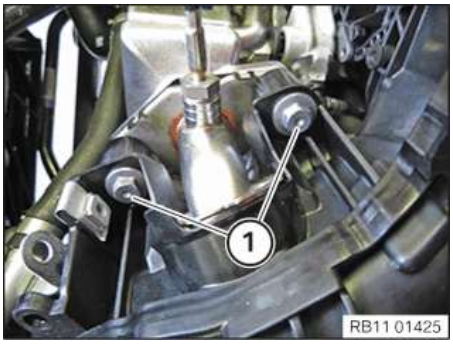
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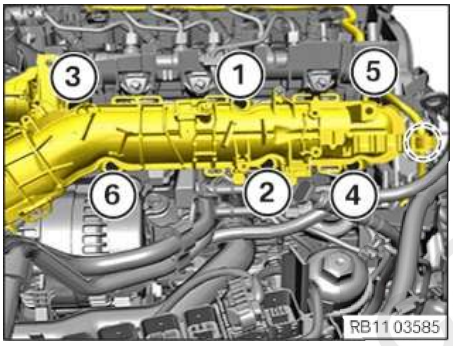
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



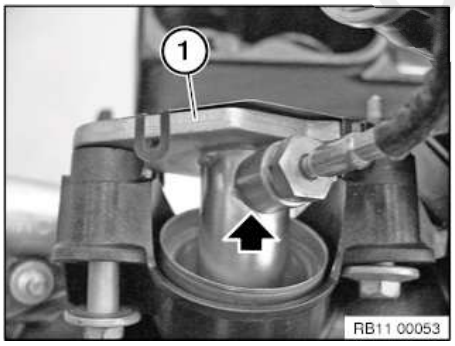
- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.



- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.



- Remove the exhaust-gas recirculation pipe (1) (arrow).

17 – Detaching the leakage oil line from the injectors

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

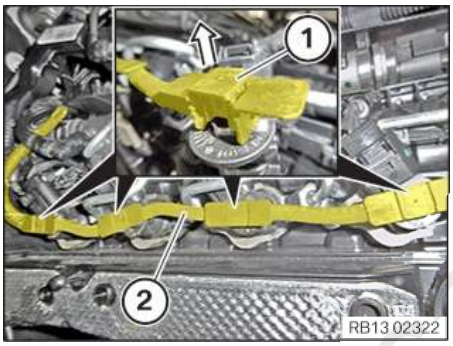
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

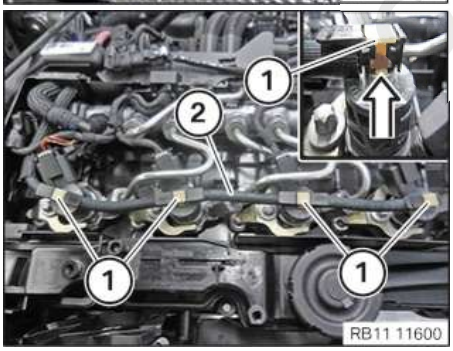


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

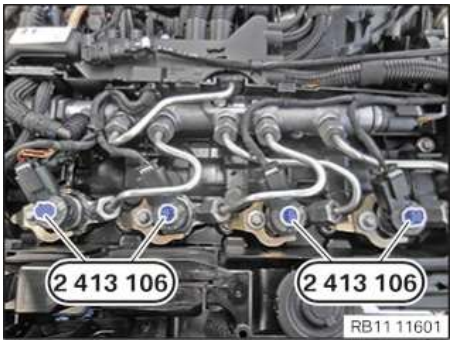


- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



- Seal open connections with special tools .

18 – Remove the high pressure lines between the injector and the rail

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WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

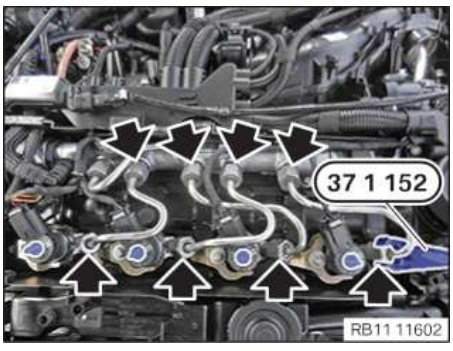
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.



- Release the high pressure lines (arrows) with the special tool .
  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

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19 – Remove the high pressure line between the high pressure pump and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

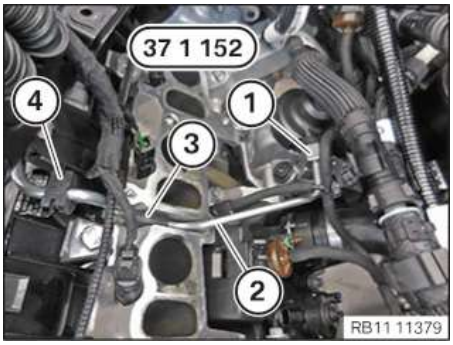
TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

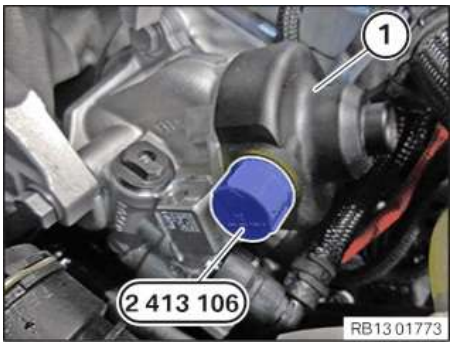


- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.

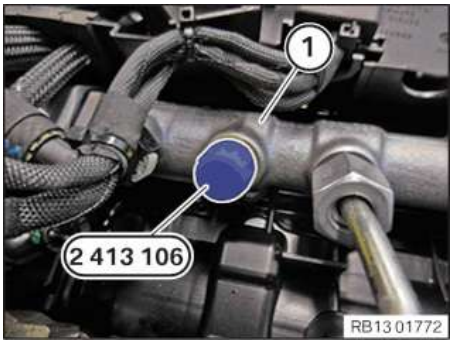
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- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

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20 – Remove high-pressure rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

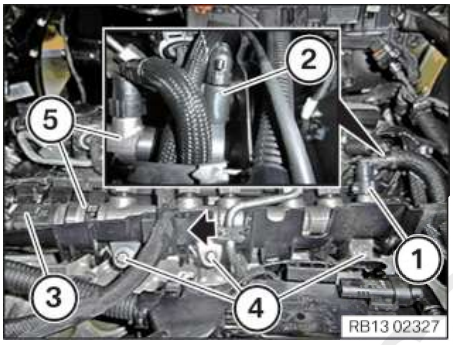
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

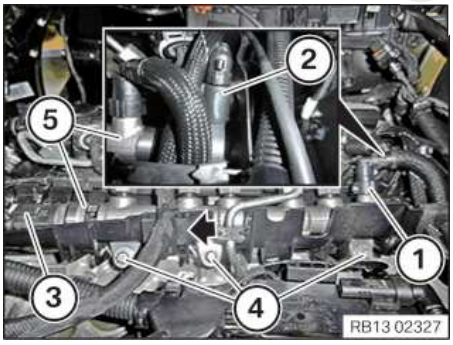
TECHNICAL INFORMATION

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



- Unlock and disconnect the fuel return line (1).
- Guide the fuel return line (1) out and set it aside.
- Unlock and disconnect the plug connection (2) on the rail pressure regulating valve.
- Unlock and disconnect the plug connection (3) on the rail pressure sensor.
- Unlock cable clip (Arrow), feed out and place aside.
- Loosen screws (4).
- Thread out and remove the rail (5).

21 – Installing the rail



- Insert and install the rail (5).
- Tighten the screws (4).

Rail to cylinder head cover

M8		Tightening torque	19 Nm

- Install and lock cable clip (arrow).
  The cable clip (arrow) must engage audibly.
- Connect and lock the connector (3) at the rail pressure sensor.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) at the rail pressure regulating valve.
  The connector (2) must engage audibly.
- Feed in fuel return line (1) and install.
  The fuel return line (1) must audibly engage.

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22 – Installing high pressure line between rail and high pressure pump

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

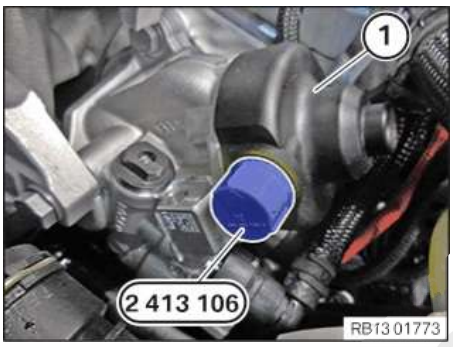
On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

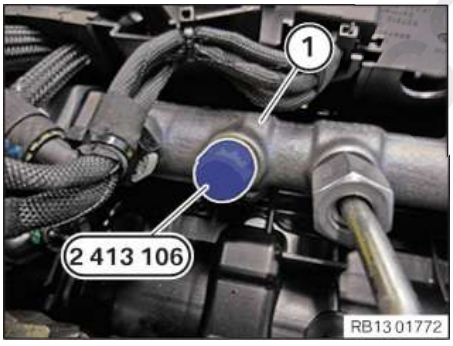
- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

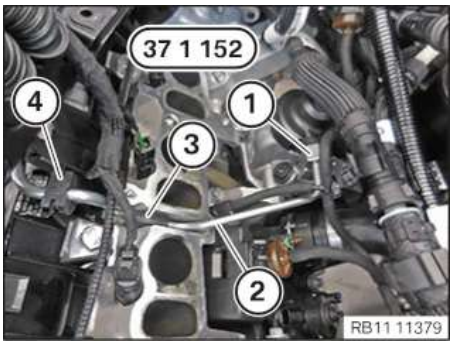
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.

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- Hand-tighten the union nut (1) on the rail.

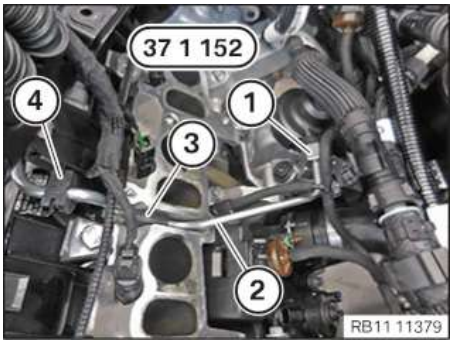
TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm



- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

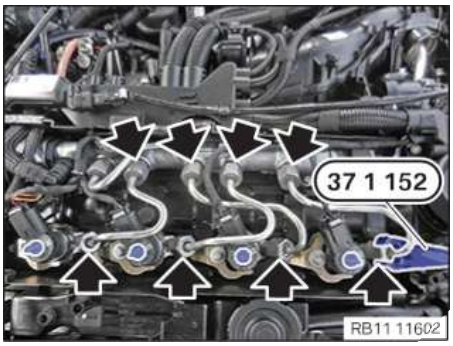
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten union nut (1) on the high pressure pump with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

23 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

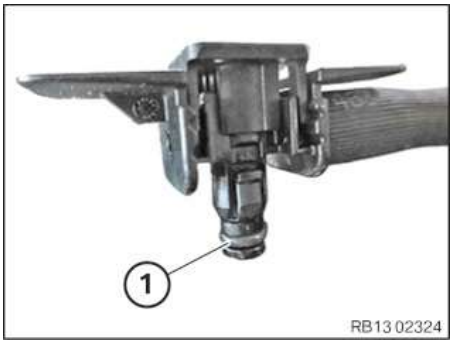
- Tighten the high pressure lines (arrows) with the special tool .

High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

24 – Attach the leakage oil line on the injectors



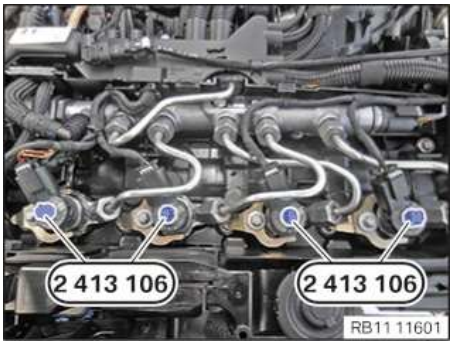
- **Version A:**

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

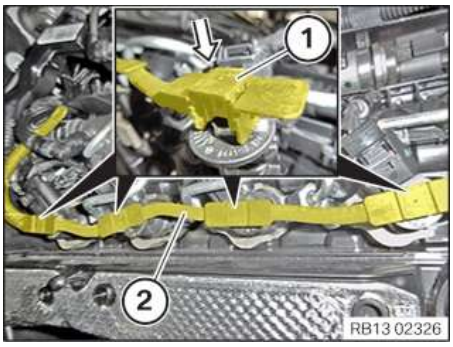
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

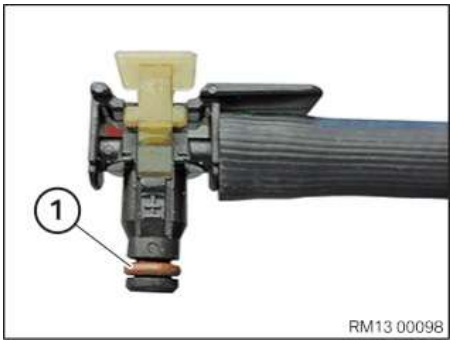
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- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.



- **Version B**:

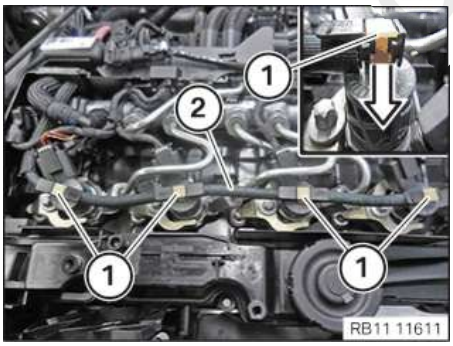
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.



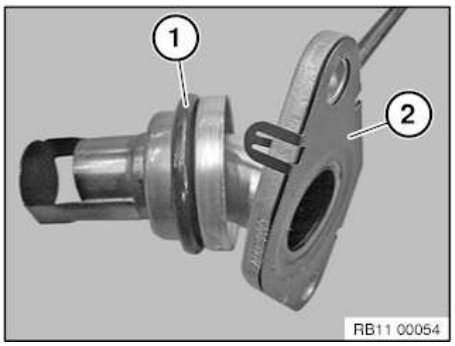
- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

25 – Installing the intake plenum

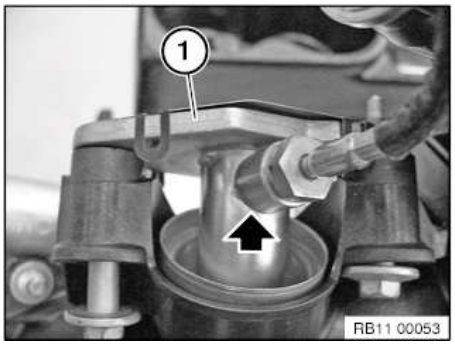
cardiagn.com



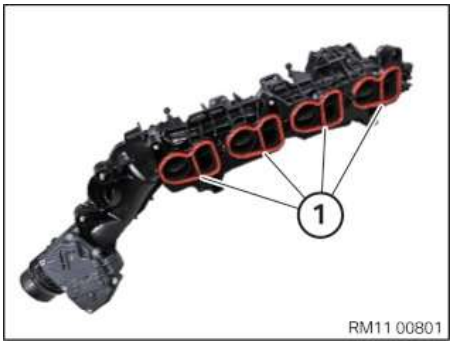
- Renew O-ring (1).

  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

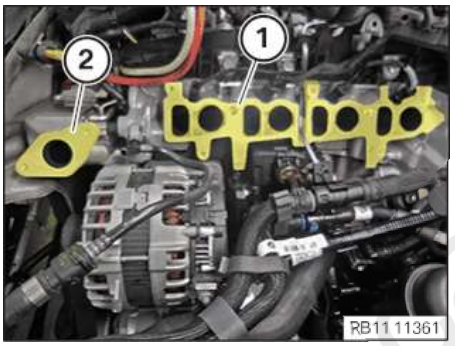


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

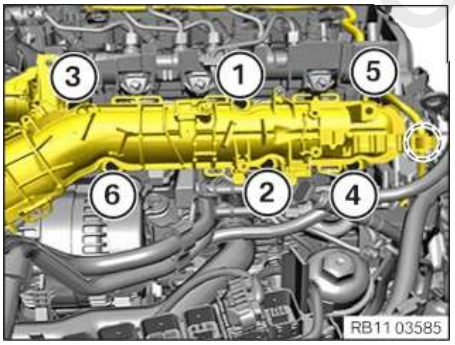


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

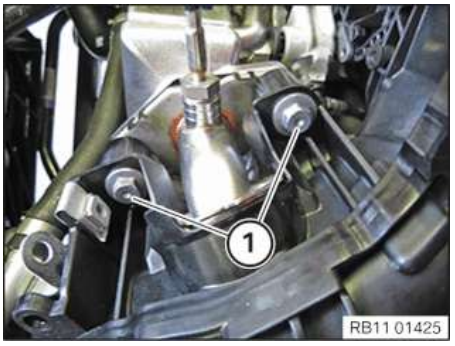


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

- Attach the wiring harness and fuel lines in the marked area on the intake plenum.

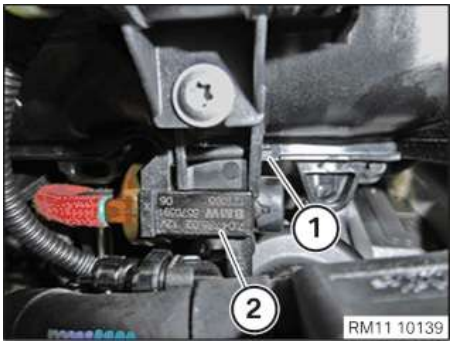


- Tighten the screws (1).

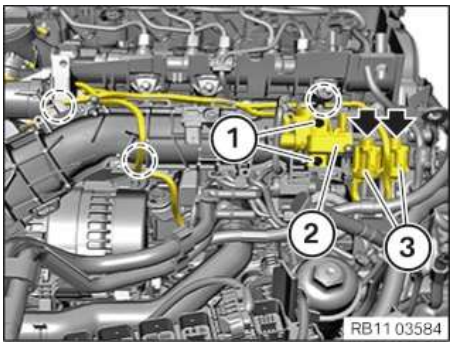
Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm

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- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.
  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

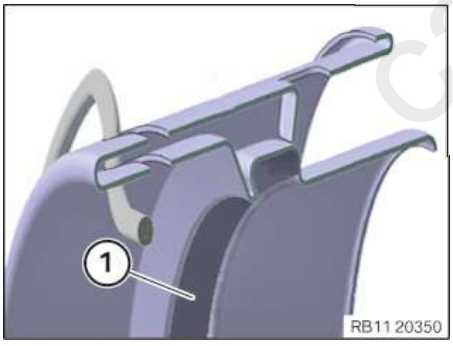


- Check the seal (1) for damage, and renew if necessary.

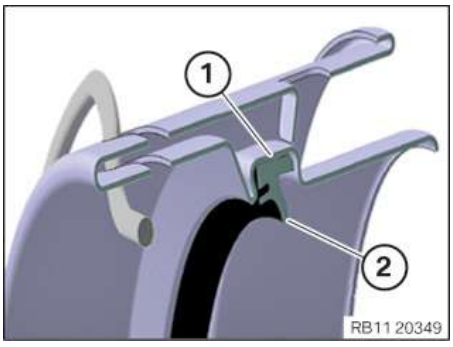
▸ **Replacing damaged seal**

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

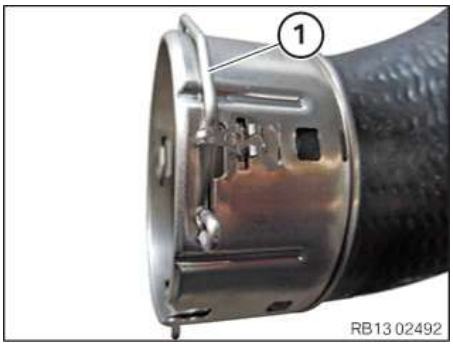
Incorrect assembly is possible. Ensure correct installation position.

- 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 directed inwards as shown.

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- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

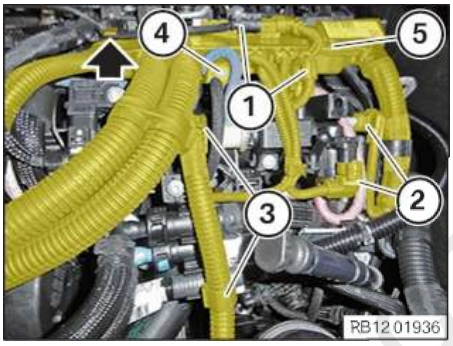
26 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

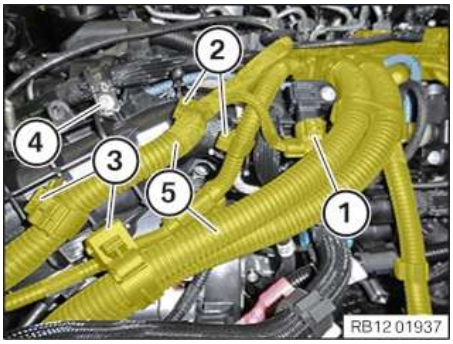
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

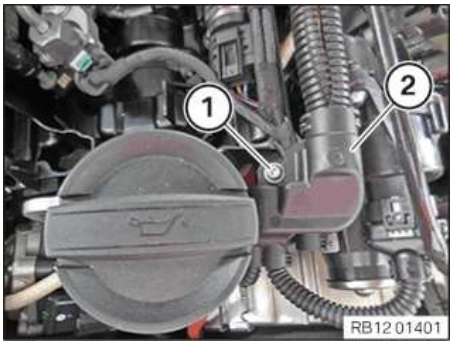
Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



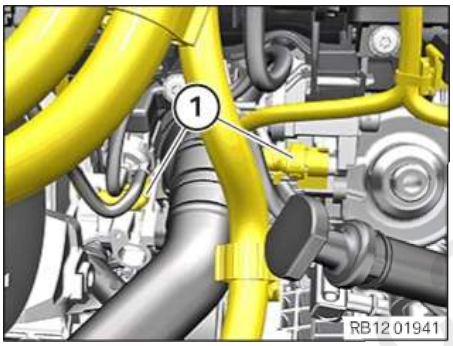
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



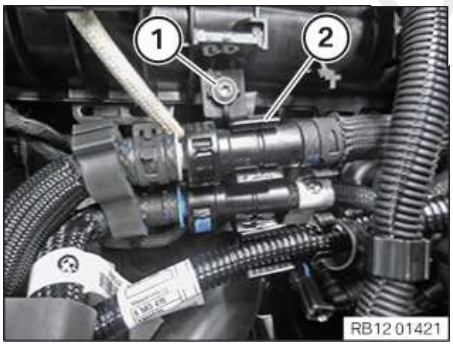
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



- Connect connectors (1) and lock.

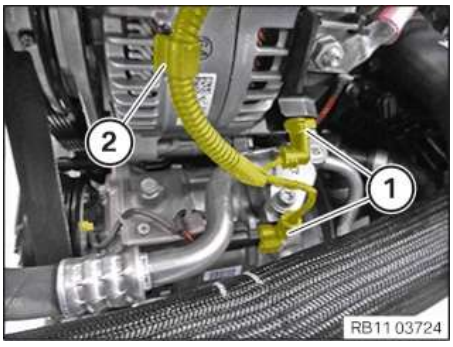
  The connectors (1) must engage audibly.



- Insert and install the holder (2).
- Tighten down screw (1).

Holder on intake plenum

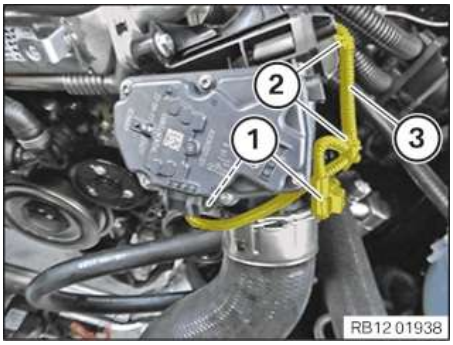
TS6X20		Tightening torque	5 Nm



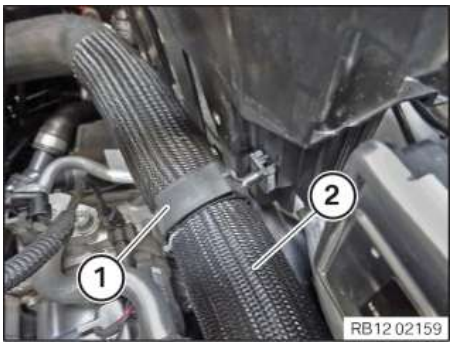
- Connect the connector (1) and lock it.

  The connectors (1) must engage audibly.
- Secure holder (2) to alternator.

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- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.



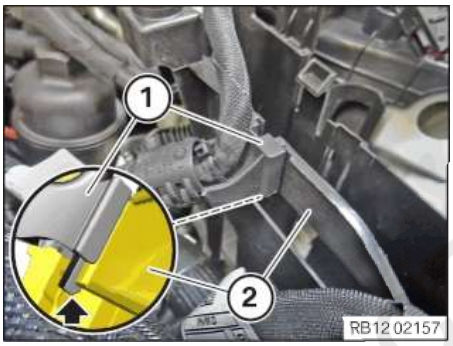
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



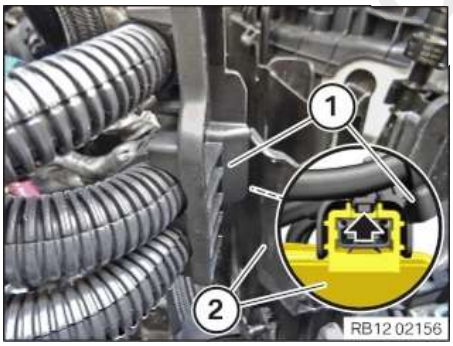
- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.



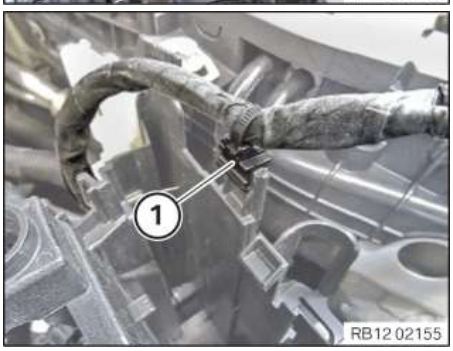
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.



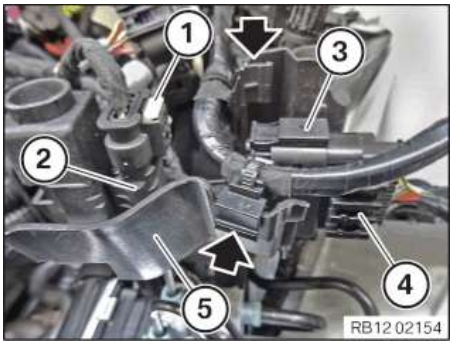
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.

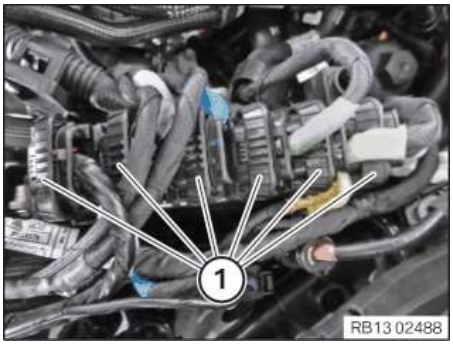


- Secure clamps (1).

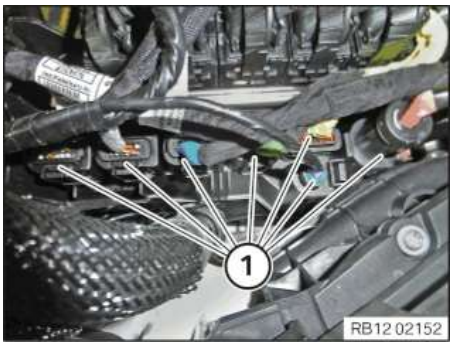
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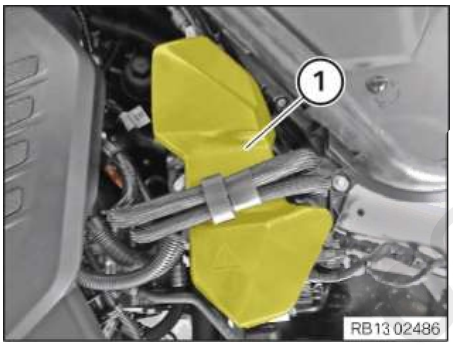
- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
-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



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

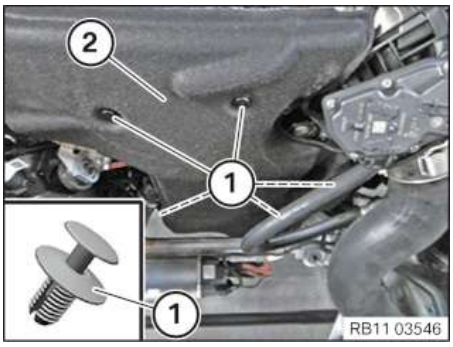


- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.



- Insert and install cover (1) into guides.

27 – Install acoustic cover for the engine, front



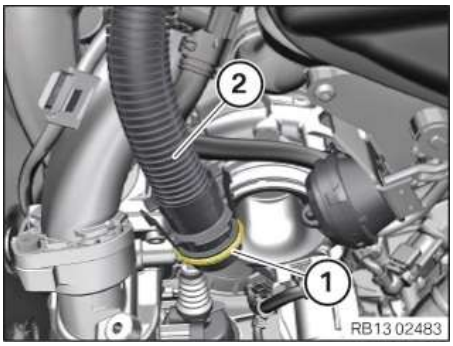
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

28 – Installing the clean air pipe with resonator

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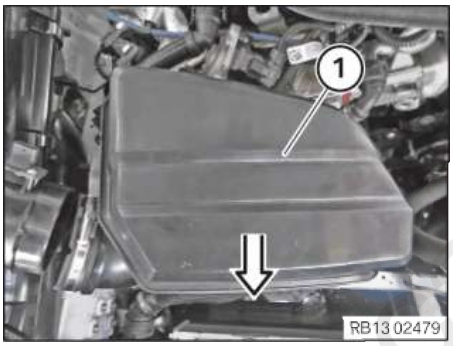
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

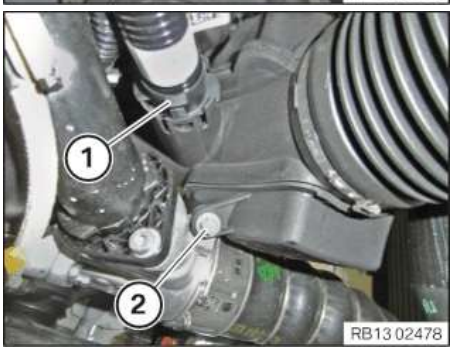


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

  The clamp (1) must engage audibly.

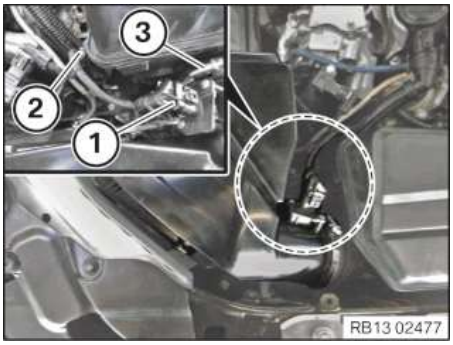


- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm

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

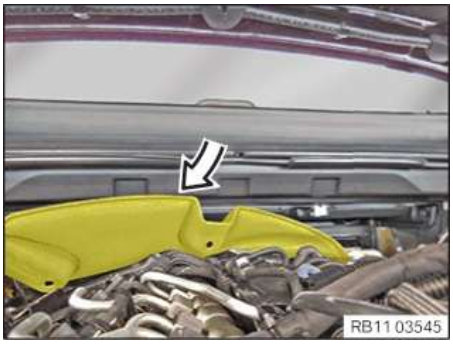
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

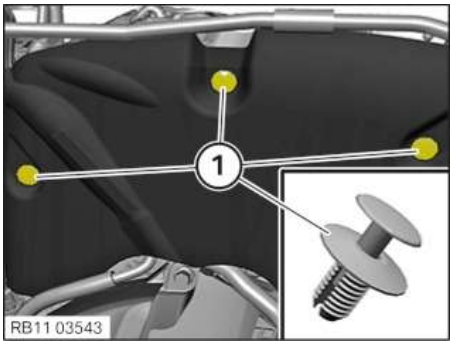
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

29 – Installing acoustic cover at rear

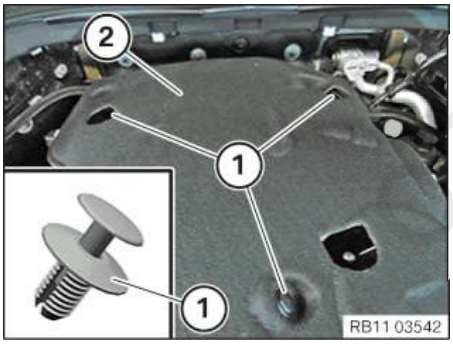


- Guide in the acoustic cover in the direction of the arrow and install it.



- Secure acoustic cover with the expanding rivets (1).

30 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

31 – Install acoustic cover

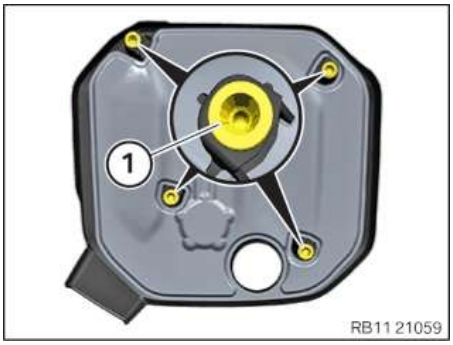
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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

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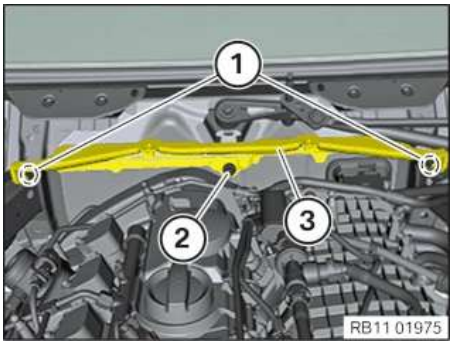


- Check the acoustic cover for correct fit of the rubber mounts (1).



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

32 – Installing centre bulkhead lower section

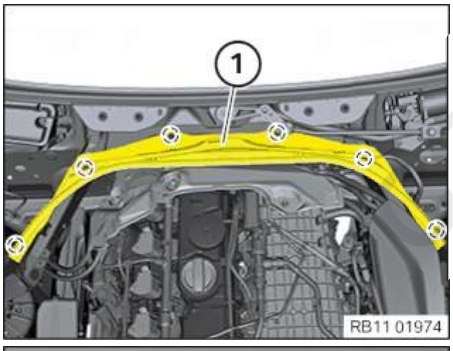


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

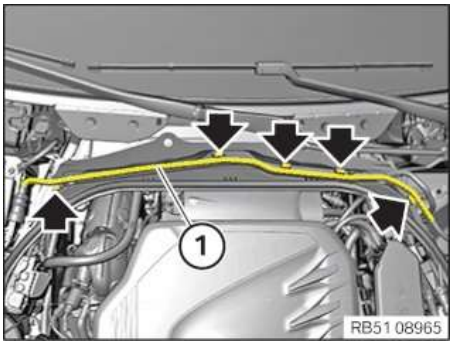
33 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

Bulkhead upper part to bottom bulkhead

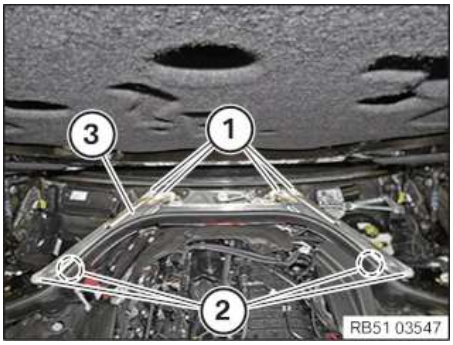
		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

34 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

35 – Installing cowl panel cover

RISK OF DAMAGE

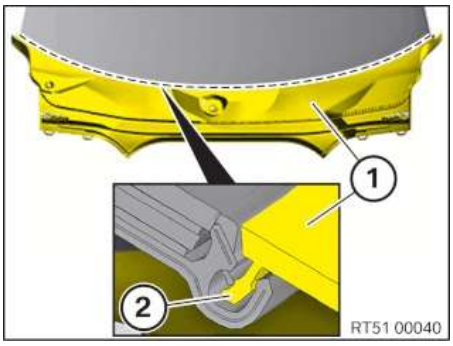
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

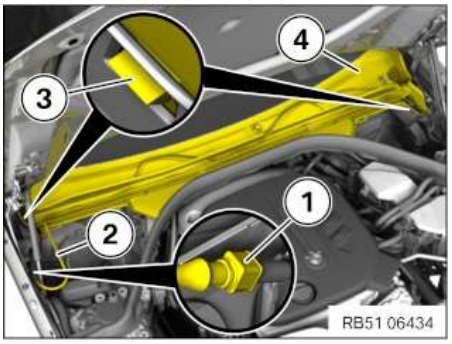
TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.

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- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

36 – Install left and right wiper arm

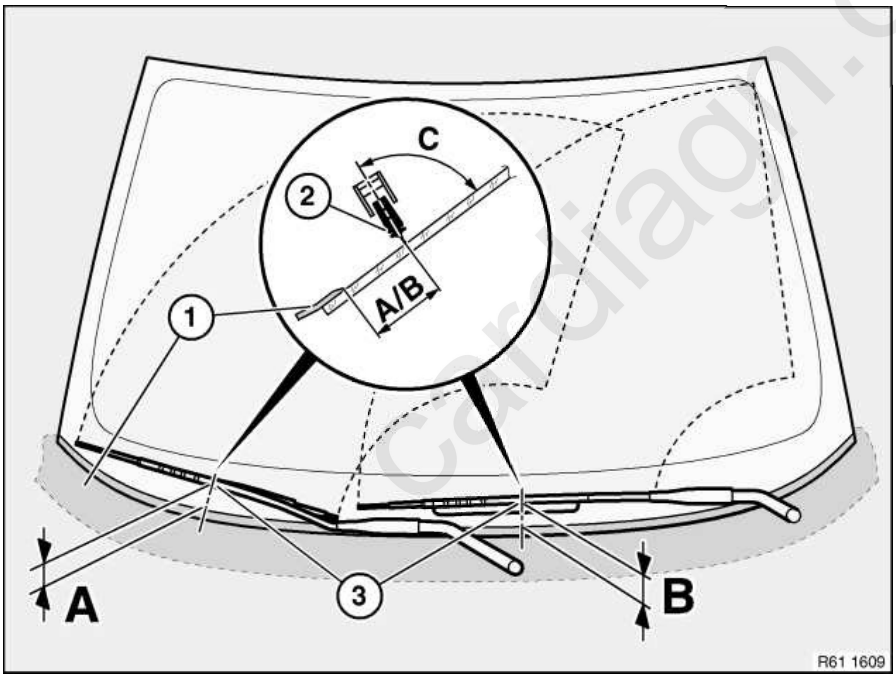
NOTICE

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

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

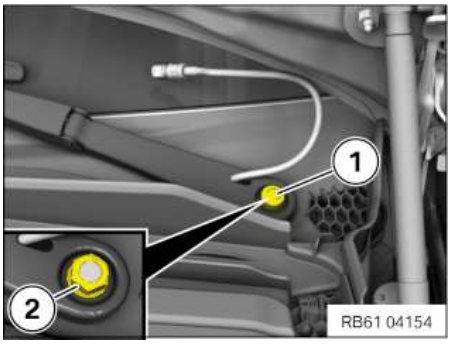
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm



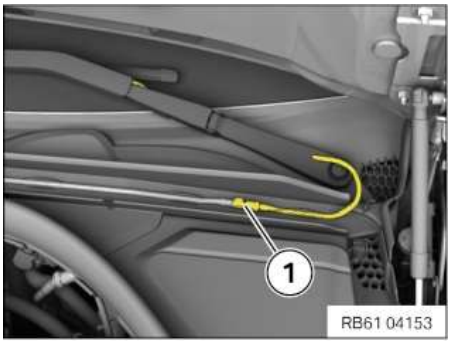
- Tighten nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

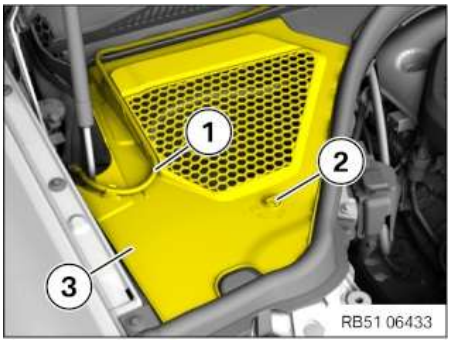
- Connect the protective cap (1).

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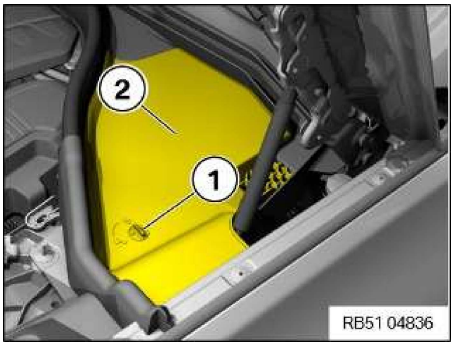
- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

37 – 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.

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



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

39 – Connecting all battery earth leads



- See additional information.

40 – Take bonnet out of the service position

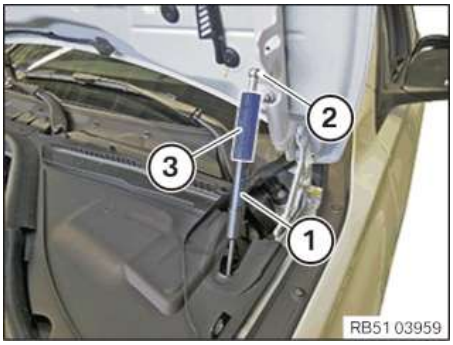
CAUTION

Shutting bonnet or tailgate.

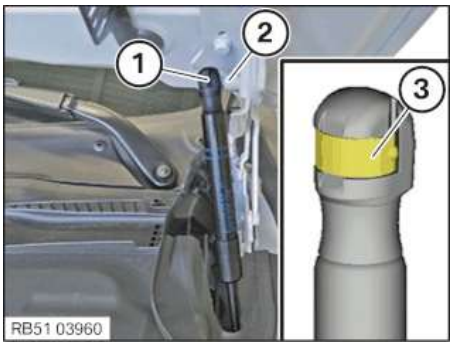
Danger of injury!

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

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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.



- 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

Rail to cylinder head cover			Used in step 21
M8		Tightening torque	19 Nm

High pressure lines between high pressure pump and rail			Used in step 22
High-pressure pipe		Tightening torque	24.5 Nm

High pressure lines between injector and rail			Used in step 23
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 25
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 25
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 25
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 26
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 26
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 26
TS5x20		Tightening torque	3,6 Nm

Holder on intake plenum			Used in step 26
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 28
M6X20		Tightening torque	8 Nm

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

Bulkhead lower part to body			Used in step 32
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 33
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 33
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 33
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 36
Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 36
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting battery earth lead	239
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	239
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting battery earth lead	239
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 20 900 Disconnecting and connecting battery earth lead	239
61 35 ... Notes on ESD protection (Electro Static Discharge)	15
61 35 ... Notes on ESD protection (Electro Static Discharge)	15

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13 53 180 Replace pressure line

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

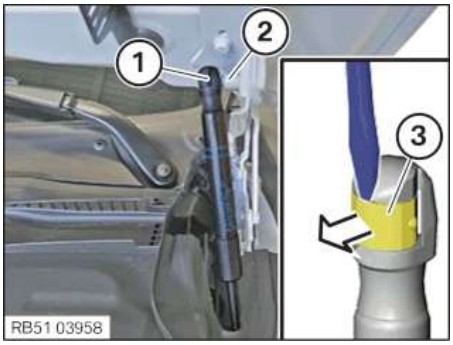
Engine compartment lid is open.

CAUTION

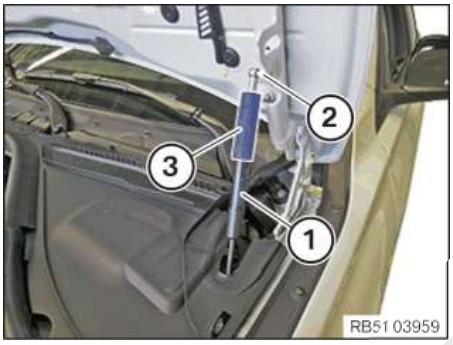
Shutting bonnet or tailgate.

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.
- Pull special tool or 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

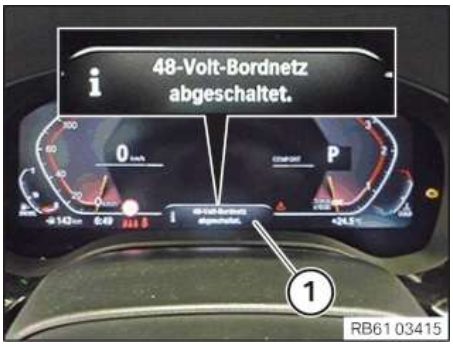
TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

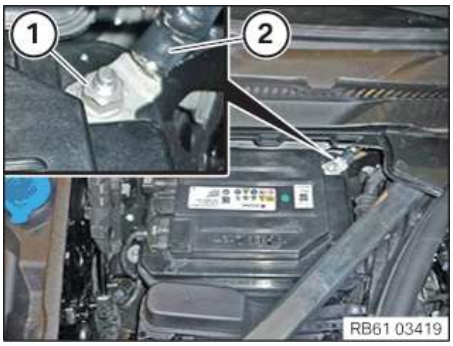
- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

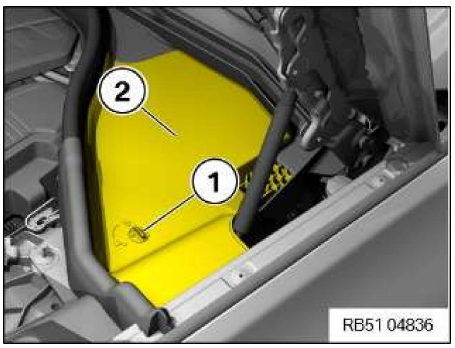
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

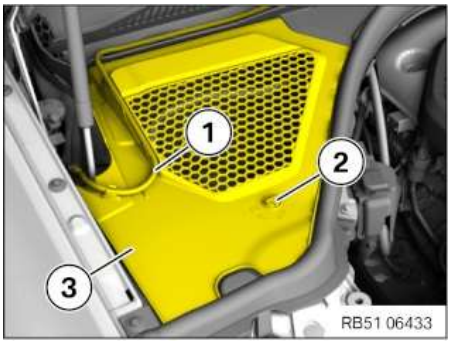
4 – Remove the cover of the engine compartment at the rear left



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

5 – 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 (3) of the rear right engine compartment.

6 – Removing the wiper arm on the left and right

NOTICE

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

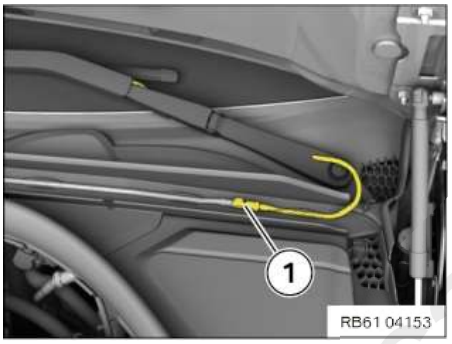
► **Remove the wiper arm**

RISK OF DAMAGE

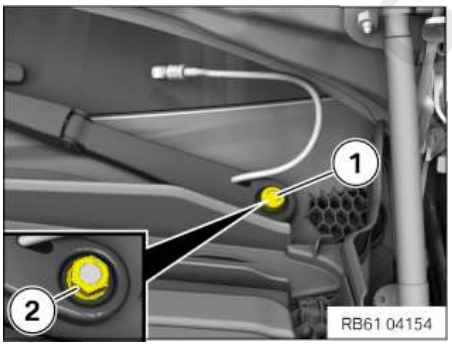
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

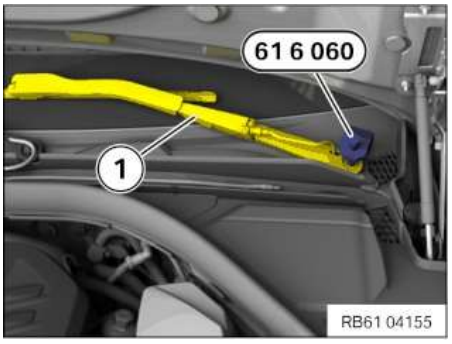
- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.



- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



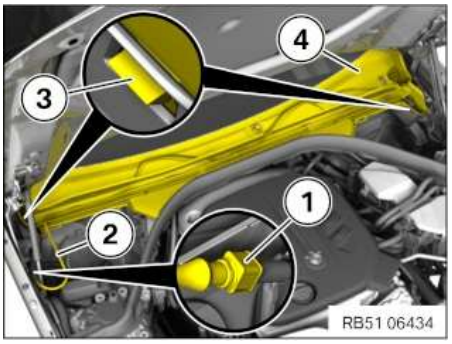
- Remove the protective cap (1).
- Loosen nut (2).



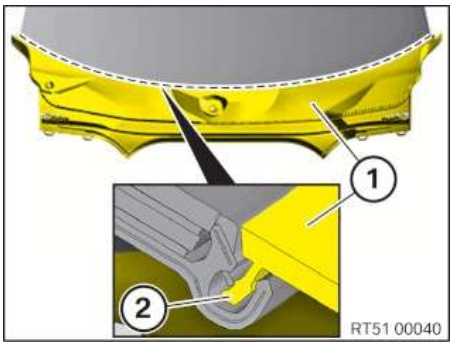
- Pull off the wiper arm (1) using special tool .

7 – Remove cowl panel cover

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- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

8 – Remove the seal for the rear bonnet

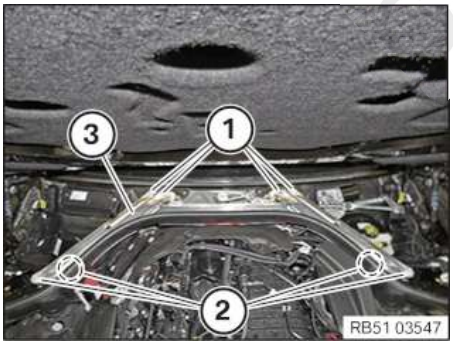


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

9 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

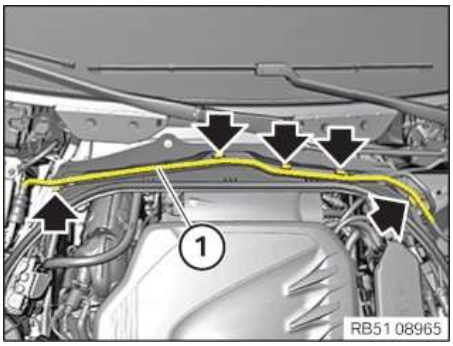
Driving without the strut brace/front-end strut or tension strut is not permitted.



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

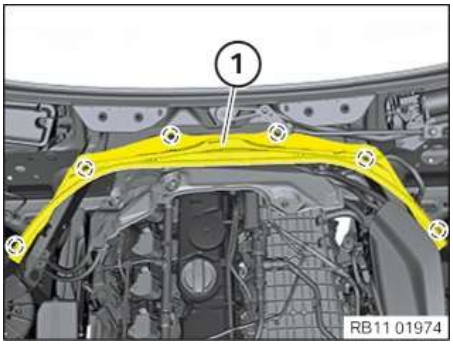
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.



- **Version with mild hybrid technology:**

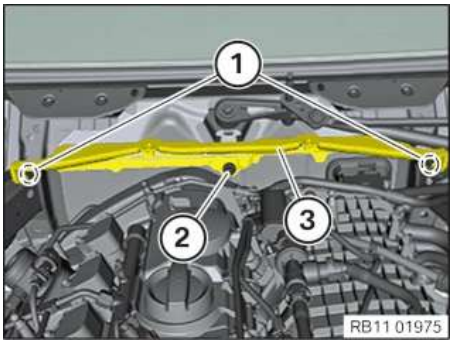
  Unclip the wire (1) at the holders (arrows).

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- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

10 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

11 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

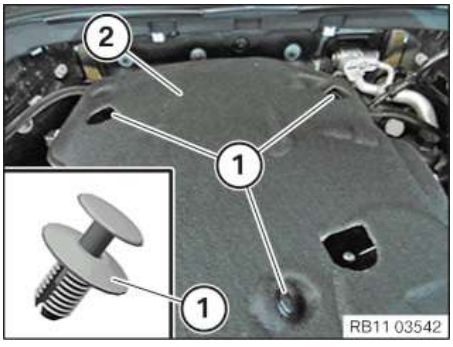
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

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



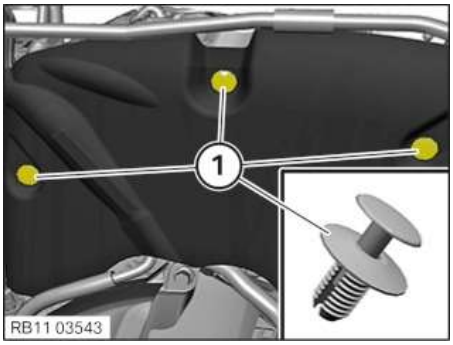
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

12 – Remove the acoustic cover for the injectors

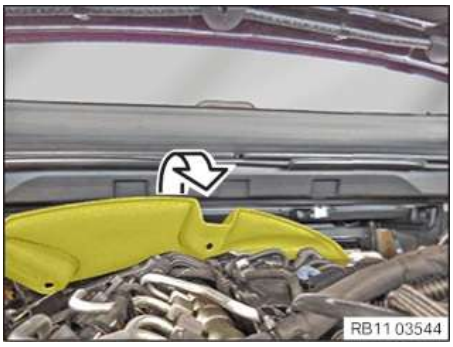


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

13 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

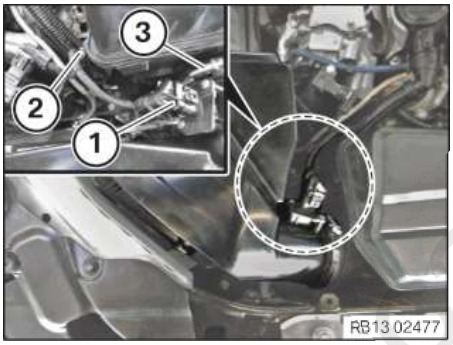
14 – Removing the clean air pipe with the resonator

WARNING

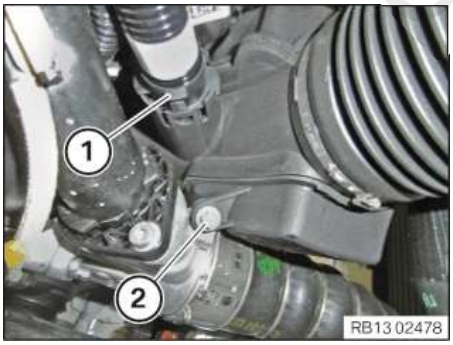
Hot surfaces.

Risk of burning!

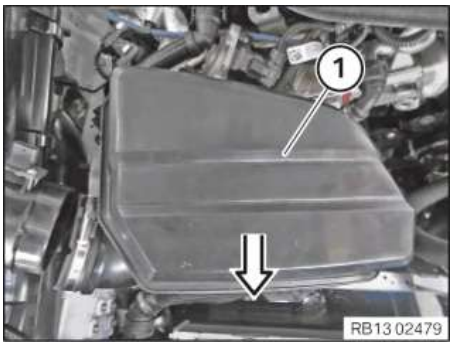
- Perform all work only on components that have cooled down.



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



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

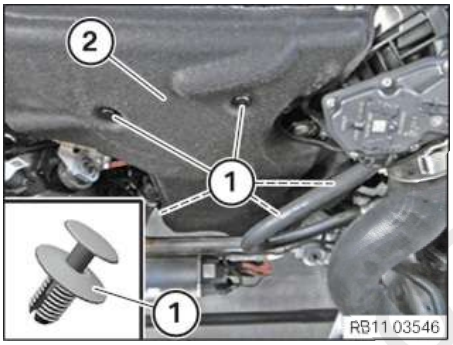
15 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

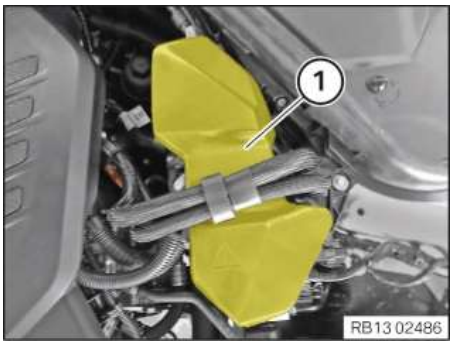
Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

16 – Remove the cover for the DDE control unit



- Pull off, guide out and remove cover (1) upwards.

17 – Partially releasing the wiring harness section on the intake plenum

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RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

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

RISK OF DAMAGE

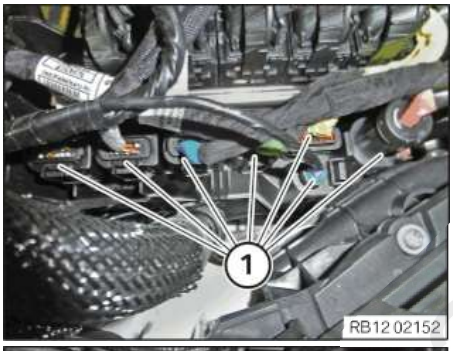
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

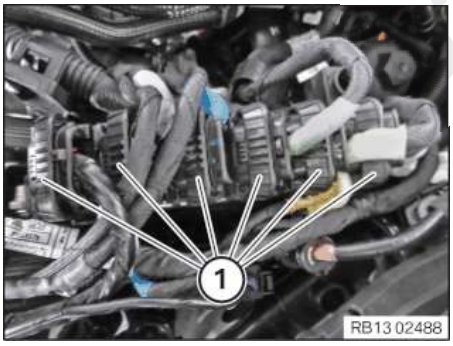
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

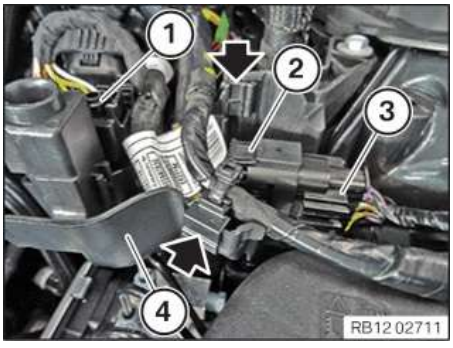
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Unlock and disconnect plug connections (1).

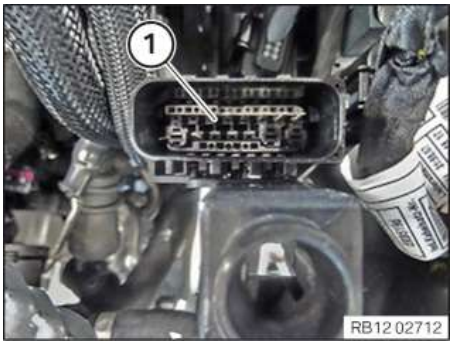


- Unlock and disconnect plug connections (1).

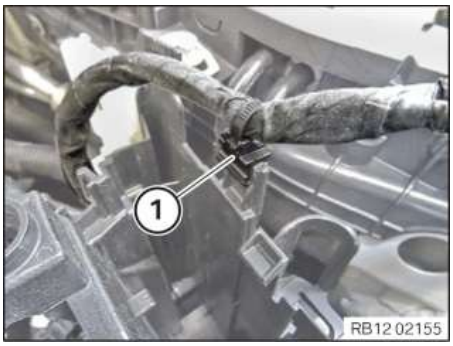


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Release the connector (3) and disconnect from the control unit holder (4).
- Release the clamps (arrows).

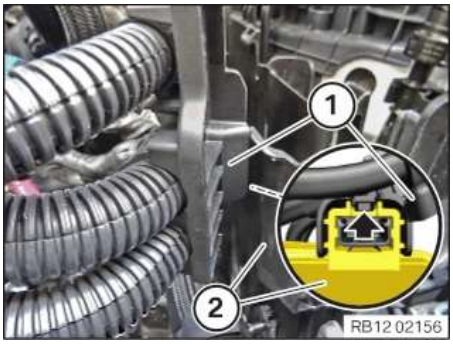
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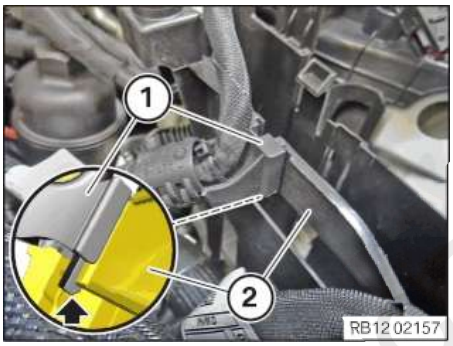
- Unlock plug connection (1) and disconnect.



- Loosen clamp (1).



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



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

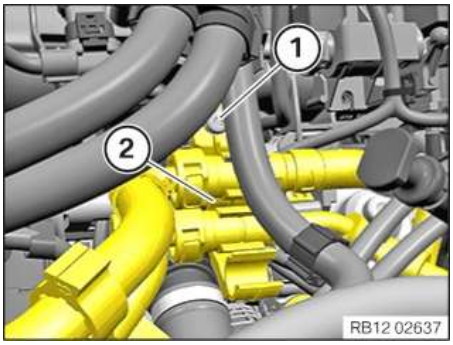


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

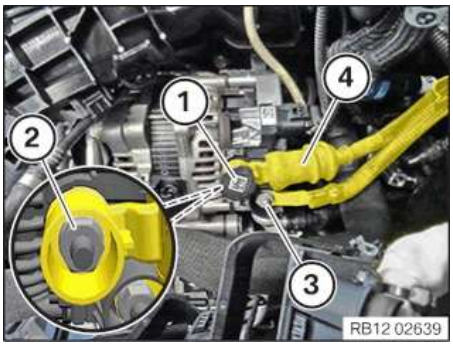


- Unlock holder (1) and feed out coolant line (2) and place it aside.

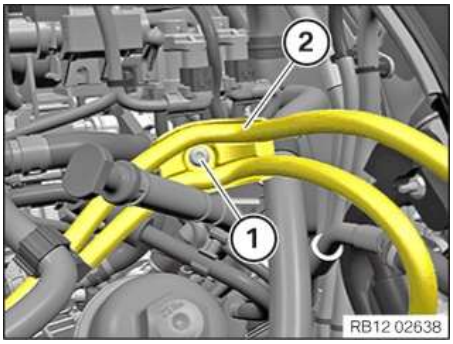
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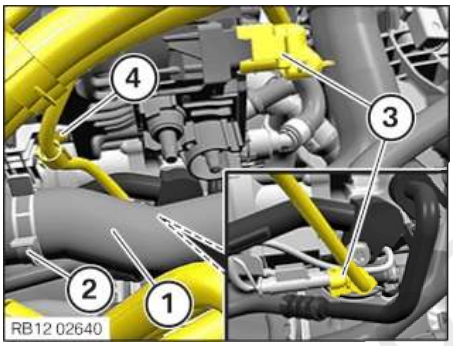
- Release the screw (1).
- Guide out fuel lines (2) and set them aside.



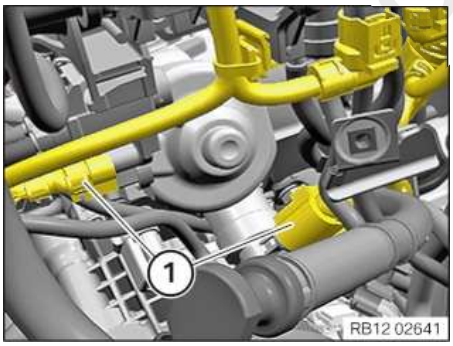
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.



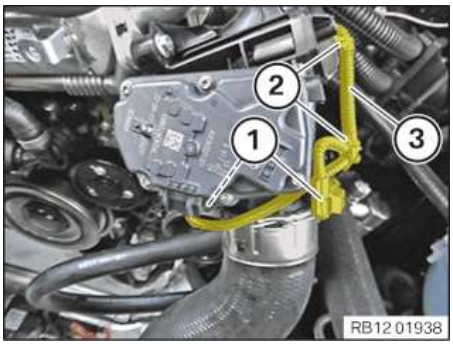
- Release the screw (1).
- Guide out the positive battery cables (2) and set them aside.



- Release the coolant line (1) from the holder (2) .
- Unlock plug connections (3) and disconnect.
- Loosen clamp (4).



- Unlock and disconnect plug connections (1).



- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.

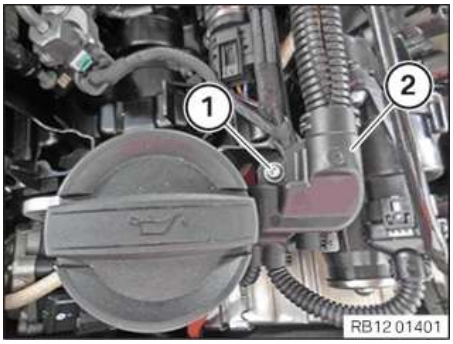
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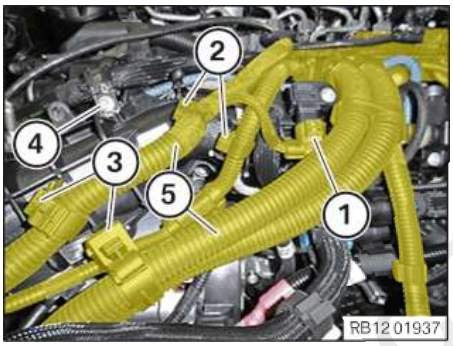
- Unlock and loosen connector (1).



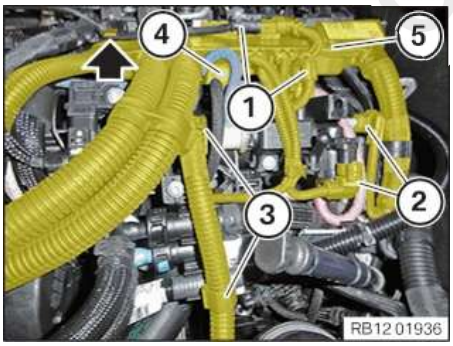
- Unlock plug connection (1) and disconnect.



- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

18 – Removing the intake plenum

TECHNICAL INFORMATION

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

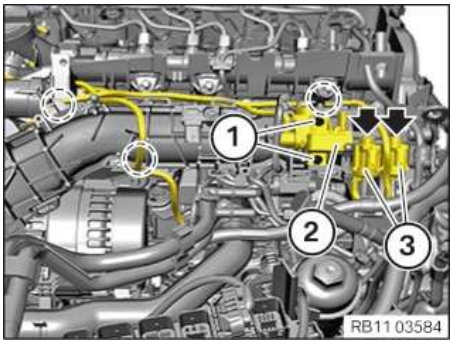
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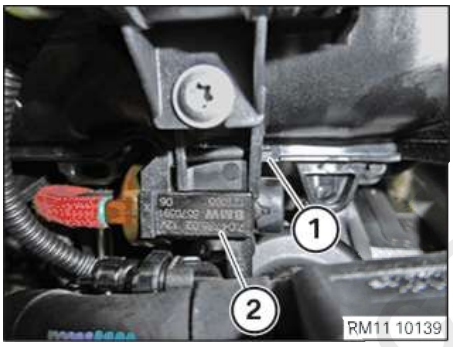
- Unlock clamp (1) and engage in this position.



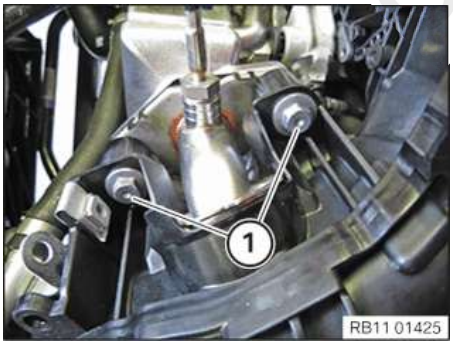
- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.



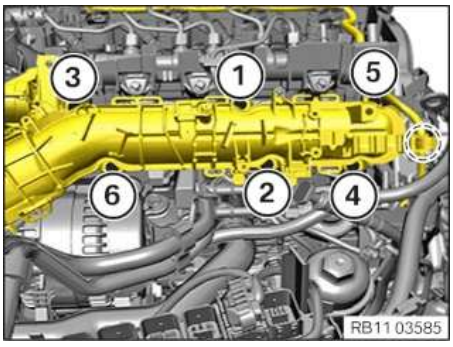
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.

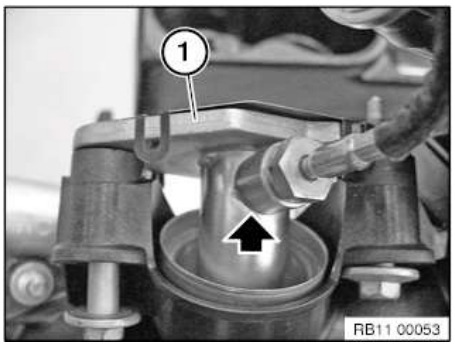


- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.

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- Remove the exhaust-gas recirculation pipe (1) (arrow).

MAIN WORK

19 – Remove the high pressure line between the high pressure pump and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

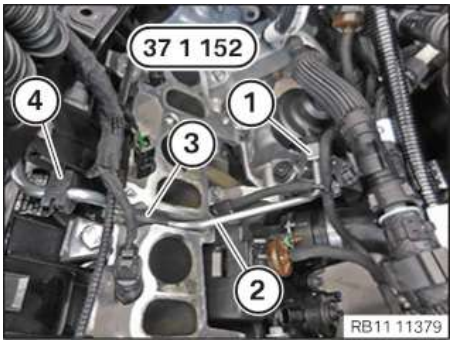
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TECHNICAL INFORMATION

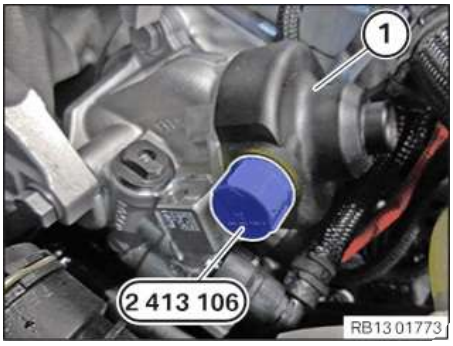
Reset special tool in early to avoid bending pressure lines.



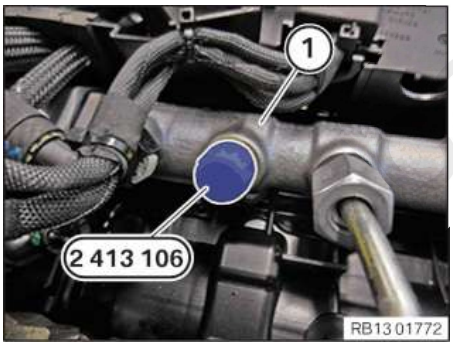
- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.



- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

20 – Installing high pressure line between rail and high pressure pump

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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CAUTION

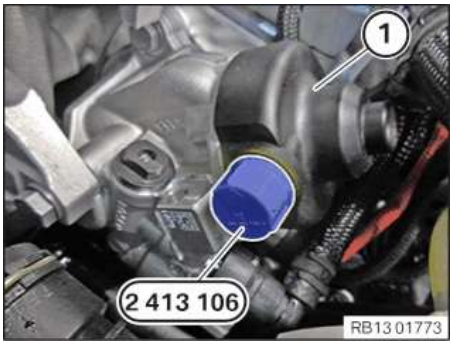
On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

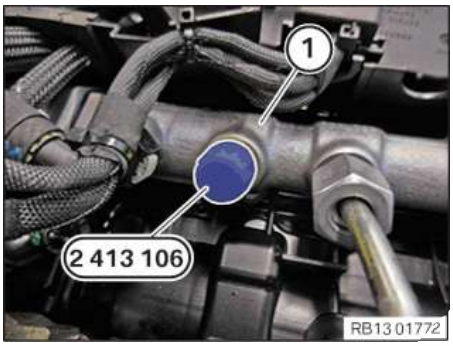
- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

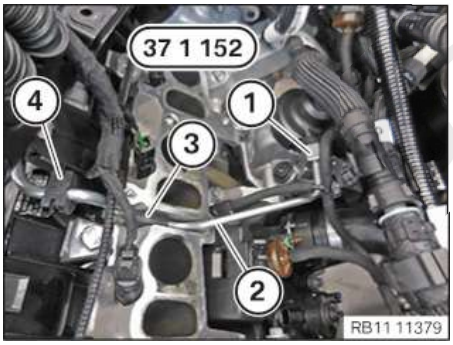
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.



- Hand-tighten the union nut (1) on the rail.

TECHNICAL INFORMATION

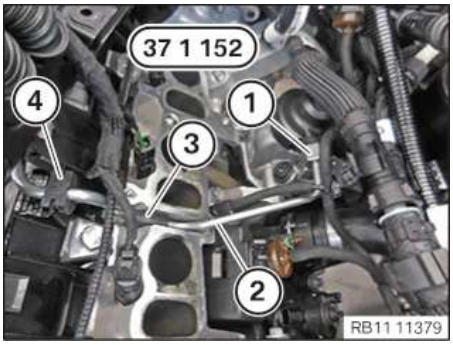
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

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- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

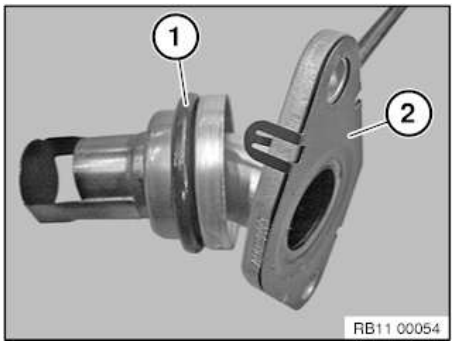
- Tighten union nut (1) on the high pressure pump with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

POSTPROCESSES

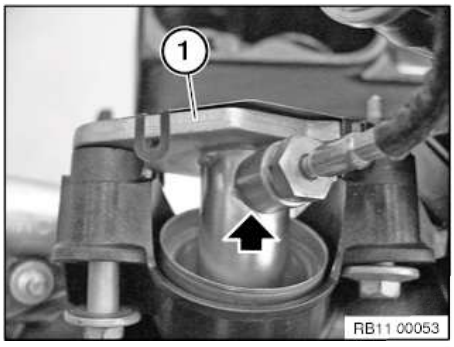
21 – Installing the intake plenum



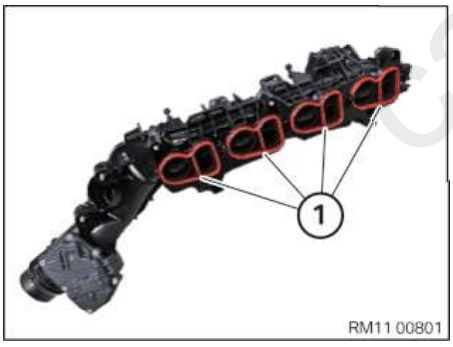
- Renew O-ring (1).

  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

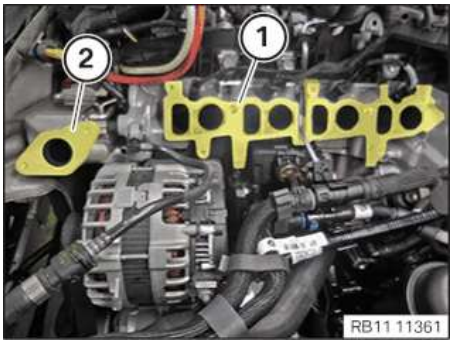


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).



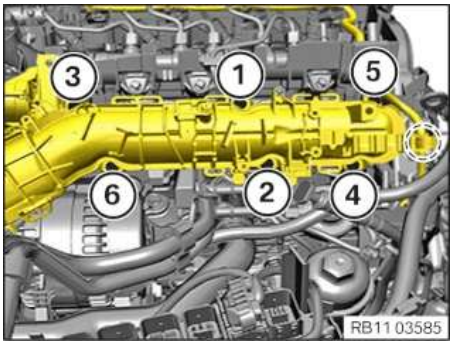
- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

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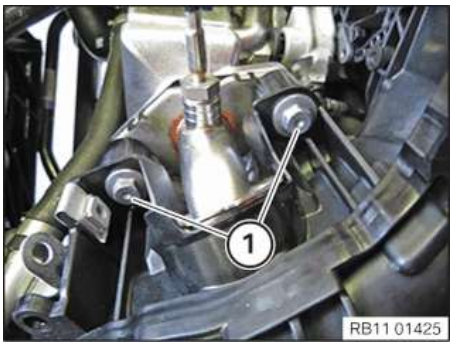


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

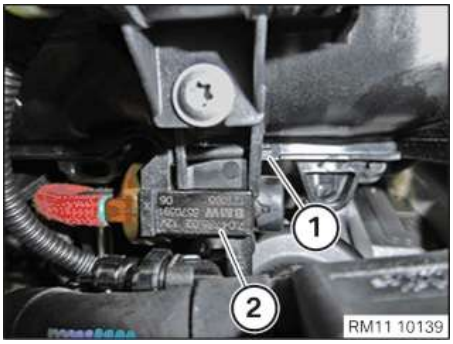
- Attach the wiring harness and fuel lines in the marked area on the intake plenum.



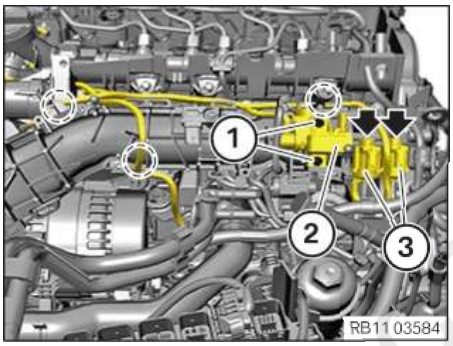
- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm



- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.
  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

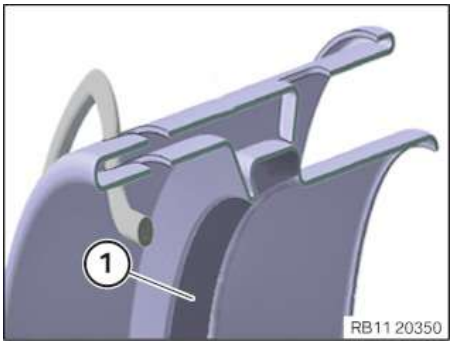


- Check the seal (1) for damage, and renew if necessary.

▸ **Replacing damaged seal**

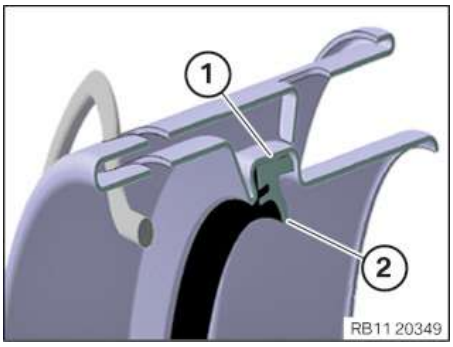
TECHNICAL INFORMATION

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 directed inwards as shown.



- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

22 – Partially securing the wiring harness section on the intake plenum

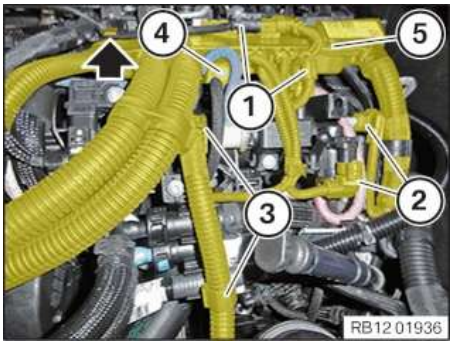
RISK OF DAMAGE

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.

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- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

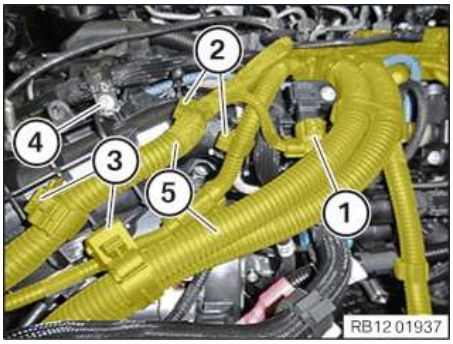
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



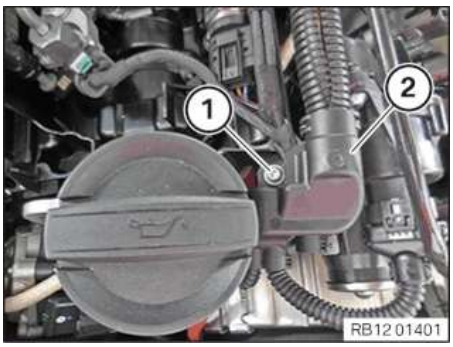
- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



- Connect connectors (1) and lock.

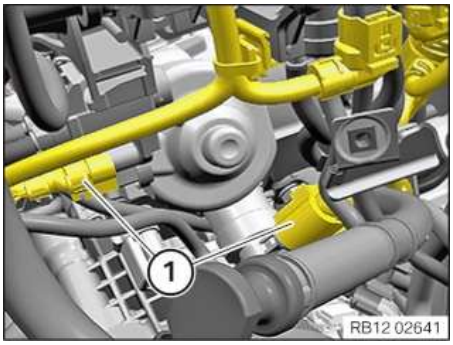
  The connector (1) must engage audibly.



- Connect the connector (1) and lock it.

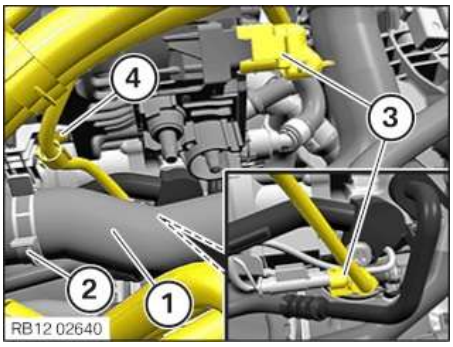
  The connector (1) must engage audibly.

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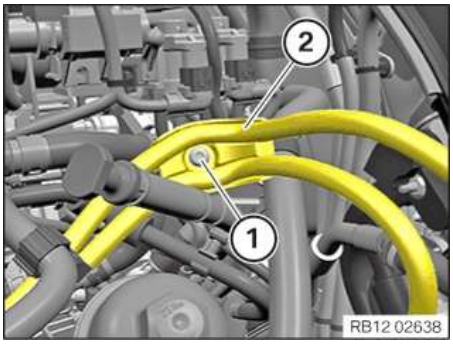
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Secure the clamp (4).
- Connect connectors (3) and lock.

  The connectors (3) must engage audibly.
- Feed the coolant line (1) into the holder (2) and install it.



- Feed in and position the positive battery cables (2) .
- Tighten down screw (1).

Standard screw connection M6

M6		Tightening torque	8 Nm



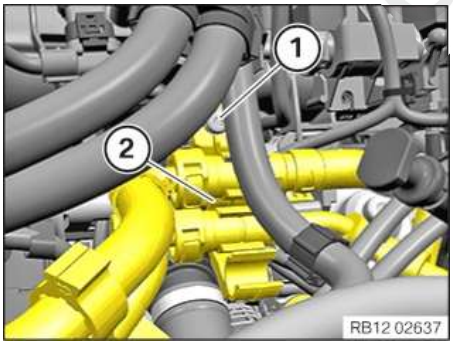
- Feed in and install the positive battery cable (4).
- Feed in and position the positive battery cables (4) .
- Renew the nuts (3) and (2).

  Parts: Nuts
- Tighten nuts (3) and (2).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm

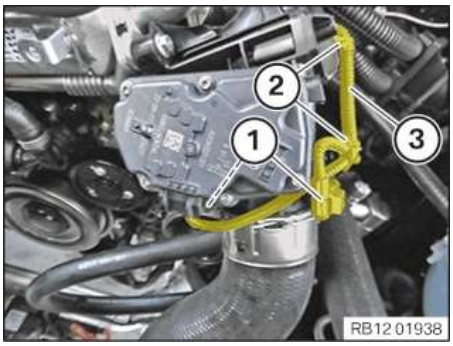
- Guide in and install the lid (1).



- Insert and install the holder (2).
- Tighten down screw (1).

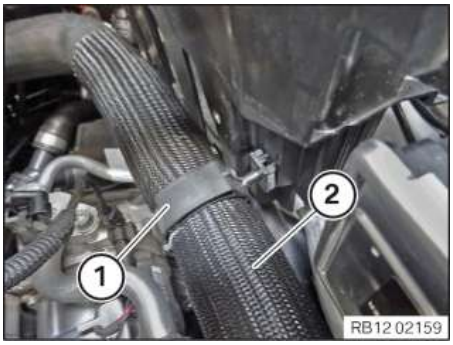
Holder on intake plenum

TS6X20		Tightening torque	5 Nm



- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.

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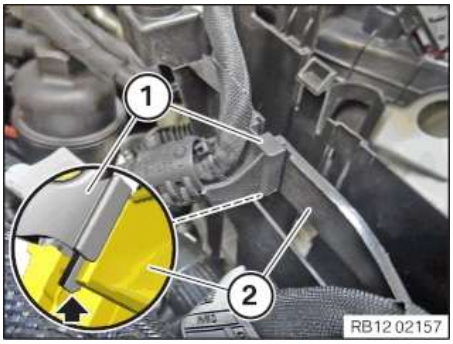
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



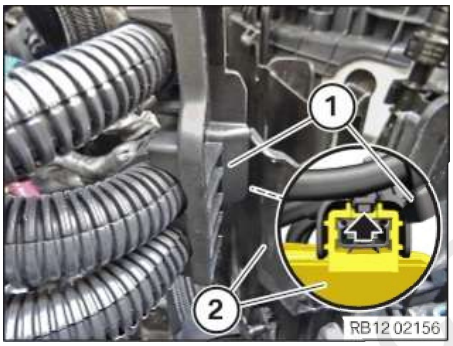
- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.



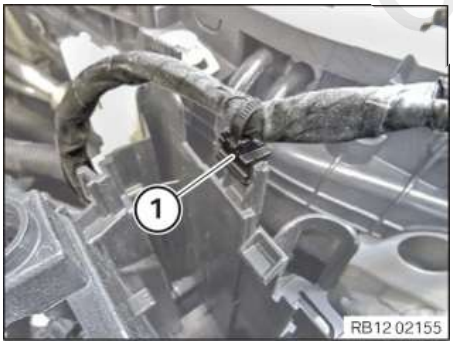
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.

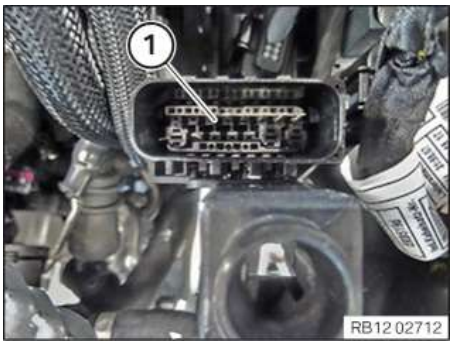


- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.



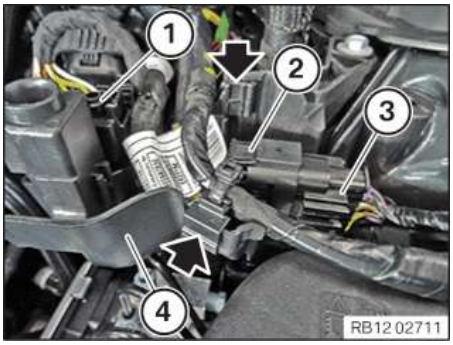
- Secure clamps (1).



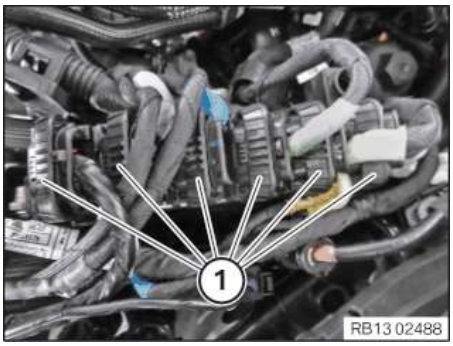
- Feed in and install the connector (1).

  The connector (1) must engage audibly.

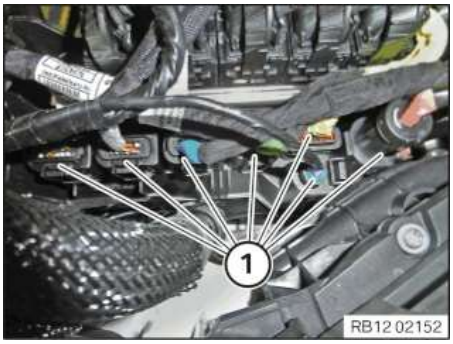
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- Connect connector (3) to control unit holder (4) and lock it.
  The connector (3) must engage audibly.
- Connect connectors (2) and lock.
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.
  The connector (1) must engage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

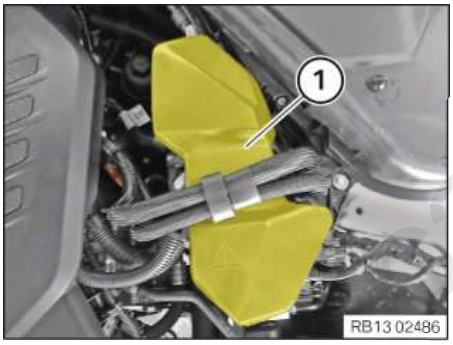


- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.



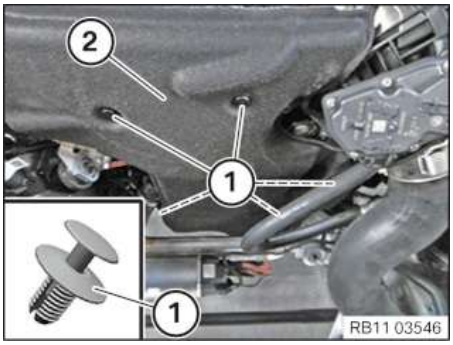
- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.

23 – Install the cover for the DDE control unit



- Insert and install cover (1) into guides.

24 – Install acoustic cover for the engine, front



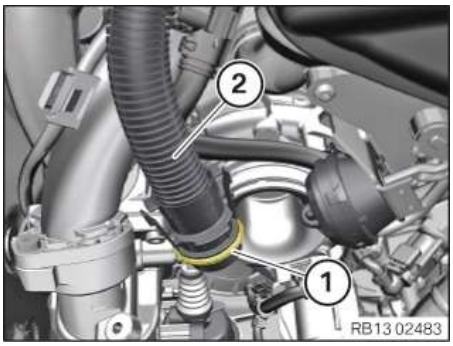
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

25 – Installing the clean air pipe with resonator

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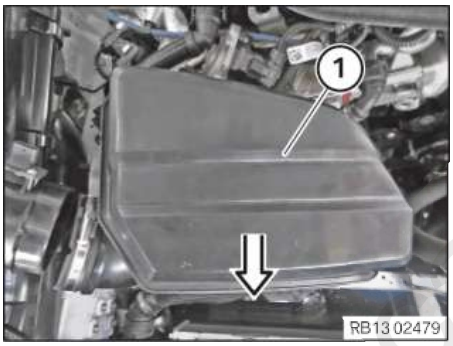
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

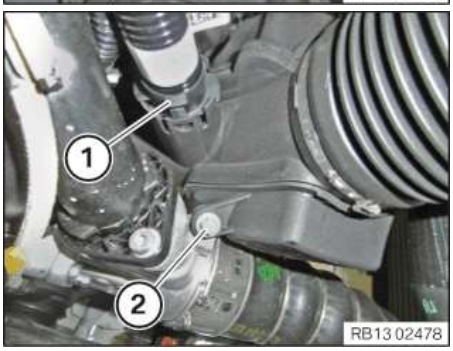


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

  The clamp (1) must engage audibly.

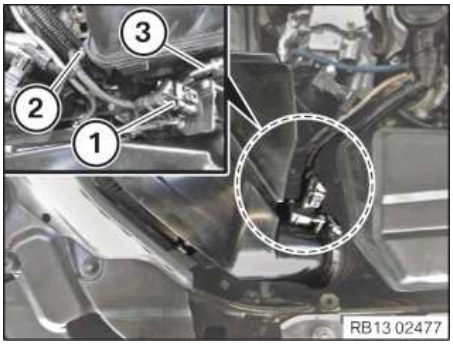


- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm

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

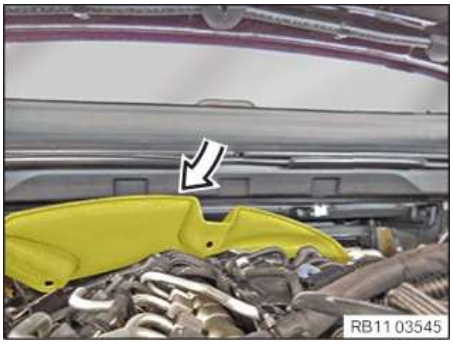
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

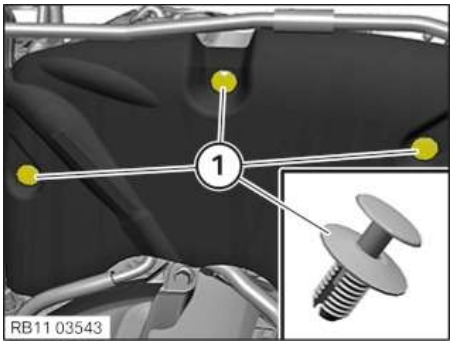
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

26 – Installing acoustic cover at rear

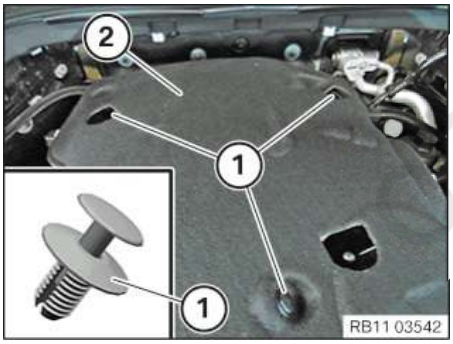


- Guide in the acoustic cover in the direction of the arrow and install it.



- Secure acoustic cover with the expanding rivets (1).

27 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

28 – Install acoustic cover

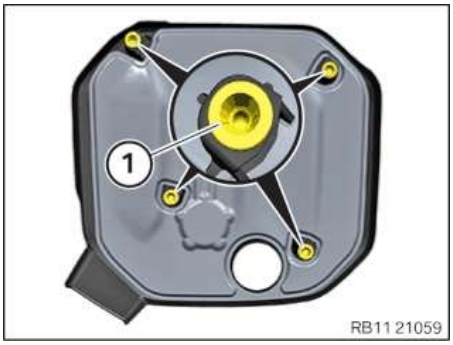
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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

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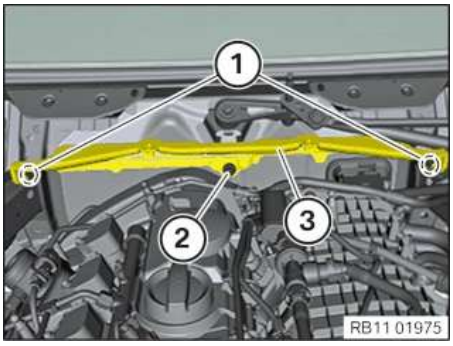


- Check the acoustic cover for correct fit of the rubber mounts (1).



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

29 – Installing centre bulkhead lower section

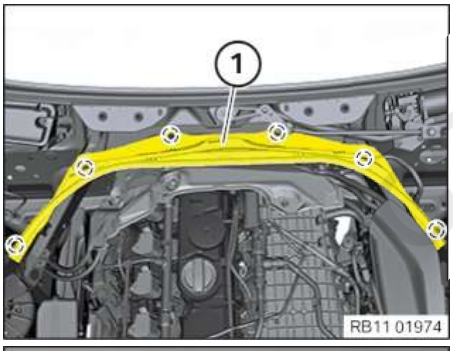


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

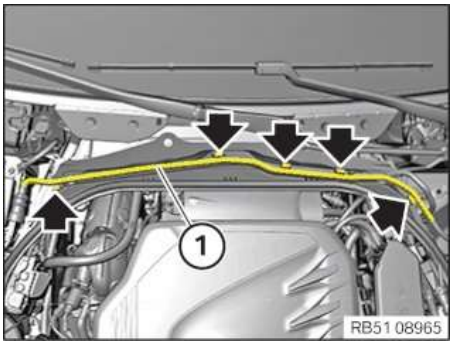
30 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

Bulkhead upper part to bottom bulkhead

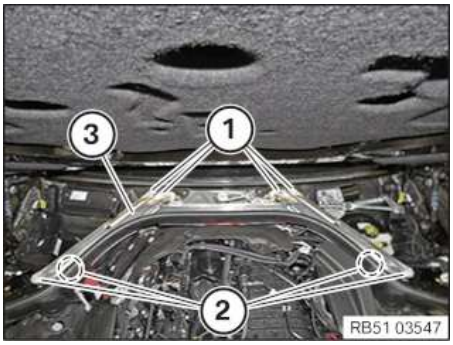
		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

31 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

32 – Installing cowl panel cover

RISK OF DAMAGE

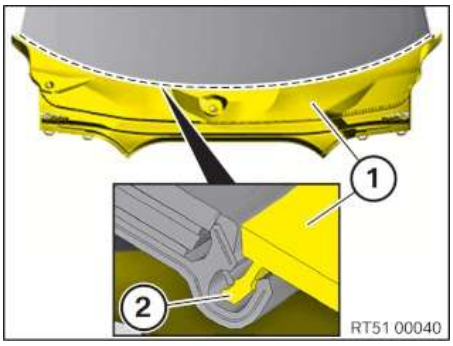
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

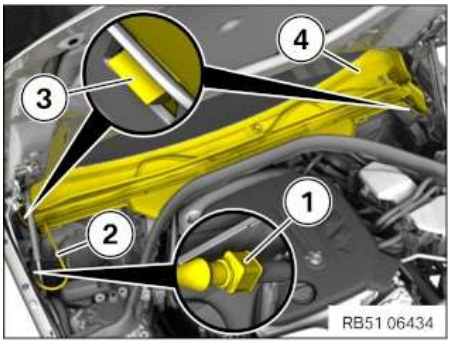
TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.

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- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

33 – Install left and right wiper arm

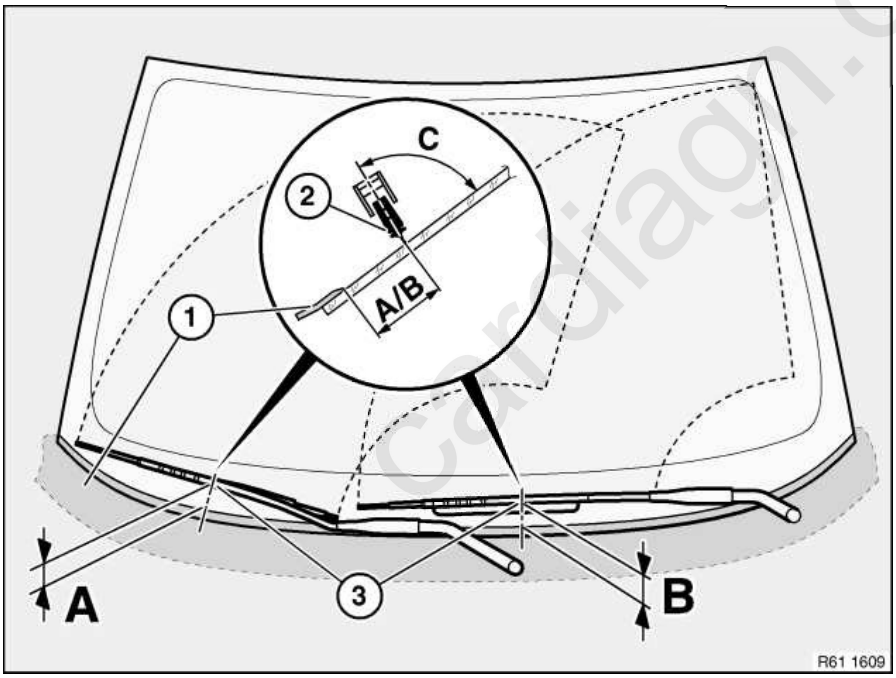
NOTICE

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

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

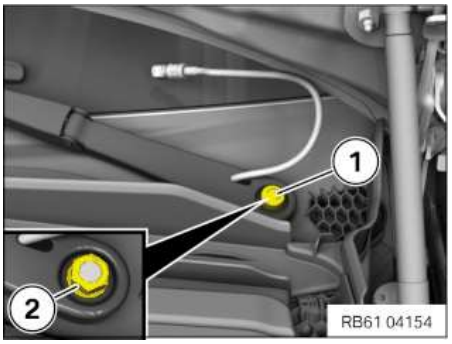
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm



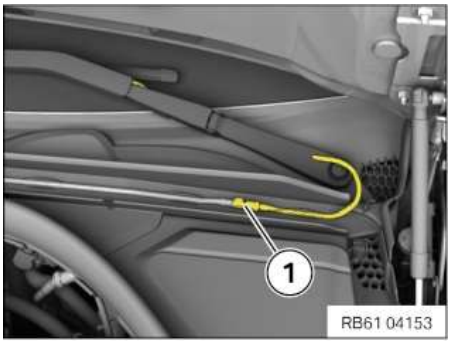
- Tighten nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

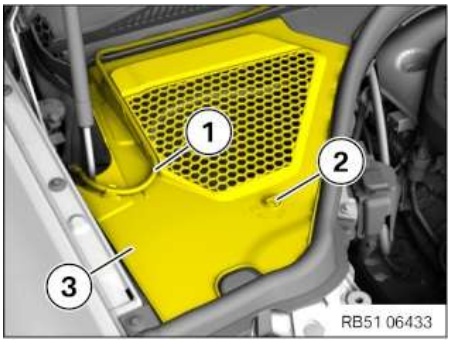
- Connect the protective cap (1).

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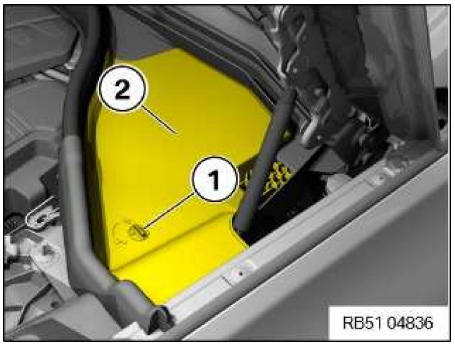
- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

34 – 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.

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 – Connecting all battery earth leads



- See additional information.

37 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

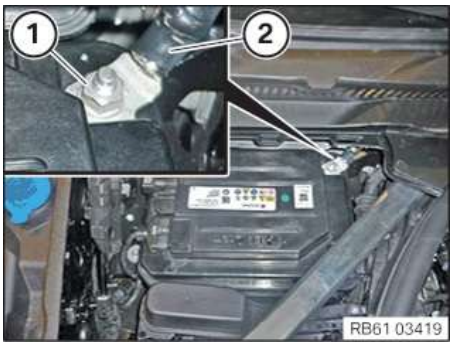
If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

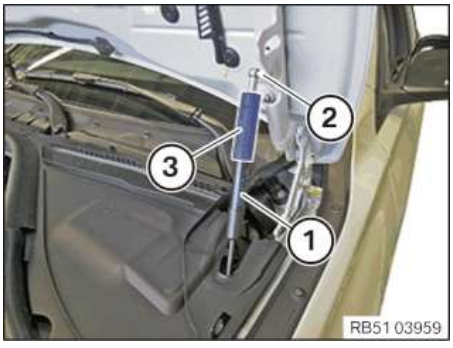
38 – Take bonnet out of the service position

CAUTION

Shutting bonnet or tailgate.

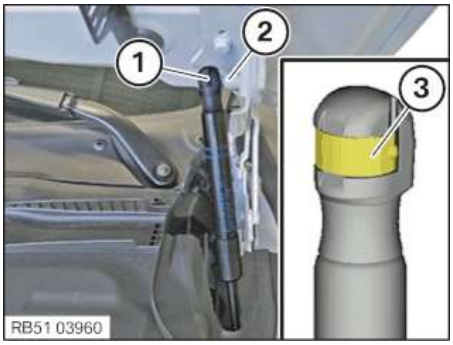
Danger of injury!

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



- 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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- 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

High pressure lines between high pressure pump and rail			Used in step 20
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 21
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 21
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 21
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 22
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 22
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 22
TS5x20		Tightening torque	3,6 Nm

Standard screw connection M6			Used in step 22
M6		Tightening torque	8 Nm

Battery positive lead on the starter motor generator			Used in step 22
M8		Tightening torque	19 Nm

Holder on intake plenum			Used in step 22
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 25
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 25
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 29
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 30
		Tightening torque	3 Nm

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Tension strut on bulkhead			Used in step 30
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 30
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 33
Combination hexagon nut		Tightening torque	35 Nm

Negative battery cable to 48-V battery			Used in step 37
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 33
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	237

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	336

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61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
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61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 35 ... Notes on ESD protection (Electro Static Discharge)	17
61 35 ... Notes on ESD protection (Electro Static Discharge)	17

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13 53 180 Replace pressure line

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

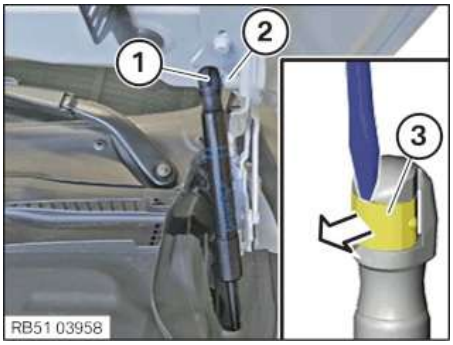
Engine compartment lid is open.

CAUTION

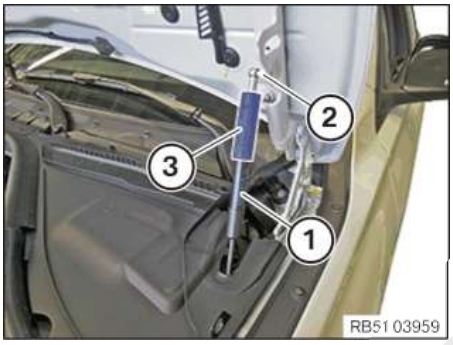
Shutting bonnet or tailgate.

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.
- Pull special tool or 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.

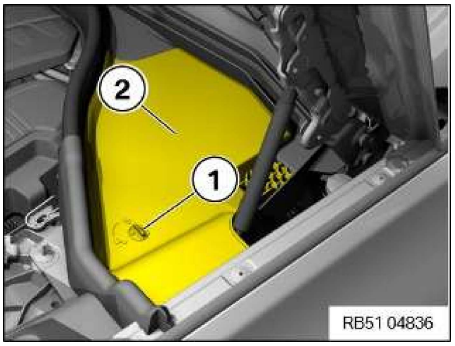
2 – Disconnecting all battery earth leads



- See additional information.

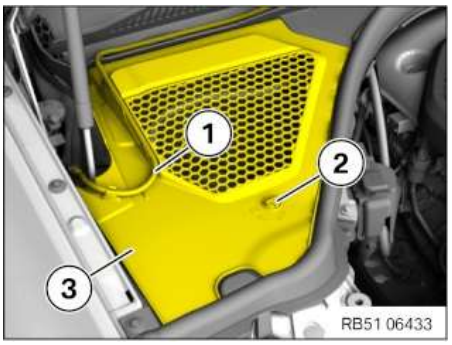
3 – Remove the cover of the engine compartment at the rear left

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

4 – Remove the cover of the rear right engine compartment



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

5 – Removing the wiper arm on the left and right

NOTICE

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

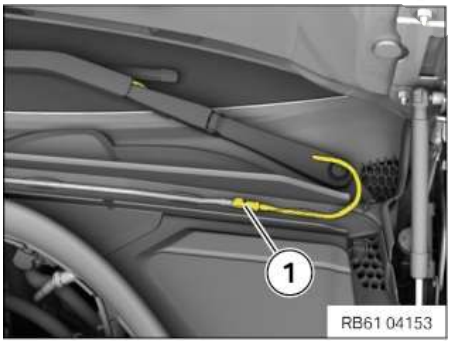
▸ **Remove the wiper arm**

RISK OF DAMAGE

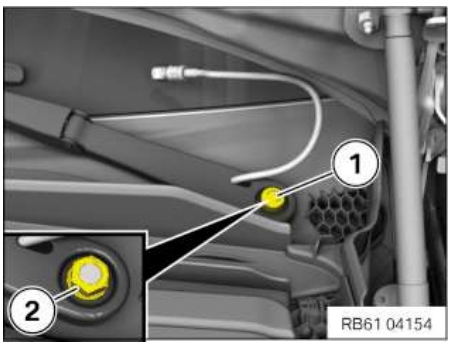
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.

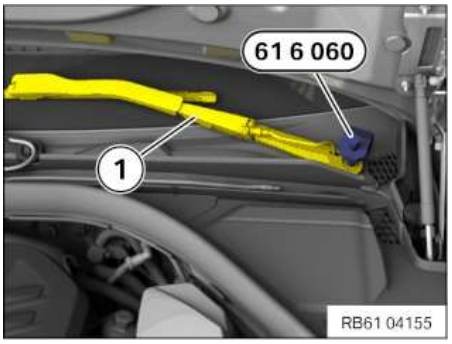


- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



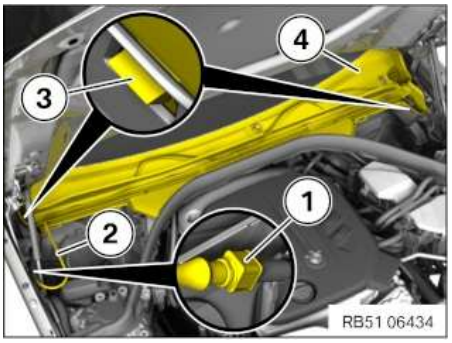
- Remove the protective cap (1).
- Loosen nut (2).

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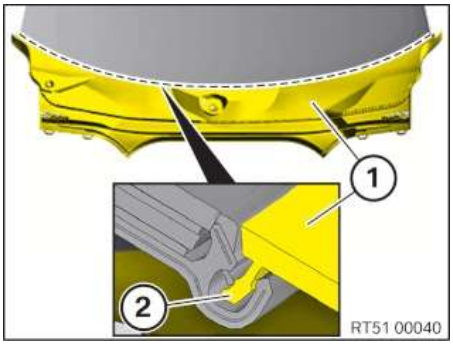


- Pull off the wiper arm (1) using special tool .

6 – Remove cowl panel cover



- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

7 – Remove the seal for the rear bonnet

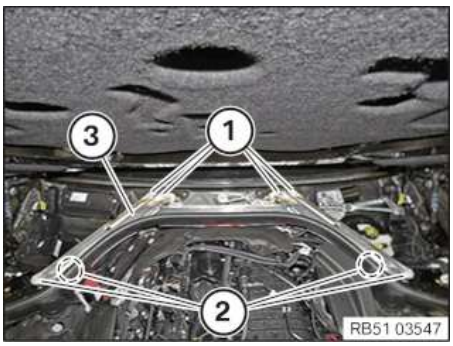


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

8 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.

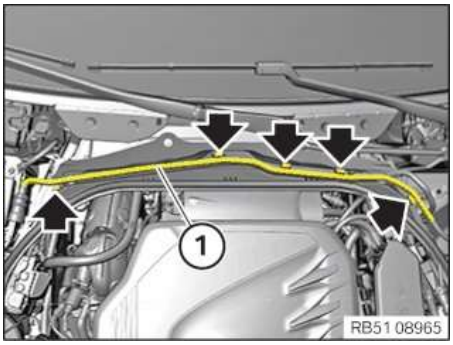


NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

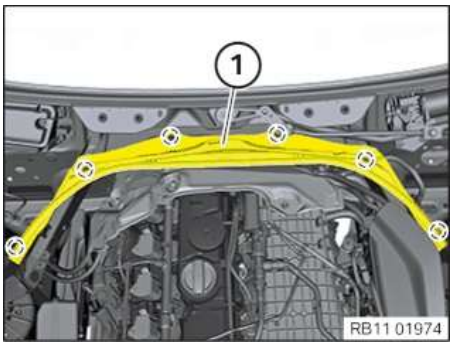
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.

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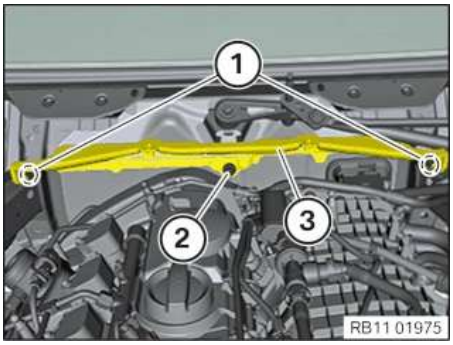
- **Version with mild hybrid technology:**

  Unclip the wire (1) at the holders (arrows).



- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

9 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

10 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

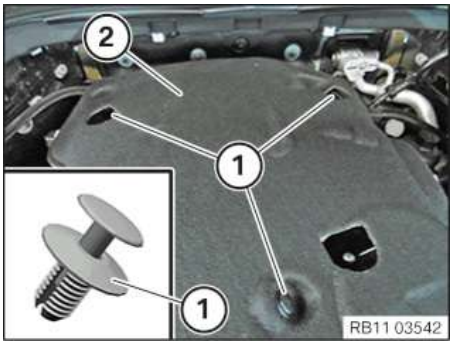
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation,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



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

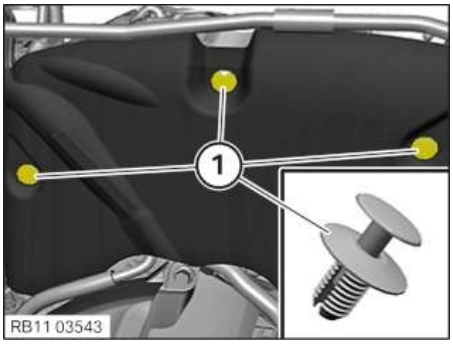
11 – Remove the acoustic cover for the injectors

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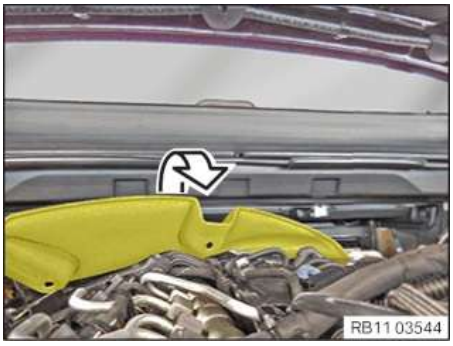


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

12 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

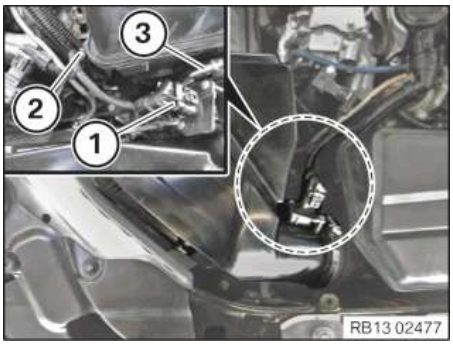
13 – Removing the clean air pipe with the resonator

WARNING

Hot surfaces.

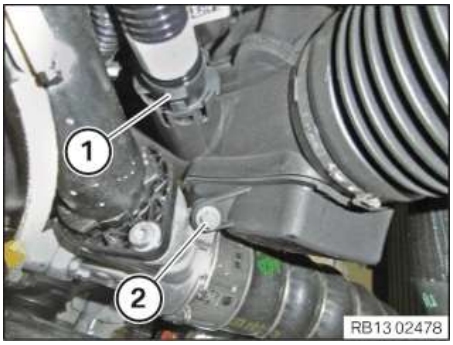
Risk of burning!

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

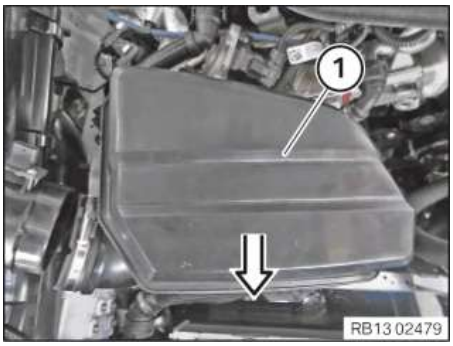


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

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- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

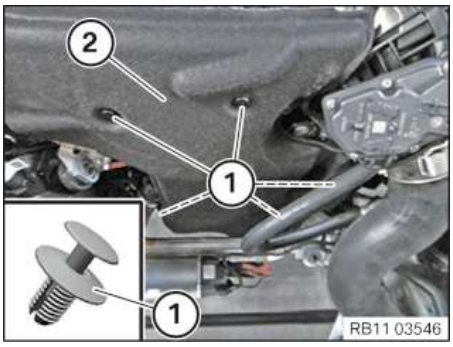
14 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

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15 – Partially releasing the wiring harness section on the intake plenum

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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

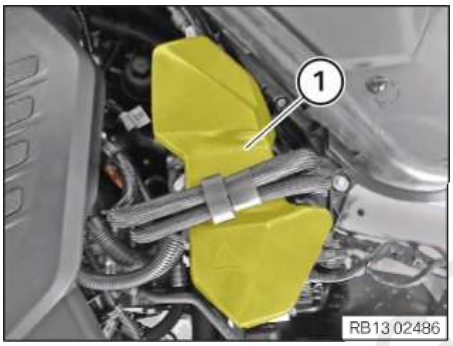
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

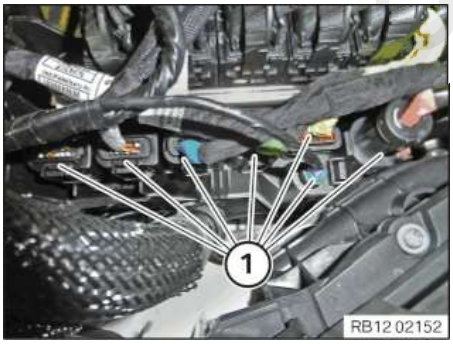
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

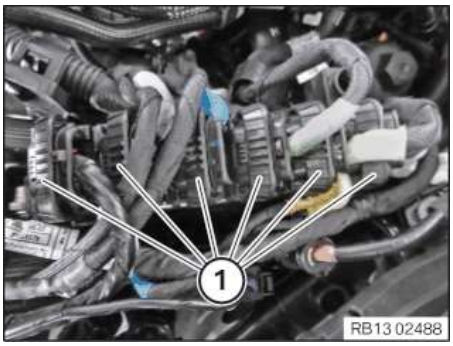
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Pull off cover (1) upwards, feed out and remove.

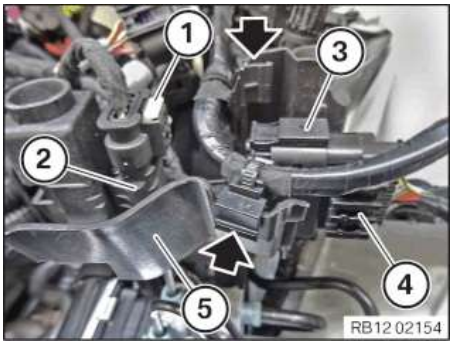


- Unlock and disconnect plug connections (1).

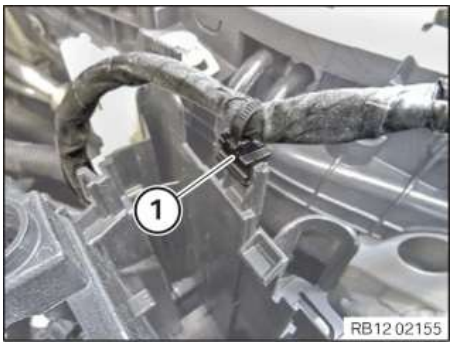


- Unlock and disconnect plug connections (1).

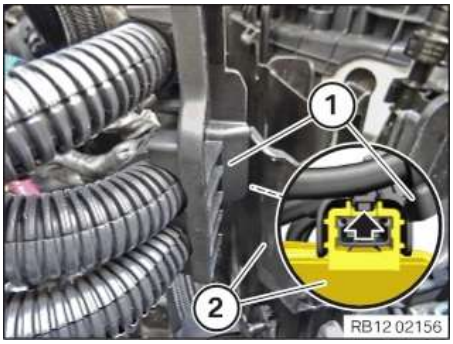
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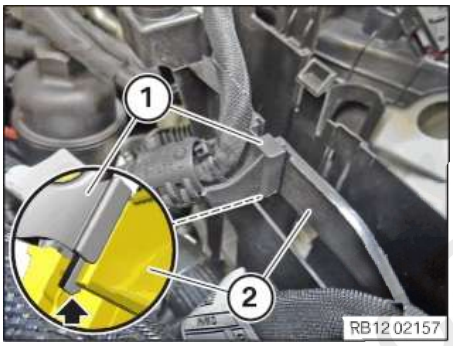
- Unlock plug connection (1) and disconnect.
- Unlock the plug (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock the plug (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).



- Loosen clamp (1).



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



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

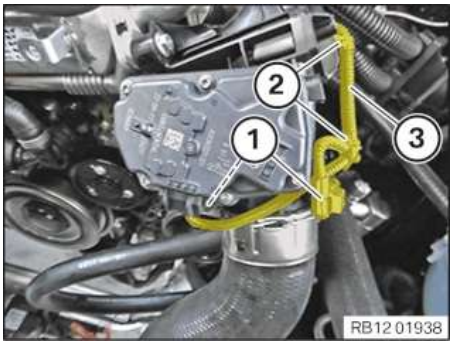


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

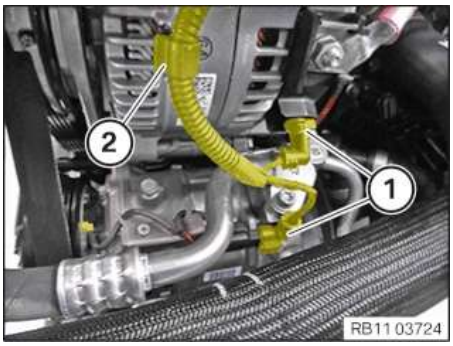


- Unlock holder (1) and feed out coolant line (2) and place it aside.

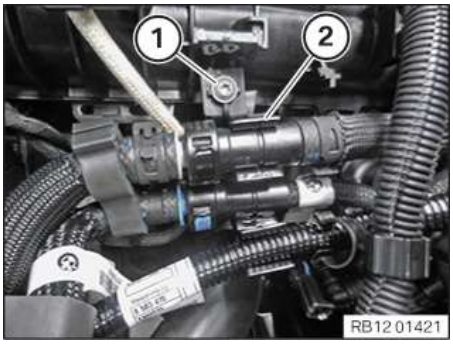
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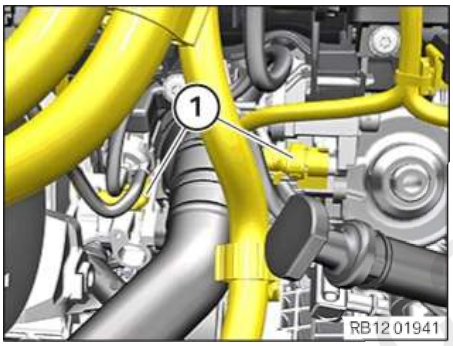
- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.



- Unlock and separate plug connections (1).
- Release the holder (2) from the alternator .



- Loosen screw (1).
- Thread out holder (2) and set aside.



- Unlock and disconnect plug connections (1).

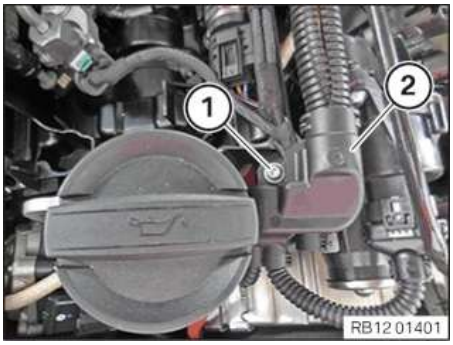


- Unlock and loosen connector (1).

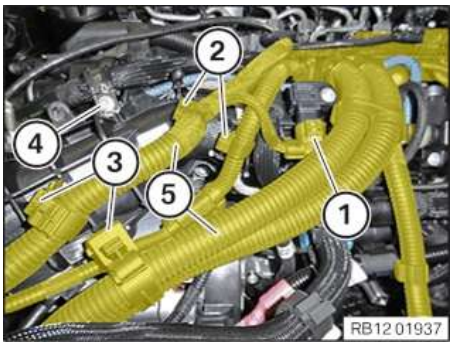


- Unlock plug connection (1) and disconnect.

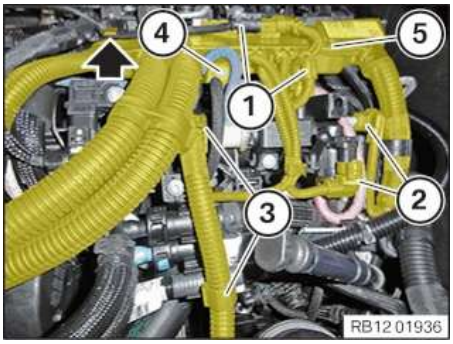
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- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

16 – Removing the intake plenum

TECHNICAL INFORMATION

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

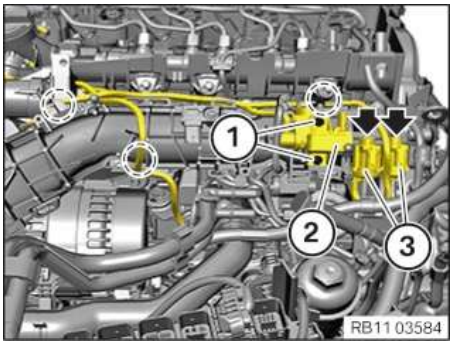


- Unlock clamp (1) and engage in this position.

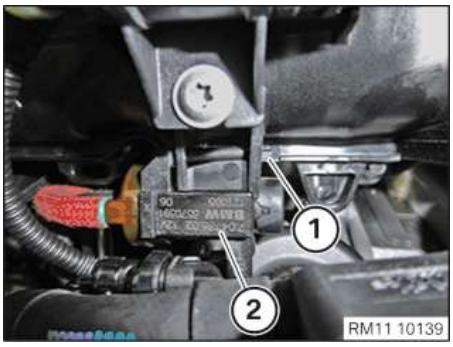


- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.

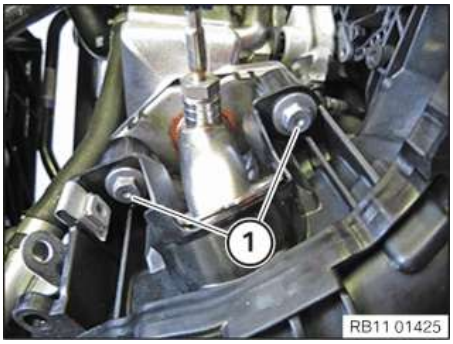
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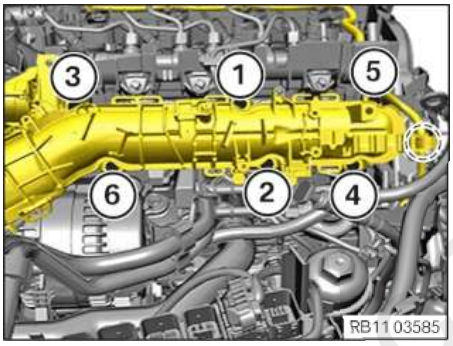
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



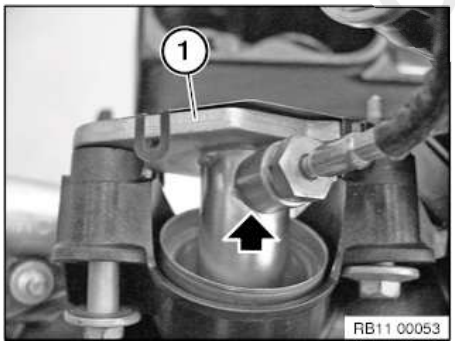
- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.



- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.



- Remove the exhaust-gas recirculation pipe (1) (arrow).

MAIN WORK

17 – Remove the high pressure line between the high pressure pump and the rail

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WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

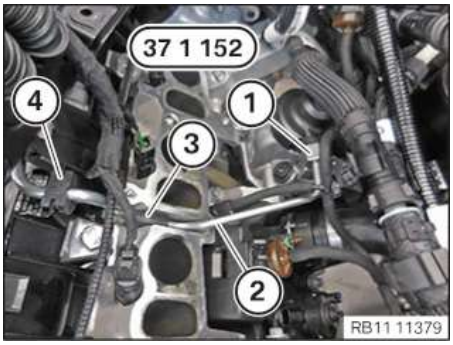
TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

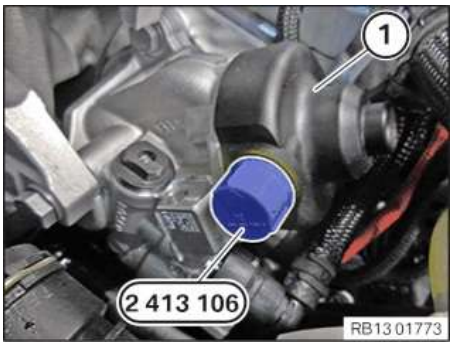


- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.

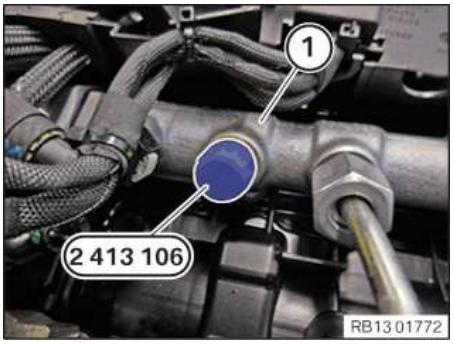
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- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

18 – Installing high pressure line between rail and high pressure pump

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

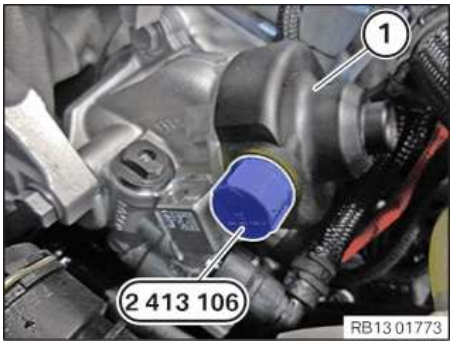
Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

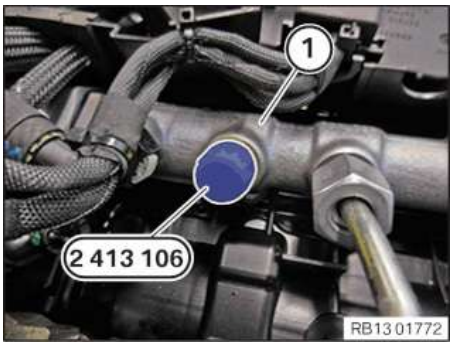
TECHNICAL INFORMATION

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

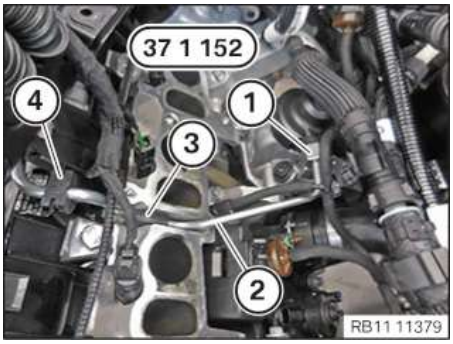
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- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.



- Hand-tighten the union nut (1) on the rail.

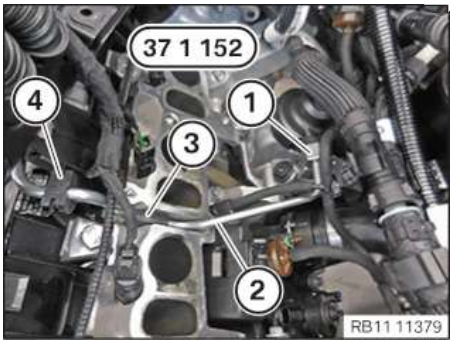
TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm



- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten union nut (1) on the high pressure pump with the special tool .

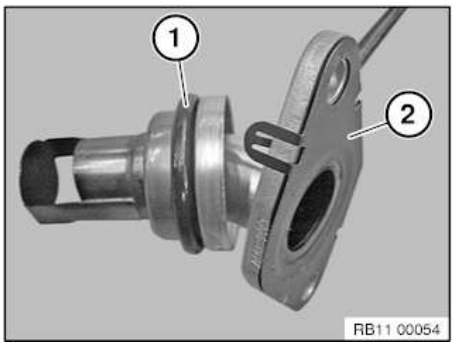
High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

POSTPROCESSES

19 – Installing the intake plenum

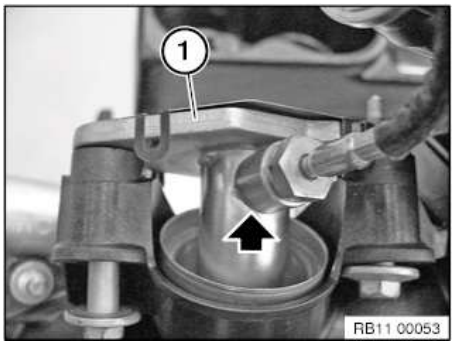
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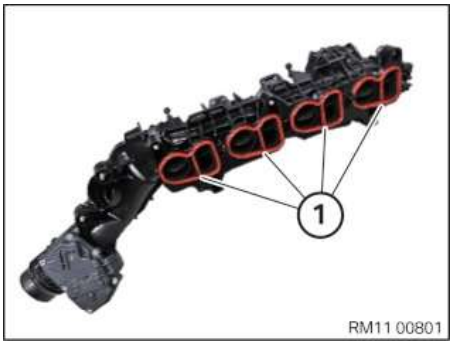
- Renew O-ring (1).

  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

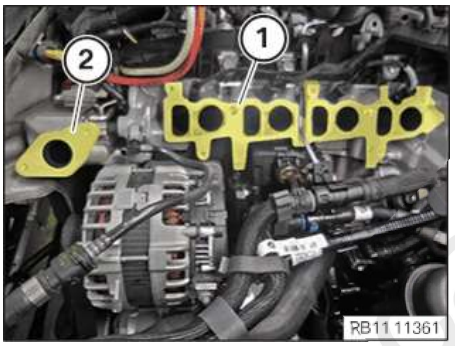


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

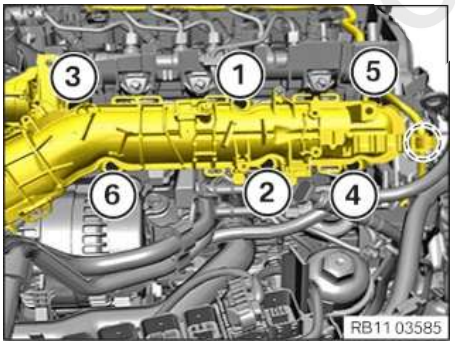


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

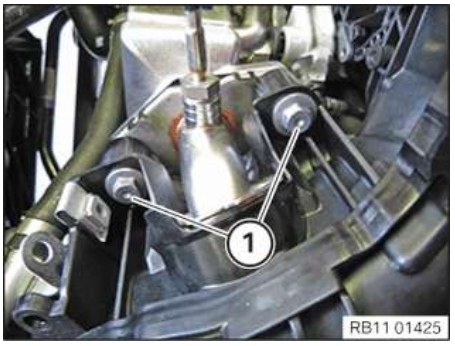


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

- Attach the wiring harness and fuel lines in the marked area on the intake plenum.

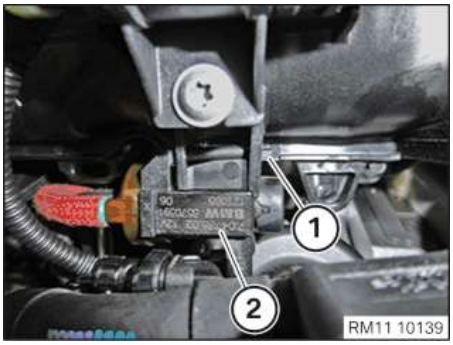


- Tighten the screws (1).

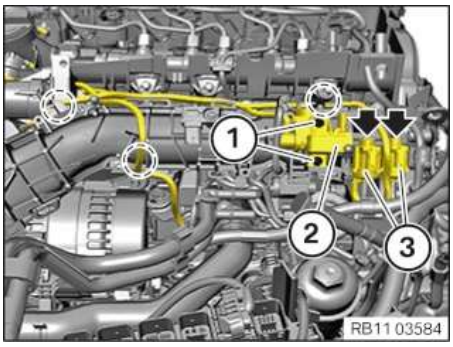
Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm

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- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.
  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

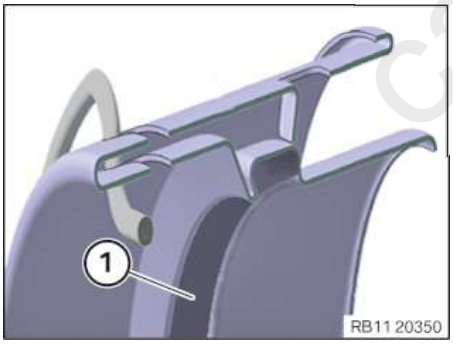


- Check the seal (1) for damage, and renew if necessary.

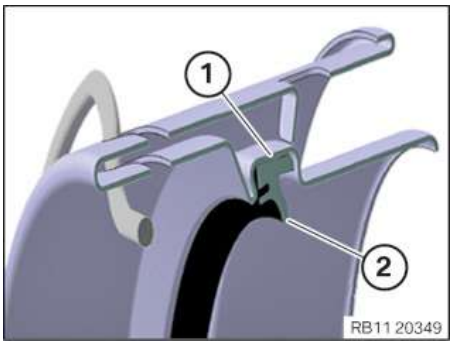
▸ **Replacing damaged seal**

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

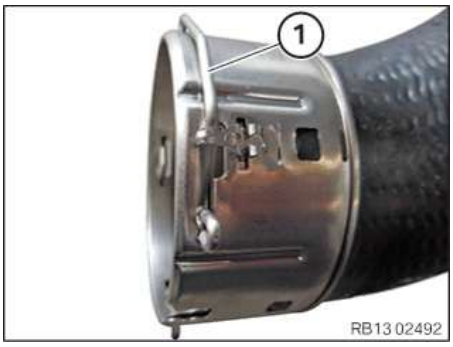
Incorrect assembly is possible. Ensure correct installation position.

- 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 directed inwards as shown.

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- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

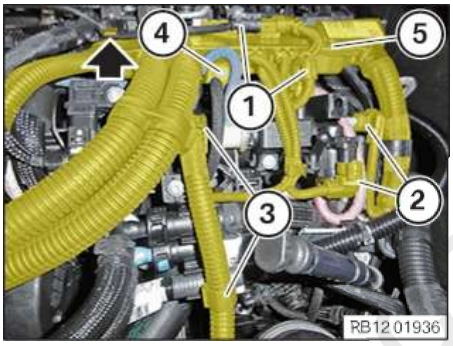
20 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

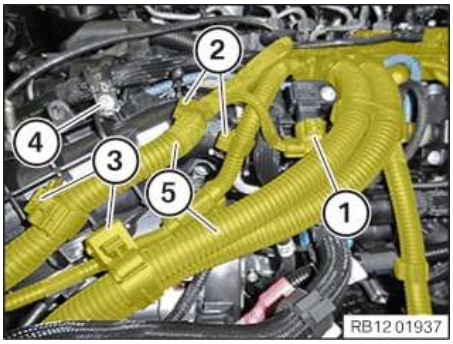
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

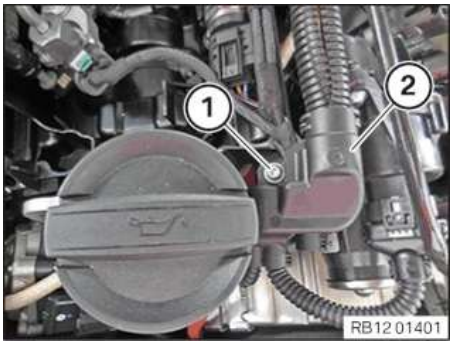
Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



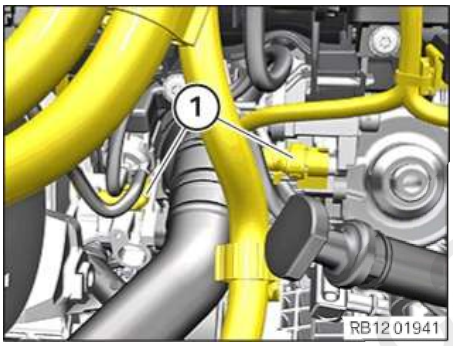
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



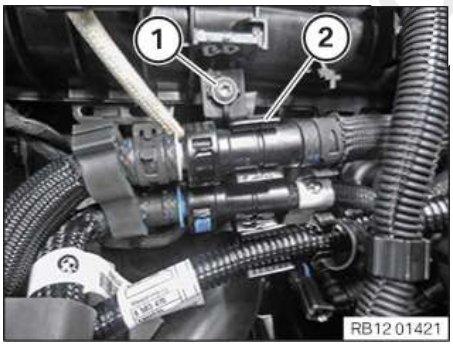
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



- Connect connectors (1) and lock.

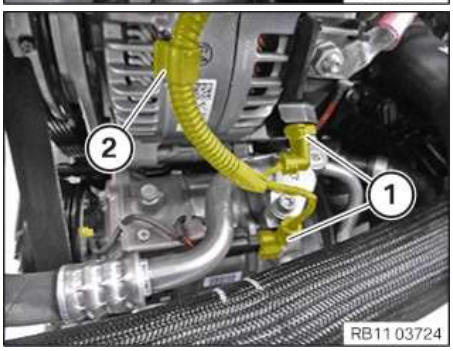
  The connectors (1) must engage audibly.



- Insert and install the holder (2).
- Tighten down screw (1).

Holder on intake plenum

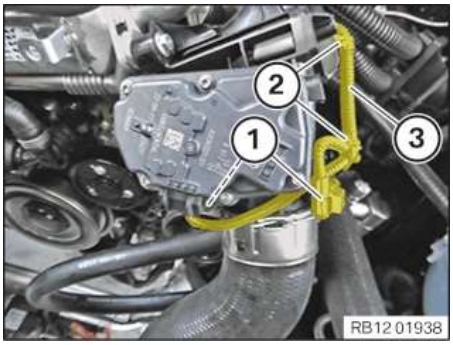
TS6X20		Tightening torque	5 Nm



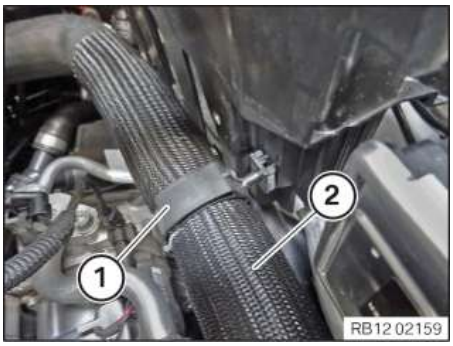
- Connect the connector (1) and lock it.

  The connectors (1) must engage audibly.
- Secure holder (2) to alternator.

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- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.



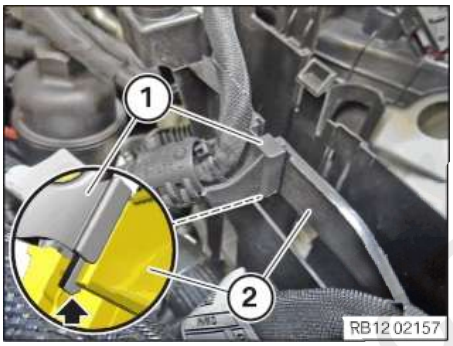
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



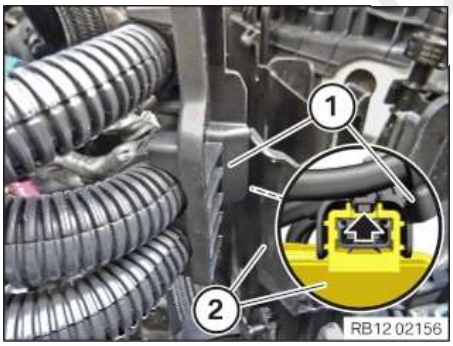
- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.



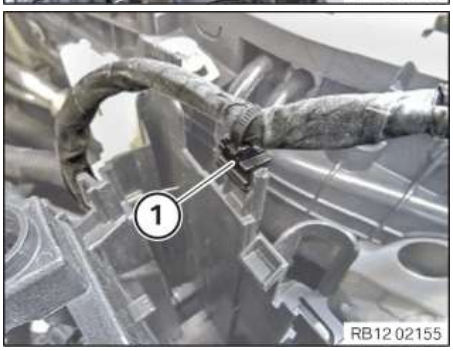
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.



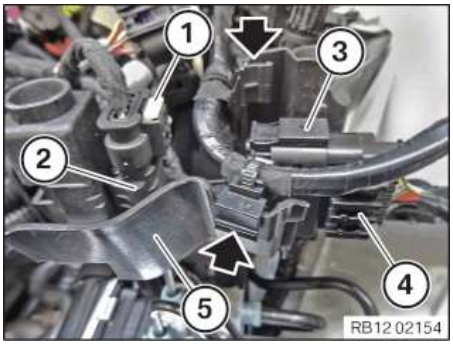
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.

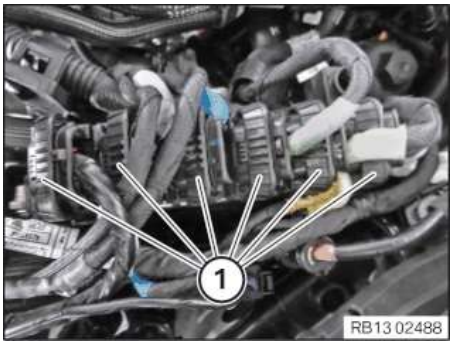


- Secure clamps (1).

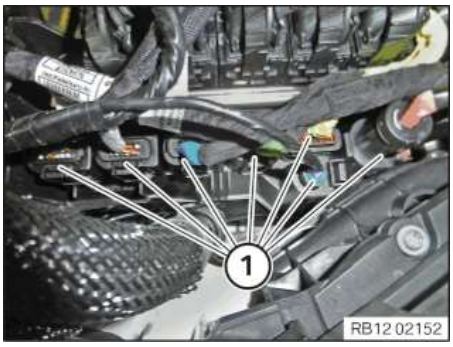
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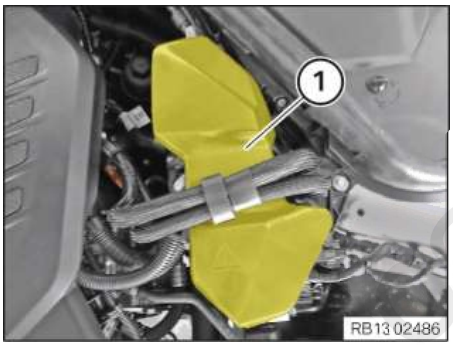
- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
-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



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

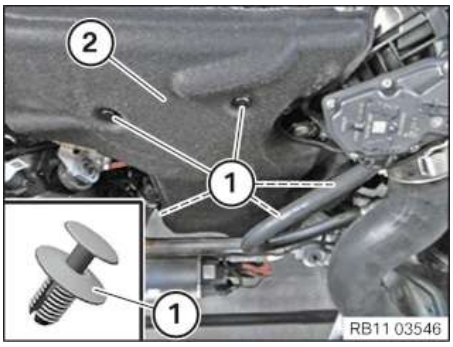


- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.



- Insert and install cover (1) into guides.

21 – Install acoustic cover for the engine, front



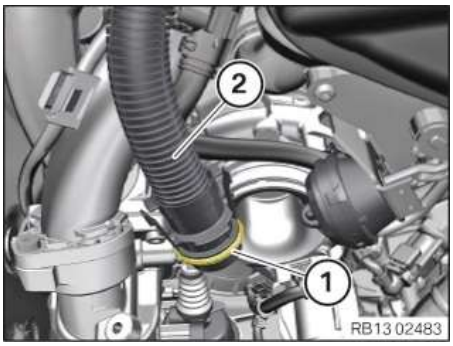
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

22 – Installing the clean air pipe with resonator

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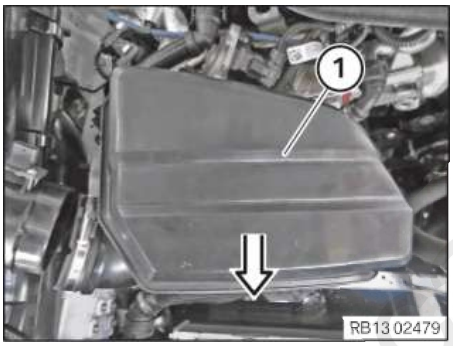
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

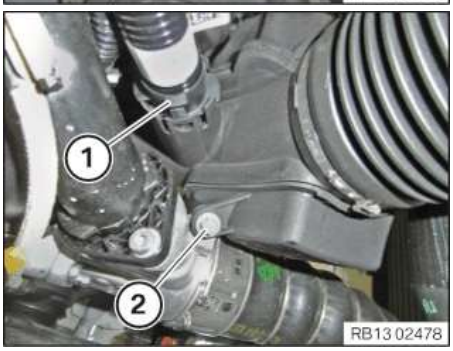


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

  The clamp (1) must engage audibly.

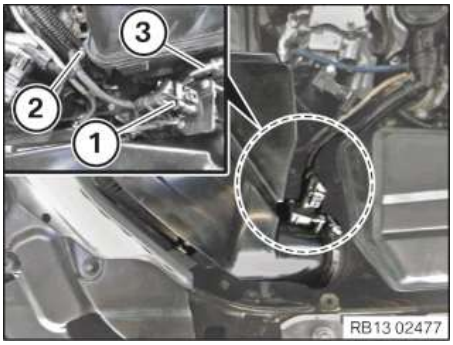


- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm

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

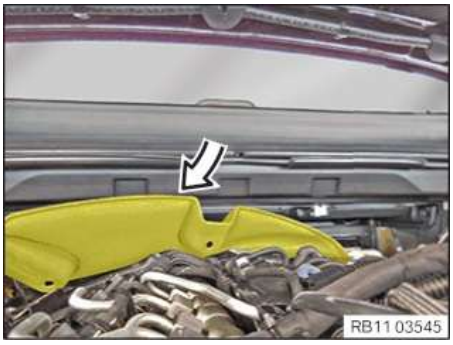
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

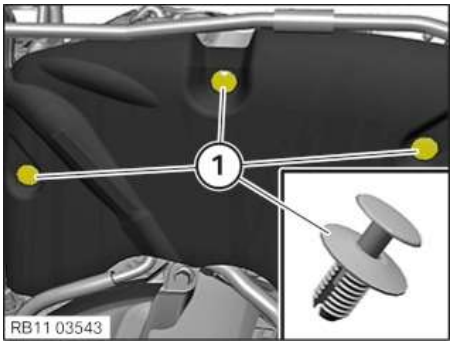
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

23 – Installing acoustic cover at rear

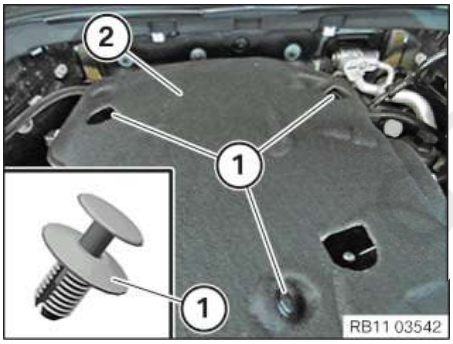


- Guide in the acoustic cover in the direction of the arrow and install it.



- Secure acoustic cover with the expanding rivets (1).

24 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

25 – Install acoustic cover

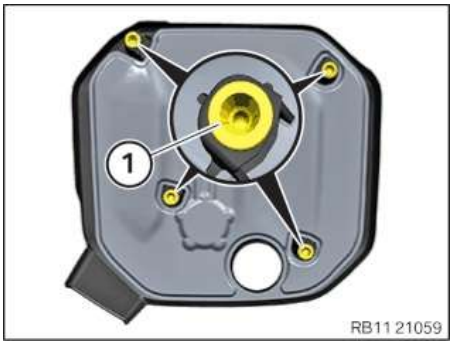
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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

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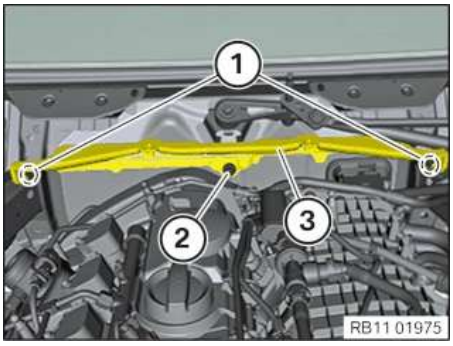


- Check the acoustic cover for correct fit of the rubber mounts (1).



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

26 – Installing centre bulkhead lower section

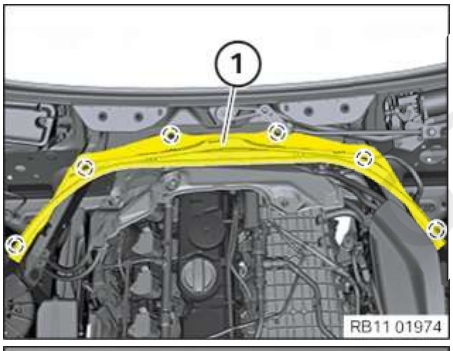


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

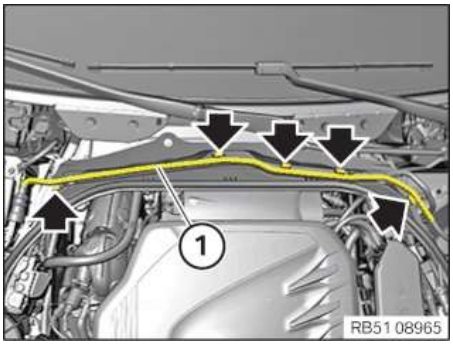
27 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

Bulkhead upper part to bottom bulkhead

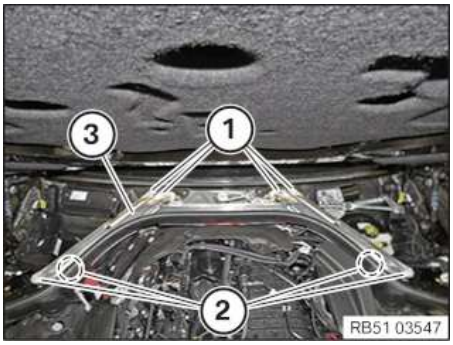
		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

28 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

29 – Installing cowl panel cover

RISK OF DAMAGE

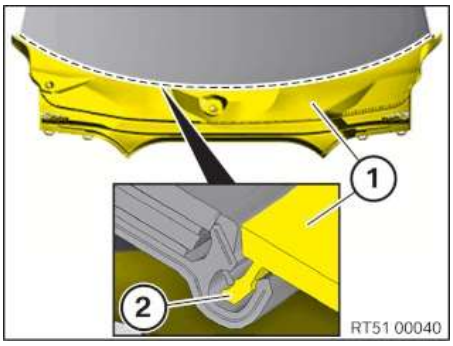
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

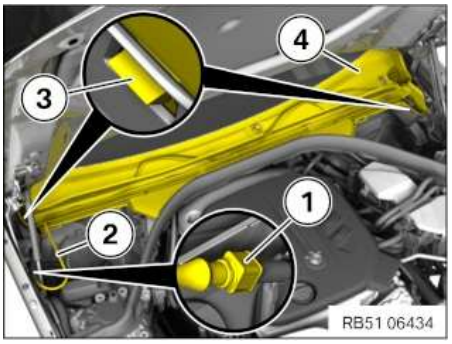
TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.

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- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

30 – Install left and right wiper arm

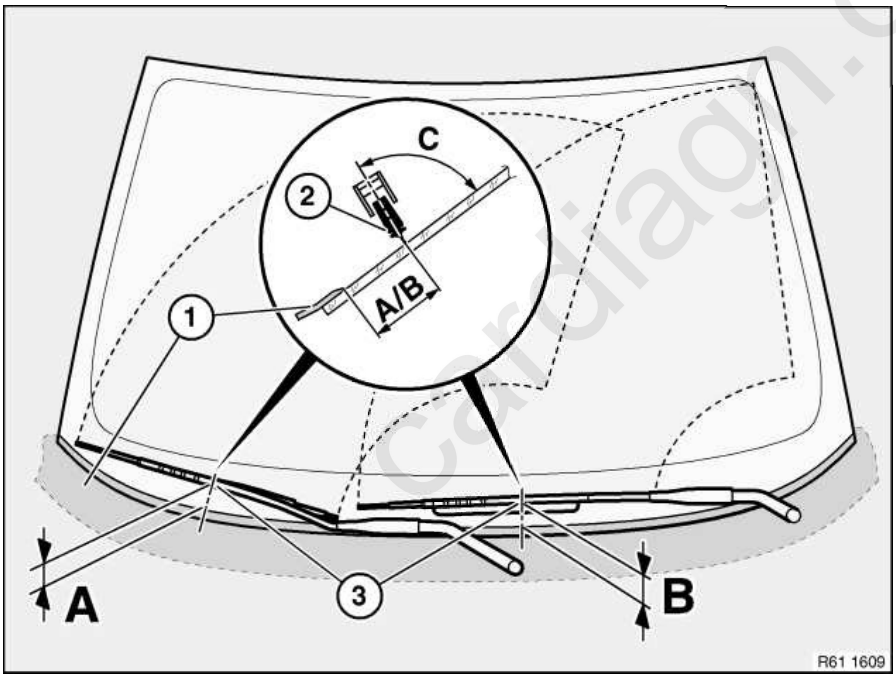
NOTICE

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

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

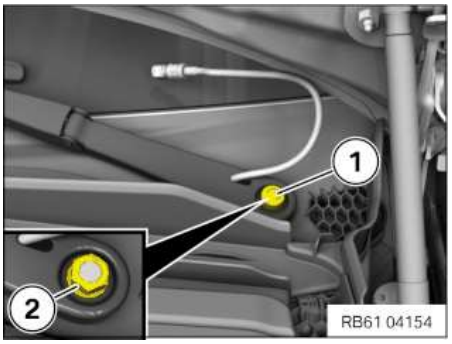
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm



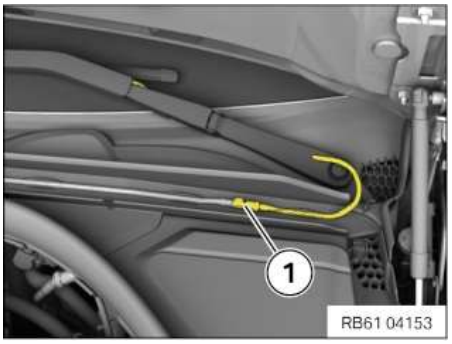
- Tighten nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

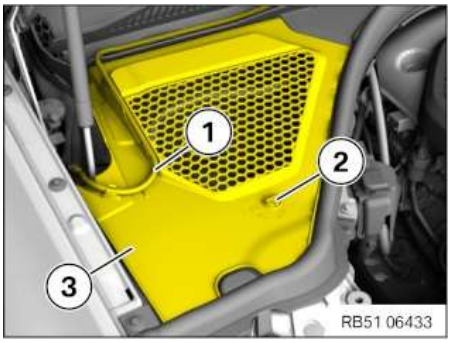
- Connect the protective cap (1).

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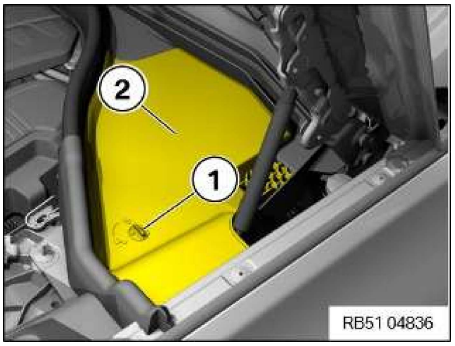
- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

31 – 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.

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



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

33 – Connecting all battery earth leads



- See additional information.

34 – Take bonnet out of the service position

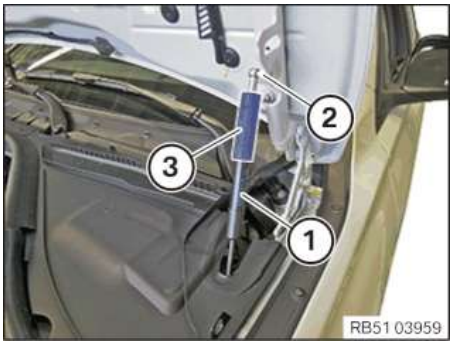
CAUTION

Shutting bonnet or tailgate.

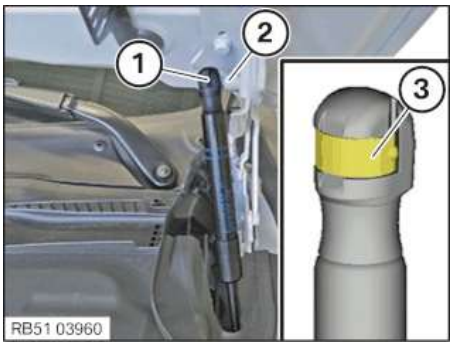
Danger of injury!

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

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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.



- 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

High pressure lines between high pressure pump and rail			Used in step 18
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 19
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 19
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 19
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 20
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 20
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 20
TS5x20		Tightening torque	3,6 Nm

Holder on intake plenum			Used in step 20
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 22
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 22
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 26
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

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Bulkhead upper part to bottom bulkhead			Used in step 27
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 27
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 27
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 30
Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 30
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
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61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233

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61 20 900 Disconnecting and connecting battery earth lead	233
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61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 35 ... Notes on ESD protection (Electro Static Discharge)	15
61 35 ... Notes on ESD protection (Electro Static Discharge)	15

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13 53 330 Replacing all leakage oil lines

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

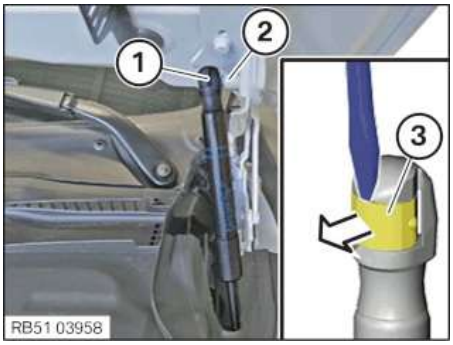
Engine compartment lid is open.

CAUTION

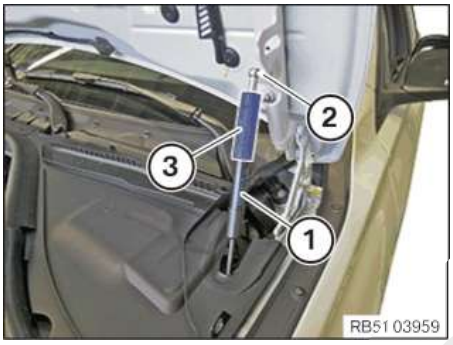
Shutting bonnet or tailgate.

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.
- Pull special tool or 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

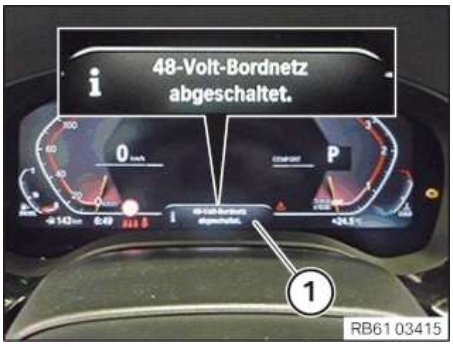
TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

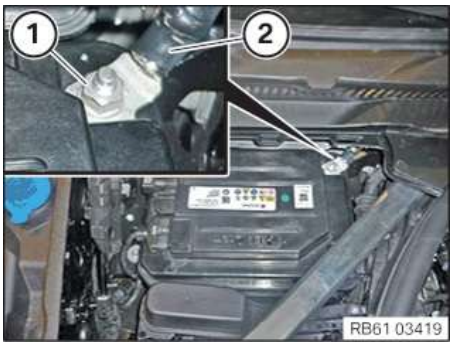
- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

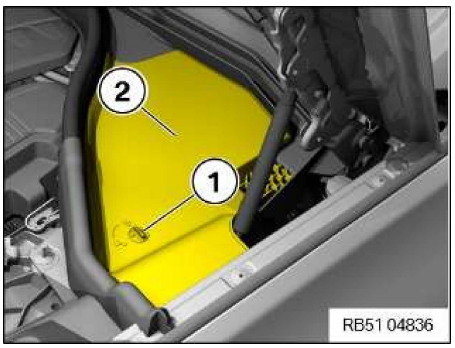
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

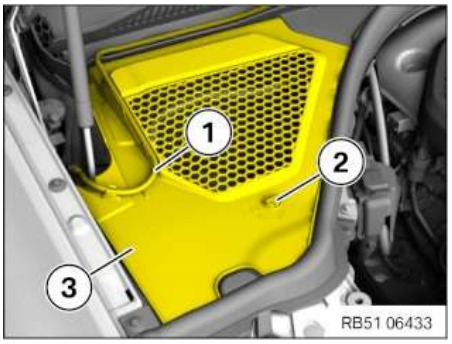
4 – Remove the cover of the engine compartment at the rear left



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

5 – 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 (3) of the rear right engine compartment.

6 – Removing the wiper arm on the left and right

NOTICE

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

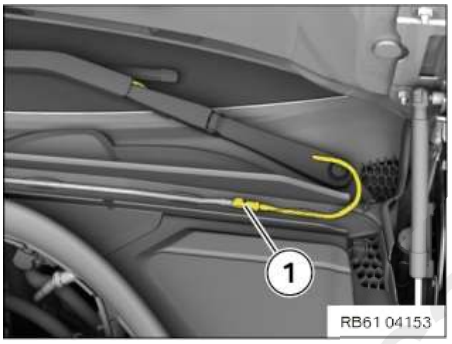
► **Remove the wiper arm**

RISK OF DAMAGE

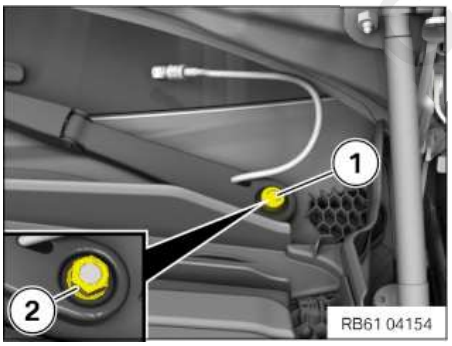
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

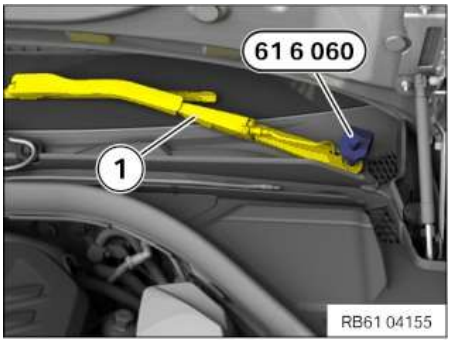
- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.



- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



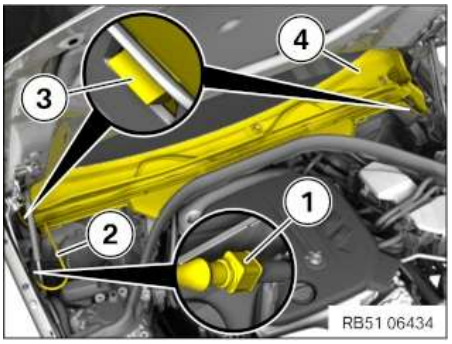
- Remove the protective cap (1).
- Loosen nut (2).



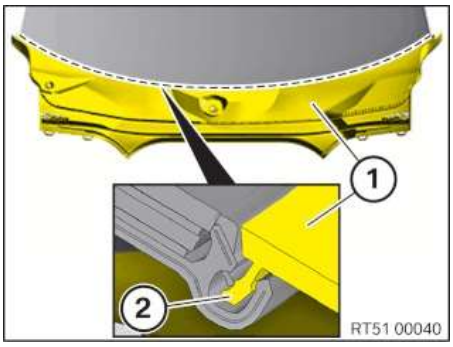
- Pull off the wiper arm (1) using special tool .

7 – Remove cowl panel cover

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- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

8 – Remove the seal for the rear bonnet

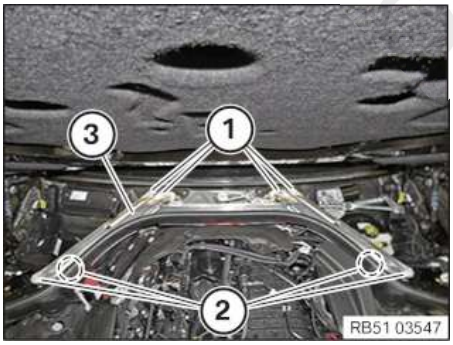


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

9 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

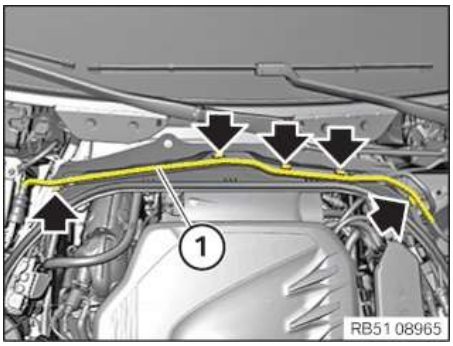
Driving without the strut brace/front-end strut or tension strut is not permitted.



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

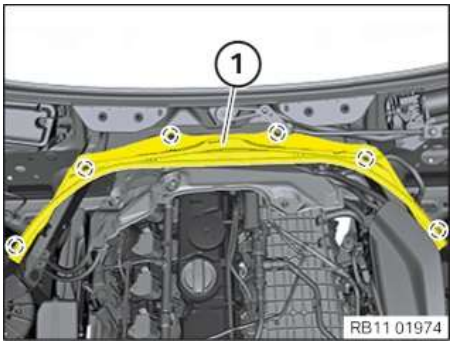
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.



- **Version with mild hybrid technology:**

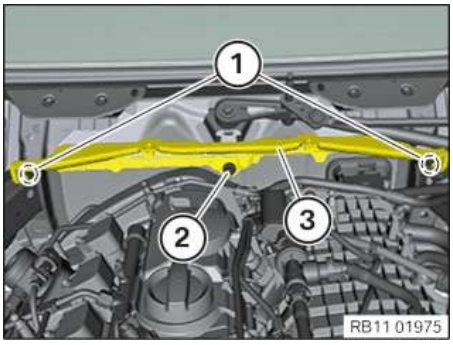
  Unclip the wire (1) at the holders (arrows).

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- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

10 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

11 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

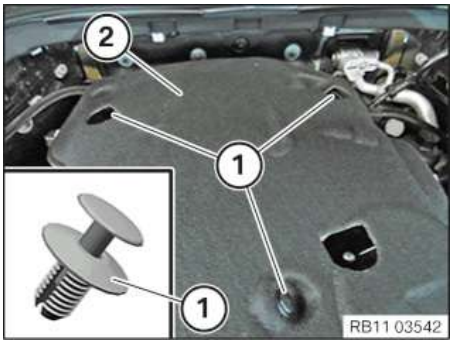
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

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



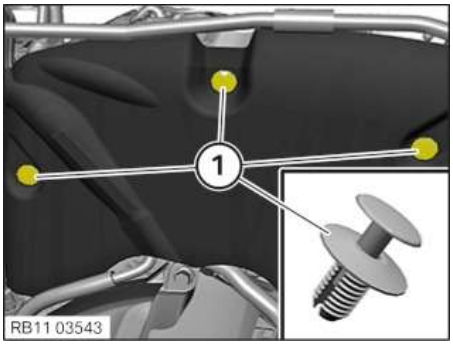
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

12 – Remove the acoustic cover for the injectors

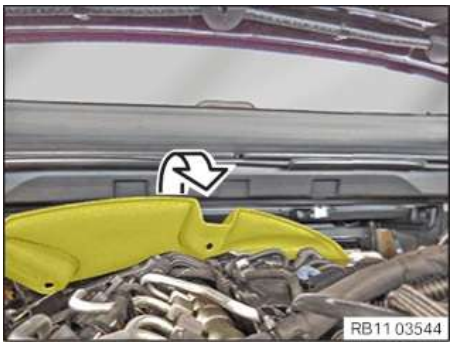


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

13 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

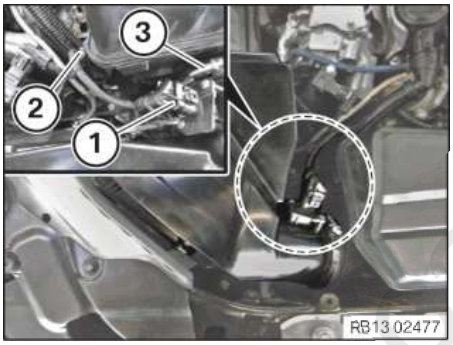
14 – Removing the clean air pipe with the resonator

WARNING

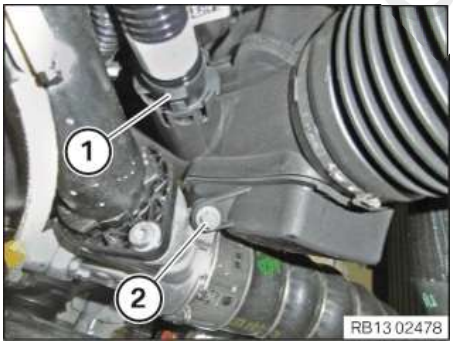
Hot surfaces.

Risk of burning!

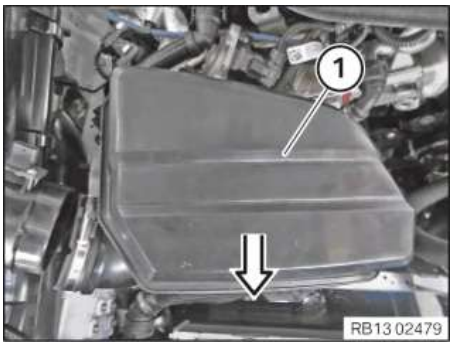
- Perform all work only on components that have cooled down.



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



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

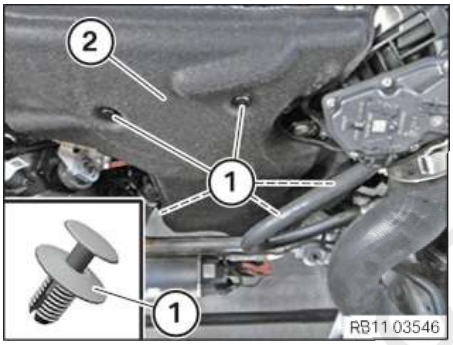
15 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

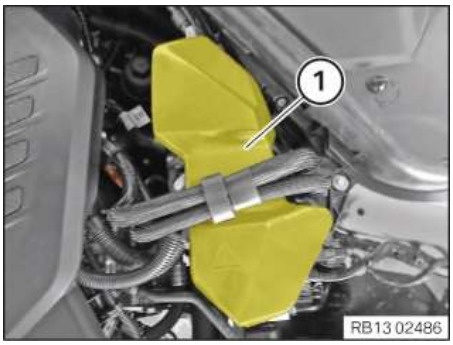
Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

16 – Remove the cover for the DDE control unit



- Pull off, guide out and remove cover (1) upwards.

17 – Partially releasing the wiring harness section on the intake plenum

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RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

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

RISK OF DAMAGE

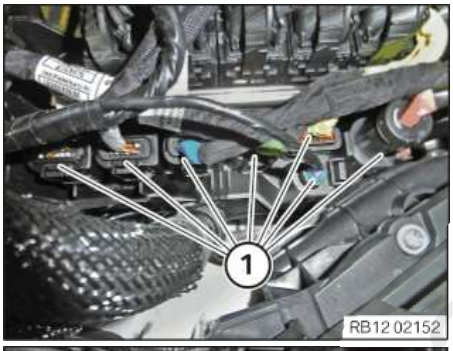
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

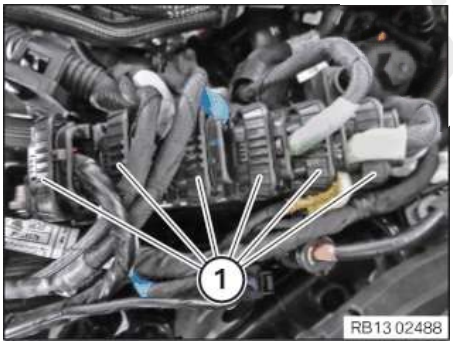
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

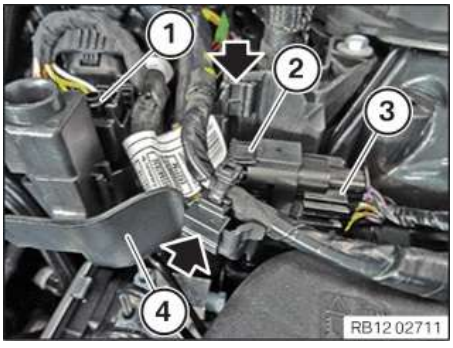
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Unlock and disconnect plug connections (1).

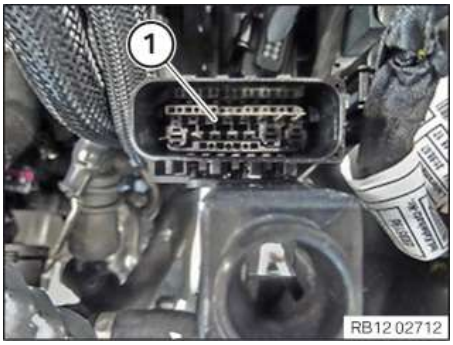


- Unlock and disconnect plug connections (1).

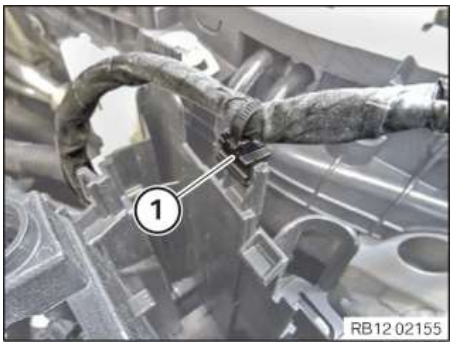


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Release the connector (3) and disconnect from the control unit holder (4).
- Release the clamps (arrows).

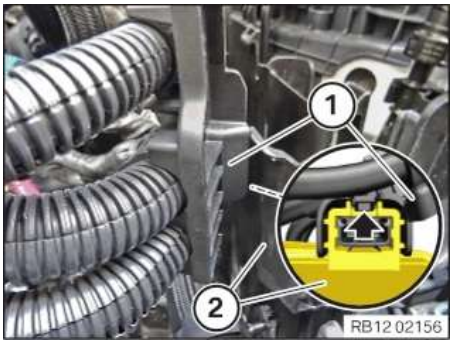
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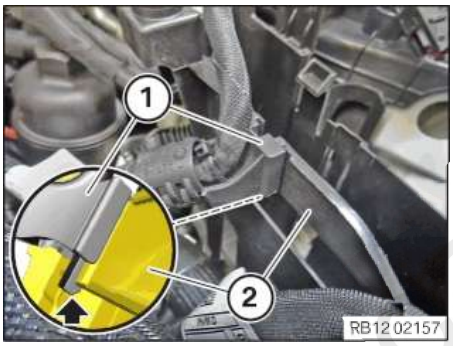
- Unlock plug connection (1) and disconnect.



- Loosen clamp (1).



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



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

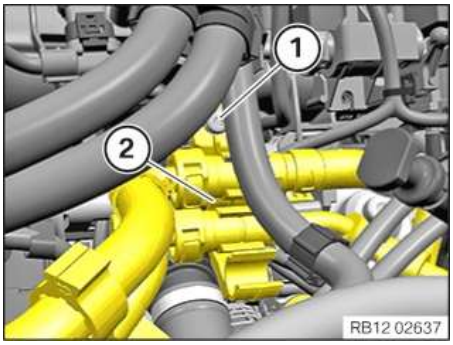


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

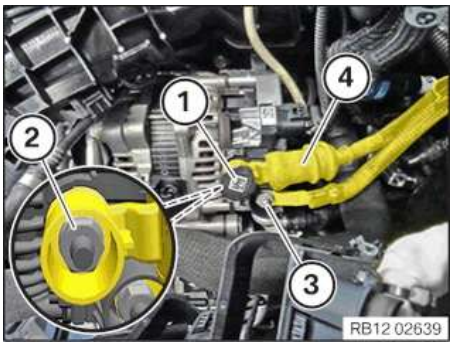


- Unlock holder (1) and feed out coolant line (2) and place it aside.

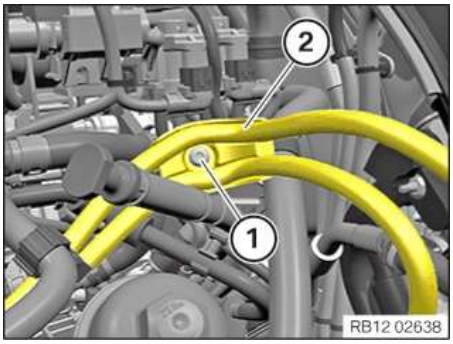
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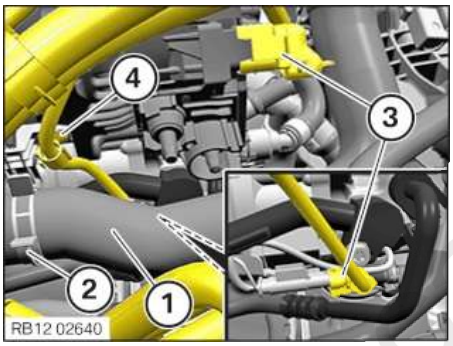
- Release the screw (1).
- Guide out fuel lines (2) and set them aside.



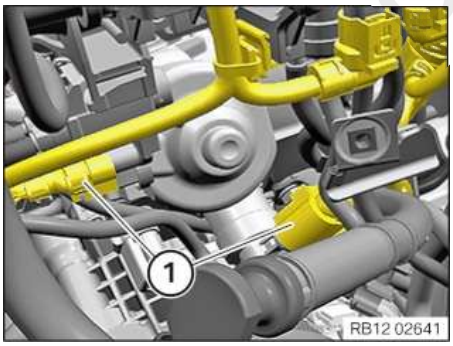
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.



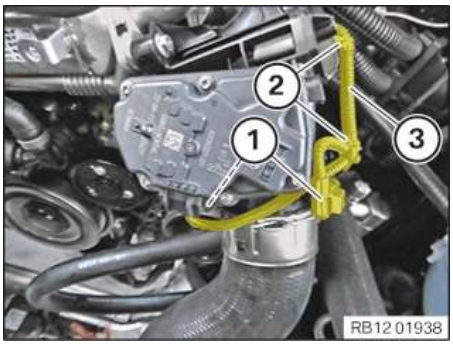
- Release the screw (1).
- Guide out the positive battery cables (2) and set them aside.



- Release the coolant line (1) from the holder (2) .
- Unlock plug connections (3) and disconnect.
- Loosen clamp (4).



- Unlock and disconnect plug connections (1).



- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.

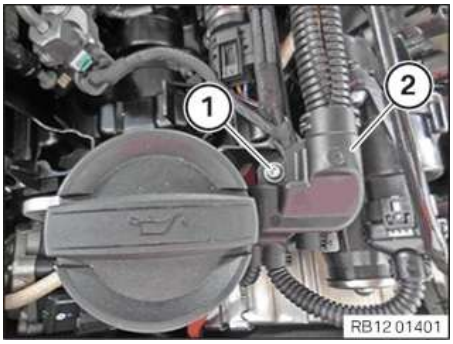
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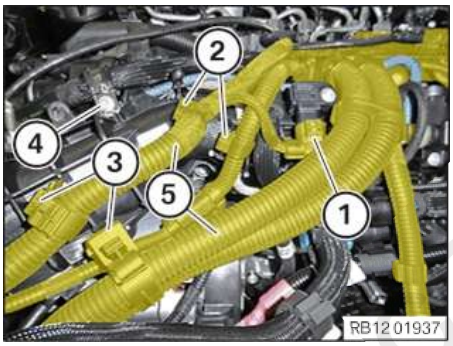
- Unlock and loosen connector (1).



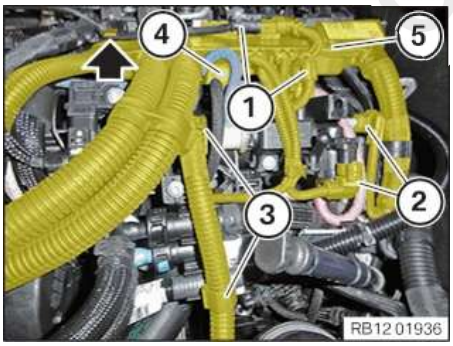
- Unlock plug connection (1) and disconnect.



- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

18 – Removing the intake plenum

TECHNICAL INFORMATION

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

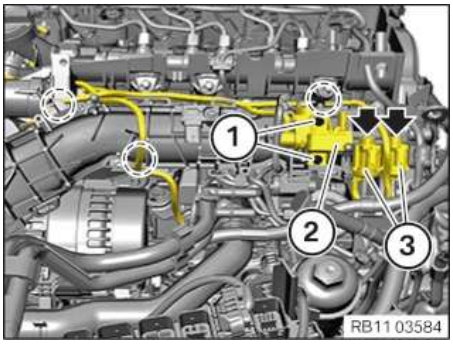
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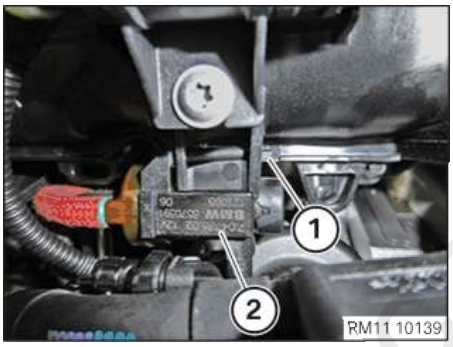
- Unlock clamp (1) and engage in this position.



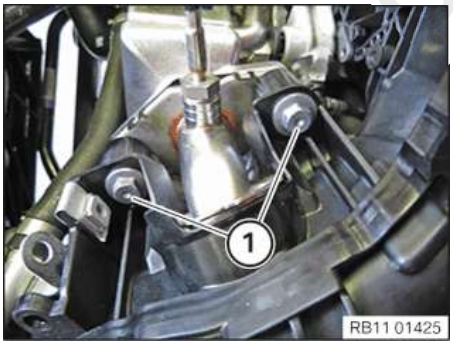
- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.



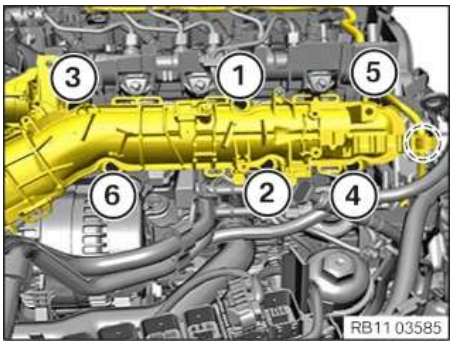
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.

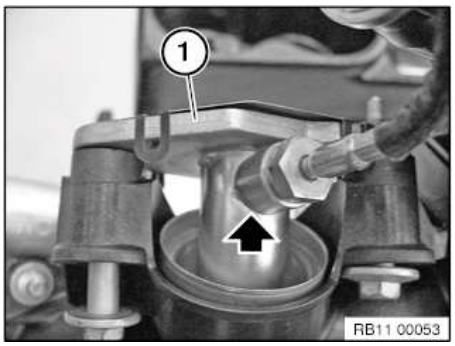


- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.

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- Remove the exhaust-gas recirculation pipe (1) (arrow).

MAIN WORK

19 – Remove leakage oil lines

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

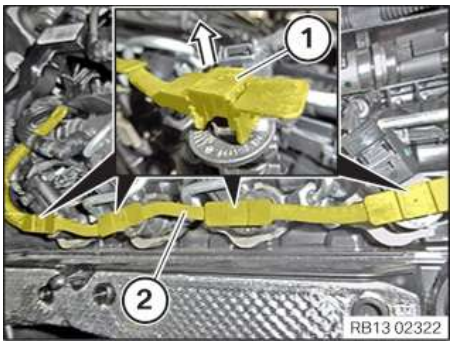
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

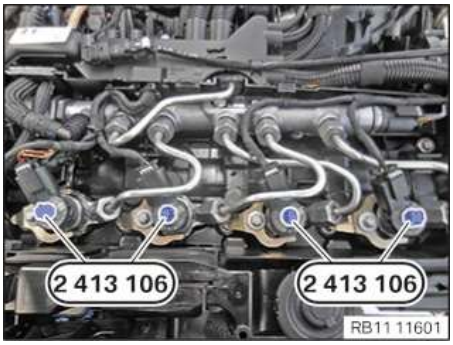
Contamination can result in malfunctions, operating failure or leaks.

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

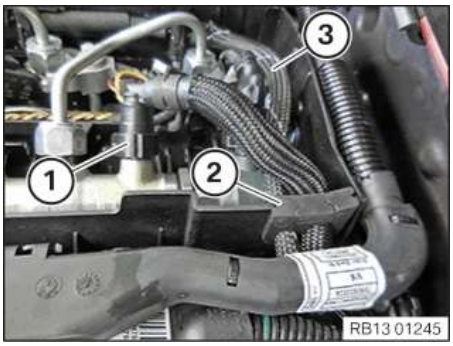


- Unlock the locks (1) in the direction of the arrow.
- Remove the leakage oil line (2) and put it to one side.
- Catch and dispose of escaping fuel.

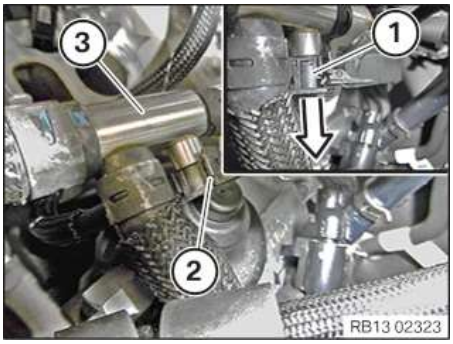
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- Seal open connections using special tool .

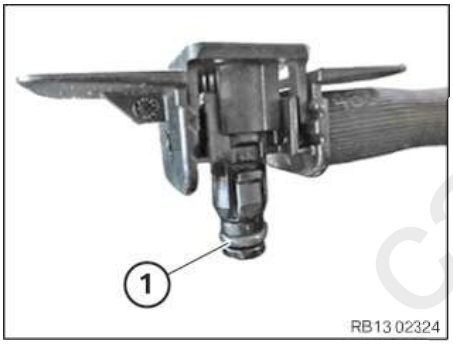


- Loosen fuel return line (1) and put to one side.
- Guide the leakage oil line (3) out of the rubber grommet (2) and set it aside.



- Release lock (1) in direction of arrow.
- Disconnect leakage oil line (2) from fuel line (3) and remove.

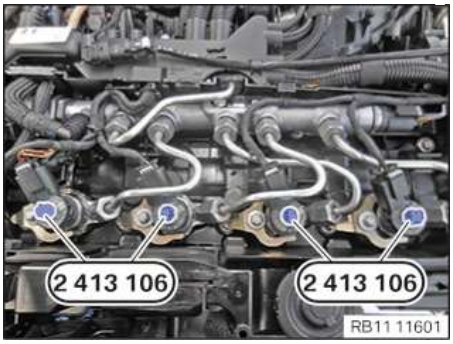
20 – Install leakage oil lines



- Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.
- Check the sealing ring (1) for damage and if necessary, renew the leakage oil line .

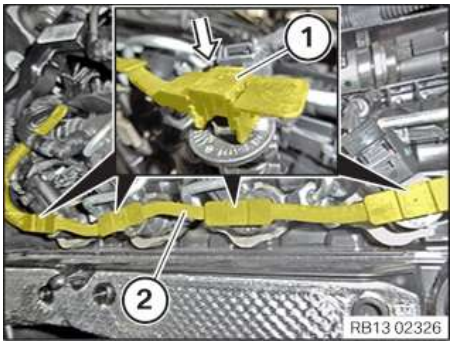
  Parts: Leakage oil line

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

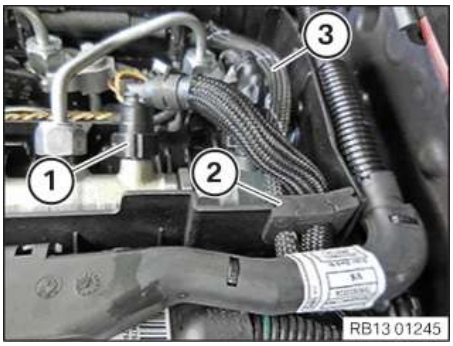


- Guide the special tool out and remove.

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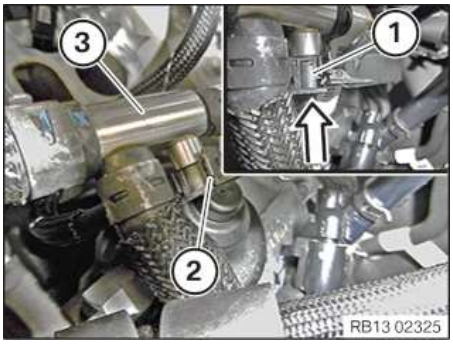


- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.



- Feed in leakage oil line (3) and install.
- Ensure the leakage oil line (3) is correctly fitted in the rubber grommet (2).
- Feed in fuel return line (1) and install.

  The fuel return line (1) must audibly engage.

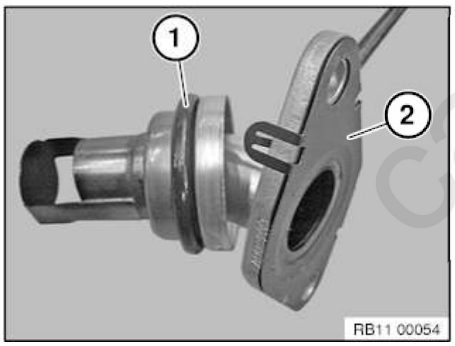


- Connect leakage oil line (2) with the fuel line (3).
- Lock the lock in direction of arrow (1).

  The lock (1) must audibly engage.

POSTPROCESSES

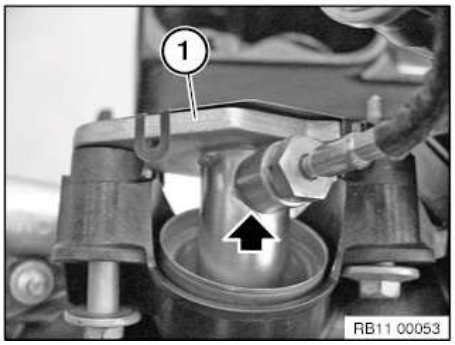
21 – Installing the intake plenum



- Renew O-ring (1).

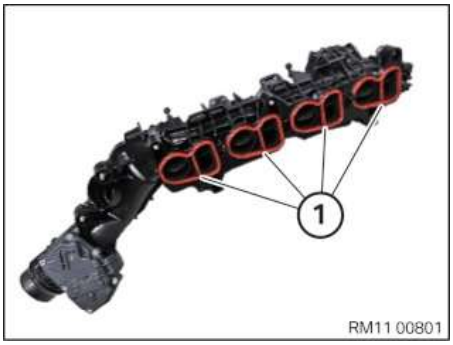
  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.



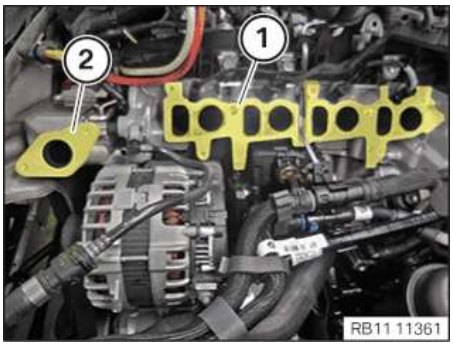
- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

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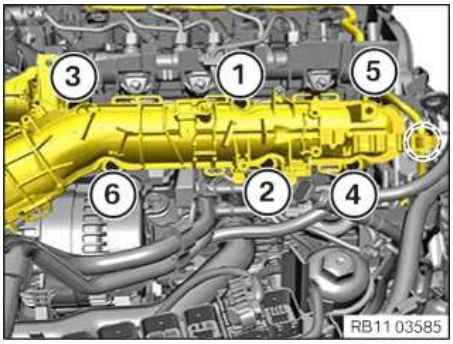


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

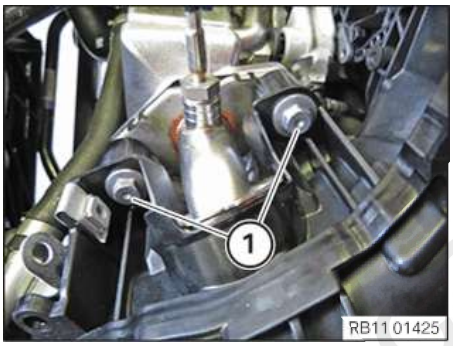


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

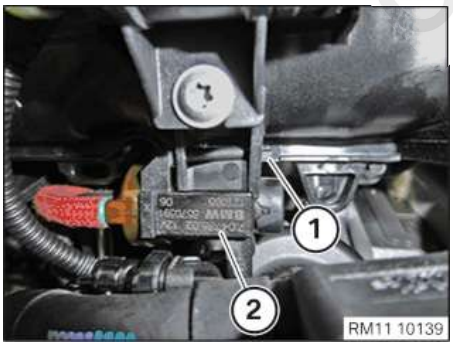
- Attach the wiring harness and fuel lines in the marked area on the intake plenum.



- Tighten the screws (1).

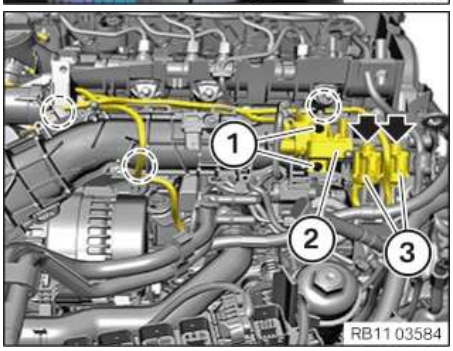
Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm



- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.

  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.

  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

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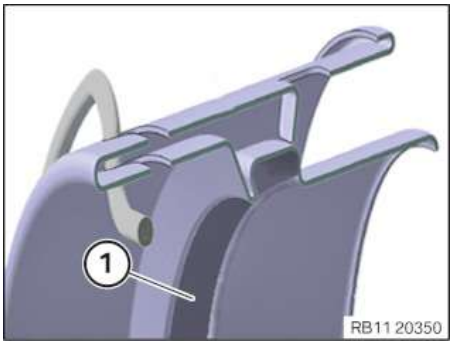


- Check the seal (1) for damage, and renew if necessary.

▸ **Replacing damaged seal**

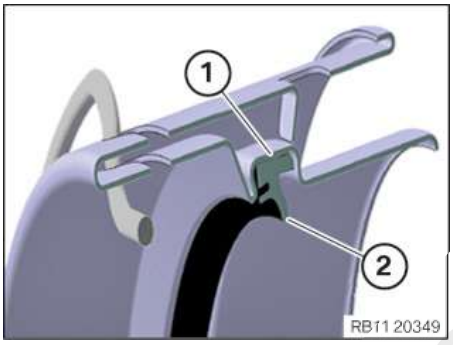
TECHNICAL INFORMATION

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 directed inwards as shown.



- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

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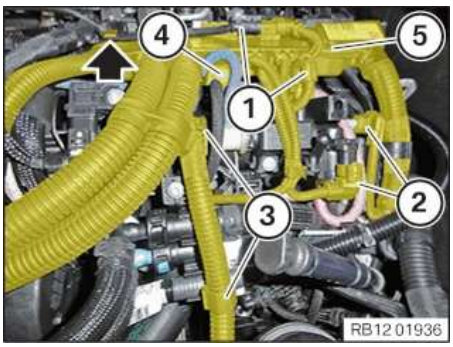
22 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

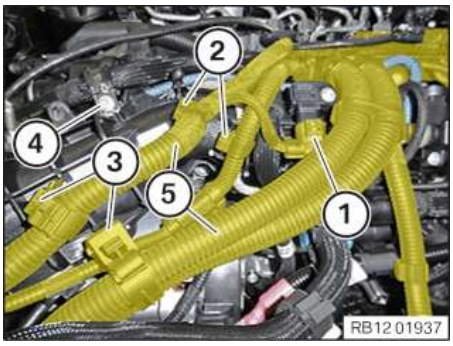
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



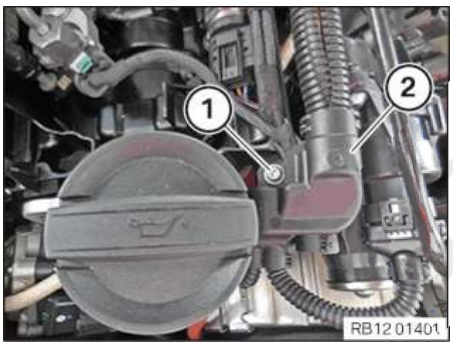
- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



- Connect connectors (1) and lock.

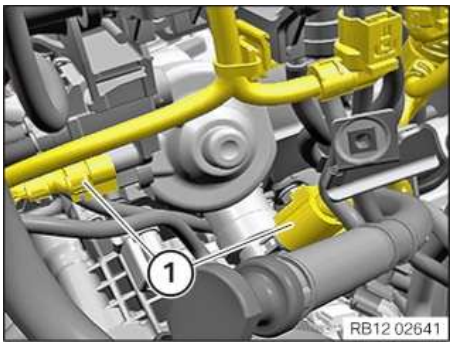
  The connector (1) must engage audibly.

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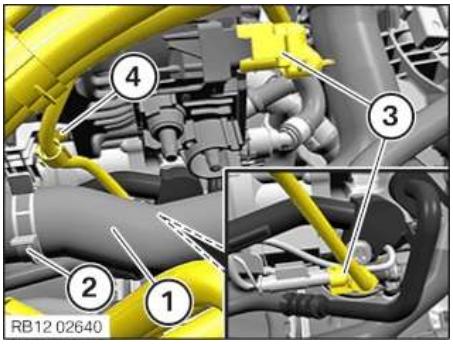
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



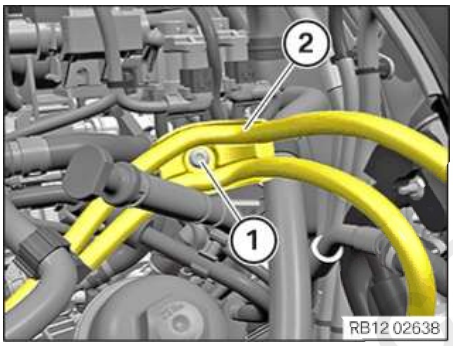
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Secure the clamp (4).
- Connect connectors (3) and lock.

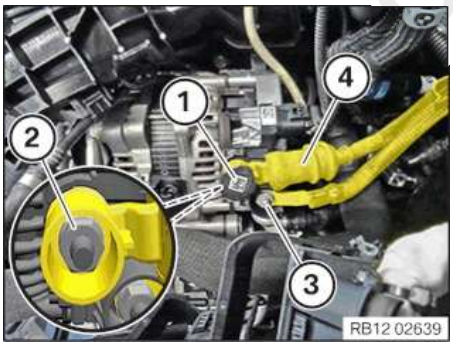
  The connectors (3) must engage audibly.
- Feed the coolant line (1) into the holder (2) and install it.



- Feed in and position the positive battery cables (2) .
- Tighten down screw (1).

Standard screw connection M6

M6		Tightening torque	8 Nm



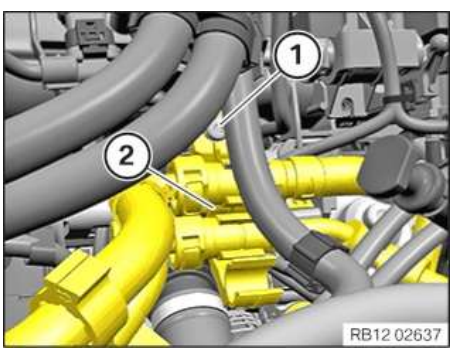
- Feed in and install the positive battery cable (4).
- Feed in and position the positive battery cables (4) .
- Renew the nuts (3) and (2).

  Parts: Nuts
- Tighten nuts (3) and (2).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm

- Guide in and install the lid (1).

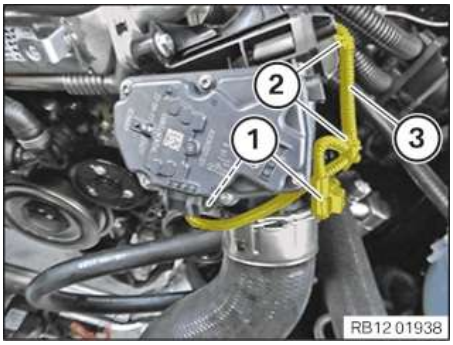


- Insert and install the holder (2).
- Tighten down screw (1).

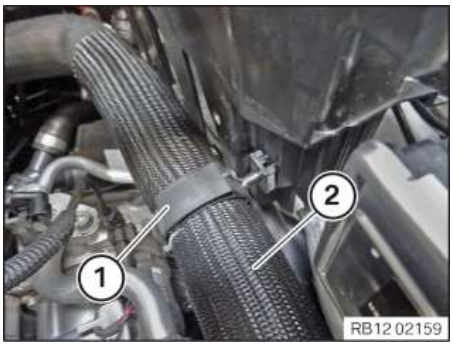
Holder on intake plenum

TS6X20		Tightening torque	5 Nm

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- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.



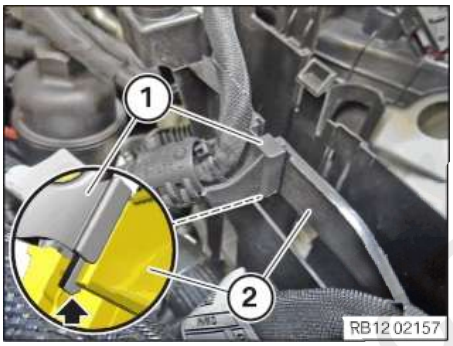
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



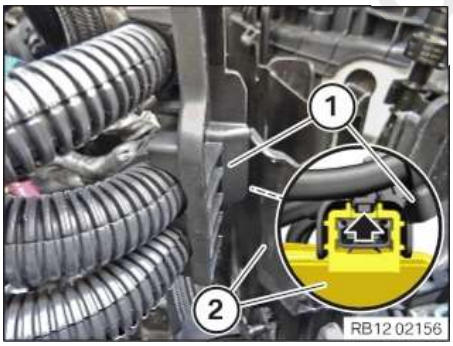
- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.



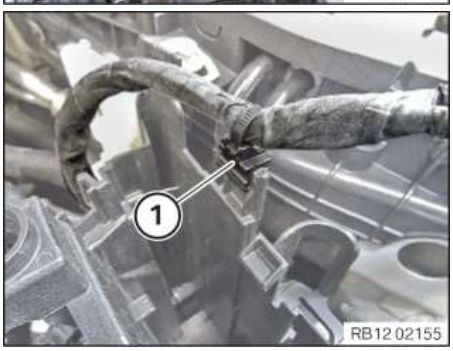
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.



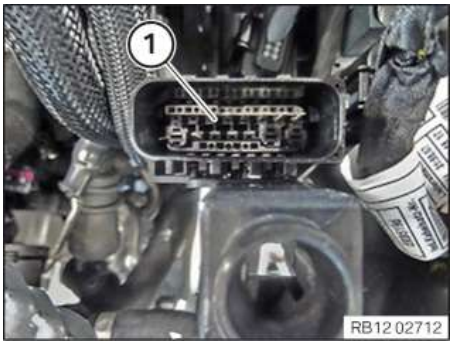
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.



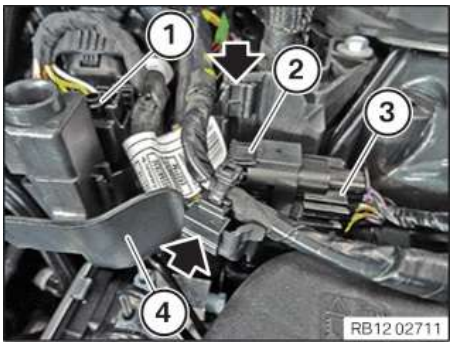
- Secure clamps (1).

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- Feed in and install the connector (1).

  The connector (1) must engage audibly.

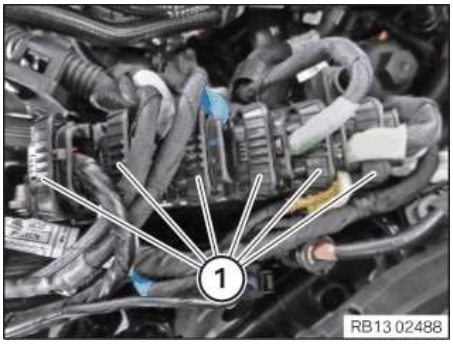


- Connect connector (3) to control unit holder (4) and lock it.

  The connector (3) must engage audibly.
- Connect connectors (2) and lock.

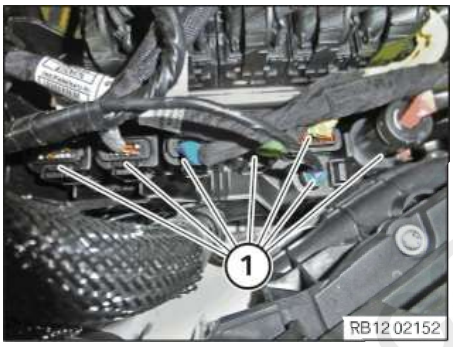
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure the clamps (arrows).



- Connect connectors (1) and lock.

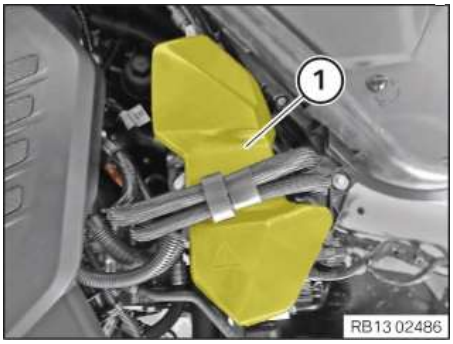
  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

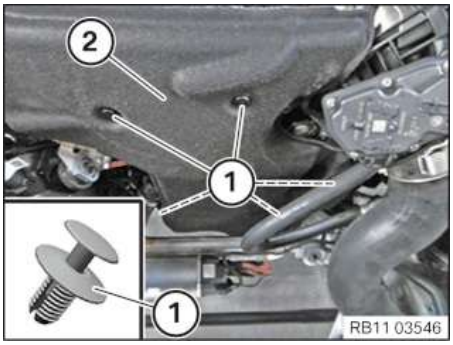
23 – Install the cover for the DDE control unit



- Insert and install cover (1) into guides.

24 – Install acoustic cover for the engine, front

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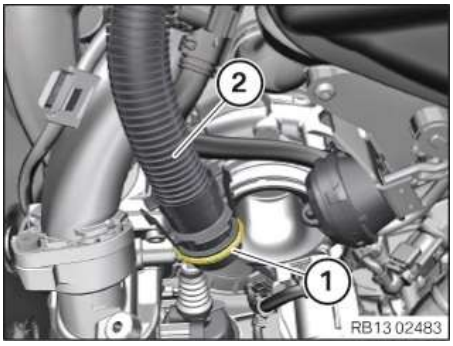


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

25 – Installing the clean air pipe with resonator



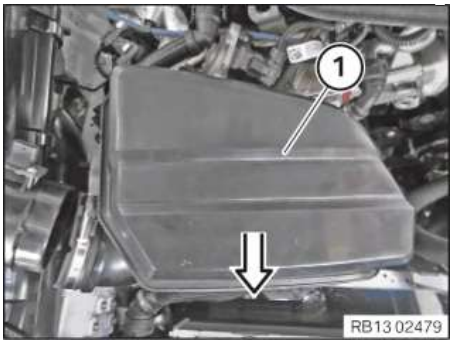
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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



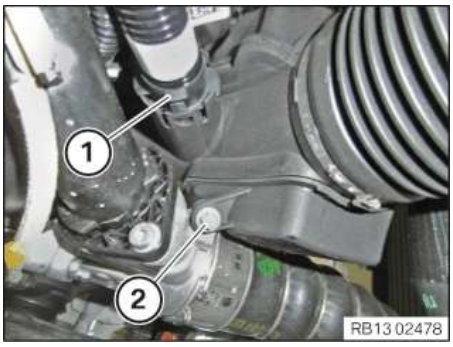
- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

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- Attach and lock the clamp (1).

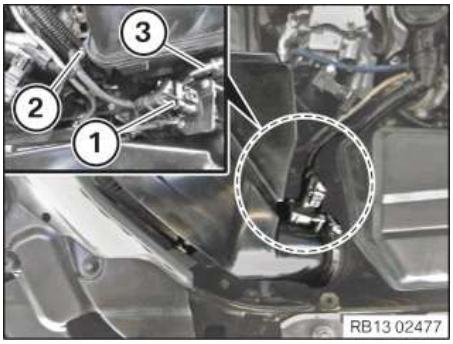
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



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

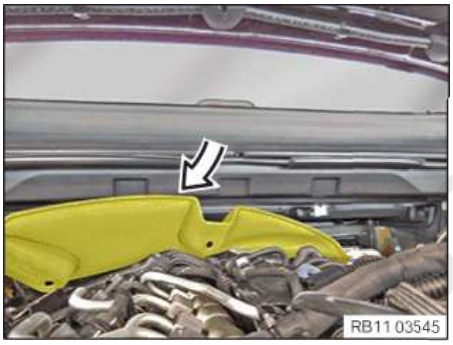
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

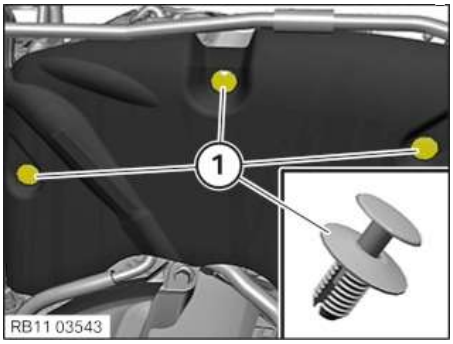
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

26 – Installing acoustic cover at rear



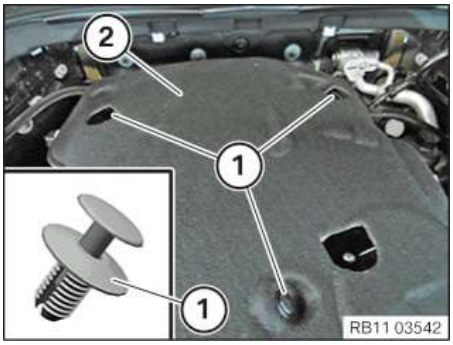
- Guide in the acoustic cover in the direction of the arrow and install it.



- Secure acoustic cover with the expanding rivets (1).

27 – Install the acoustic cover for the injectors

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- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

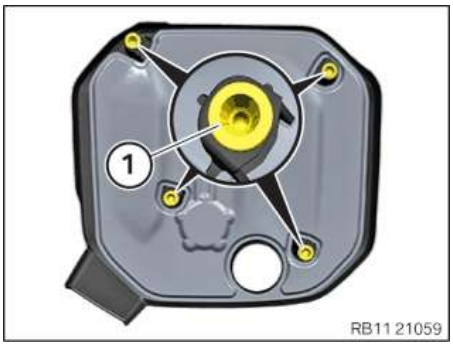
28 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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

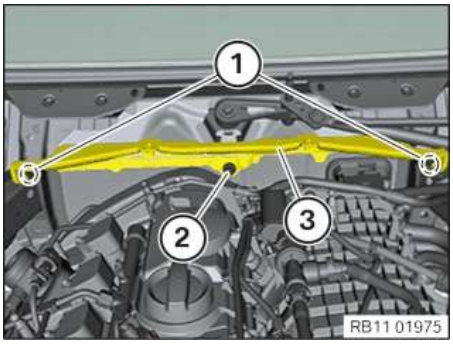


- Check the acoustic cover for correct fit of the rubber mounts (1).



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

29 – Installing centre bulkhead lower section



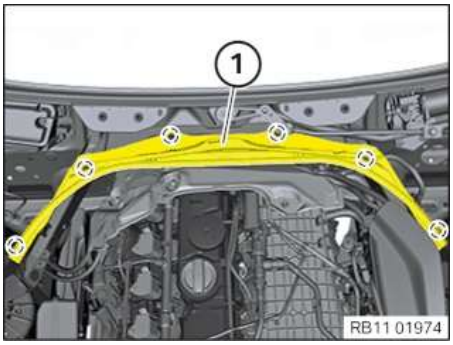
- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

30 – Installing the centre bulkhead upper part

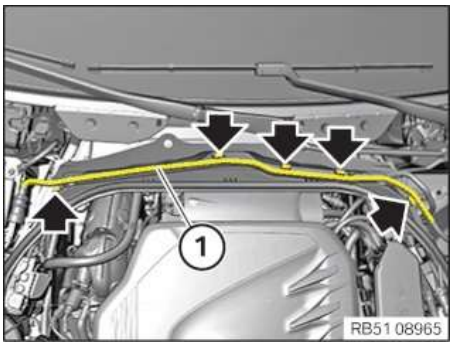
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- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

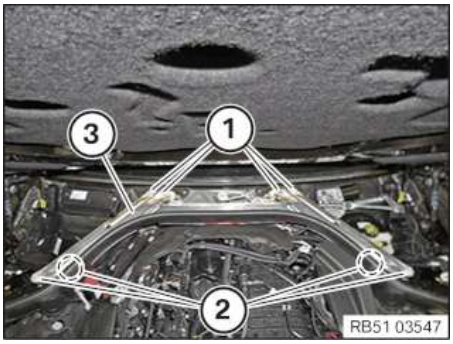
Bulkhead upper part to bottom bulkhead

	Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

31 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

32 – Installing cowl panel cover

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RISK OF DAMAGE

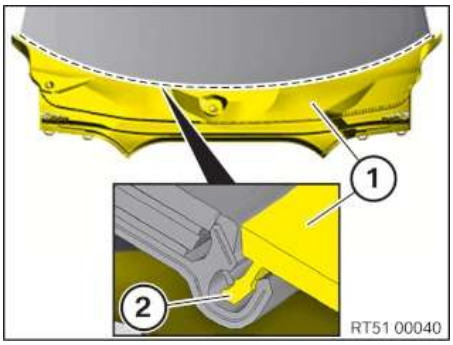
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

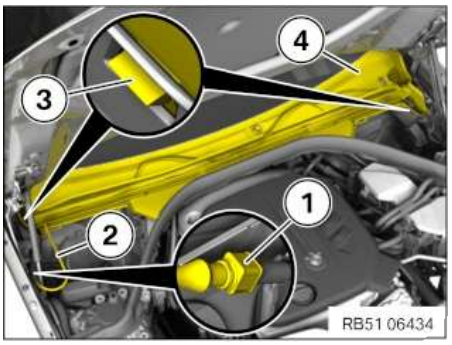
- Ensure correct installation of the components.
- Only use undamaged components.

TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

33 – Install left and right wiper arm

NOTICE

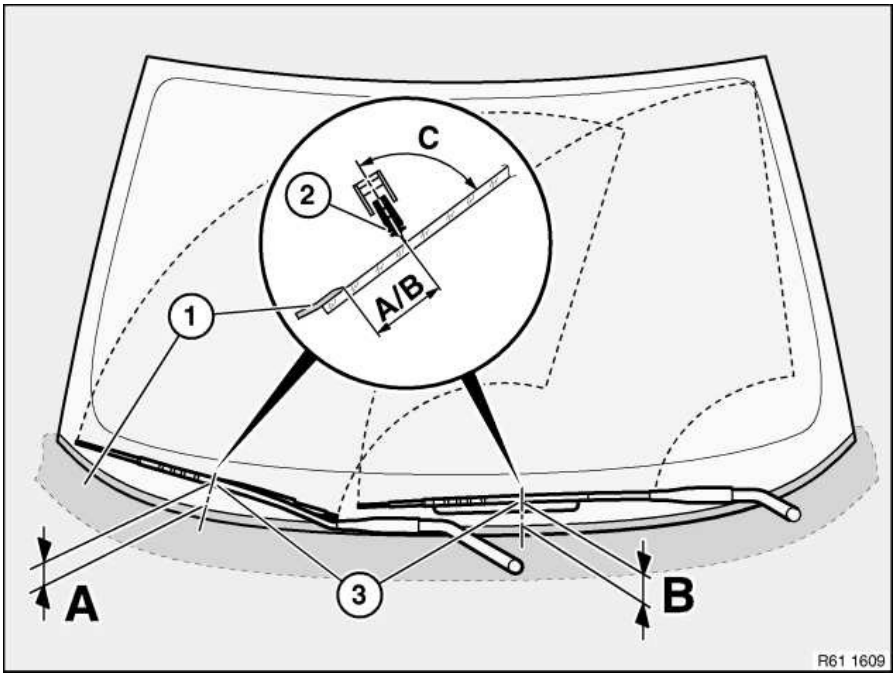
Description is for left component only. Procedure on the right side is identical.

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.

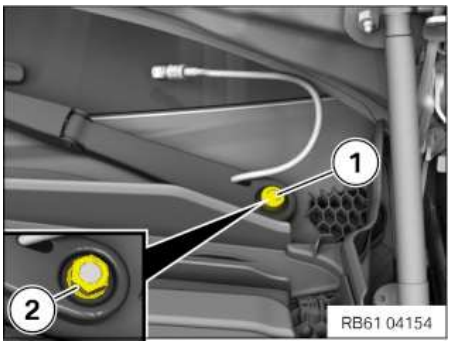
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- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

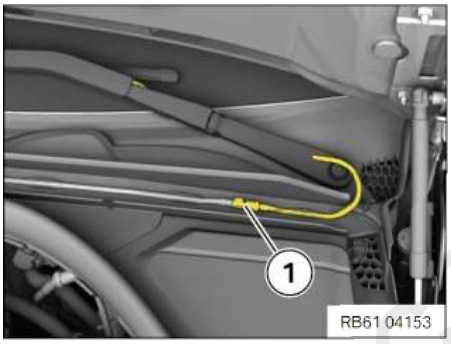


- Tighten nut (2).

Windscreen wiper arm

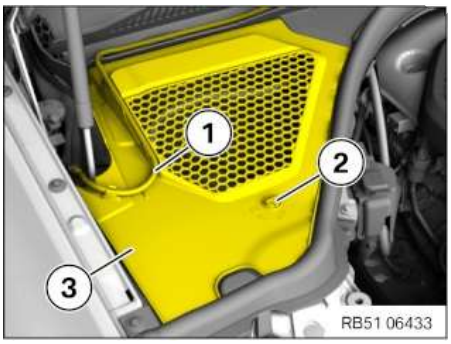
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

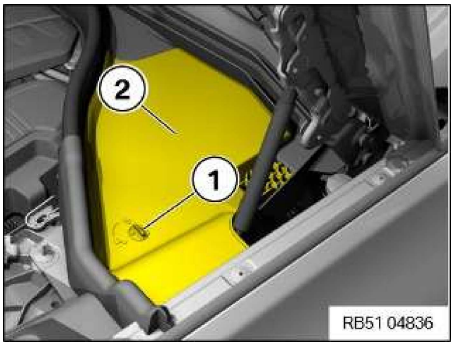
34 – Install the rear right engine compartment cover



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

35 – 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).

36 – Connecting all battery earth leads



- See additional information.

37 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

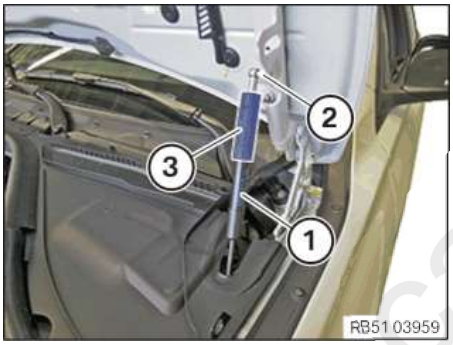
38 – Take bonnet out of the service position

CAUTION

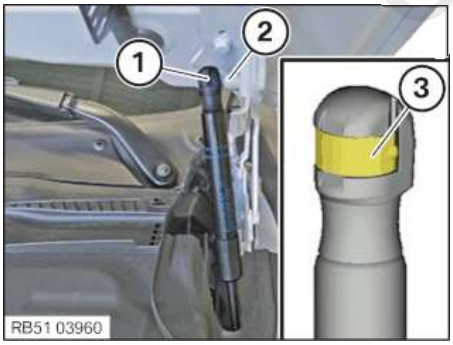
Shutting bonnet or tailgate.

Danger of injury!

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



- 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.



- 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

Intake plenum to cylinder head — Used in step 21

M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum — Used in step 21

		Tightening torque	10 Nm

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Electric changeover valve to intake plenum			Used in step 21
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 22
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 22
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 22
TS5x20		Tightening torque	3,6 Nm

Standard screw connection M6			Used in step 22
M6		Tightening torque	8 Nm

Battery positive lead on the starter motor generator			Used in step 22
M8		Tightening torque	19 Nm

Holder on intake plenum			Used in step 22
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 25
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 25
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 29
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 30
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 30
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 30
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 33
Combination hexagon nut		Tightening torque	35 Nm

Negative battery cable to 48-V battery			Used in step 37
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 33
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

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Repair instructions (PRE)	Used in step
Notes on 48-V battery	237

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
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61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
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61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336
61 20 900 Disconnecting and connecting battery earth lead	336

61 35 ... Notes on ESD protection (Electro Static Discharge) 17
61 35 ... Notes on ESD protection (Electro Static Discharge) 17

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13 53 330 Replacing all leakage oil lines

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

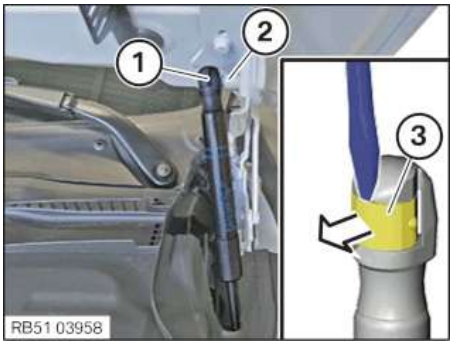
Engine compartment lid is open.

CAUTION

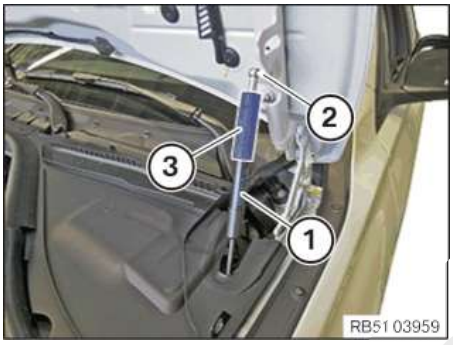
Shutting bonnet or tailgate.

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.
- Pull special tool or 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.

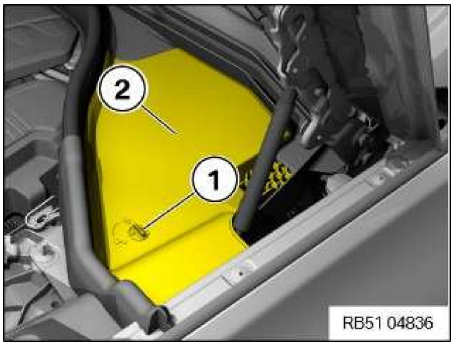
2 – Disconnecting all battery earth leads



- See additional information.

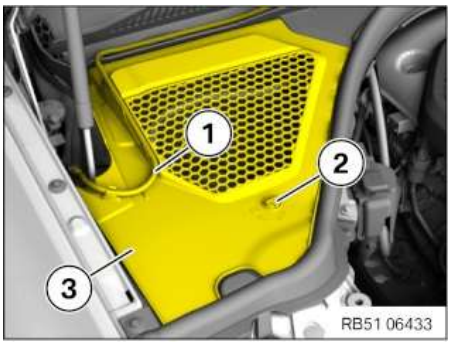
3 – Remove the cover of the engine compartment at the rear left

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

4 – Remove the cover of the rear right engine compartment



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

5 – Removing the wiper arm on the left and right

NOTICE

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

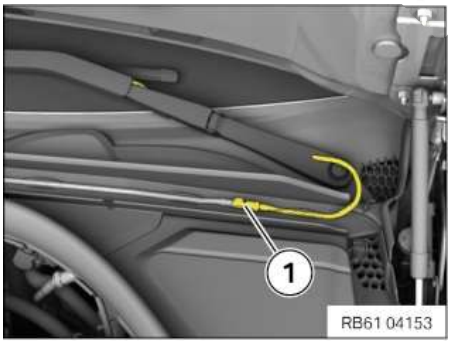
▸ **Remove the wiper arm**

RISK OF DAMAGE

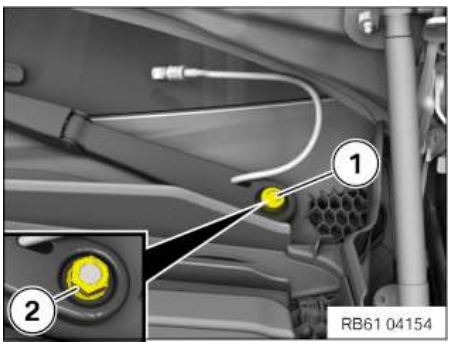
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.

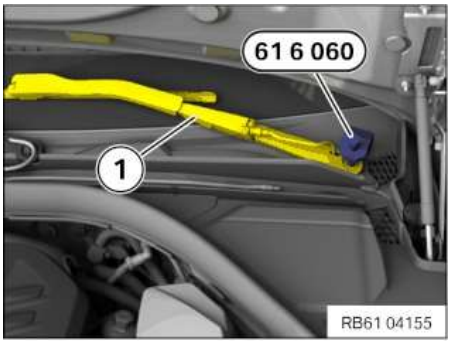


- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



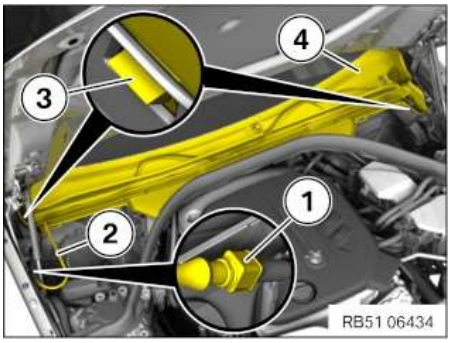
- Remove the protective cap (1).
- Loosen nut (2).

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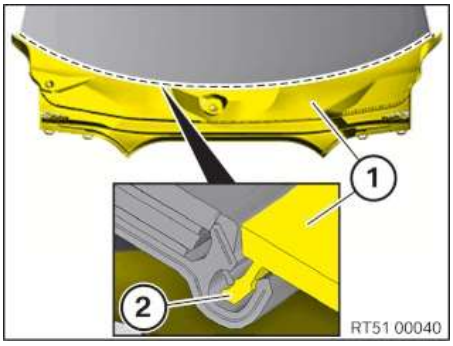


- Pull off the wiper arm (1) using special tool .

6 – Remove cowl panel cover



- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

7 – Remove the seal for the rear bonnet

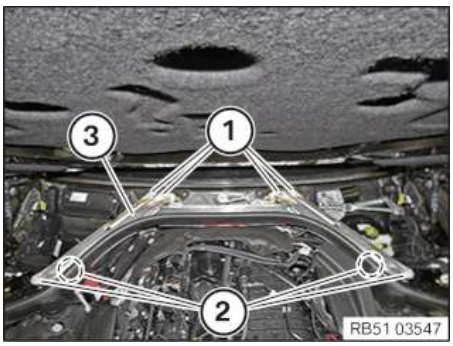


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

8 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.

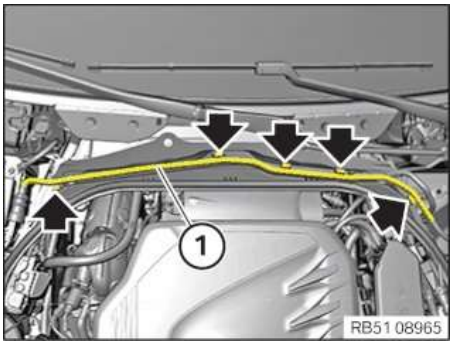


NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

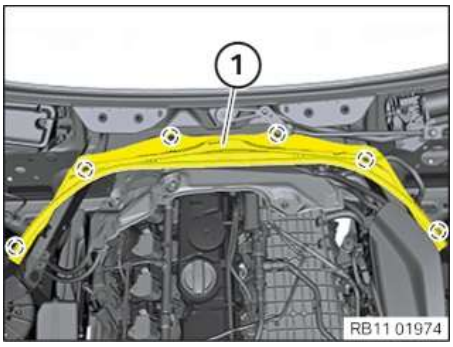
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.

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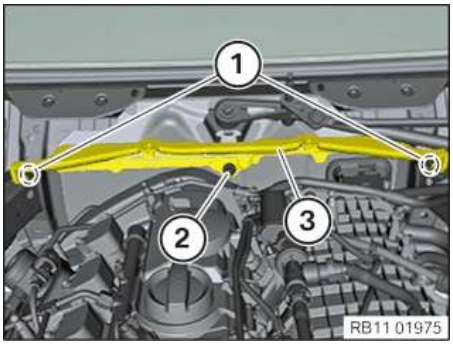
- **Version with mild hybrid technology:**

  Unclip the wire (1) at the holders (arrows).



- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

9 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

10 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

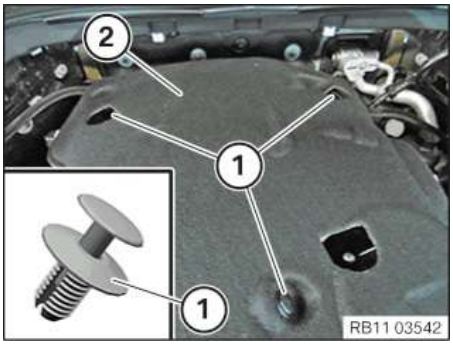
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation,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



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

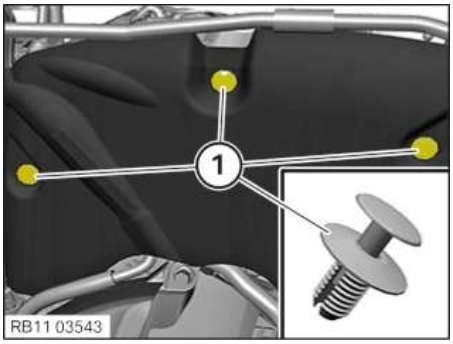
11 – Remove the acoustic cover for the injectors

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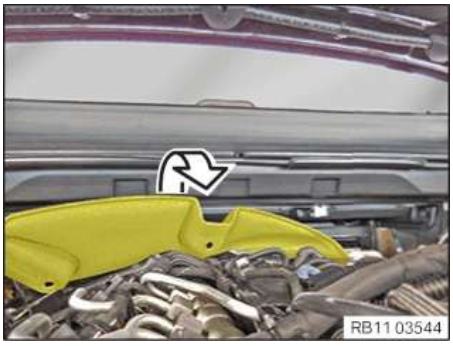


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

12 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

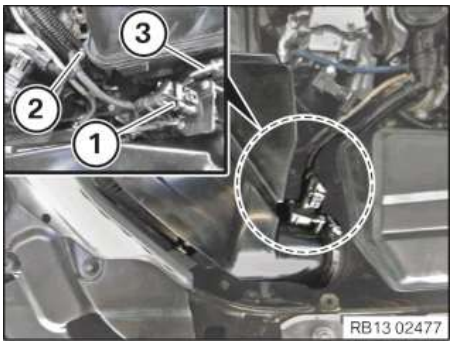
13 – Removing the clean air pipe with the resonator

WARNING

Hot surfaces.

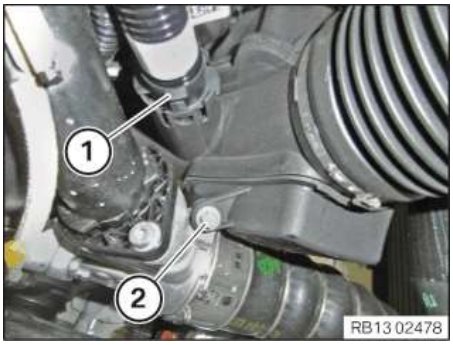
Risk of burning!

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

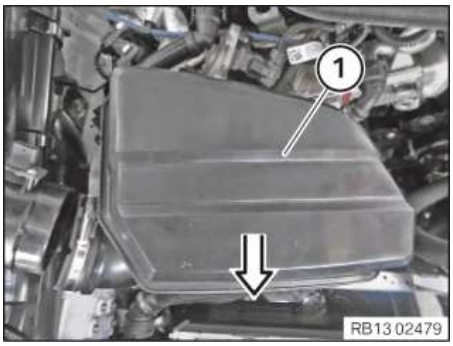


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

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- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

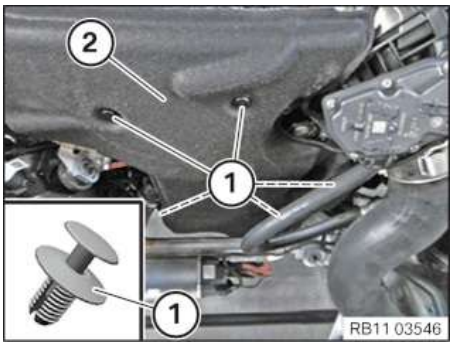
14 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

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15 – Partially releasing the wiring harness section on the intake plenum

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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

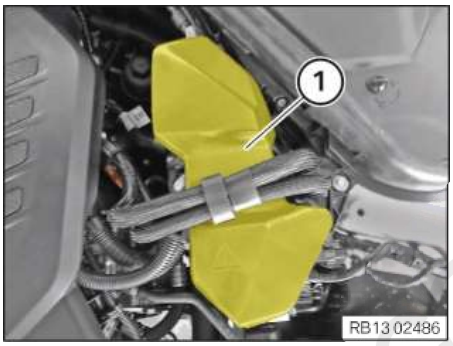
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

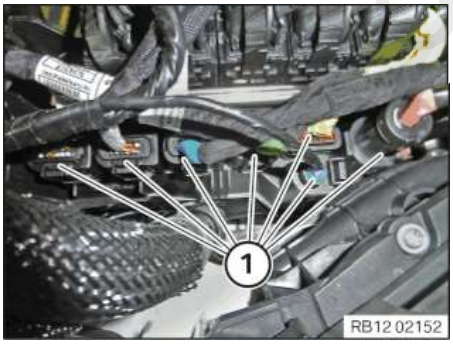
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

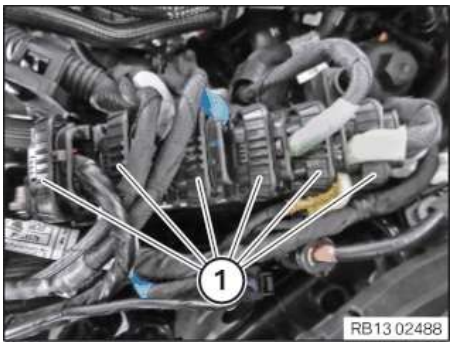
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Pull off cover (1) upwards, feed out and remove.

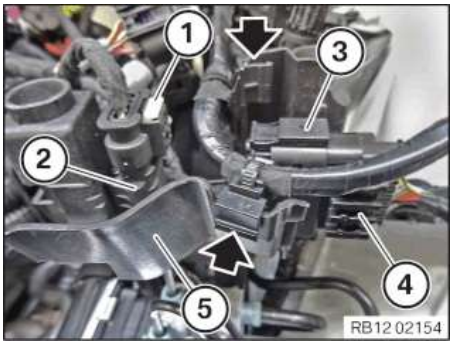


- Unlock and disconnect plug connections (1).

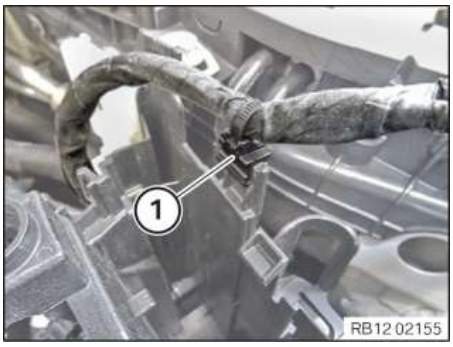


- Unlock and disconnect plug connections (1).

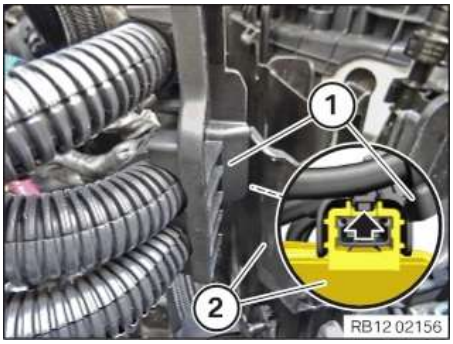
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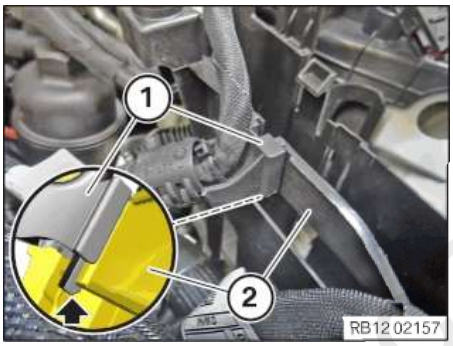
- Unlock plug connection (1) and disconnect.
- Unlock the plug (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock the plug (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).



- Loosen clamp (1).



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



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

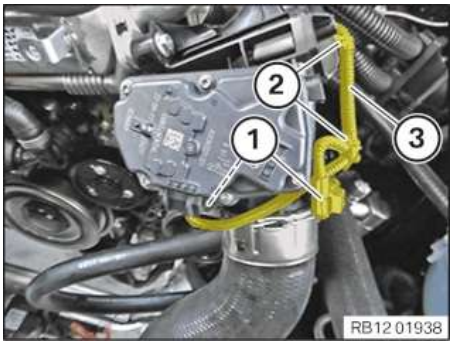


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

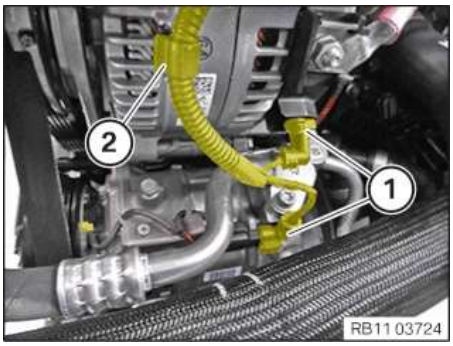


- Unlock holder (1) and feed out coolant line (2) and place it aside.

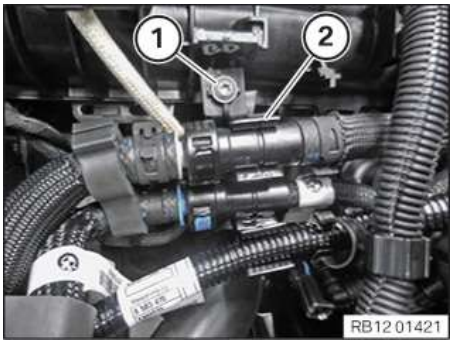
gardiagn.com



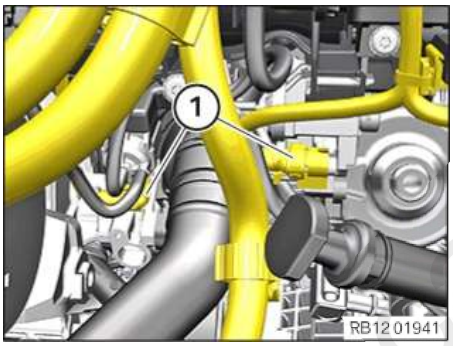
- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.



- Unlock and separate plug connections (1).
- Release the holder (2) from the alternator .



- Loosen screw (1).
- Thread out holder (2) and set aside.



- Unlock and disconnect plug connections (1).

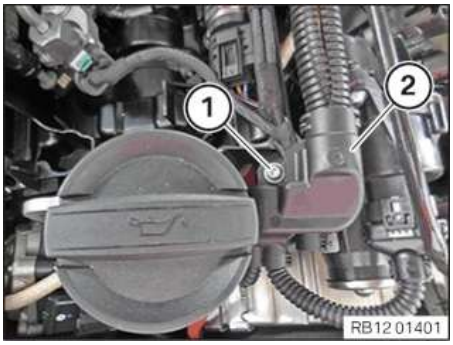


- Unlock and loosen connector (1).

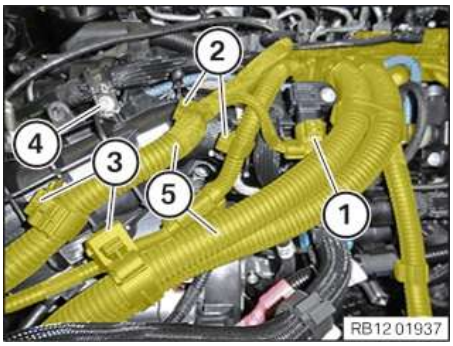


- Unlock plug connection (1) and disconnect.

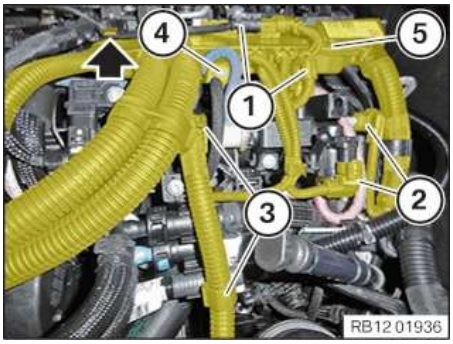
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- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

16 – Removing the intake plenum

TECHNICAL INFORMATION

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

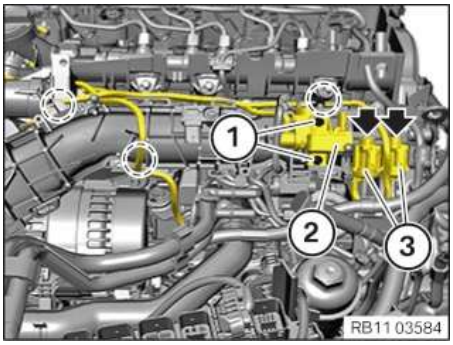


- Unlock clamp (1) and engage in this position.

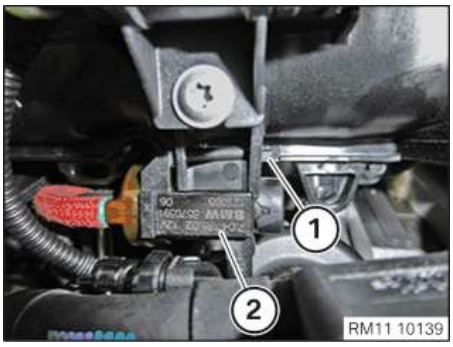


- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.

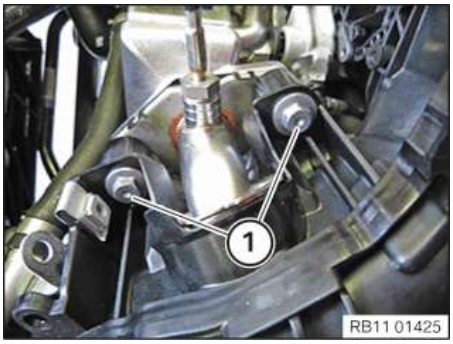
cardiagn.com



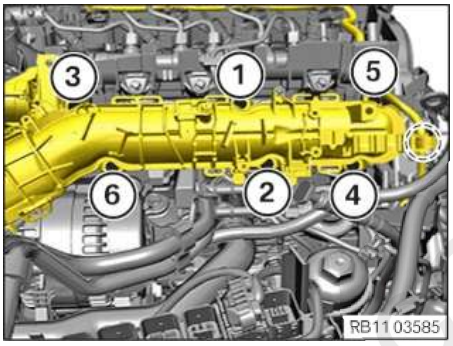
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



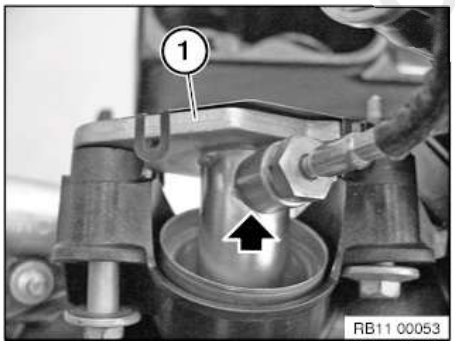
- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.



- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.



- Remove the exhaust-gas recirculation pipe (1) (arrow).

MAIN WORK

17 – Remove leakage oil lines

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

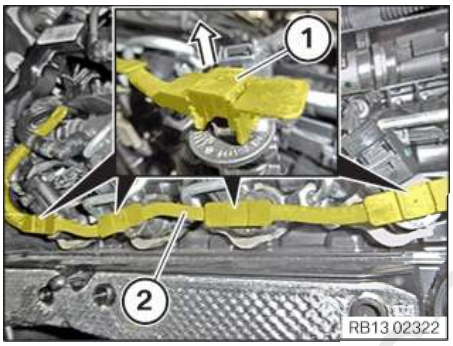
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

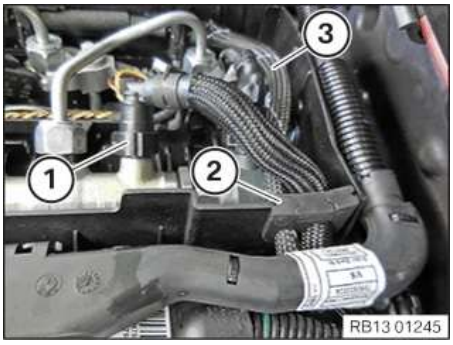
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.



- Unlock the locks (1) in the direction of the arrow.
- Remove the leakage oil line (2) and put it to one side.
- Catch and dispose of escaping fuel.

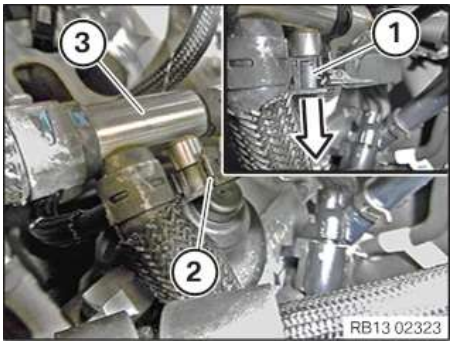


- Seal open connections using special tool .



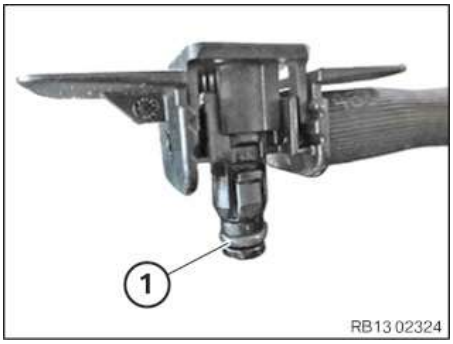
- Loosen fuel return line (1) and put to one side.
- Guide the leakage oil line (3) out of the rubber grommet (2) and set it aside.

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- Release lock (1) in direction of arrow.
- Disconnect leakage oil line (2) from fuel line (3) and remove.

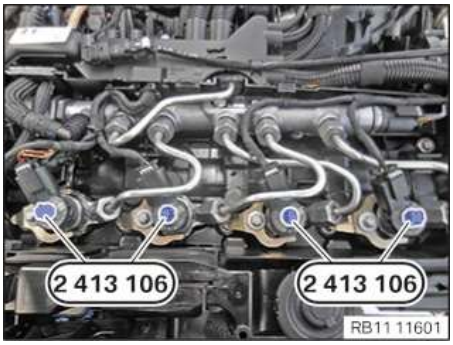
18 – Install leakage oil lines



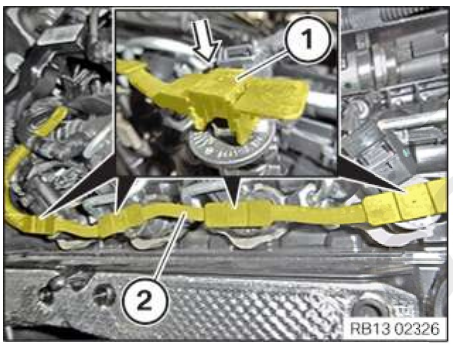
- Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.
- Check the sealing ring (1) for damage and if necessary, renew the leakage oil line .

  Parts: Leakage oil line

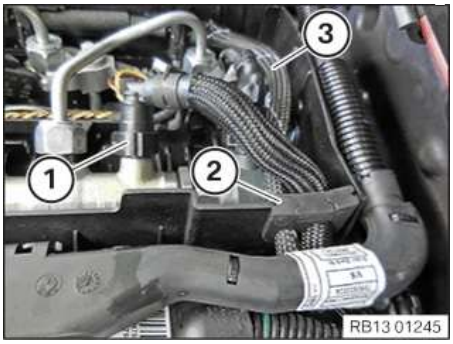
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.



- Guide the special tool out and remove.

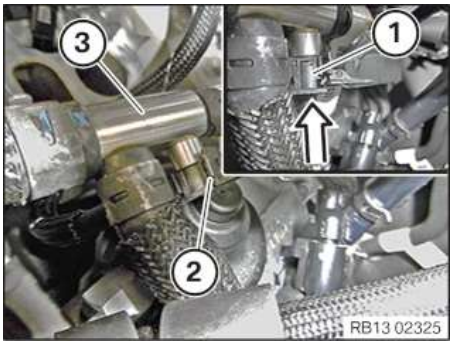


- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.



- Feed in leakage oil line (3) and install.
- Ensure the leakage oil line (3) is correctly fitted in the rubber grommet (2).
- Feed in fuel return line (1) and install.

  The fuel return line (1) must audibly engage.

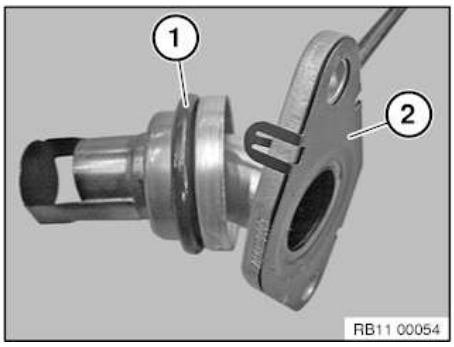


- Connect leakage oil line (2) with the fuel line (3).
- Lock the lock in direction of arrow (1).

  The lock (1) must audibly engage.

POSTPROCESSES

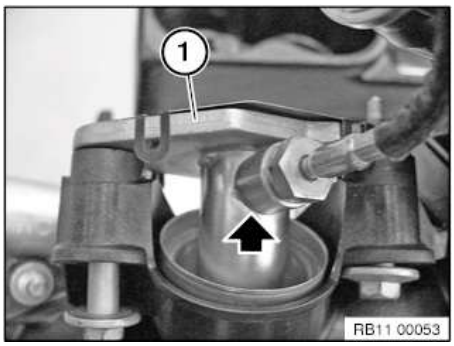
19 – Installing the intake plenum



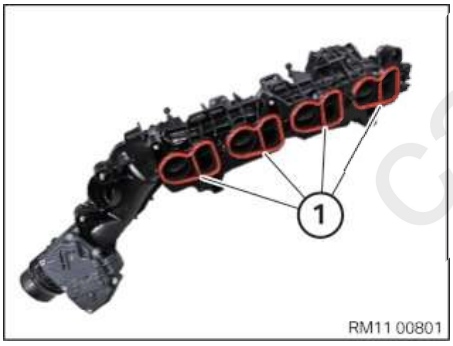
- Renew O-ring (1).

  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

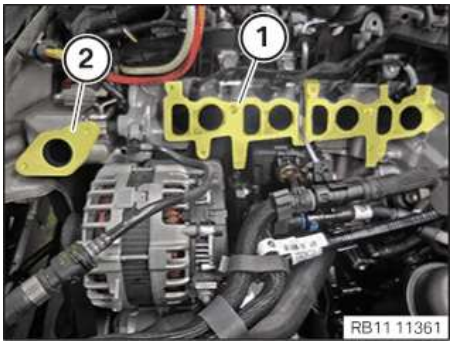


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).



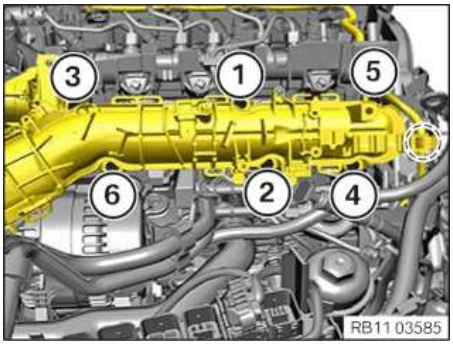
- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

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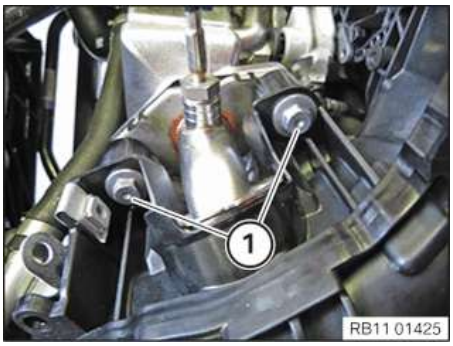


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

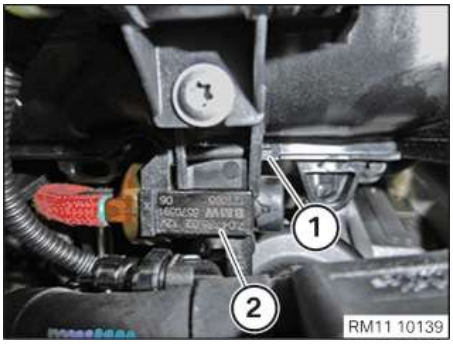
- Attach the wiring harness and fuel lines in the marked area on the intake plenum.



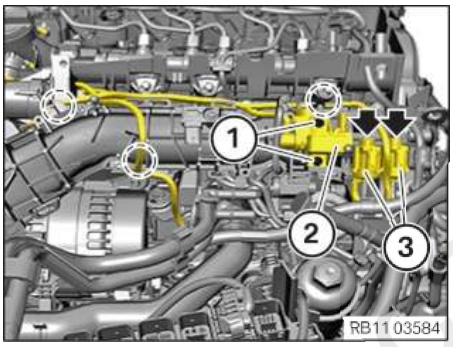
- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm



- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.
  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

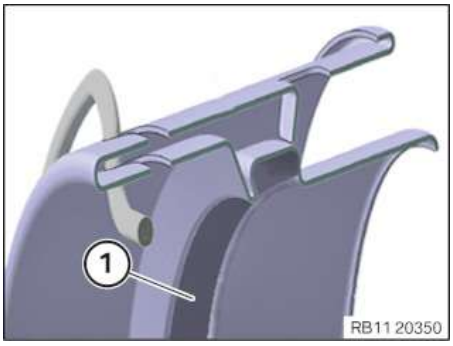


- Check the seal (1) for damage, and renew if necessary.

▸ **Replacing damaged seal**

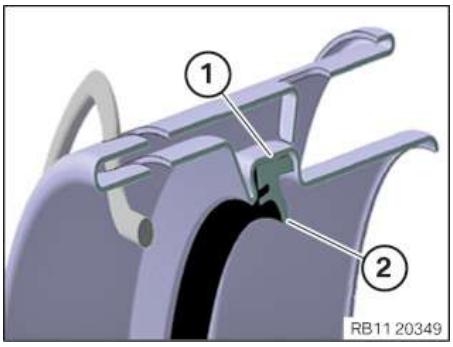
TECHNICAL INFORMATION

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 directed inwards as shown.



- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

20 – Partially securing the wiring harness section on the intake plenum

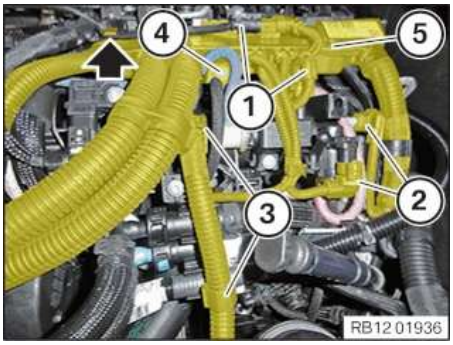
RISK OF DAMAGE

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.

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- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

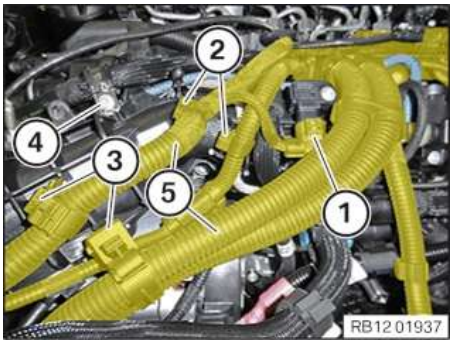
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



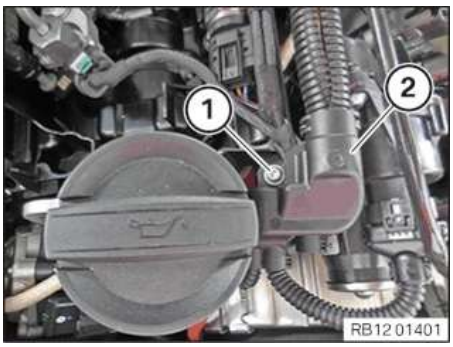
- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



- Connect connectors (1) and lock.

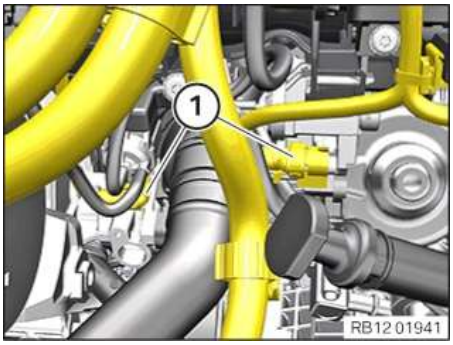
  The connector (1) must engage audibly.



- Connect the connector (1) and lock it.

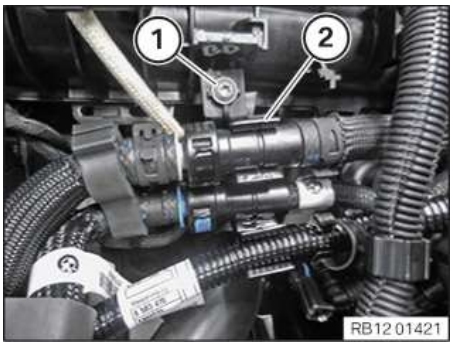
  The connector (1) must engage audibly.

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- Connect connectors (1) and lock.

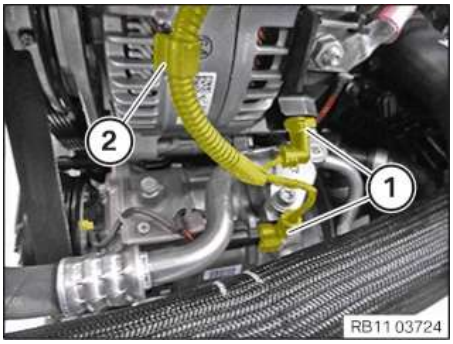
  The connectors (1) must engage audibly.



- Insert and install the holder (2).
- Tighten down screw (1).

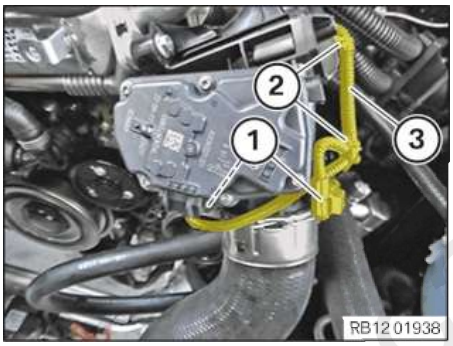
Holder on intake plenum

TS6X20		Tightening torque	5 Nm

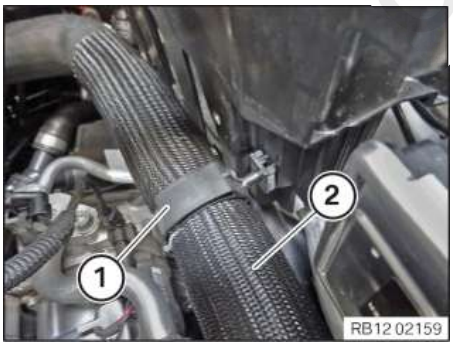


- Connect the connector (1) and lock it.

  The connectors (1) must engage audibly.
- Secure holder (2) to alternator.



- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.



- Feed in and install coolant line (2).
- Lock holder (1).

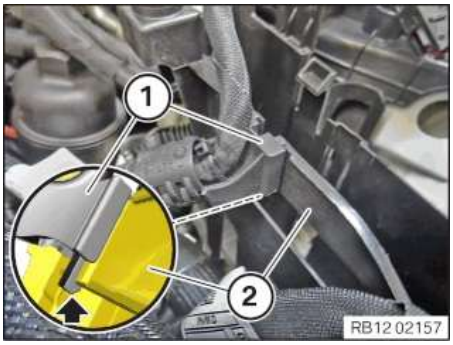
  The holder (1) must engage audibly.



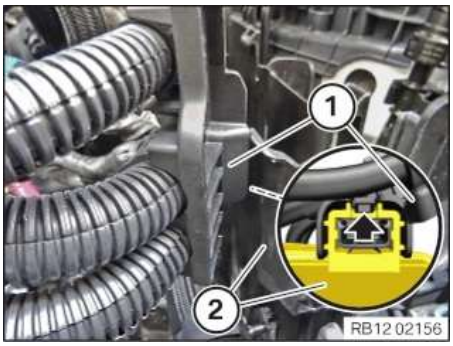
- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.

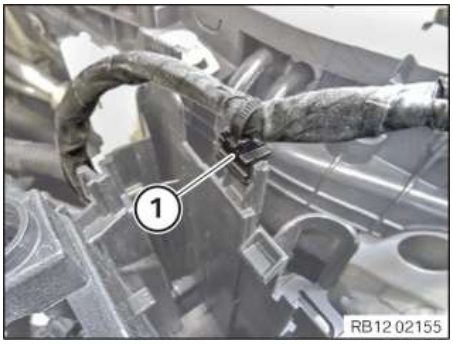
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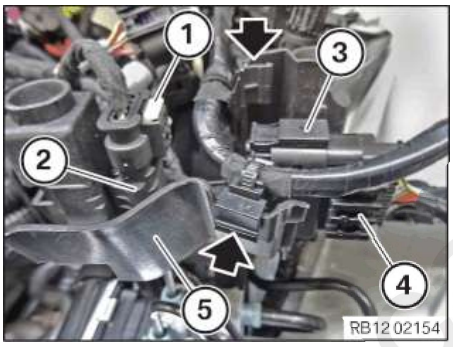
- Connect the cable clip (1) with the control unit holder (2) and lock it.
  Lock (arrow) must audibly engage.



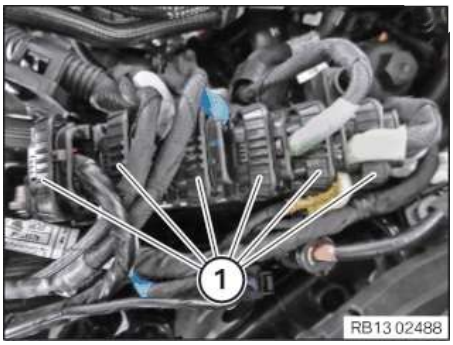
- Connect the cable clip (1) with the control unit holder (2) and lock it.
  Lock (arrow) must audibly engage.



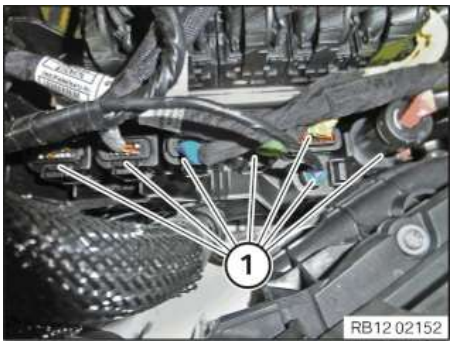
- Secure clamps (1).



- 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).

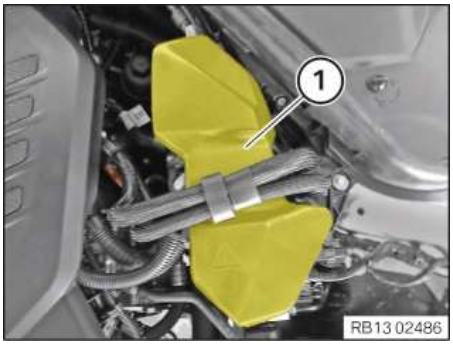


- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.



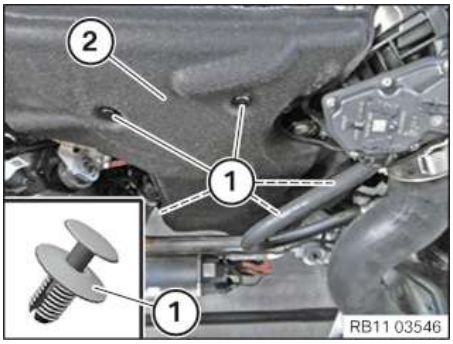
- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.

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- Insert and install cover (1) into guides.

21 – Install acoustic cover for the engine, front

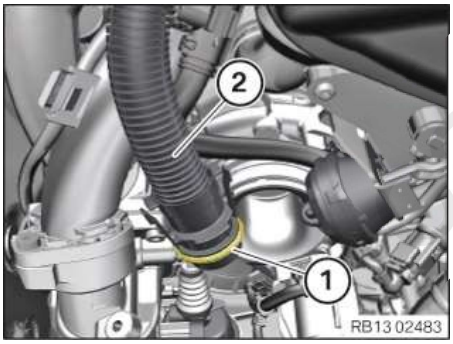


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

22 – Installing the clean air pipe with resonator



- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.

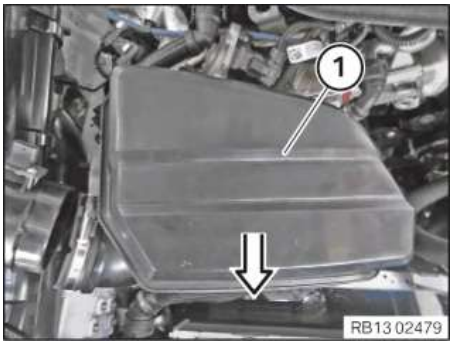


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

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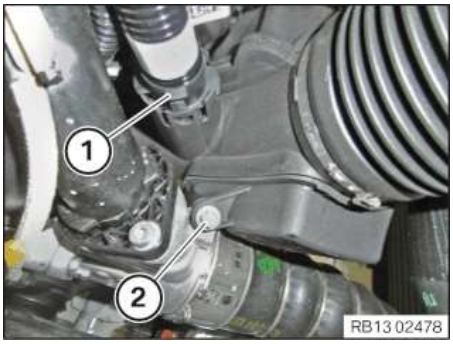


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

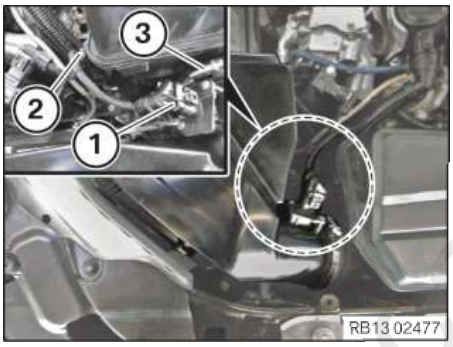
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



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

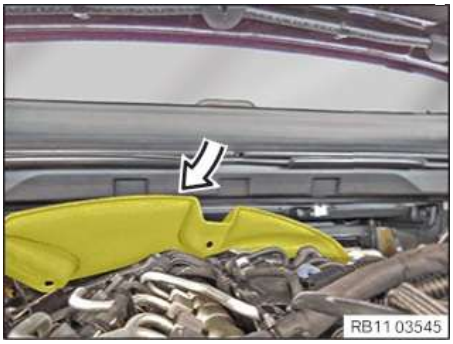
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

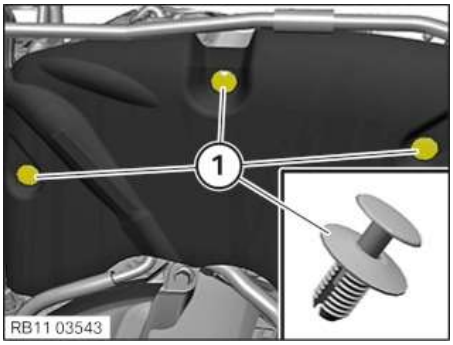
  The connector (1) must engage audibly.

23 – Installing acoustic cover at rear



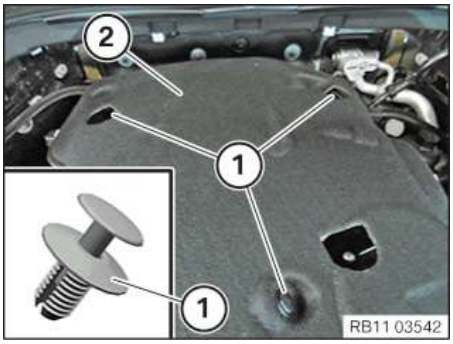
- Guide in the acoustic cover in the direction of the arrow and install it.

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- Secure acoustic cover with the expanding rivets (1).

24 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

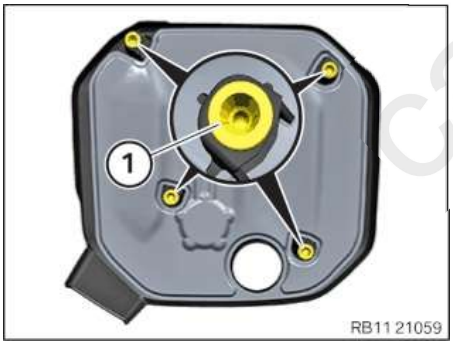
25 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



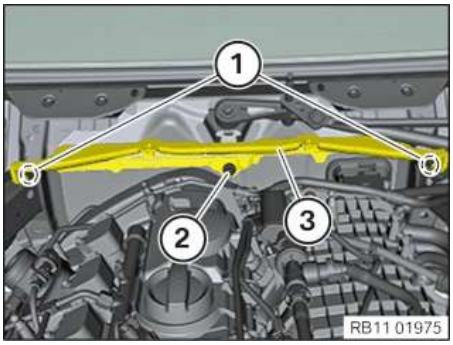
- Check the acoustic cover for correct fit of the rubber mounts (1).



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

26 – Installing centre bulkhead lower section

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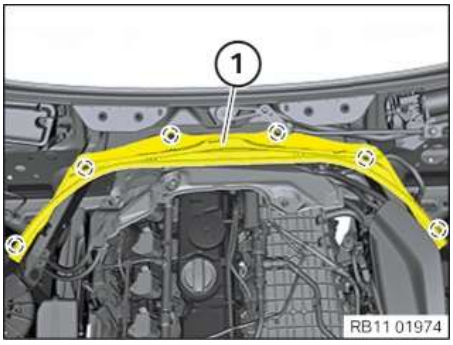


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

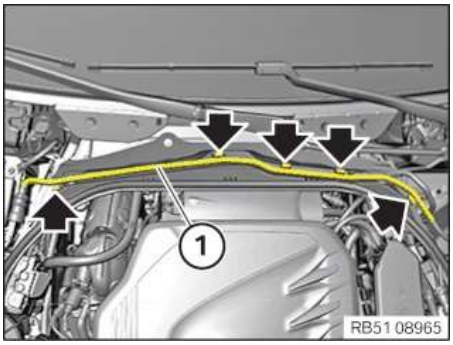
27 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

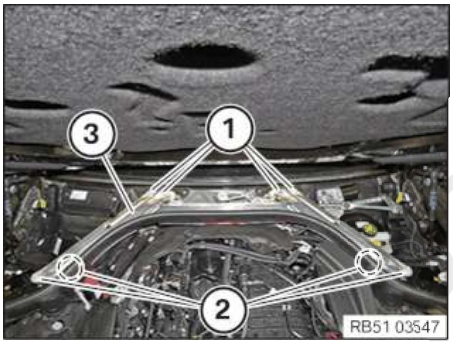
Bulkhead upper part to bottom bulkhead

		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

28 – Install the seal for the bonnet

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- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

29 – Installing cowl panel cover

RISK OF DAMAGE

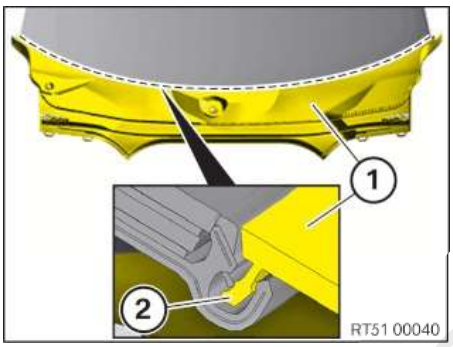
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

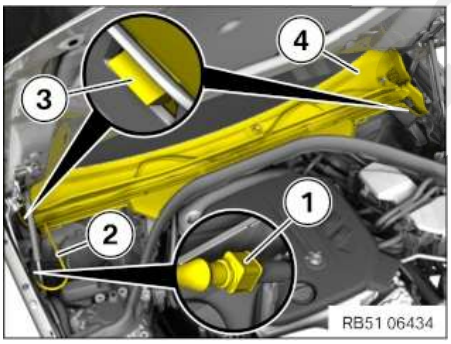
- Ensure correct installation of the components.
- Only use undamaged components.

TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

30 – Install left and right wiper arm

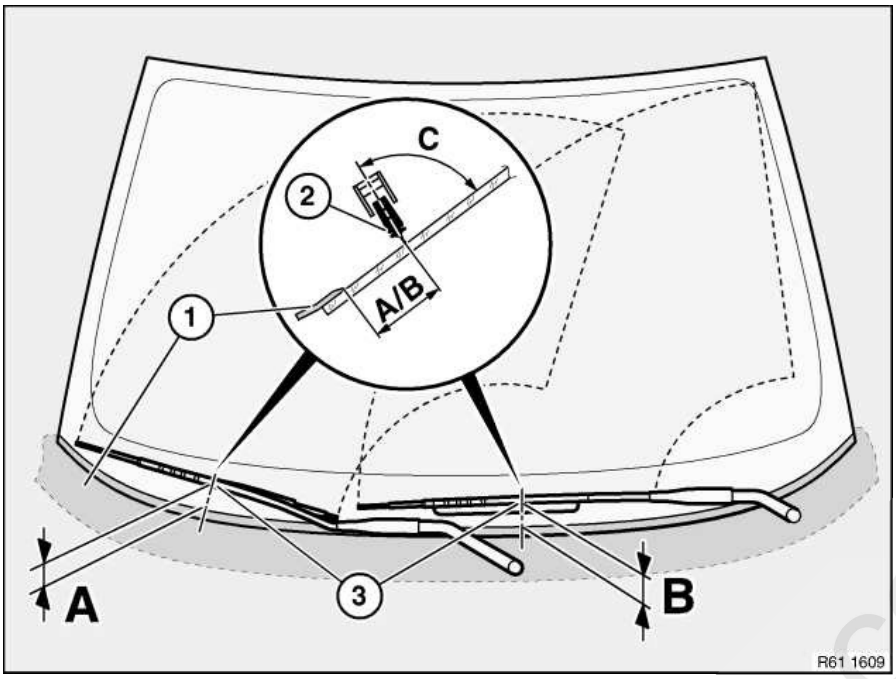
NOTICE

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

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

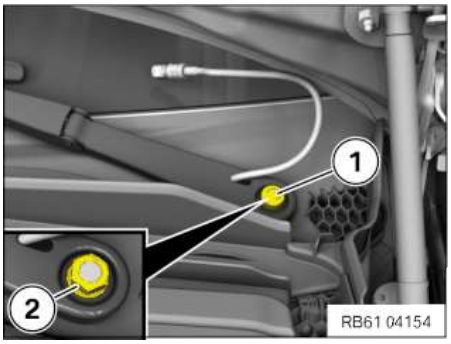
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

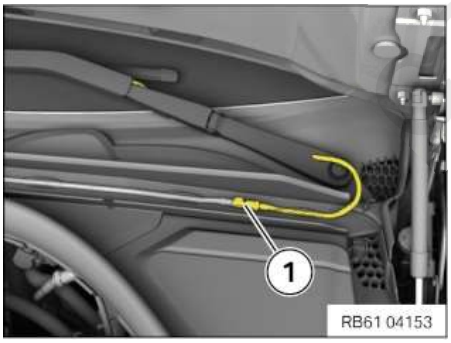


- Tighten nut (2).

Windscreen wiper arm

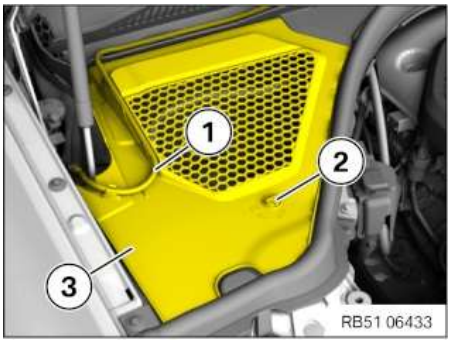
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

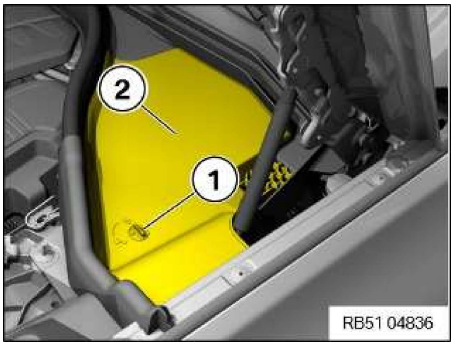
31 – Install the rear right engine compartment cover



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

32 – 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).

33 – Connecting all battery earth leads



- See additional information.

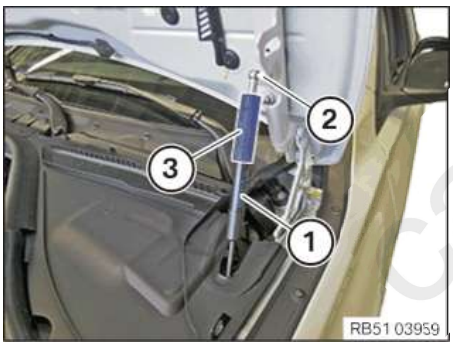
34 – Take bonnet out of the service position

CAUTION

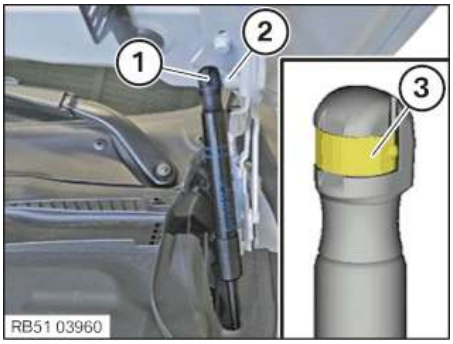
Shutting bonnet or tailgate.

Danger of injury!

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



- 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.



- 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

Intake plenum to cylinder head Used in step 19

M6		Tightening torque	11 Nm

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Exhaust-gas recirculation cooler to intake plenum			Used in step 19
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 19
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 20
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 20
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 20
TS5x20		Tightening torque	3,6 Nm

Holder on intake plenum			Used in step 20
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 22
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 22
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 26
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 27
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 27
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 27
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 30
Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 30
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233

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61 20 900 Disconnecting and connecting battery earth lead	233
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61 20 900 Disconnecting and connecting battery earth lead	233
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
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61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 20 900 Disconnecting and connecting battery earth lead	233
61 35 ... Notes on ESD protection (Electro Static Discharge)	15
61 35 ... Notes on ESD protection (Electro Static Discharge)	15

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13 53 170 Replacing all pressure lines

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

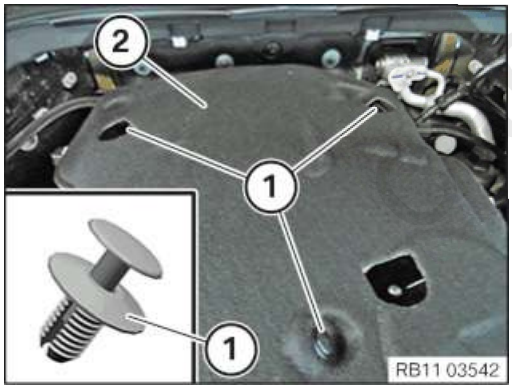
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

3 – Detaching the leakage oil line from the injectors

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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WARNING

Hot surfaces.

Risk of burning!

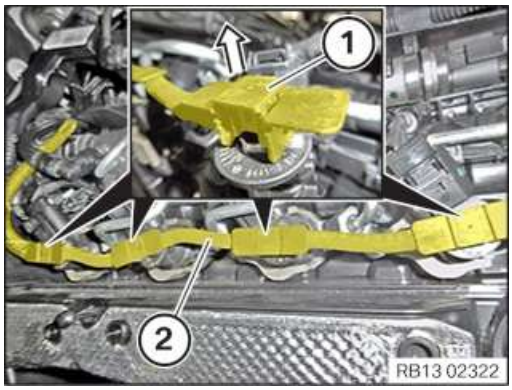
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

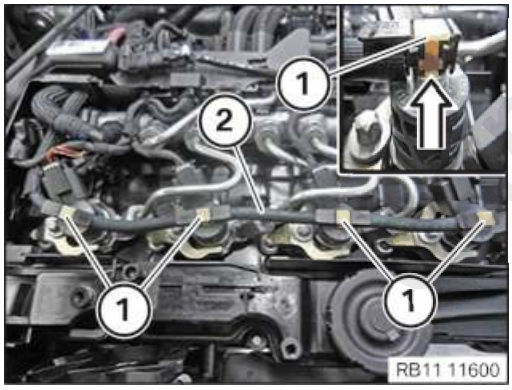


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

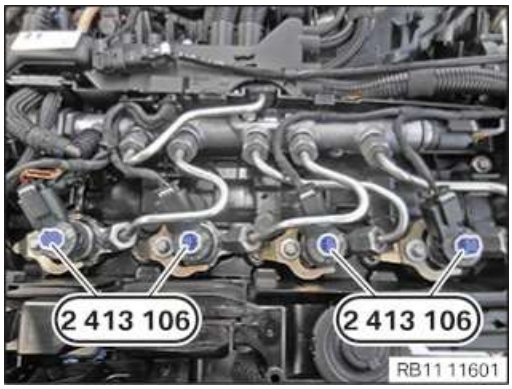


- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



- Seal open connections with special tools .

MAIN WORK

4 – Remove the high pressure lines between the injector and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

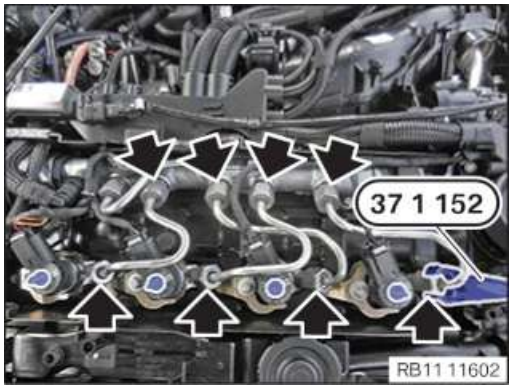
TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

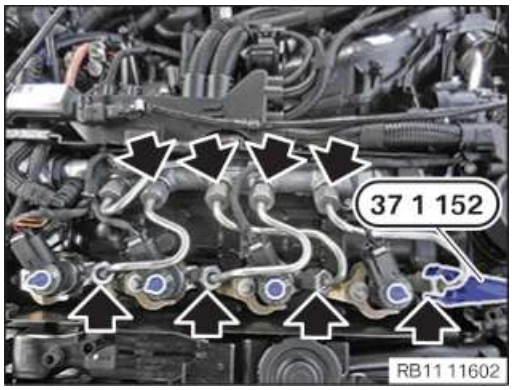
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- Release the high pressure lines (arrows) with the special tool .

  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

5 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the high pressure lines (arrows) with the special tool .

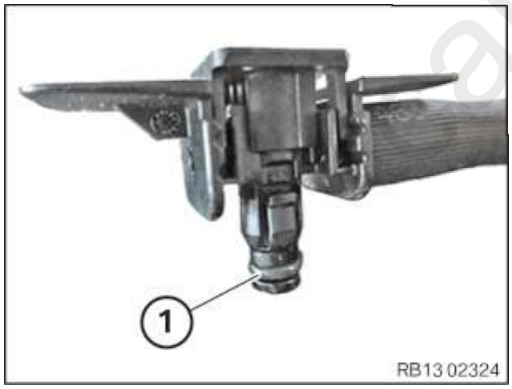
High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

POSTPROCESSES

6 – Attach the leakage oil line on the injectors



- **Version A:**

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

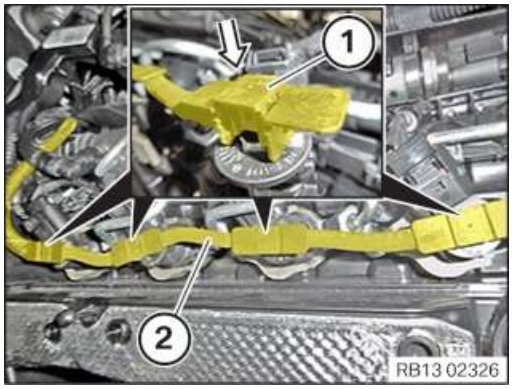
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

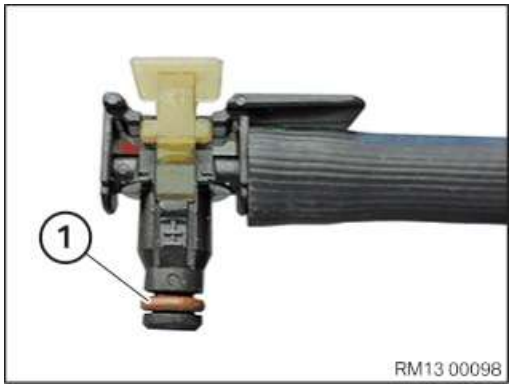


- Feed out the special tools and remove.

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- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.



- **Version B**:

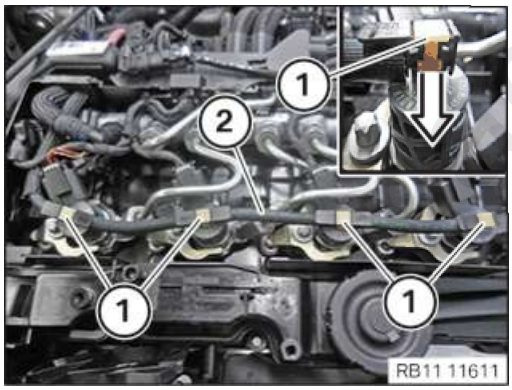
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

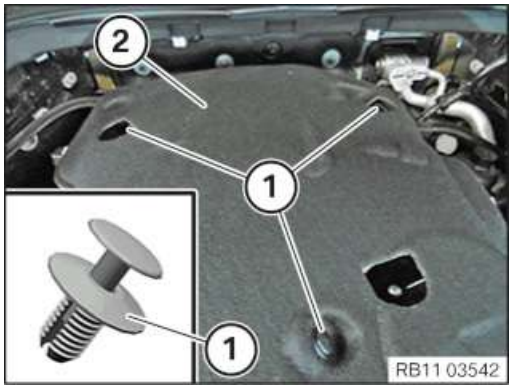


- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

7 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

8 – Install acoustic cover

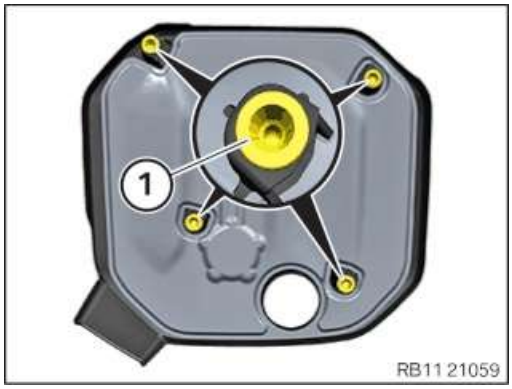
rdiagn.com

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



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

Additional Information

Overview of Tightening Torques

High pressure lines between injector and rail — Used in step 5

High-pressure pipe		Tightening torque	24.5 Nm

Overview of Special Tools

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13 53 570 Replacing the injection system pressure regulator

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

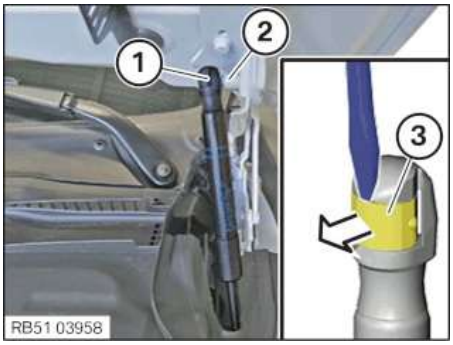
Engine compartment lid is open.

CAUTION

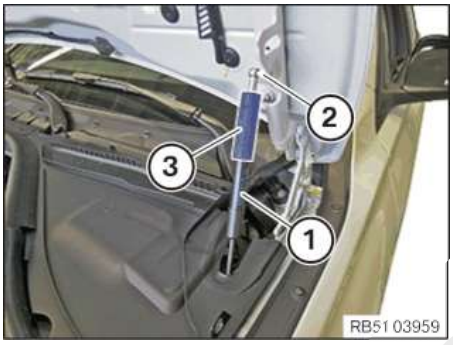
Shutting bonnet or tailgate.

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.
- Pull special tool or 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

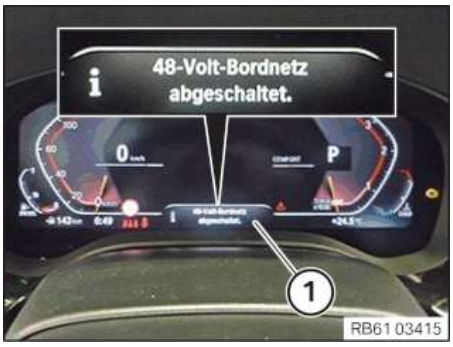
TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

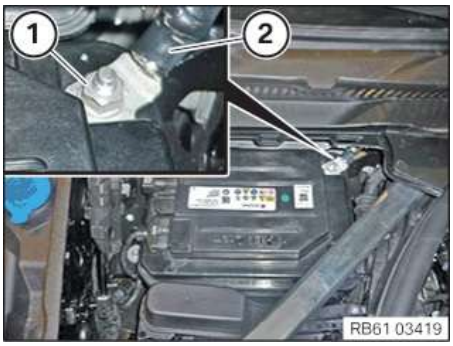
- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

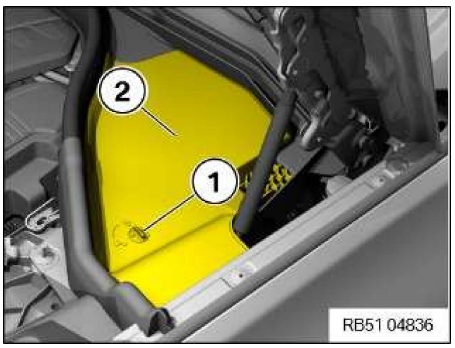
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

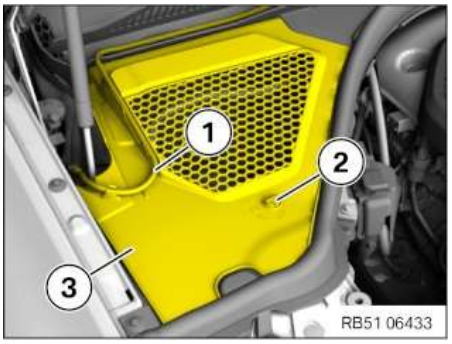
4 – Remove the cover of the engine compartment at the rear left



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

5 – 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 (3) of the rear right engine compartment.

6 – Removing the wiper arm on the left and right

NOTICE

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

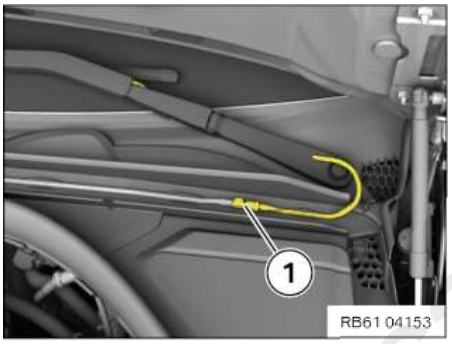
► **Remove the wiper arm**

RISK OF DAMAGE

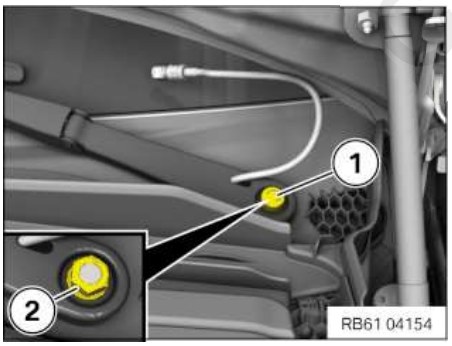
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

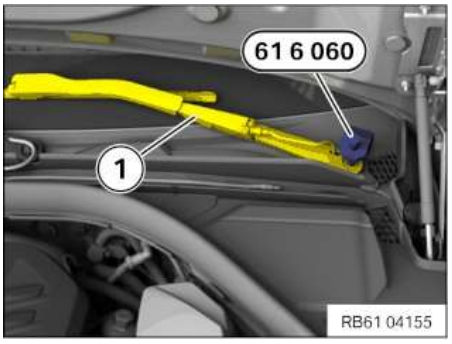
- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.



- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



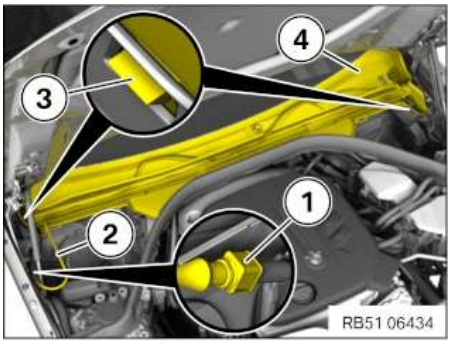
- Remove the protective cap (1).
- Loosen nut (2).



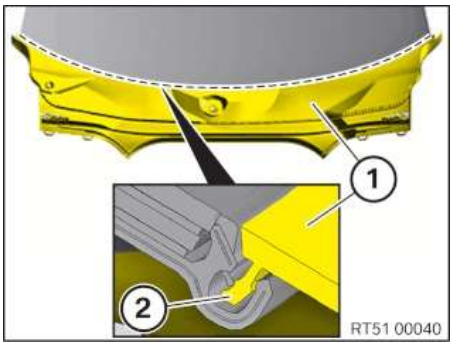
- Pull off the wiper arm (1) using special tool .

7 – Remove cowl panel cover

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- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

8 – Remove the seal for the rear bonnet

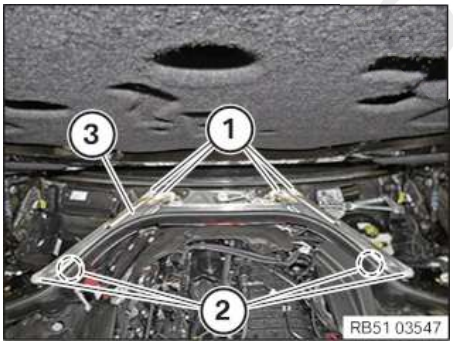


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

9 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

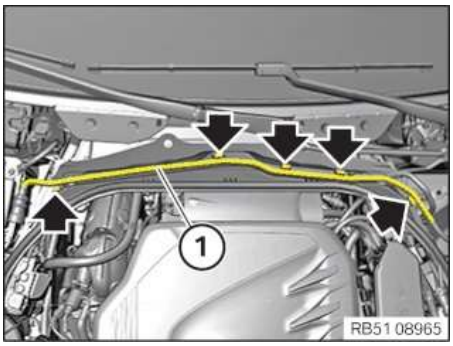
Driving without the strut brace/front-end strut or tension strut is not permitted.



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

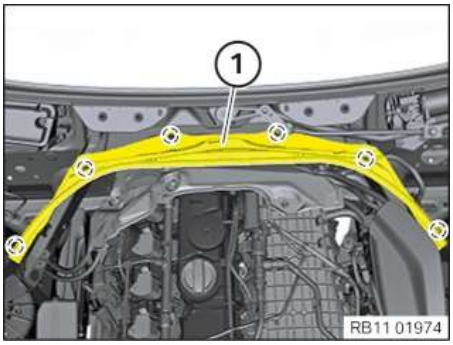
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.



- **Version with mild hybrid technology:**

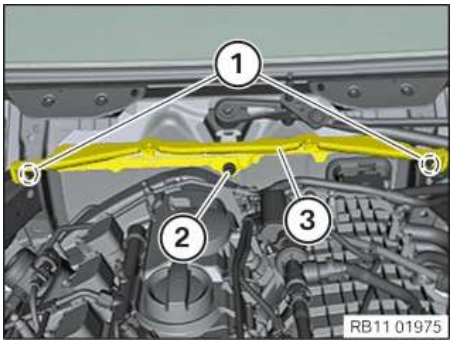
  Unclip the wire (1) at the holders (arrows).

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- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

10 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

11 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

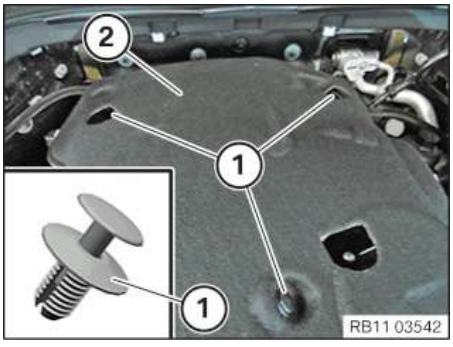
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

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



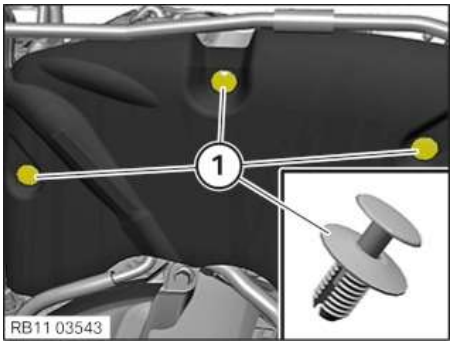
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

12 – Remove the acoustic cover for the injectors

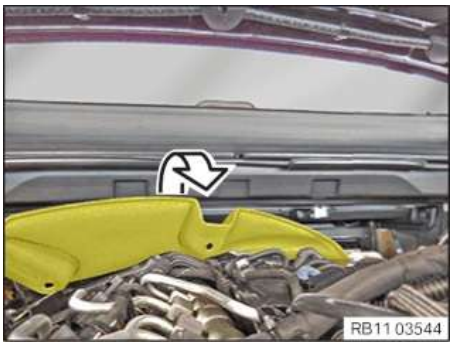


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

13 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

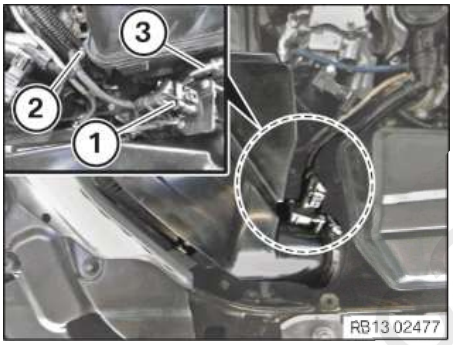
14 – Removing the clean air pipe with the resonator

WARNING

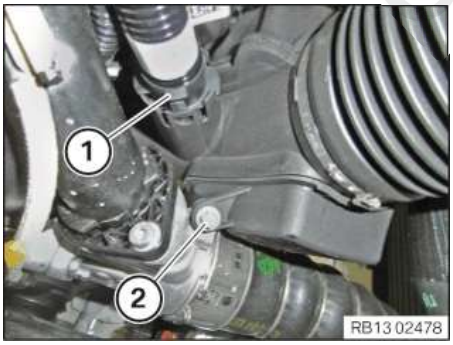
Hot surfaces.

Risk of burning!

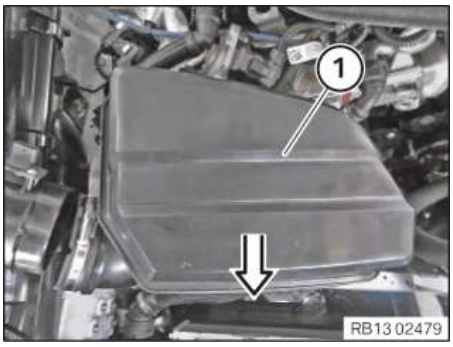
- Perform all work only on components that have cooled down.



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



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

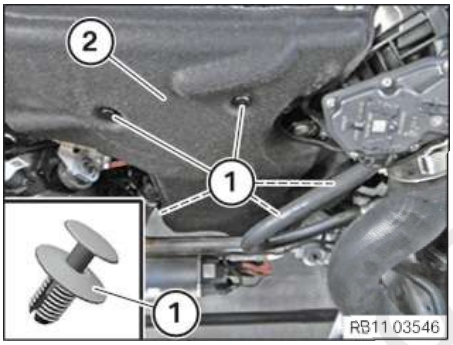
15 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

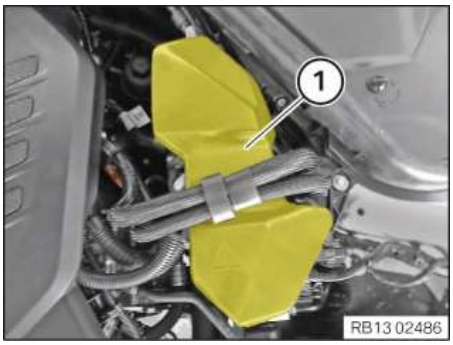
Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

16 – Remove the cover for the DDE control unit



- Pull off, guide out and remove cover (1) upwards.

17 – Partially releasing the wiring harness section on the intake plenum

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RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

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

RISK OF DAMAGE

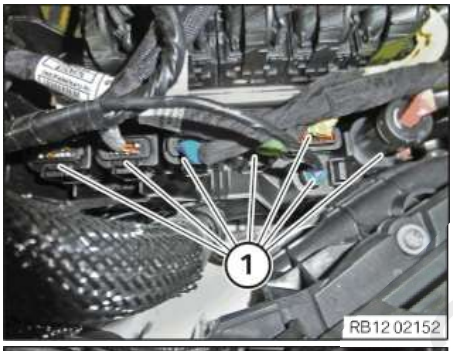
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

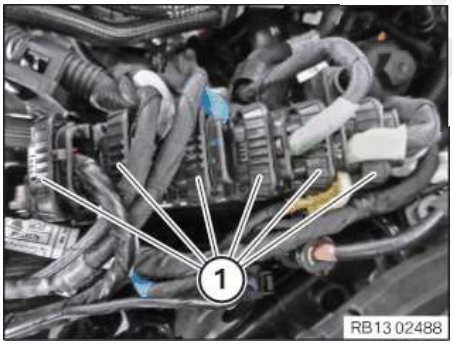
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

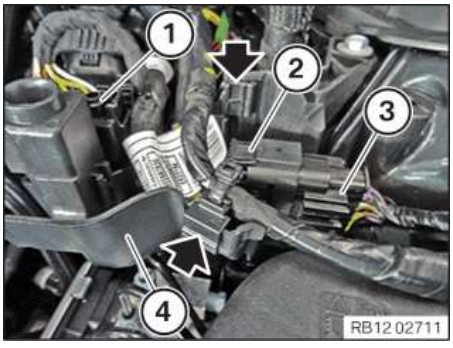
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Unlock and disconnect plug connections (1).

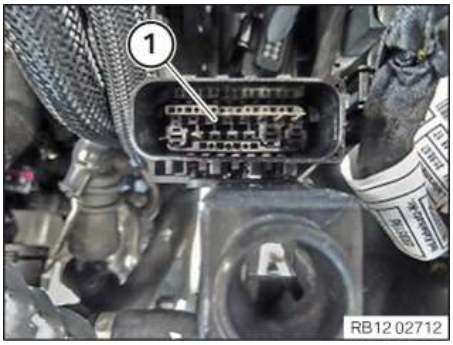


- Unlock and disconnect plug connections (1).

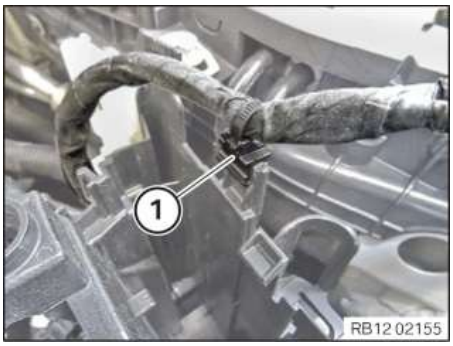


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Release the connector (3) and disconnect from the control unit holder (4).
- Release the clamps (arrows).

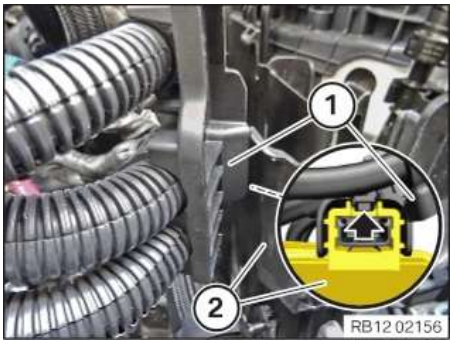
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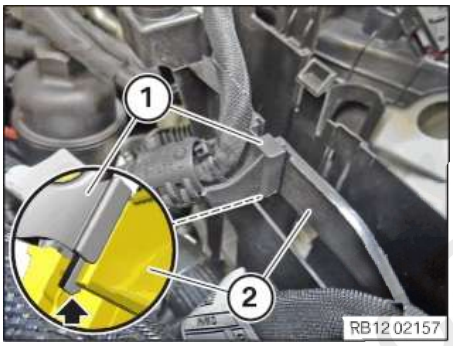
- Unlock plug connection (1) and disconnect.



- Loosen clamp (1).



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



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

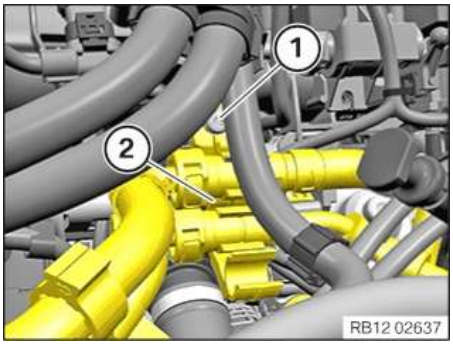


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

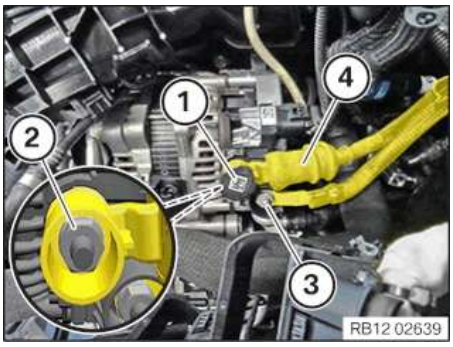


- Unlock holder (1) and feed out coolant line (2) and place it aside.

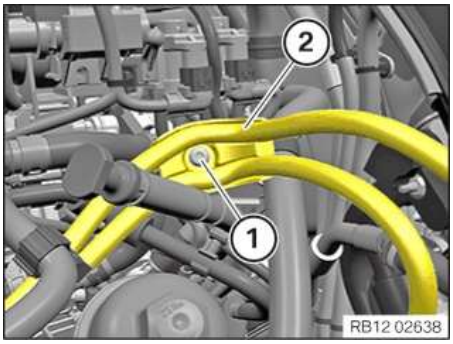
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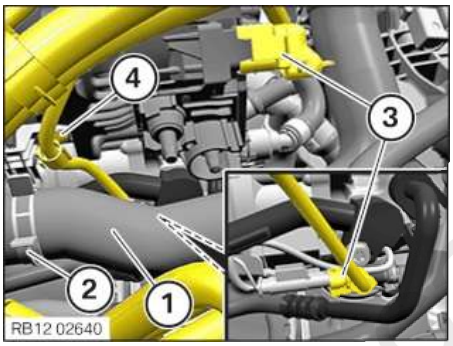
- Release the screw (1).
- Guide out fuel lines (2) and set them aside.



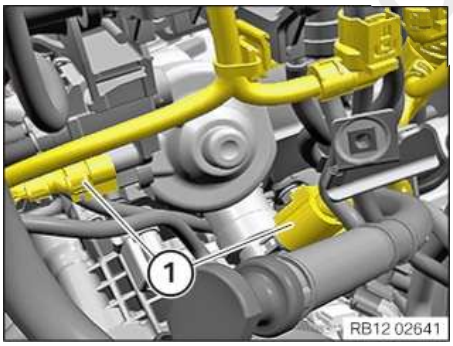
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.



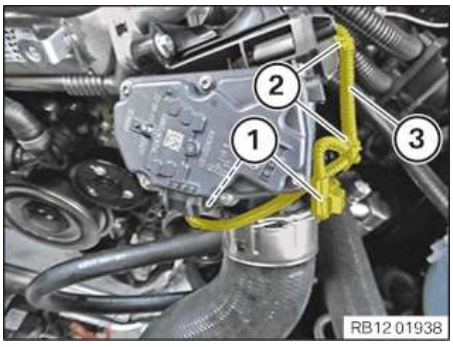
- Release the screw (1).
- Guide out the positive battery cables (2) and set them aside.



- Release the coolant line (1) from the holder (2) .
- Unlock plug connections (3) and disconnect.
- Loosen clamp (4).



- Unlock and disconnect plug connections (1).



- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.

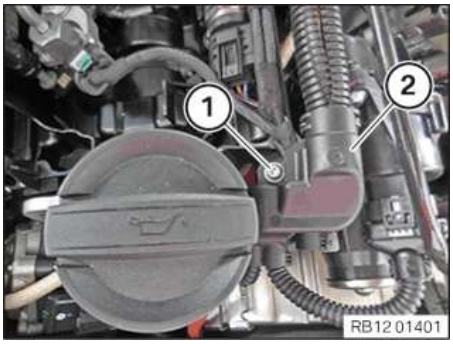
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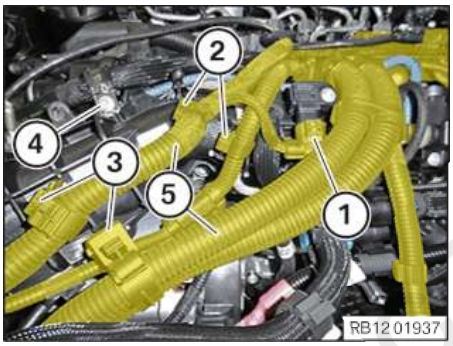
- Unlock and loosen connector (1).



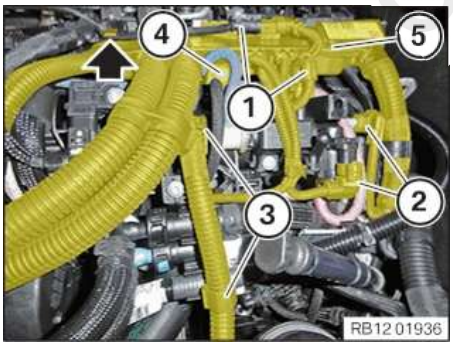
- Unlock plug connection (1) and disconnect.



- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

18 – Removing the intake plenum

TECHNICAL INFORMATION

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

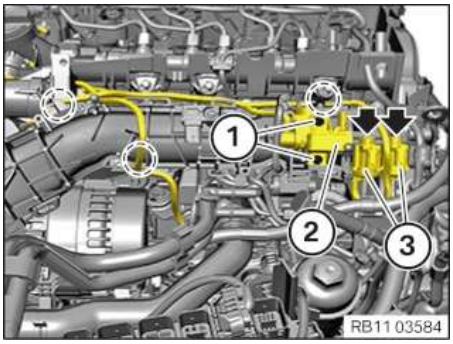
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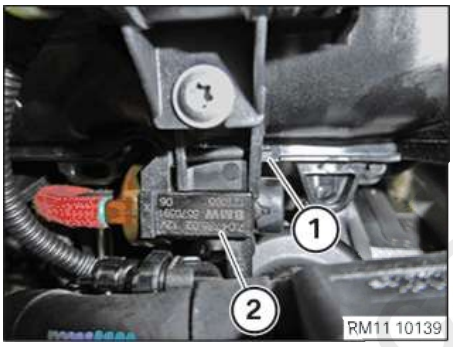
- Unlock clamp (1) and engage in this position.



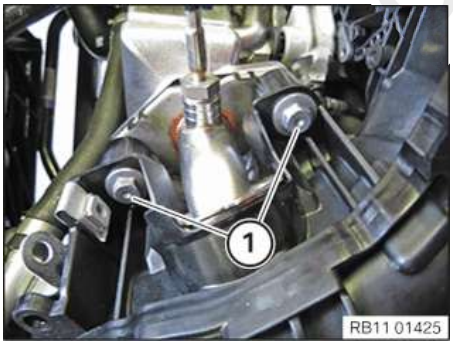
- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.



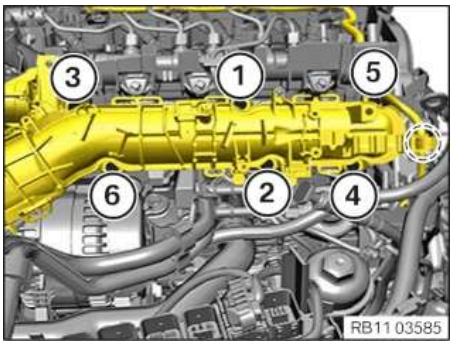
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.

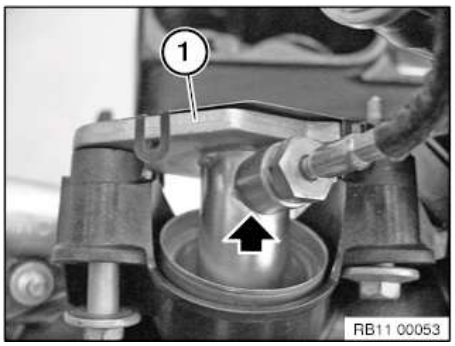


- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.

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- Remove the exhaust-gas recirculation pipe (1) (arrow).

19 – Detaching the leakage oil line from the injectors

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

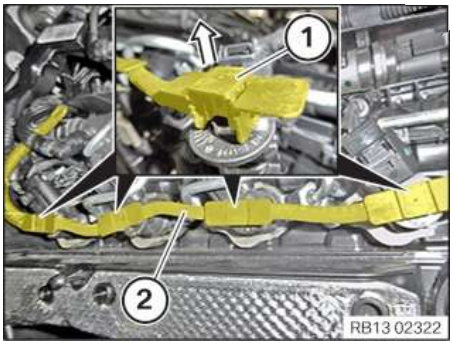
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

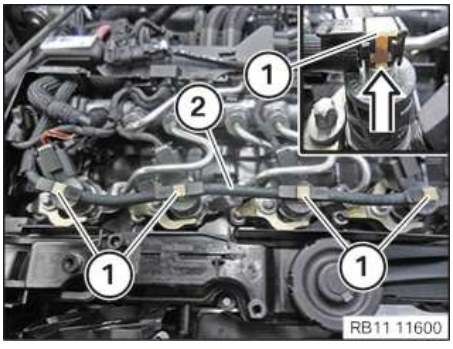


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



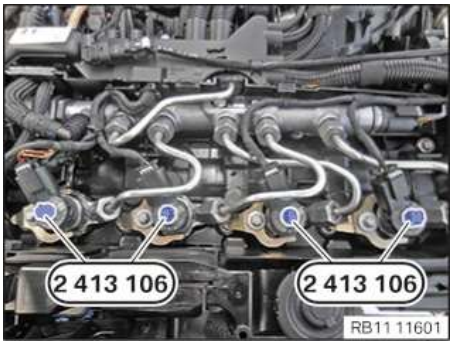
- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

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- Seal open connections with special tools .

20 – Remove the high pressure lines between the injector and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

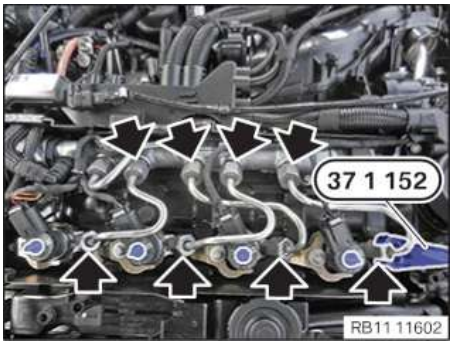
TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

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TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.



- Release the high pressure lines (arrows) with the special tool .
  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

21 – Remove the high pressure line between the high pressure pump and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

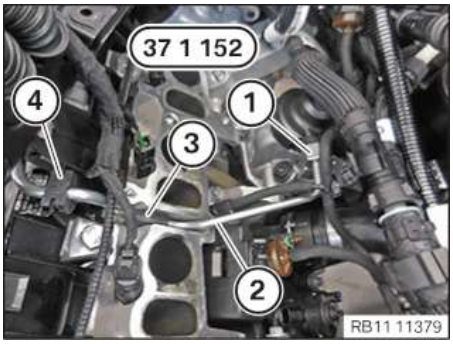
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TECHNICAL INFORMATION

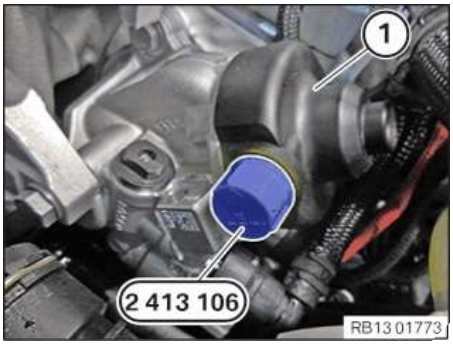
Reset special tool in early to avoid bending pressure lines.



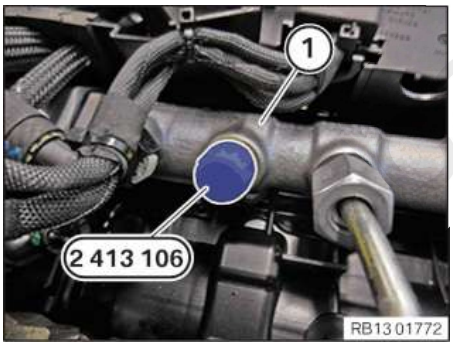
- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.



- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

22 – Remove high-pressure rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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RISK OF DAMAGE

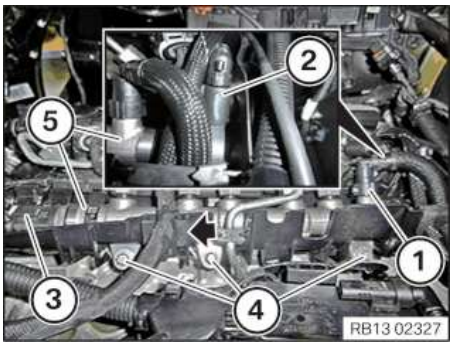
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

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



- Unlock and disconnect the fuel return line (1).
- Guide the fuel return line (1) out and set it aside.
- Unlock and disconnect the plug connection (2) on the rail pressure regulating valve.
- Unlock and disconnect the plug connection (3) on the rail pressure sensor.
- Unlock cable clip (Arrow), feed out and place aside.
- Loosen screws (4).
- Thread out and remove the rail (5).

MAIN WORK

23 – Removing rail pressure regulating valve from rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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 ... Notes for ESD protection (electrostatic discharge)

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RISK OF DAMAGE

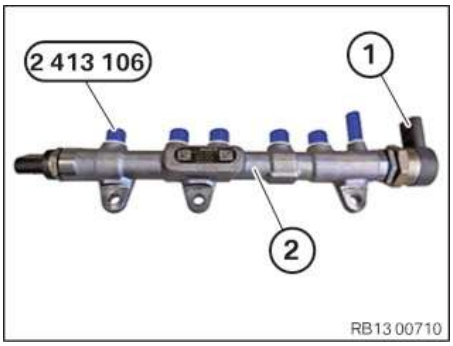
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

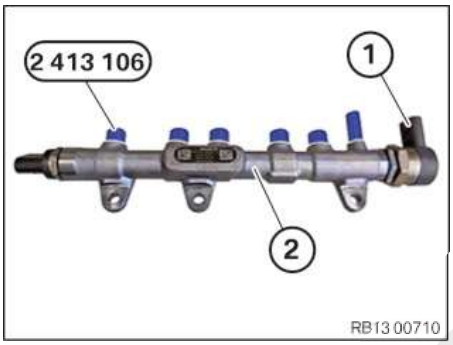
TECHNICAL INFORMATION

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



- Grip the removed rail (2) on the flattened area.
- Observe the installation position on the rail pressure regulating valve (1) and mark, if applicable.
- Hold the rail (2) at the hexagon head and unscrew and remove the rail pressure regulating valve (1).
- Catch and dispose of escaping fuel.

24 – Install the rail pressure regulating valve on the rail



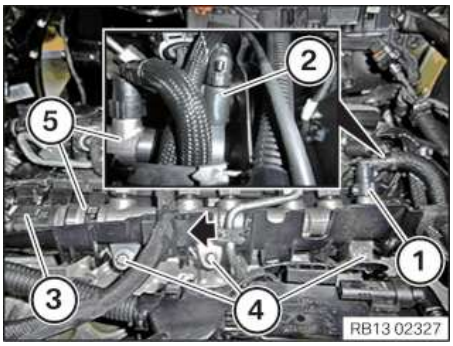
- Observe the installation position on the rail pressure regulating valve (1) and/or the mark you applied.
- Screw the rail pressure regulating valve (1) in by hand.
- Counter support the rail (2) at the hexagon head and tighten the rail pressure regulating valve (1).

Rail pressure regulating valve to rail

	Initial tightening torque	80 Nm
	Release	90 °
	Tightening torque	85 Nm

POSTPROCESSES

25 – Installing the rail



- Insert and install the rail (5).
- Tighten the screws (4).

Rail to cylinder head cover

M8		Tightening torque	19 Nm

- Install and lock cable clip (arrow).

  The cable clip (arrow) must engage audibly.
- Connect and lock the connector (3) at the rail pressure sensor.

  The connector (3) must engage audibly.
- Connect and lock the connector (2) at the rail pressure regulating valve.

  The connector (2) must engage audibly.
- Feed in fuel return line (1) and install.

  The fuel return line (1) must audibly engage.

26 – Installing high pressure line between rail and high pressure pump

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

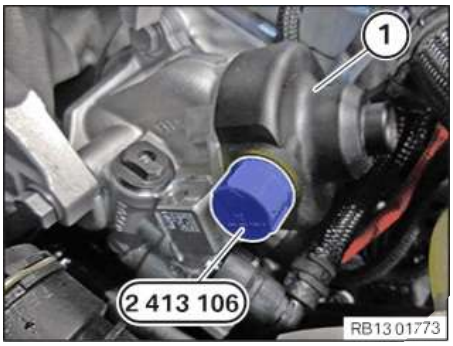
On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

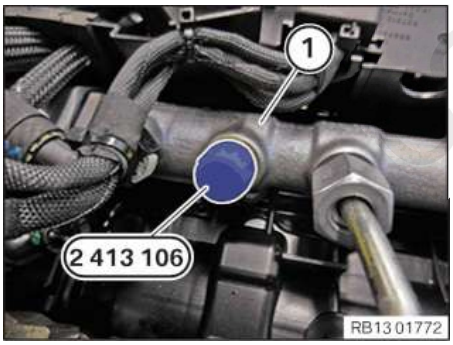
- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

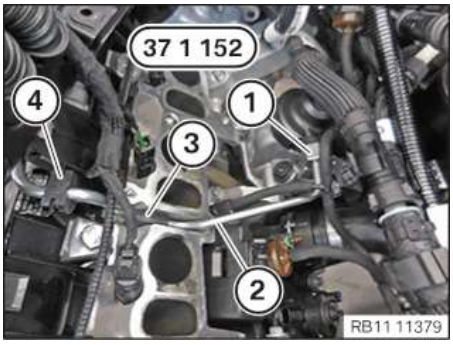
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.

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- Hand-tighten the union nut (1) on the rail.

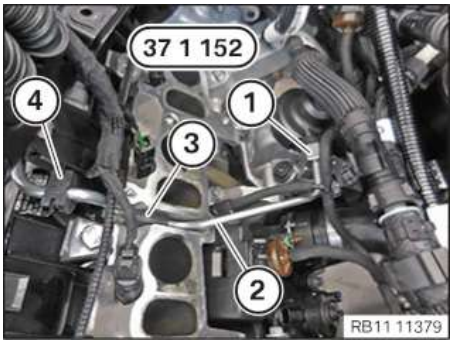
TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm



- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

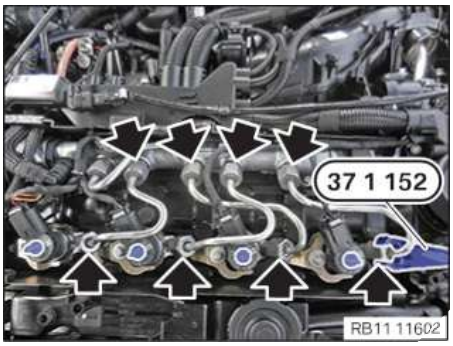
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten union nut (1) on the high pressure pump with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

27 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

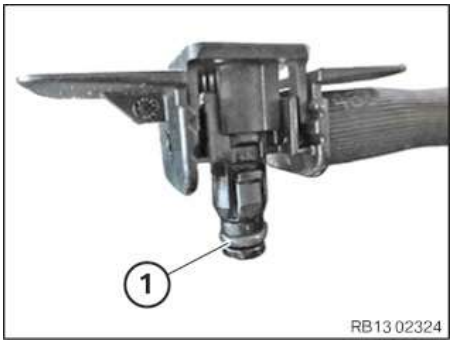
- Tighten the high pressure lines (arrows) with the special tool .

High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

28 – Attach the leakage oil line on the injectors



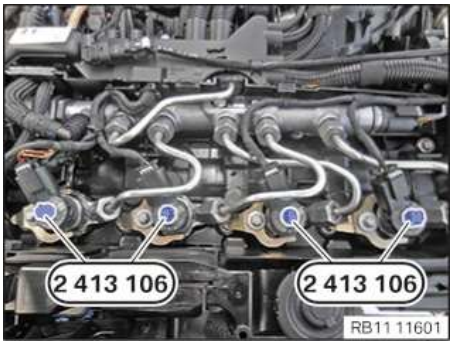
- **Version A:**

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

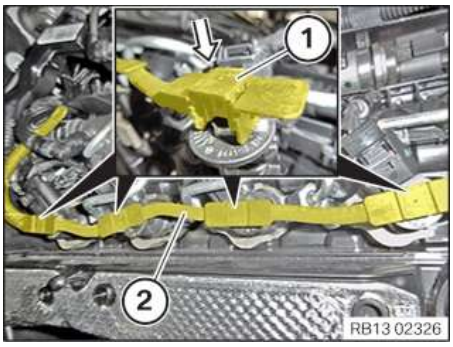
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

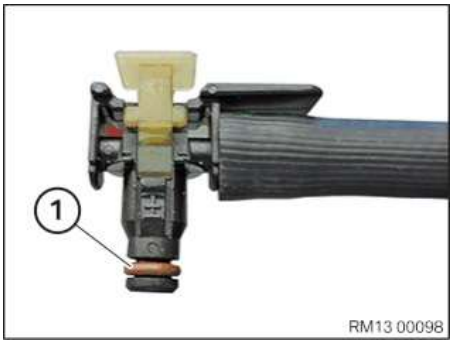
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- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.



- **Version B**:

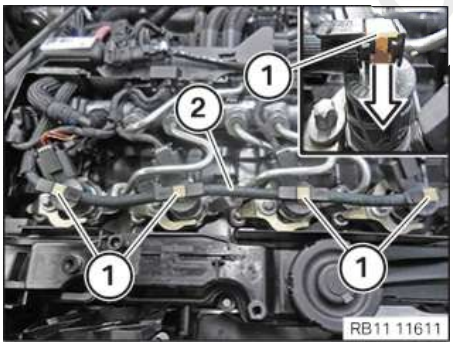
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.



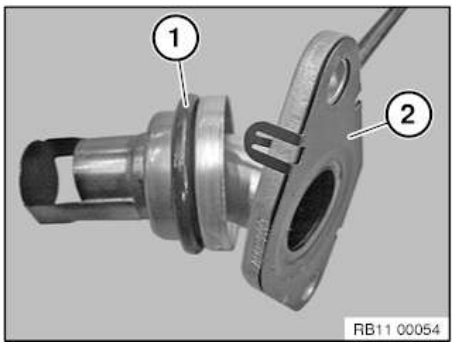
- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

29 – Installing the intake plenum

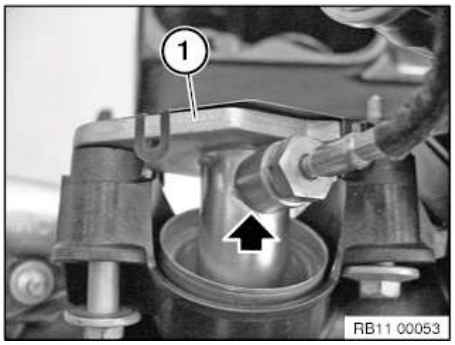
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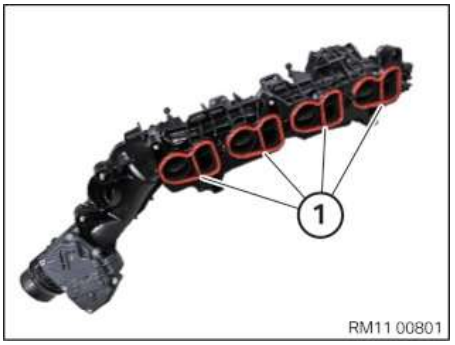
- Renew O-ring (1).

  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

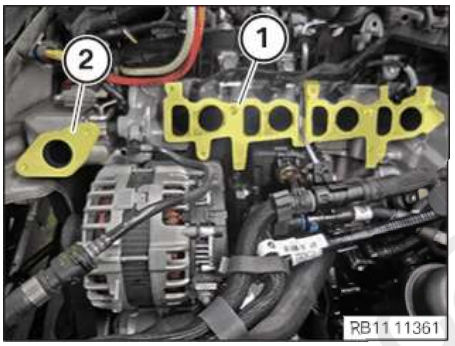


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

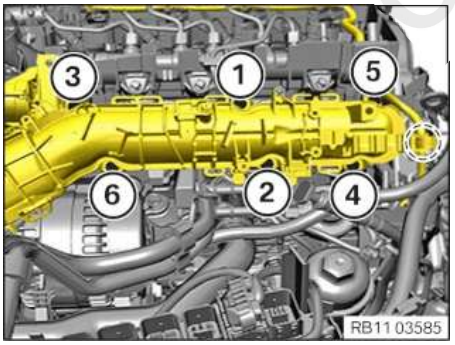


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

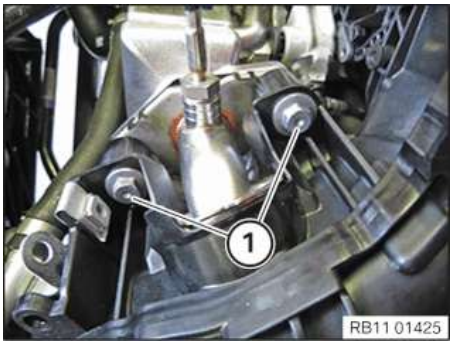


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

- Attach the wiring harness and fuel lines in the marked area on the intake plenum.

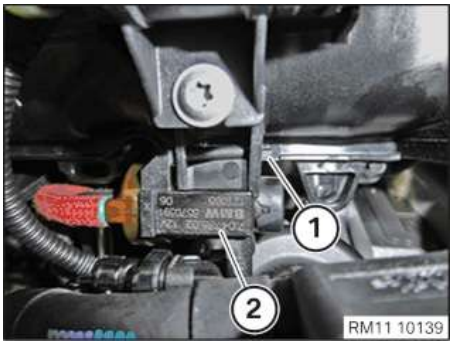


- Tighten the screws (1).

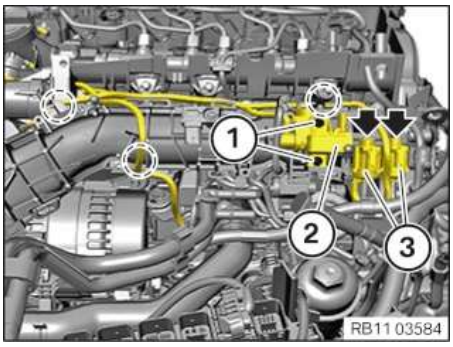
Exhaust-gas recirculation cooler to intake plenum

		Tightening torque	10 Nm

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- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.
  The lock (1) must audibly engage.



- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

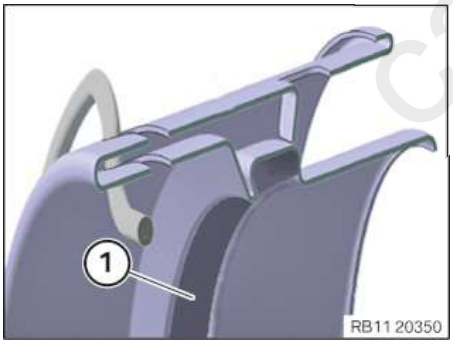


- Check the seal (1) for damage, and renew if necessary.

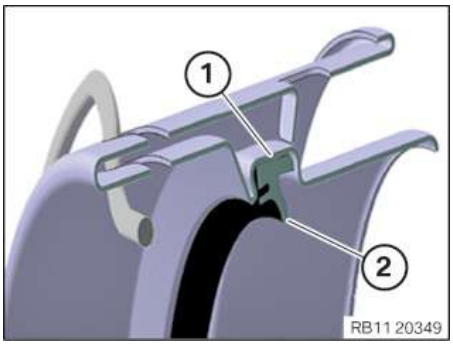
▸ **Replacing damaged seal**

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

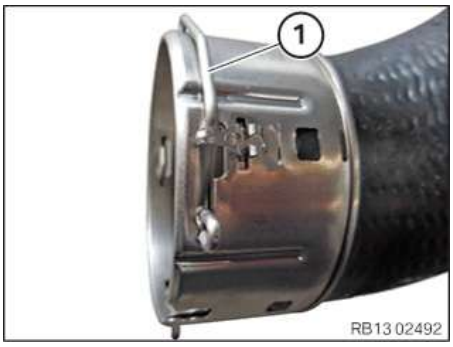
Incorrect assembly is possible. Ensure correct installation position.

- 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 directed inwards as shown.

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- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.



- Check that the locks (1) are correctly seated on the pressure pipe.

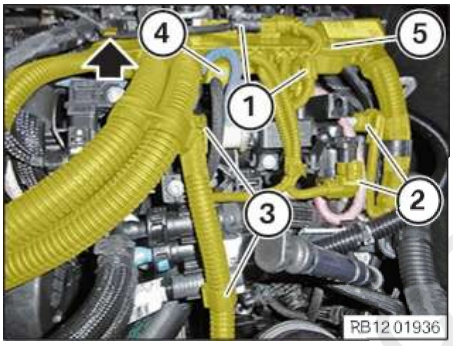
30 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

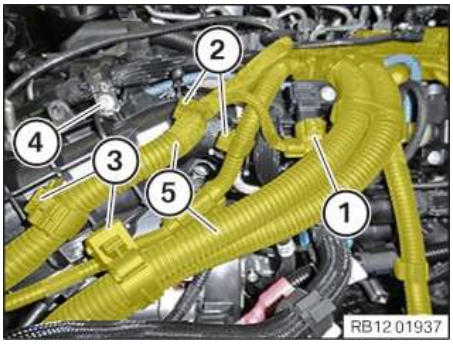
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

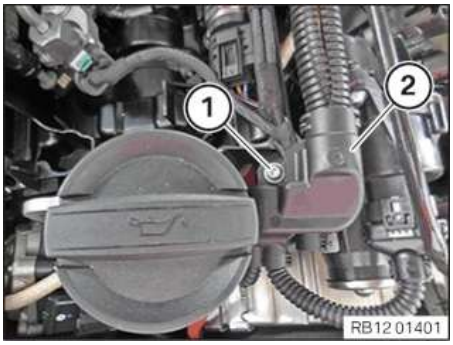
Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



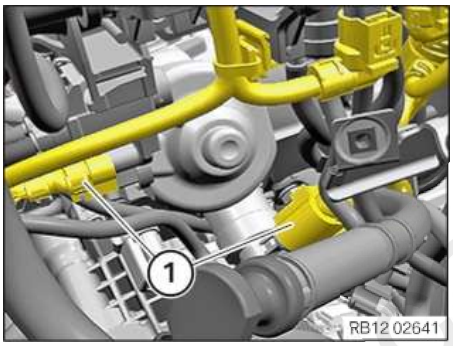
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



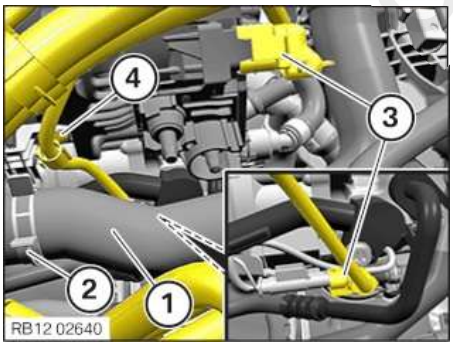
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



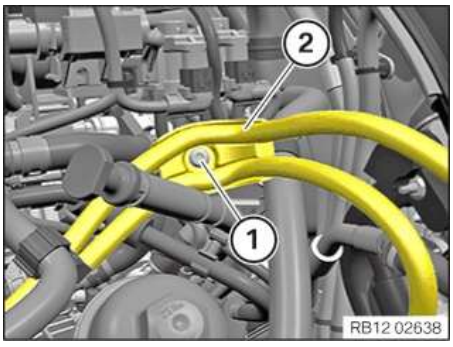
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Secure the clamp (4).
- Connect connectors (3) and lock.

  The connectors (3) must engage audibly.
- Feed the coolant line (1) into the holder (2) and install it.



- Feed in and position the positive battery cables (2) .
- Tighten down screw (1).

Standard screw connection M6

M6		Tightening torque	8 Nm

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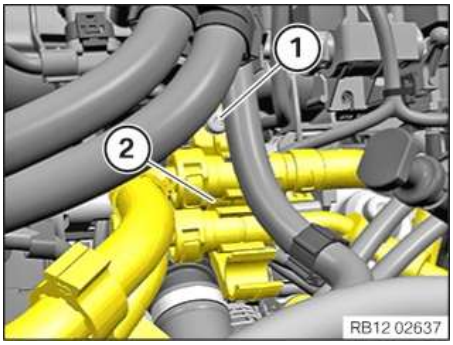
- Feed in and install the positive battery cable (4).
- Feed in and position the positive battery cables (4) .
- Renew the nuts (3) and (2).

  Parts: Nuts
- Tighten nuts (3) and (2).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm

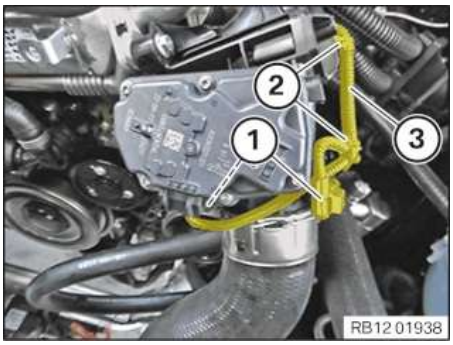
- Guide in and install the lid (1).



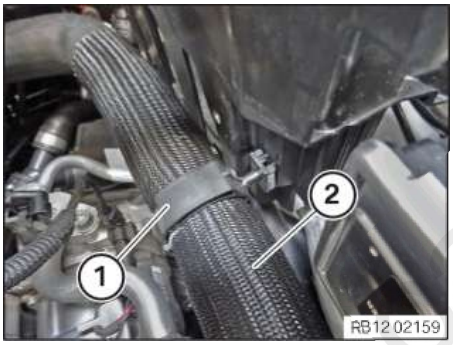
- Insert and install the holder (2).
- Tighten down screw (1).

Holder on intake plenum

TS6X20		Tightening torque	5 Nm



- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.



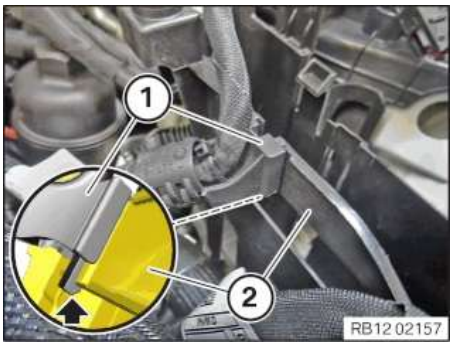
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



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

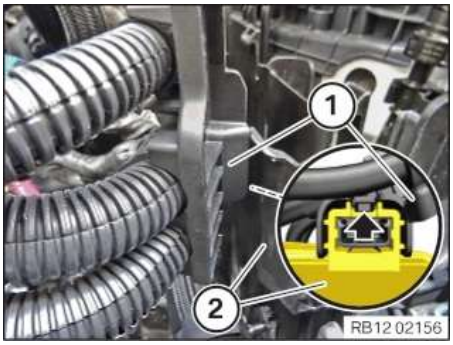
  Lock (arrow) must audibly engage.



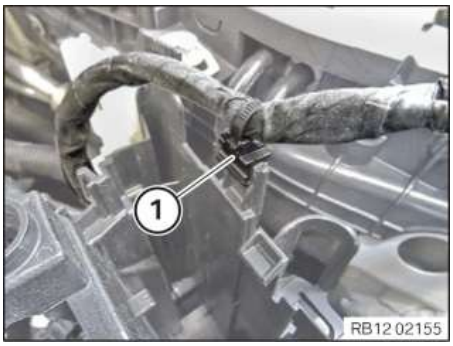
- Connect the cable clip (1) with the control unit holder (2) and lock it.

  Lock (arrow) must audibly engage.

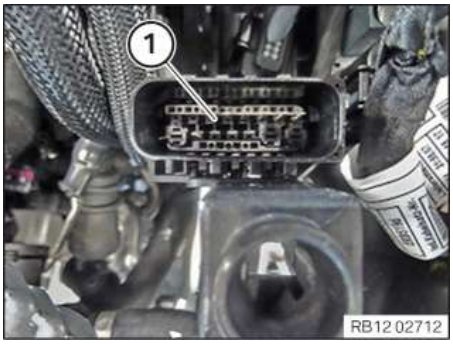
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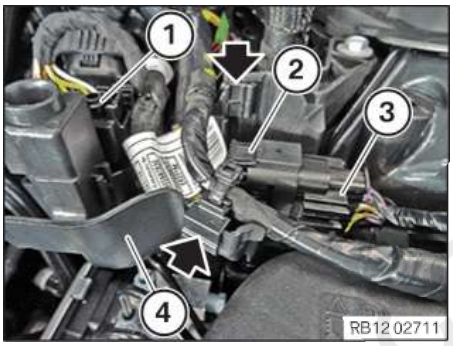
- Connect the cable clip (1) with the control unit holder (2) and lock it.
  Lock (arrow) must audibly engage.



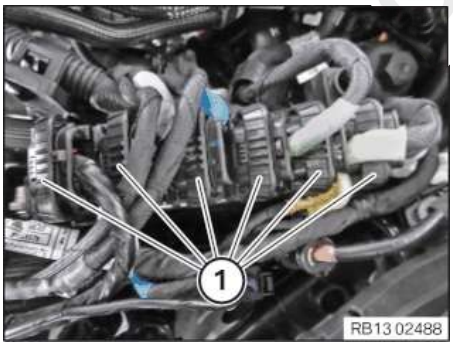
- Secure clamps (1).



- Feed in and install the connector (1).
  The connector (1) must engage audibly.



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



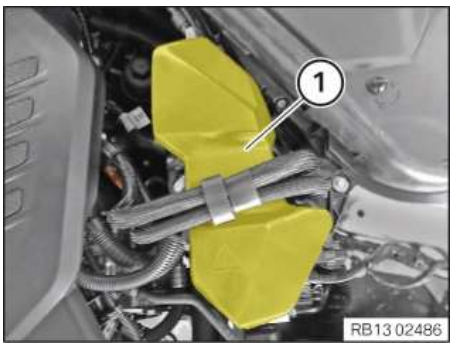
- Connect connectors (1) and lock.
  The connectors (1) must engage audibly.



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

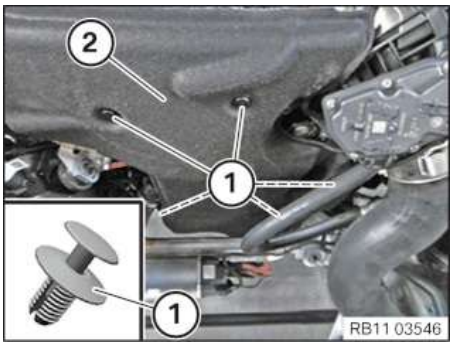
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31 – Install the cover for the DDE control unit



- Insert and install cover (1) into guides.

32 – Install acoustic cover for the engine, front

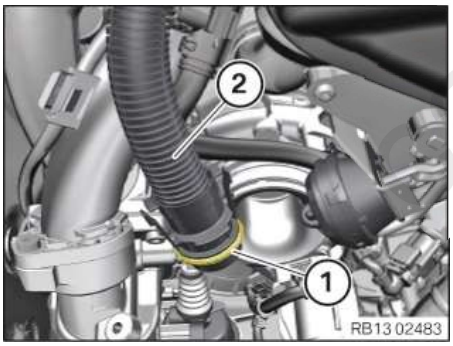


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

33 – Installing the clean air pipe with resonator



- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.

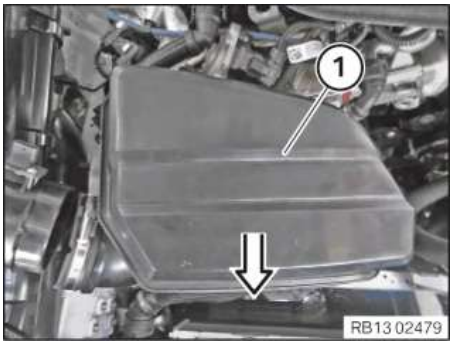


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

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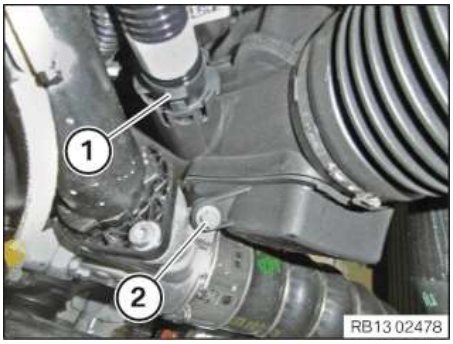


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

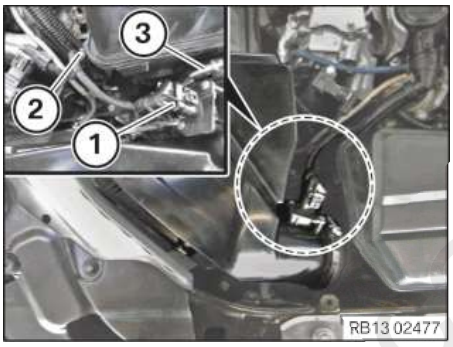
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



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

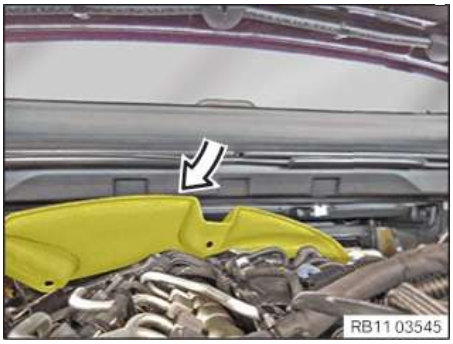
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

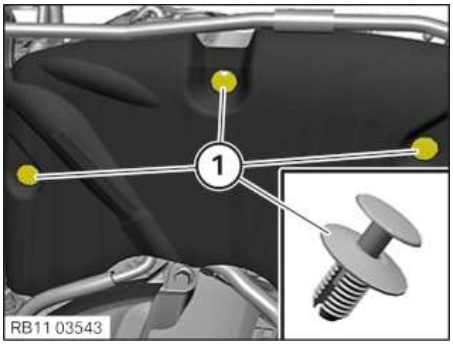
  The connector (1) must engage audibly.

34 – Installing acoustic cover at rear



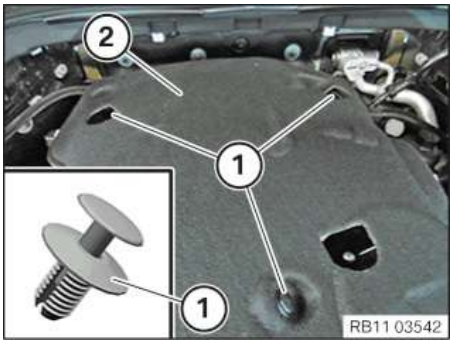
- Guide in the acoustic cover in the direction of the arrow and install it.

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- Secure acoustic cover with the expanding rivets (1).

35 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

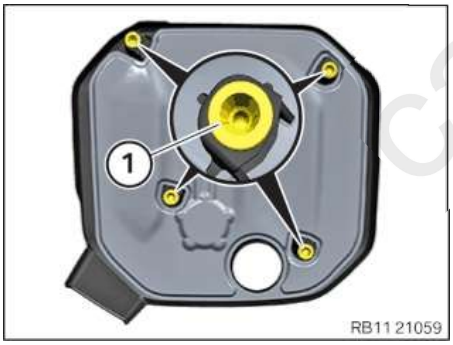
36 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



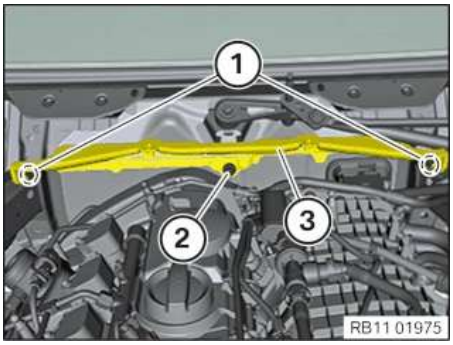
- Check the acoustic cover for correct fit of the rubber mounts (1).



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

37 – Installing centre bulkhead lower section

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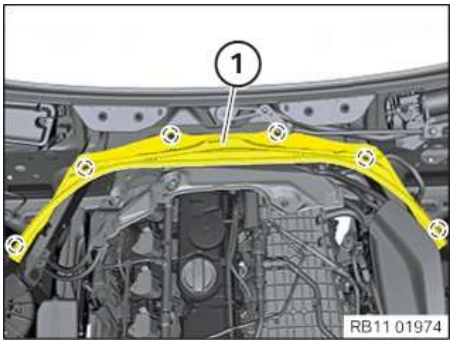


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

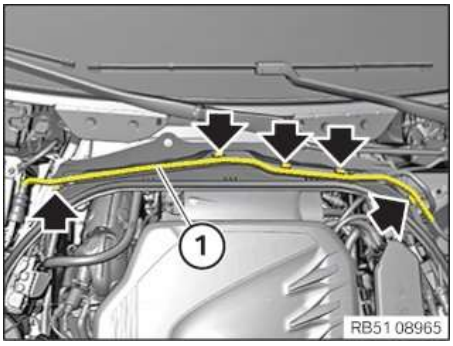
38 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

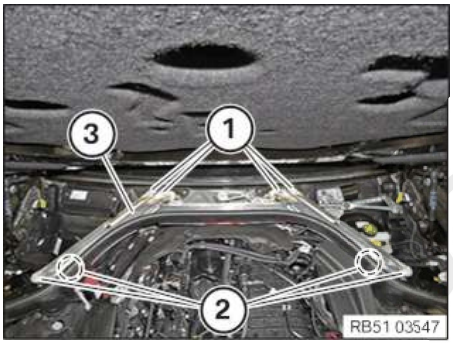
Bulkhead upper part to bottom bulkhead

		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

39 – Install the seal for the bonnet

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- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

40 – Installing cowl panel cover

RISK OF DAMAGE

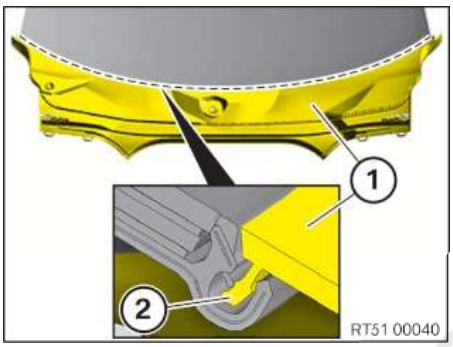
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

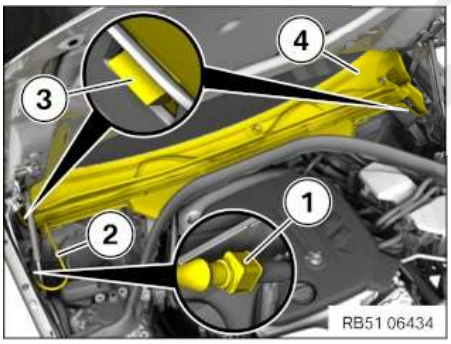
- Ensure correct installation of the components.
- Only use undamaged components.

TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

41 – Install left and right wiper arm

NOTICE

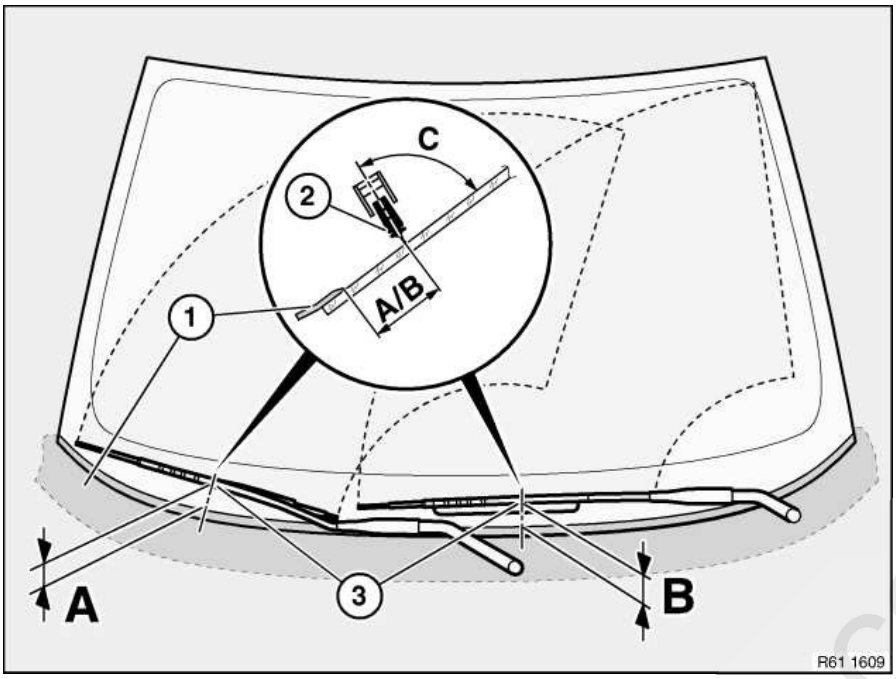
Description is for left component only. Procedure on the right side is identical.

▸ **Installing left and right wiper arm**

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TECHNICAL INFORMATION

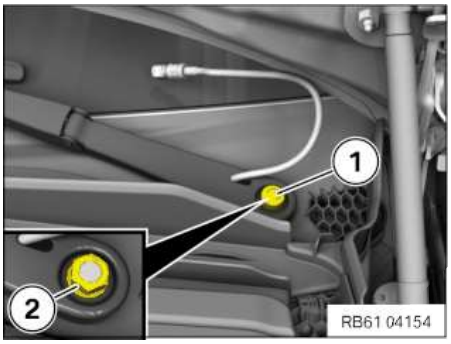
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

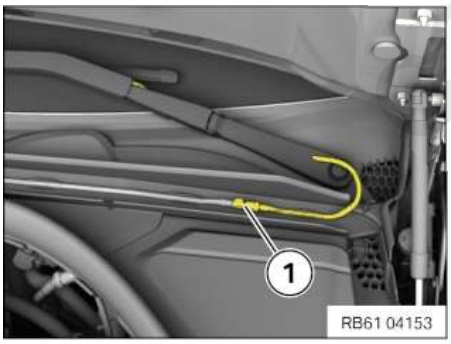


- Tighten nut (2).

Windscreen wiper arm

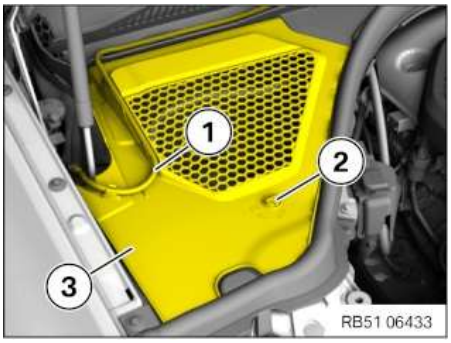
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

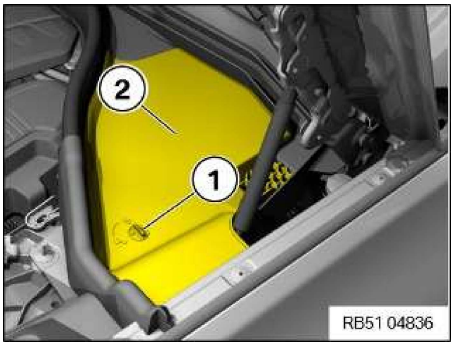
42 – Install the rear right engine compartment cover



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

43 – 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).

44 – Connecting all battery earth leads



- See additional information.

45 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

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- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

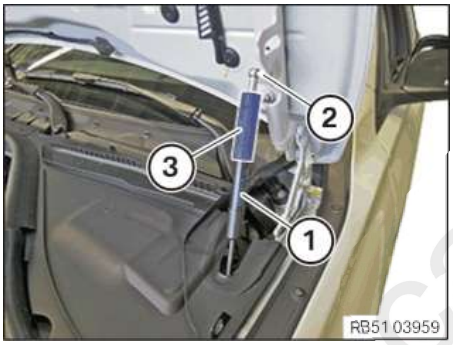
46 – Take bonnet out of the service position

CAUTION

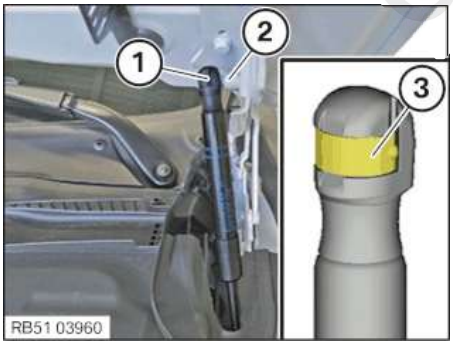
Shutting bonnet or tailgate.

Danger of injury!

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



- 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.



- 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

Rail pressure regulating valve to rail Used in step 24

	Initial tightening torque	80 Nm
	Release	90 °
	Tightening torque	85 Nm

Rail to cylinder head cover			Used in step 25
M8		Tightening torque	19 Nm

High pressure lines between high pressure pump and rail			Used in step 26
High-pressure pipe		Tightening torque	24.5 Nm

High pressure lines between injector and rail			Used in step 27
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 29
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 29
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 29
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 30
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 30
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 30
TS5x20		Tightening torque	3,6 Nm

Standard screw connection M6			Used in step 30
M6		Tightening torque	8 Nm

Battery positive lead on the starter motor generator			Used in step 30
M8		Tightening torque	19 Nm

Holder on intake plenum			Used in step 30
TS6X20		Tightening torque	5 Nm

Clean air pipe to exhaust turbocharger			Used in step 33
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 33
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 37
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 38
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 38
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 38
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 41
Combination hexagon nut		Tightening torque	35 Nm

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Negative battery cable to 48-V battery			Used in step 45
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 41
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	245

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	344
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
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61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 20 900 Disconnecting and connecting battery earth lead	344
61 35 ... Notes on ESD protection (Electro Static Discharge)	1723
61 35 ... Notes on ESD protection (Electro Static Discharge)	172324

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13 53 570 Replacing the injection system pressure regulator

PRELIMINARY WORK

1 – Bring front compartment lid in the service position

Prerequisite

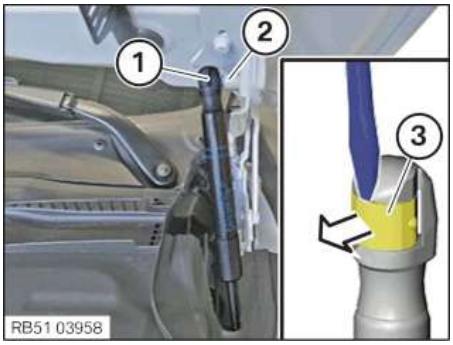
Engine compartment lid is open.

CAUTION

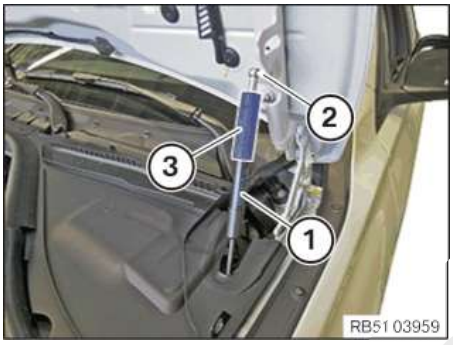
Shutting bonnet or tailgate.

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.
- Pull special tool or 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.

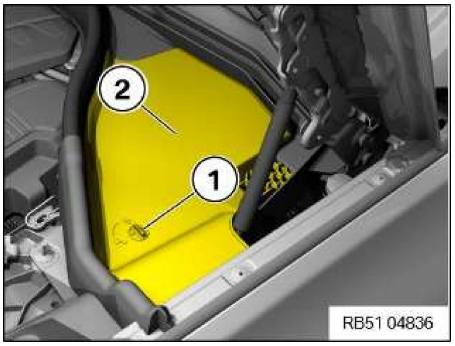
2 – Disconnecting all battery earth leads



- See additional information.

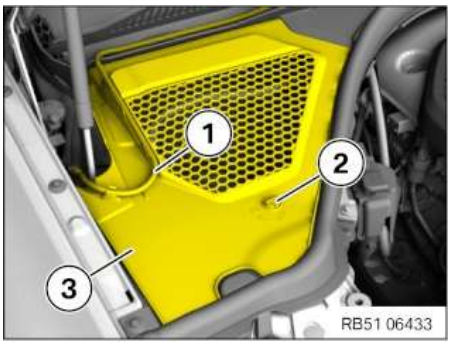
3 – Remove the cover of the engine compartment at the rear left

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

4 – Remove the cover of the rear right engine compartment



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

5 – Removing the wiper arm on the left and right

NOTICE

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

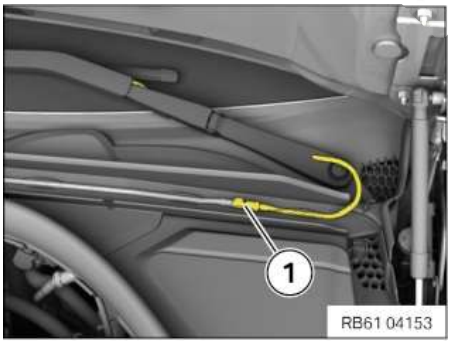
▸ **Remove the wiper arm**

RISK OF DAMAGE

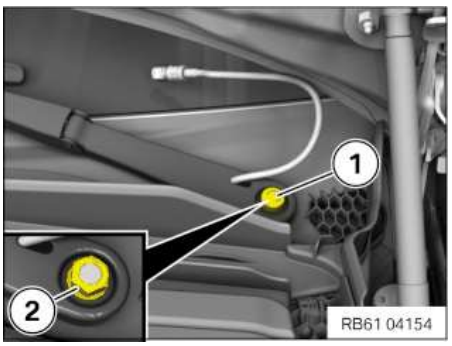
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.

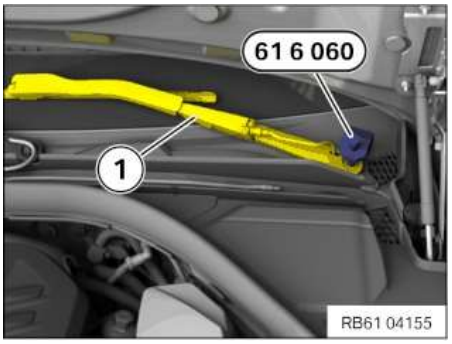


- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



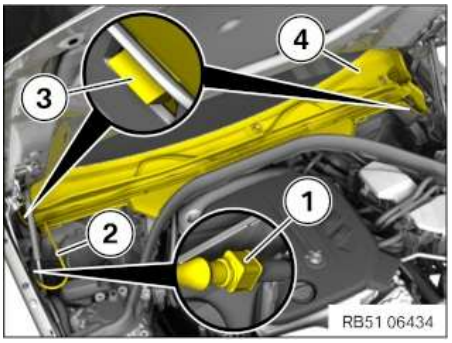
- Remove the protective cap (1).
- Loosen nut (2).

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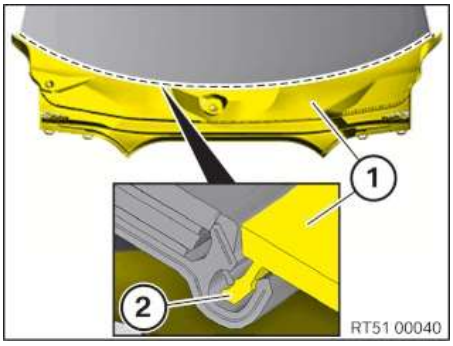


- Pull off the wiper arm (1) using special tool .

6 – Remove cowl panel cover



- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

7 – Remove the seal for the rear bonnet

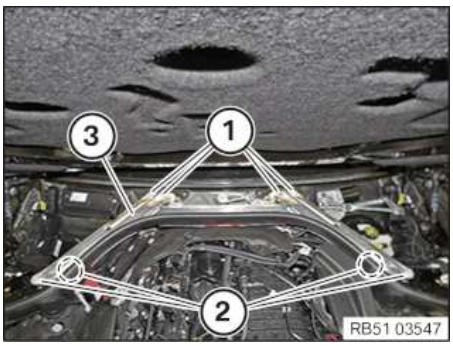


- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

8 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.

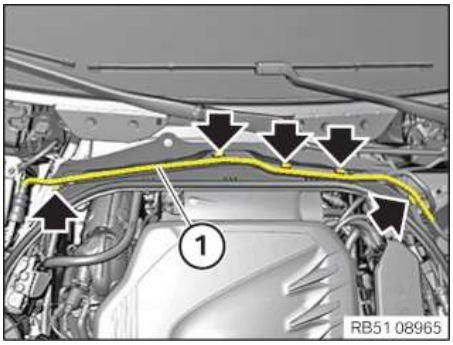


NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

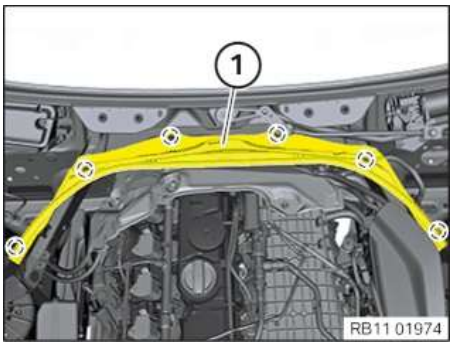
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.

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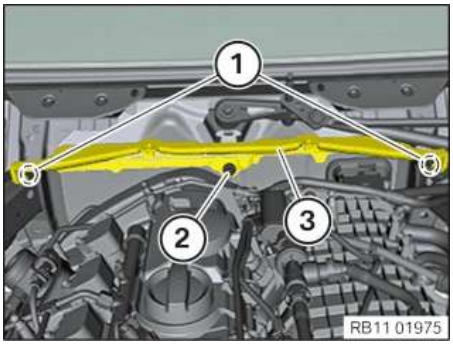
- **Version with mild hybrid technology:**

  Unclip the wire (1) at the holders (arrows).



- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

9 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

10 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

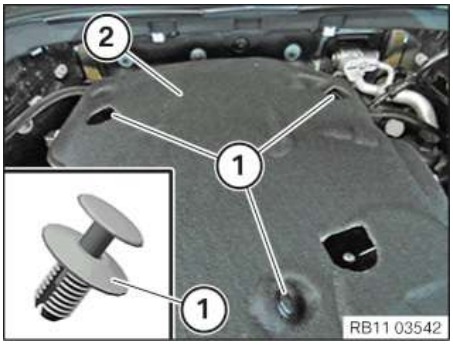
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation,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



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

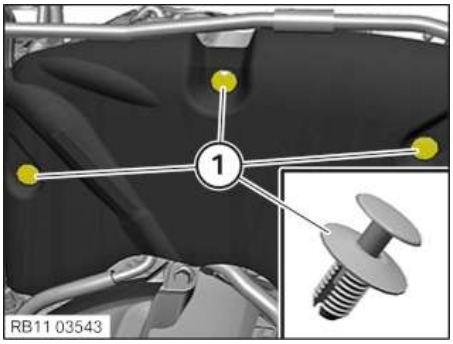
11 – Remove the acoustic cover for the injectors

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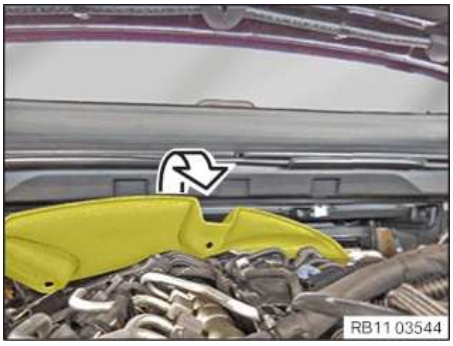


- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

12 – Removing acoustic cover at rear



- Loosen the expanding rivet (1).



- Guide out and remove the acoustic cover in the direction of the arrow.

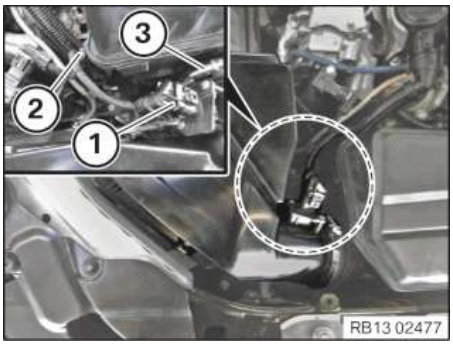
13 – Removing the clean air pipe with the resonator

WARNING

Hot surfaces.

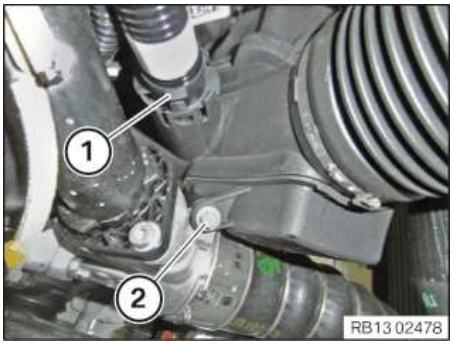
Risk of burning!

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

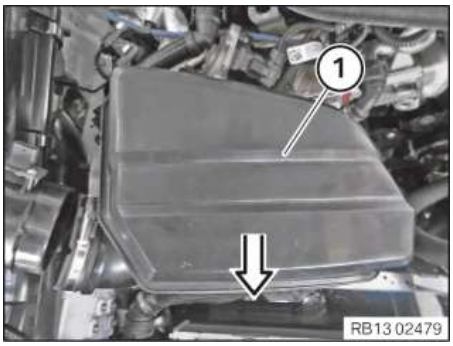


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

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- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

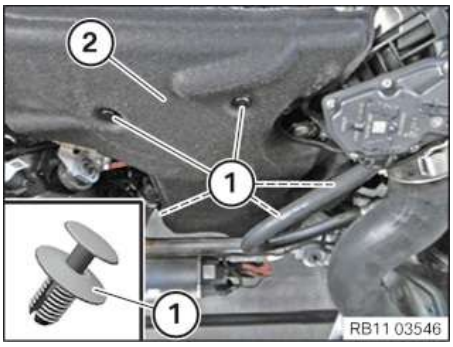
14 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

Risk of burning!

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



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

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15 – Partially releasing the wiring harness section on the intake plenum

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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

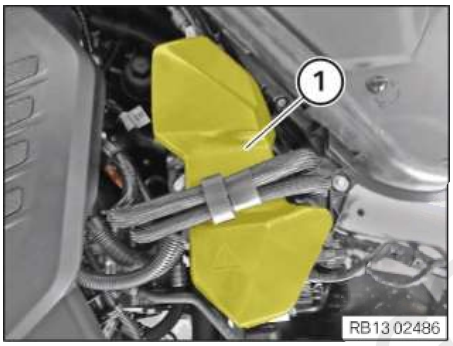
Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

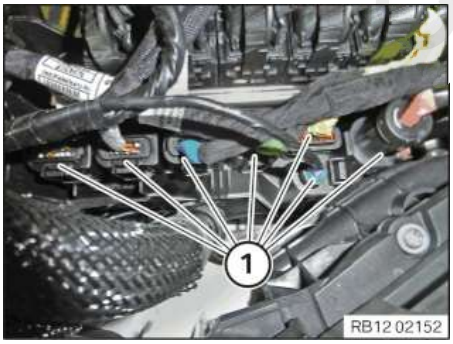
- Do not pull on the wires when disconnecting connectors and plug connections.

TECHNICAL INFORMATION

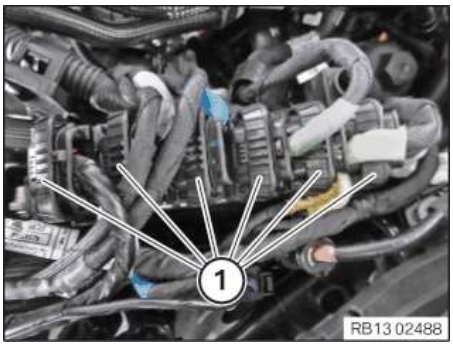
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Pull off cover (1) upwards, feed out and remove.

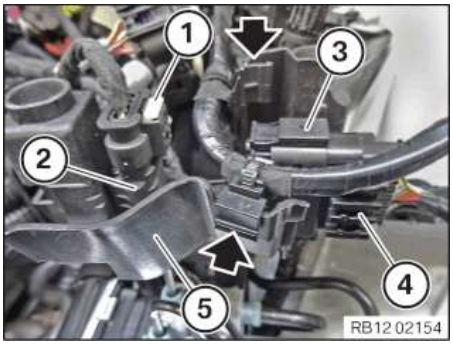


- Unlock and disconnect plug connections (1).

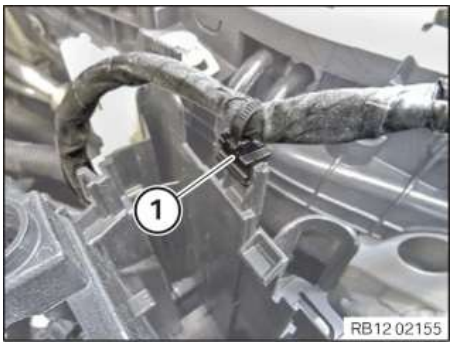


- Unlock and disconnect plug connections (1).

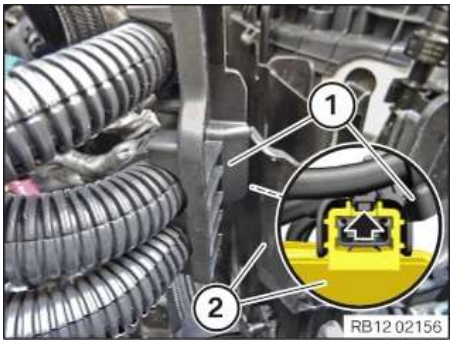
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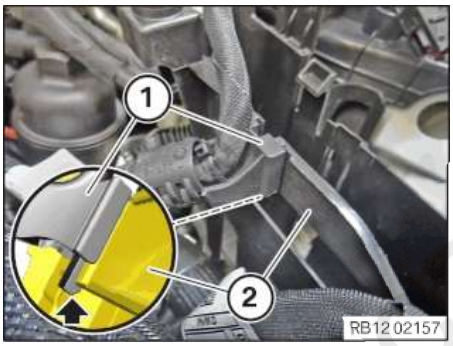
- Unlock plug connection (1) and disconnect.
- Unlock the plug (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock the plug (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).



- Loosen clamp (1).



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



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

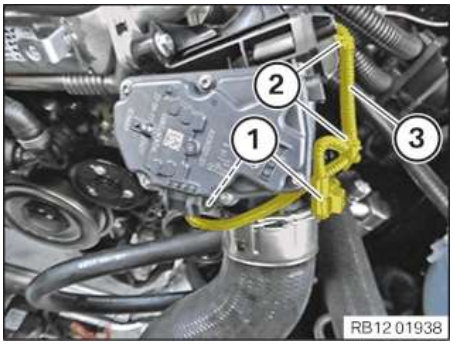


- Unlock the lock (arrow).
- Feed out cable holder (1) towards top and remove.

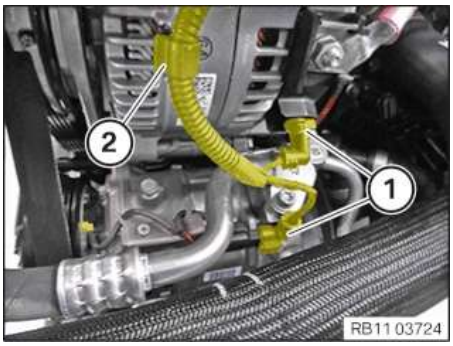


- Unlock holder (1) and feed out coolant line (2) and place it aside.

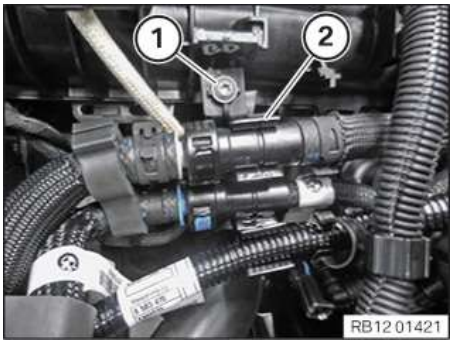
gardiagn.com



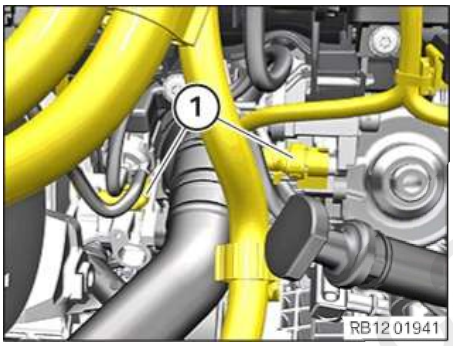
- Unlock and disconnect plug connections (1).
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.



- Unlock and separate plug connections (1).
- Release the holder (2) from the alternator .



- Loosen screw (1).
- Thread out holder (2) and set aside.



- Unlock and disconnect plug connections (1).

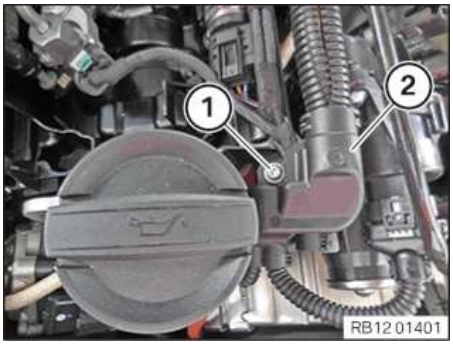


- Unlock and loosen connector (1).

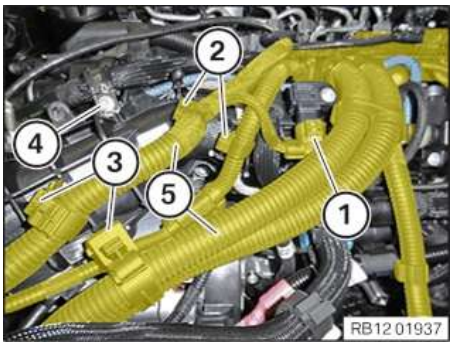


- Unlock plug connection (1) and disconnect.

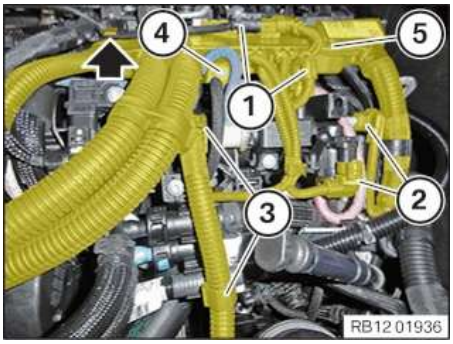
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- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.



- Unlock and disconnect plug connections (1).
- Release line from clamp (Arrow).
- Unlock and disconnect plug connections (2).
- Loosen clamps (3).
- Loosen screw (4).
- Remove the wiring harness section (5) and put to one side.

16 – Removing the intake plenum

TECHNICAL INFORMATION

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

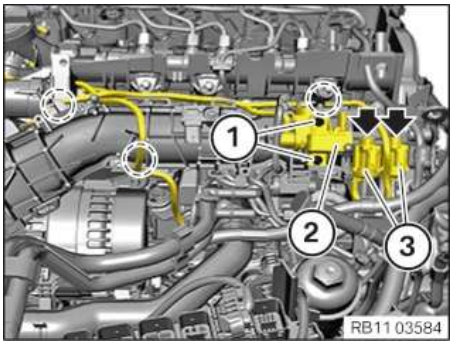


- Unlock clamp (1) and engage in this position.

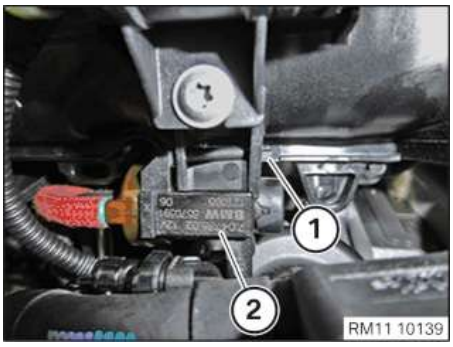


- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.

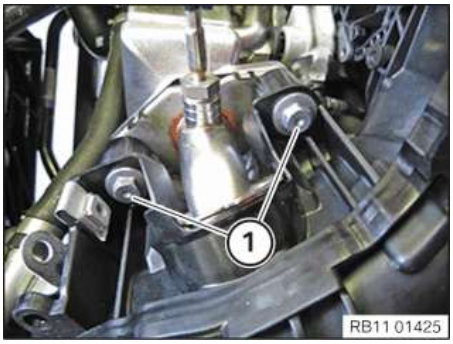
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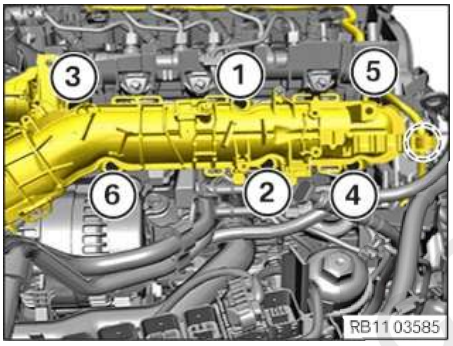
- Release the vacuum hose in the marked areas of the intake plenum.
- Release screws (1) and set aside electric changeover valve (2).
- Unlock electric changeover valves (3) at the top (arrows) and remove them downwards.



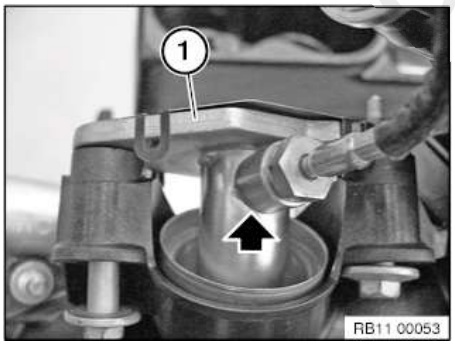
- Unlock the lock (1) upward.
- Guide out the electric changeover valve (2) to the left and set it aside.



- Loosen screws (1).



- Detach the leakage oil lines in the marked area from the intake plenum.
- Loosen screws in the order (6) to (1).
- Guide the intake plenum out forwards and remove it.



- Remove the exhaust-gas recirculation pipe (1) (arrow).

17 – Detaching the leakage oil line from the injectors

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Hot surfaces.

Risk of burning!

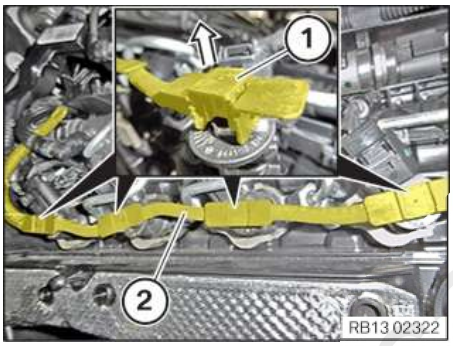
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

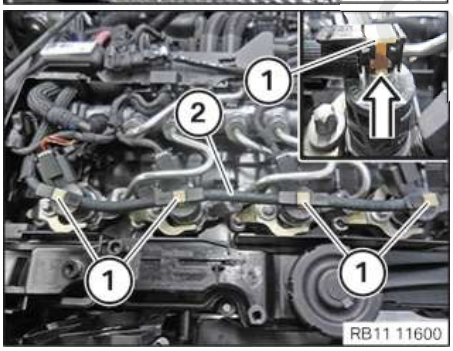


- **Version A:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.

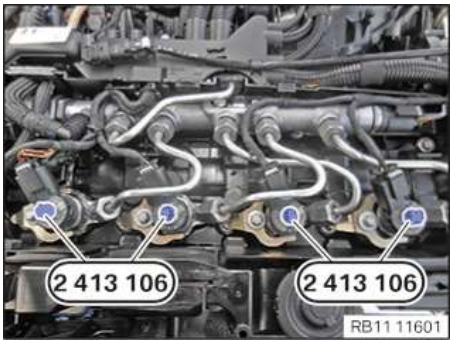


- **Version B:**

  Unlock the locks (1) in the direction of the arrow.

  Remove the leakage oil line (2) and put it to one side.

  Catch and dispose of escaping fuel.



- Seal open connections with special tools .

18 – Remove the high pressure lines between the injector and the rail

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WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

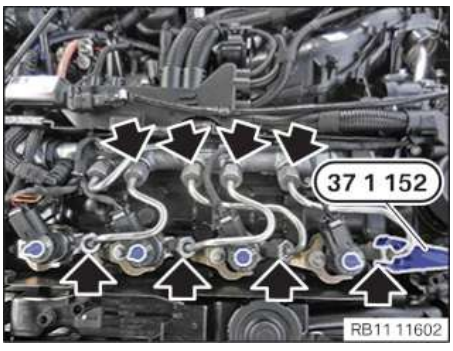
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

TECHNICAL INFORMATION

If several high pressure lines are removed, ensure that each high pressure line is installed in its original location. Label high pressure lines.

TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.



- Release the high pressure lines (arrows) with the special tool .
  Reset the special tool early on to prevent bending of the high pressure line.
- Catch and dispose of escaping fuel.
- Feed out and remove the high pressure lines (arrows).
- Seal off all the open cable connections with the special tool .

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19 – Remove the high pressure line between the high pressure pump and the rail

WARNING

Hot surfaces.

Risk of burning!

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

WARNING

Hot fluids.

Risk of scalding!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

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

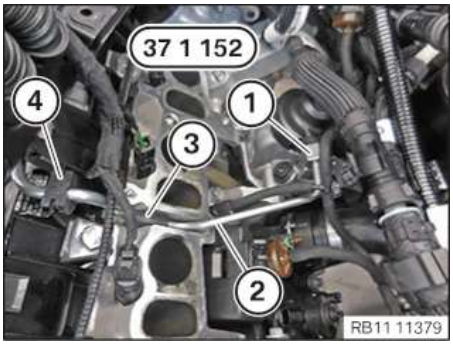
TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

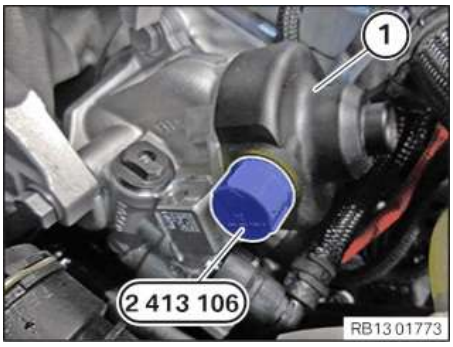


- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.

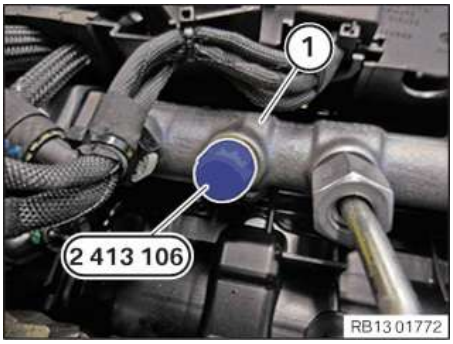
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- Loosen union nut (1) with special tool .
- Reset the special tool in good time in order to avoid bending the high pressure line.
- Catch and dispose of escaping fuel.
- Guide out and remove the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).



- Seal off the opening at the high pressure pump (1) with the special tool .



- Seal off the opening on the rail (1) with the special tool .

20 – Remove high-pressure rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

Contaminant or foreign body.

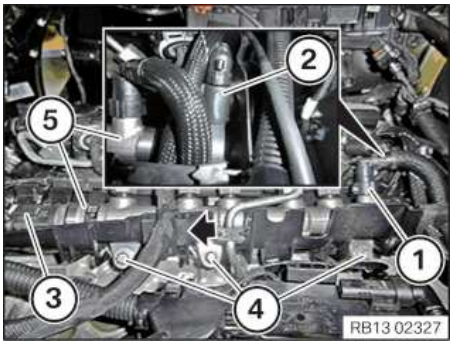
Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

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

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- Unlock and disconnect the fuel return line (1).
- Guide the fuel return line (1) out and set it aside.
- Unlock and disconnect the plug connection (2) on the rail pressure regulating valve.
- Unlock and disconnect the plug connection (3) on the rail pressure sensor.
- Unlock cable clip (Arrow), feed out and place aside.
- Loosen screws (4).
- Thread out and remove the rail (5).

MAIN WORK

21 – Removing rail pressure regulating valve from rail

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

Contaminant or foreign body.

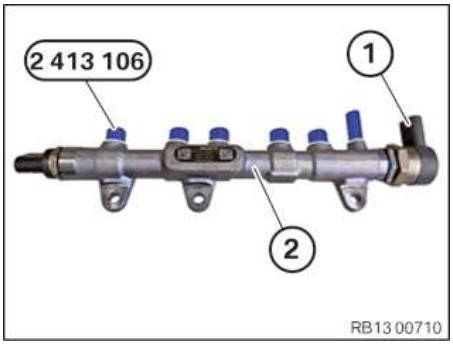
Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

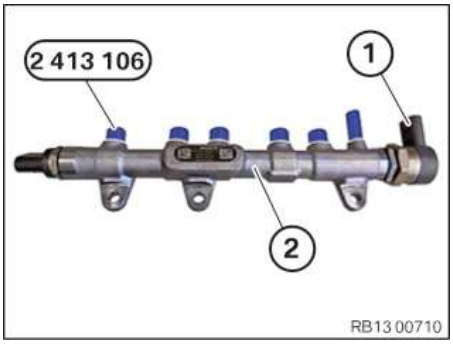
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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- Grip the removed rail (2) on the flattened area.
- Observe the installation position on the rail pressure regulating valve (1) and mark, if applicable.
- Hold the rail (2) at the hexagon head and unscrew and remove the rail pressure regulating valve (1).
- Catch and dispose of escaping fuel.

22 – Install the rail pressure regulating valve on the rail



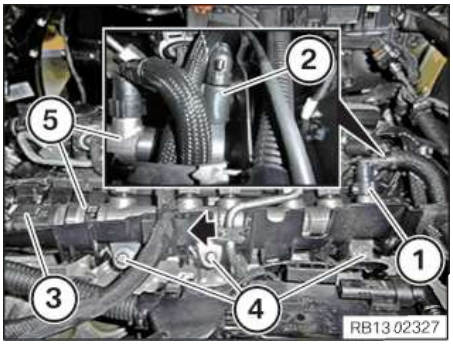
- Observe the installation position on the rail pressure regulating valve (1) and/or the mark you applied.
- Screw the rail pressure regulating valve (1) in by hand.
- Counter support the rail (2) at the hexagon head and tighten the rail pressure regulating valve (1).

Rail pressure regulating valve to rail

	Initial tightening torque	80 Nm
	Release	90 °
	Tightening torque	85 Nm

POSTPROCESSES

23 – Installing the rail



- Insert and install the rail (5).
- Tighten the screws (4).

Rail to cylinder head cover

M8	Tightening torque	19 Nm

- Install and lock cable clip (arrow).

  The cable clip (arrow) must engage audibly.
- Connect and lock the connector (3) at the rail pressure sensor.

  The connector (3) must engage audibly.
- Connect and lock the connector (2) at the rail pressure regulating valve.

  The connector (2) must engage audibly.
- Feed in fuel return line (1) and install.

  The fuel return line (1) must audibly engage.

24 – Installing high pressure line between rail and high pressure pump

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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CAUTION

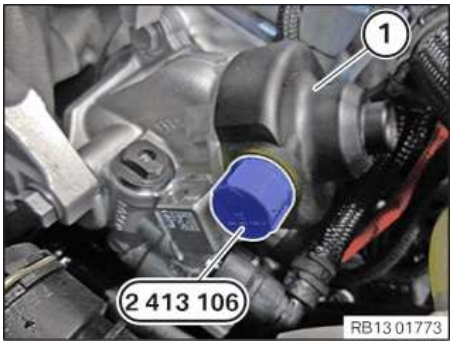
On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

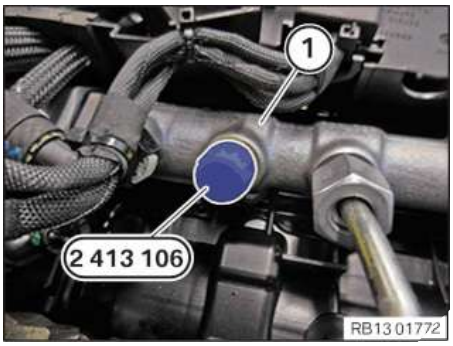
- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

TECHNICAL INFORMATION

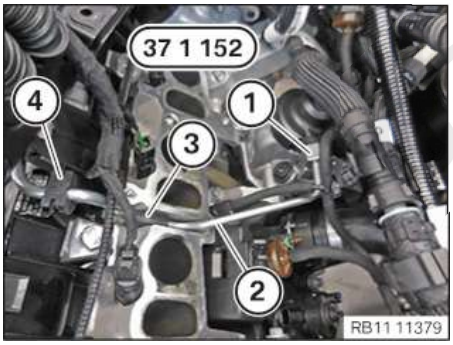
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Feed out and remove special tool on the high pressure pump (1).



- Feed out the special tool on the rail (1) and remove.



- Insert and install the high pressure line (2) with the abrasion protection (3) and the rubber mount (4).
- Hand-tighten the union nut (1) on the high pressure pump.



- Hand-tighten the union nut (1) on the rail.

TECHNICAL INFORMATION

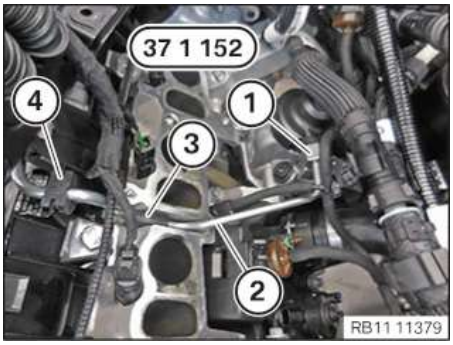
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten the union nut (1) with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

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- Make sure that the high pressure line (2) is correctly installed with the abrasion protection (3) and the rubber mount (4).

TECHNICAL INFORMATION

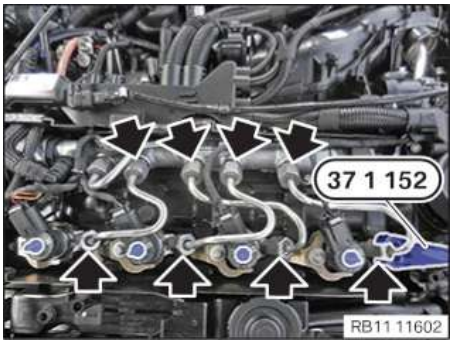
Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

- Tighten union nut (1) on the high pressure pump with the special tool .

High pressure lines between high pressure pump and rail

High-pressure pipe		Tightening torque	24.5 Nm

25 – Installing the high pressure lines between the injector and the rail



- Remove the special tool from all cable connections.
- Feed in and install the high pressure lines (arrows).
- Hand-tighten the high pressure lines (arrows).

TECHNICAL INFORMATION

Renew high pressure lines when the tightening torque exceeds the maximum of 30 Nm.

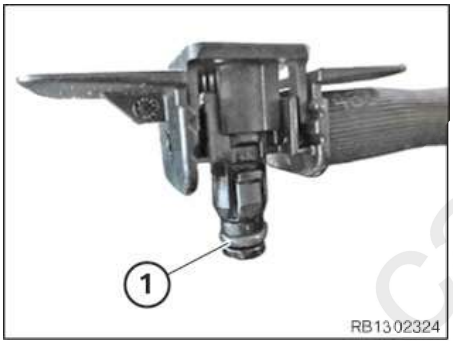
- Tighten the high pressure lines (arrows) with the special tool .

High pressure lines between injector and rail

High-pressure pipe		Tightening torque	24.5 Nm

- Check the high pressure lines (arrows) for tightness (**visual inspection**).

26 – Attach the leakage oil line on the injectors

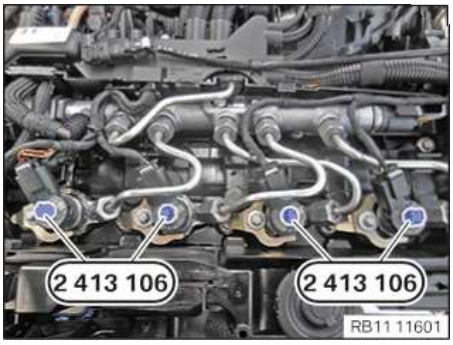


- **Version A:**

  Check sealing ring (1) for damage, renew leakage oil line if necessary.

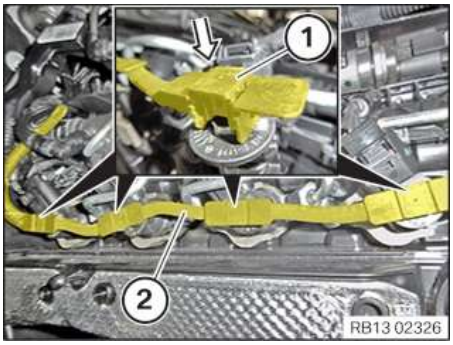
  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

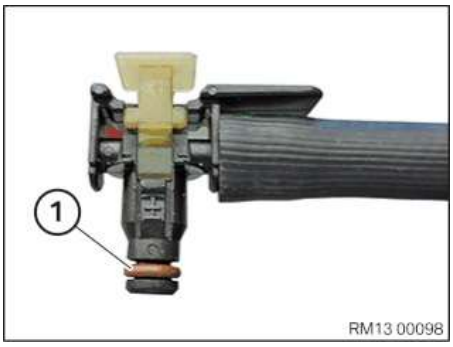


- Feed out the special tools and remove.

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- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

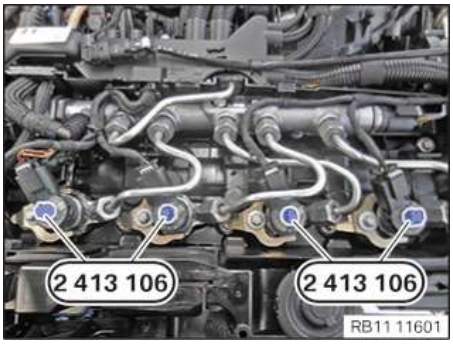


- **Version B**:

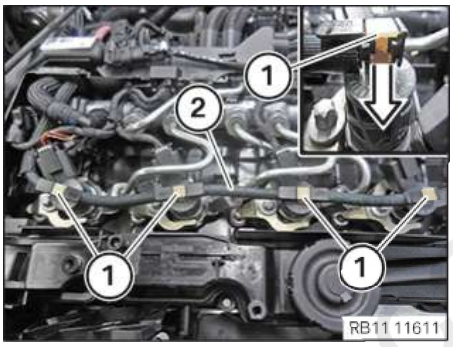
  Check sealing ring (1) for damage, renew leakage oil line if necessary.

  Damaged sealing rings may cause malfunctions during fuel pressure build-up.

  Coat the sealing ring (1) with lubricant before connecting the leakage oil line to the injector.

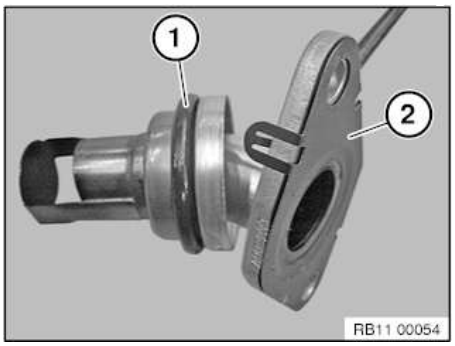


- Feed out the special tools and remove.



- Feed in leakage oil line (2) and install.
- Lock the locks (1) in the direction of the arrow.
- Ensure that the locks (1) engage audibly.

27 – Installing the intake plenum

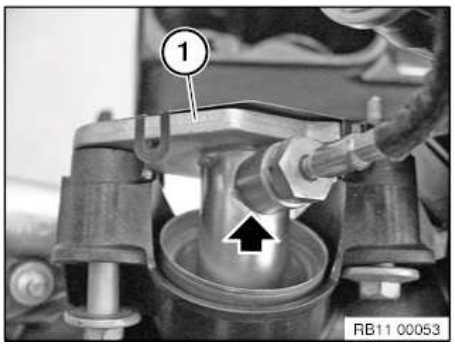


- Renew O-ring (1).

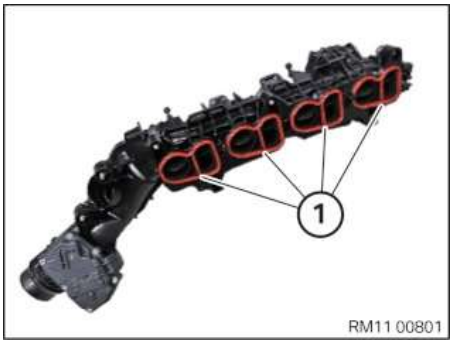
  Parts: O-ring
- Unclip the seal (2).
- Renew the seal (2).

  Parts: Gasket
- Position the seal (2) and clip it in.

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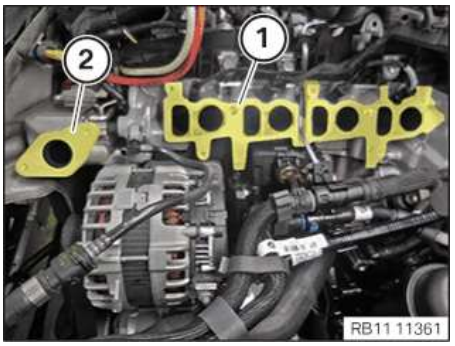


- Install exhaust-gas recirculation pipe (1) in the intake plenum (arrow).

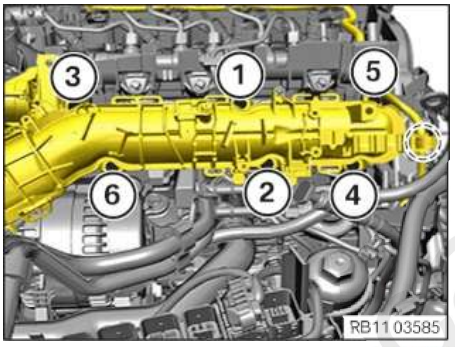


- Renew seals (1).

  Parts: Seals
- Ensure that the seals (1) are firmly mounted on the intake plenum.



- Clean connection points (1) at cylinder head.
- Clean the connection point (2) on the exhaust-gas recirculation cooler.

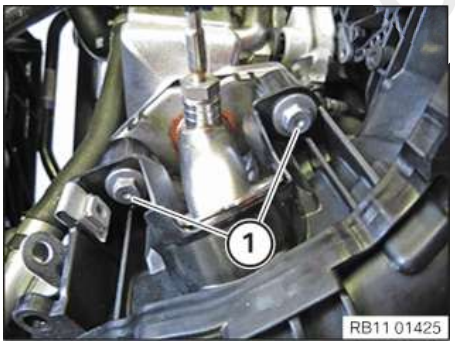


- Guide in and install intake plenum .
- Tighten the screws in the order (1) to (6).

Intake plenum to cylinder head

M6		Tightening torque	11 Nm

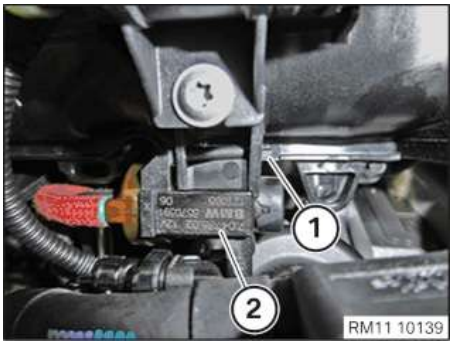
- Attach the wiring harness and fuel lines in the marked area on the intake plenum.



- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

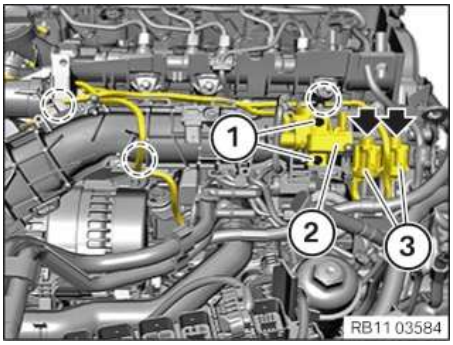
		Tightening torque	10 Nm



- Install electric changeover valve (2) from the left to the right in the holder on the intake plenum.

  The lock (1) must audibly engage.

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- Install intake plenum electric changeover valve (3) on the intake plenum.
  The locks (arrows) must engage audibly.
- Position the electric changeover valve (2) on the intake plenum.
- Tighten the screws (1).

Electric changeover valve to intake plenum

TS6x20		Tightening torque	5 Nm

- Fasten the vacuum hoses on the intake plenum in the marked areas.

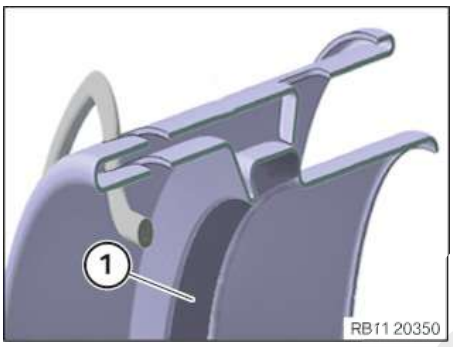


- Check the seal (1) for damage, and renew if necessary.

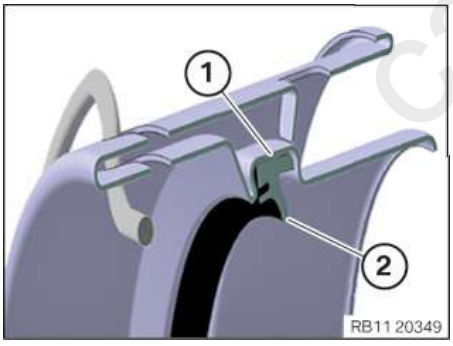
▸ **Replacing damaged seal**

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 directed inwards as shown.



- Connect the pressure pipe to the throttle body until the locks (1) engage on both sides.

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- Check that the locks (1) are correctly seated on the pressure pipe.

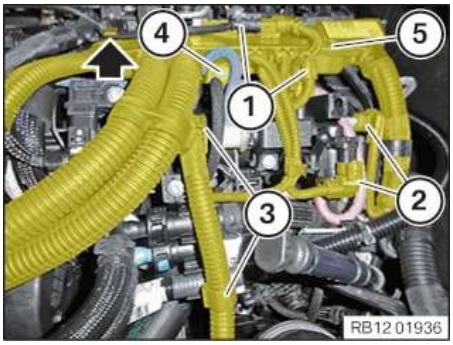
28 – Partially securing the wiring harness section on the intake plenum

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 the wiring harness section (5) and install.
- Tighten down screw (4).

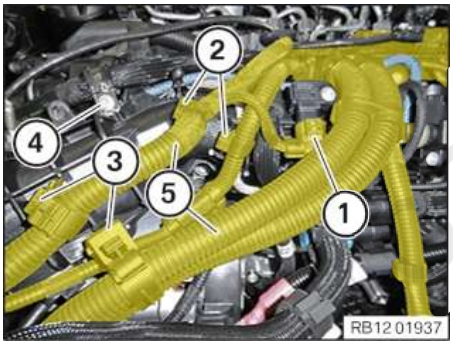
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

- Secure clamps (3).
- Connect connectors (2) and lock.

  The connectors (2) must engage audibly.
- Secure the line at clamp (Arrow).
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



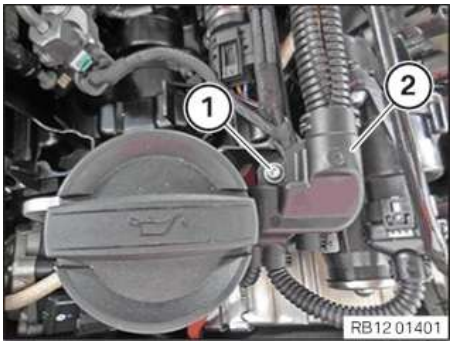
- Guide in the wiring harness section (5) and install.
- Tighten down screw (4).

Standard screw connection 4 Nm

Oval-head screw		Tightening torque	4 Nm

- Secure clamps (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



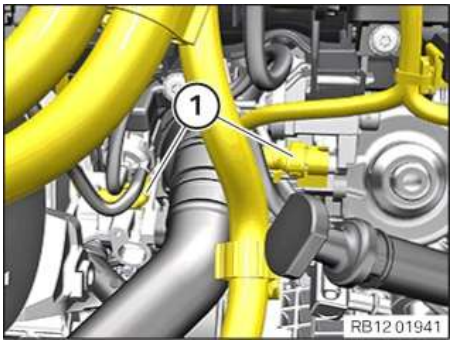
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



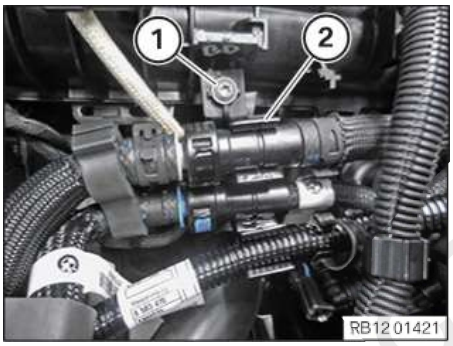
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



- Connect connectors (1) and lock.

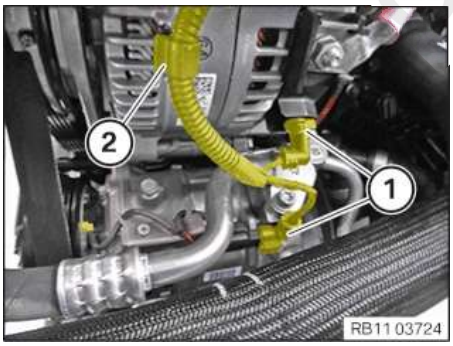
  The connectors (1) must engage audibly.



- Insert and install the holder (2).
- Tighten down screw (1).

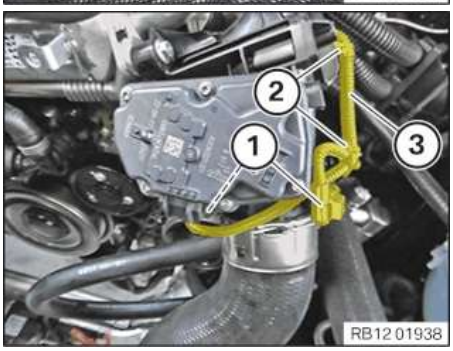
Holder on intake plenum

TS6X20		Tighten torque	5 Nm



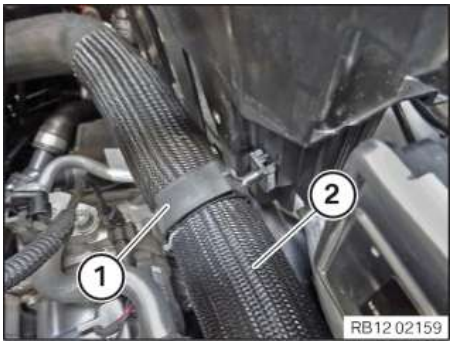
- Connect the connector (1) and lock it.

  The connectors (1) must engage audibly.
- Secure holder (2) to alternator.



- Guide in the wiring harness section (3) and install.
- Secure clamps (2).
- Connect connectors (1) and lock.

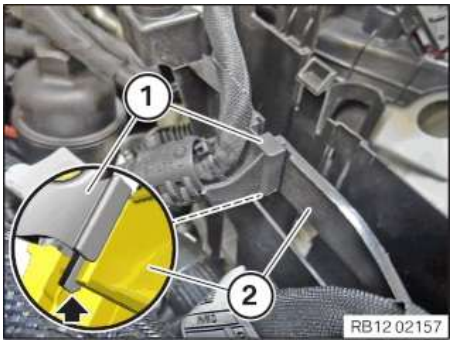
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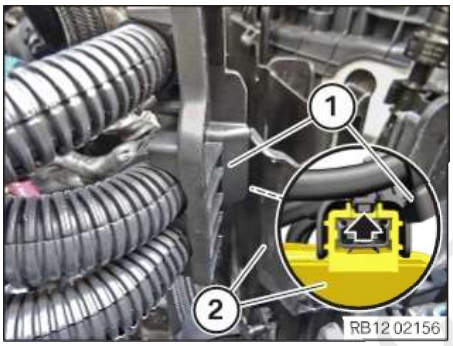
- Feed in and install coolant line (2).
- Lock holder (1).
  The holder (1) must engage audibly.



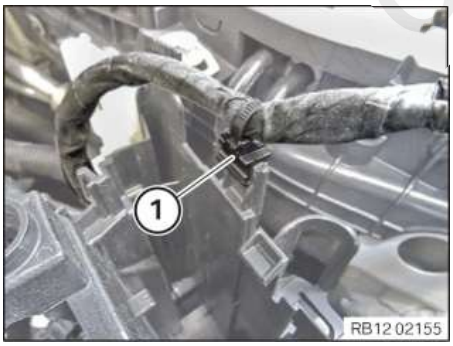
- Feed in and install the cable clip (1).
  Lock (arrow) must audibly engage.



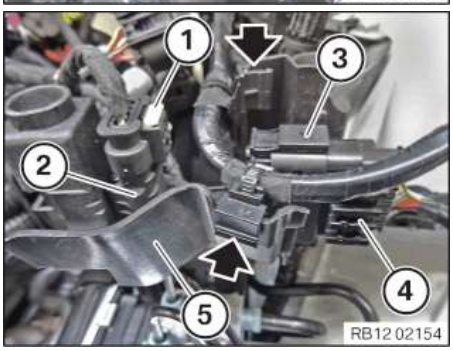
- Connect the cable clip (1) with the control unit holder (2) and lock it.
  Lock (arrow) must audibly engage.



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

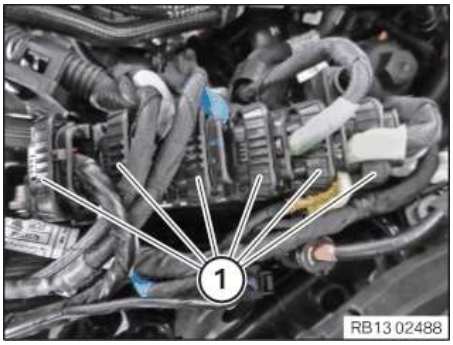


- Secure clamps (1).



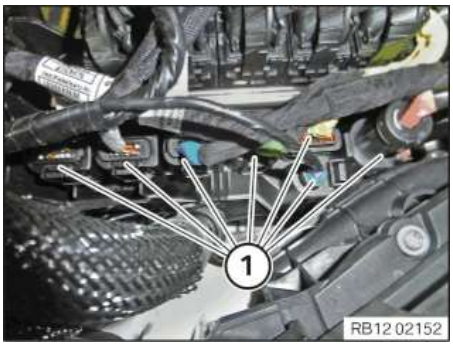
- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
-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

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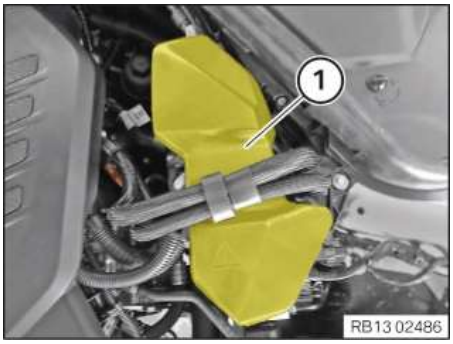
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



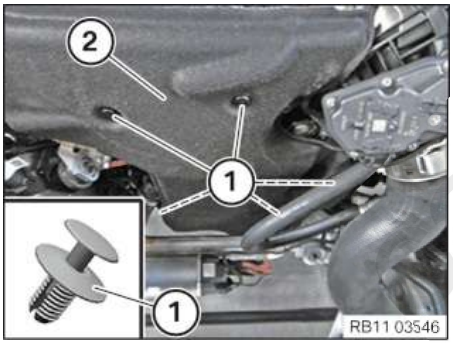
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Insert and install cover (1) into guides.

29 – Install acoustic cover for the engine, front



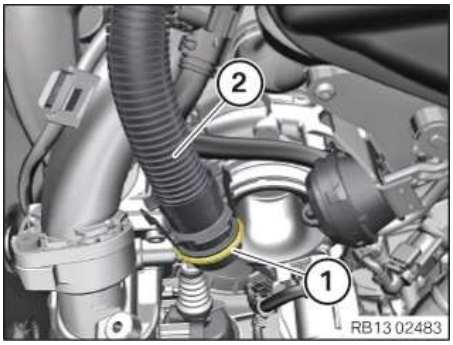
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

30 – Installing the clean air pipe with resonator



- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.

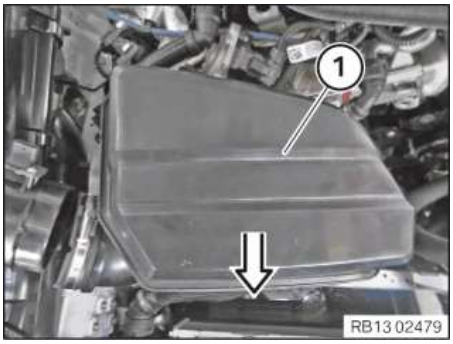
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- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

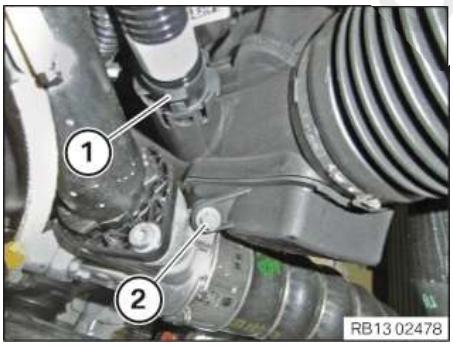


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

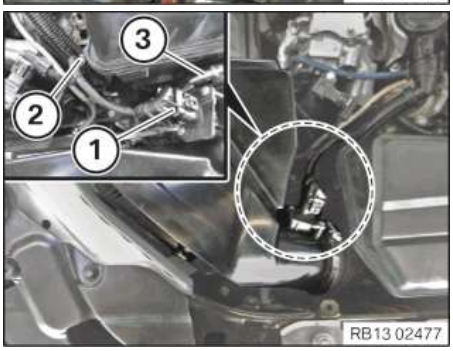
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



- 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

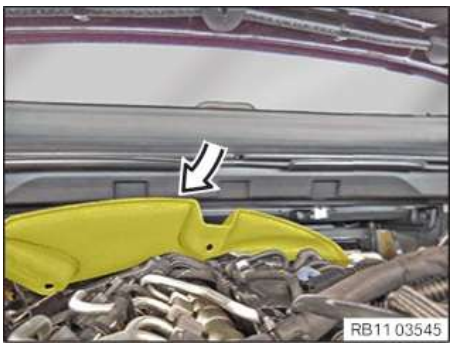
Clamp		Tightening torque	3 Nm

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

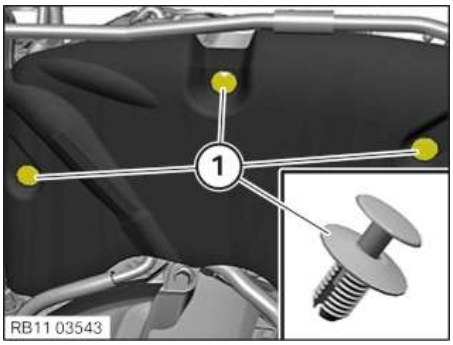
  The connector (1) must engage audibly.

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31 – Installing acoustic cover at rear

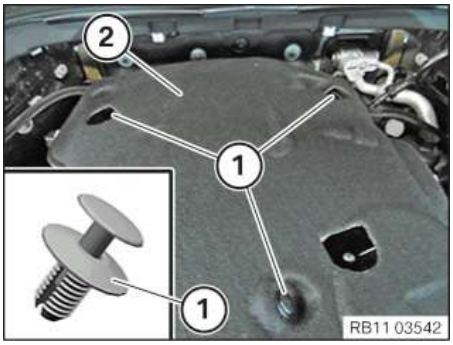


- Guide in the acoustic cover in the direction of the arrow and install it.



- Secure acoustic cover with the expanding rivets (1).

32 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

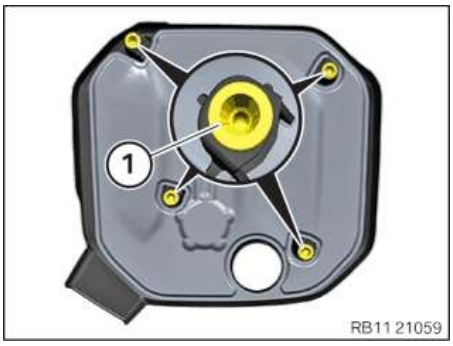
33 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



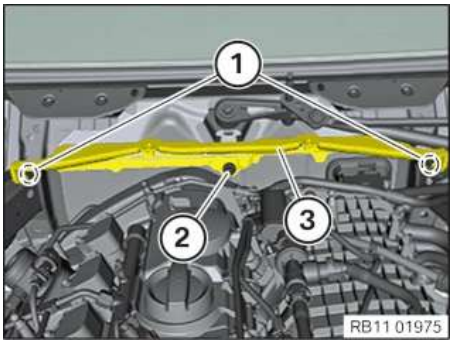
- Check the acoustic cover for correct fit of the rubber mounts (1).

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

34 – Installing centre bulkhead lower section

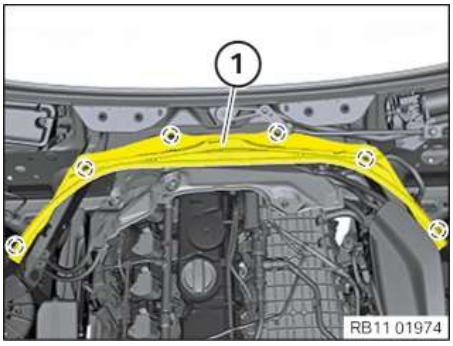


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

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

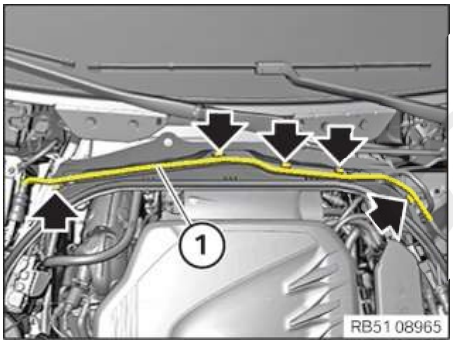
35 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

Bulkhead upper part to bottom bulkhead

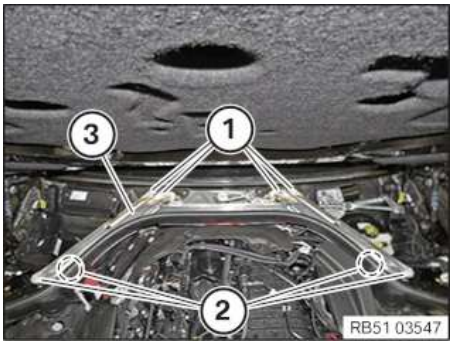
		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

36 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

37 – Installing cowl panel cover

RISK OF DAMAGE

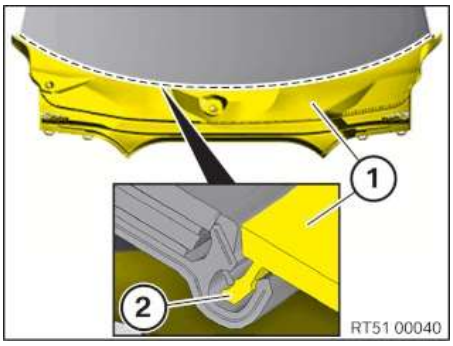
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

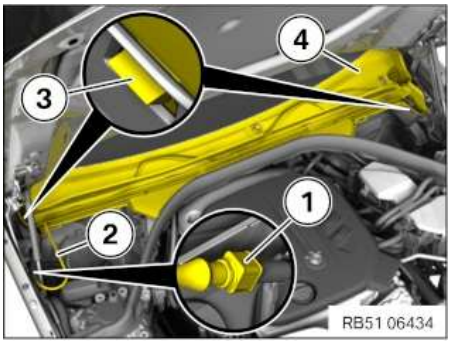
TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.

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- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

38 – Install left and right wiper arm

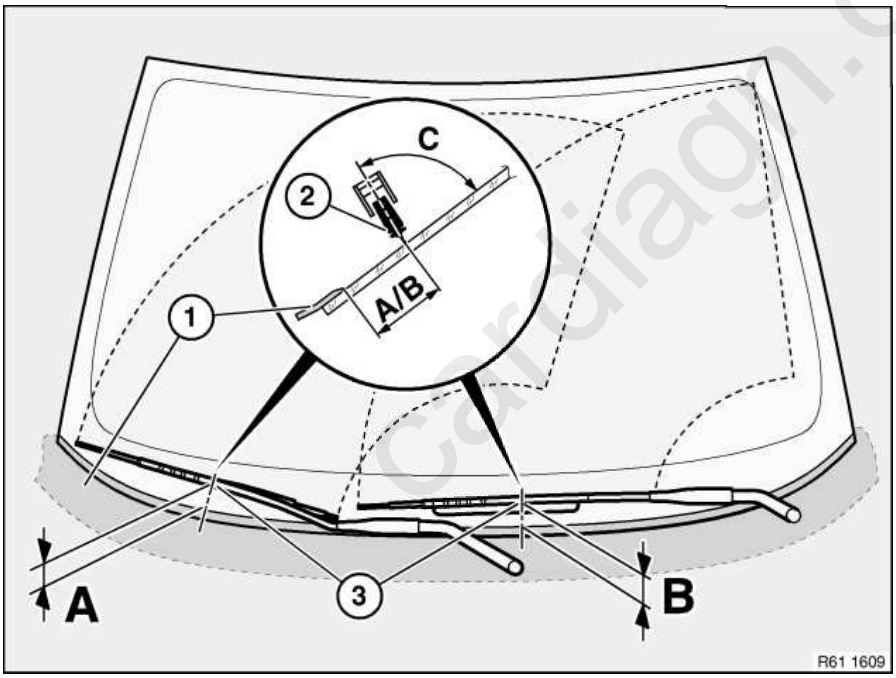
NOTICE

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

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

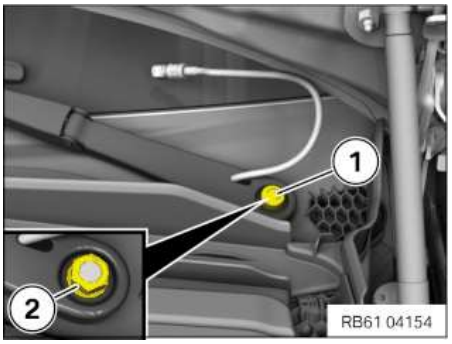
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm



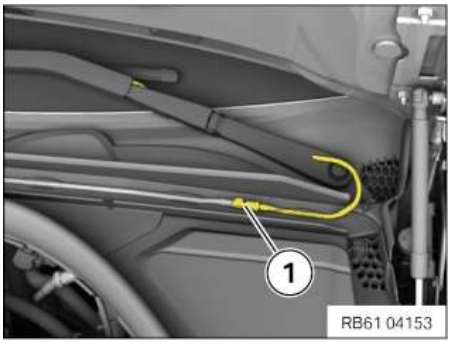
- Tighten nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

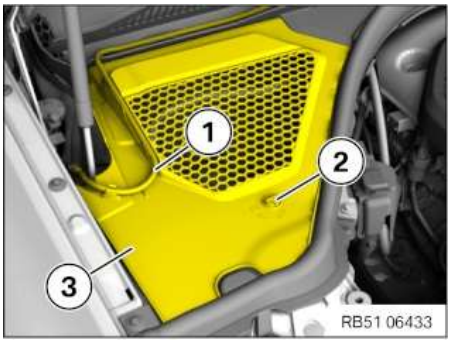
- Connect the protective cap (1).

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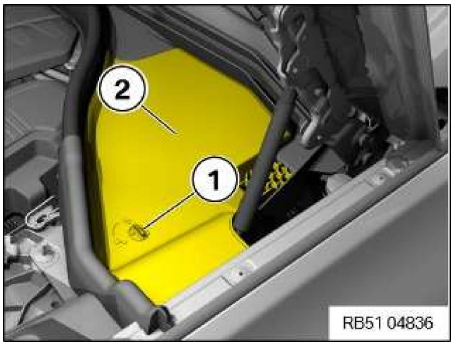
- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

39 – 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.

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



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

41 – Connecting all battery earth leads



- See additional information.

42 – Take bonnet out of the service position

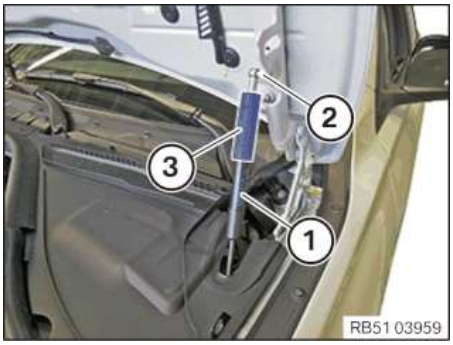
CAUTION

Shutting bonnet or tailgate.

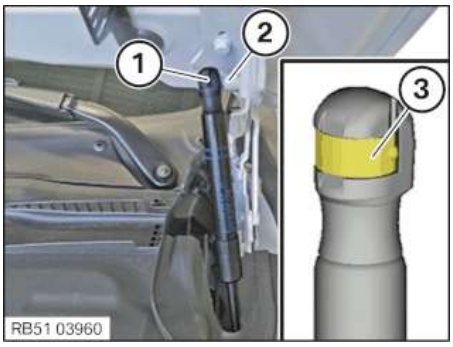
Danger of injury!

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

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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.



- 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

Rail pressure regulating valve to rail			Used in step 22
		Initial tightening torque	80 Nm
		Release	90 °
		Tightening torque	85 Nm

Rail to cylinder head cover			Used in step 23
M8		Tightening torque	19 Nm

High pressure lines between high pressure pump and rail			Used in step 24
High-pressure pipe		Tightening torque	24.5 Nm

High pressure lines between injector and rail			Used in step 25
High-pressure pipe		Tightening torque	24.5 Nm

Intake plenum to cylinder head			Used in step 27
M6		Tightening torque	11 Nm

Exhaust-gas recirculation cooler to intake plenum			Used in step 27
		Tightening torque	10 Nm

Electric changeover valve to intake plenum			Used in step 27
TS6x20		Tightening torque	5 Nm

Wiring harness section to manifold			Used in step 28
TS5x20		Tightening torque	3,6 Nm

Standard screw connection 4 Nm			Used in step 28
Oval-head screw		Tightening torque	4 Nm

Wiring harness section to cylinder head cover			Used in step 28
TS5x20		Tightening torque	3,6 Nm

Holder on intake plenum			Used in step 28
TS6X20		Tightening torque	5 Nm

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Clean air pipe to exhaust turbocharger			Used in step 30
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 30
Clamp		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 34
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 35
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 35
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 35
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 38
Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 38
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
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61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 20 900 Disconnecting and connecting battery earth lead	241
61 35 ... Notes on ESD protection (Electro Static Discharge)	1521
61 35 ... Notes on ESD protection (Electro Static Discharge)	152122

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13 54 031 Completely replacing the throttle body

WARNING

Hot surfaces.

Risk of burning!

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

PRELIMINARY WORK

1 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

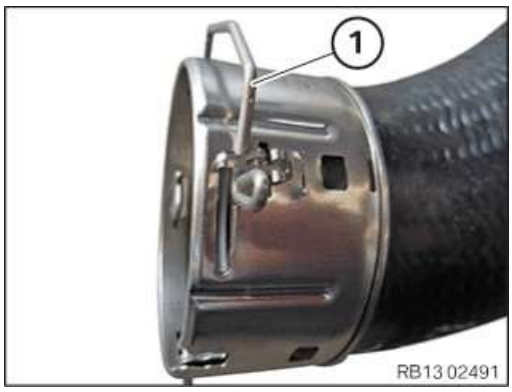
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

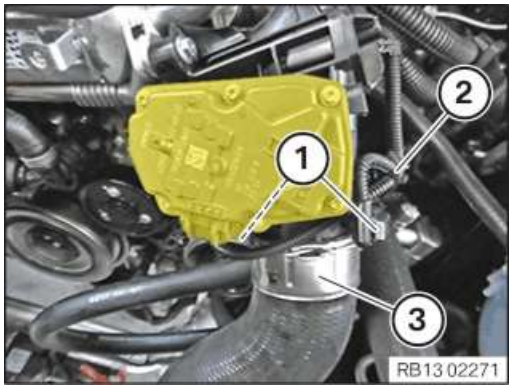
Damage to or destruction of electrical components.

- 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 ... Notes for ESD protection (electrostatic discharge)



- Unlock clamp (1) and engage in this position.

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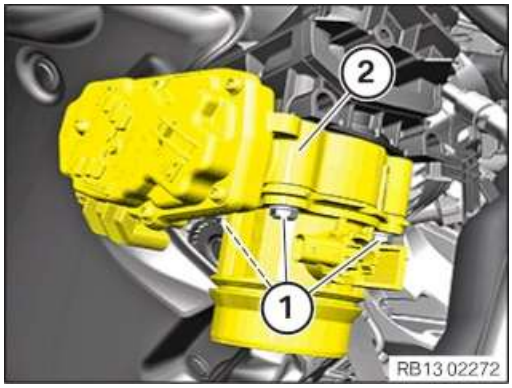


- Unlock and disconnect plug connections (1).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

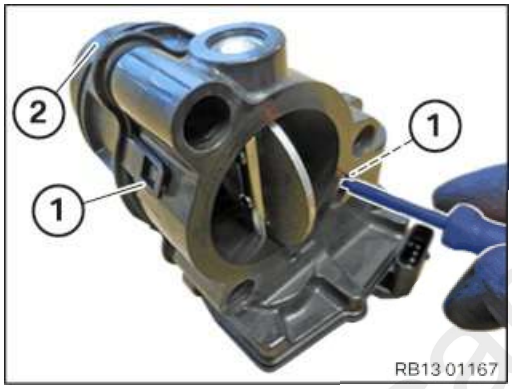
- Loosen clamp (2).
- Unlock and disconnect the pressure pipe (3).



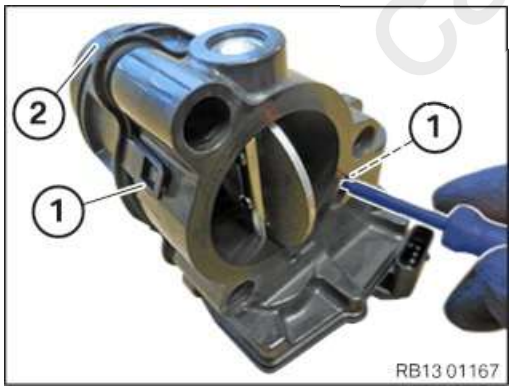
- Loosen screws (1).
- Remove throttle body (2).

MAIN WORK

2 – Replacing the air duct



- Unlock and loosen the locks (1).
- Remove the air duct (2).



- Renew air duct (2).

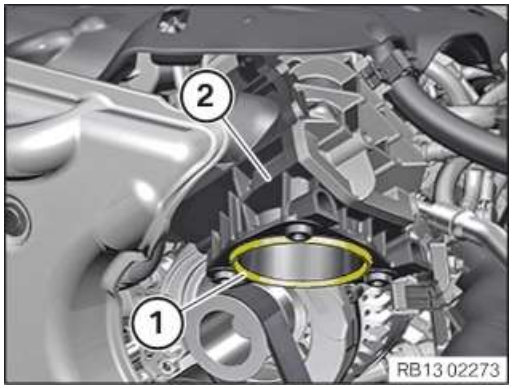
  Parts: Air duct
- Mount the air duct (2) on the throttle valve.

  The locks (1) must engage audibly.

POSTPROCESSES

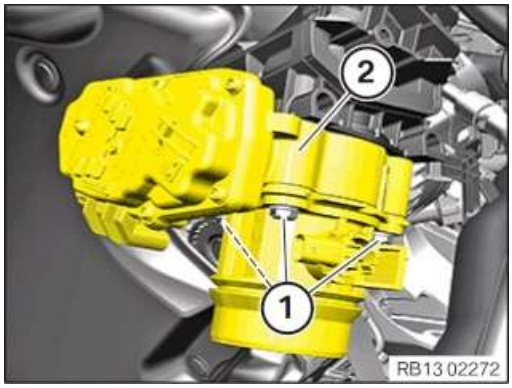
3 – Installing the throttle body

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- Renew the sealing ring (1) on the intake plenum .

  Parts: Sealing ring



- Feed in and install the throttle body (2).
- Tighten the screws (1).

Throttle body to intake plenum

6x50		Tightening torque	8 Nm

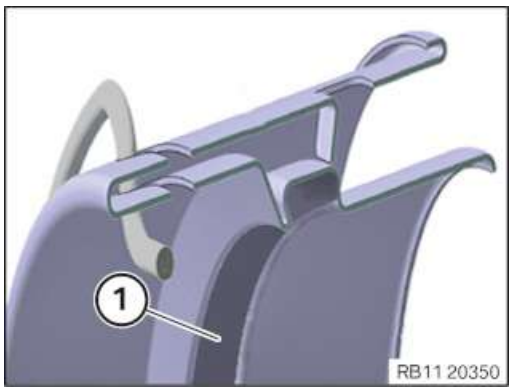


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

TECHNICAL INFORMATION

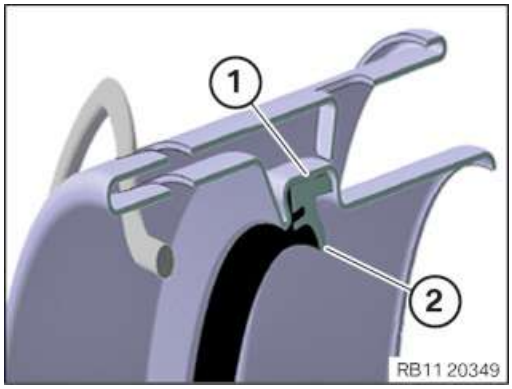
Do not use pointed or sharp-edged tools for the installation and/or removal.



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

  The gasket groove (1) must be clean.

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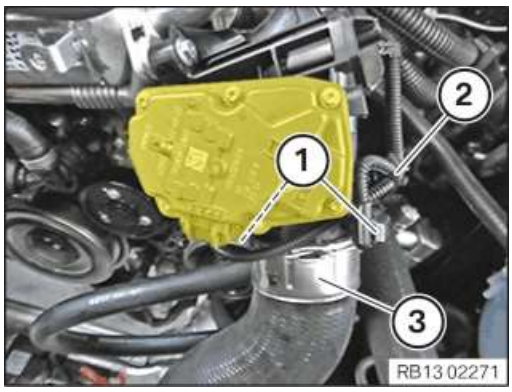
- Renew gasket.

  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 directed inwards as shown.



- Connect the pressure pipe (3) and lock.

  The pressure pipe (3) must engage audibly.

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

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

  The connectors (1) must engage audibly.



- Lock clamp (1).

Additional Information

Overview of Tightening Torques

Throttle body to intake plenum			Used in step 3
6x50		Tightening torque	8 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

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13 54 034 Remove and install/ replace throttle valve

WARNING

Hot surfaces.

Risk of burning!

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

PRELIMINARY WORK

1 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

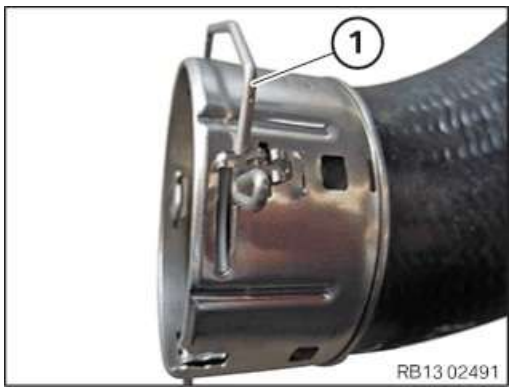
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

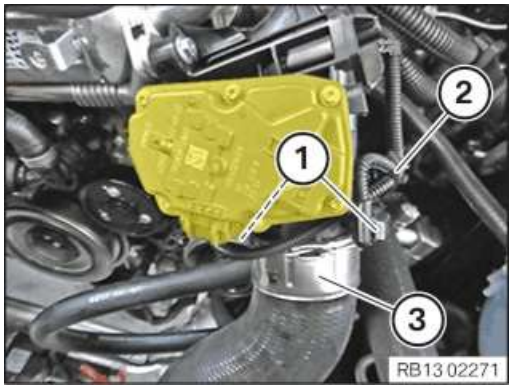
Damage to or destruction of electrical components.

- 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 ... Notes for ESD protection (electrostatic discharge)



- Unlock clamp (1) and engage in this position.

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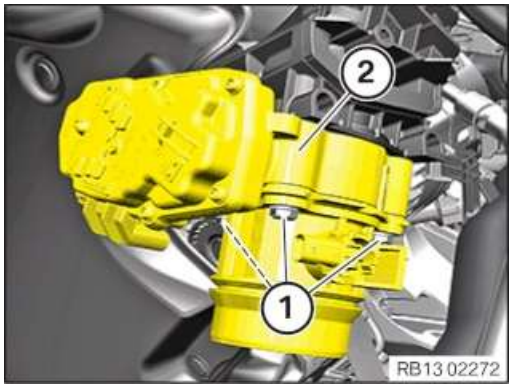


- Unlock and disconnect plug connections (1).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

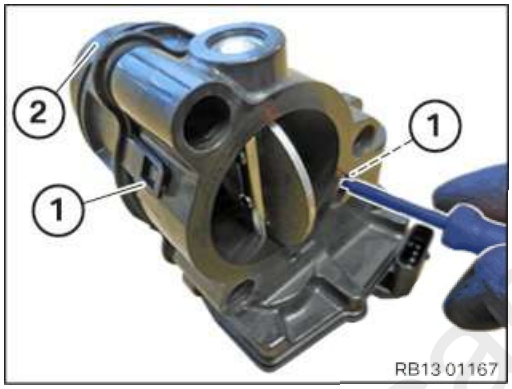
- Loosen clamp (2).
- Unlock and disconnect the pressure pipe (3).



- Loosen screws (1).
- Remove throttle body (2).

MAIN WORK

2 – Replace throttle valve



- Unlock and loosen the locks (1).
- Remove the air duct (2).



- Renew sealing ring (1).

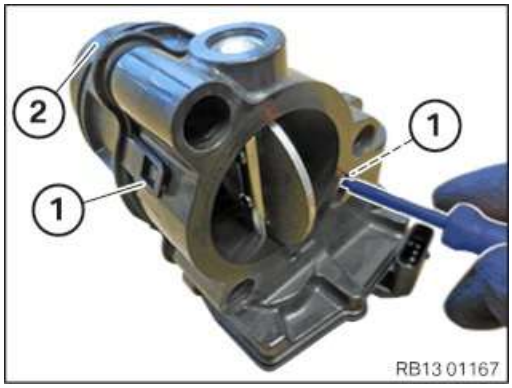
  Parts: Sealing ring

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- Renew throttle valve (1).

  Parts: Throttle valve

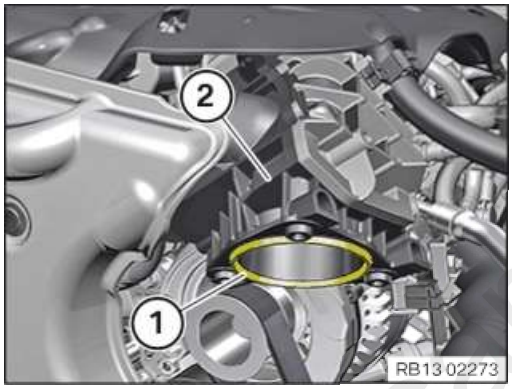


- Mount the air duct (2) on the new throttle valve.

  The locks (1) must engage audibly.

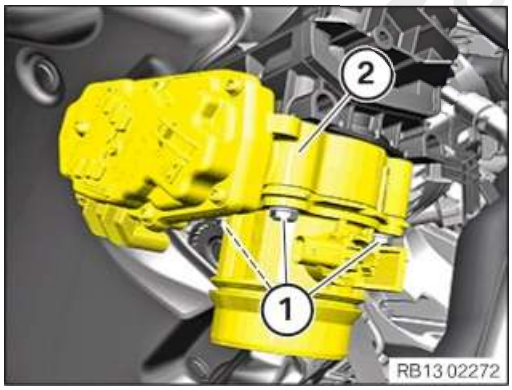
POSTPROCESSES

3 – Installing the throttle body



- Renew the sealing ring (1) on the intake plenum .

  Parts: Sealing ring



- Feed in and install the throttle body (2).
- Tighten the screws (1).

Throttle body to intake plenum

6x50		Tightening torque	8 Nm

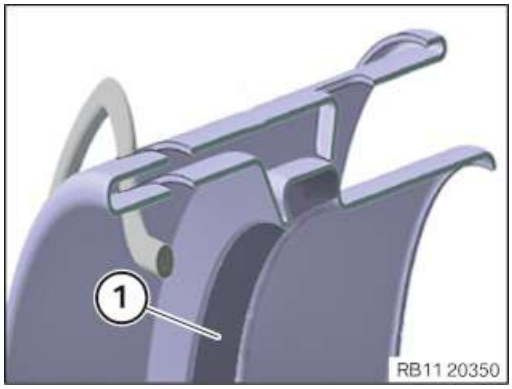


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

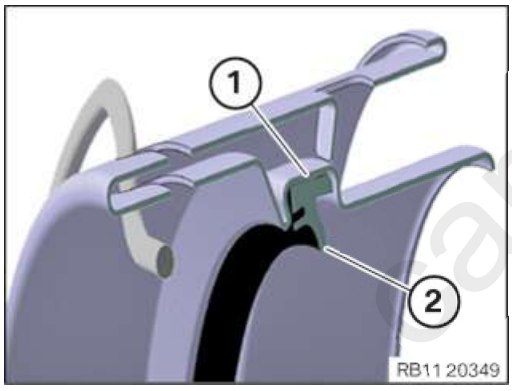
TECHNICAL INFORMATION

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.



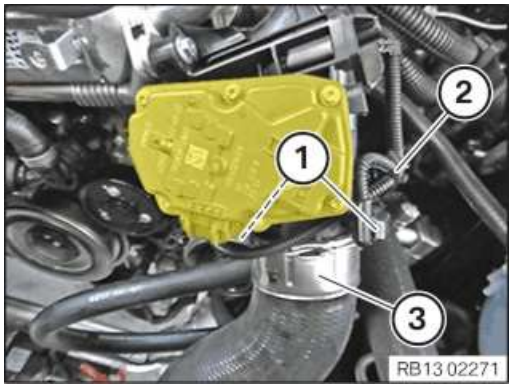
- Renew gasket.

  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 directed inwards as shown.



- Connect the pressure pipe (3) and lock.

  The pressure pipe (3) must engage audibly.

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

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

  The connectors (1) must engage audibly.

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- Lock clamp (1).

Additional Information

Overview of Tightening Torques

Throttle body to intake plenum			Used in step 3
6x50		Tightening torque	8 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

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13 54 030 Remove and install/seal throttle body

WARNING

Hot surfaces.

Risk of burning!

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

1 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

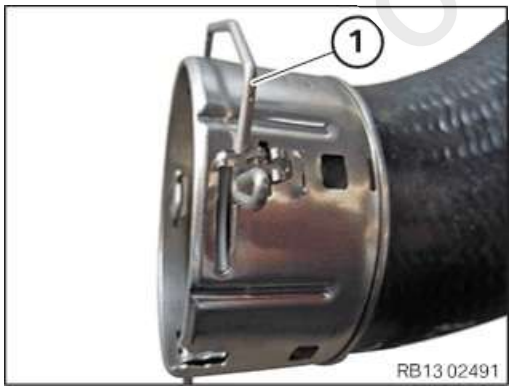
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

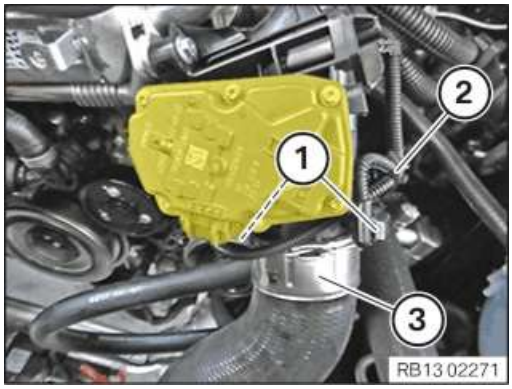
Damage to or destruction of electrical components.

- 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 ... Notes for ESD protection (electrostatic discharge)



- Unlock clamp (1) and engage in this position.

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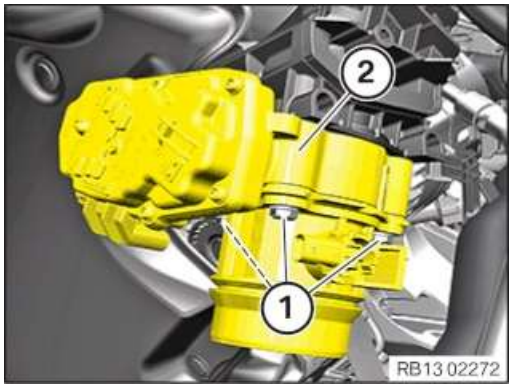


- Unlock and disconnect plug connections (1).

NOTICE

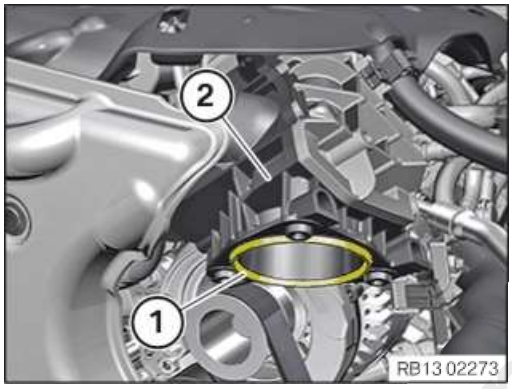
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen clamp (2).
- Unlock and disconnect the pressure pipe (3).



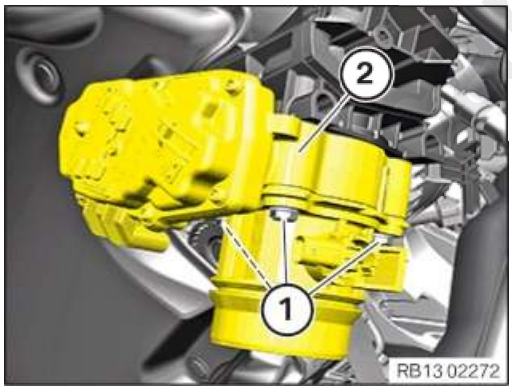
- Loosen screws (1).
- Remove throttle body (2).

2 – Installing the throttle body



- Renew the sealing ring (1) on the intake plenum .

  Parts: Sealing ring



- Feed in and install the throttle body (2).
- Tighten the screws (1).

Throttle body to intake plenum

6x50		Tightening torque	8 Nm



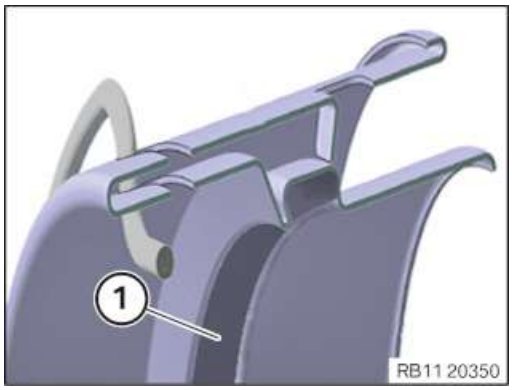
- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

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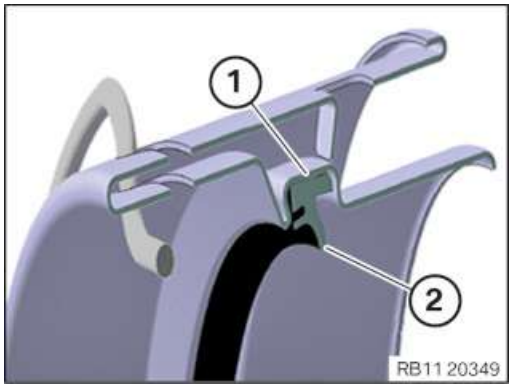
TECHNICAL INFORMATION

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.



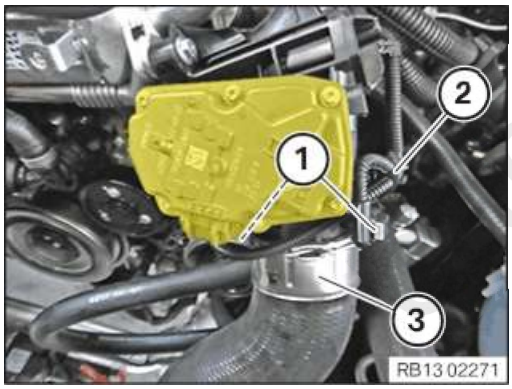
- Renew gasket.

  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 directed inwards as shown.



- Connect the pressure pipe (3) and lock.

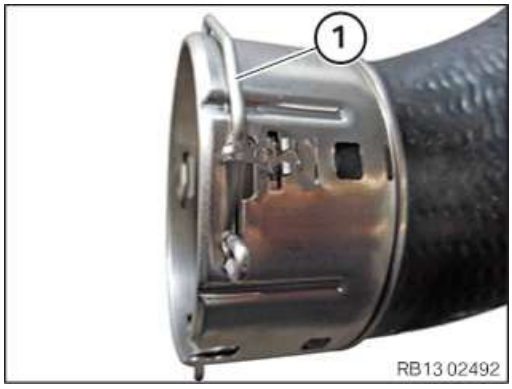
  The pressure pipe (3) must engage audibly.

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

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

  The connectors (1) must engage audibly.



- Lock clamp (1).

Additional Information

Overview of Tightening Torques

Throttle body to intake plenum			Used in step 2
6x50		Tightening torque	8 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

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13 61 501 Replace control unit

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.
- Detach battery earth lead from battery.
- With auxiliary 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 – Disconnecting all battery earth leads



- See additional information.

MAIN WORK

2 – Remove DDE 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 ... Notes for ESD protection (electrostatic discharge)

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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

Follow instructions for removing and installing control units.

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

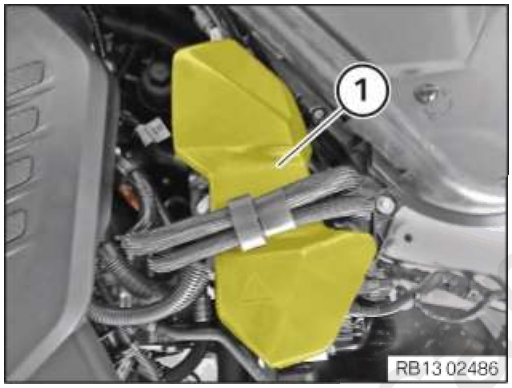
TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.

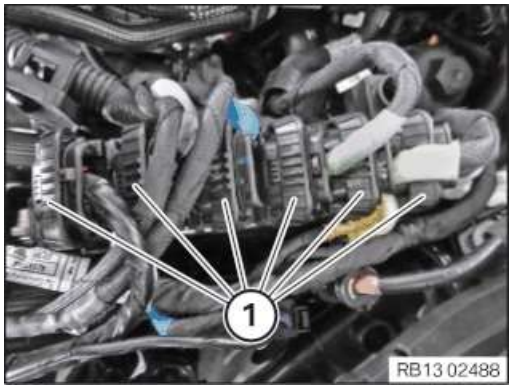
For additional information see: 61 00 ... Programming/encoding control unit(s)



- Pull off cover (1) upwards, feed out and remove.



- Unlock plug connection (1) and disconnect.



- Unlock and disconnect plug connections (1).



- Release the latch mechanisms (arrows).
- Thread out and remove DDE control unit (1).

3 – Install DDE control unit

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

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

Control unit must be programmed after it is replaced.

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

TECHNICAL INFORMATION

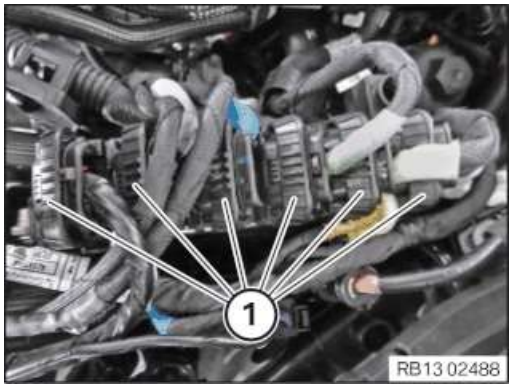
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

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- Install DDE control unit(1).

  The latch mechanisms (arrows) must engage audibly.



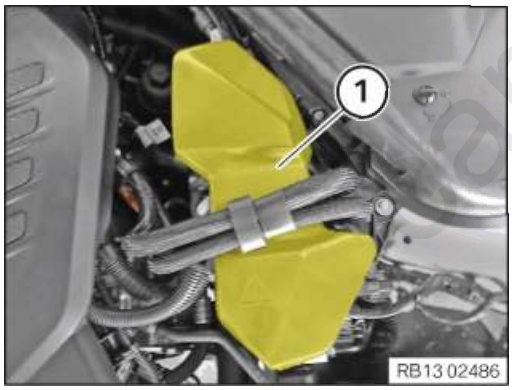
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Insert and install cover (1) into guides.

POSTPROCESSES

4 – Connecting all battery earth leads

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- See additional information.

5 – Replacement: Encode the DDE control unit

▸ **Encode/program control unit(s)**

Prerequisite

The control unit was replaced.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.

The battery voltage must not fall below 13.0 V during programming.

Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.

The high-voltage system will be automatically switched off by the programming system.

Exception:

BMW I01: Note Product and Measures Management Aftersales measure 55176388.

- Connect the battery charger to the vehicle (activity not included in the flat rate unit).
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.

▸ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

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TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

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

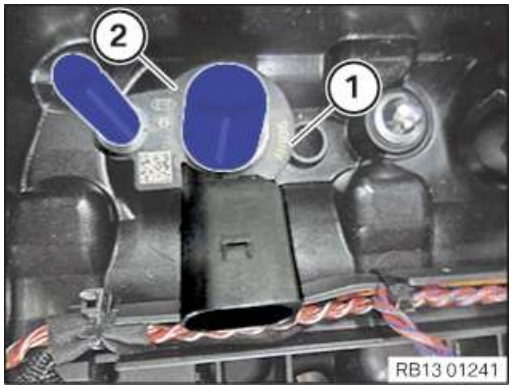
▸ **Replacement: Perform injection quantity compensation**

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

NOTICE

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



- Read off the adjustment value (1) on the new injector (2).

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- Connect diagnosis system:
  - Vehicle identification
  - Function selection
  - Service functions
  - Digital diesel electronics (DDE)
  - Adjustment of injectors
  - Testing schedule
- Start service function with the right arrow button.

Additional Information

Links

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	23

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
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61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14

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61 20 900 Disconnecting and connecting battery earth lead	14
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61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 35 ... Notes on ESD protection (Electro Static Discharge)	2
61 35 ... Notes on ESD protection (Electro Static Discharge)	2
61 00 730 Encode/program control unit(s) (after vehicle test)	3

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13 61 501 Replace control unit

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.
- Detach battery earth lead from battery.
- With auxiliary 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

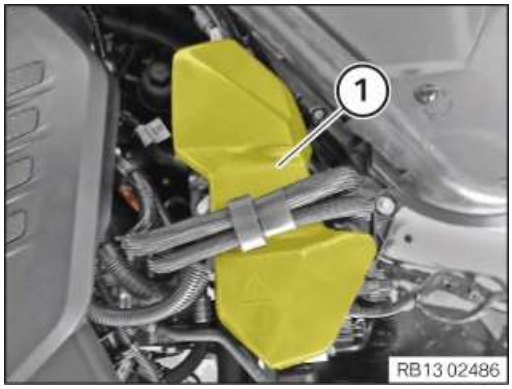
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

2 – Disconnecting all battery earth leads



- See additional information.

3 – Remove the cover for the DDE control unit



- Pull off, guide out and remove cover (1) upwards.

MAIN WORK

4 – Remove DDE 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 ... Notes for ESD protection (electrostatic discharge)

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

Follow instructions for removing and installing control units.

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

TECHNICAL INFORMATION

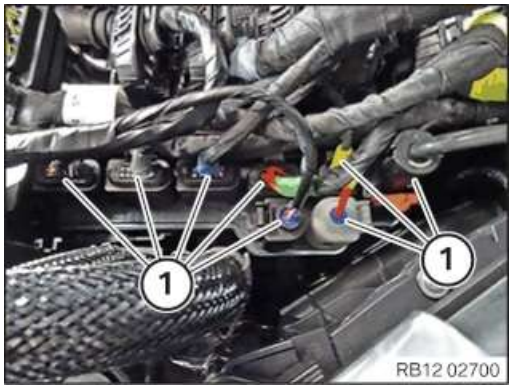
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

TECHNICAL INFORMATION

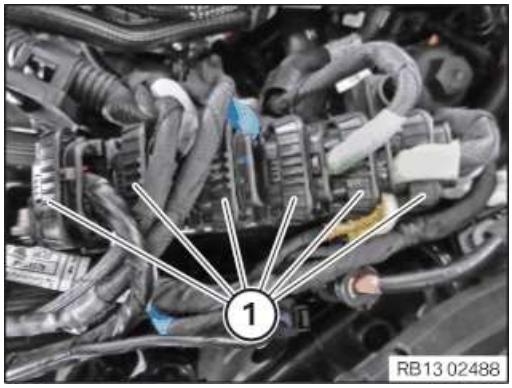
Control unit must be programmed after it is replaced.

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

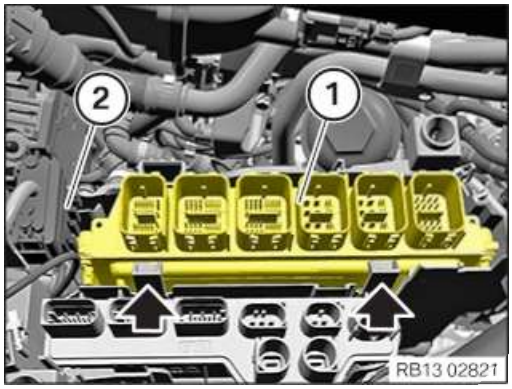
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- Unlock plug connections (1) and disconnect.



- Unlock and disconnect plug connections (1).



- Release the latch mechanisms (arrows).
- Ensure that the plug connection is (2) not damaged.
- Feed out the DDE control unit (1) **carefully** and remove.

5 – Install DDE control unit

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

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

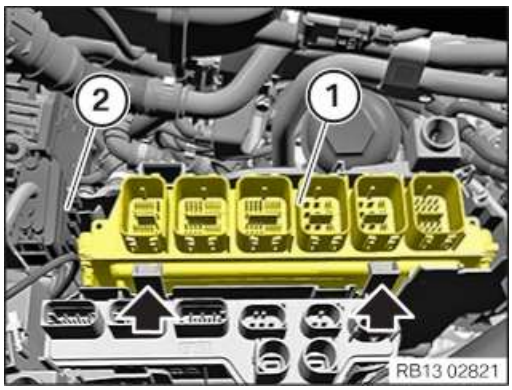
Control unit must be programmed after it is replaced.

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

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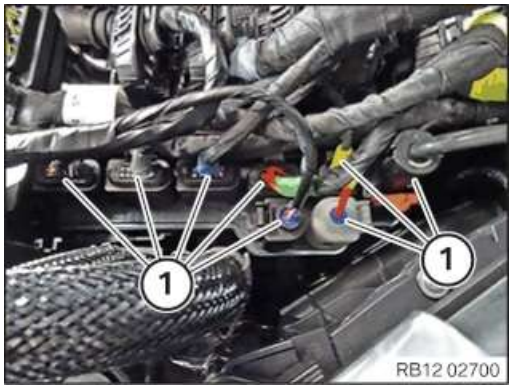
TECHNICAL INFORMATION

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



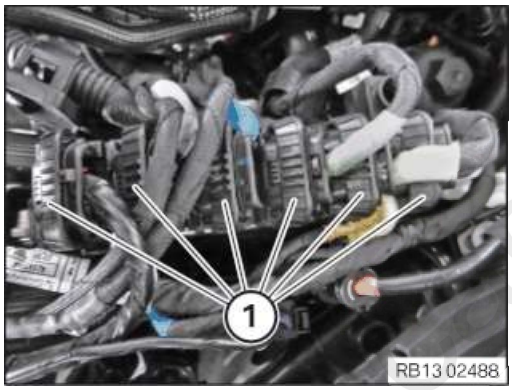
- Make sure that the plug connection (2) does not get damaged.
- Insert the DDE control unit (1) **carefully** and install it.

  The latch mechanisms (arrows) must engage audibly.



- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

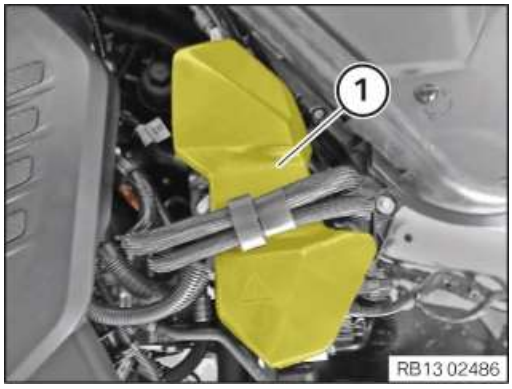


- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

POSTPROCESSES

6 – Install the cover for the DDE control unit



- Insert and install cover (1) into guides.

7 – Connecting all battery earth leads



- See additional information.

8 – Activating the 48 V electrical system

Prerequisite

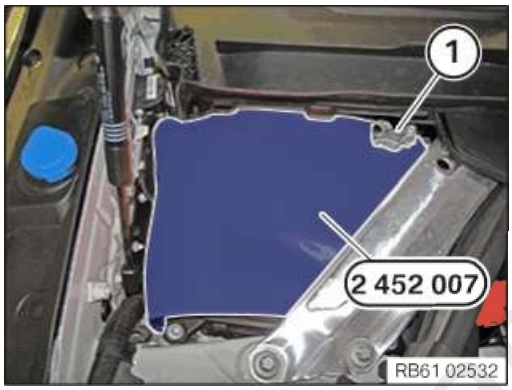
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

9 – Replacement: Encode the DDE control unit

▸ **Encode/program control unit(s)**

Prerequisite

The control unit was replaced.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.

The battery voltage must not fall below 13.0 V during programming.

Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.

The high-voltage system will be automatically switched off by the programming system.

Exception:

BMW I01: Note Product and Measures Management Aftersales measure 55176388.

- Connect the battery charger to the vehicle (activity not included in the flat rate unit).
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.

▸ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

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TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

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

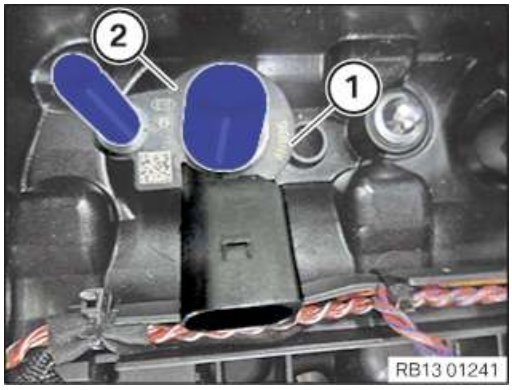
▸ **Replacement: Perform injection quantity compensation**

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

NOTICE

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



- Read off the adjustment value (1) on the new injector (2).

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- Connect diagnosis system:
  - Vehicle identification
  - Function selection
  - Service functions
  - Digital diesel electronics (DDE)
  - Adjustment of injectors
  - Testing schedule
- Start service function with the right arrow button.

Additional Information

Overview of Tightening Torques

Negative battery cable to 48-V battery			Used in step 8
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	**Used in step**
Notes on 48-V battery	18

General repair instructions	**Used in step**
12 00 ... Instructions for removal and replacement of control units	45

Repair instructions	**Used in step**
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
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61 20 900 Disconnecting and connecting battery earth lead	27
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
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61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 35 ... Notes on ESD protection (Electro Static Discharge)	4
61 35 ... Notes on ESD protection (Electro Static Discharge)	4
61 00 730 Encode/program control unit(s) (after vehicle test)	5

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13 62 560 Remove and install/replace hot film air mass meter

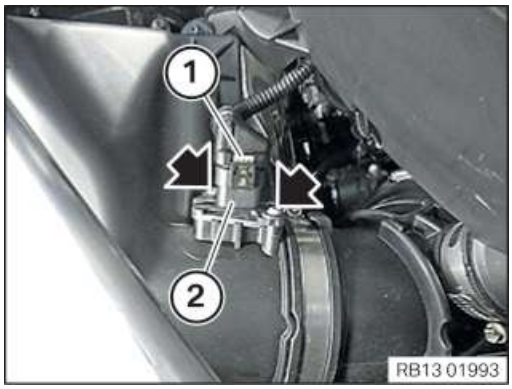
1 – Removing hot film air mass meter

RISK OF DAMAGE

Electrostatic discharge.

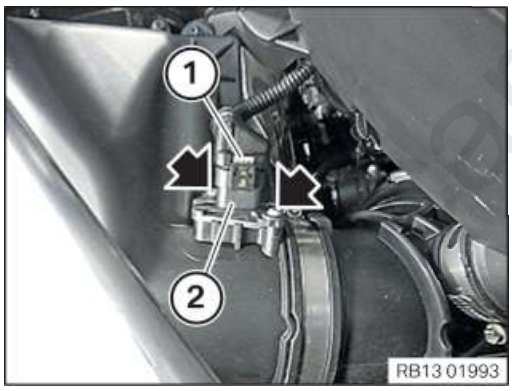
Damage to or destruction of electrical components.

- 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 ... Notes for ESD protection (electrostatic discharge)



- Unlock plug connection (1) and disconnect.
- Remove screws (arrows).
- Remove the hot film air mass meter (2).

2 – Installing hot film air mass meter



- Insert and install the hot film air mass meter (2).
- Tighten screws (arrows).

Hot film air mass meter to intake silencer

Screw TS 4x16		Tightening torque	1,5 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

3 – When replacing the hot film air mass metre: Reset adaptation value

- Reset the adaptation value for the air mass system with the diagnosis system.

Additional Information

Overview of Tightening Torques

Hot film air mass meter to intake silencer Used in step 2

Screw TS 4x16		Tightening torque	1,5 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

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13 62 110 Removing and installing/replacing exhaust gas pressure pipe

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

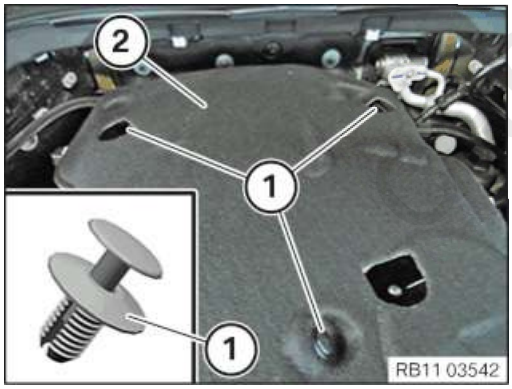
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

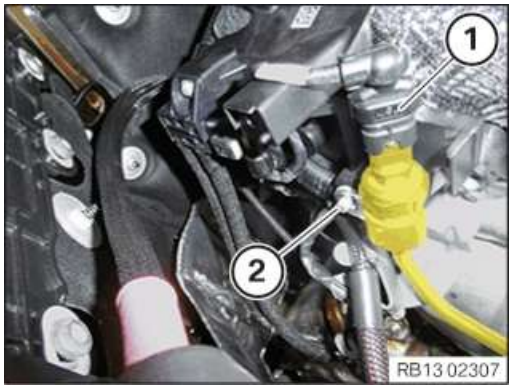
2 – Remove the acoustic cover for the injectors



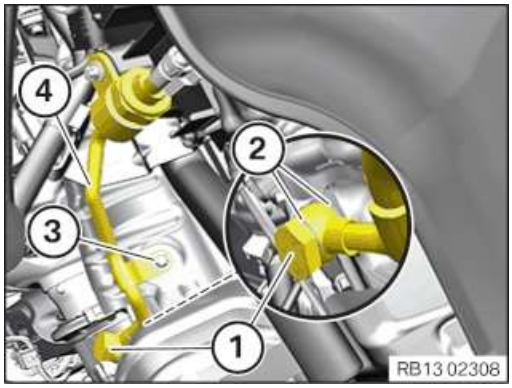
- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

MAIN WORK

3 – Remove the exhaust gas pressure pipe

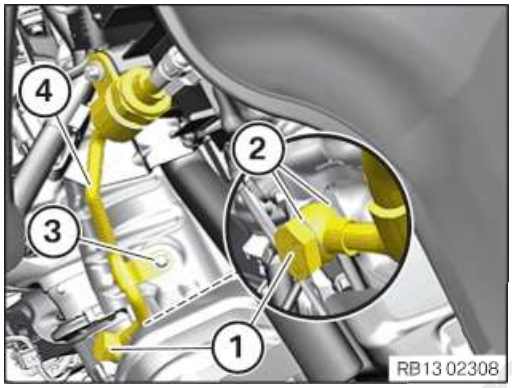


- Unlock plug connection (1) and disconnect.
- Loosen screw (2).



- Unscrew the banjo bolt (1).
- Feed out and remove the sealing rings (2).
- Loosen screw (3).
- Feed out and remove the exhaust gas pressure pipe (4).

4 – Install the exhaust gas pressure pipe



- Insert and install the exhaust gas pressure pipe (4).
- Replace the sealing rings (2).

  Parts: Sealing ring
- Apply the banjo bolt (1) hand-tight.
- Tighten down screw (3).

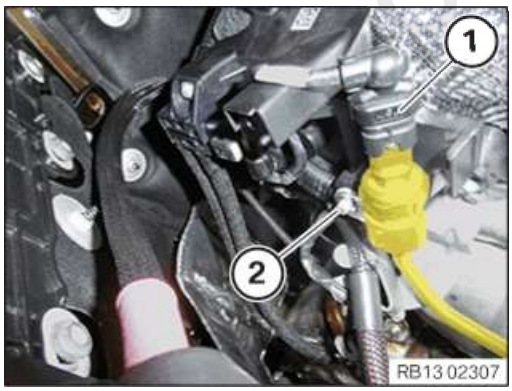
Heat shield to exhaust manifold

M6x12		Tightening torque	10 Nm

- Tighten the banjo bolt (1).

Banjo bolt for exhaust pressure pipe to exhaust manifold

Hollow bolt	Renew sealing rings.	Tightening torque	30 Nm



- Tighten down screw (2).

Exhaust gas pressure pipe to sensor system holder

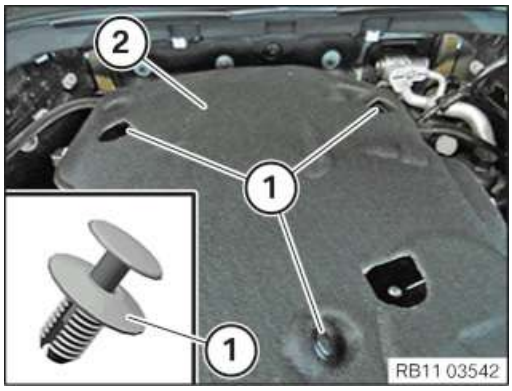
TS6x20		Tightening torque	5,7 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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5 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

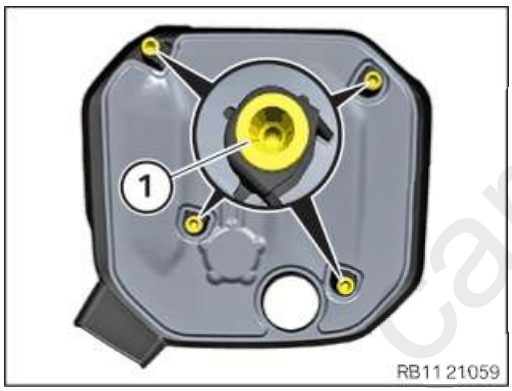
6 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



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

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Additional Information

Overview of Tightening Torques

Heat shield to exhaust manifold — Used in step 4

M6x12		Tightening torque	10 Nm

Banjo bolt for exhaust pressure pipe to exhaust manifold — Used in step 4

Hollow bolt	Renew sealing rings.	Tightening torque	30 Nm

Exhaust gas pressure pipe to sensor system holder — Used in step 4

TS6x20		Tightening torque	5,7 Nm

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13 62 538 Replace charge air temperature sensor

1 – Removing the charge air temperature sensor

WARNING

Hot surfaces.

Risk of burning!

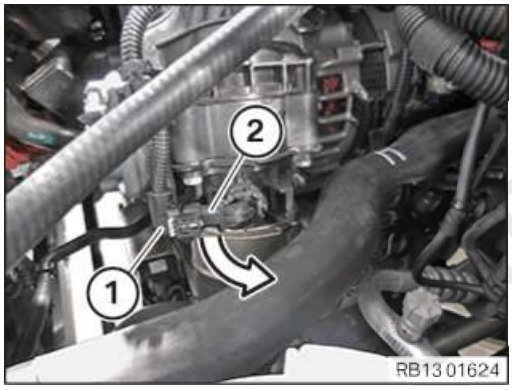
- Perform all work only on components that have cooled down.

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 ... Notes for ESD protection (electrostatic discharge)



- Unlock and loosen connector (1).
- Unlock and loosen the temperature sensor (2) in the direction of the arrow.

2 – Installing the charge air temperature sensor

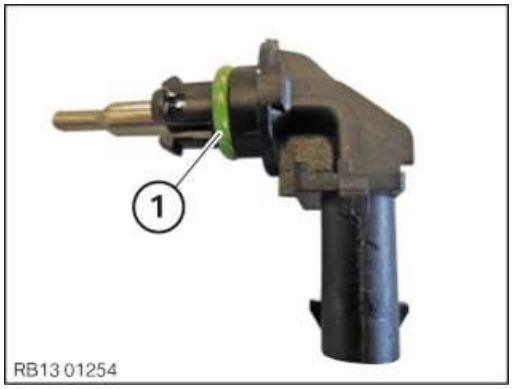
Prerequisite

RISK OF DAMAGE

Contaminant or foreign body.

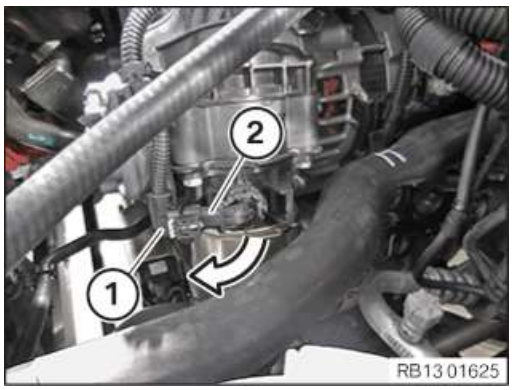
Contamination can result in malfunctions, operating failure or leaks.

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



- Renew the sealing ring (1) if it is damaged.

  Parts: Sealing ring



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

Additional Information

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

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13 62 535 Replace charging pressure sensor

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

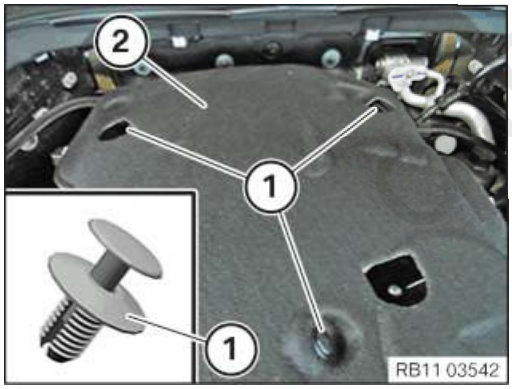
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

MAIN WORK

3 – Removing the charging pressure sensor from the intake plenum

WARNING

Hot surfaces.

Risk of burning!

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

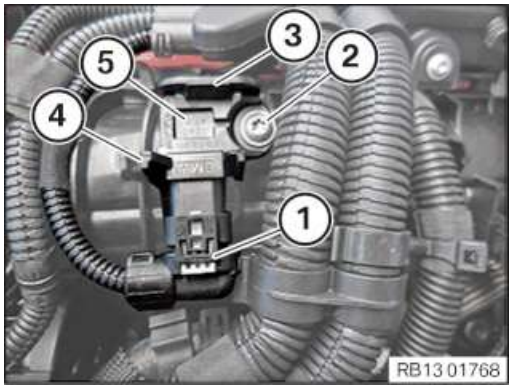
mdiagn.com

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 ... Notes for ESD protection (electrostatic discharge)

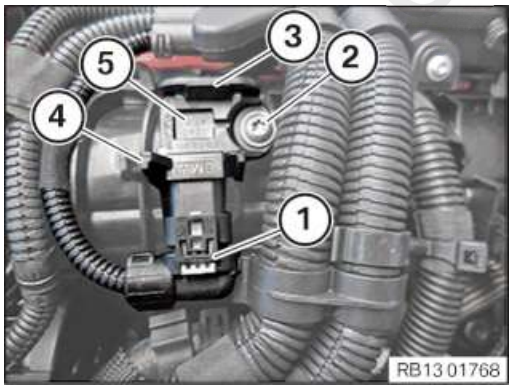


- Unlock and loosen connector (1).
- Loosen screw (2).
- Disengage locks (3) and (4).
- Remove the charging pressure sensor (5).

4 – Installing the charging pressure sensor on the intake plenum



- Check sealing ring (1) for damage, renew if necessary.



- Insert and install the charging pressure sensor (5).
- Make sure that the charging pressure sensor (5) audibly engages in the locks (3) and (4).
- Tighten down screw (2).

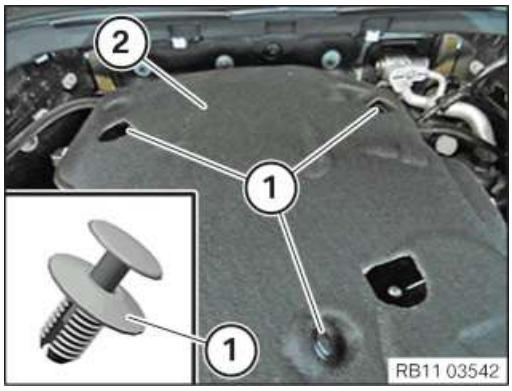
Charging pressure sensor to intake plenum

Torx screw 6x20		Tightening torque	5 Nm
Hexagon bolt 6X20		Tightening torque	8 Nm

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

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5 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

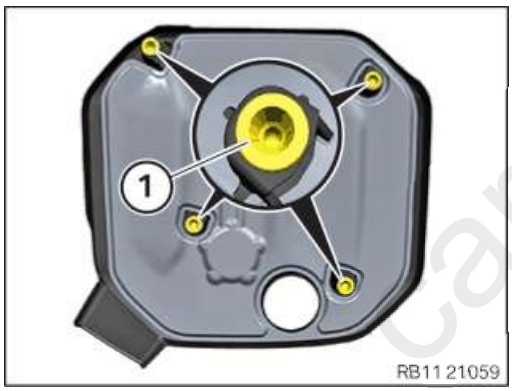
6 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



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

Additional Information

Overview of Tightening Torques

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Charging pressure sensor to intake plenum			Used in step 4
Torx screw 6x20		Tightening torque	5 Nm
Hexagon bolt 6X20		Tightening torque	8 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	3
61 35 ... Notes on ESD protection (Electro Static Discharge)	3

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13 62 531 Replace coolant temperature sensor

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

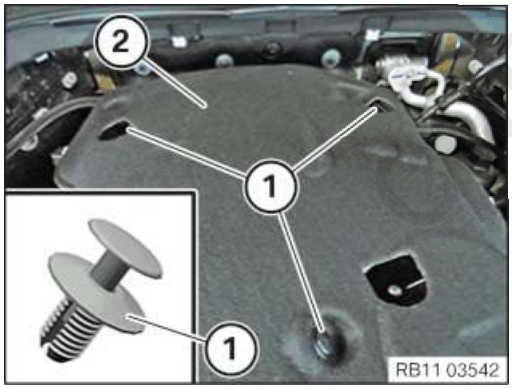
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

3 – Partly releasing front engine acoustic cover



- Unlock and move expanding rivets (1).

4 – Remove coolant temperature sensor

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

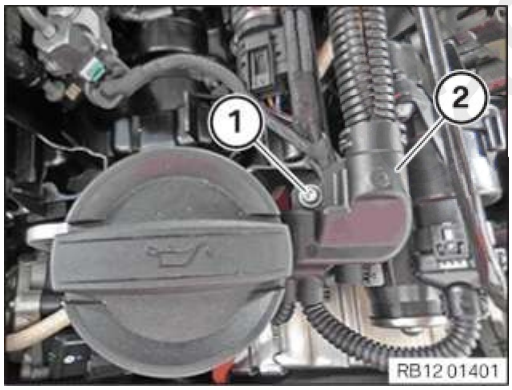
Electrostatic discharge.

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 ... Notes for ESD protection (electrostatic discharge)

TECHNICAL INFORMATION

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



- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock and release plug connection (1).



- Release the coolant temperature sensor (1) with the special tool .
- Catch and dispose of escaping coolant.

5 – Install coolant temperature sensor



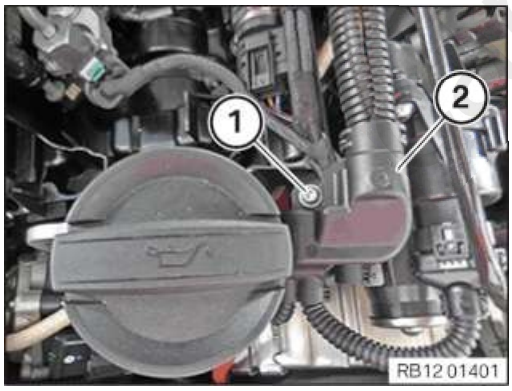
- Tighten the coolant temperature sensor (1) using the special tool .

Coolant temperature sensor at cylinder head

Sensor		Tightening torque	3,5 Nm



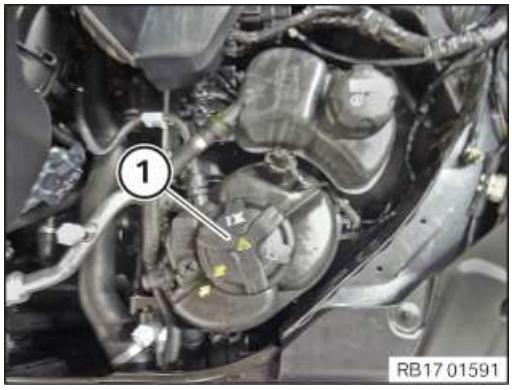
- Connect connectors (1) and lock.



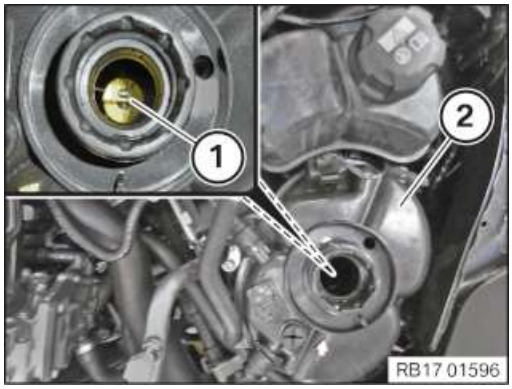
- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



- Loosen sealing cap (1).



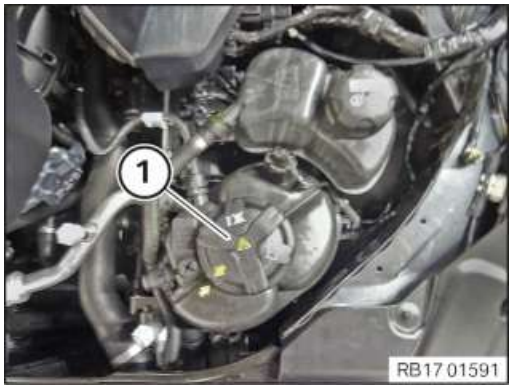
TECHNICAL INFORMATION

After the cooling system bleeding routine, the cooling system is topped up above the maximum mark.

Overfilling the cooling system serves to balance the remaining air in the cooling system.

The normal filling level of the coolant is reached while driving.

- Adjust the filling level in the coolant expansion tank (2) of the high-temperature coolant circuit to **300 ml** over the **maximum mark** (1).



- Close sealing cap (1).
- Close the sealing cap (1) until the **arrows** are flush.

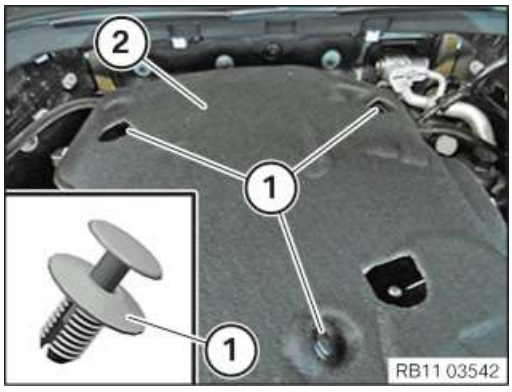
POSTPROCESSES

6 – Securing front acoustic cover of engine (partly removed)



- Install and lock the expanding rivets (1).

7 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

8 – Install acoustic cover

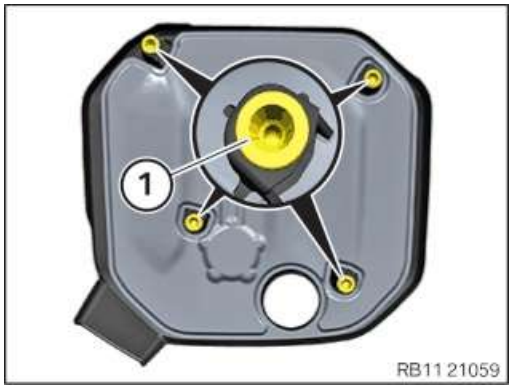
carfdiag.com

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



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

Additional Information

Overview of Tightening Torques

Coolant temperature sensor at cylinder head — Used in step 5

Sensor		Tightening torque	3,5 Nm

Wiring harness section to cylinder head cover — Used in step 5

TS5x20		Tightening torque	3,6 Nm

Overview of Special Tools

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	4
61 35 ... Notes on ESD protection (Electro Static Discharge)	4

Operating materials	Used in step

cardiagn.com

cardiagn.com

13 62 531 Replace coolant temperature sensor

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

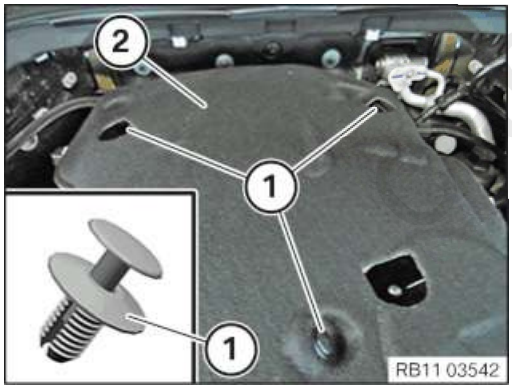
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

3 – Partly releasing front engine acoustic cover



- Unlock and move expanding rivets (1).

4 – Remove coolant temperature sensor

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

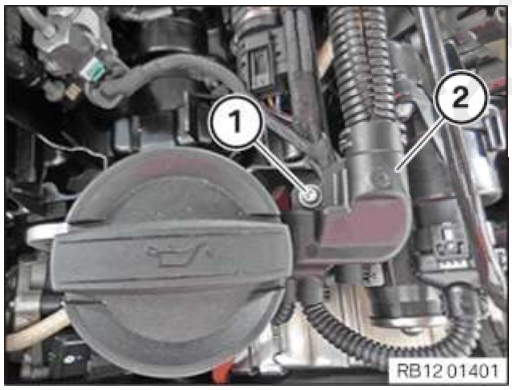
Electrostatic discharge.

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 ... Notes for ESD protection (electrostatic discharge)

TECHNICAL INFORMATION

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



- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock and release plug connection (1).



- Release the coolant temperature sensor (1) with the special tool .
- Catch and dispose of escaping coolant.

5 – Install coolant temperature sensor



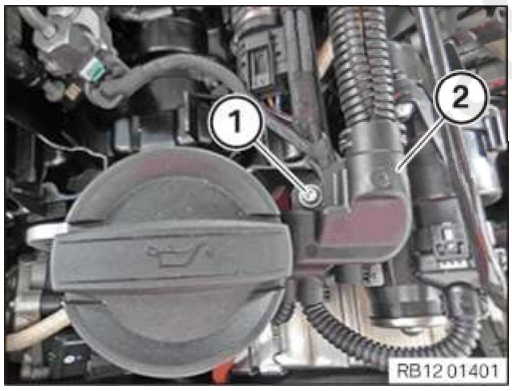
- Tighten the coolant temperature sensor (1) using the special tool .

Coolant temperature sensor at cylinder head

Sensor		Tightening torque	3,5 Nm



- Connect connectors (1) and lock.



- Guide in the wiring harness section (2) and install.
- Tighten down screw (1).

Wiring harness section to cylinder head cover

TS5x20		Tightening torque	3,6 Nm



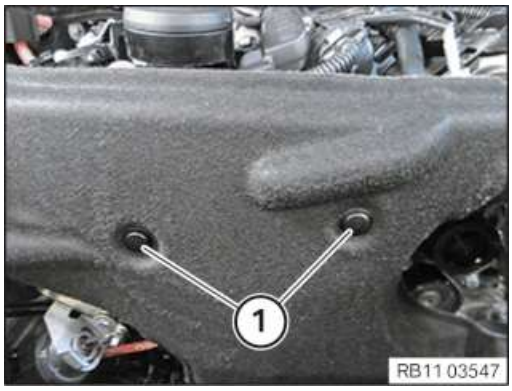
TECHNICAL INFORMATION

Follow notes for repair work on the cooling system.
For additional information see:
Main group 17
17 00 ... Notes for working on the cooling system

- Adjust the filling level in the coolant expansion tank to the **maximum mark**.
- Close the sealing cap (1) until the arrows are flush.

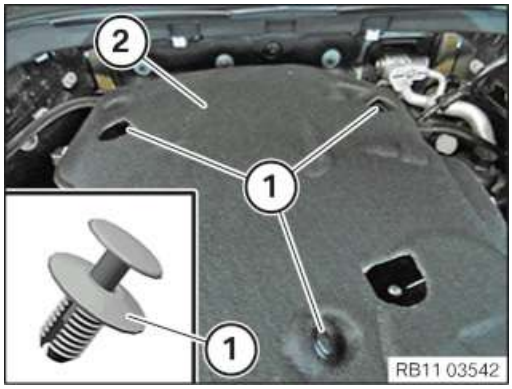
diagn.com

6 – Securing front acoustic cover of engine (partly removed)



- Install and lock the expanding rivets (1).

7 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

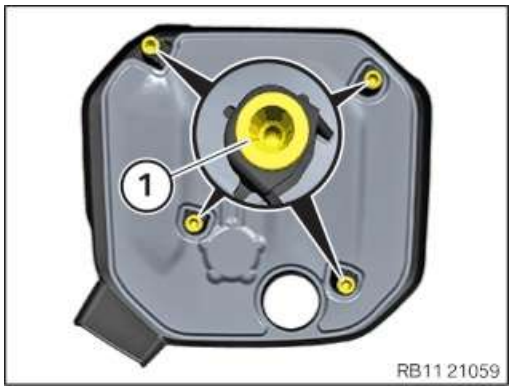
8 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).

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

Additional Information

Overview of Tightening Torques

Coolant temperature sensor at cylinder head			Used in step 5
Sensor		Tightening torque	3,5 Nm

Wiring harness section to cylinder head cover			Used in step 5
TS5x20		Tightening torque	3,6 Nm

Overview of Special Tools

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	4
61 35 ... Notes on ESD protection (Electro Static Discharge)	4

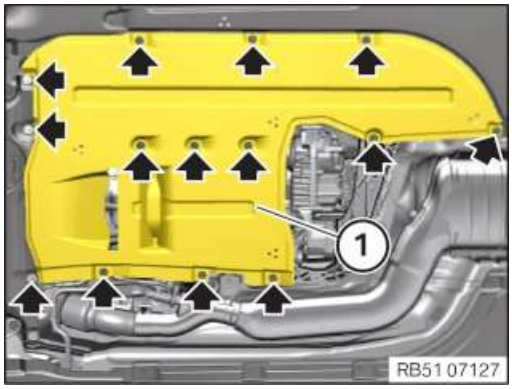
Operating materials	Used in step
Main group 17	5

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13 62 668 Replace diesel particulate sensor

PRELIMINARY WORK

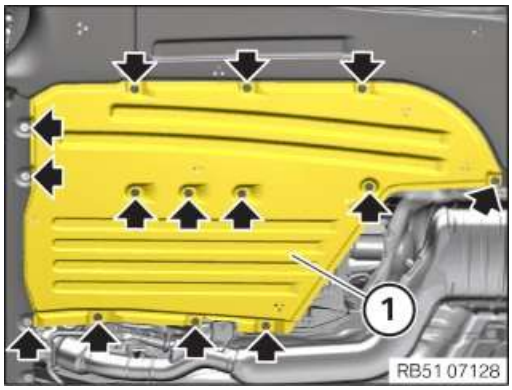
1 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

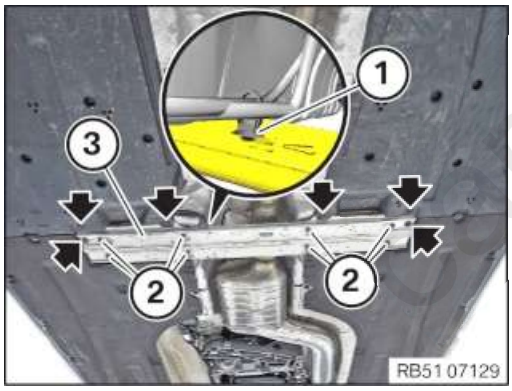


- **Version B:**

  Remove screws (arrows).

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

2 – Remove the connecting support from the tunnel



- Remove screws (arrows).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.

MAIN WORK

3 – Remove the diesel particulate sensor

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

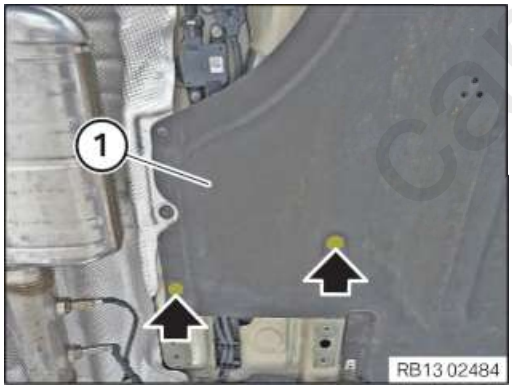
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the 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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

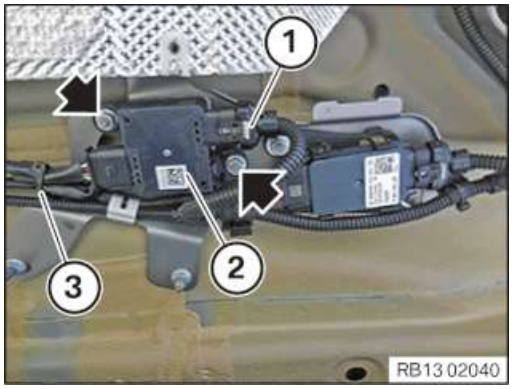
Damage to the diesel particulate sensor

Failure of the diesel particulate sensor due to contamination or preliminary mechanical damage.

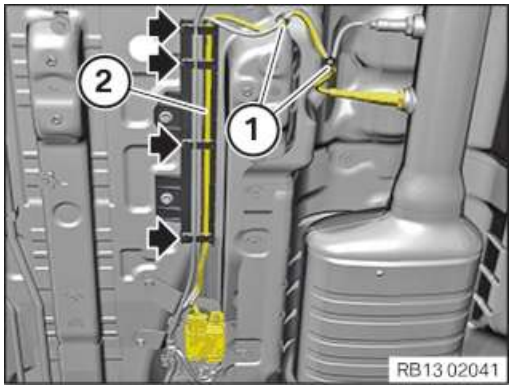
- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.



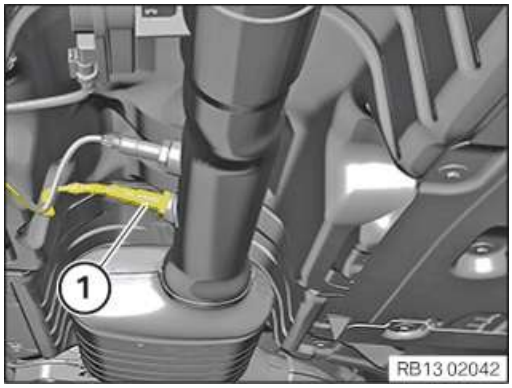
- Remove screws (arrows).
- Loosen cover (1) and place to one side.



- Unlock and loosen connector (1).
- Unscrew the nuts (arrows).
- Guide out the evaluation electronics (2) for the diesel particulate sensor and remove.
- Loosen clamp (3).



- Loosen clamps (1).
- Release the cable (2) from the cable clip (arrows).



- Release and remove the diesel particulate sensor (1).

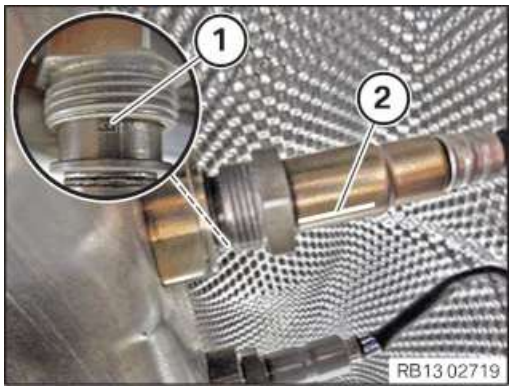
4 – Install the diesel particulate sensor

RISK OF DAMAGE

Damage to the diesel particulate sensor

Failure of the diesel particulate sensor due to contamination or preliminary mechanical damage.

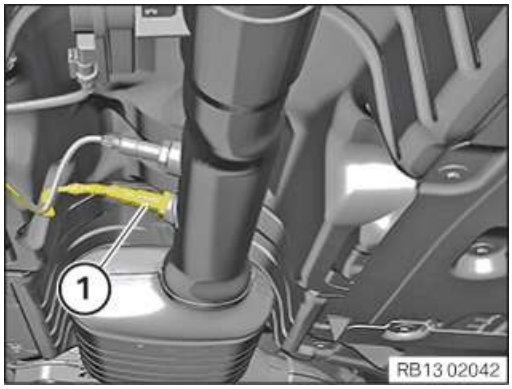
- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.



- When installing the diesel particulate sensor, ensure that the QR code (1) below the union nut is facing down.
- **If fitted:**

  Make sure that the marking (white line) (2) faces down during installation.

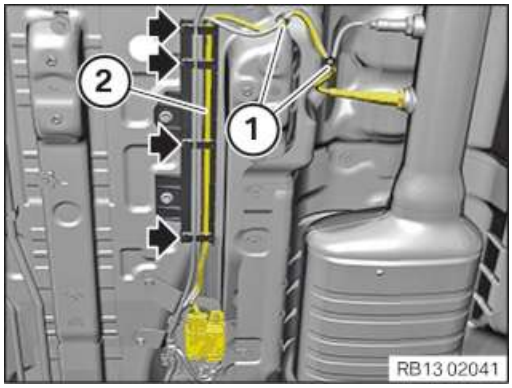
cardiagn.com



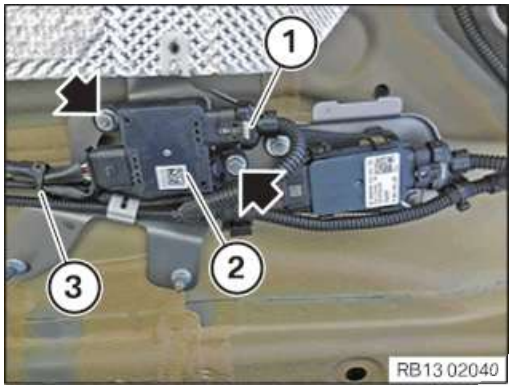
- Install diesel particulate sensor (1) and tighten.

Diesel particulate sensor to exhaust system

Sensor		Tightening torque	50 Nm



- Secure clamps (1).
- Secure the cable (2) in the cable clip (arrows).



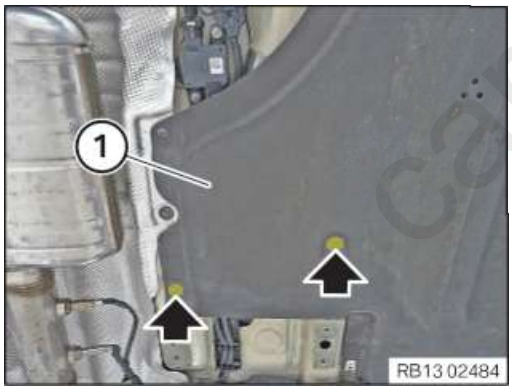
- Insert and install the evaluation electronics (2) for the diesel particulate sensor.
- Tighten the nuts (arrows).

Evaluation electronics of diesel particulate sensor to holder

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure clamps (3).



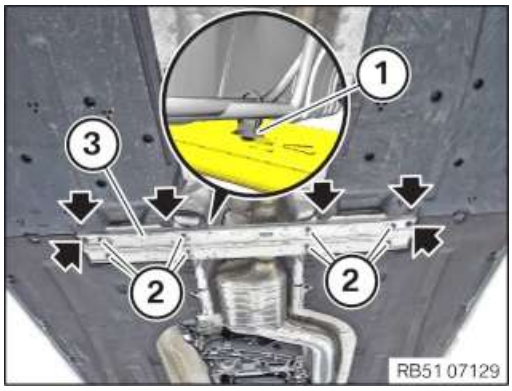
- Guide in and install cover (1).
- Tighten screws (arrows).

Underbody panelling

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

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5 – Install the connecting supports on the tunnel



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).
- Tighten screws (arrows).

Connecting support to tunnel

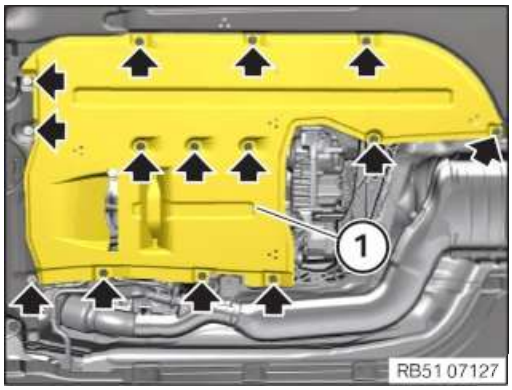
M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Secure the clamp (1).

6 – Installing underbody protection at rear



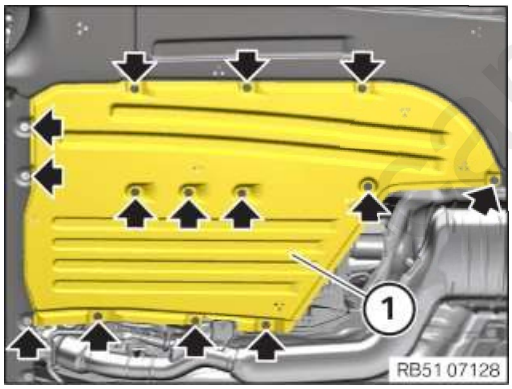
- **Version A:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version B:**

  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

Diesel particulate sensor to exhaust system			Used in step 4
Sensor		Tightening torque	50 Nm

Evaluation electronics of diesel particulate sensor to holder			Used in step 4
Hexagon nut		Tightening torque	8 Nm

Underbody panelling			Used in step 4
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Connecting support to tunnel			Used in step 5
M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Underbody protection			Used in step 6
Hexagon screw		Tightening torque	3 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	3
61 35 ... Notes on ESD protection (Electro Static Discharge)	3

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13 62 589 Replace differential pressure sensor for diesel particulate filter

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1 – Remove differential pressure sensor for the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

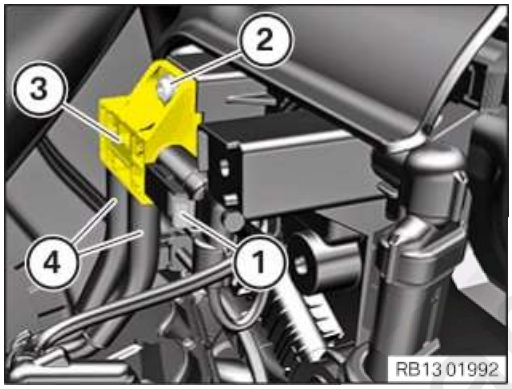
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

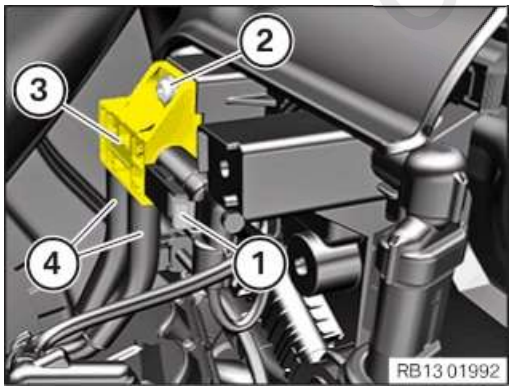
Damage to or destruction of electrical components.

- 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 ... Notes for ESD protection (electrostatic discharge)



- Unlock plug connection (1) and disconnect.
- Loosen screw (2).
- Pull off pressure hose (4).
- Feed out differential pressure sensor (3) and remove.

2 – Installing the differential pressure sensor for the diesel particulate filter



- Feed in and install the differential pressure sensor (3).
- Tighten down screw (2).

Differential pressure sensor of diesel particulate filter on cylinder head cover

TS5x20		Tightening torque	4 Nm

- Check the pressure hoses (4) for hardening and damage, renew if necessary.
- Connect the pressure hoses (4) and secure them using 15 mm to 19 mm screw clamps.

Clamp for the pressure hose on the differential pressure sensor

Clamp 15–19mm		Tightening torque	3 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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3 – Replacement: Reset adaptation values



- Reset the adaptation values with the diagnosis system:
  - Power train
  - DDE/DME
  - Reset adaptations
  - Delete adaptations

Additional Information

Overview of Tightening Torques

Differential pressure sensor of diesel particulate filter on cylinder head cover			Used in step 2
TS5x20		Tightening torque	4 Nm

Clamp for the pressure hose on the differential pressure sensor			Used in step 2
Clamp 15–19mm		Tightening torque	3 Nm

Links

Repair instructions	**Used in step**
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

cardiagn.com

13 62 667 Replace exhaust gas pressure sensor before exhaust turbocharger

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

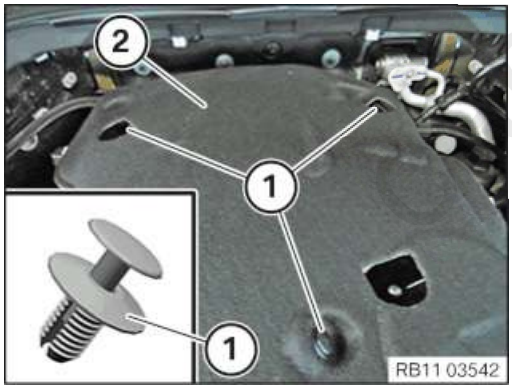
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

MAIN WORK

3 – Removing the exhaust gas pressure sensor

WARNING

Hot surfaces.

Risk of burning!

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

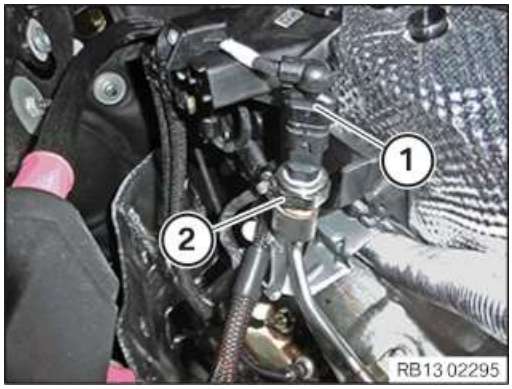
mdiagn.com

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 ... Notes for ESD protection (electrostatic discharge)

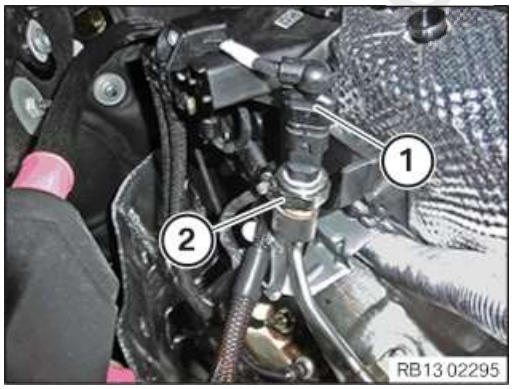


- Unlock and loosen connector (1).
- Release the exhaust gas pressure sensor (2) with the special tool and remove.

4 – Installing the exhaust gas pressure sensor



- Check sealing ring (1) for damage, renew if necessary.



- Position the exhaust gas pressure sensor (2) and tighten it with the special tool .

Exhaust gas pressure sensor

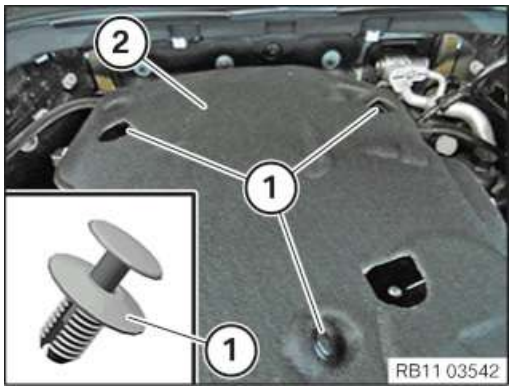
M14x1.5		Tightening torque	13,5 Nm

- Connect and lock the connector (1).

  The connector (1) must engage audibly.

cardiagn.com

5 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

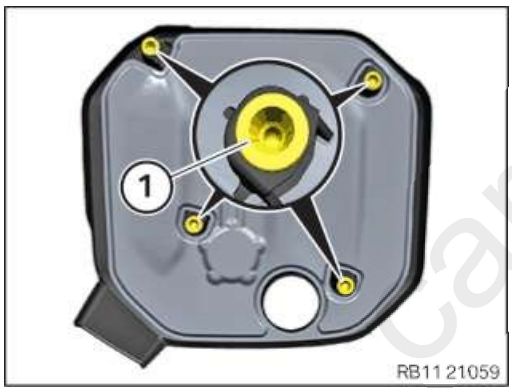
6 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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



- Check the acoustic cover for correct fit of the rubber mounts (1).



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

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Additional Information

Additional Information

Overview of Tightening Torques

Exhaust gas pressure sensor			Used in step 4
M14x1.5		Tightening torque	13,5 Nm

Overview of Special Tools

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	3
61 35 ... Notes on ESD protection (Electro Static Discharge)	3

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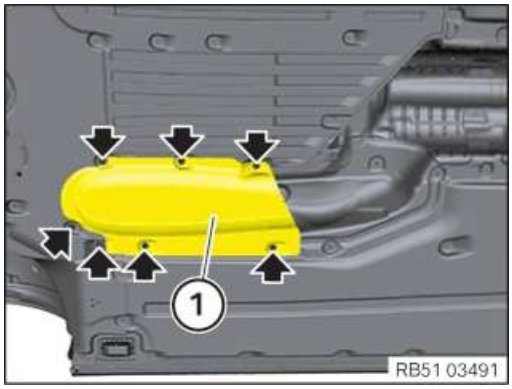
13 62 620 Replace nitrogen oxide sensor ahead of SCR catalytic converter

PRELIMINARY WORK

1 – Remove the underbody panelling of the transmission on the side

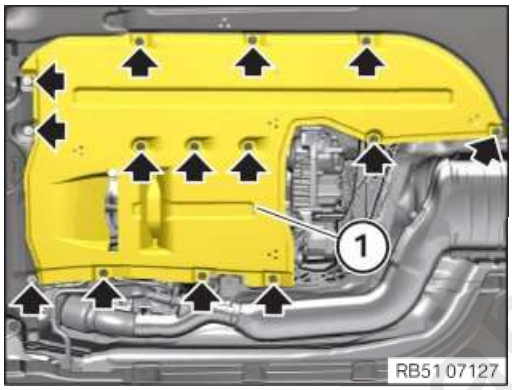
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Remove screws (arrows).
- Remove the underbody panelling (1).

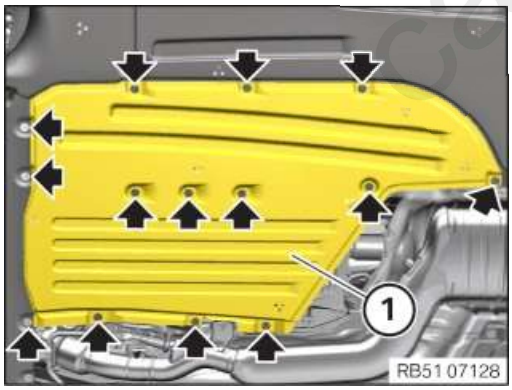
2 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



- **Version B:**

  Remove screws (arrows).

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

3 – Disconnect the SCR metering module

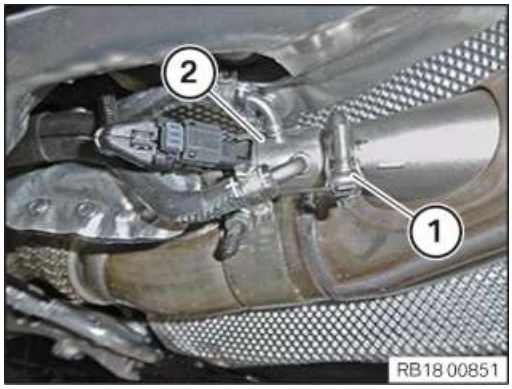
WARNING

Hot surfaces.

Risk of burning!

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

carfdiagn.com



- Loosen V-band clamp (1).
- Remove the SCR metering module (2) and set it aside.

MAIN WORK

4 – Removing the nitrogen oxide sensor before SCR catalytic converter

WARNING

Hot surfaces.

Risk of burning!

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

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 ... Notes for ESD protection (electrostatic discharge)

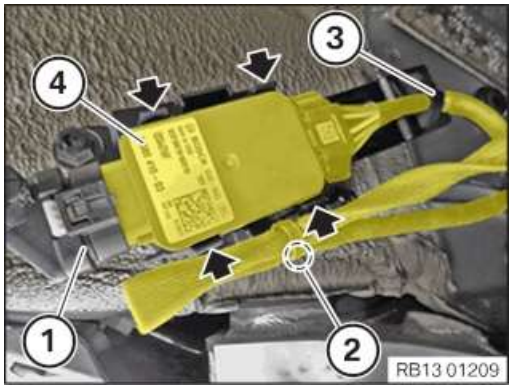
RISK OF DAMAGE

Damage to the nitrogen oxide sensor.

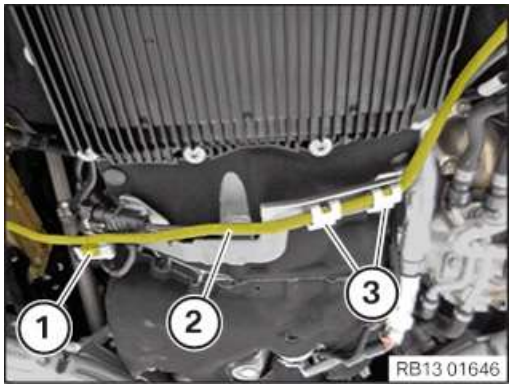
Failure of the nitrogen oxide sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

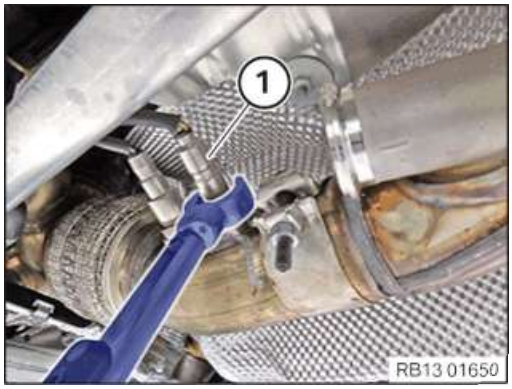
carlagn.com



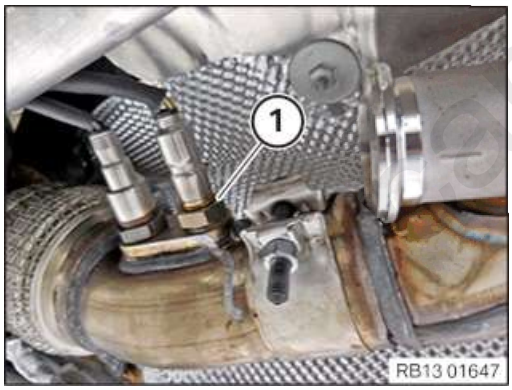
- Unlock plug connection (1) and disconnect.
- Release cable clip in area (2).
- Release line from the holder (3).
- Unclip control unit (4).



- Loosen clamp (1).
- Loosen the cables (2) from the clamps (3).



- Loosen the nitrogen oxide sensor (1) using commercially available tools.



- Feed out and remove the nitrogen oxide sensor (1).

5 – Installing the nitrogen oxide sensor upstream of SCR catalytic converter

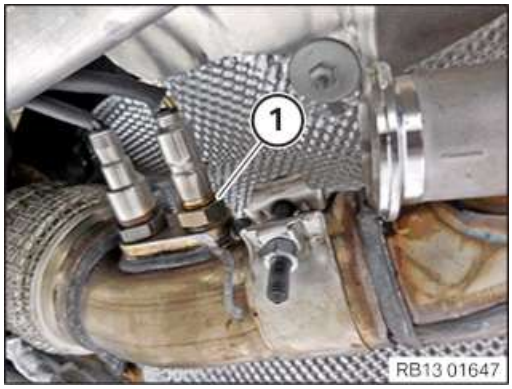
cardiagn.com

RISK OF DAMAGE

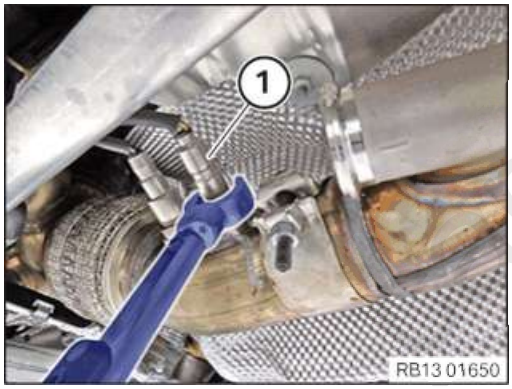
Damage to the nitrogen oxide sensor.

Failure of the nitrogen oxide sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.



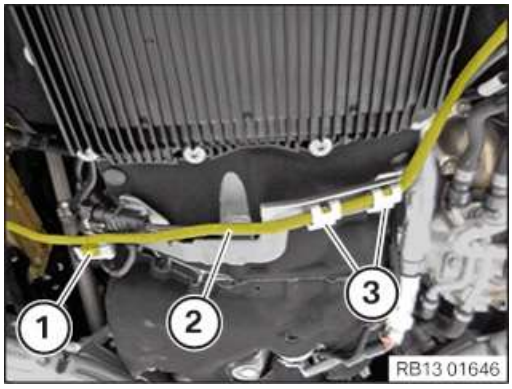
- Feed in and install the nitrogen oxide sensor (1).



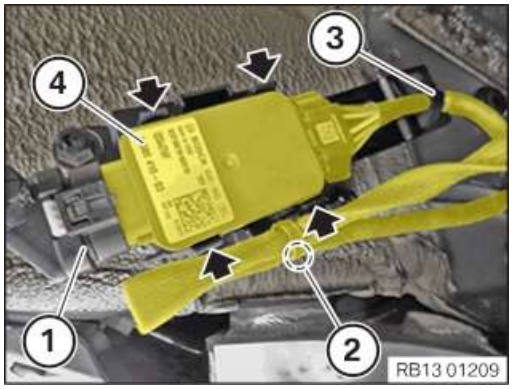
- Tighten the nitrogen oxide sensor (1) using commercially available tools.

Nitrogen oxide sensor before SCR catalytic converter

Sensor		Tightening torque	50 Nm



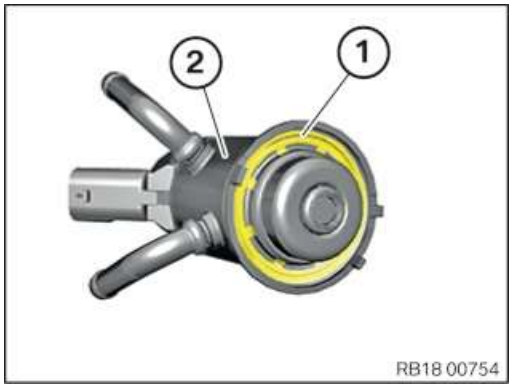
- Secure the cables (2) to the clamps (3).
- Secure clamps (1).



- Clip in the control unit (4) (arrows).
- Fasten the cable in the holder (3).
- Secure the cable holder (2).
- Plug in the connector (1) and lock audibly.

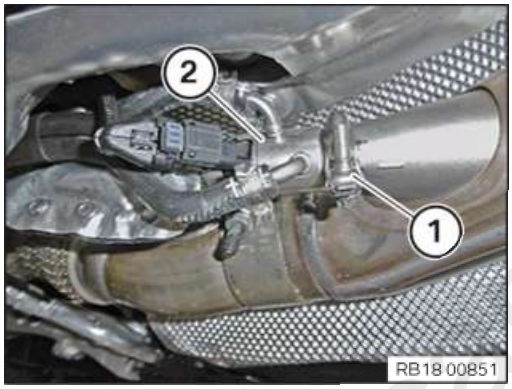
POSTPROCESSES

6 – Attach the SCR metering module



- Renew the seal (1) of the SCR metering module (2).

  Parts: Sealing ring



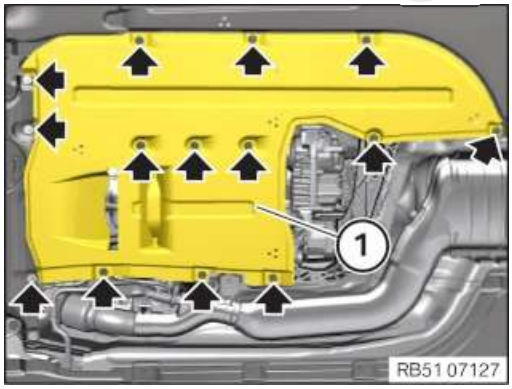
- Insert and install the SCR metering module (2).
- Renew the V-clip (1).

  Parts: V-band clamp
- Tighten V-band clamp (1).

SCR metering module V-clip to exhaust system

V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

7 – Installing underbody protection at rear



- **Version A:**

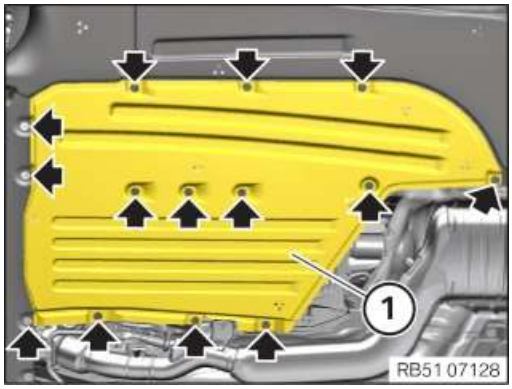
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

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- **Version B:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

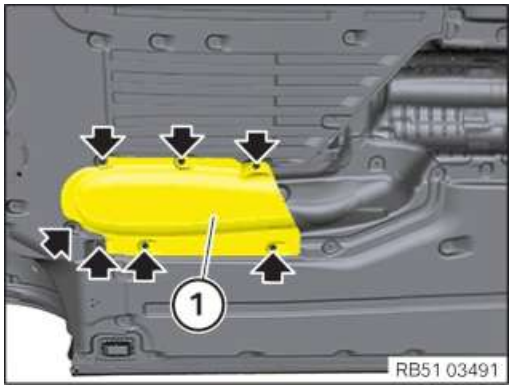
Underbody protection

Hexagon screw		Tightening torque	3 Nm

8 – Install the underbody panelling of the transmission on the side

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Insert the underbody panelling (1).
- Tighten screws (arrows).

Underbody panelling

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

9 – Reset the adaptations and adjustments of the SCR system

- Connect diagnosis system:
  - Service functions
  - Power train
  - Digital Diesel Electronics
  - SCR system
  - SCR system adjustments and adaptations

Additional Information

Overview of Tightening Torques

Nitrogen oxide sensor before SCR catalytic converter — Used in step 5

Sensor		Tightening torque	50 Nm

SCR metering module V-clip to exhaust system — Used in step 6

V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

Underbody protection — Used in step 7

Hexagon screw		Tightening torque	3 Nm

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Underbody panelling			Used in step 8
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Links

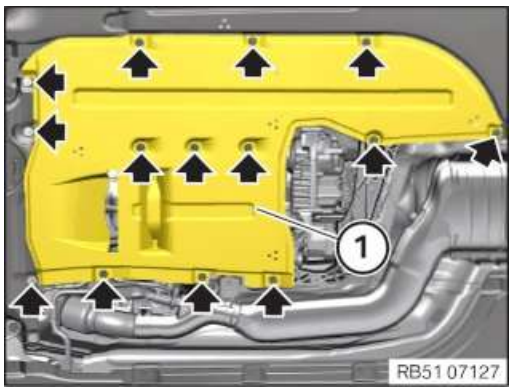
Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	4
61 35 ... Notes on ESD protection (Electro Static Discharge)	4

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13 62 622 Replace nitrogen oxide sensor downstream of SCR catalytic converter

PRELIMINARY WORK

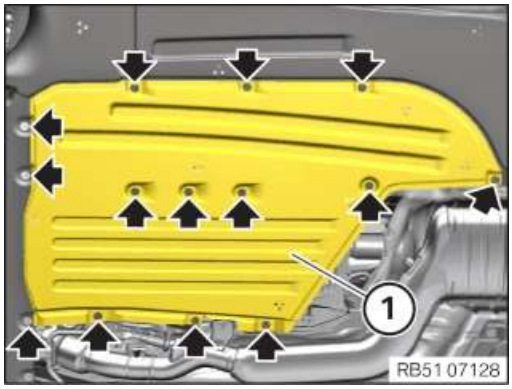
1 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

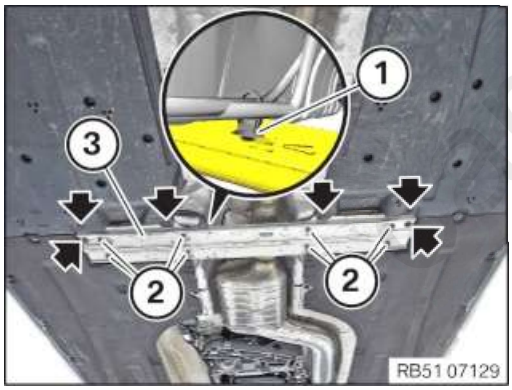


- **Version B:**

  Remove screws (arrows).

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

2 – Remove the connecting support from the tunnel



- Remove screws (arrows).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.

MAIN WORK

3 – Remove the nitrogen oxide sensor after the SCR catalytic converter

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

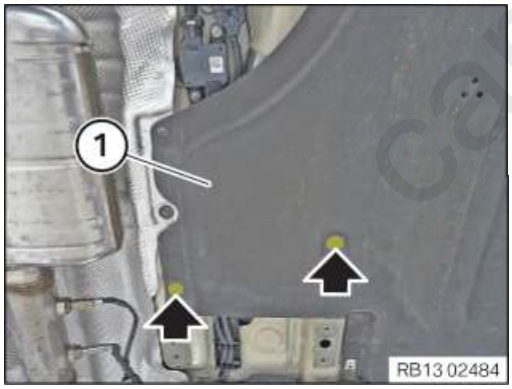
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the 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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

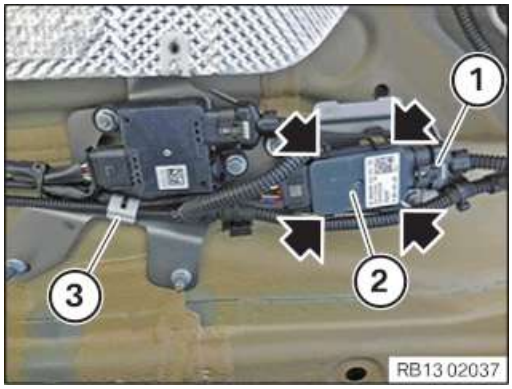
Damage to the nitrogen oxide sensor.

Failure of the nitrogen oxide sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

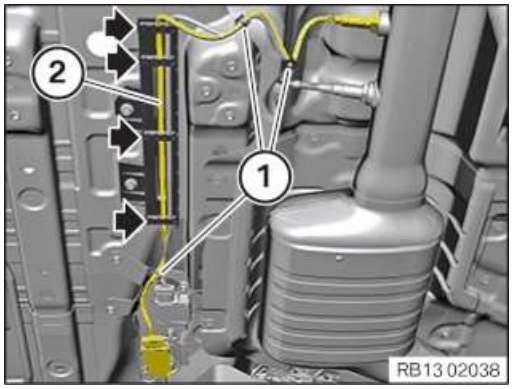


- Remove screws (arrows).
- Loosen cover (1) and place to one side.

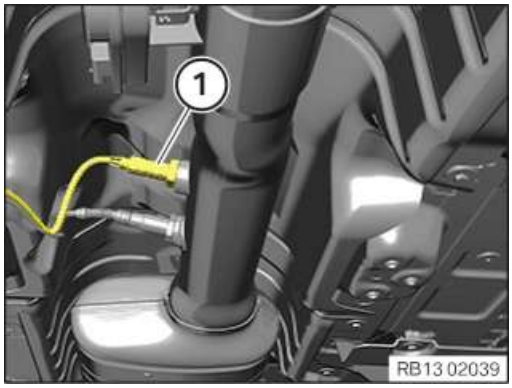


- Unlock plug connection (1) and disconnect.
- Disconnect the evaluation electronics (2) for the nitrogen oxide sensor (arrows).
- Loosen clamp (3).

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- Loosen clamps (1).
- Release the cable (2) from the cable clip (arrows).



- Release and remove nitrogen oxide sensor (1) downstream of the SCR catalytic converter using special tool .

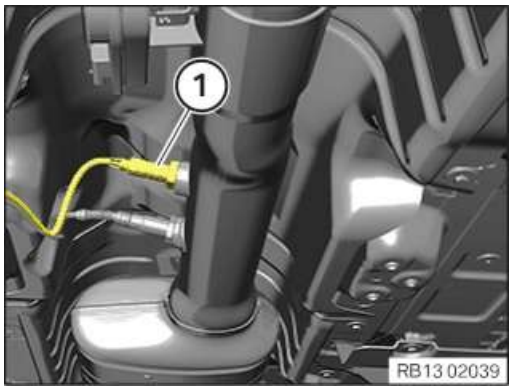
4 – Install the nitrogen oxide sensor after the SCR catalytic converter

RISK OF DAMAGE

Damage to the nitrogen oxide sensor.

Failure of the nitrogen oxide sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

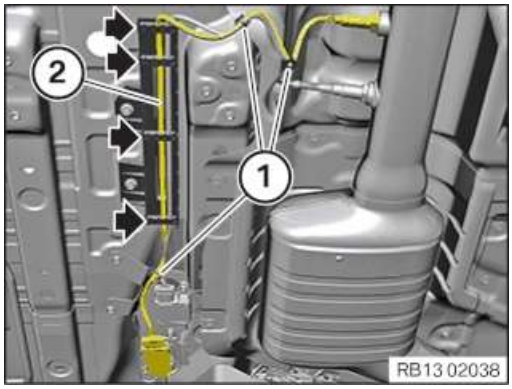


- Tighten the nitrogen oxide sensor after SCR catalytic converter (1) with the special tool .

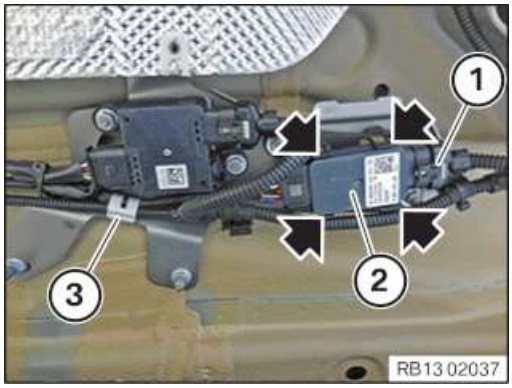
Nitrogen oxide sensor downstream of SCR catalytic converter

Sensor		Tightening torque	55 Nm

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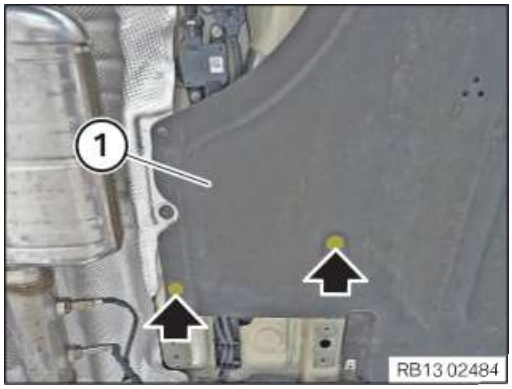


- Secure clamps (1).
- Secure the cable (2) in the cable clip (arrows).



- Attach the evaluation electronics (2) for the nitrogen oxide sensor (arrows).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure clamps (3).



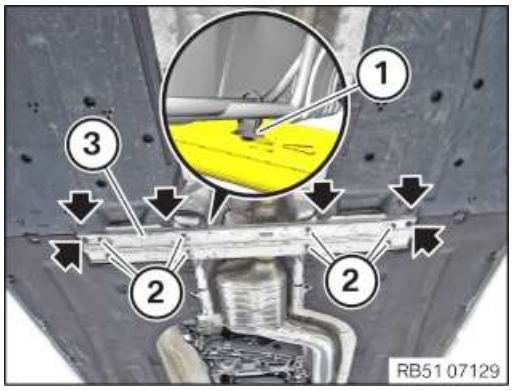
- Guide in and install cover (1).
- Tighten screws (arrows).

Underbody panelling

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

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5 – Install the connecting supports on the tunnel



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).
- Tighten screws (arrows).

Connecting support to tunnel

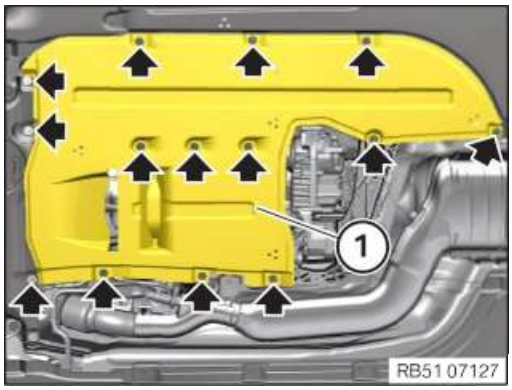
M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Secure the clamp (1).

6 – Installing underbody protection at rear



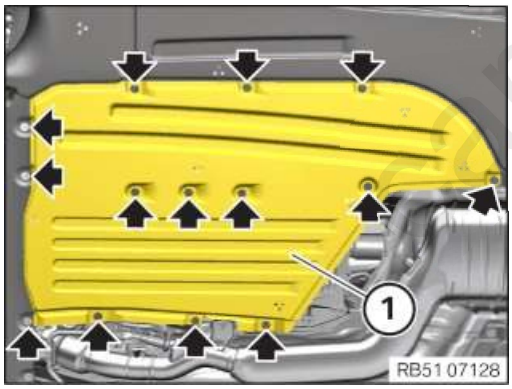
- **Version A:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version B:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

7 – Reset the adaptations and adjustments of the SCR system



- Connect diagnosis system:
  - Service functions
  - Power train
  - Digital Diesel Electronics
  - SCR system
  - SCR system adjustments and adaptations

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Additional Information

Overview of Tightening Torques

Nitrogen oxide sensor downstream of SCR catalytic converter			Used in step 4
Sensor		Tightening torque	55 Nm

Underbody panelling			Used in step 4
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Connecting support to tunnel			Used in step 5
M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Underbody protection			Used in step 6
Hexagon screw		Tightening torque	3 Nm

Overview of Special Tools

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	3
61 35 ... Notes on ESD protection (Electro Static Discharge)	3

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13 62 651 Replace the front oxygen sensor

PRELIMINARY WORK

1 – Remove differential pressure sensor for the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

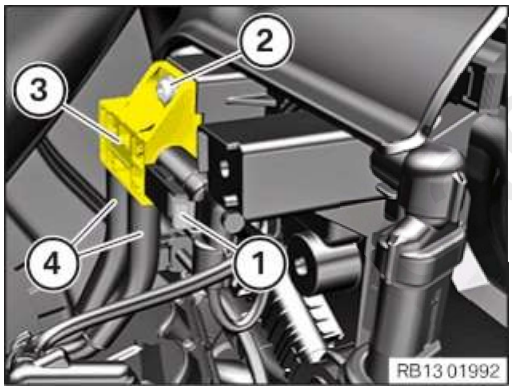
- Perform all work only on components that have cooled down.

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 ... Notes for ESD protection (electrostatic discharge)



- Unlock plug connection (1) and disconnect.
- Loosen screw (2).
- Pull off pressure hose (4).
- Feed out differential pressure sensor (3) and remove.

MAIN WORK

2 – Removing the front oxygen sensor on the diesel particulate filter on top

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

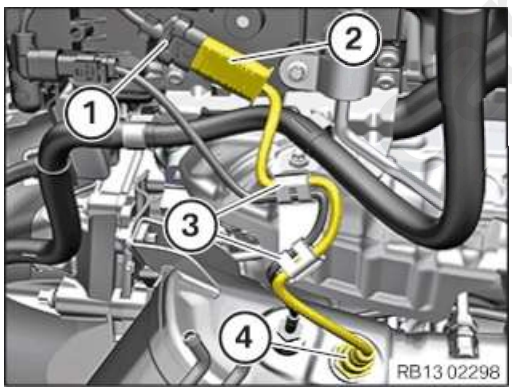
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the 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 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.



- Unlock plug connection (1) and disconnect.
- Unlock and disconnect connector (2).
- Pull the front oxygen sensor (4) out from the clamps (3) and remove it.



- Release the front oxygen sensor (1) with the standard tools and remove it.

3 – Installing the front oxygen sensor on the diesel particulate filter

RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

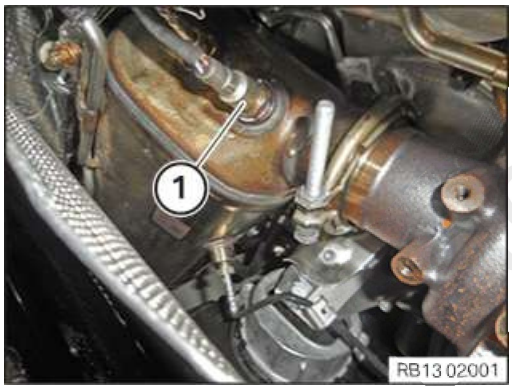
TECHNICAL INFORMATION

New oxygen sensors are to be greased lightly and evenly on the thread.

For oxygen sensors that are reused, the following should be observed:

Lightly and evenly grease the oxygen sensor only on the thread. Do not clean and grease that part of the oxygen sensor which protrudes in the exhaust branch (sensor ceramics).

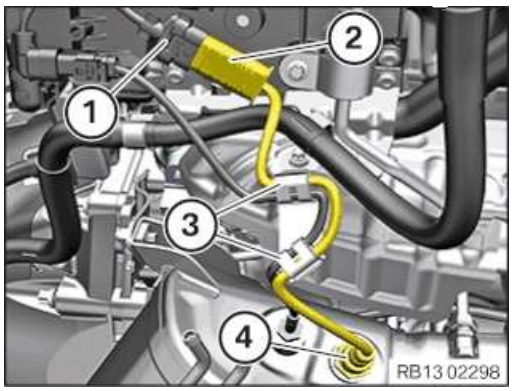
For additional information see: 11 00 ... Overview of consumables in Electronic Parts Catalogue



- Insert and install the front oxygen sensor (1).
- Tighten the front oxygen sensor (1) with standard tools.

Front oxygen sensor to top of diesel particulate filter

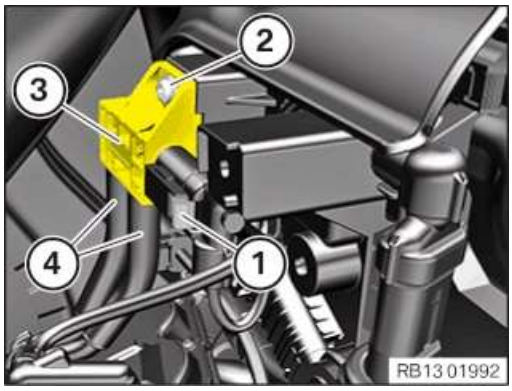
Sensor		Tightening torque	50 Nm



- Fasten the front oxygen sensor (4) to the clamps (3).
- Connect connectors (2) and lock.
- Connect connectors (1) and lock.

  The connectors (1) and (2) must audibly engage.

4 – Installing the differential pressure sensor for the diesel particulate filter



- Feed in and install the differential pressure sensor (3).
- Tighten down screw (2).

Differential pressure sensor of diesel particulate filter on cylinder head cover

TS5x20		Tightening torque	4 Nm

- Check the pressure hoses (4) for hardening and damage, renew if necessary.
- Connect the pressure hoses (4) and secure them using 15 mm to 19 mm screw clamps.

Clamp for the pressure hose on the differential pressure sensor

Clamp 15–19mm		Tightening torque	3 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

Additional Information

Overview of Tightening Torques

Front oxygen sensor to top of diesel particulate filter — Used in step 3

Sensor		Tightening torque	50 Nm

Differential pressure sensor of diesel particulate filter on cylinder head cover — Used in step 4

TS5x20		Tightening torque	4 Nm

Clamp for the pressure hose on the differential pressure sensor — Used in step 4

Clamp 15–19mm		Tightening torque	3 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	12
61 35 ... Notes on ESD protection (Electro Static Discharge)	12

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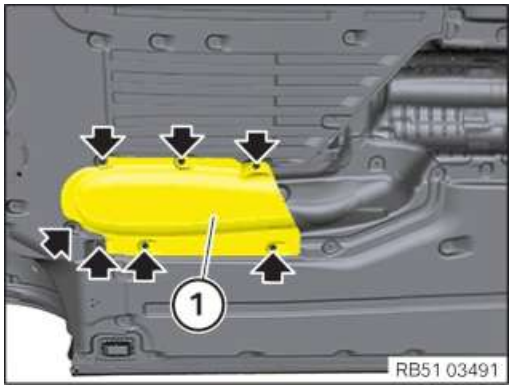
13 62 664 Replace the lambda oxygen monitoring sensor

PRELIMINARY WORK

1 – Remove the underbody panelling of the transmission on the side

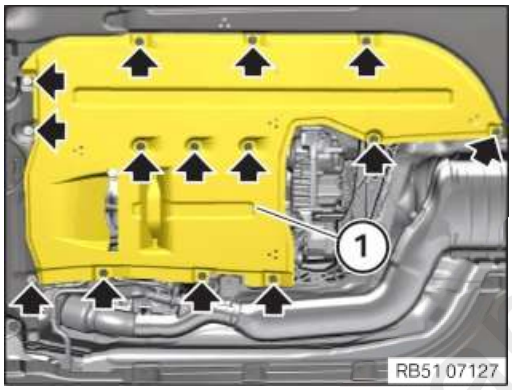
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Remove screws (arrows).
- Remove the underbody panelling (1).

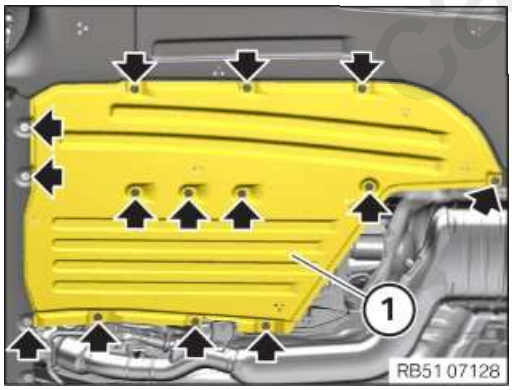
2 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



- **Version B:**

  Remove screws (arrows).

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

3 – Disconnect the SCR metering module

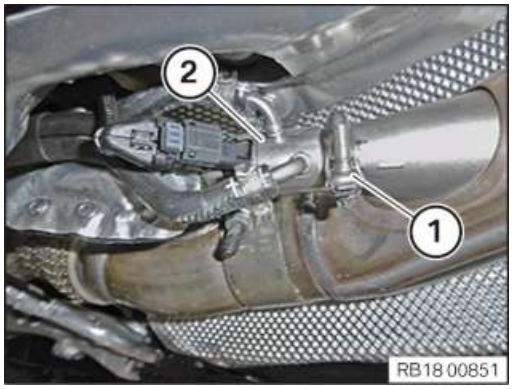
WARNING

Hot surfaces.

Risk of burning!

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

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- Loosen V-band clamp (1).
- Remove the SCR metering module (2) and set it aside.

MAIN WORK

4 – Removing the monitoring oxygen sensor after the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

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

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 ... Notes for ESD protection (electrostatic discharge)

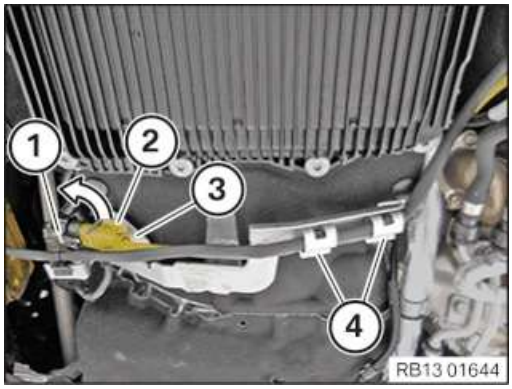
RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

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- Unlock and loosen connector (1).
- Loosen connector (2) from the holder (3) in direction of arrow.
- Release the monitoring oxygen sensor from the clamps (4).



- Release the monitoring oxygen sensor (1) with the standard tools.



- Thread out the monitoring oxygen sensor (1) and remove it.

5 – Installing the monitoring oxygen sensor after the diesel particulate filter

RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

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TECHNICAL INFORMATION

New oxygen sensors are to be greased lightly and evenly on the thread.

For oxygen sensors that are reused, the following should be observed:

Lightly and evenly grease the oxygen sensor only on the thread. Do not clean and grease that part of the oxygen sensor which protrudes in the exhaust branch (sensor ceramics).

For additional information see: 11 00 ... Overview of consumables in Electronic Parts Catalogue



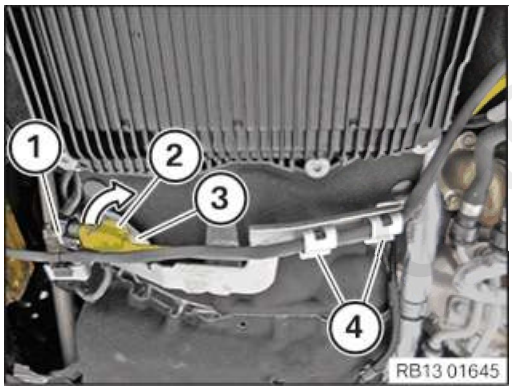
- Insert the monitoring oxygen sensor (1) and install it.



- Tighten the monitoring oxygen sensor (1) with standard tools.

Monitoring oxygen sensor

Sensor		Tightening torque	50 Nm

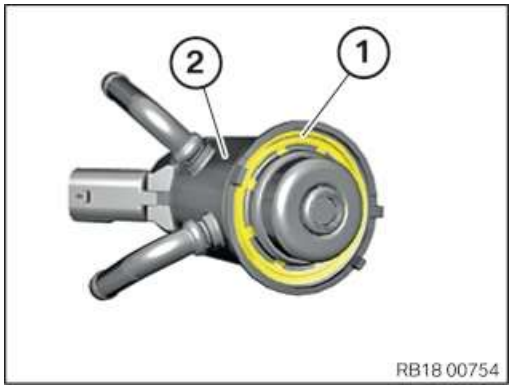


- Fasten the monitoring oxygen sensor to the clamps (4).
- Secure the connector (2) on the holder (3) in direction of arrow.
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

POSTPROCESSES

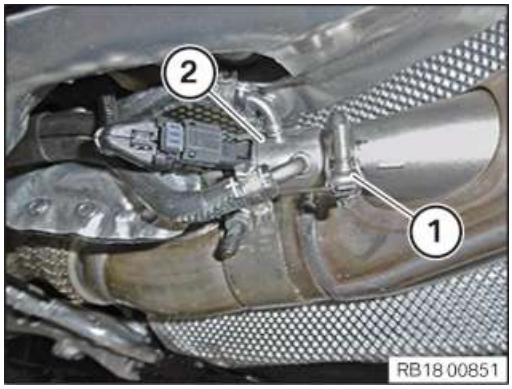
6 – Attach the SCR metering module



- Renew the seal (1) of the SCR metering module (2).

  Parts: Sealing ring

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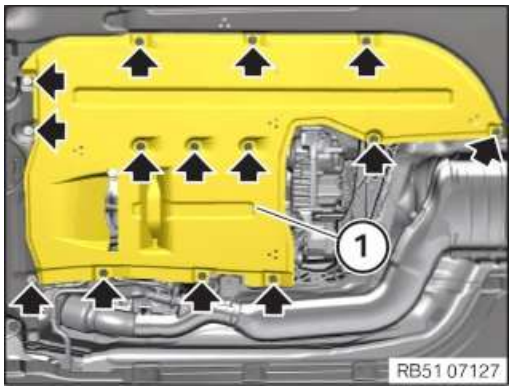
- Insert and install the SCR metering module (2).
- Renew the V-clip (1).

  Parts: V-band clamp
- Tighten V-band clamp (1).

SCR metering module V-clip to exhaust system

V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

7 – Installing underbody protection at rear



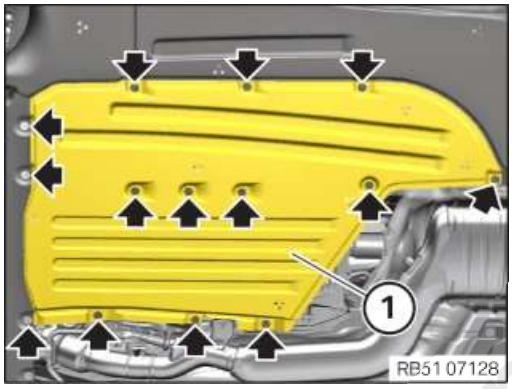
- **Version A:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version B:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

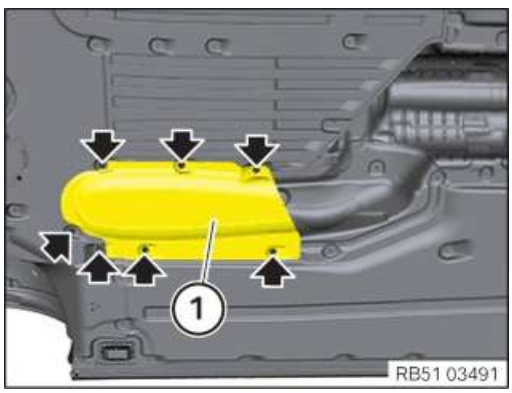
Underbody protection

Hexagon screw		Tightening torque	3 Nm

8 – Install the underbody panelling of the transmission on the side

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Insert the underbody panelling (1).
- Tighten screws (arrows).

Underbody panelling

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

Additional Information

Overview of Tightening Torques

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Monitoring oxygen sensor			Used in step 5
Sensor		Tightening torque	50 Nm

SCR metering module V-clip to exhaust system			Used in step 6
V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

Underbody protection			Used in step 7
Hexagon screw		Tightening torque	3 Nm

Underbody panelling			Used in step 8
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	4
61 35 ... Notes on ESD protection (Electro Static Discharge)	4

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13 62 650 Replacing camshaft sensor

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

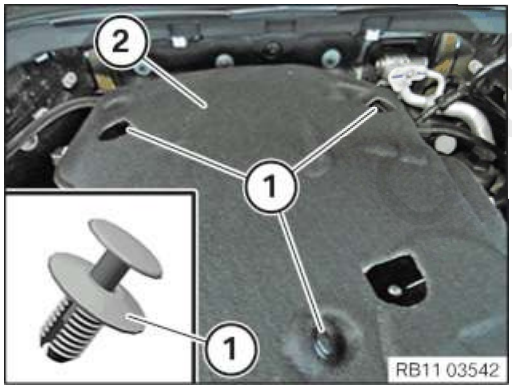
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

MAIN WORK

3 – Removing the camshaft sensor

WARNING

Hot surfaces.

Risk of burning!

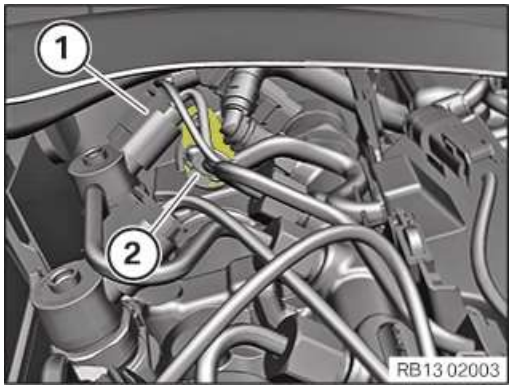
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

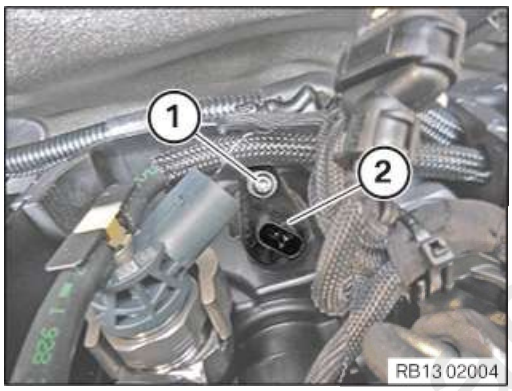
Electrostatic discharge.

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 ... Notes for ESD protection (electrostatic discharge)



- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.



- Loosen screw (1).
- Feed out and remove the camshaft sensor (2).

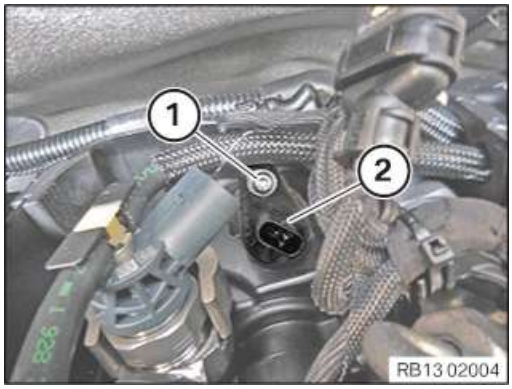
4 – Installing the camshaft sensor



- Check the sealing ring (1) for damage, and replace if necessary.

  Parts: Sealing ring

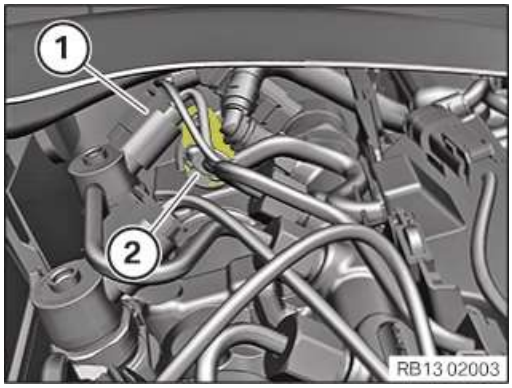
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- Feed in and install the camshaft sensor (2).
- Tighten down screw (1).

Camshaft sensor to cylinder head cover

TS5x20		Tightening torque	4 Nm

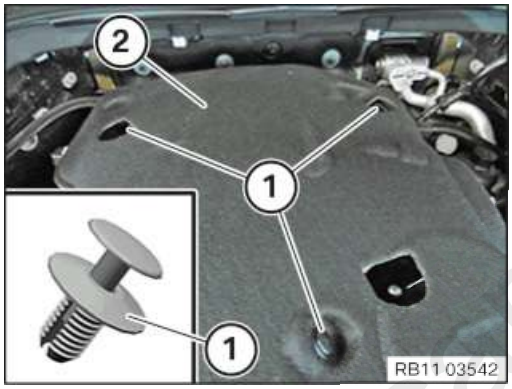


- Connect and lock the connector (2).
- Connect and lock the connector (1).

  The connectors (1) and (2) must audibly engage.

POSTPROCESSES

5 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

6 – Install acoustic cover

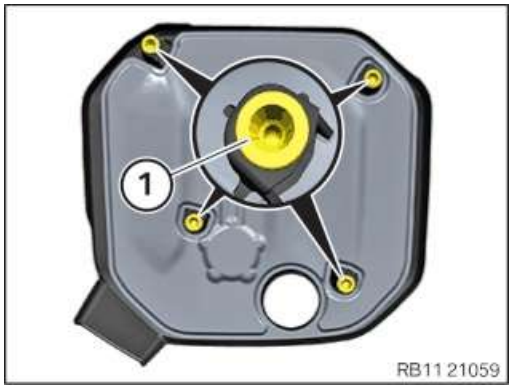
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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

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- Check the acoustic cover for correct fit of the rubber mounts (1).



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

Additional Information

Overview of Tightening Torques

Camshaft sensor to cylinder head cover			Used in step 4
TS5x20		Tightening torque	4 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	3
61 35 ... Notes on ESD protection (Electro Static Discharge)	3

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13 62 662 Replacing exhaust temperature sensor for exhaust-gas recirculation

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

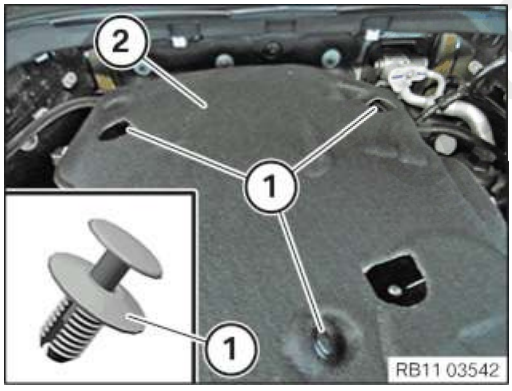
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design 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 indicated area towards the top.

2 – Remove the acoustic cover for the injectors



- **If installed:** Release the expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

MAIN WORK

3 – Remove the exhaust temperature sensor for the exhaust-gas recirculation

WARNING

Hot surfaces.

Risk of burning!

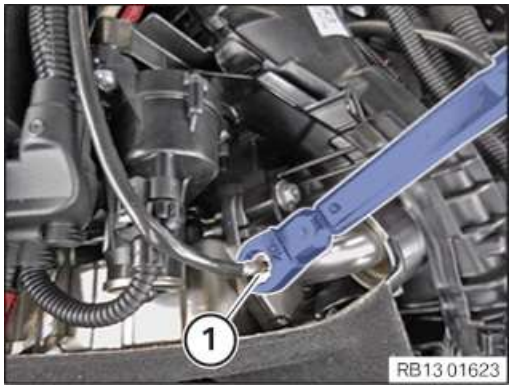
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

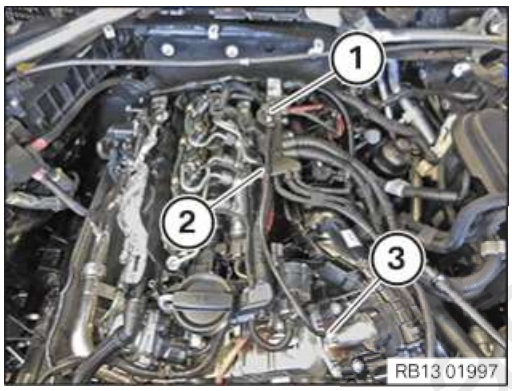
Electrostatic discharge.

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 ... Notes for ESD protection (electrostatic discharge)

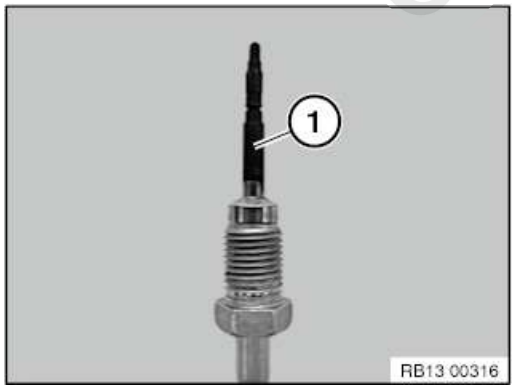


- Loosen exhaust temperature sensor (1).



- Unlock and loosen connector (1).
- Release the exhaust temperature sensor (3) from the clamp (2).
- Feed out and remove exhaust temperature sensor (3).

4 – Install the exhaust temperature sensor for the exhaust-gas recirculation



RISK OF DAMAGE

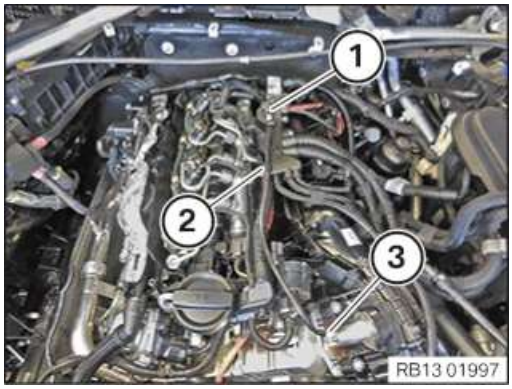
Damage of exhaust temperature sensor.

Damage to exhaust temperature sensors leads to malfunctions.

- Make sure that the gauge tip is not damaged.

- Check gauge tip (1) for damage.

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- Feed in and install the exhaust temperature sensor (3).
- Secure the exhaust temperature sensor (3) to the clamp (2).
- Connect and lock the connector (1).
- Make sure the connector (1) engages audibly.



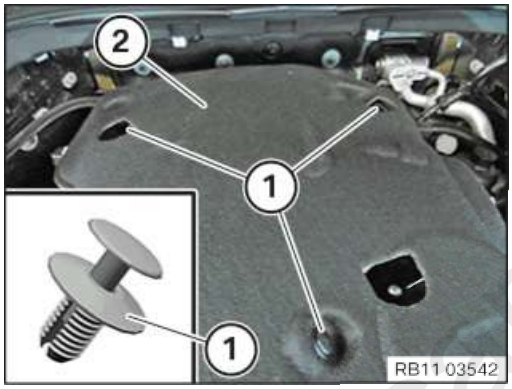
- Tighten the exhaust temperature sensor (1).

Exhaust temperature sensor for EGR

Sensor		Tightening torque	21,7 Nm

POSTPROCESSES

5 – Install the acoustic cover for the injectors



- Feed the acoustic cover (2) in and install.
- **If installed:** Secure the acoustic cover (2) with the expanding rivets (1) .

6 – Install acoustic cover

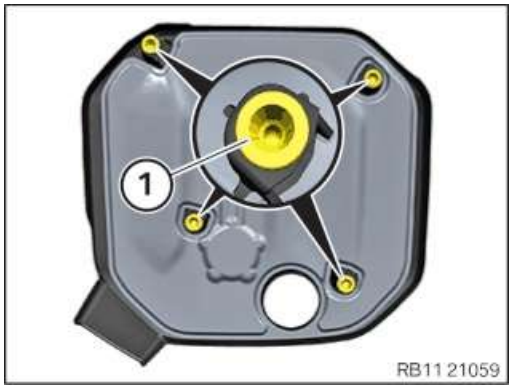
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

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

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

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- Check the acoustic cover for correct fit of the rubber mounts (1).



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

Additional Information

Overview of Tightening Torques

Exhaust temperature sensor for EGR			Used in step 4
Sensor		Tightening torque	21,7 Nm

Links

Repair instructions	**Used in step**
61 35 ... Notes on ESD protection (Electro Static Discharge)	3
61 35 ... Notes on ESD protection (Electro Static Discharge)	3

cardiagn.com

13 62 680 Replacing the charging pressure sensor on the compressor bypass

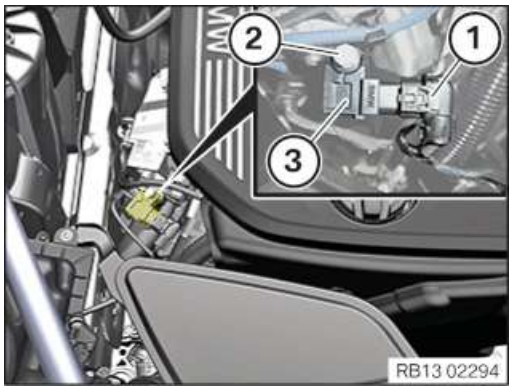
1 – Remove the charging pressure sensor from the compressor bypass

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 ... Notes for ESD protection (electrostatic discharge)

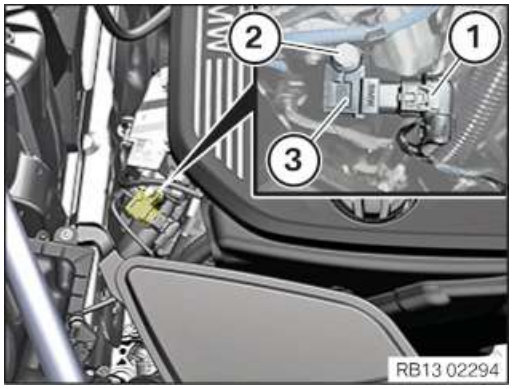


- Unlock plug connection (1) and disconnect.
- Loosen screw (2).
- Remove the charging pressure sensor (3).

2 – Install the charging pressure sensor on the compressor bypass



- Check sealing ring (1) for damage, renew if necessary.



- Insert and install the charging pressure sensor (3).
- Tighten down screw (2).

Charging pressure sensor to compressor bypass

Hexagon screw M6x20		Tightening torque	8 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

Additional Information

cardiagn.com

Overview of Tightening Torques

Charging pressure sensor to compressor bypass			Used in step 2
Hexagon screw M6x20		Tightening torque	8 Nm

Links

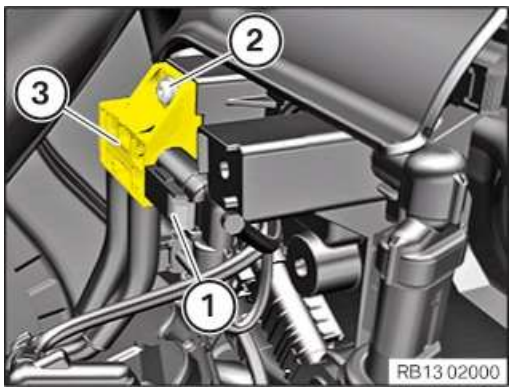
Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

cardiagn.com

13 62 534 Replacing the exhaust temperature sensor for diesel particulate filter

PRELIMINARY WORK

1 – Releasing the differential pressure sensor for the diesel particulate filter



- Unlock plug connection (1) and disconnect.
- Loosen screw (2).
- Remove the differential pressure sensor (3) and put it to one side.

MAIN WORK

2 – Remove the exhaust temperature sensor on the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

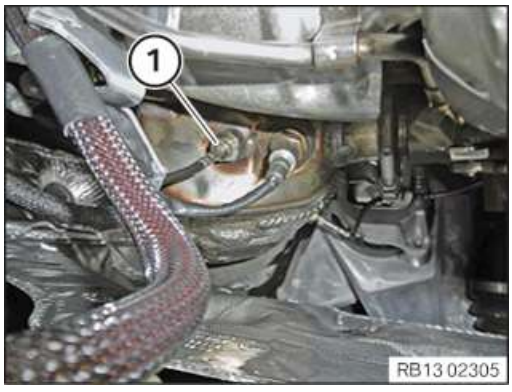
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

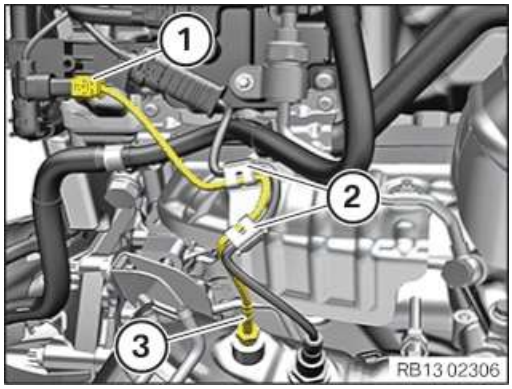
Damage to or destruction of electrical components.

- 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 ... Notes for ESD protection (electrostatic discharge)



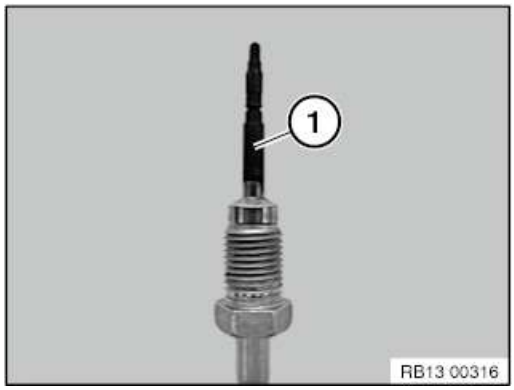
- Release exhaust temperature sensor (1) using special tool .

cardiagn.com



- Unlock plug connection (1) and disconnect.
- Remove the exhaust temperature sensor (3) from the clamps (2).
- Feed out and remove exhaust temperature sensor (3).

3 – Install the exhaust-gas temperature sensor on the diesel particulate filter



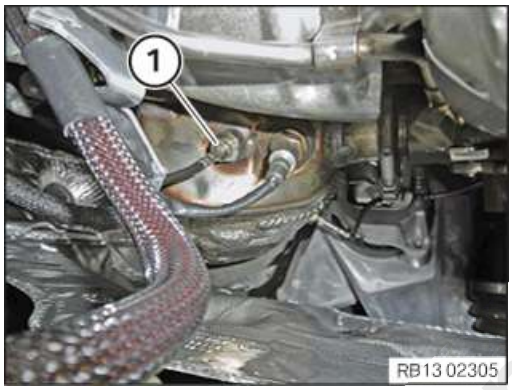
RISK OF DAMAGE

Damage of exhaust temperature sensor.

Damage to exhaust temperature sensors leads to malfunctions.

- Make sure that the gauge tip is not damaged.

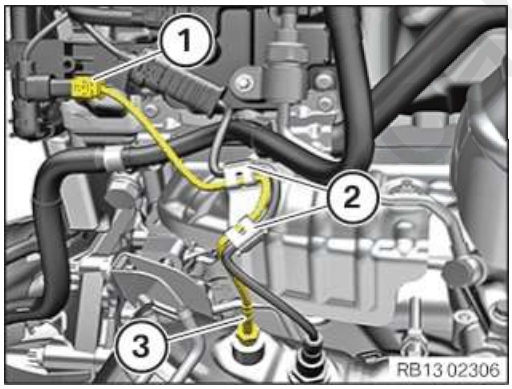
- Check gauge tip (1) for damage.



- Feed in and install the exhaust temperature sensor (1).
- Tighten the exhaust temperature sensor (1) with the special tool .

Exhaust-gas temperature sensor to diesel particulate filter

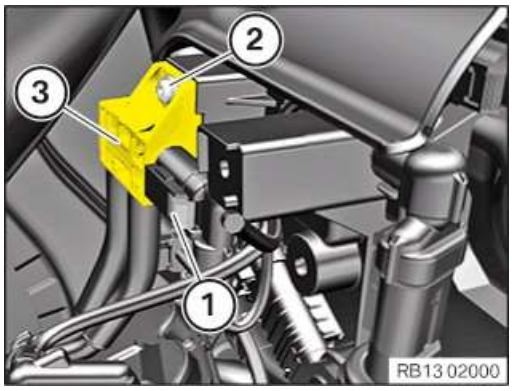
Sensor	Tightening torque	30 Nm



- Secure the exhaust temperature sensor (3) to the clamp (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

4 – Securing the differential pressure sensor for the diesel particulate filter



- Feed in and install the differential pressure sensor (3).
- Tighten down screw (2).

Differential pressure sensor of diesel particulate filter on cylinder head cover

TS5x20		Tightening torque	4 Nm

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

Additional Information

Overview of Tightening Torques

Exhaust-gas temperature sensor to diesel particulate filter — Used in step 3

Sensor		Tightening torque	30 Nm

Differential pressure sensor of diesel particulate filter on cylinder head cover — Used in step 4

TS5x20		Tightening torque	4 Nm

Overview of Special Tools

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	2
61 35 ... Notes on ESD protection (Electro Static Discharge)	2

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13 62 663 Replacing the exhaust temperature sensor for the exhaust system after the catalytic converter on the diesel particulate filter

1 – Removing the exhaust temperature sensor for the exhaust system downstream the catalytic converter at the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

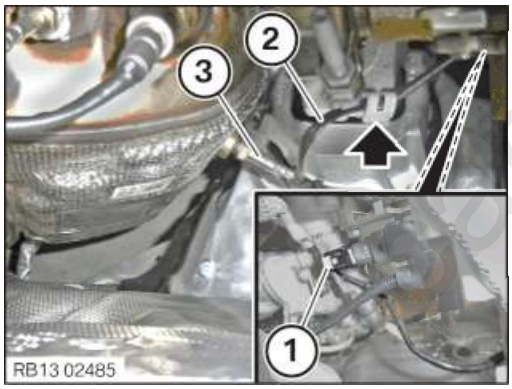
- Perform all work only on components that have cooled down.

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 ... Notes for ESD protection (electrostatic discharge)

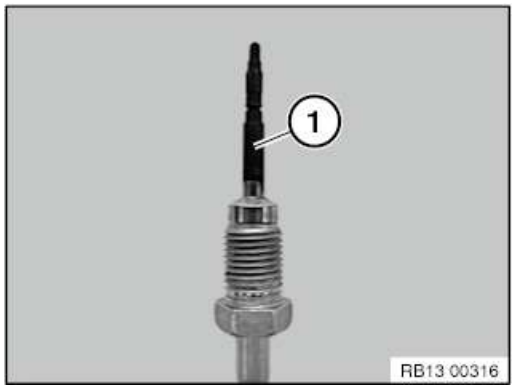


- Unlock plug connection (1) and disconnect.

Note: The exhaust temperature sensor is located near the right engine mount.

- Release cable (2) from the clamps (arrow).
- Loosen exhaust temperature sensor (3).
- Feed out and remove exhaust temperature sensor (3).

2 – Installing the exhaust temperature sensor for the exhaust system downstream the catalytic converter on the diesel particulate filter



RISK OF DAMAGE

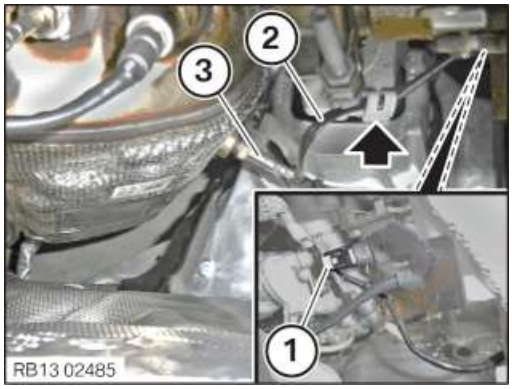
Damage of exhaust temperature sensor.

Damage to exhaust temperature sensors leads to malfunctions.

- Make sure that the gauge tip is not damaged.

- Check the gauge tip (1) for damage.

partdiagram.com



- Feed in and install the exhaust temperature sensor (3).
- Tighten the exhaust temperature sensor (3).

Exhaust temperature sensor for the exhaust system after catalytic converter before diesel particulate filter

Sensor		Tightening torque	30 Nm

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

  The connector (1) must engage audibly.

Additional Information

Overview of Tightening Torques

Exhaust temperature sensor for the exhaust system after catalytic converter before diesel particulate filter Used in step 2

Sensor		Tightening torque	30 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

cardiagn.com

13 62 669 Replacing the exhaust temperature sensor on the catalytic converter

1 – Remove the exhaust temperature sensor before the SCR catalytic converter

WARNING

Hot surfaces.

Risk of burning!

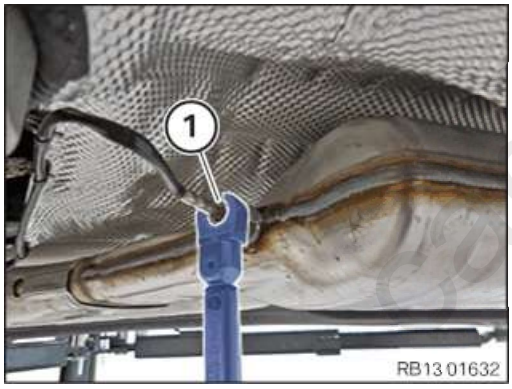
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

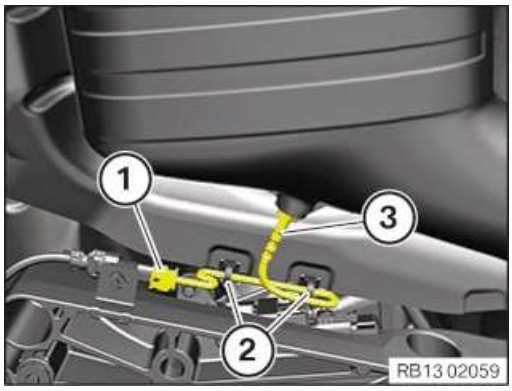
Electrostatic discharge.

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 ... Notes for ESD protection (electrostatic discharge)

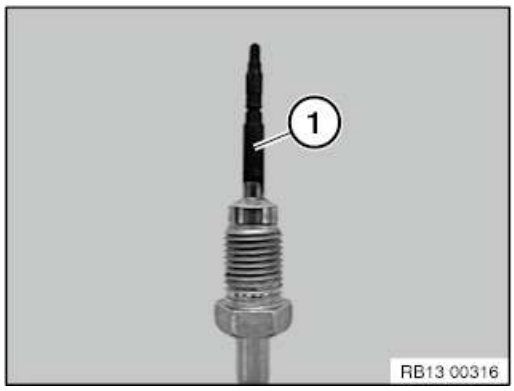


- Loosen exhaust temperature sensor (1).



- Unlock and loosen connector (1).
- Loosen clamps (2).
- Feed out and remove exhaust temperature sensor (3).

2 – Install the exhaust temperature sensor before SCR catalytic converter



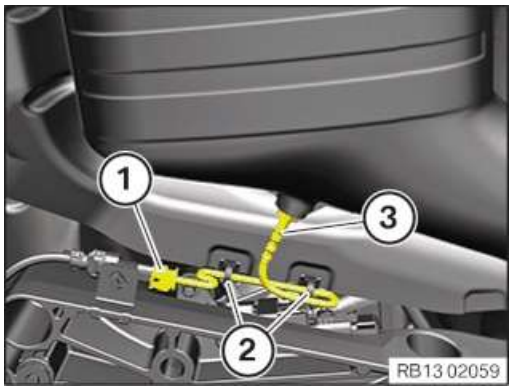
RISK OF DAMAGE

Damage of exhaust temperature sensor.

Damage to exhaust temperature sensors leads to malfunctions.

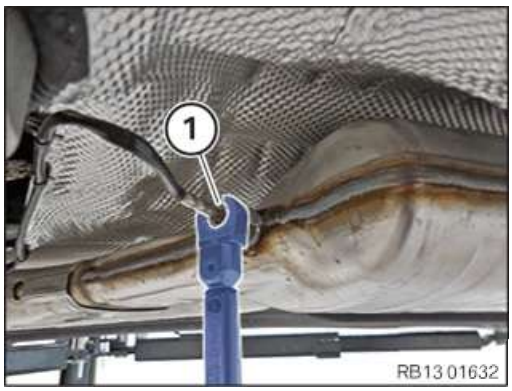
- Make sure that the gauge tip is not damaged.

- Check the gauge tip (1) for damage and renew the exhaust temperature sensor as needed.



- Feed in and install the exhaust temperature sensor (3).
- Secure clamps (2).
- Connect and lock the connector (1).

  The connector (1) must engage audibly.



- Tighten the exhaust temperature sensor (1).

Exhaust-gas temperature sensor upstream of SCR catalytic converter

Sensor		Tightening torque	30 Nm

Additional Information

Overview of Tightening Torques

Exhaust-gas temperature sensor upstream of SCR catalytic converter Used in step 2

Sensor		Tightening torque	30 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	1
61 35 ... Notes on ESD protection (Electro Static Discharge)	1

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13 71 000 Remove and install intake silencer housing

WARNING

Hot surfaces.

Risk of burning!

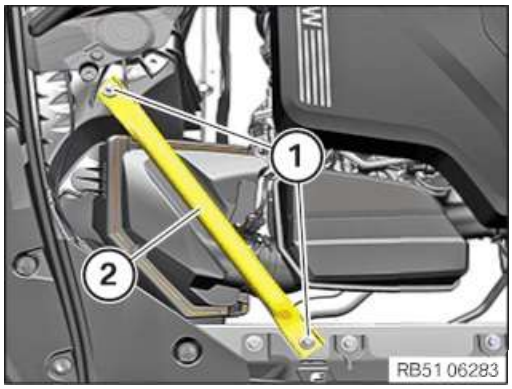
- Perform all work only on components that have cooled down.

PRELIMINARY WORK

1 – Remove right front-end strut

TECHNICAL INFORMATION

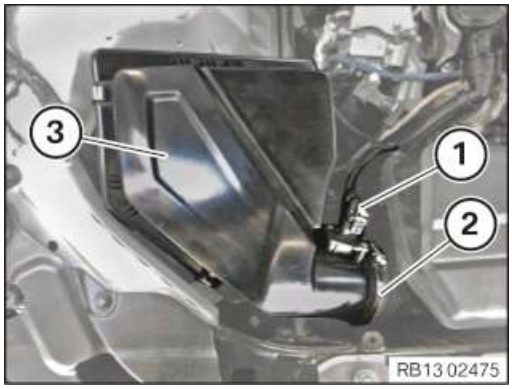
Driving without the strut brace/front-end strut or tension strut is not permitted.



- Loosen screws (1).
- Remove the front-end strut (2).

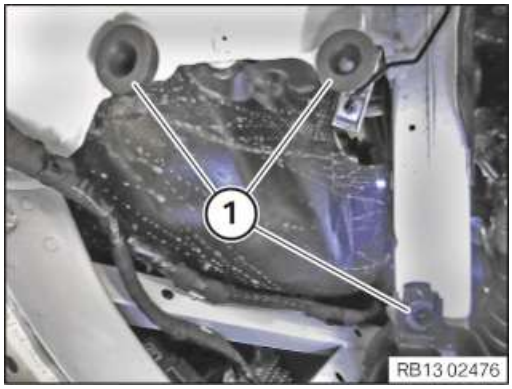
cardiagn.com

2 – Removing intake silencer housing

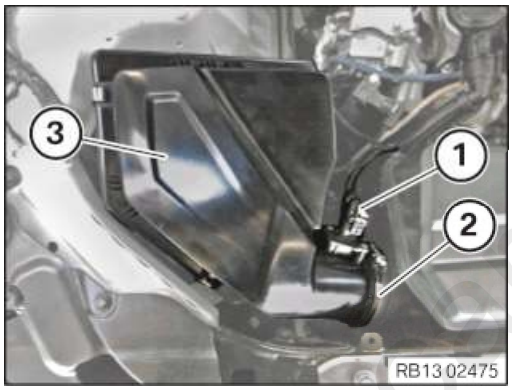


- Unlock plug connection (1) and disconnect.
- Unfasten clamp (2).
- Pull out and remove the intake silencer housing (3) from the rubber mounts towards the top.

3 – Installing intake silencer housing



- Check the rubber mount (1) for correct fit.



- Feed the intake filter housing (3) in and engage it in the rubber mounts.
- Tighten clamp (2).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Connect connectors (1) and lock.

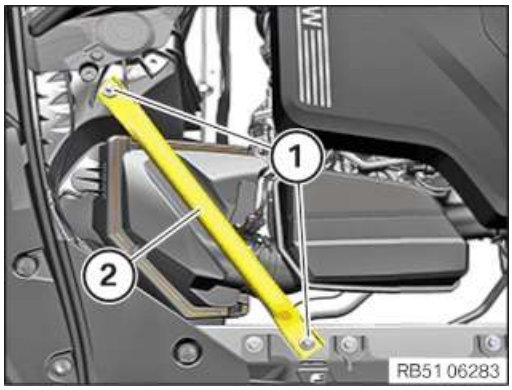
  The connector (1) must engage audibly.

ofdiagn.com

4 – Install the right front-end strut

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.



- Install the front-end strut (2).
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

Front end strut

Screw		Tightening torque	56 Nm

Additional Information

Overview of Tightening Torques

Clean air pipe to upper section of intake filter housing — Used in step 3

Clamp		Tightening torque	3 Nm

Front end strut — Used in step 4

Screw		Tightening torque	56 Nm

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13 71 035 Removing and installing/replacing clean air pipe

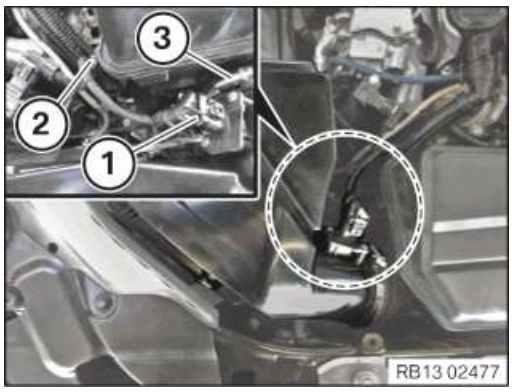
1 – Removing the clean air pipe with the resonator

WARNING

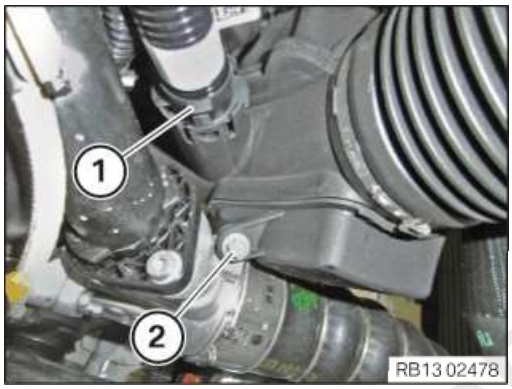
Hot surfaces.

Risk of burning!

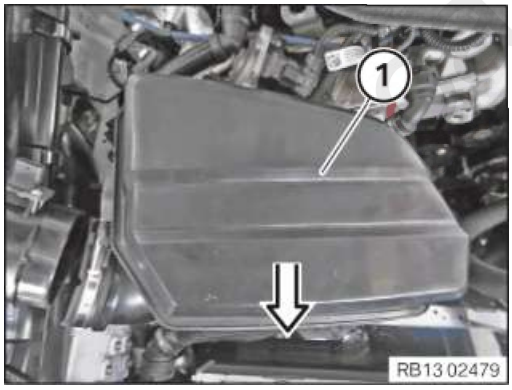
- Perform all work only on components that have cooled down.



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



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



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



- Unlock and loosen clamp (1).

.diagn.com

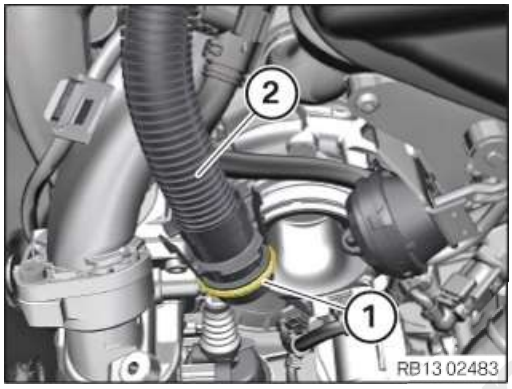


- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

2 – Installing the clean air pipe with resonator



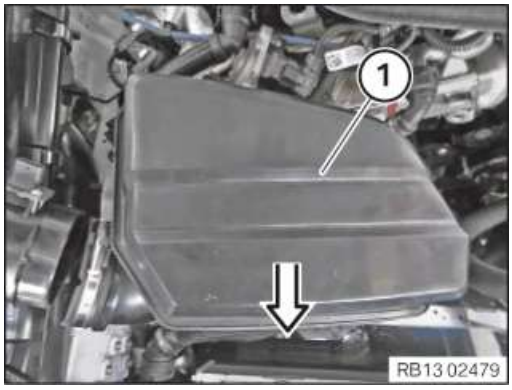
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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



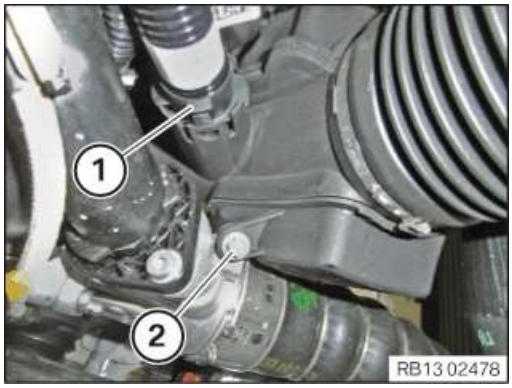
- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

.diagn.com



- Attach and lock the clamp (1).

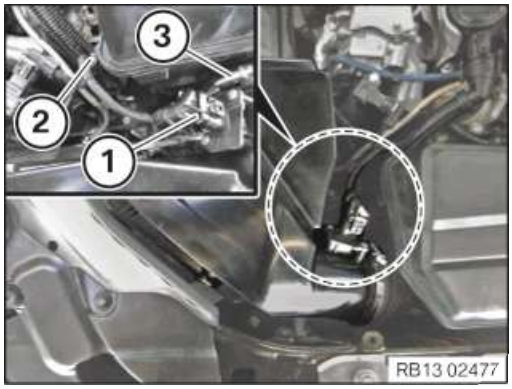
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



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

  The connector (1) must engage audibly.

Additional Information

Overview of Tightening Torques

Clean air pipe to exhaust turbocharger Used in step 2

M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing Used in step 2

Clamp		Tightening torque	3 Nm

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13 72 001 Replacing air filter element

WARNING

Hot surfaces.

Risk of burning!

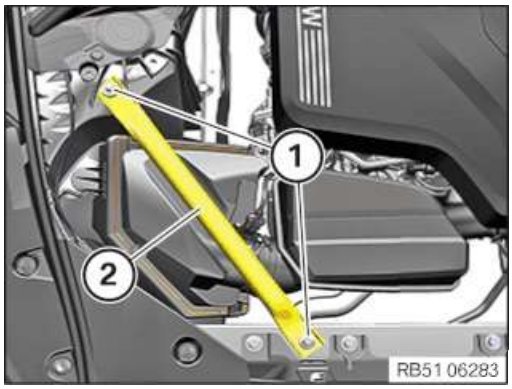
- Perform all work only on components that have cooled down.

PRELIMINARY WORK

1 – Remove right front-end strut

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.



- Loosen screws (1).
- Remove the front-end strut (2).

MAIN WORK

2 – Removing air filter element

Prerequisite

Ignition is switched off.

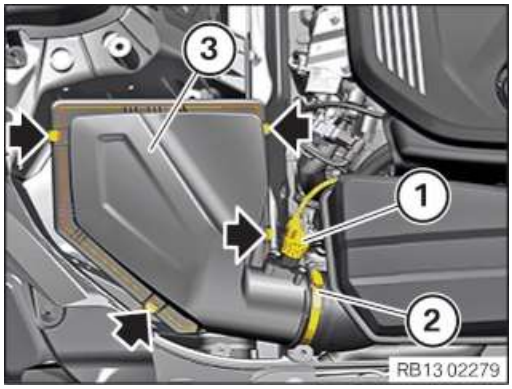
RISK OF DAMAGE

Damage to the clean air line. Damage to the air filter.

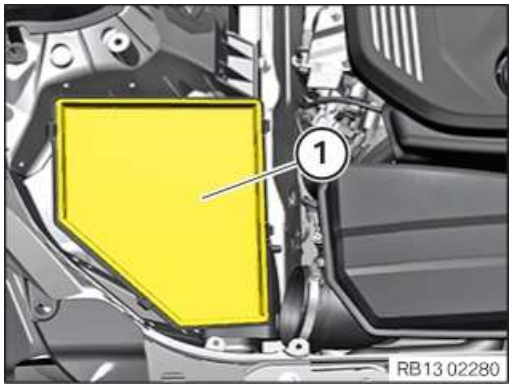
For changing the air filter insert, if the upper section of intake filter housing is only raised and not completely removed, the clean air line and the air filter insert may be damaged.

- Do not lift upper section of intake filter housing by force.
- Unfasten clamp.
- Remove upper section of intake filter housing completely.

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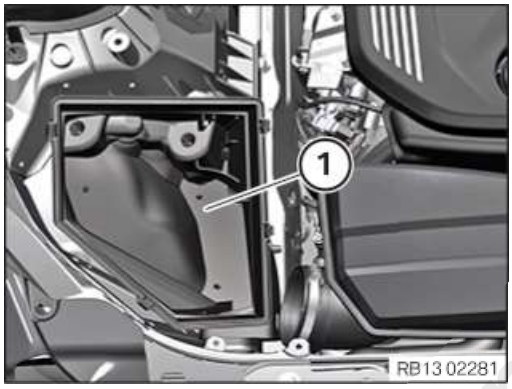


- Unlock plug connection (1) and disconnect.
- Unfasten clamp (2).
- Unlock clamps (arrows).
- Remove the upper section of the intake filter housing (3).

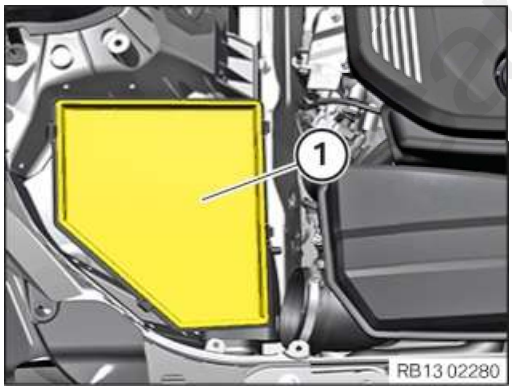


- Remove the air filter element (1).

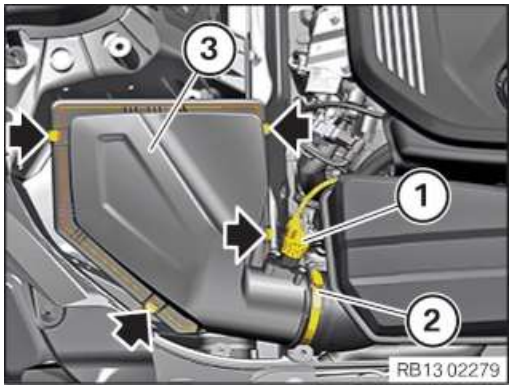
3 – Installing the air filter element



- Clean lower section of intake filter housing (1).



- Install the air filter element (1).



- Insert and install the upper section of the intake filter housing (3).
- Lock clamps (arrows).

  The clamps (arrows) must engage audibly.
- Tighten clamp (2).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Connect connectors (1) and lock.

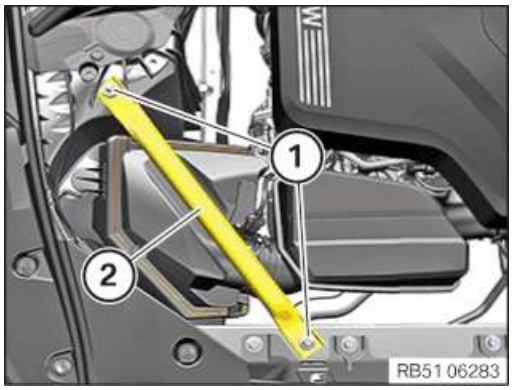
  The connector (1) must engage audibly.

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4 – Install the right front-end strut

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.



- Install the front-end strut (2).
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

Front end strut

Screw		Tightening torque	56 Nm

Additional Information

Overview of Tightening Torques

Clean air pipe to upper section of intake filter housing — Used in step 3

Clamp		Tightening torque	3 Nm

Front end strut — Used in step 4

Screw		Tightening torque	56 Nm

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16 00 005 Draining and filling fuel tank

1 – Drawing off the fuel tank

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.



- Open fuel filler cap.
- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Push the suction hose (1) of the extractor unit through the special tool and into the fuel filler neck. If necessary, slightly turn the suction hose.

  For the extractor unit: see BMW service workshop equipment.

  The insertion length of the suction hose is 135 cm.
- Start engine and allow to run, so that the electric fuel pump is running.

  This will ensure that the fuel is pumped by the suction jet pump from the left-hand side of the fuel tank to the right hand-side.
- Draw off fuel with the extractor unit as far as possible. In the process, track the drawing off of the fuel on the fuel gauge in the instrument cluster.

2 – Filling the fuel tank



- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Slide the suction hose (1) of the extractor unit about 40 cm into the fuel filler neck. If necessary, slightly turn the suction hose.
- Fill fuel from suction extractor unit.
- After completing the work and before starting the engine for the first time: Fill the fuel tank by the fuel filler neck with a minimum of 5 l of fuel.

Additional Information

Overview of Special Tools

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16 11 060 Removing and installing/replacing fuel filler pipe

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 ... Raise the vehicle using a vehicle lift.

WARNING

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

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

WARNING

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

Danger! Life-threatening injuries!

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

PRELIMINARY WORK

1 – Drawing off the fuel tank

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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- Open fuel filler cap.
- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Push the suction hose (1) of the extractor unit through the special tool and into the fuel filler neck. If necessary, slightly turn the suction hose.

  For the extractor unit: see BMW service workshop equipment.

  The insertion length of the suction hose is 135 cm.
- Start engine and allow to run, so that the electric fuel pump is running.

  This will ensure that the fuel is pumped by the suction jet pump from the left-hand side of the fuel tank to the right hand-side.
- Draw off fuel with the extractor unit as far as possible. In the process, track the drawing off of the fuel on the fuel gauge in the instrument cluster.

2 – Removing the rear left and right wheels

NOTICE

Perform the operations on the left and right side.

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▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



- If several wheels are removed at the same time: 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 the correct adapter from the set of special tools .

3 – Remove rear right wheel arch cover

3 – Remove rear right wheel arch cover

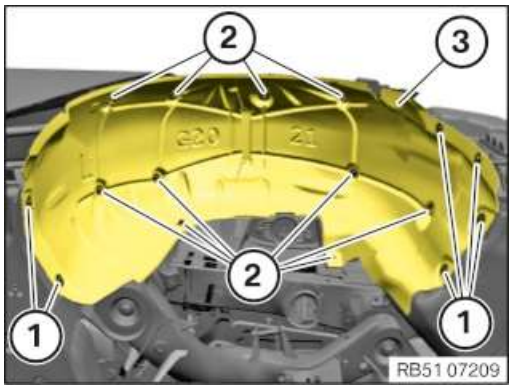
NOTICE

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

▸ **Removing rear wheel arch cover**

NOTICE

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



- Loosen screws (1).
- Loosen nuts (2).
- Guide the wheel arch cover (3) out.

4 – Remove complete exhaust system

WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Component with heavy weight.

Danger of injury!

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

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

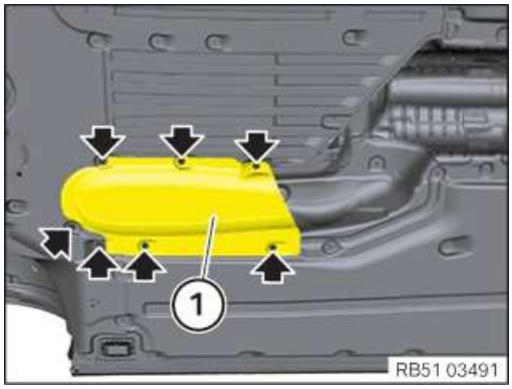
- Remove and install heavy components with the aid of another person/other persons.

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▸ **Remove the underbody panelling of the transmission on the side**

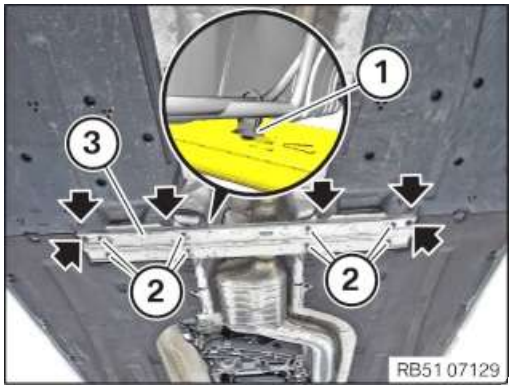
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Remove screws (arrows).
- Remove the underbody panelling (1).

▸ **Remove the connecting support from the tunnel**



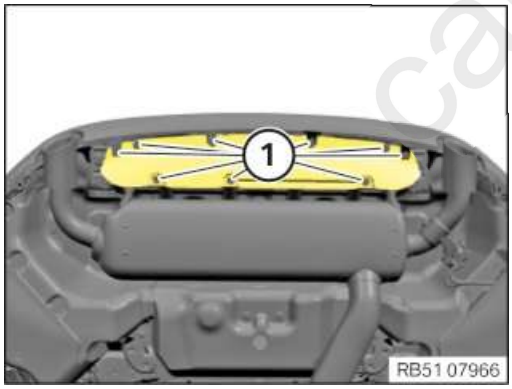
- Remove screws (arrows).

NOTICE

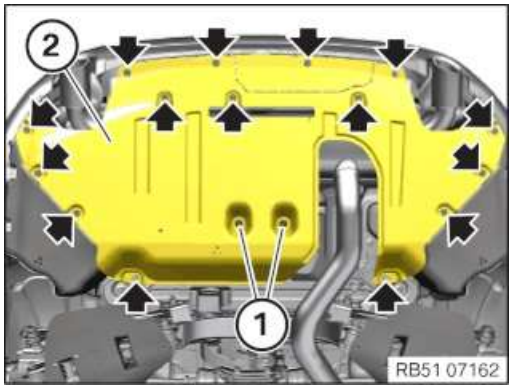
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.

▸ **Removing the rear diffuser**

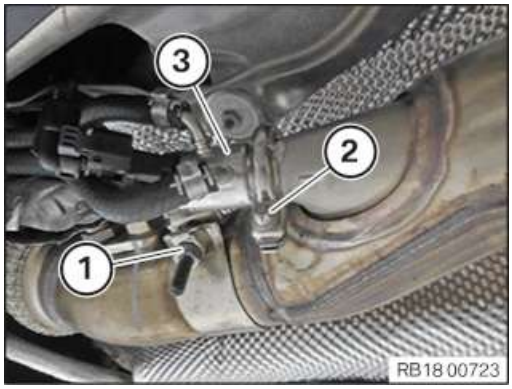


- **Version 1:**
- Release the screws and nuts (1).
- Remove the diffuser.

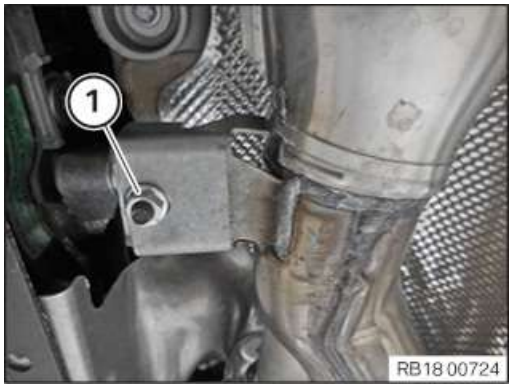


- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).

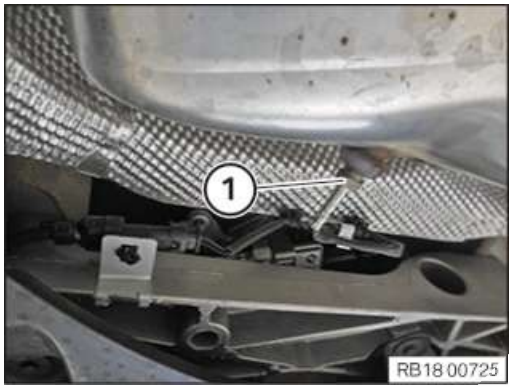
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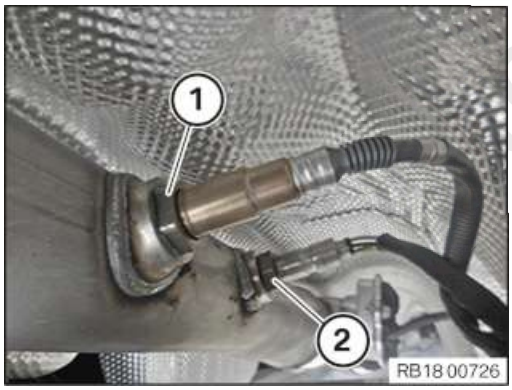
- Unfasten clamp (1).
- Detach the clamp (2) of the SCR metering module (3).
- Detach the SCR metering module (3) from the exhaust system and set it aside.



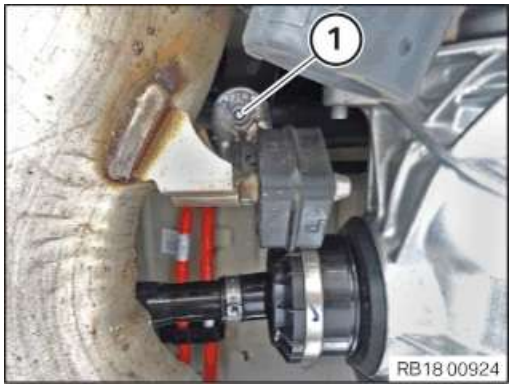
- Loosen nut (1).



- Detach the exhaust temperature sensor (1) from the exhaust system.

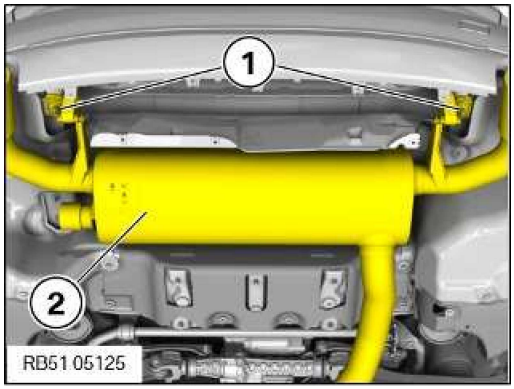


- Detach the diesel particulate sensor (1) from the exhaust system and set it aside.
- Detach the nitrogen oxide sensor (2) from the exhaust system and set it aside.



- Release the nut (1) on the rear axle support.

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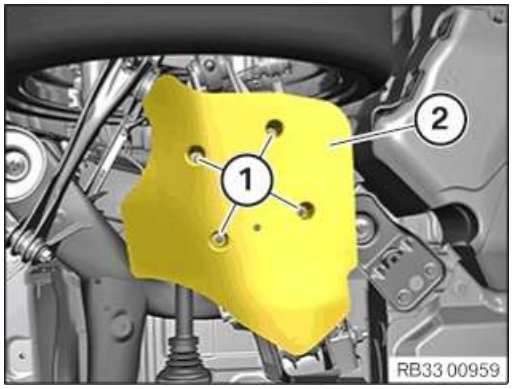
- Loosen nuts (1).
- Lower and remove the exhaust system (2) with the assistance of a second person.

5 – Remove the cover of the camber control arm on the left and right

NOTICE

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

▸ **Removing the cover of camber control arm**



- Loosen nuts (1).
- Remove the cover (2) of camber control arm.

6 – Remove tank cover on left and right

NOTICE

Perform the operations on the left and right side.

▸ **Removing the tank cover**



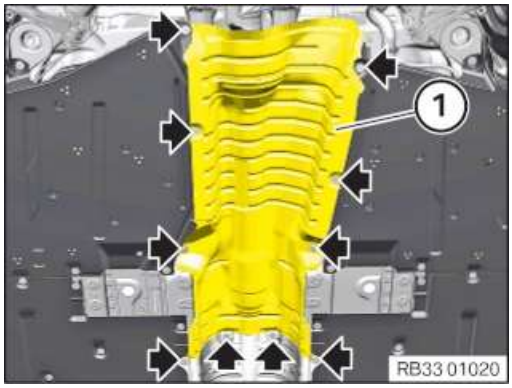
- Release all bolts (arrows).
- Remove the tank cover (1).

7 – Remove heat shield at rear.

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NOTICE

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



- Loosen bolts and nuts (arrows).
- Remove the rear heat shield (1).

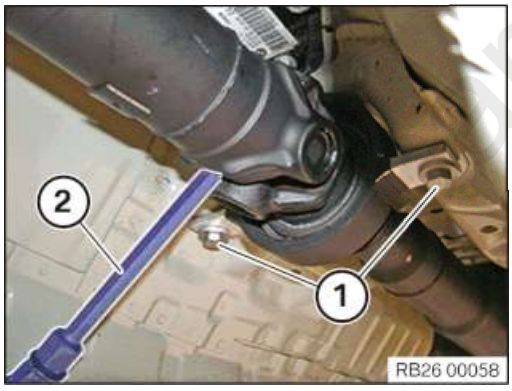
8 – Releasing the propeller shaft from the rear axle differential

RISK OF DAMAGE

Damage to propeller shaft during removal.

Non-observance of the removal guidelines for the propeller shaft on the rear axle differential may cause severe damage.

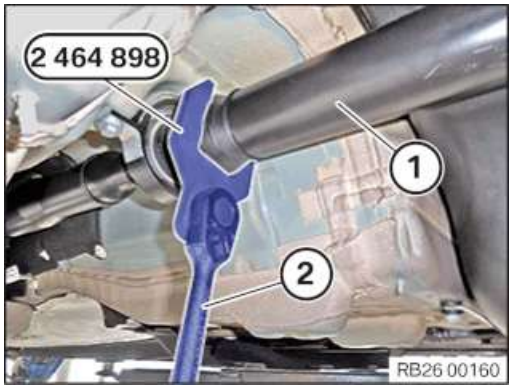
- Do not disassemble the three-hole flange, flexible disc and propeller shaft. The three-hole flange to the rear axle differential is balanced with the flexible disc and propeller shaft.
- Loosen the recessed nut against the direction of travel in clockwise direction. The propeller shaft must be loosened on the recessed nut only and exclusively in the direction of rotation otherwise the anti-twist lock of the bi-hexagonal flange nut is damaged.
- In the event of a damaged anti-twist lock on the bi-hexagonal flange nut: Replace the rear axle differential.



- Loosen screws (1).

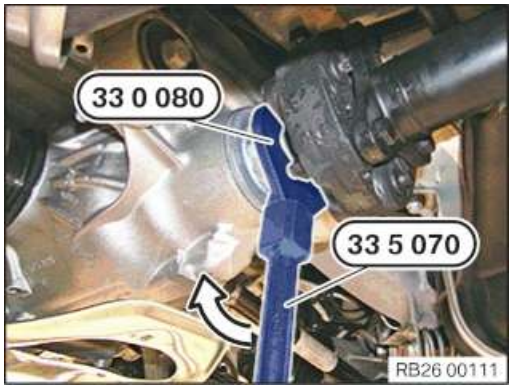
  Do not remove bolts (1) yet.
- **Version A (propeller shaft with wide universal joint):**

  Secure the propeller shaft against twisting at the centre universal joint using a suitable tool (2).



- **Version B (propeller shaft with narrow universal joint):**

  Secure the propeller shaft (1) against twisting by using the special tool 2 464 898 and a suitable tool (2) at the central universal joint.



RISK OF DAMAGE

Damage to rear axle differential.

Non-observance of the removal and installation guidelines may cause severe damage to the rear axle differential.

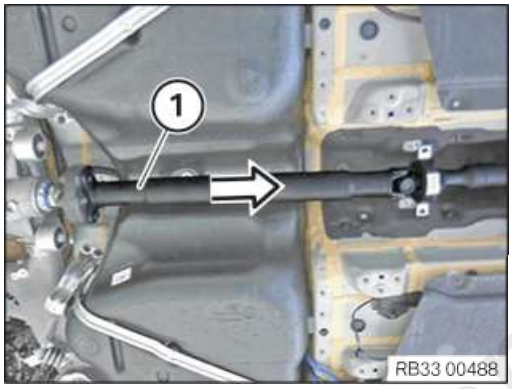
- Do not use the double hexagon head flange nut as counter support.

- Loosen the recessed nut **against** the direction of travel **in clockwise direction** using special tools 0 495 554 (33 5 070) and .

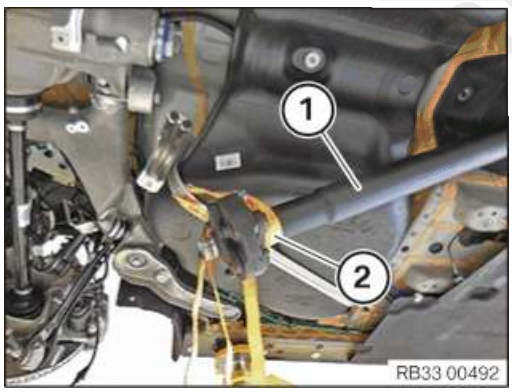
  The bi-hexagonal flange nut must not be used for counter-holding.



- Loosen screws (1) on centre mount.



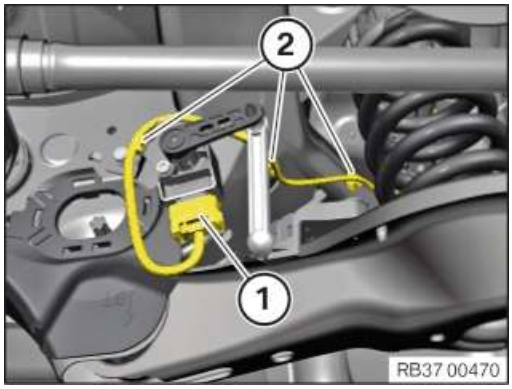
- Loosen the propeller shaft (1) from the rear axle differential in the direction of the arrow.



- Tie up the propeller shaft (1) using a tensioning strap (2).

9 – Releasing the cable for the ride height sensor from the rear axle support

.com



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

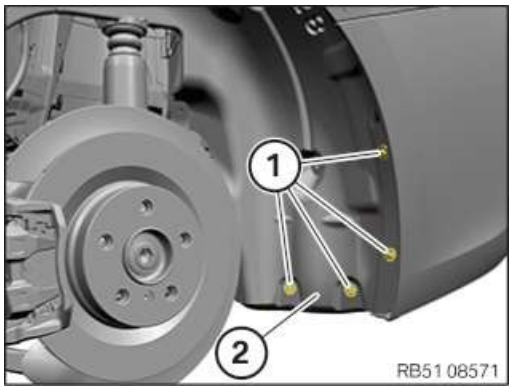
- Unlock the plug connection (1) from the ride height sensor and disconnect.
- Release the cable with the holders (2) from the rear axle support.

10 – Loosen cable of rear left and right RPM sensor

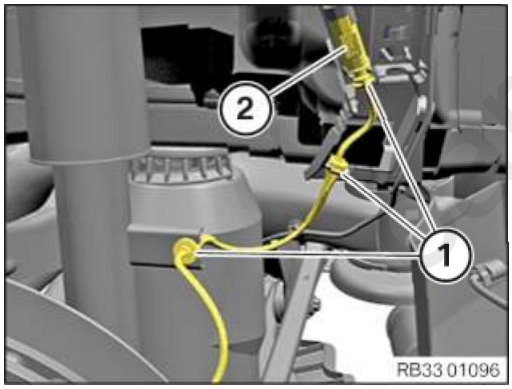
NOTICE

Perform the operations on the left and right side.

▸ **Release the cable of the rear wheel speed sensor**



- Loosen screws (1).
- Set the wheel arch cover (2) aside.



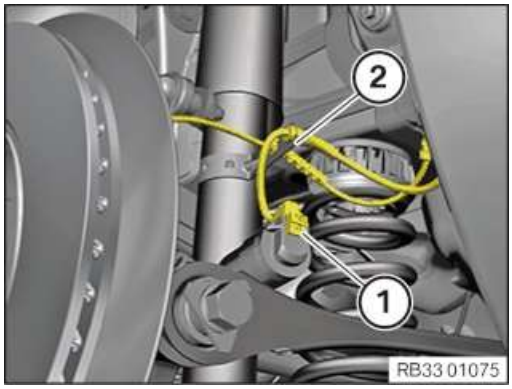
- Detach the wheel speed sensor cable from the brackets (1).
- Unlock plug connection (2) and disconnect.

11 – Release the shock absorbers at the rear left and right from the body

NOTICE

Perform the operations on the left and right side.

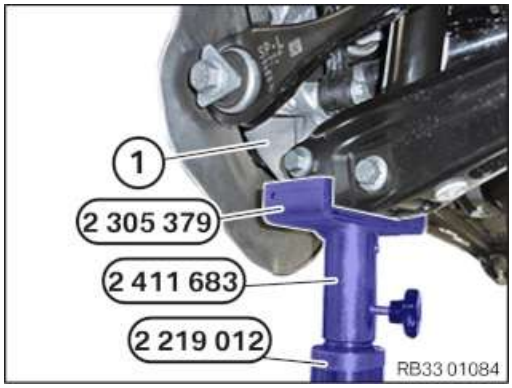
▸ **Releasing the rear shock absorber from the body**



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Release all the existing cables from holder (2).
- Unlock plug connection (1) and disconnect.



WARNING

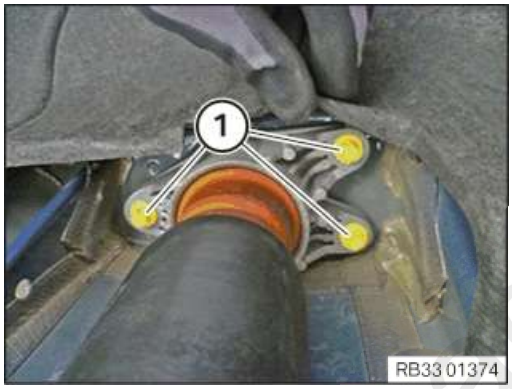
Motor vehicle may slip off the vehicle hoist where components are supported.

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

- Position the special tool 2 219 012 with the special tools 2 411 683 and 2 305 379 under the wheel carrier (1).
- Support the wheel carrier (1) with the special tool 2 219 012.

  Do not press against the spring force of the coil spring.



- Loosen screws (1).
- Disconnect the special tool 2 219 012 and set it aside.

12 – Remove the coil spring on the left and right

NOTICE

Perform the operations on the left and right side.

▸ **Remove coil spring**

▹ **Preparing the special tool (G22/G23/G26/G42)**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

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- **Basic version:**

  Spindle = Special tools and

  Upper spring cup = Special tool 5 A36 B04

  Lower spring cup = Special tool 5 A36 B05



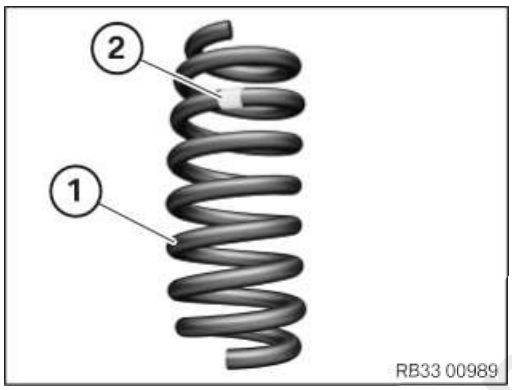
- **BMW M Performance Automobile (Sport) and Alpina:**

  Spindle = special tools , and

  Upper spring cup = Special tool

  Lower spring cup = Special tool

◁



TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

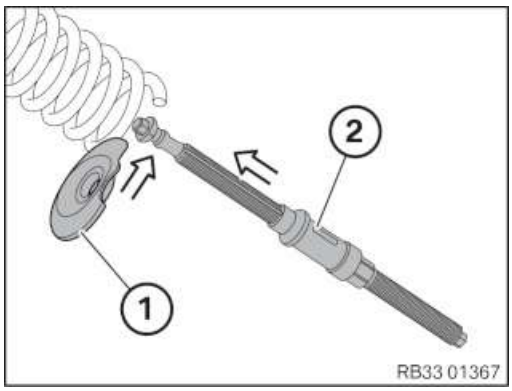
- The installation position of the coil spring(1) is marked with a label (2).

  The label (2) is attached at the top end of the coil spring (1) and is marked as “top”

- Check coil spring (1) for availability of label (2)

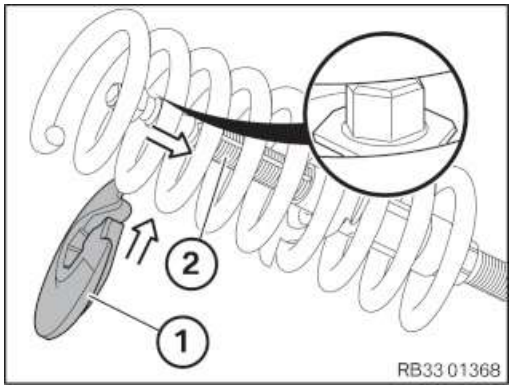
  If the label (2) on the installed coil spring (1) is missing and it has to be fixed after repair, then the installation position of the coil spring (1) must be marked necessarily.

Note: Mark the installation position of the coil spring, by attaching an adhesive tape at the top end of spring.



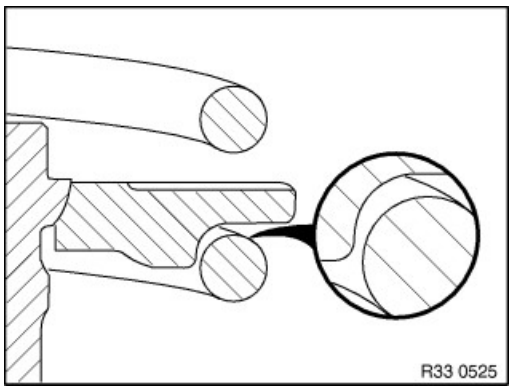
- Insert the bottom spring cup (1) sideways in the direction of arrow in the coil spring and turn up to the lowest coil.
- Insert the spindle (2) from below in the direction of arrow through the camber control arm and the bottom spring cup (1).

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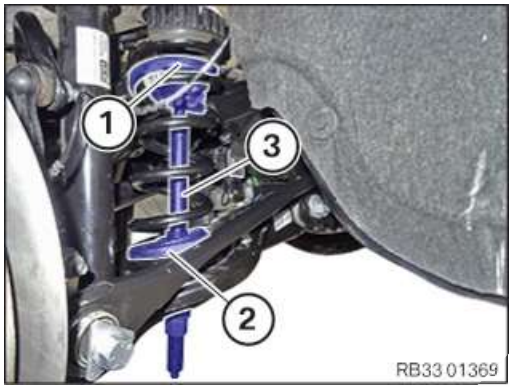


- Insert the top spring cup (1) sideways in the direction of arrow in the coil spring, feed in to the spindle (2) and turn it upwards as far as possible.

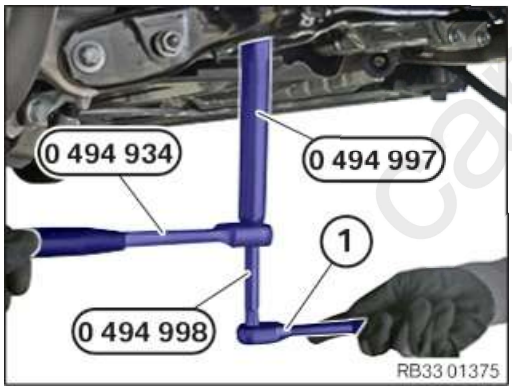
  Check the position of the spindle (2) with the hexagon head in the top spring cup (1) and correct if necessary.
- Pull the spindle (2) downwards in the direction of arrow.



- Check the position of the spring cup in the coil spring at the top and bottom and, if necessary, correct it.



- Align the top spring cup (1) and the bottom spring cup (2) with the spindle (3) in the centre to reach the highest possible contact surface on the coil spring.



RISK OF DAMAGE

Compression of coil spring to solid height.

Damage of the coil spring.

- Do not compress coil spring to solid height.
- Make sure there is a gap between the spring coils.

- Tension the coil spring using special tools and . In doing so, counter support at the spindle with the special tool and the standard tool (1).

  Standard tool:



- Feed out coil spring on upper spring pad (1). If necessary, remove upper spring pad (1).

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- Guide out and remove the coil spring (1) toward the top in the direction of the arrow.

13 – Releasing left and right brake caliper

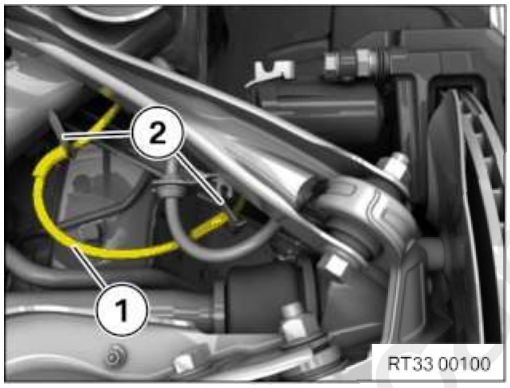
NOTICE

Perform the operations on the left and right side.

▸ **Releasing the brake caliper**

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

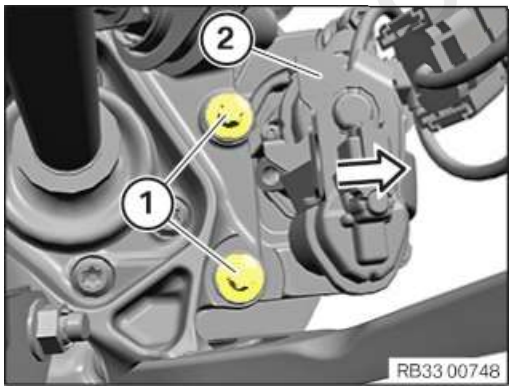


- Release the cable for the parking brake (1) from the holders (2).

NOTICE

Perform this step on the right side only.

- Release the cable for brake pad wear indicator from rear axle support.



- Loosen screws (1).
- Pull brake caliper (2) down in direction of arrow.

  The brake caliper must not hang on the brake hose.



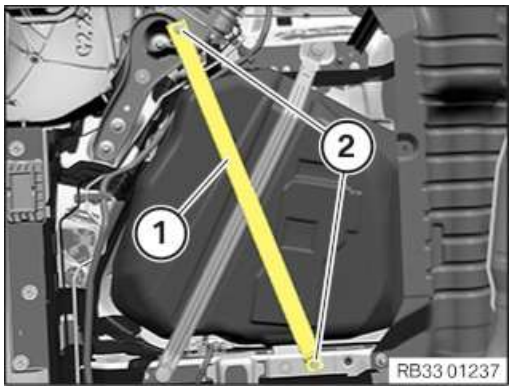
- Tie the brake caliper (1) up with the special tool 2 413 317.

14 – Remove reinforcement strut on the left and right

NOTICE

Perform the operations on the left and right side.

▸ **Remove stiffening strut**



NOTICE

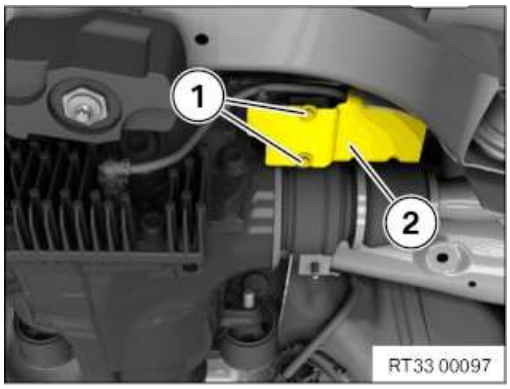
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen screws (2).
- Remove bracing strut (1).

15 – Releasing the wiring harness from the M Sport differential

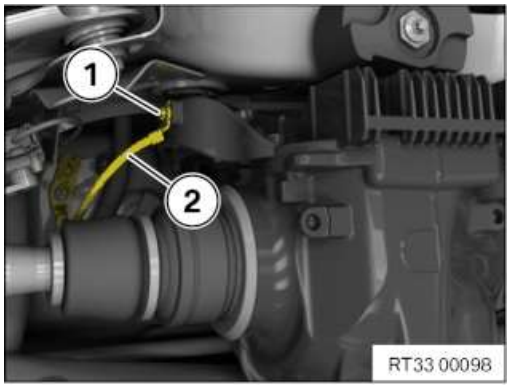
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

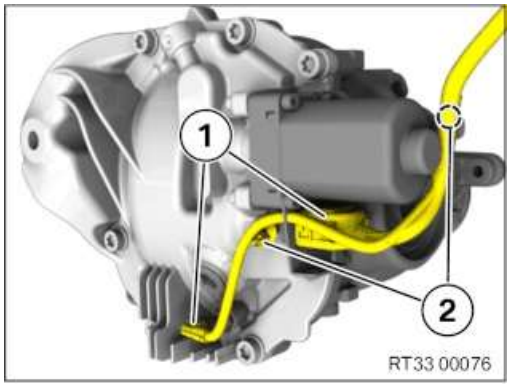


- Loosen screws (1).
- Remove heat shield (2).

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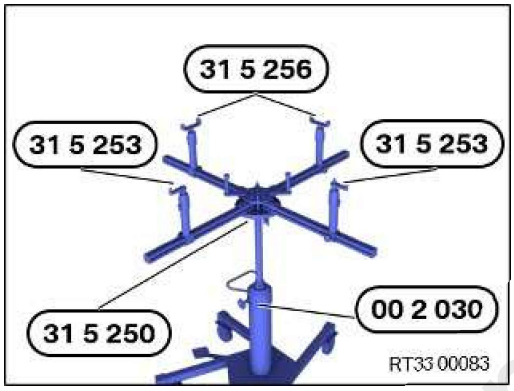


- Release the screw (1).
- Detach the ground strap (2) from the rear axle differential.



- Unlock and disconnect plug connections (1).
- Release cable from brackets (2).

16 – Preparing the special tool



TECHNICAL INFORMATION

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

- Apply special tool completely on the special tool 0 490 133 (00 2 030) with an auxiliary person helping.
- Insert special tool in telescopic supports of a profile rail pair.
- Insert special tools in telescopic supports of other profile rail pair.

17 – Positioning the special tool on the rear axle support

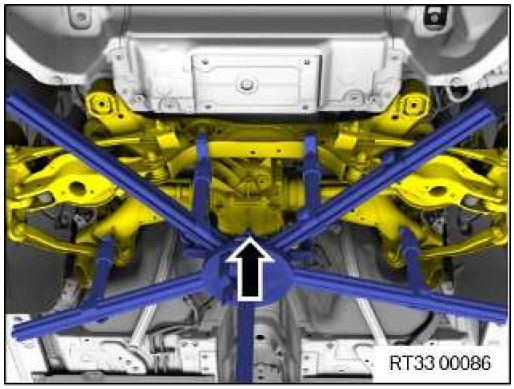
TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

The centre of gravity of the axle support must be in the centre over the special tool.

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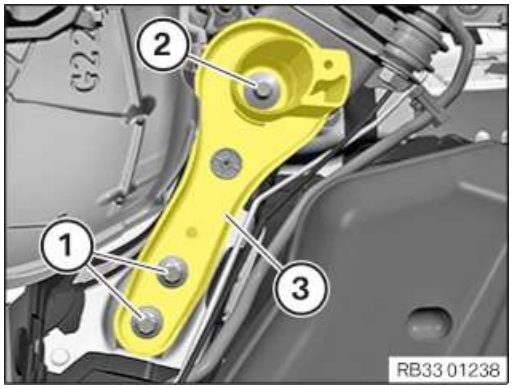
- Align special tools to rear axle support.
- Lift the special tool 2 219 012 and support the rear axle support.
- Secure the rear axle support with a tensioning strap on the special tool .

18 – Loosening the rear axle support

NOTICE

Perform the operations on the left and right side.

▸ **Remove compression strut**



RISK OF DAMAGE

Damage to the components on the rear axle.

If both compression struts are removed simultaneously, it can cause serious damage to the rear axle.

- Renew or remove compression strut only individually.
- When lowering or removing the rear axle: Support rear axle support before both compression struts are removed.

- Loosen screws (1).
- Loosen screw (2).
- Remove compression strut (3).

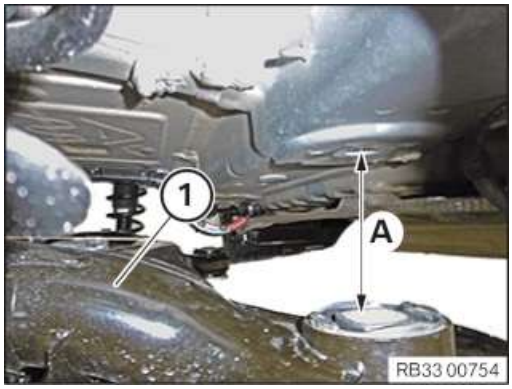
▸ **Removing the rear compression strut**



- Loosen screws (2).
- Loosen screw (3).
- Remove compression strut (1).

19 – Lowering rear axle support

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- Lower the rear axle support (1) with the special tool 2 219 012 by the dimension (A).

  Dimension (A) = approx. 10 cm

MAIN WORK

20 – Remove fuel filler pipe

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

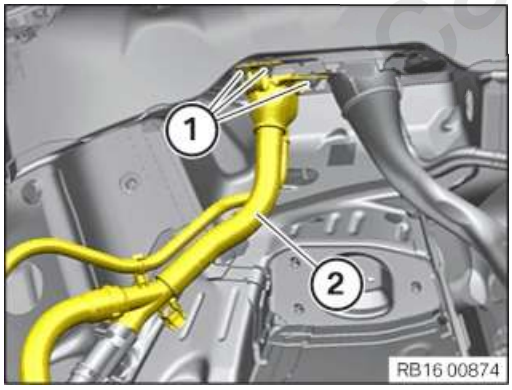
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

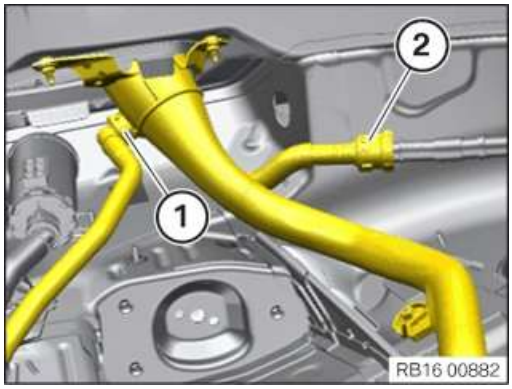
Contact with hazardous fluids.

Hazardous to health!

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



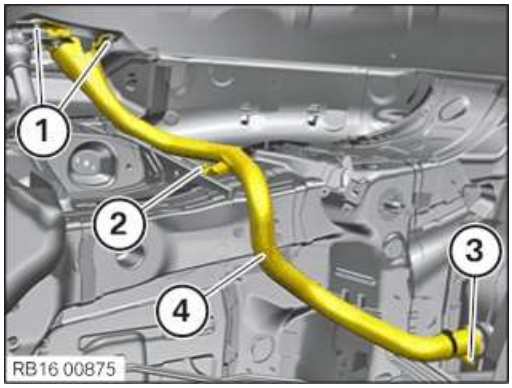
- Loosen nuts (1).
- Partially remove SCR filling system (2).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Unlock and disconnect snap fastener (1).
- Unlock and disconnect snap fastener (2).



- Loosen nuts (1).
- Unfasten nut (2).
- Loosen clamp (3).
- Remove fuel filler pipe (4).

21 – Install the fuel filler pipe

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

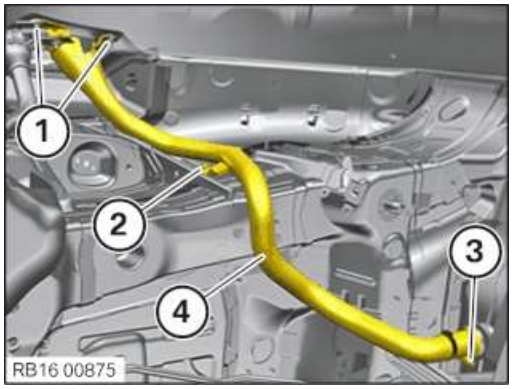
WARNING

Contact with hazardous fluids.

Hazardous to health!

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

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- Position fuel filler pipe (4) and install.
- Set and tighten the nuts (1).

  Parts: Nuts

Fuel filler pipe on upper body

Nut M6	Renew nut.	Tightening torque	8 Nm

- Fit nut (2) and tighten.

  Parts: Nut

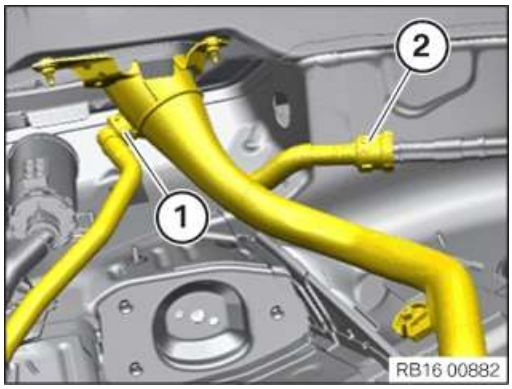
Plastic nut to fuel filler pipe

Plastic nut	Renew nut.	Tightening torque	3,5 Nm

- Close circlip (3) and tighten.

Fuel filler hose to fuel filler pipe

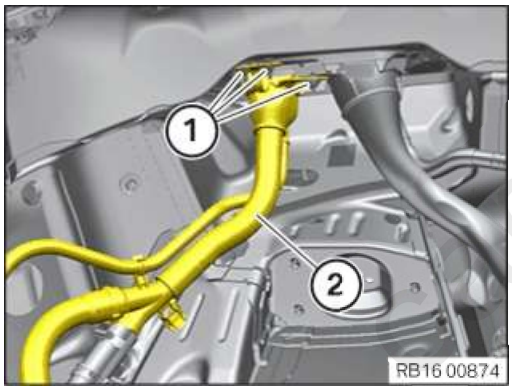
Hose clamp		Tightening torque	3,5 Nm



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Connect snap fastener (1) and lock.
- Connect snap fastener (2) and lock.



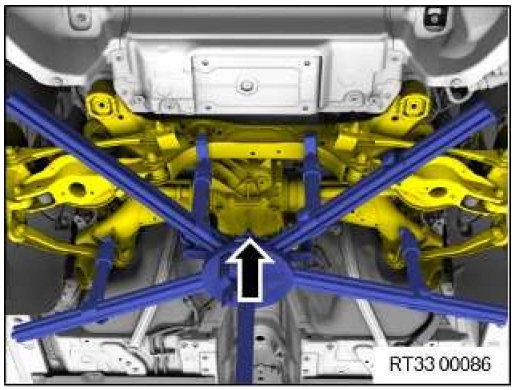
- Position SCR filling system (2) and install.
- Set and tighten the nuts (1).

SCR filler pipe to body

Nut M6		Tightening torque	8 Nm

POSTPROCESSES

22 – Raising the rear axle support



- Lift the rear axle support with the special tool 2 219 012 and position on the body.

23 – Securing the rear axle support

NOTICE

Perform the operations on the left and right side.



▸ **Installing the rear compression strut**

- Renew screws (2) and (3).
  Parts: Screws
- Position compression strut (1).
- Screw in screws (2) and (3).
- Tighten down screw (3).

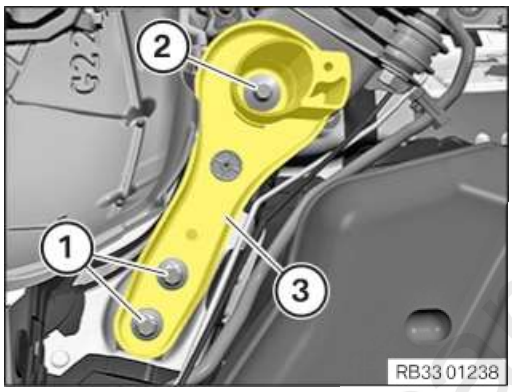
Rear axle carrier to body

M12	Renew screws.	Tightening torque	108 Nm

- Tighten the screws (2).

Compression strut on body

M10	Renew screws.	Jointing torque	47 Nm
		Angle of rotation	45 °



▸ **Install compression strut**

- Renew screws (1) and (2).
  Parts: Screws
- Position compression strut (3).
- Screw in screws (1) and (2).
- Tighten down screw (2).

Rear axle carrier to body

M12	Renew screws.	Tightening torque	108 Nm

- Tighten the screws (1).

Compression strut on body

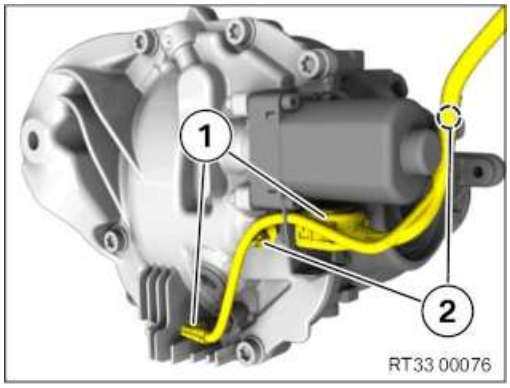
M10	Renew screws.	Jointing torque	47 Nm
		Angle of rotation	45 °

24 – Mounting the wiring harness to the M Sport differential

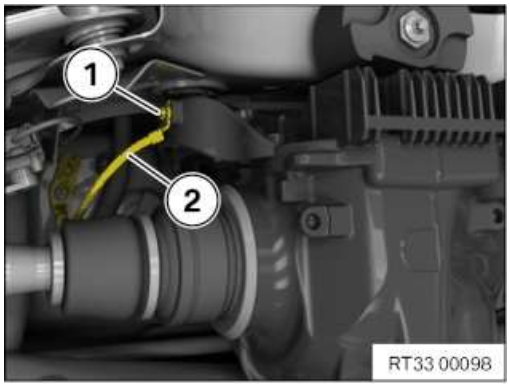
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

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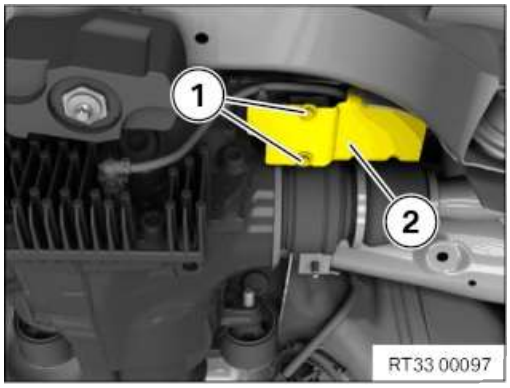
- Connect connectors (1) and lock.
- Secure the cables on the brackets (2).



- Position the ground strap (2) on the rear axle differential.
- Tighten down screw (1).

Ground strap to rear axle differential

M6x20		Tightening torque	8 Nm



- Position the heat shield (2).
- Tighten the screws (1).

Heat shield to servomotor

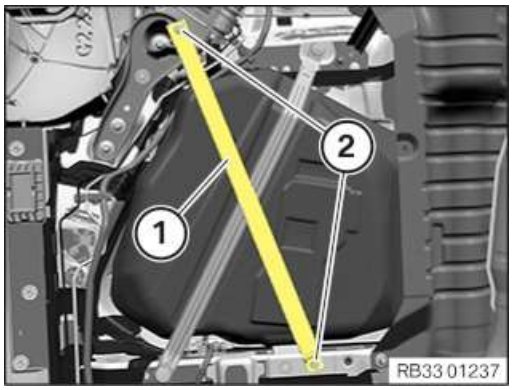
M5x10		Tightening torque	5 Nm

25 – Installing the bracing strut on the left and right

NOTICE

Perform the operations on the left and right side.

▸ **Installing the bracing strut**



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Position the reinforcement strut (1).
- Tighten the screws (2).

Bracing strut on compression strut/body

M8		Tightening torque	28 Nm

26 – Securing the brake calipers at left and right

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NOTICE

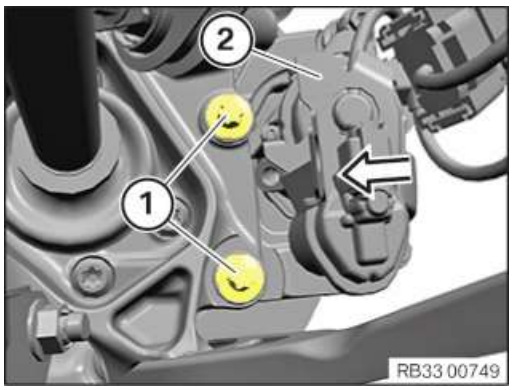
Perform the operations on the left and right side.

▸ **Securing the brake caliper**



- Release and remove special tool 2 413 317.

  The brake caliper must not hang on the brake hose.

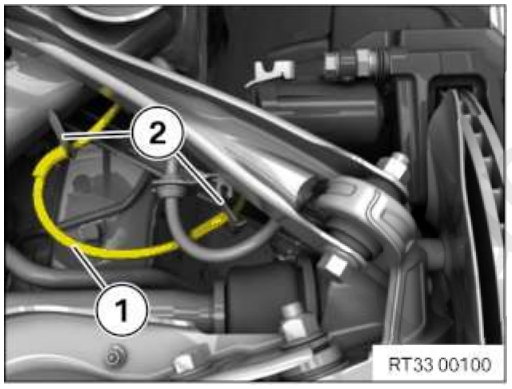


- Position the brake caliper (2) in the direction of the arrow.
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

Caliper carrier to rear wheel carrier

M12	Renew screw.	Tightening torque	130 Nm



- Fasten the cable for the parking brake (1) to the holders (2).

NOTICE

Perform this step on the right side only.

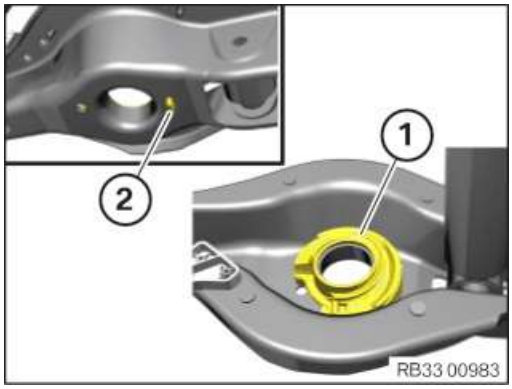
- Fasten the cable for the brake pad wear indicator on the rear axle support.

27 – Install the left and right coil spring

NOTICE

Perform the operations on the left and right side.

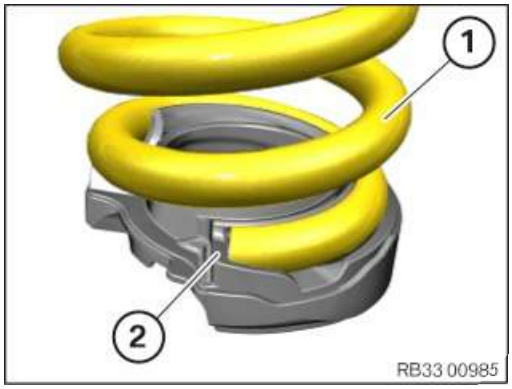
▸ **Install the coil springs**



- Check bottom spring pad (1) for damage, renew if necessary.
- Check the position of the lower spring pad (1) with the plastic tab (2) on the camber control arm, correct if necessary.



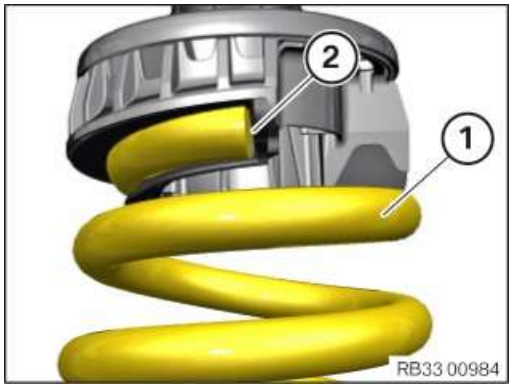
- Feed in the coil spring (1) in direction of arrow from the top and lock.



- Position the coil spring (1) in such a way that the coil spring end is in form-fit contact with the lower spring pad (2).



- Feed in the spring pad at the top (1).



- Position the upper spring pad on the coil spring (1) in such a way that the coil spring end (2) is in form-fit contact with the upper spring pad.

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- Slacken the coil spring with the special tools and . In doing so, counter support at the spindle with the special tool and the standard tool (1).

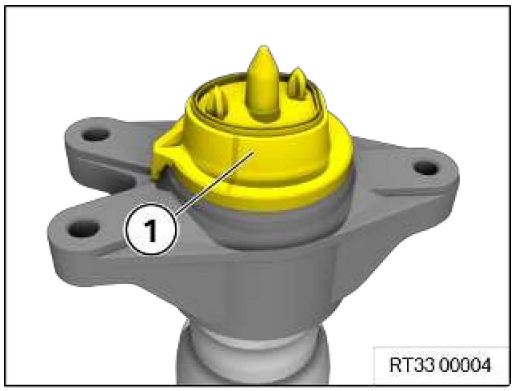
  Standard tool:

  Pay attention to the mounting orientation when releasing the coil spring, correct if necessary.
- Remove special tools.

28 – Securing rear left and right shock absorbers to body

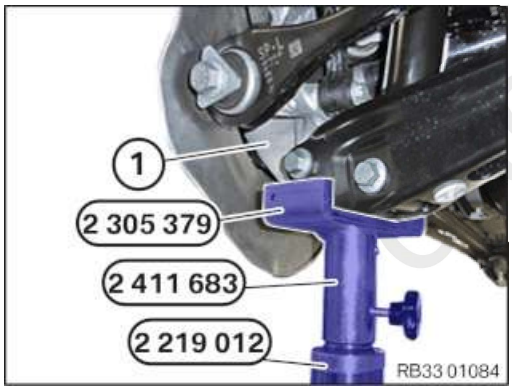
NOTICE

Perform the operations on the left and right side.



▸ **Securing shock absorber at rear to body**

- Check the centering plate (1) for damage, renew if necessary.
- Check the position of the centering plate (1), correct if necessary.



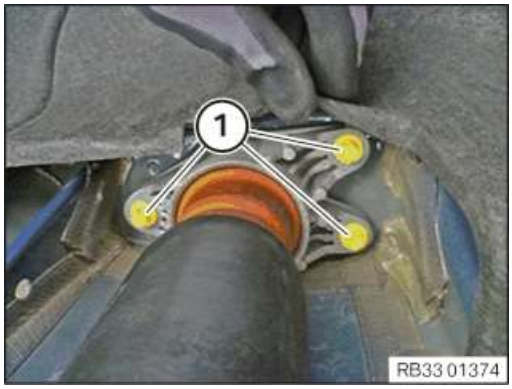
WARNING

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

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

- Position the special tool 2 219 012 with the special tools 2 411 683 and 2 305 379 under the wheel carrier (1).



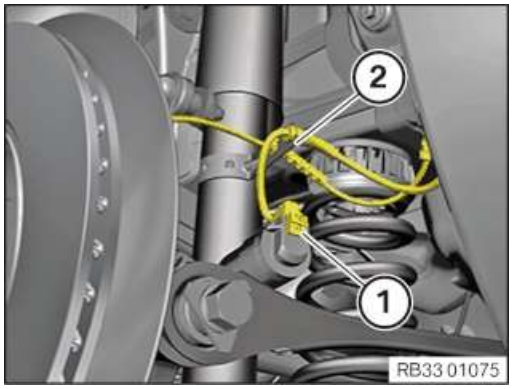
- Slightly lift the wheel carrier with the special tool 2 219 012. Position the shock absorber on the body in the process.

  Do not press against the spring force of the coil spring.
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8x40	Renew screws.	Tightening torque	28 Nm



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

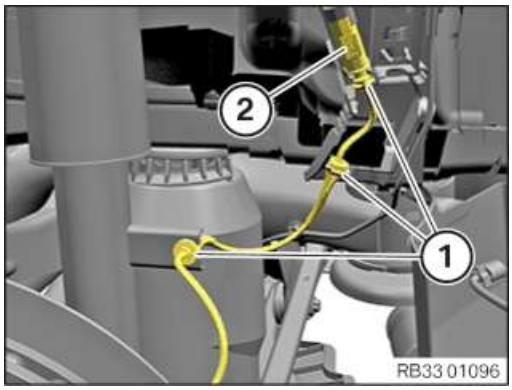
- Secure all existing cables on the holder (2).
- Connect connectors (1) and lock.

29 – Securing cable of rear left and right wheel speed sensor

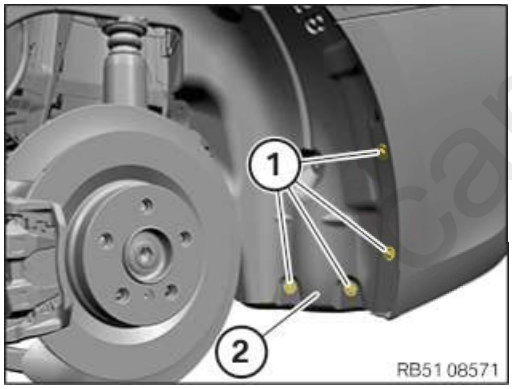
NOTICE

Perform the operations on the left and right side.

▸ **Mounting the cable of the rear wheel speed sensor**



- Connect connectors (2) and lock.
- Mount the cable of wheel speed sensor on the holders (1).

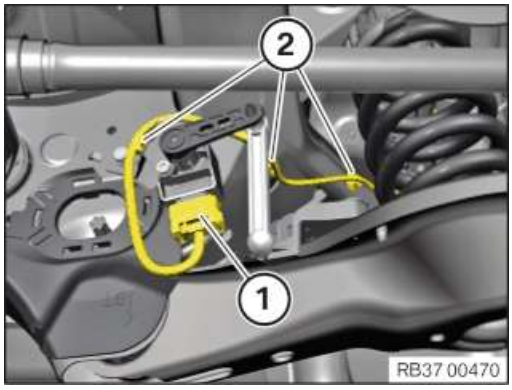


- Insert the wheel arch cover (2).
- Tighten the screws (1).

Rear wheel arch cover to bumper trim panel

Hexagon screw		Tightening torque	2,6 Nm

30 – Fastening the cable for the ride height sensor on the rear axle support



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Secure the cable with the holders (2) on the rear axle support.
- Connect the connector (1) to the ride height sensor and lock it.

31 – Securing the propeller shaft on the rear axle differential

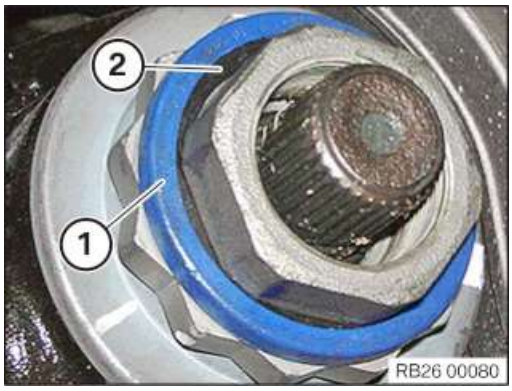
cardiagn.com

RISK OF DAMAGE

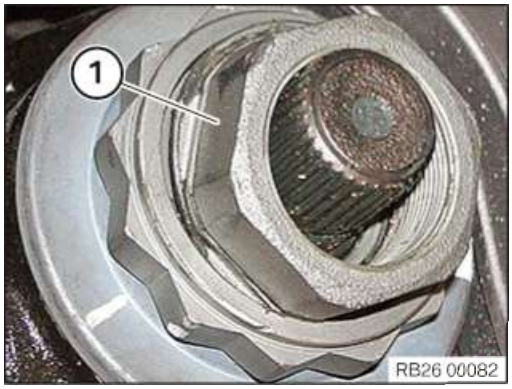
Damage to the propeller shaft during installation.

Non-observance of the installation guidelines for the propeller shaft on the rear axle differential may cause severe damage.

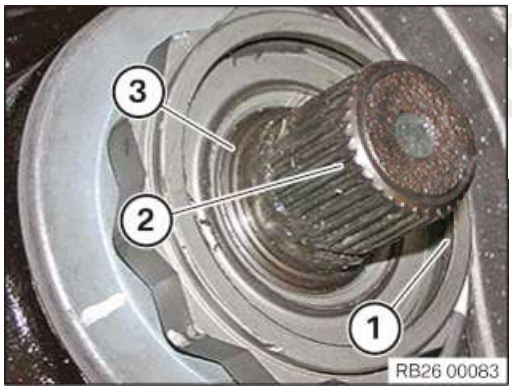
- Always renew the recessed nut on the rear axle differential. Screw locking must be available.
- Strictly observe a hardening time of minimum 3 h after screwing the recessed nut. The hardening time may be longer at lower temperatures.



- Remove the retaining ring (1) and the seal (2).



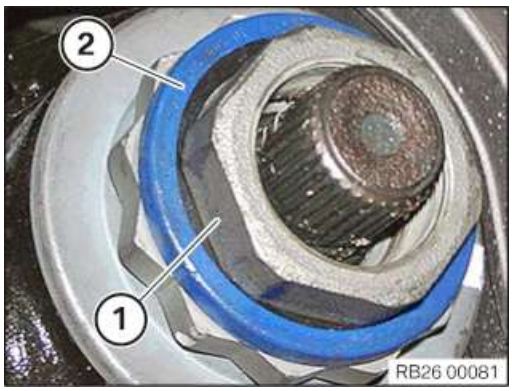
- Remove recessed nut (1).



- Clean and degrease the recessed collar (1) the flange nut, the gearing on the bevel pinion (2) and the taper (3) without any residue.
- Top up the collar insert (1)with grease.

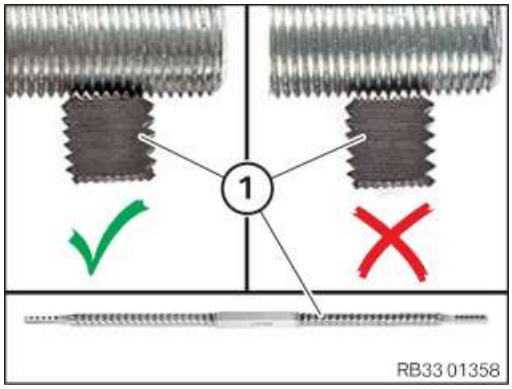
Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754



- Renew the recessed nut (1), seal and retaining ring (2).

  Parts: Recessed nut, seal, retaining ring
- Insert recessed nut (1) including gasket into collar insert of the flange nut.
- Mount the retaining ring (2).



- Use a thread file (1) to remove the adhesive residue on the thread.
- **Make sure that the thread pitch is correct!**



RISK OF DAMAGE

Damage to the output flange.

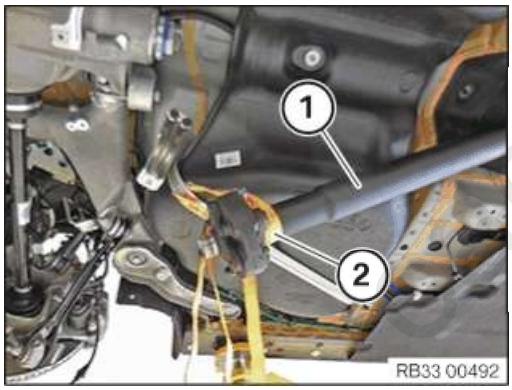
Failure to observe the greasing specifications may lead to damage on the output flange.

- Do not contaminate the thread of the output flange with grease.

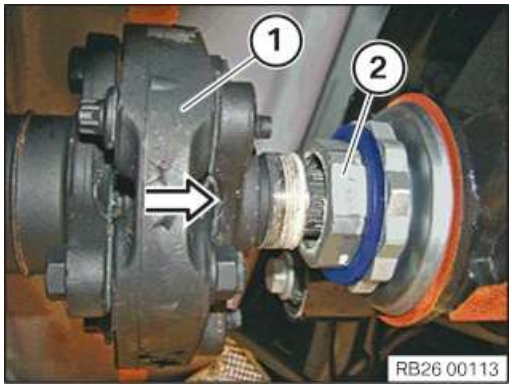
- Remove any adhesive residue on thread (1) of the flange and clean it.
- Clean gearing (2).
- Grease gearing (2).

Expendable materials

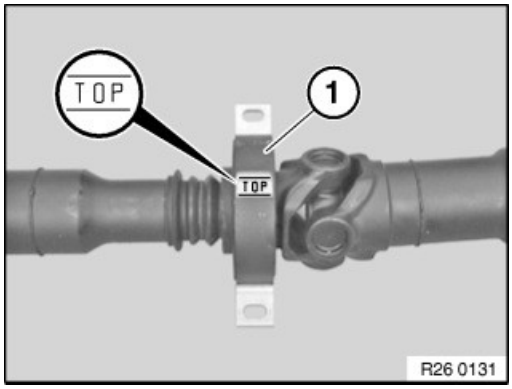
Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754



- Loosen the tensioning strap (2) from the propeller shaft (1).

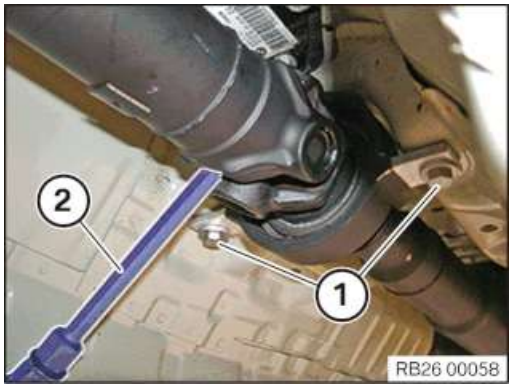


- Push the propeller shaft (1) in the direction of the arrow against the recessed nut (2) up to the limit position.
- Screw and secure recessed nut (2) at least 2 thread starts onto propeller shaft (1) by hand.



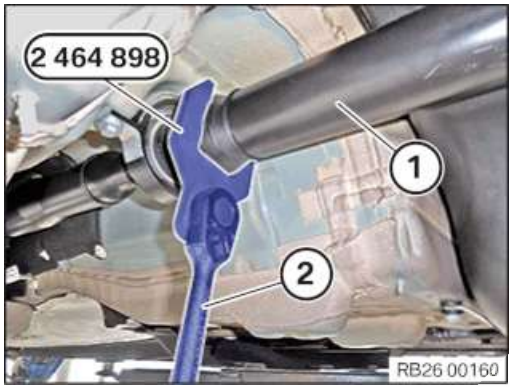
- Position the centre mount (1).

  Position the centre mount (1) with the designation TOP at the top in the transmission tunnel.



- Screw in the screws (1) by a few turns.
- **Version with a broad universal joint:**

  Secure the propeller shaft from twisting with a suitable tool (2) on the centre universal joint.



- **Version with a narrow universal joint:**

  Secure the propeller shaft (1) from twisting with the special tool 2 464 898 and a suitable tool (2) on the centre universal joint.



RISK OF DAMAGE

Damage to the flange nut.

Failure to observe the installation specifications may lead to serious damage to the flange nut and the rear axle differential.

- Do not use the double hexagon flange nut as counter support.
- Screw in the recessed nut within 5 minutes.

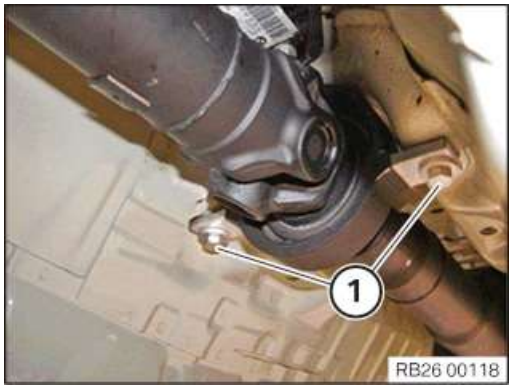
- Tighten recessed nut **counter-clockwise in the direction of the arrow** using special tools 0 495 554 (33 5 070) and .

Propeller shaft on the rear axle differential

Insert nut	Replace insert nut.	Tightening torque	100 Nm

- **After the propeller shaft is installed and the recessed nut is screwed in, strictly observe a hardening time of minimum 3 hours.**

  Do not move or push the vehicle during this time!



- Tighten the screws (1).

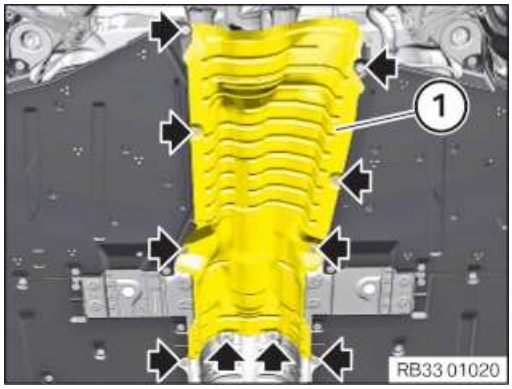
Centre mount to body

M8		Tightening torque	19 Nm

32 – Installing the rear heat shield

NOTICE

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



- Position the rear heat shield (1).
- Tighten the nuts and bolts (arrows).

Heat shield to undercarriage

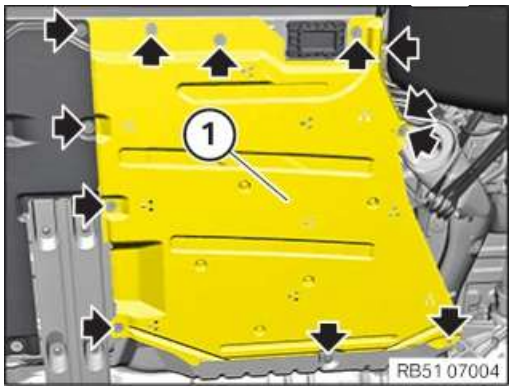
Screws and nuts		Tightening torque	3 Nm

33 – Install left and right tank cover

NOTICE

Perform the operations on the left and right side.

▸ **Installing tank cover**



- Position the tank cover (1).
- Tighten all bolts (arrows).

Underbody panelling

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

34 – Installing the complete exhaust system

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CAUTION

Component with heavy weight.

Danger of injury!

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

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

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

CAUTION

Grinding dust when grinding components.

Hazardous to health!

- Directly draw off the grinding dust.
- Ensure adequate ventilation.
- Conduct all work in appropriate personal protective equipment only.

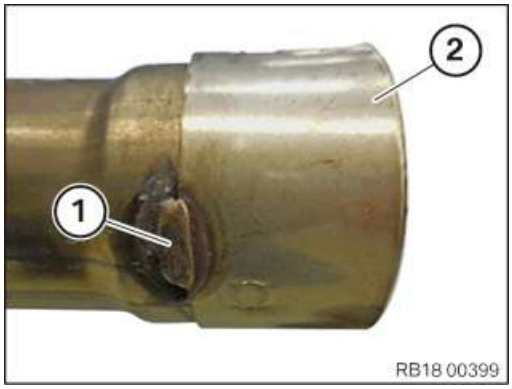
TECHNICAL INFORMATION

Check the exhaust system for tightness after installation.

TECHNICAL INFORMATION

Mount the exhaust system in voltage-free state, maintaining the tightening sequence from the rear silencer towards the exhaust manifold.

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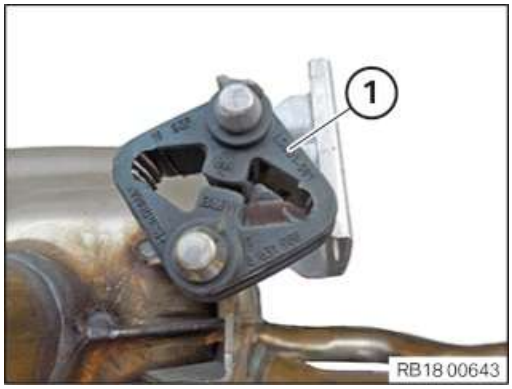
CAUTION

Swarf resulting from sawing or grinding components.

Danger of injury!

- Conduct all work in appropriate personal protective equipment only.
- Wear safety goggles and protective gloves.

- Open the weld seam (1) with a standard tool.
- Remove the clamp (2).

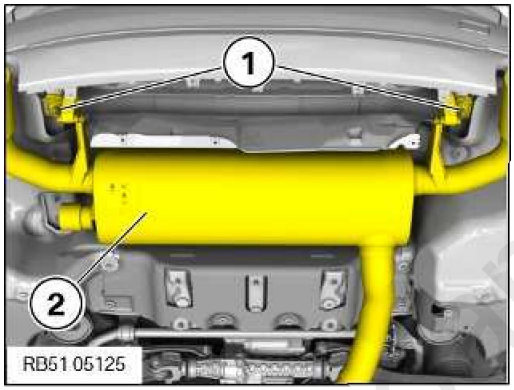


NOTICE

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

- Check all the rubber mounts (1) of the exhaust system for damage.
- Replaced damaged rubber mounts.

  Parts: Rubber mount

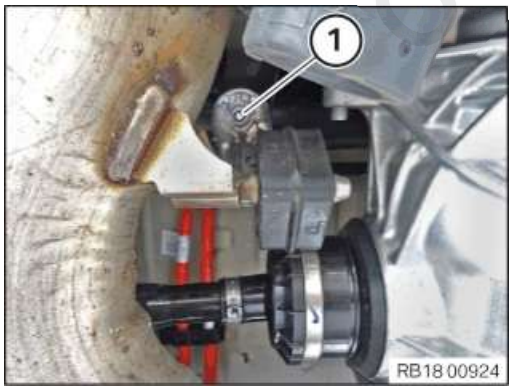


- Insert and install the exhaust system (2).
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Rear silencer to body / bumper support

M8	Replace nuts.	Tightening torque	19 Nm



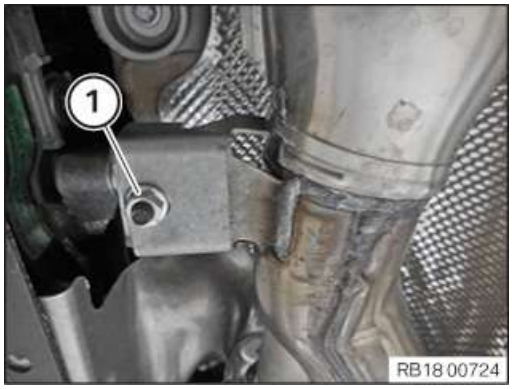
- Renew nut (1) on the rear axle support.

  Parts: Nut
- Tighten nut (1).

Exhaust system to rear axle carrier

M8 nut		Tightening torque	19 Nm

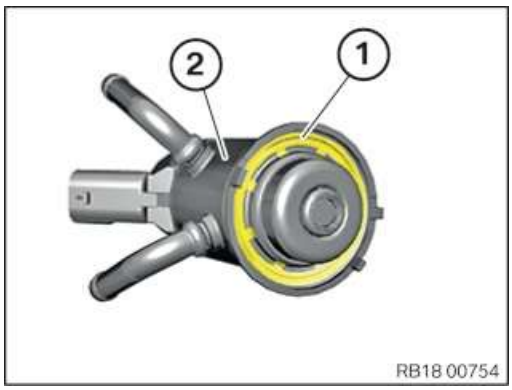
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- Tighten nut (1).

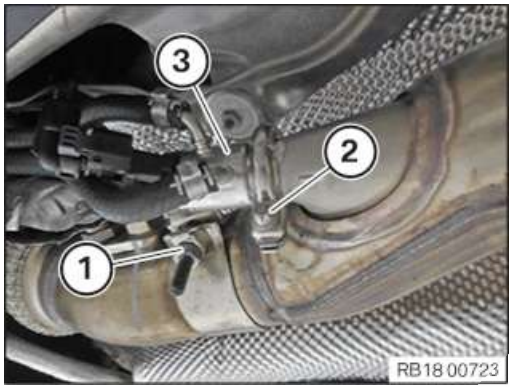
Exhaust system to transmission

M8		Tightening torque	19 Nm



- Renew sealing ring (1) of the SCR metering module (2).

  Parts: Sealing ring



- If necessary, renew clamp (1).

  Parts: Clamp
- Tighten clamp (1).

Exhaust system to diesel particle filter

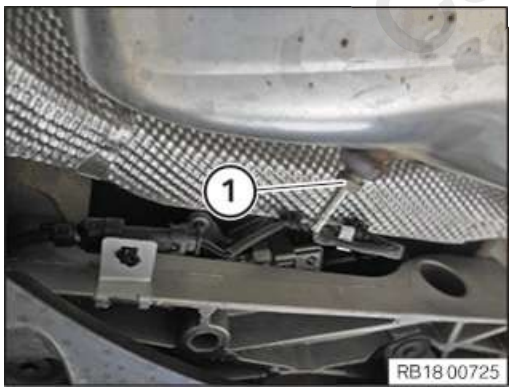
M8	If necessary, renew clamp.	Tightening torque	26 ±2 Nm

- Renew the V-clip (2).

  Parts: V-band clamp
- Install the SCR metering module (3) in the exhaust system.
- Tighten the V-clip (2) of the SCR metering module (3).

SCR metering module V-clip to exhaust system

V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

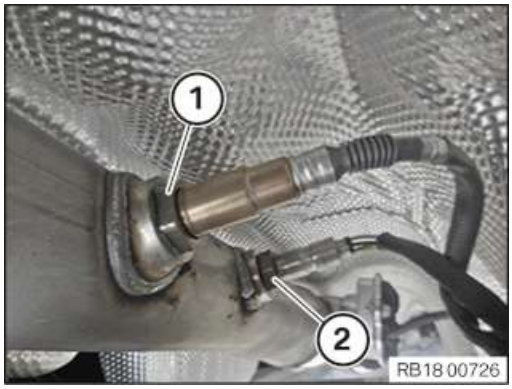


- Install the exhaust temperature sensor (1) in the exhaust system and tighten.

Exhaust-gas temperature sensor upstream of SCR catalytic converter

Sensor		Tightening torque	30 Nm

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- Install the diesel particulate sensor (1) in the exhaust system and tighten.

Diesel particulate sensor to exhaust system

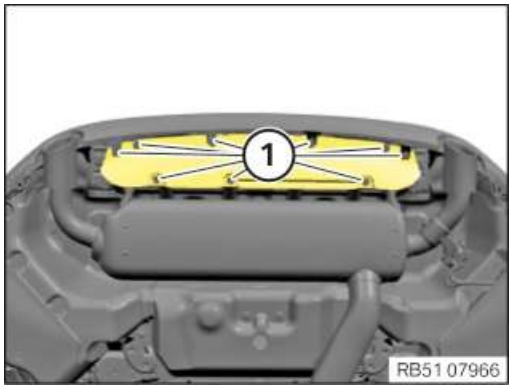
Sensor		Tightening torque	50 Nm

- Install the nitrogen oxide sensor (2) in the exhaust system and tighten.

Nitrogen oxide sensor downstream of SCR catalytic converter

Sensor		Tightening torque	55 Nm

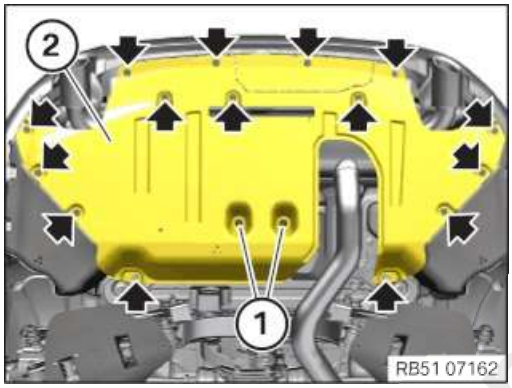
▸ **Installing the rear diffuser**



- **Version 1:**
- Install the diffuser and tighten the nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser / underbody panelling

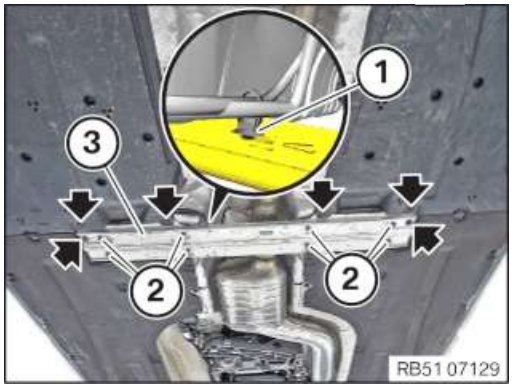
Nuts and screws		Tightening torque	3 Nm

- Tighten nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

▸ **Install the connecting supports on the tunnel**



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).
- Tighten screws (arrows).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

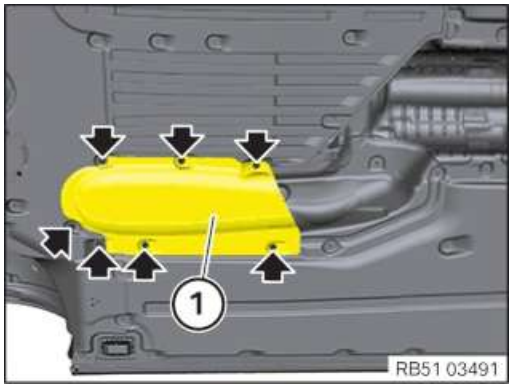
- Secure the clamp (1).

▸ **Install the underbody panelling of the transmission on the side**

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Insert the underbody panelling (1).
- Tighten screws (arrows).

Underbody panelling

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

35 – Installing the rear wheel arch cover on the right

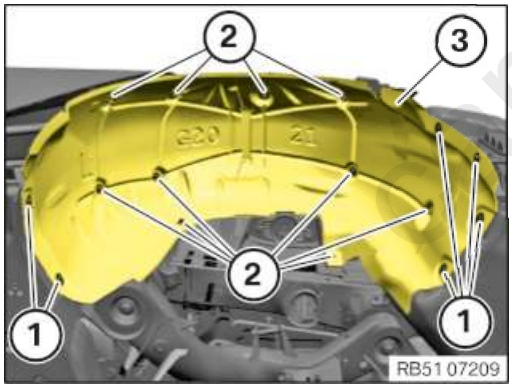
NOTICE

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

▸ **Removing the rear wheel arch cover**

NOTICE

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



- Guide the wheel arch cover (3) in.
- Tighten the screws (1).
- Tighten nuts (2).

Wheel arch cover

Screw		3 Nm
Plastic nut		2,6 Nm

36 – Installing the rear wheel on the left and right

NOTICE

Perform the operations on the left and right side.

▸ **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.

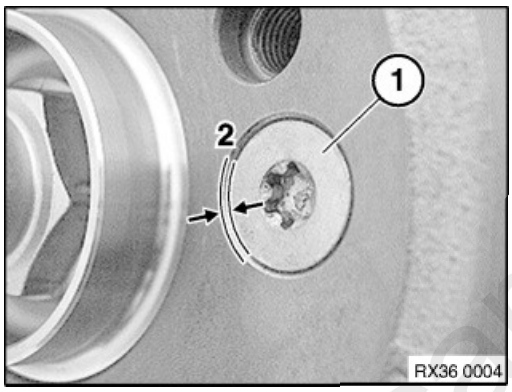
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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).



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

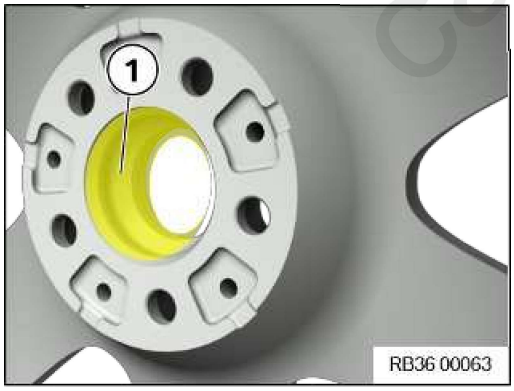
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

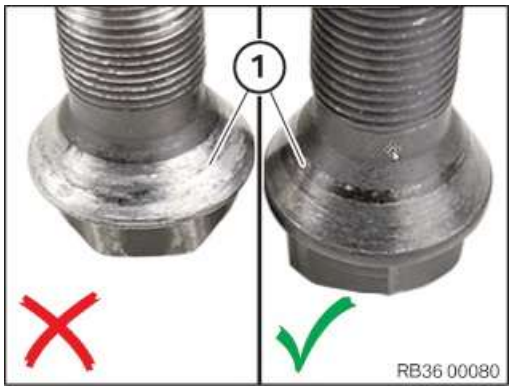
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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 the corroded wheel bolts (arrows).

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

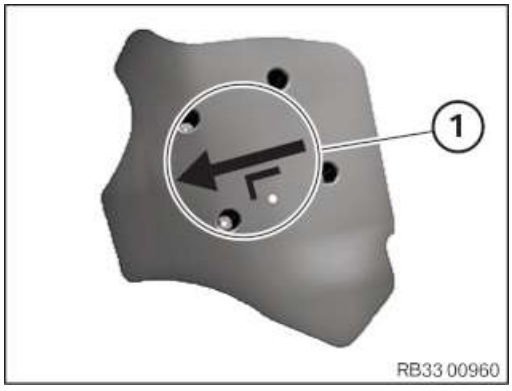
Wheel bolts

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

37 – Install the cover of the camber control arm on the left and right

NOTICE

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



▸ **Installing the cover of the camber control arm**

- It is imperative to note the installation location and direction of installation (1).

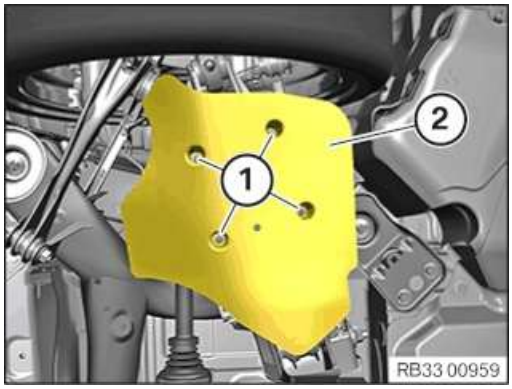
  Direction of installation (1):

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right

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- Position the cover (2) of the camber control arm on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

38 – Filling the fuel tank



- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Slide the suction hose (1) of the extractor unit about 40 cm into the fuel filler neck. If necessary, slightly turn the suction hose.
- Fill fuel from suction extractor unit.
- After completing the work and before starting the engine for the first time: Fill the fuel tank by the fuel filler neck with a minimum of 5 l of fuel.

Additional Information

Overview of Tightening Torques

Fuel filler pipe on upper body — Used in step 21

Nut M6	Renew nut.	Tightening torque	8 Nm

Plastic nut to fuel filler pipe — Used in step 21

Plastic nut	Renew nut.	Tightening torque	3,5 Nm

Fuel filler hose to fuel filler pipe — Used in step 21

Hose clamp		Tightening torque	3,5 Nm

SCR filler pipe to body — Used in step 21

Nut M6		Tightening torque	8 Nm

Rear axle carrier to body — Used in step 23

M12	Renew screws.	Tightening torque	108 Nm

Compression strut on body — Used in step 23

M10	Renew screws.	Jointing torque	47 Nm
		Angle of rotation	45 °

Ground strap to rear axle differential — Used in step 24

M6x20		Tightening torque	8 Nm

Heat shield to servomotor — Used in step 24

M5x10		Tightening torque	5 Nm

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Bracing strut on compression strut/body			Used in step 25
M8		Tightening torque	28 Nm

Caliper carrier to rear wheel carrier			Used in step 26
M12	Renew screw.	Tightening torque	130 Nm

Nut and locknut/self-locking nut			Used in step 28
M8x40	Renew screws.	Tightening torque	28 Nm

Rear wheel arch cover to bumper trim panel			Used in step 29
Hexagon screw		Tightening torque	2,6 Nm

Propeller shaft on the rear axle differential			Used in step 31
Insert nut	Replace insert nut.	Tightening torque	100 Nm

Centre mount to body			Used in step 31
M8		Tightening torque	19 Nm

Heat shield to undercarriage			Used in step 32
Screws and nuts		Tightening torque	3 Nm

Underbody panelling			Used in step 3334
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Rear silencer to body / bumper support			Used in step 34
M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to rear axle carrier			Used in step 34
M8 nut		Tightening torque	19 Nm

Exhaust system to transmission			Used in step 34
M8		Tightening torque	19 Nm

Exhaust system to diesel particle filter			Used in step 34
M8	If necessary, renew clamp.	Tightening torque	26 ±2 Nm

SCR metering module V-clip to exhaust system			Used in step 34
V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

Exhaust-gas temperature sensor upstream of SCR catalytic converter			Used in step 34
Sensor		Tightening torque	30 Nm

Diesel particulate sensor to exhaust system			Used in step 34
Sensor		Tightening torque	50 Nm

Nitrogen oxide sensor downstream of SCR catalytic converter			Used in step 34
Sensor		Tightening torque	55 Nm

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Diffuser / underbody panelling — Used in step 34

Nuts and screws		Tightening torque	3 Nm

Connecting support to tunnel — Used in step 34

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Wheel arch cover — Used in step 35

Screw			3 Nm
Plastic nut			2,6 Nm

Brake disc to front wheel hub — Used in step 36

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 36

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 36

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

Cover to camber control arm — Used in step 37

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 464 898 Open-end spanner



Common — Used in step 831

Usage	Open-end spanner SW50 for disassembly and installation of the propeller shaft on rear axle differential. The silhouette foil is included in the delivery specification.
Included in the tool or work	
Storage location	A7
Replaced by	
In connection with	
SI-Number	01 19 18 (579)

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0 495 554 (33 5 070) Extension



Common	Used in step 831
Usage	Pull-out extension for 33 5 040, 33 5 050, 33 5 060.
Included in the tool or work	
Storage location	A18
Replaced by	
In connection with	
SI-Number	01 21 06 (300)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 592 (33 5 071)		**Extension** (Extension (1 item)) discontinued, can only be ordered using complete tool	

2 219 012 Hydraulic lifter



Common	Used in step 1117192228
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)

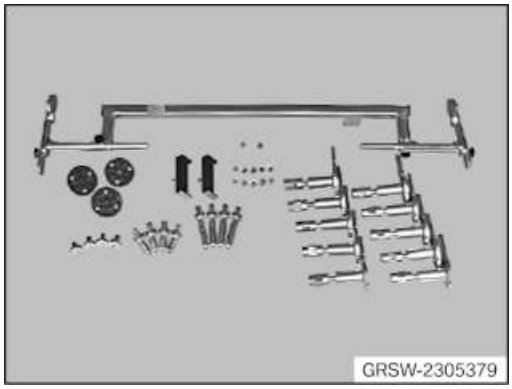
2 411 683 Adapter



Common	Used in step 1128
Usage	Adapter for connecting a mounting plate part number: 2 357 071 on universal hydraulic lifting equipment centrically on piston rod.
Included in the tool or work	
Storage location	B76
Replaced by	
In connection with	
SI-Number	

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2 305 379 Accessories



Common	Used in step 1128
Usage	Holder set for MHT 1200 major assembly table lift and new generation (from 2020)
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	Mobile major assembly table lift MHT 1200 81222184136
SI-Number	06 01 10 (649)

5 A36 B04 Spring cups



Common	Used in step 12
Usage	Spring cup for disassembly and installation of suspension springs on the rear axle in connection with the spring tensioner basic unit, SWZ 33 5 010 or SWZ 33 5 100.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 23 21 (851)

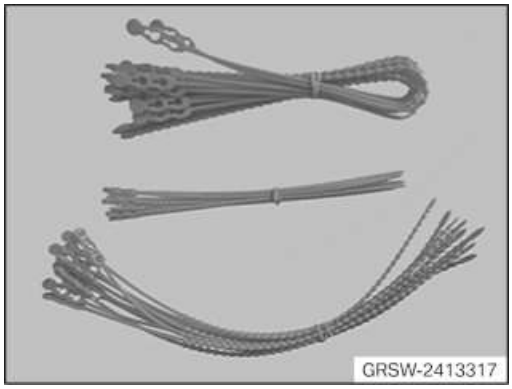
5 A36 B05 Spring cups



Common	Used in step 12
Usage	Spring cup for disassembly and installation of suspension springs on the rear axle in connection with the spring tensioner basic unit, SWZ 33 5 010 or SWZ 33 5 100.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 23 21 (851)

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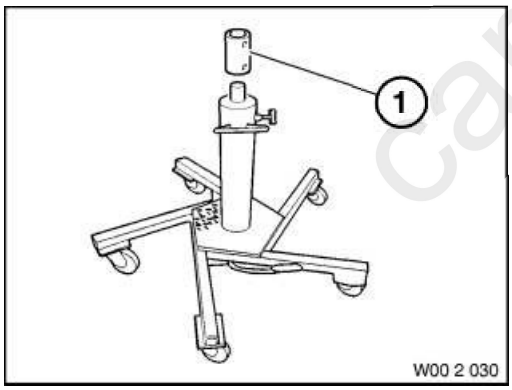
2 413 317 Cable strap



Common Used in step 1326

Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

0 490 133 (00 2 030) Device



Common Used in step 16

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

Consisting of

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

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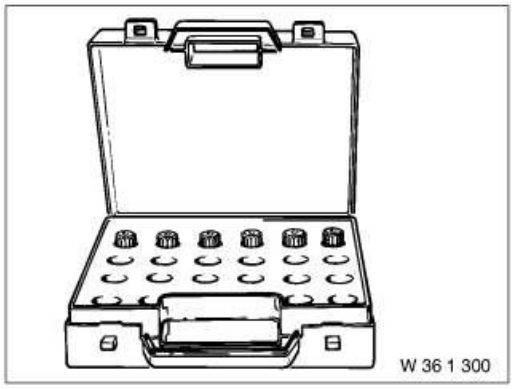
2 344 011 Tool



Common	Used in step 36
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 2
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 2
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 2
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 2
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 2
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 2
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 2
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 2
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
00 02 001 Raising the vehicle using a vehicle lift	236

Operating materials	Used in step
1.1 Grease for propeller shaft inserted	31
1.0 Grease for propeller shaft (flexible disc centring and sliding piece)	31

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16 12 058 Replacing fuel feed line, front

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.
- Detach battery earth lead from battery.
- With auxiliary 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

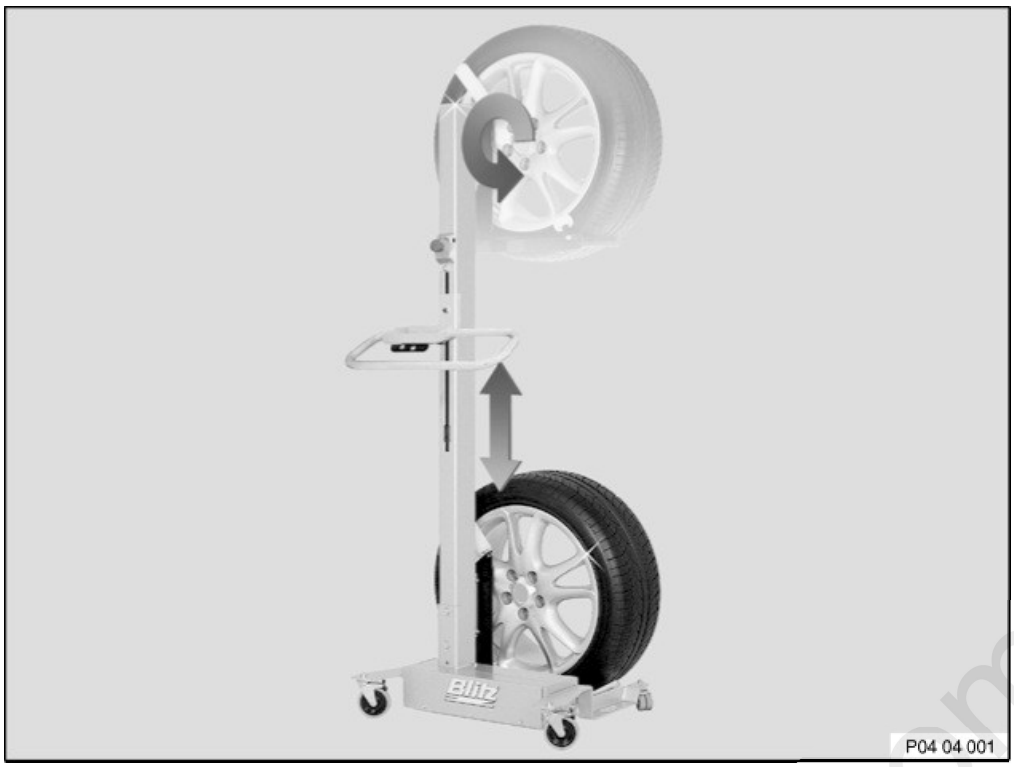
2 – Disconnecting all battery earth leads



- See additional information.

3 – Removing the front left wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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

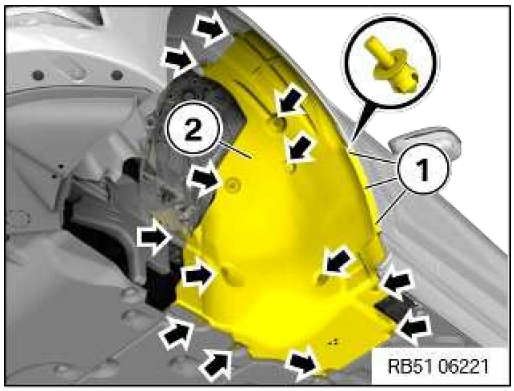


- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

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

NOTICE

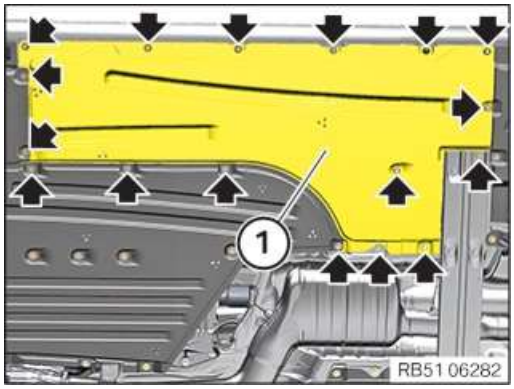
To provide a better overview: Schematic diagram with partially hidden components.



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

5 – Remove side underbody panelling

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- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

6 – Remove DDE 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 ... Notes for ESD protection (electrostatic discharge)

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

Follow instructions for removing and installing control units.

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

TECHNICAL INFORMATION

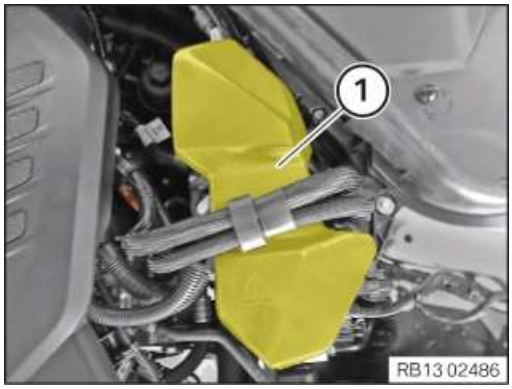
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

TECHNICAL INFORMATION

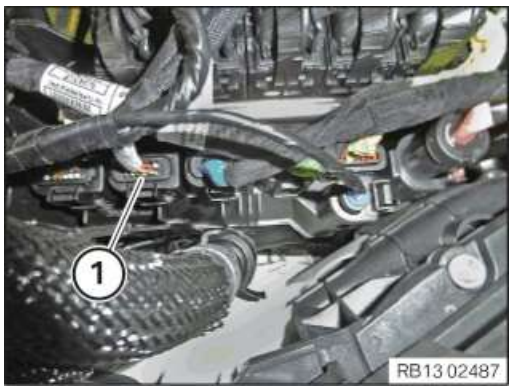
Control unit must be programmed after it is replaced.

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

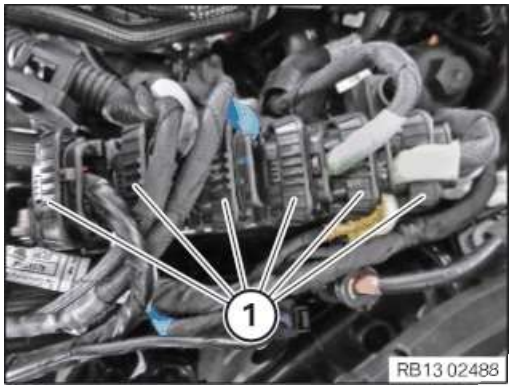
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- Pull off cover (1) upwards, feed out and remove.



- Unlock plug connection (1) and disconnect.



- Unlock and disconnect plug connections (1).



- Release the latch mechanisms (arrows).
- Thread out and remove DDE control unit (1).

7 – Removing integrated supply module (PDM)

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RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

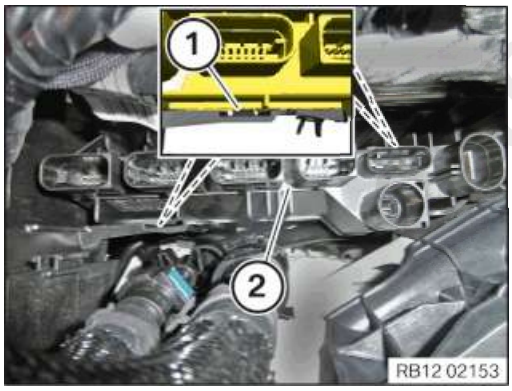
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the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

TECHNICAL INFORMATION

The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.

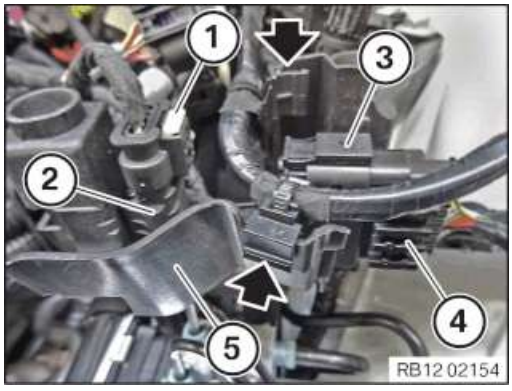


- Unlock and disconnect plug connections (1).



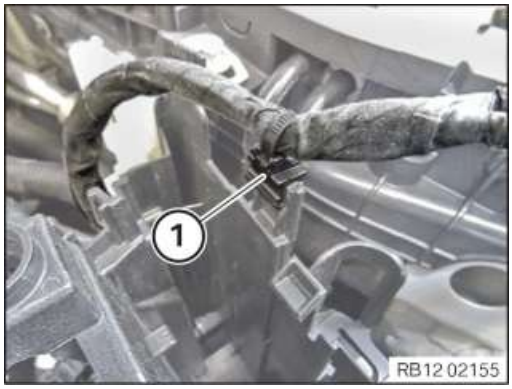
- Loosen the latch mechanisms (1).
- Feed out and remove the integrated supply module (PDM) (2) upwards.

8 – Removing the control unit holder

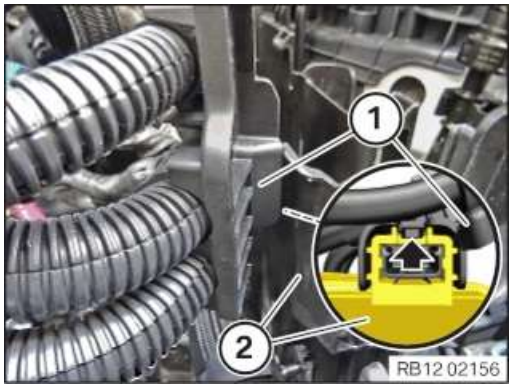


- Unlock plug connection (1) and disconnect.
- Unlock connector (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock connector (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).

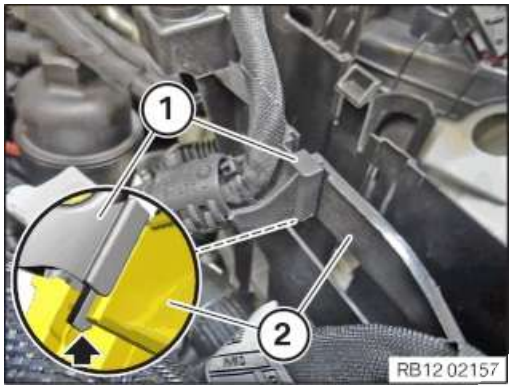
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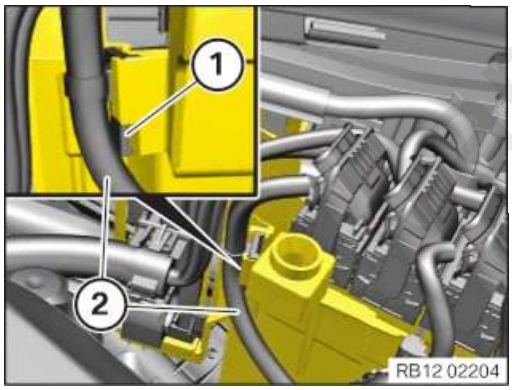
- Loosen clamp (1).



- Unlock the lock (arrow).
- Disconnect cable clip (1) from the control unit holder (2) to the top.



- Unlock the lock (arrow).
- Disconnect cable clip (1) from the control unit holder (2) to the top.

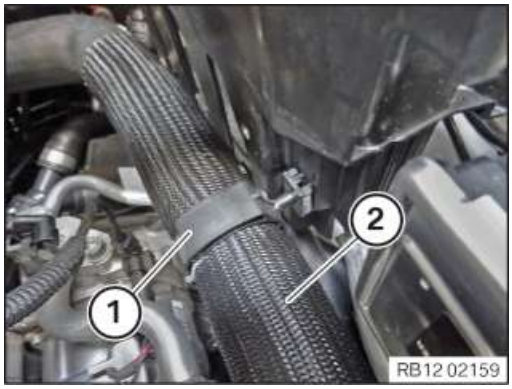


- Unlock and loosen the cable clip (1).
- Remove the wiring harness section (2) and put to one side.

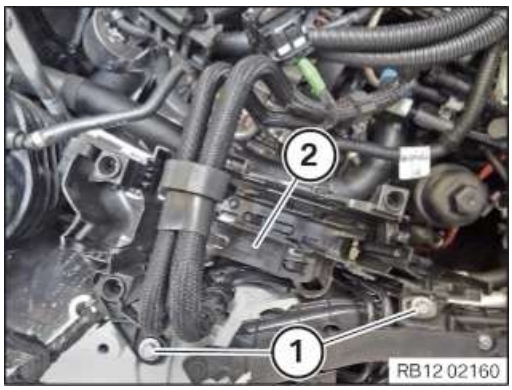


- Unlock the lock (arrow).
- Feed out the cable clip (1) to the top and set it aside.

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- Unlock holder (1), feed out coolant line (2) and place to one side.



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

MAIN WORK

9 – Removing the front fuel feed line

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

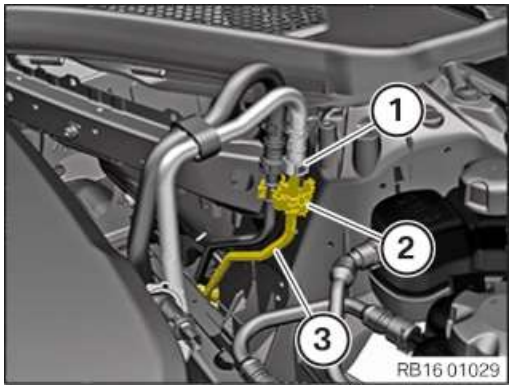
WARNING

Contact with hazardous fluids.

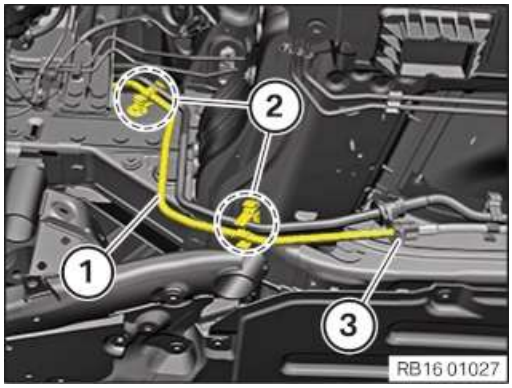
Hazardous to health!

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

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- Unlock and disconnect snap fastener (1).
- Unclip the fuel feed line (3) from the holder (2).



- Unlock and disconnect snap fastener (3).
- Unclip the fuel feed line (1) from the holders (2).

10 – Installing the front fuel feed line

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

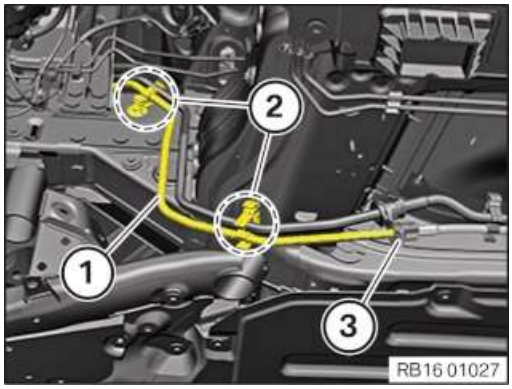
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

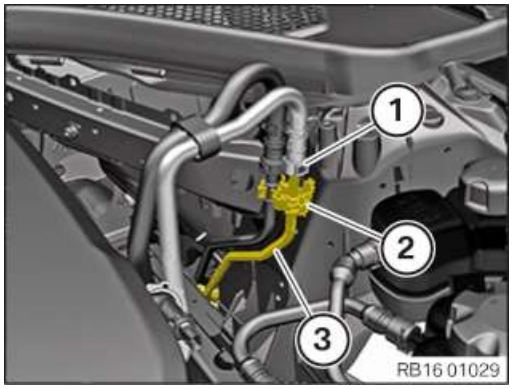
Hazardous to health!

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



- Connect snap fastener (3) and lock.
- Clip the fuel feed line (1) into the holder (2).

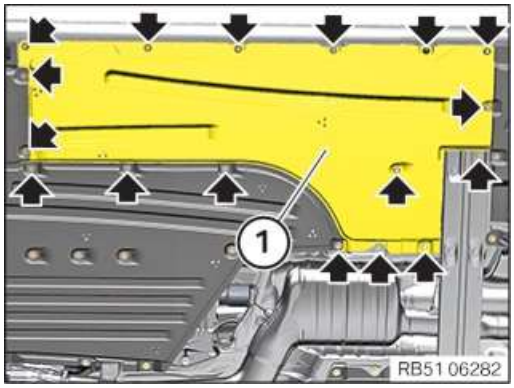
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- Connect snap fastener (1) and lock.
- Clip the fuel feed line (3) into the holder (2).

POSTPROCESSES

11 – Installing the underbody panelling on the sides



- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

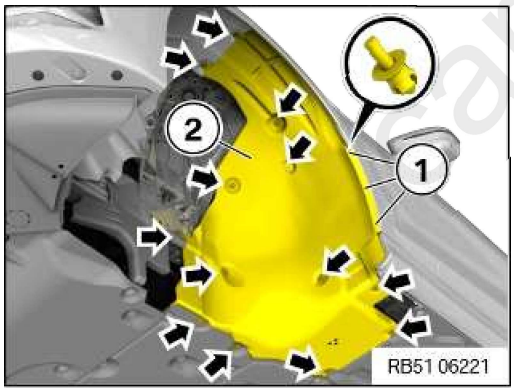
Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

12 – 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).

13 – Attaching the front left wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

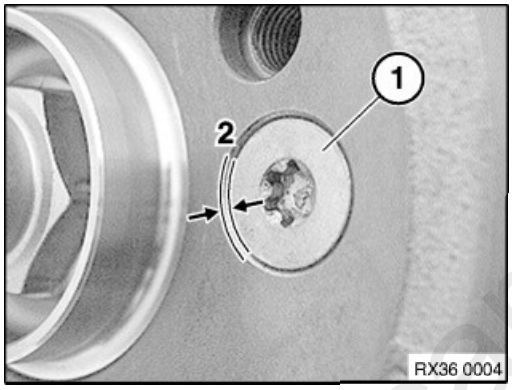
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

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



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

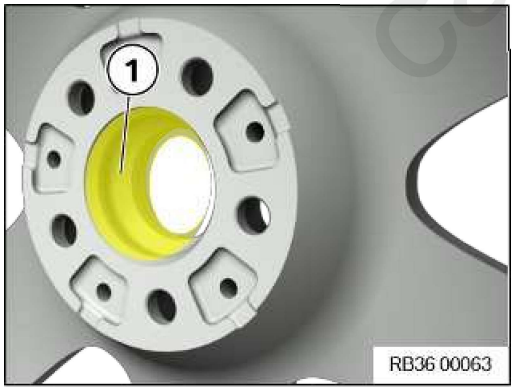
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

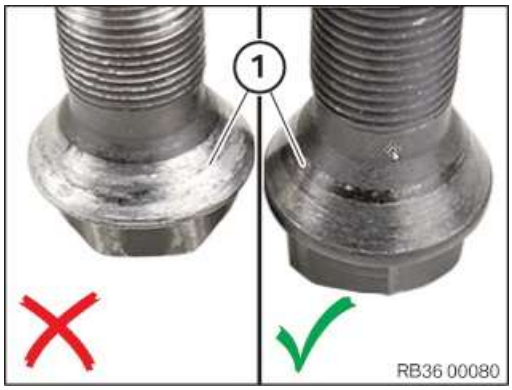
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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.

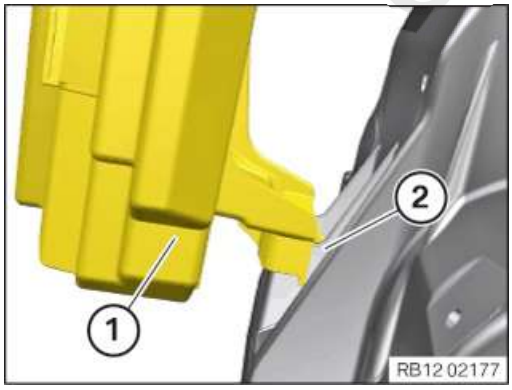
- Renew the corroded wheel bolts (arrows).

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

Wheel bolts

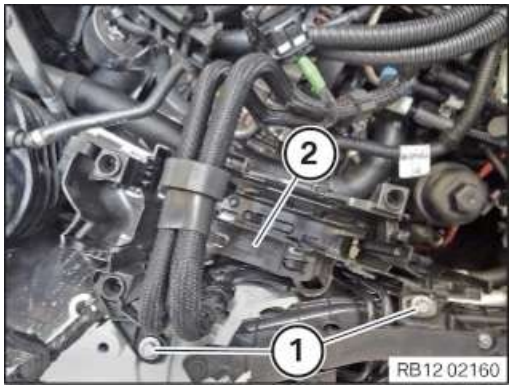
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or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

14 – Installing the control unit holder



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

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

Control unit holder

M6		Tightening torque	8 Nm



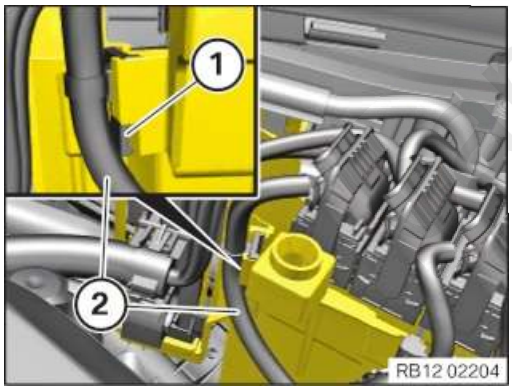
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.

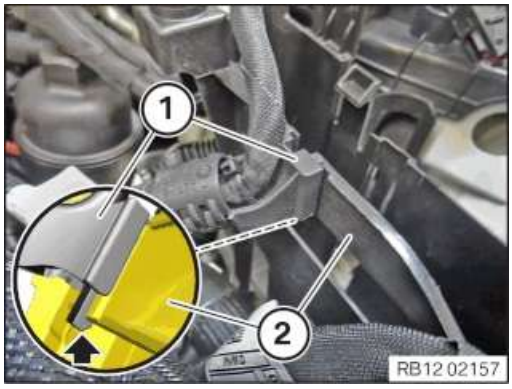


- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.



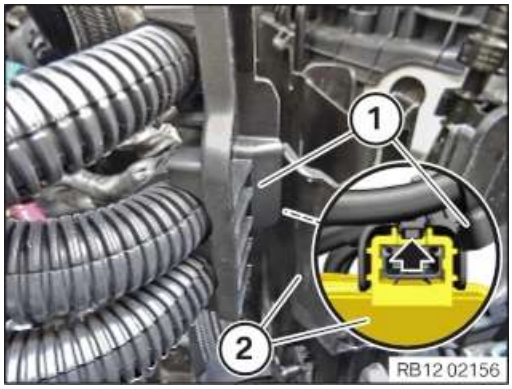
- Guide in the wiring harness section (2) and install.
- Connect and lock the cable clip (1).



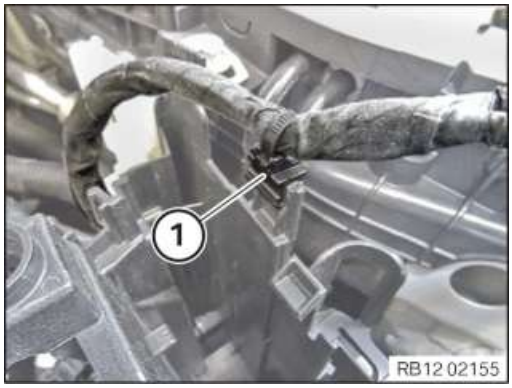
- Connect the cable clip (1) with the control unit holder (2) and lock.

  Lock (arrow) must audibly engage.

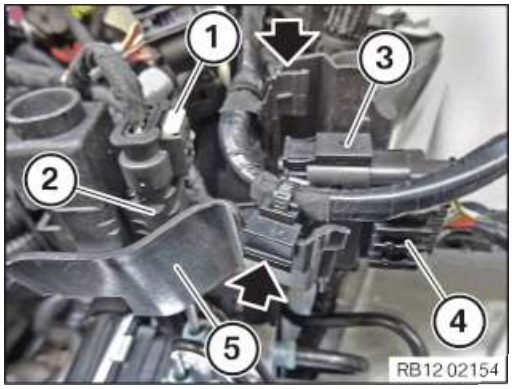
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- Connect the cable clip (1) with the control unit holder (2) and lock.
  Lock (arrow) must audibly engage.



- Secure clamps (1).

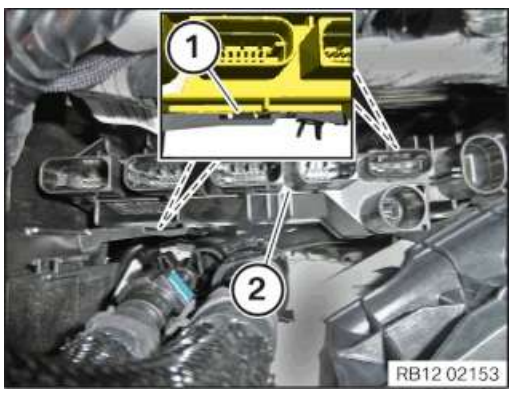


- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
-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

15 – Installing the integrated supply module (PDM)

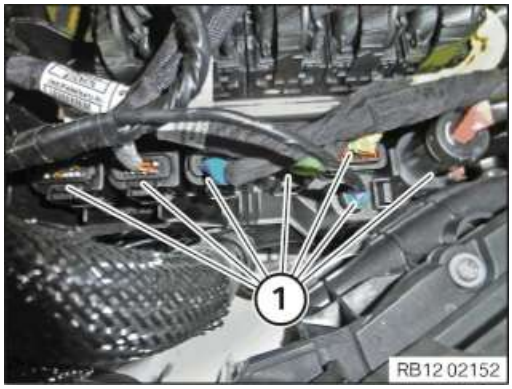
TECHNICAL INFORMATION

The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.



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

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- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

16 – Install DDE control unit

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

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

Control unit must be programmed after it is replaced.

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

TECHNICAL INFORMATION

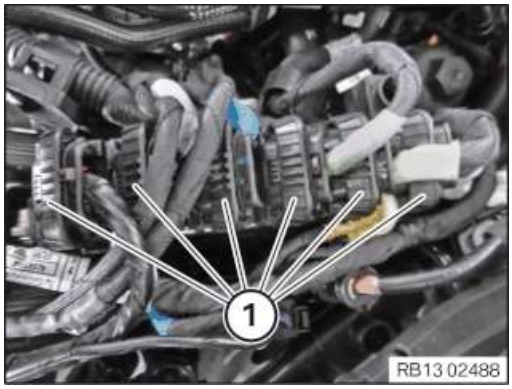
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Install DDE control unit(1).

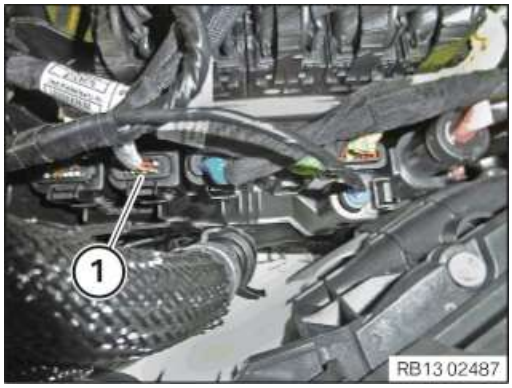
  The latch mechanisms (arrows) must engage audibly.

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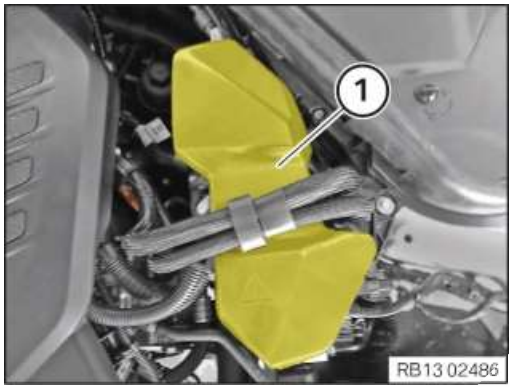
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Insert and install cover (1) into guides.

17 – Connecting all battery earth leads



- See additional information.

18 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

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RISK OF DAMAGE

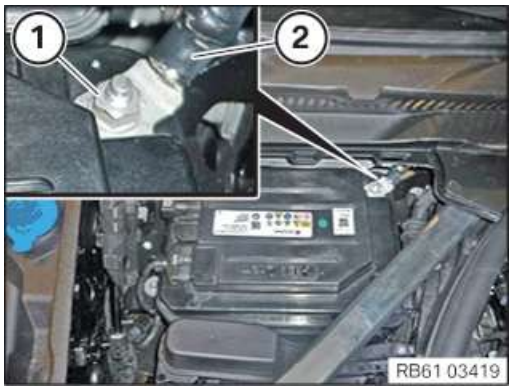
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

Additional Information

Overview of Tightening Torques

Underbody panelling, side			Used in step 11
Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Wheel arch trim panel, front			Used in step 12
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Brake disc to front wheel hub			Used in step 13
M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub			Used in step 13
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 13
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

Control unit holder			Used in step 14
M6		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 18
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

2 344 011 Tool



Common	Used in step 13
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



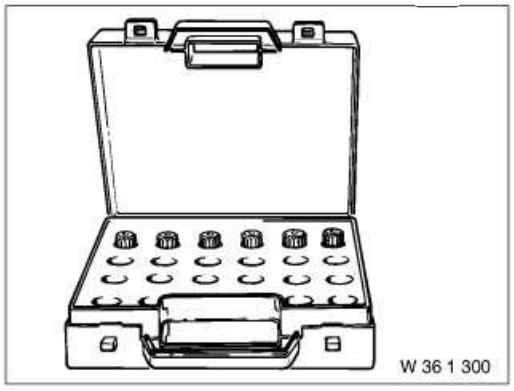
Common	Used in step 3
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 3
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 3
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 3
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 3
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 3
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 229 (36 1 332) Wheel stud



Common	Used in step 3
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 3
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	118

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	616

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
00 02 001 Raising the vehicle using a vehicle lift	313
61 35 ... Notes on ESD protection (Electro Static Discharge)	67
61 35 ... Notes on ESD protection (Electro Static Discharge)	67

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16 12 059 Replacing fuel feed line, rear

PRELIMINARY WORK

1 – Drawing off the fuel tank

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.



- Open fuel filler cap.
- Insert special tool into fuel filler neck.

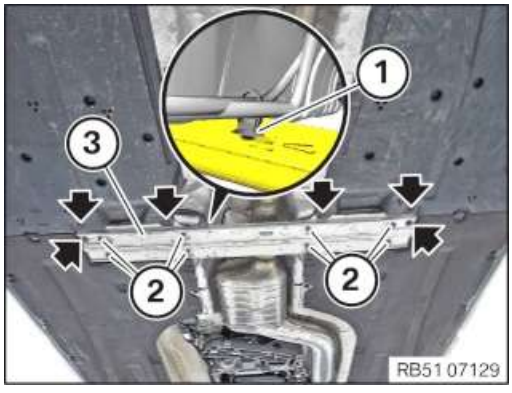
  The special tool has two different diameters for petrol and diesel vehicles.
- Push the suction hose (1) of the extractor unit through the special tool and into the fuel filler neck. If necessary, slightly turn the suction hose.

  For the extractor unit: see BMW service workshop equipment.

  The insertion length of the suction hose is 135 cm.
- Start engine and allow to run, so that the electric fuel pump is running.

  This will ensure that the fuel is pumped by the suction jet pump from the left-hand side of the fuel tank to the right hand-side.
- Draw off fuel with the extractor unit as far as possible. In the process, track the drawing off of the fuel on the fuel gauge in the instrument cluster.

2 – Remove the connecting support from the tunnel



- Remove screws (arrows).

NOTICE

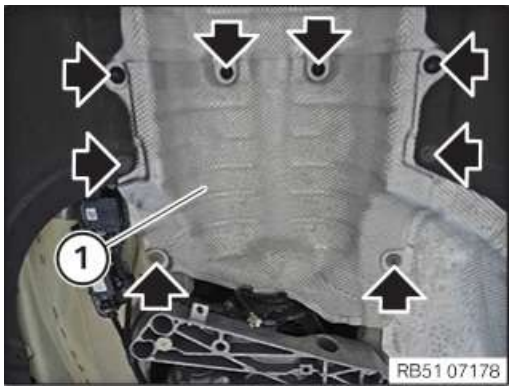
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.

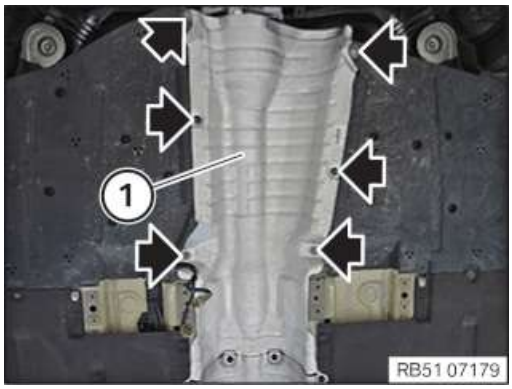
3 – Remove the heat shield

cardiagn.com

3 – Remove the heat shield

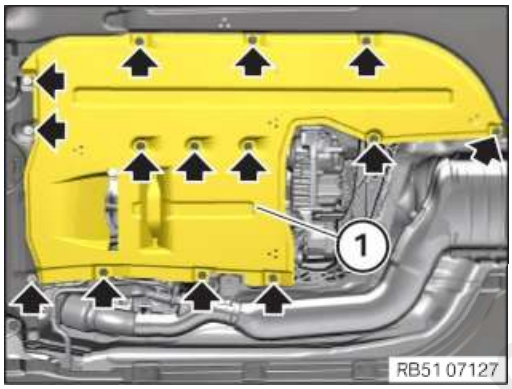


- Loosen bolts and nuts (arrows).
- Remove the heat shield (1).



- Loosen bolts and nuts (arrows).
- Remove the heat shield (1).

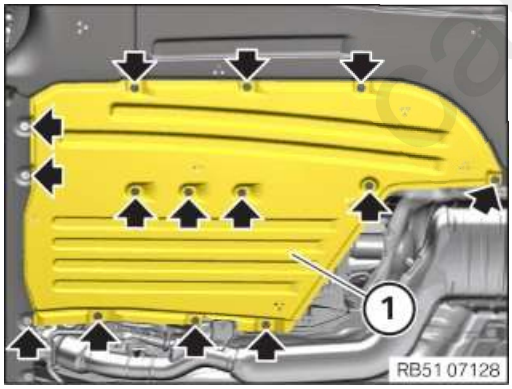
4 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



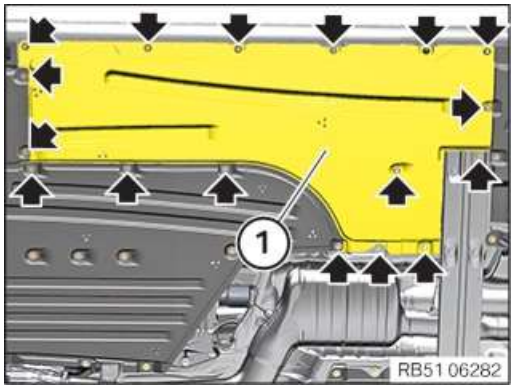
- **Version B:**

  Remove screws (arrows).

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

5 – Remove side underbody panelling

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- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

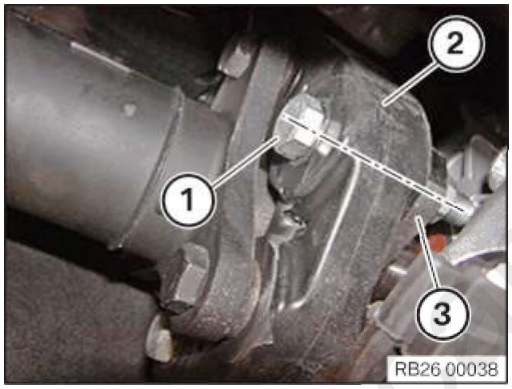
6 – Completely removing the propeller shaft (plug-in - rear flexible disc)

RISK OF DAMAGE

Damage to propeller shaft during removal.

Non-observance of the removal guidelines for the propeller shaft on the rear axle differential may cause severe damage.

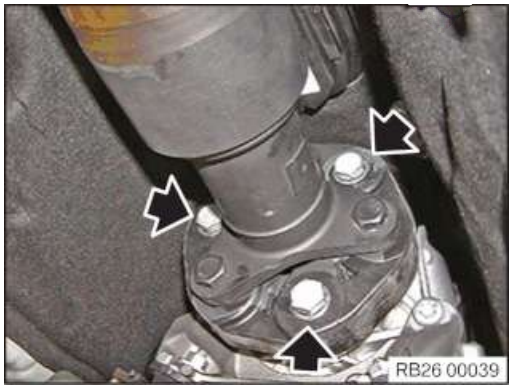
- Do not disassemble the three-hole flange, flexible disc and propeller shaft. The three-hole flange to the rear axle differential is balanced with the flexible disc and propeller shaft.
- Loosen the recessed nut against the direction of travel in clockwise direction. The propeller shaft must be loosened on the recessed nut only and exclusively in the direction of rotation otherwise the anti-twist lock of the bi-hexagonal flange nut is damaged.
- In the event of a damaged anti-twist lock on the bi-hexagonal flange nut: Replace the rear axle differential.



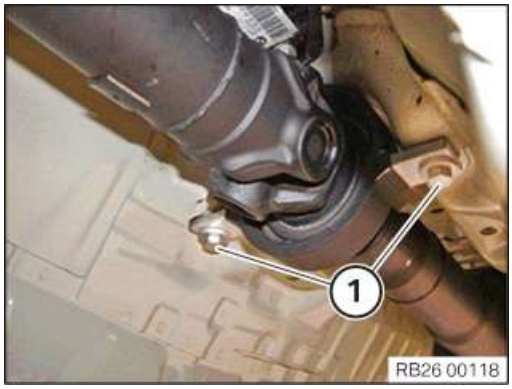
TECHNICAL INFORMATION

Compliance with the following instructions is required to avoid a humming noise from the propeller shaft after refitting the propeller shaft.

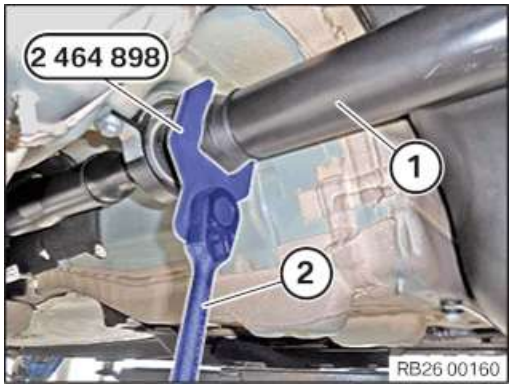
- Before loosening the flexible disc connection (1) at the front of the propeller shaft, it **must** be marked in one plane with the flexible disc (2) and the three-hole flange (3).
- It is essential to reassemble the three-hole flange (3) with the flexible disc (2) in the same position during installation.



- Remove screws (arrows).

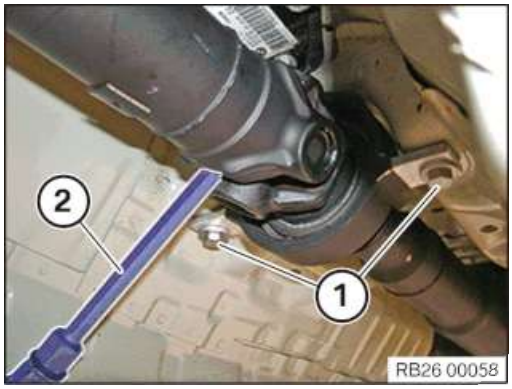


- Loosen screws (1).



- **Version with a narrow universal joint:**

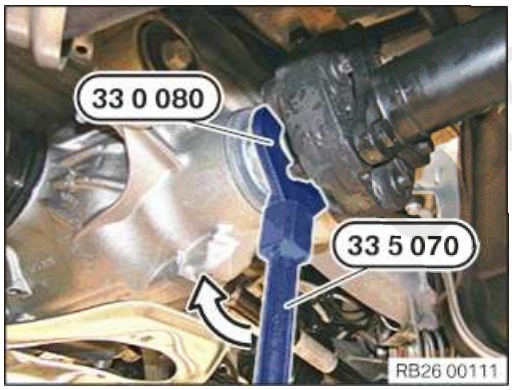
  With the special tool 2 464 898 and a suitable tool (2), secure the propeller shaft (1) on the centre universal joint against twisting.



- **Vehicles with a broad universal joint:**

  Secure the propeller shaft on the centre universal joint with a suitable tool (2) to protect it from twisting.

  Remove the screws (1) of the centre mount only after opening the recessed nuts are removed completely.



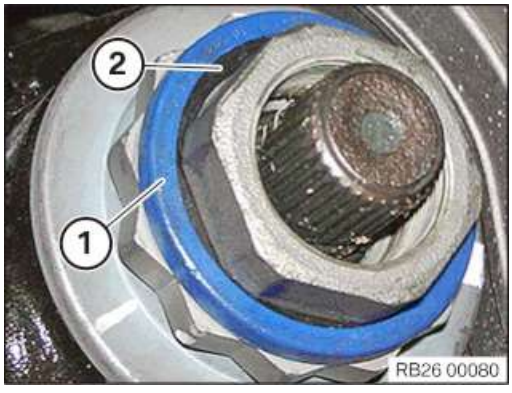
RISK OF DAMAGE

Damage to rear axle differential.

Non-observance of the removal and installation guidelines may cause severe damage to the rear axle differential.

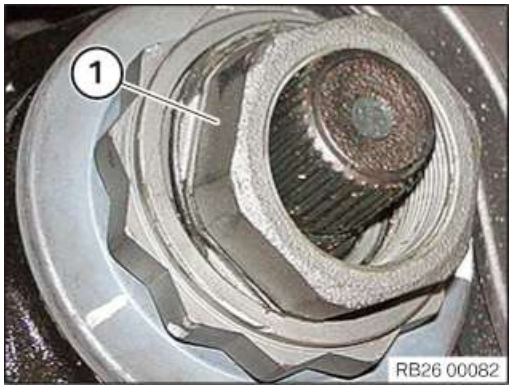
- Do not use the double hexagon head flange nut as counter support.

- Release the recessed nut with the special tools 0 495 554 (33 5 070) and **in the direction of arrow (clockwise)**.



- Remove the mounting clip (1) and the seal (2).

diagn.com



- Remove recessed nut (1).

7 – Removing the rear right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



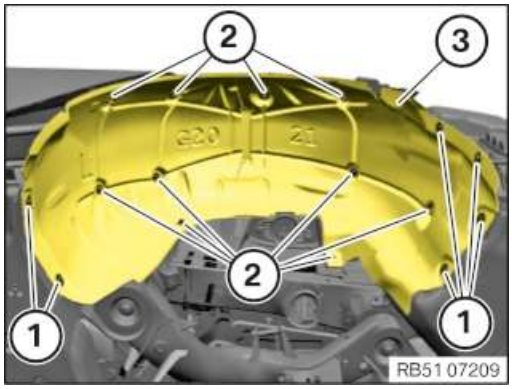
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

8 – Removing rear wheel arch cover

NOTICE

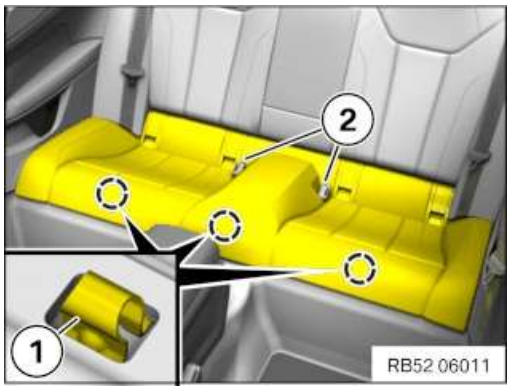
To provide a better overview: Schematic diagram with partially hidden components.

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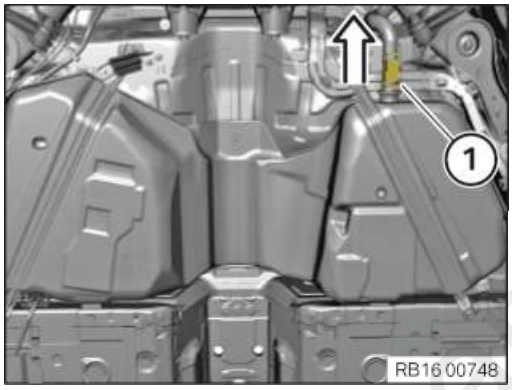
- Loosen screws (1).
- Loosen nuts (2).
- Guide the wheel arch cover (3) out.

9 – Remove rear seat bench

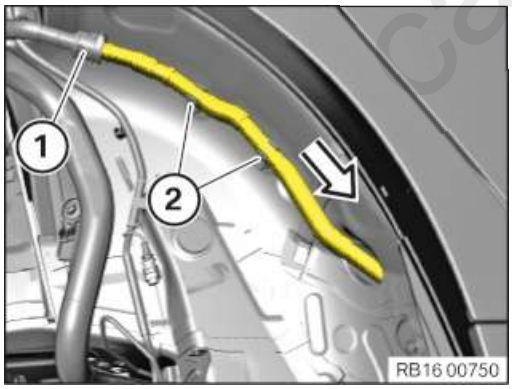


- Unclip the rear seat bench upwards from clamps (1) and guide out seat belt buckles (2).
- Remove the rear seat bench.

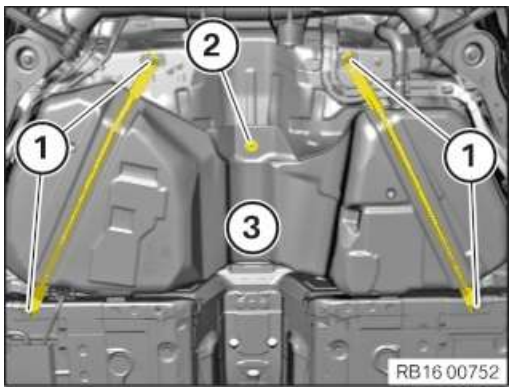
10 – Remove fuel tank



- Loosen hose clamp (1).
- Pull off rubber hose from fuel tank in direction of arrow.



- Unlock and disconnect snap fastener (1).
- Detach the fuel filler neck breather pipe from the holder (2).
- During lowering of the fuel tank: Feed the fuel filler neck breather pipe through the body n the direction of the arrow.



- Support the fuel tank (3)**extensively**.
- Unscrew the screws (1) and remove the retaining straps.
- Unscrew the nut (2) and lower the fuel tank (3).

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11 – Removing the feed line at the rear

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

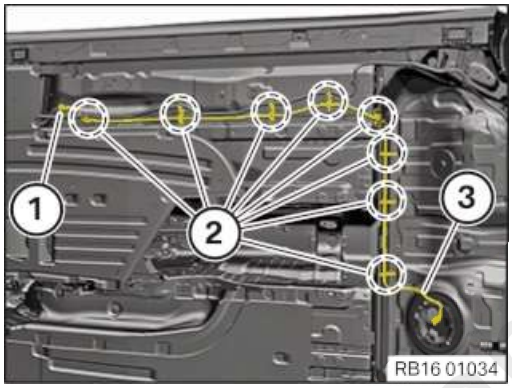
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

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



- Unlock and disconnect snap fastener (1).
- Unclip the feed line (3) from the holders (2).

12 – Installing the feed line at the rear

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

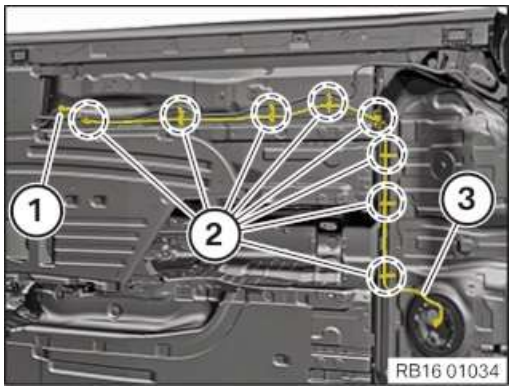
cardiagn.com

WARNING

Contact with hazardous fluids.

Hazardous to health!

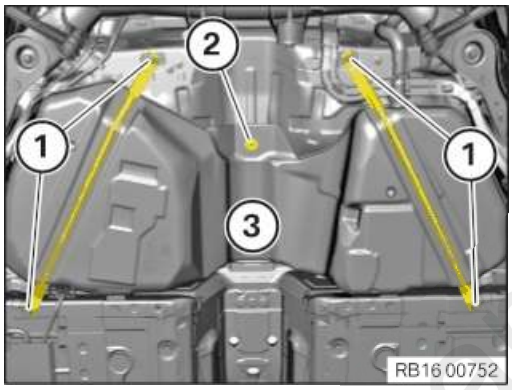
- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.



- Connect snap fastener (1) and lock.
- Clip the feed line (3) into the holder (2).

POSTPROCESSES

13 – Install fuel tank



- Raise the fuel tank (3) while feeding the fuel filler neck breather pipe through the rear axle support.
- Guide the fuel filler neck breather pipe through the body into the wheel arch.
- Raise the fuel tank (3) to the installation position while paying attention to the installation position of the fuel filler neck breather pipe.
- Renew nut (2).

  Parts: Nut
- Fit nut (2) and tighten.

Fuel tank to body

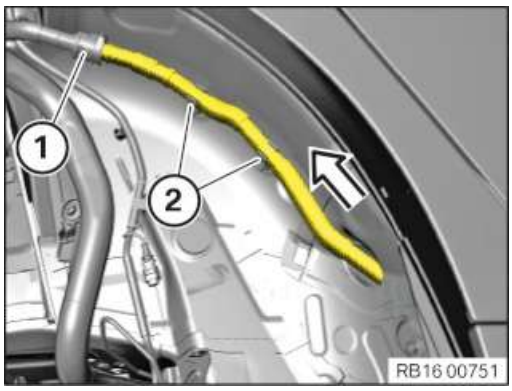
Nut M8	Renew nut.	Tightening torque	19 Nm

- Renew screws (1).

  Parts: Bolts
- Mount the retaining straps and position and tighten the screws (1).

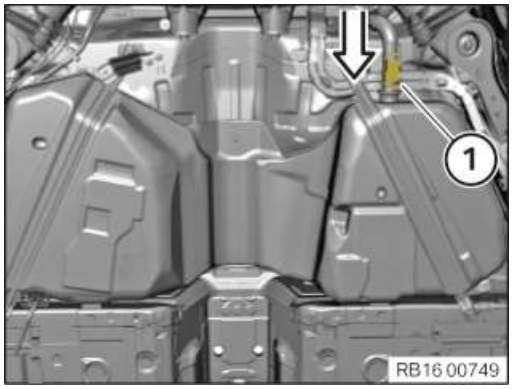
Fuel tank retaining strap to body

M8 screw	Renew screws.	Tightening torque	19 Nm



- Attach the fuel filler neck breather pipe in the brackets (1).
- Position snap fastener (2) and lock.

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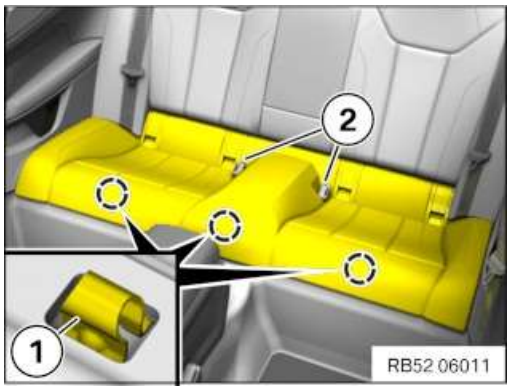
- Mount rubber hose on fuel tank in direction of arrow.
- Renew the hose clamp (1).

  Parts: Hose clamp
- Position hose clamp (1) and tighten.

Filling hose on fuel tank

Hose clamp	Replace hose clamp.	Tightening torque	4 Nm

14 – Installing the rear seat bench

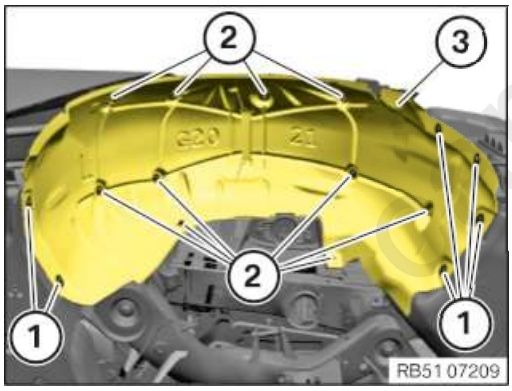


- Feed in the seat belt buckles (2).
- Position the rear seat bench and clip into the clamps (1).

15 – Removing the rear wheel arch cover

NOTICE

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



- Guide the wheel arch cover (3) in.
- Tighten the screws (1).
- Tighten nuts (2).

Wheel arch cover

Screw		3 Nm
Plastic nut		2,6 Nm

16 – Mounting the rear right wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

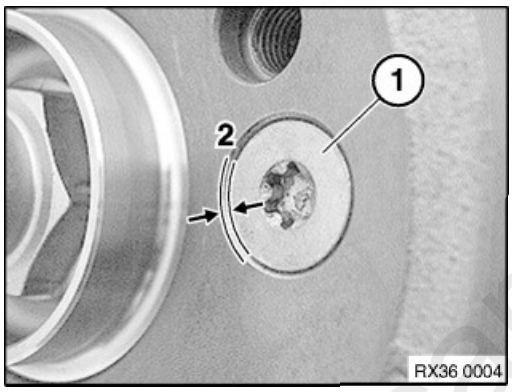
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

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



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

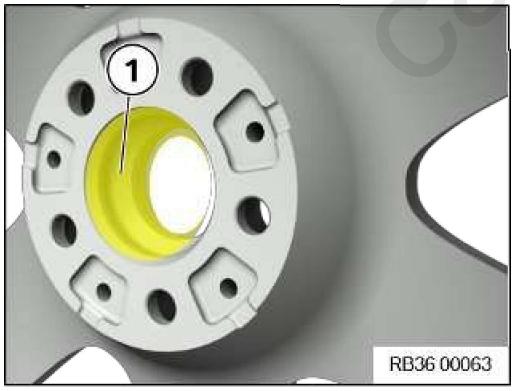
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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

cardiagn.com



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

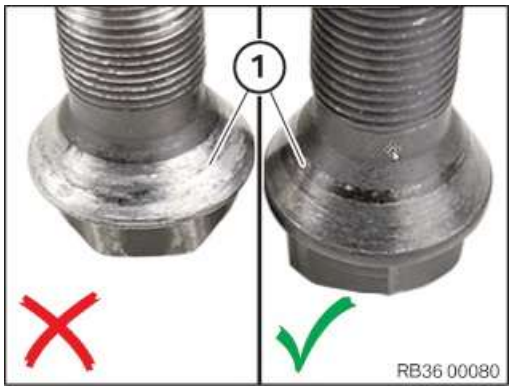
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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 the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) 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.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

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17 – Completely installing the propeller shaft

RISK OF DAMAGE

Damage to the propeller shaft during installation.

Non-observance of the installation guidelines for the propeller shaft on the rear axle differential may cause severe damage.

- Always renew the recessed nut on the rear axle differential. Screw locking must be available.
- Strictly observe a hardening time of minimum 3 h after screwing the recessed nut. The hardening time may be longer at lower temperatures.

- Observe following installation sequence:
  - Position propeller shaft on transmission.
  - Position the propeller shaft at the rear axle differential.
  - Position centre mount.
- Observe the following screwing sequence:
  - Insert nut
  - Flexible disc to transmission
  - Centre mount



- Check the centring (arrow) for damage and renew if necessary.



- Apply a thin coat of grease to the soft centring (1), if necessary.

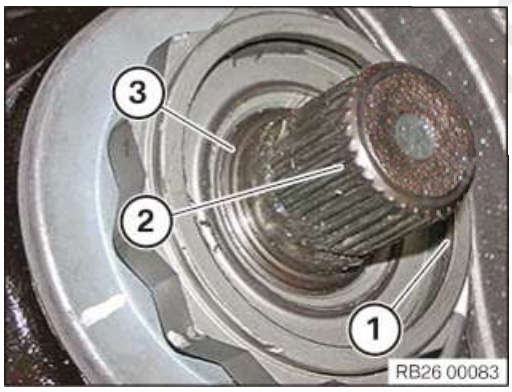
Expendable materials

Lubricating grease Olistamoly 2 LN 584 LO	100 g, Tube	83 19 0 447 919

Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754

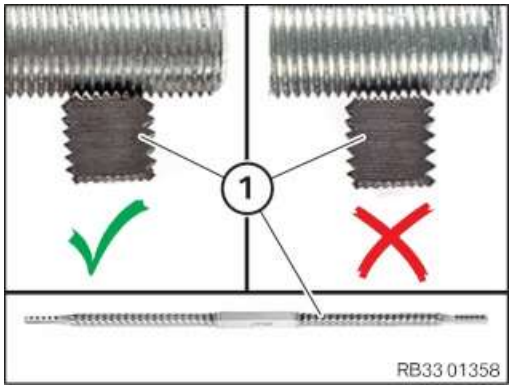
- Hard centring (2) must **not** be greased.



- Clean all residue from the insert collar (1) of the flange nut and the gearing on the bevel pinion (2) and degrease them.
- Top up the collar insert (1)with grease.

Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754



- Use a thread file (1) to remove the adhesive residue on the thread.

  Make sure that the thread pitch is correct!

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RISK OF DAMAGE

Damage to the output flange.

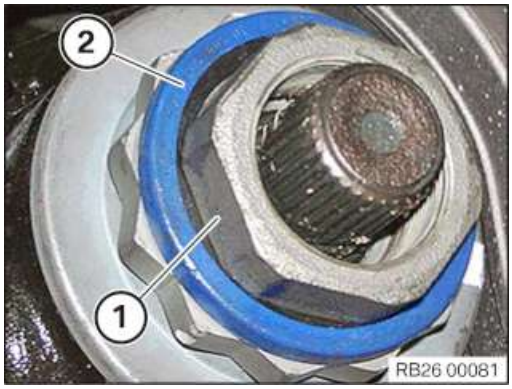
Failure to observe the greasing specifications may lead to damage on the output flange.

- Do not contaminate the thread of the output flange with grease.

- Clean thread (1) of flange off adhesive residue.
- Clean gearing (2).
- Grease gearing (2).

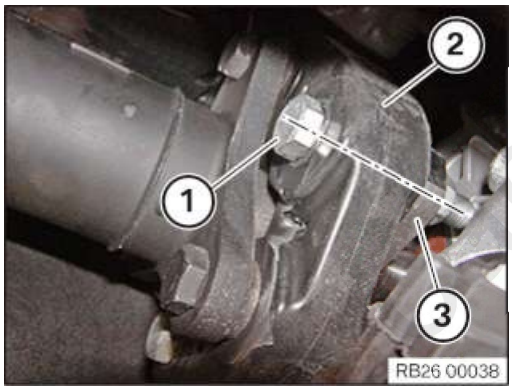
Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754



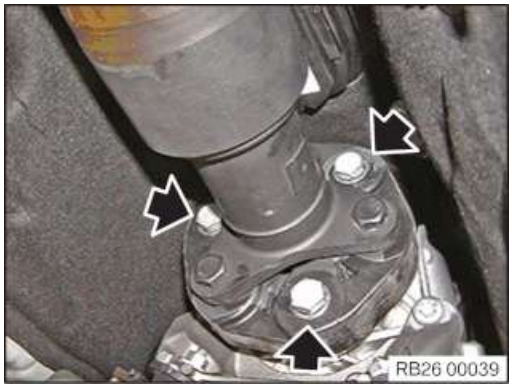
- Renew the seal, recessed nut (1) and the retaining ring (2).

  Parts: Seal, recessed nut, retaining ring
- Insert recessed nut (1) including gasket into collar insert of the flange nut.
- Mount the retaining ring (2).



- It is imperative to reassemble the three-hole flange (3) with the flexible disc (2) in the same position in order to avoid humming noise of the drivetrain after reinstalling the propeller shaft.
- Renew ZNS screws and the self-locking nuts (1).

  Parts: ZNS screws, self-locking nuts

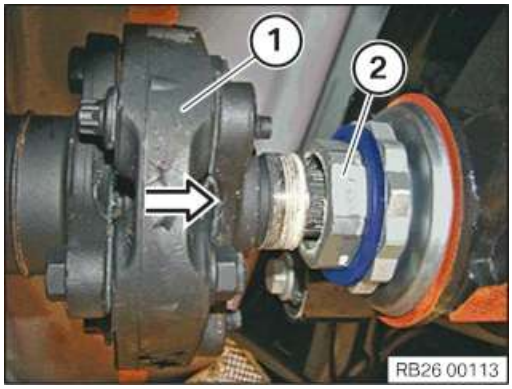


- Position the screws and nuts (arrows).
- Tighten the screws.

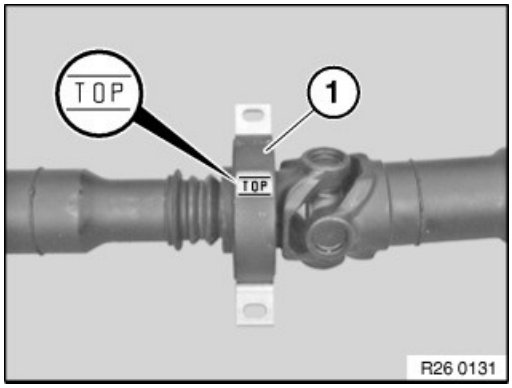
Front flexible disc to propeller shaft

M12	Renew screws. Comply with jointing torque and angle of rotation. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

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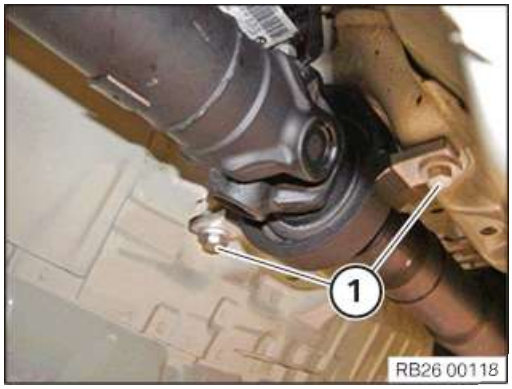


- Push the propeller shaft (1) in the direction of the arrow against the recessed nut (2) up to the limit position.
- Manually screw on and tighten the recessed nut (2) onto the propeller shaft (1) by a minimum of two threads.

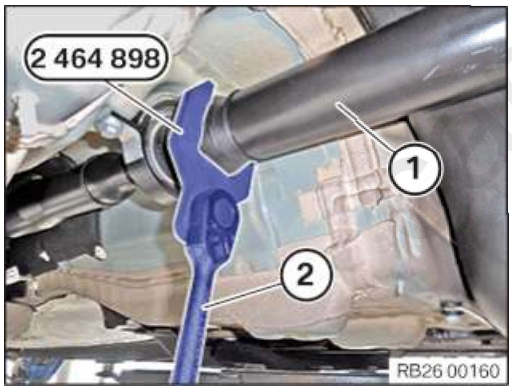


- **Version with the TOP designation:**

  The centre mount (1) must be installed with the TOP marking at the top in the gearbox tunnel.

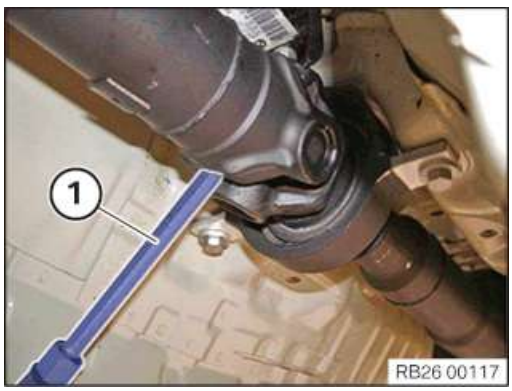


- Position centre mount.
- Position screws (1).



- **Version with a narrow universal joint:**

  Using the special tool 2 464 898 and a suitable tool (2), secure the propeller shaft (1) to the centre universal joint against twisting.



- **Version with a broad universal joint:**

  Secure the propeller shaft against twisting at the central universal joint using a suitable tool (1).

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RISK OF DAMAGE

Damage to the flange nut.

Failure to observe the installation specifications may lead to serious damage to the flange nut and the rear axle differential.

- Do not use the double hexagon flange nut as counter support.
- Screw in the recessed nut within 5 minutes.

- Screw in the recessed nut **counter-clockwise, see direction of arrow** with special tools 0 495 554 (33 5 070) and .

  The recessed nut must be screwed in within 5 min .

Propeller shaft on the rear axle differential

Insert nut	Replace insert nut.	Tightening torque	100 Nm

- **After the propeller shaft is installed and the recessed nut is screwed in, strictly observe a hardening time of minimum 3 hours.**

  Do not move or push the vehicle during this time!

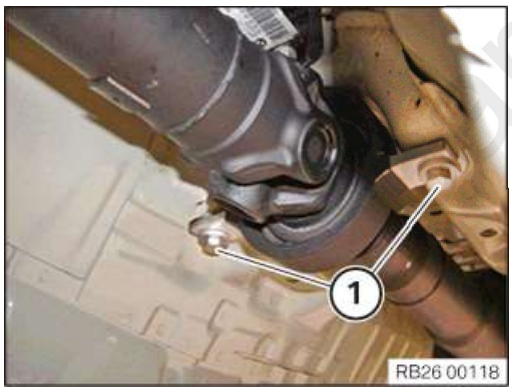


- Brace mounting bolts of flexible disc on nut and tighten by screw.

Rear flexible disc to three-hole flange

M12	Renew screws. Jointing torque and angle of rotation must be observed without fail. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

- Secure the special angle of rotation tool 0 490 504 (00 9 120) with the magnets to the vehicle underbody and screw it further depending on the angle of rotation.

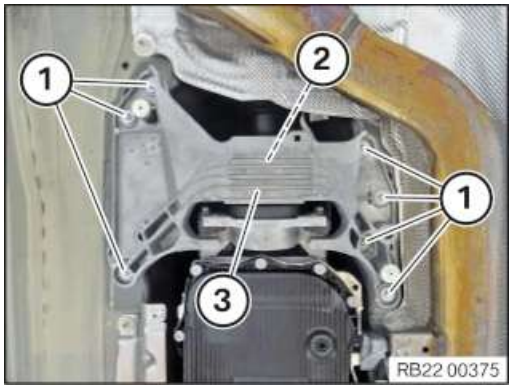


- Tighten the screws (1).

Centre mount to body

M8		Tightening torque	19 Nm

18 – Install transmission cross member.



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

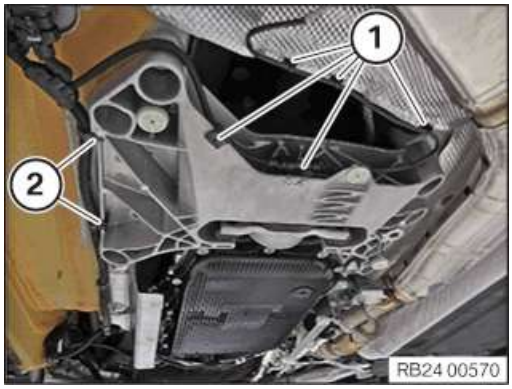
Transmission cross member to body

M8		Tightening torque	19 Nm

- Tighten down screw (2).

Transmission cross member to rubber mounts

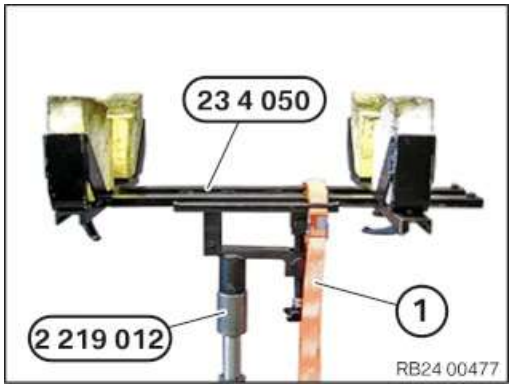
M12		Tightening torque	100 Nm



- **Only B47 and B57:**

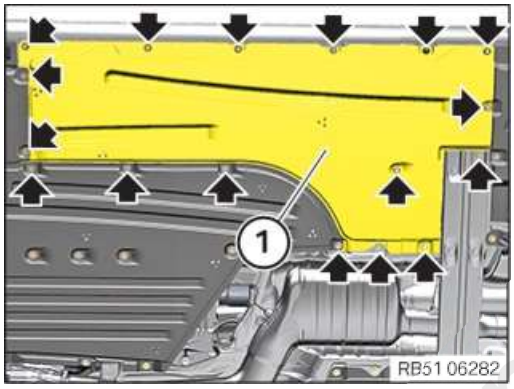
  Install the cable.

  Fasten the cable with clamps (1) and (2).



- 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.

19 – Installing the underbody panelling on the sides

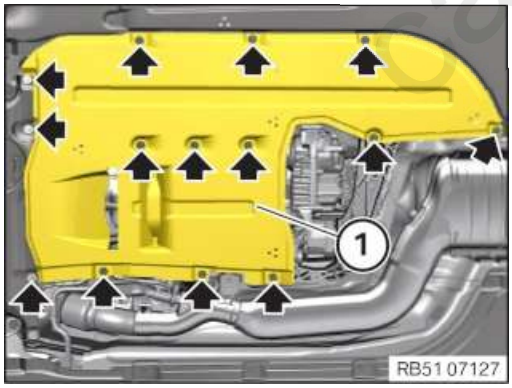


- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

20 – Installing underbody protection at rear



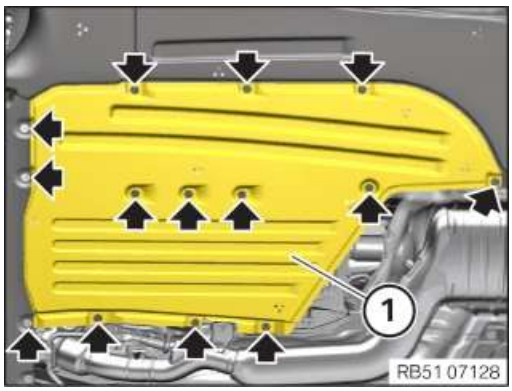
- **Version A:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version B:**

  Insert and install the rear underbody protection (1).

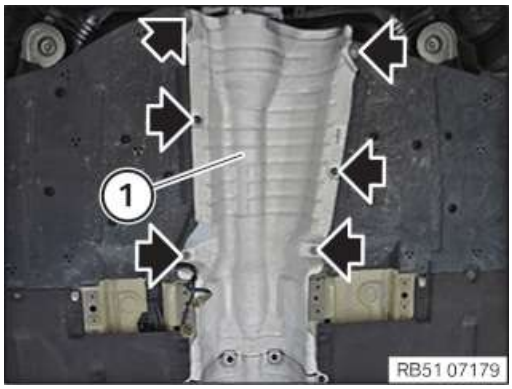
  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

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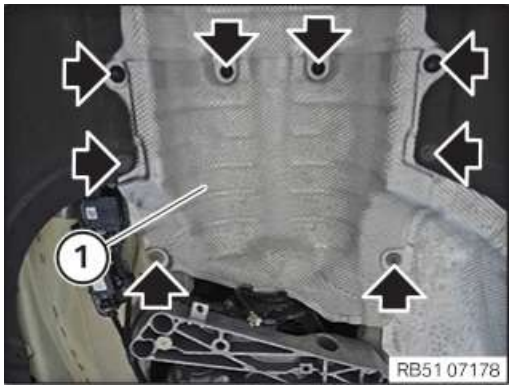
21 – Installing the heat shields



- Install the heat shield (1).
- Tighten the nuts and bolts (arrows).

Heat shield to undercarriage

Screws and nuts		Tightening torque	3 Nm

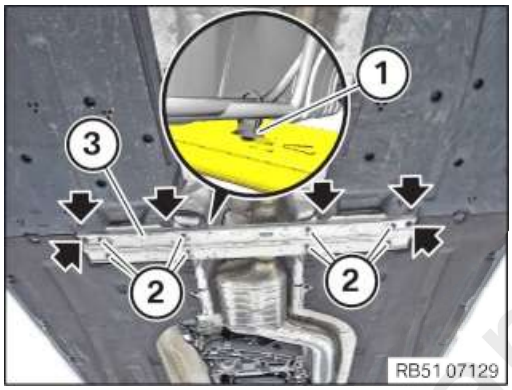


- Install the heat shield (1).
- Tighten the nuts and bolts (arrows).

Heat shield to undercarriage

Screws and nuts		Tightening torque	3 Nm

22 – Install the connecting supports on the tunnel



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).
- Tighten screws (arrows).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Secure the clamp (1).

23 – Filling the fuel tank



- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Slide the suction hose (1) of the extractor unit about 40 cm into the fuel filler neck. If necessary, slightly turn the suction hose.
- Fill fuel from suction extractor unit.
- After completing the work and before starting the engine for the first time: Fill the fuel tank by the fuel filler neck with a minimum of 5 l of fuel.

Additional Information

Overview of Tightening Torques

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Overview of Tightening Torques

Fuel tank to body — Used in step 13

Nut M8	Renew nut.	Tightening torque	19 Nm

Fuel tank retaining strap to body — Used in step 13

M8 screw	Renew screws.	Tightening torque	19 Nm

Filling hose on fuel tank — Used in step 13

Hose clamp	Replace hose clamp.	Tightening torque	4 Nm

Wheel arch cover — Used in step 15

Screw			3 Nm
Plastic nut			2,6 Nm

Brake disc to front wheel hub — Used in step 16

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 16

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 16

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

Front flexible disc to propeller shaft — Used in step 17

M12	Renew screws. Comply with jointing torque and angle of rotation. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

Propeller shaft on the rear axle differential — Used in step 17

Insert nut	Replace insert nut.	Tightening torque	100 Nm

Rear flexible disc to three-hole flange — Used in step 17

M12	Renew screws. Jointing torque and angle of rotation must be observed without fail. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

Centre mount to body — Used in step 17

M8		Tightening torque	19 Nm

Transmission cross member to body — Used in step 18

M8		Tightening torque	19 Nm

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Transmission cross member to rubber mounts — Used in step 18

M12		Tightening torque	100 Nm

Underbody panelling, side — Used in step 19

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Underbody protection — Used in step 20

Hexagon screw		Tightening torque	3 Nm

Heat shield to undercarriage — Used in step 21

Screws and nuts		Tightening torque	3 Nm

Connecting support to tunnel — Used in step 22

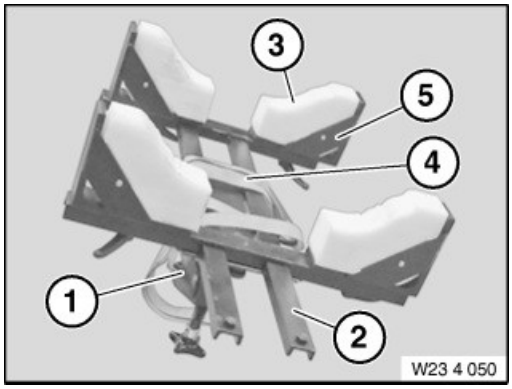
M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Overview of Special Tools

0 495 498 (23 4 050) Fixture

Used in step 18

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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 inserts (1 set = 4 pcs.))	
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)		**Fixture** (Fixture for foam insert) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	

2 219 012 Hydraulic lifter



Common Used in step 18

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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2 464 898 Open-end spanner



Common	Used in step 617
Usage	Open-end spanner SW50 for disassembly and installation of the propeller shaft on rear axle differential. The silhouette foil is included in the delivery specification.
Included in the tool or work	
Storage location	A7
Replaced by	
In connection with	
SI-Number	01 19 18 (579)

0 495 554 (33 5 070) Extension



Common	Used in step 617
Usage	Pull-out extension for 33 5 040, 33 5 050, 33 5 060.
Included in the tool or work	
Storage location	A18
Replaced by	
In connection with	
SI-Number	01 21 06 (300)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 592 (33 5 071)		**Extension** (Extension (1 item)) discontinued, can only be ordered using complete tool	

2 344 011 Tool



Common	Used in step 16
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

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



Common	Used in step 17
Usage	For torsion angle adjustment of cylinder head bolts (all engines) And reinforcement plate front axle support E46
Included in the tool or work	
Storage location	A4
Replaced by	
In connection with	
SI-Number	

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Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 7
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 7
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 7
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 7
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 7
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 7
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 7
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 7
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
00 02 001 Raising the vehicle using a vehicle lift	716

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16 12 049 Replacing fuel return line, front

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.
- Detach battery earth lead from battery.
- With auxiliary 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 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

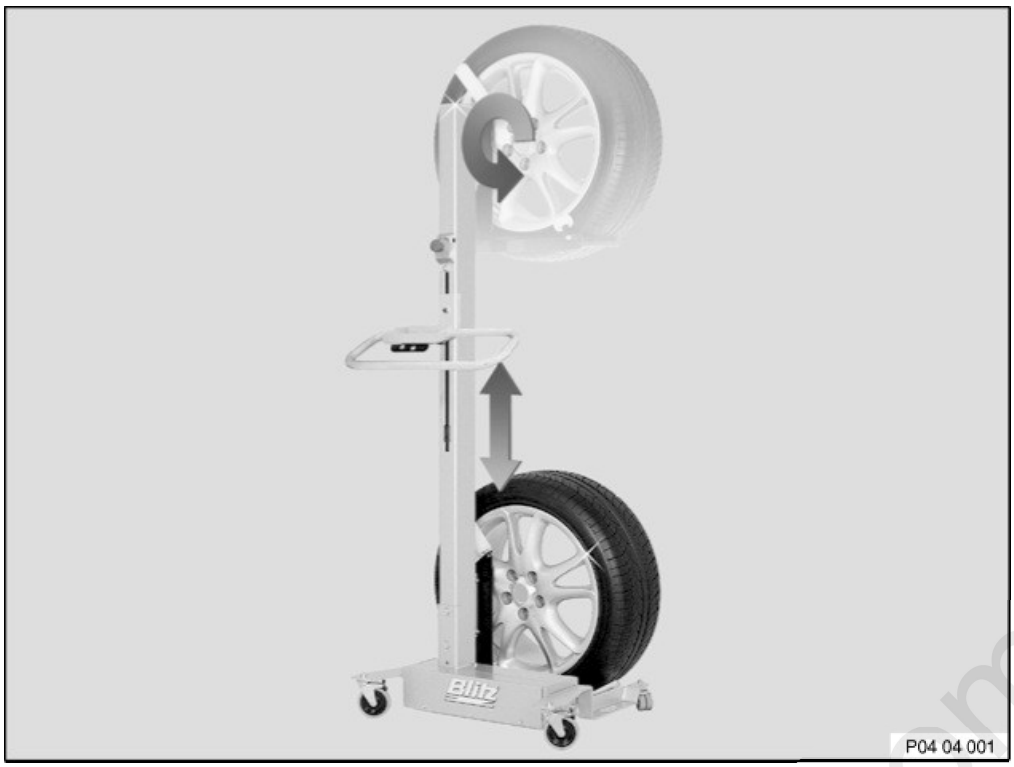
2 – Disconnecting all battery earth leads



- See additional information.

3 – Removing the front left wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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

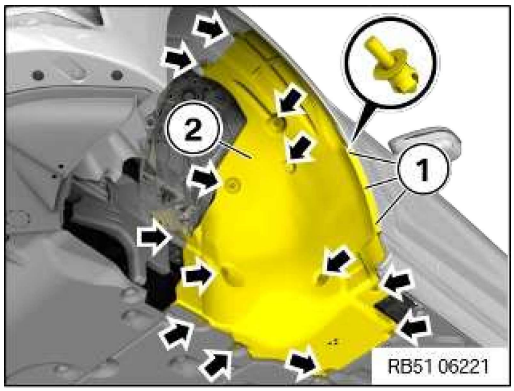


- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

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

NOTICE

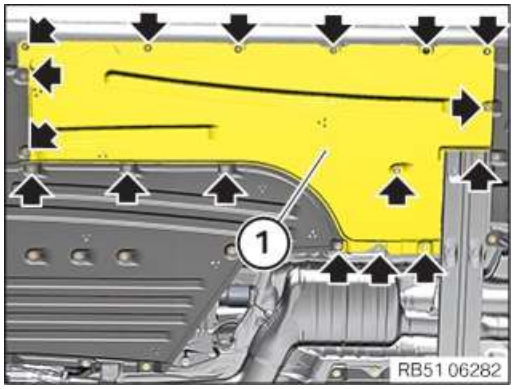
To provide a better overview: Schematic diagram with partially hidden components.



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

5 – Remove side underbody panelling

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- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

6 – Remove DDE 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 ... Notes for ESD protection (electrostatic discharge)

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

Follow instructions for removing and installing control units.

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

TECHNICAL INFORMATION

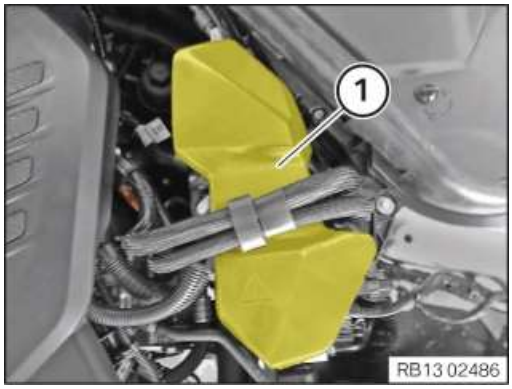
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

TECHNICAL INFORMATION

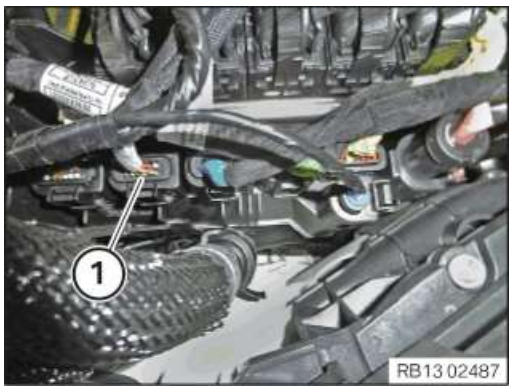
Control unit must be programmed after it is replaced.

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

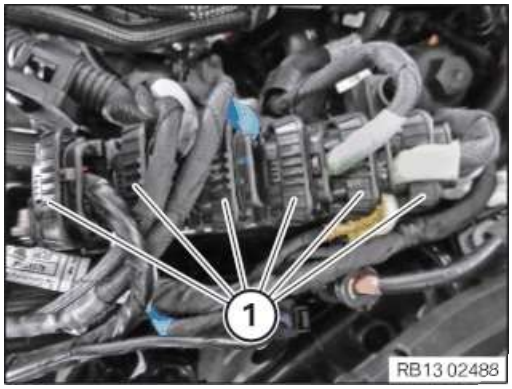
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- Pull off cover (1) upwards, feed out and remove.



- Unlock plug connection (1) and disconnect.



- Unlock and disconnect plug connections (1).



- Release the latch mechanisms (arrows).
- Thread out and remove DDE control unit (1).

7 – Removing integrated supply module (PDM)

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RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

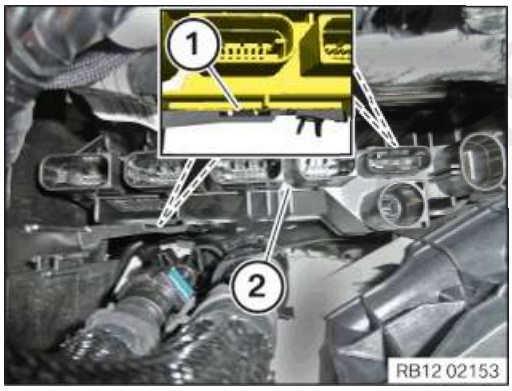
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the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

TECHNICAL INFORMATION

The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.

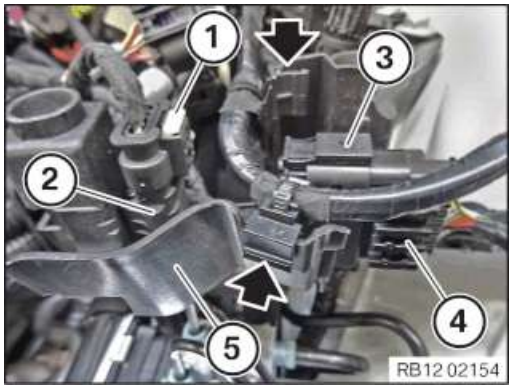


- Unlock and disconnect plug connections (1).



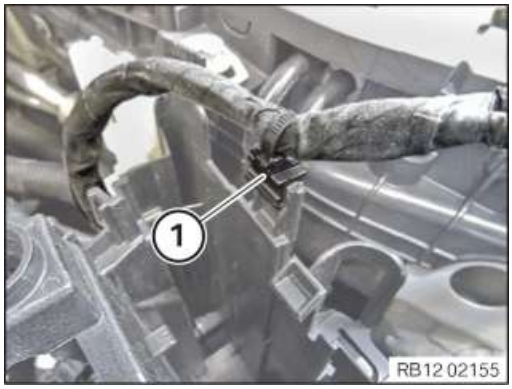
- Loosen the latch mechanisms (1).
- Feed out and remove the integrated supply module (PDM) (2) upwards.

8 – Removing the control unit holder

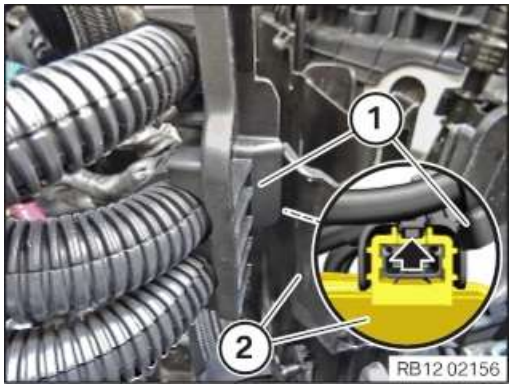


- Unlock plug connection (1) and disconnect.
- Unlock connector (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock connector (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).

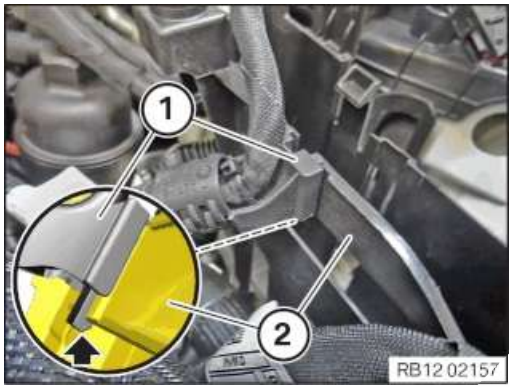
rdiagn.com



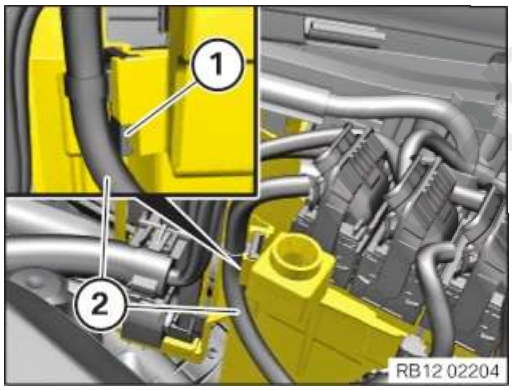
- Loosen clamp (1).



- Unlock the lock (arrow).
- Disconnect cable clip (1) from the control unit holder (2) to the top.



- Unlock the lock (arrow).
- Disconnect cable clip (1) from the control unit holder (2) to the top.

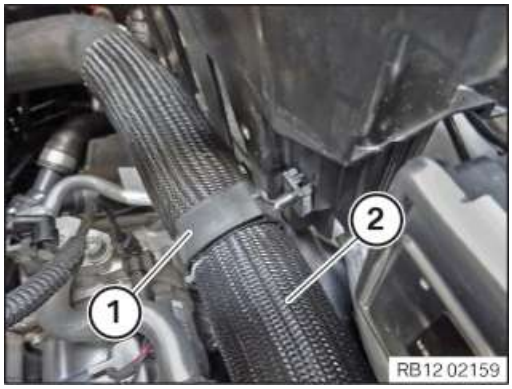


- Unlock and loosen the cable clip (1).
- Remove the wiring harness section (2) and put to one side.

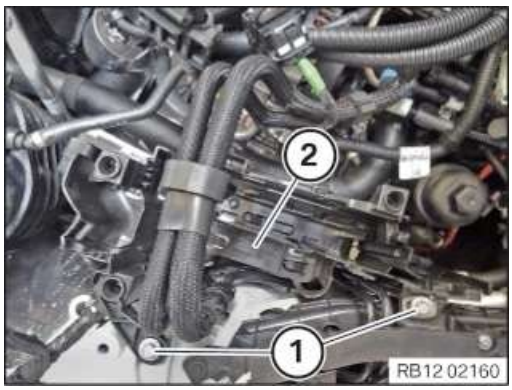


- Unlock the lock (arrow).
- Feed out the cable clip (1) to the top and set it aside.

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- Unlock holder (1), feed out coolant line (2) and place to one side.



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

MAIN WORK

9 – Removing front fuel return line

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

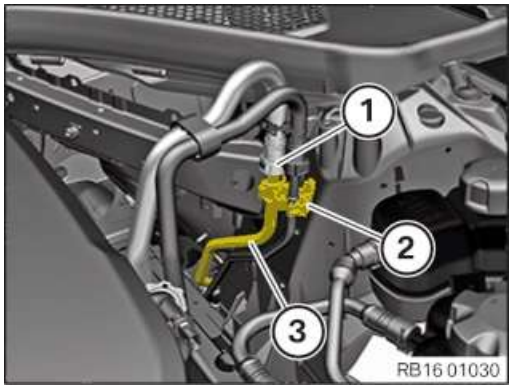
WARNING

Contact with hazardous fluids.

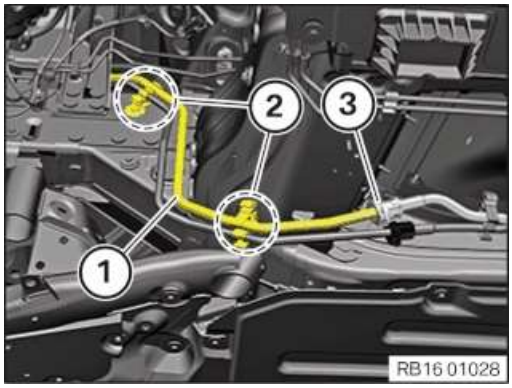
Hazardous to health!

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

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- Unlock and disconnect snap fastener (1).
- Unclip the fuel return line (3) from the holder (2).



- Unlock and disconnect snap fastener (3).
- Unclip the fuel return line (1) from the holders (2).

10 – Installing front fuel return line

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

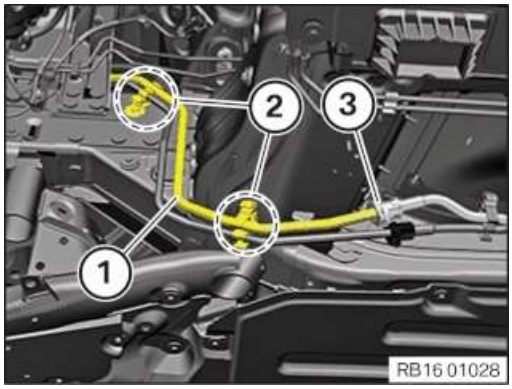
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

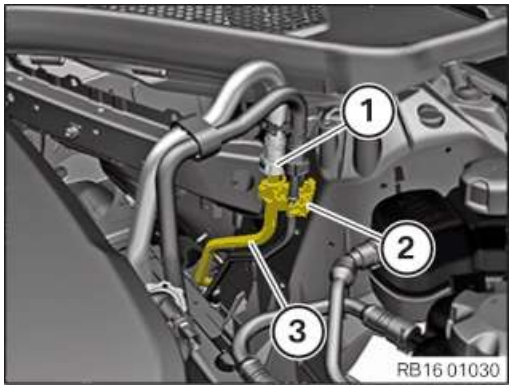
Hazardous to health!

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



- Connect snap fastener (3) and lock.
- Clip in the fuel return line (1) to the holder (2).

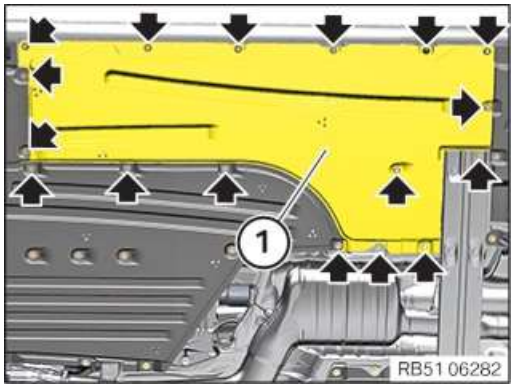
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- Connect snap fastener (1) and lock.
- Clip in the fuel return line (3) into the holder (2).

POSTPROCESSES

11 – Installing the underbody panelling on the sides



- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

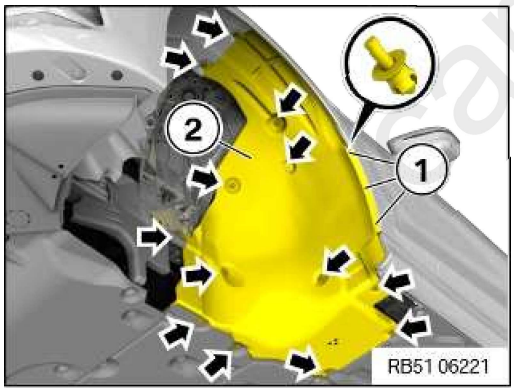
Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

12 – 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).

13 – Attaching the front left wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

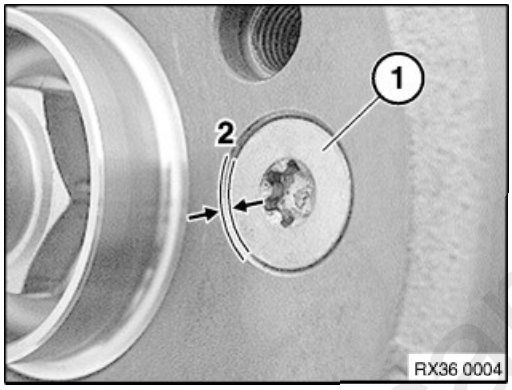
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

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



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

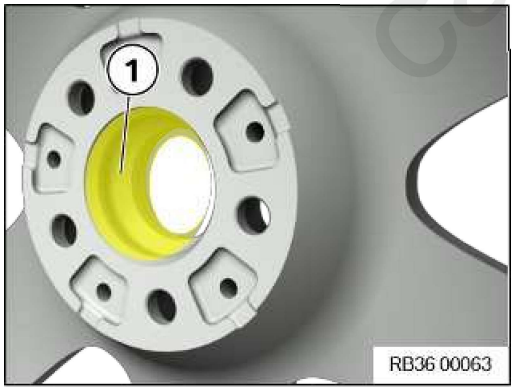
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

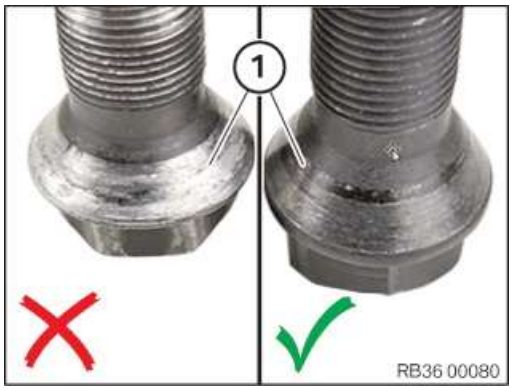
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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.

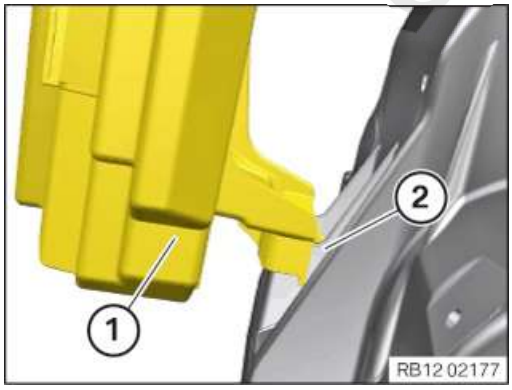
- Renew the corroded wheel bolts (arrows).

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

Wheel bolts

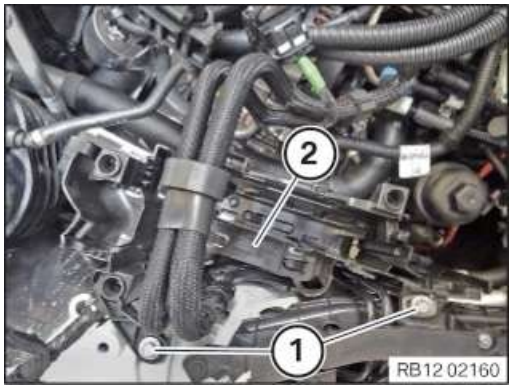
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or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

14 – Installing the control unit holder



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

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

Control unit holder

M6		Tightening torque	8 Nm



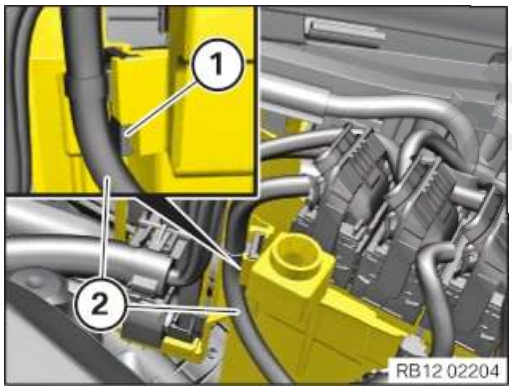
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.

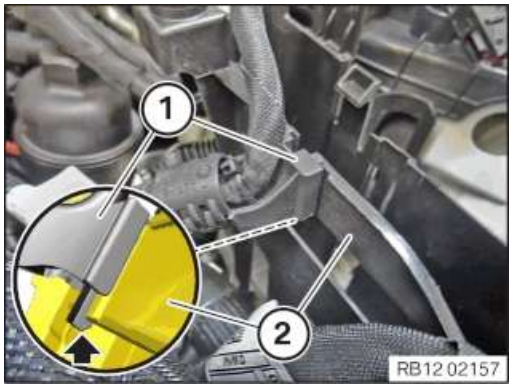


- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.



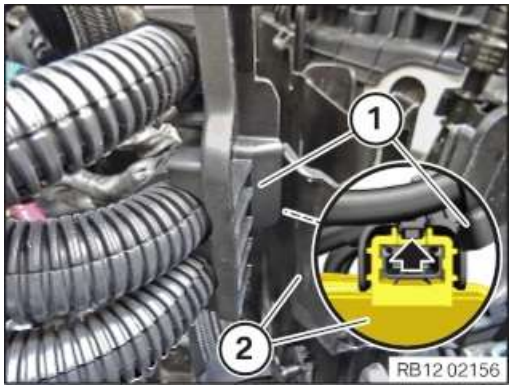
- Guide in the wiring harness section (2) and install.
- Connect and lock the cable clip (1).



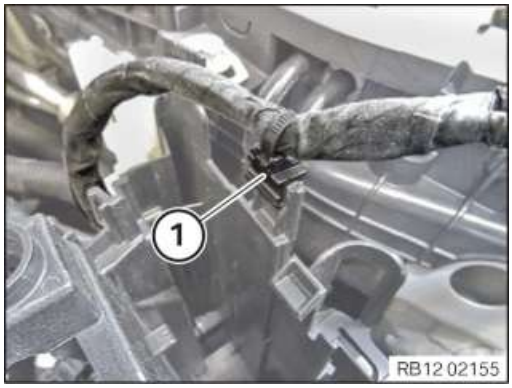
- Connect the cable clip (1) with the control unit holder (2) and lock.

  Lock (arrow) must audibly engage.

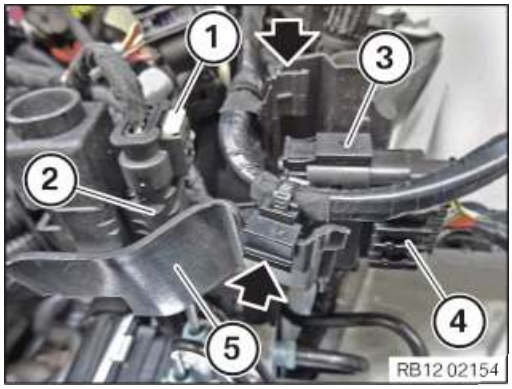
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- Connect the cable clip (1) with the control unit holder (2) and lock.
  Lock (arrow) must audibly engage.



- Secure clamps (1).

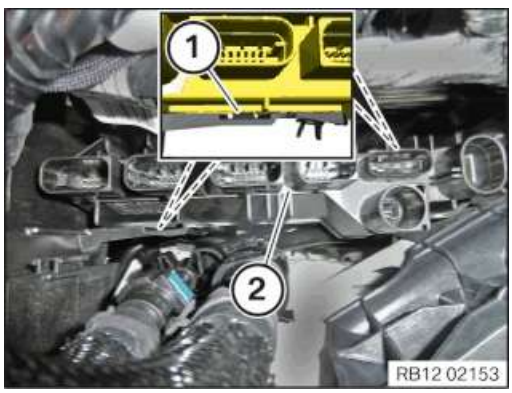


- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
-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

15 – Installing the integrated supply module (PDM)

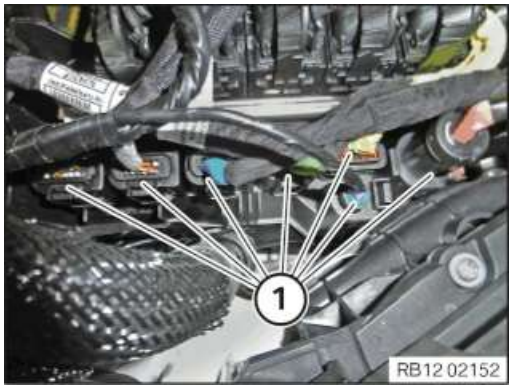
TECHNICAL INFORMATION

The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.



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

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- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

16 – Install DDE control unit

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

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

Control unit must be programmed after it is replaced.

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

TECHNICAL INFORMATION

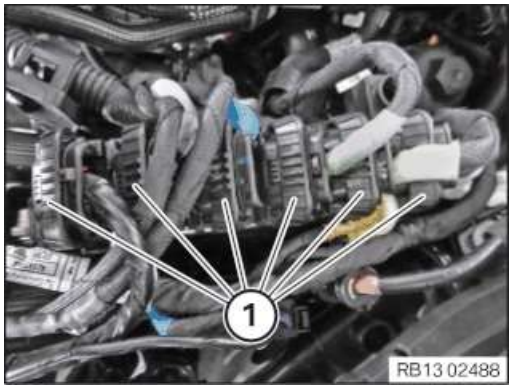
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Install DDE control unit(1).

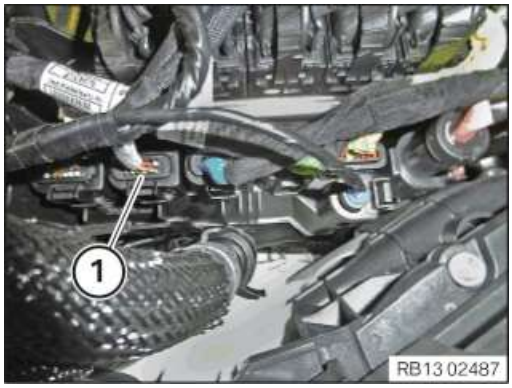
  The latch mechanisms (arrows) must engage audibly.

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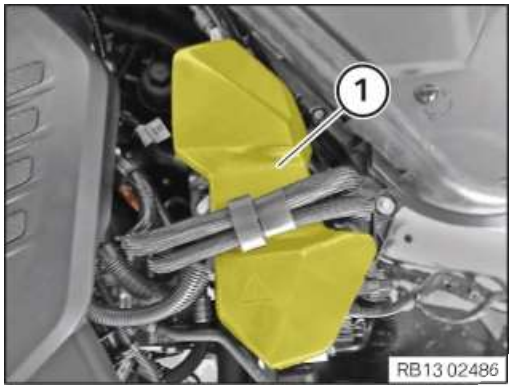
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Insert and install cover (1) into guides.

17 – Connecting all battery earth leads



- See additional information.

18 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

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RISK OF DAMAGE

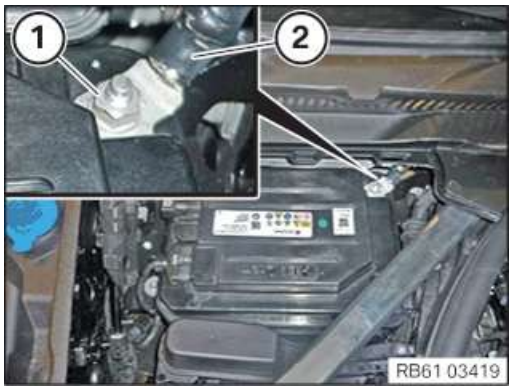
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

Additional Information

Overview of Tightening Torques

Underbody panelling, side			Used in step 11
Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Wheel arch trim panel, front			Used in step 12
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Brake disc to front wheel hub			Used in step 13
M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub			Used in step 13
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 13
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

Control unit holder			Used in step 14
M6		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 18
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

2 344 011 Tool



Common	Used in step 13
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



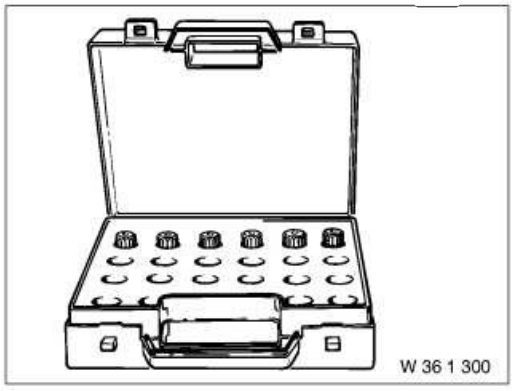
Common	Used in step 3
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 3
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 3
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 3
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 3
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 3
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 229 (36 1 332) Wheel stud



Common	Used in step 3
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 3
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	118

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	616

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217

61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead	217
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61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
61 20 900 Disconnecting and connecting battery earth lead	217
00 02 001 Raising the vehicle using a vehicle lift	313
61 35 ... Notes on ESD protection (Electro Static Discharge)	67
61 35 ... Notes on ESD protection (Electro Static Discharge)	67

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16 12 050 Replacing fuel return line, rear

PRELIMINARY WORK

1 – Drawing off the fuel tank

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.



- Open fuel filler cap.
- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Push the suction hose (1) of the extractor unit through the special tool and into the fuel filler neck. If necessary, slightly turn the suction hose.

  For the extractor unit: see BMW service workshop equipment.

  The insertion length of the suction hose is 135 cm.
- Start engine and allow to run, so that the electric fuel pump is running.

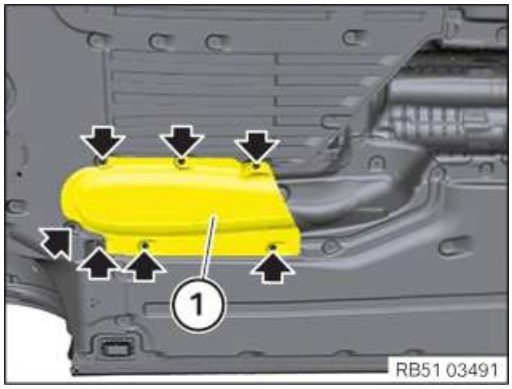
  This will ensure that the fuel is pumped by the suction jet pump from the left-hand side of the fuel tank to the right hand-side.
- Draw off fuel with the extractor unit as far as possible. In the process, track the drawing off of the fuel on the fuel gauge in the instrument cluster.

2 – Remove the underbody panelling of the transmission on the side

NOTICE

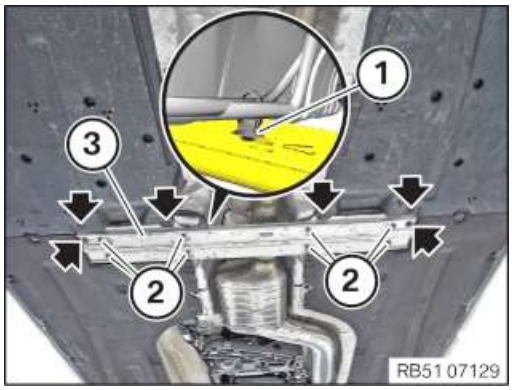
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

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- Remove screws (arrows).
- Remove the underbody panelling (1).

3 – Remove the connecting support from the tunnel



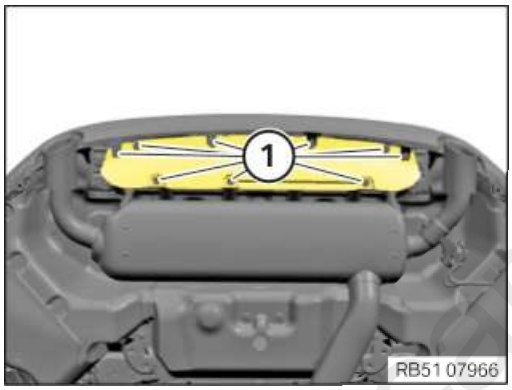
- Remove screws (arrows).

NOTICE

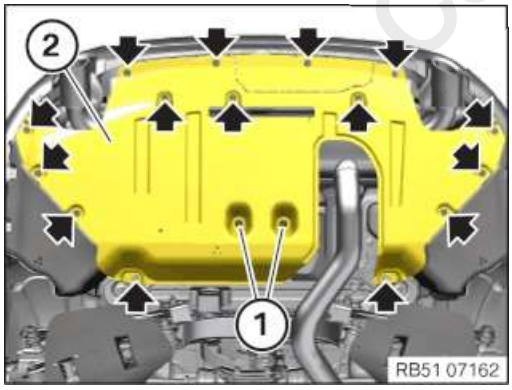
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.

4 – Removing the rear diffuser



- **Version 1:**
- Release the screws and nuts (1).
- Remove the diffuser.



- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).

5 – Remove exhaust system

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WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Component with heavy weight.

Danger of injury!

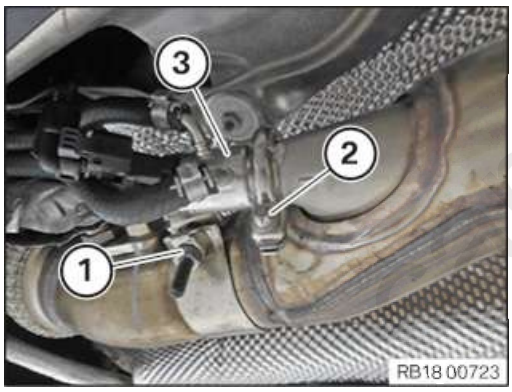
- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

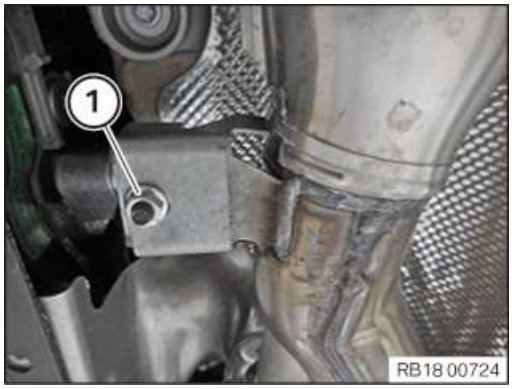
Heavy component.

Heavy components can lead to injury or damage.

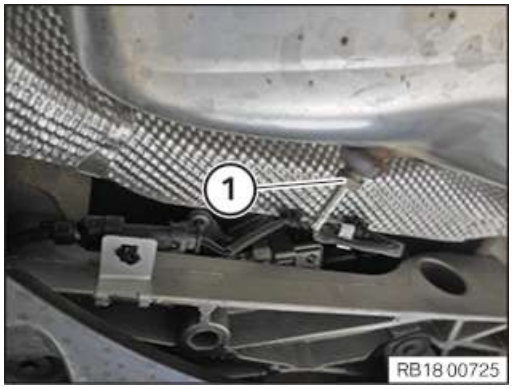
- Remove and install heavy components with the aid of another person/other persons.



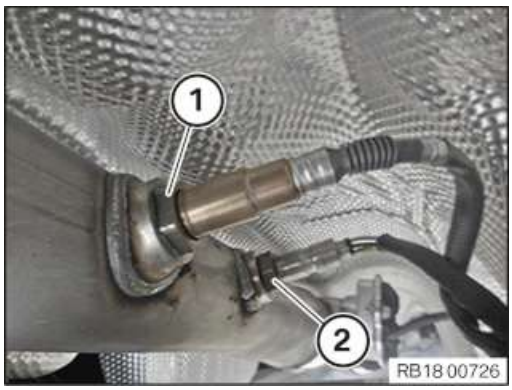
- Unfasten clamp (1).
- Detach the clamp (2) of the SCR metering module (3).
- Detach the SCR metering module (3)from the exhaust system and place to one side.



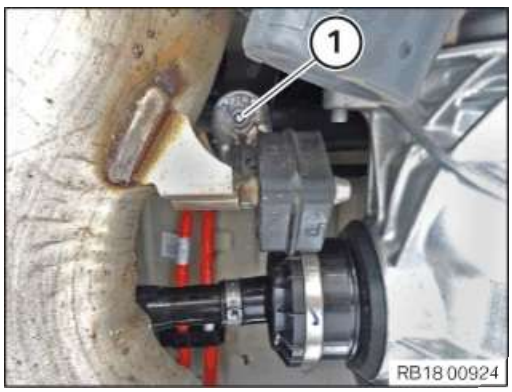
- Loosen nut (1).



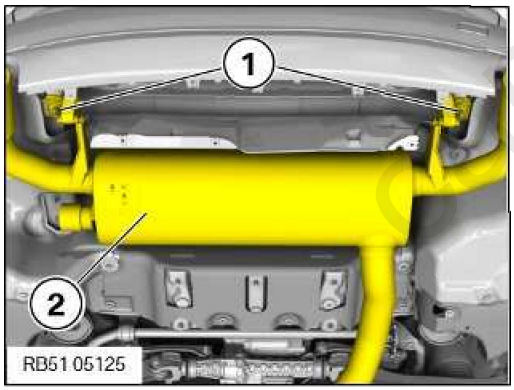
- Detach the exhaust temperature sensor (1) from the exhaust system.



- Release the diesel particulate sensor (1) from the exhaust system and place to one side.
- Release the nitrogen oxide sensor (2) from the exhaust system and place to one side.

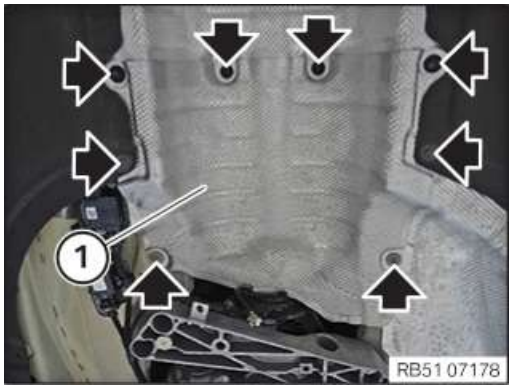


- Release the nut (1) on the rear axle support.



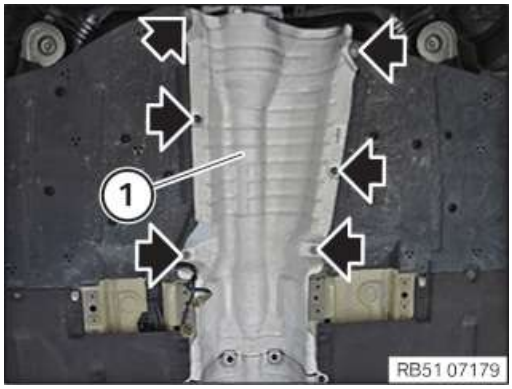
- Loosen nuts (1).
- Lower and remove the exhaust system (2) with the assistance of a second person.

6 – Remove the heat shield



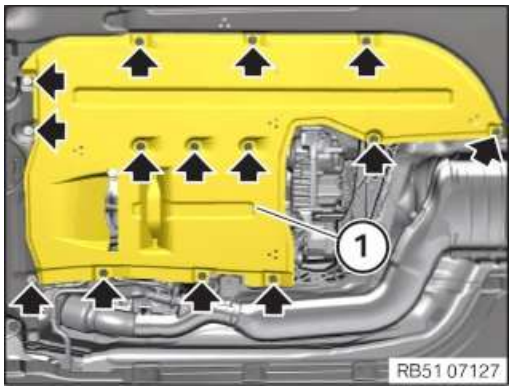
- Loosen bolts and nuts (arrows).
- Remove the heat shield (1).

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- Loosen bolts and nuts (arrows).
- Remove the heat shield (1).

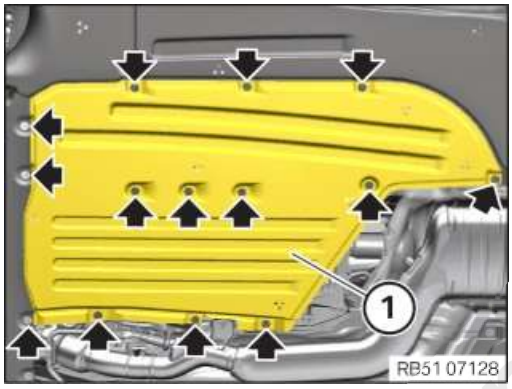
7 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

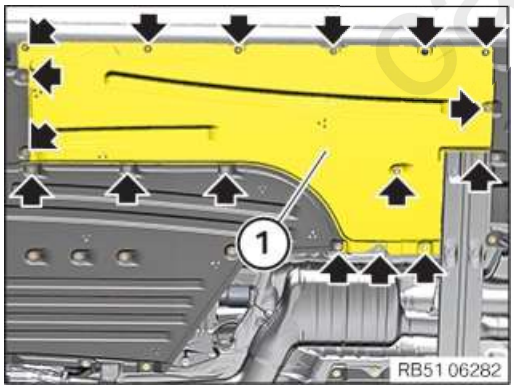


- **Version B:**

  Remove screws (arrows).

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

8 – Remove side underbody panelling



- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

9 – Completely removing the propeller shaft (plug-in - rear flexible disc)

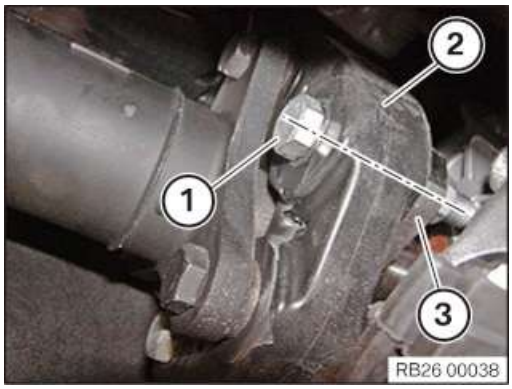
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RISK OF DAMAGE

Damage to propeller shaft during removal.

Non-observance of the removal guidelines for the propeller shaft on the rear axle differential may cause severe damage.

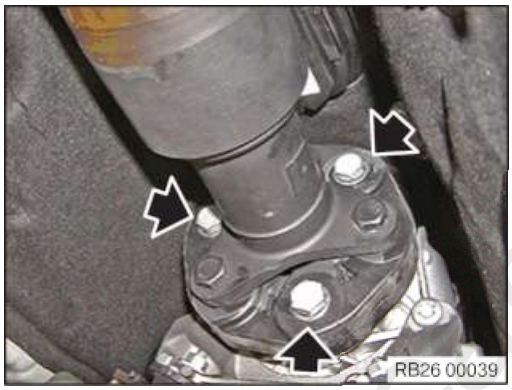
- Do not disassemble the three-hole flange, flexible disc and propeller shaft. The three-hole flange to the rear axle differential is balanced with the flexible disc and propeller shaft.
- Loosen the recessed nut against the direction of travel in clockwise direction. The propeller shaft must be loosened on the recessed nut only and exclusively in the direction of rotation otherwise the anti-twist lock of the bi-hexagonal flange nut is damaged.
- In the event of a damaged anti-twist lock on the bi-hexagonal flange nut: Replace the rear axle differential.



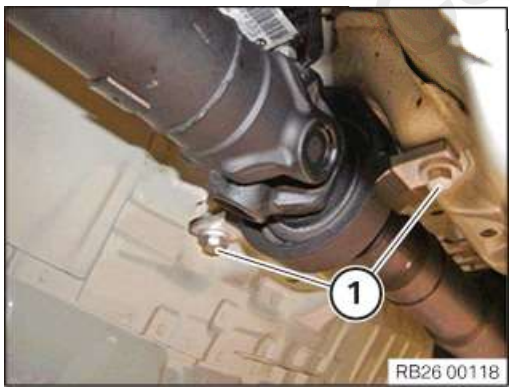
TECHNICAL INFORMATION

Compliance with the following instructions is required to avoid a humming noise from the propeller shaft after refitting the propeller shaft.

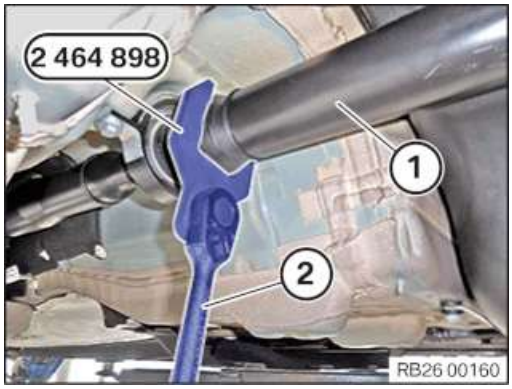
- Before loosening the flexible disc connection (1) at the front of the propeller shaft, it **must** be marked in one plane with the flexible disc (2) and the three-hole flange (3).
- It is essential to reassemble the three-hole flange (3) with the flexible disc (2) in the same position during installation.



- Remove screws (arrows).

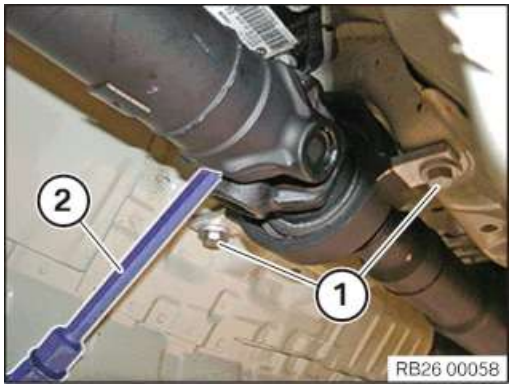


- Loosen screws (1).



- **Version with a narrow universal joint:**

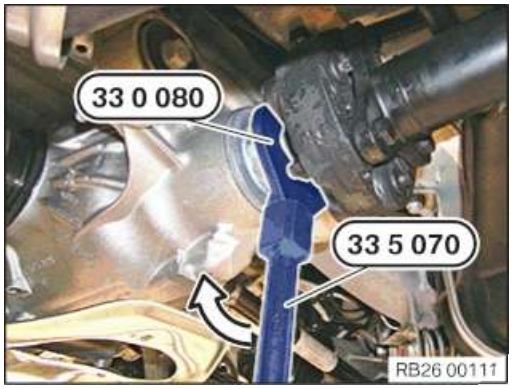
  With the special tool 2 464 898 and a suitable tool (2), secure the propeller shaft (1) on the centre universal joint against twisting.



- **Vehicles with a broad universal joint:**

  Secure the propeller shaft on the centre universal joint with a suitable tool (2) to protect it from twisting.

  Remove the screws (1) of the centre mount only after opening the recessed nuts are removed completely.



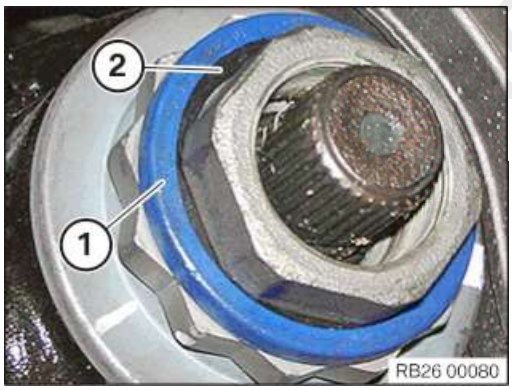
RISK OF DAMAGE

Damage to rear axle differential.

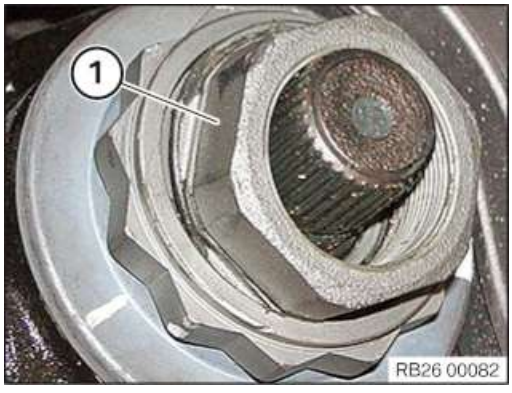
Non-observance of the removal and installation guidelines may cause severe damage to the rear axle differential.

- Do not use the double hexagon head flange nut as counter support.

- Release the recessed nut with the special tools 0 495 554 (33 5 070) and **in the direction of arrow (clockwise)**.



- Remove the mounting clip (1) and the seal (2).



- Remove recessed nut (1).

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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

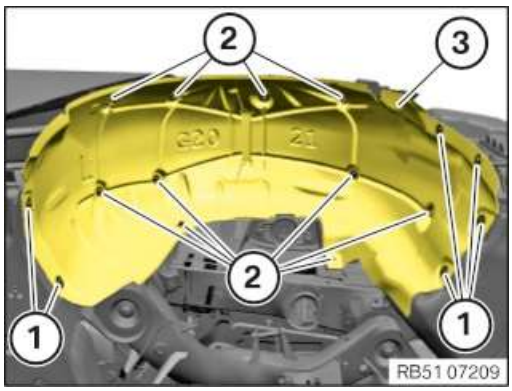


- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

11 – Removing rear wheel arch cover

NOTICE

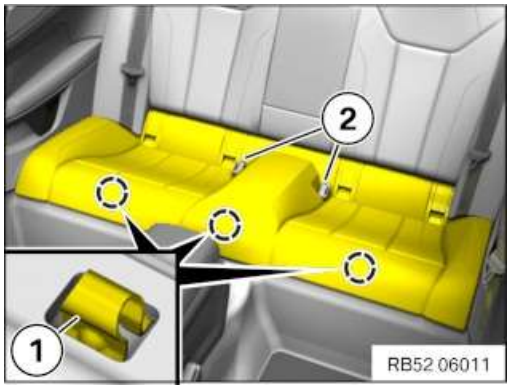
To provide a better overview: Schematic diagram with partially hidden components.



- Loosen screws (1).
- Loosen nuts (2).
- Guide the wheel arch cover (3) out.

12 – Remove rear seat bench

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- Unclip the rear seat bench upwards from clamps (1) and guide out seat belt buckles (2).
- Remove the rear seat bench.

13 – Unplugging the delivery unit (vehicles without pre-heating)

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

TECHNICAL INFORMATION

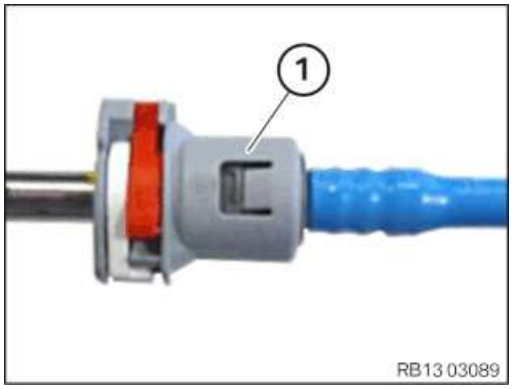
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

▸ **Unlocking and disconnecting fuel line with a snap fastener**

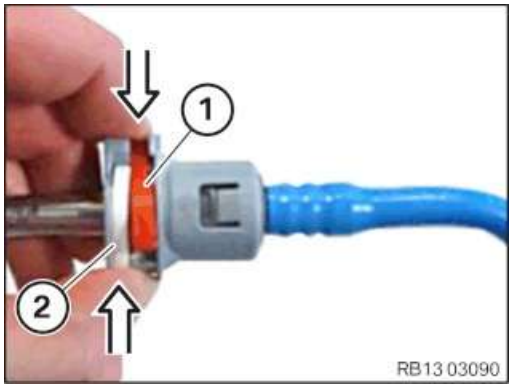
TECHNICAL INFORMATION

No tools may be used to unlock/lock and disconnect/connect the fuel line with a snap fastener manufactured by Hutchinson.

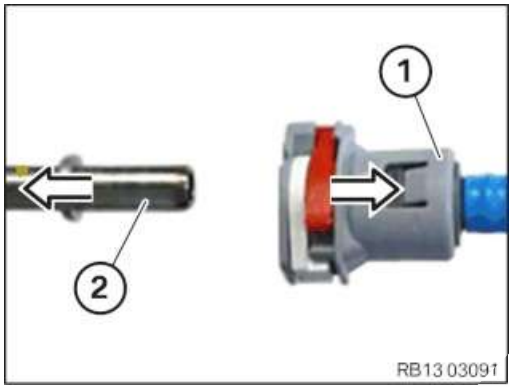
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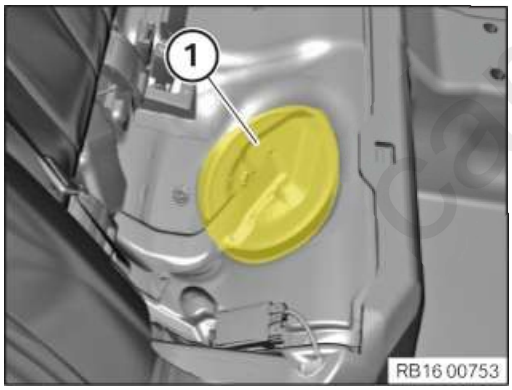
- Observe the following instruction to unlock snap fastener (1) of the fuel line.



- Press in locks (1) and (2) in direction of arrow.



- Disconnect fuel lines (1) and (2) in direction of arrows.

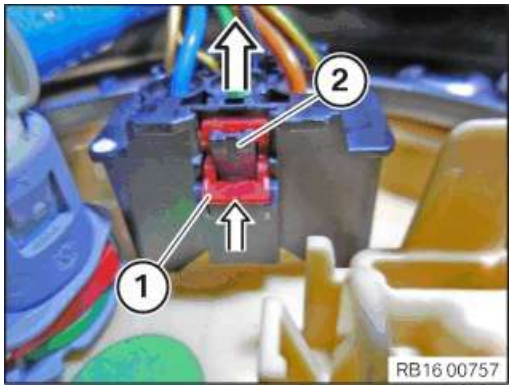


- Unfold the insulating mat in the area (1).



- Open the sealing cap (1) in the direction of arrow.

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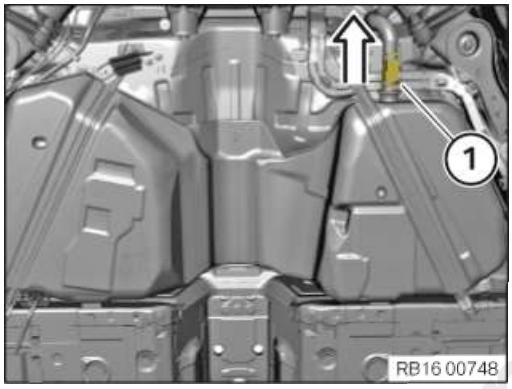


- Unlock the locking tab (1) in the direction of the arrow.
- Press the tab (2) and disconnect the plug connection.

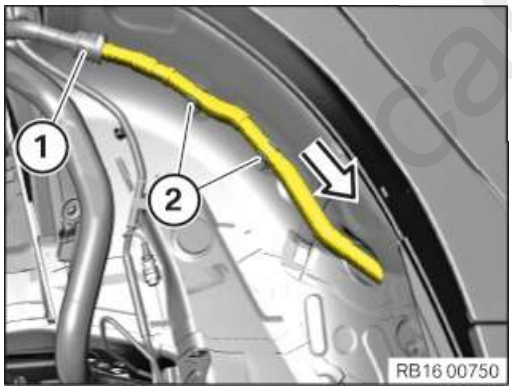


- Unlock and disconnect the snap fasteners (1).

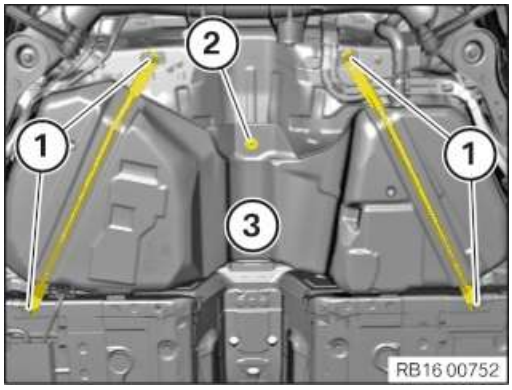
14 – Remove fuel tank



- Loosen hose clamp (1).
- Pull off rubber hose from fuel tank in direction of arrow.



- Unlock and disconnect snap fastener (1).
- Detach the fuel filler neck breather pipe from the holder (2).
- During lowering of the fuel tank: Feed the fuel filler neck breather pipe through the body n the direction of the arrow.



- Support the fuel tank (3)**extensively**.
- Unscrew the screws (1) and remove the retaining straps.
- Unscrew the nut (2) and lower the fuel tank (3).

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15 – Removing the return line in the rear

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

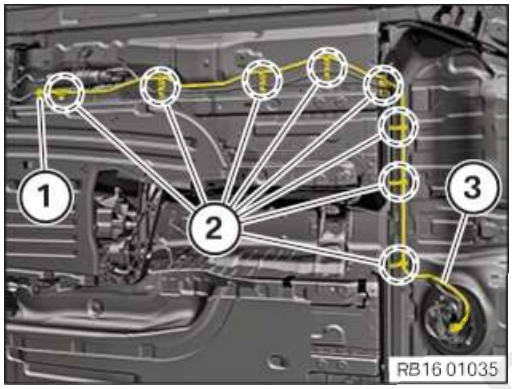
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

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



- Unlock and disconnect snap fastener (1).
- Unclip feed line (3) from holders (2).

16 – Installing the return line at the rear

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

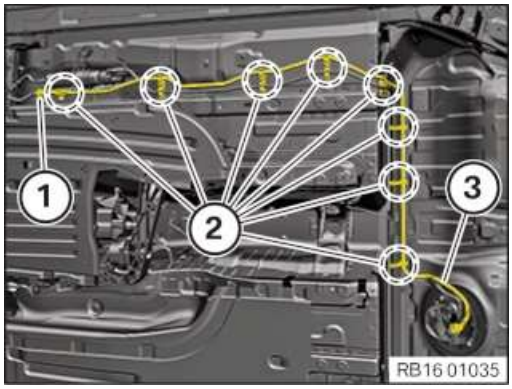
WARNING

Contact with hazardous fluids.

Hazardous to health!

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

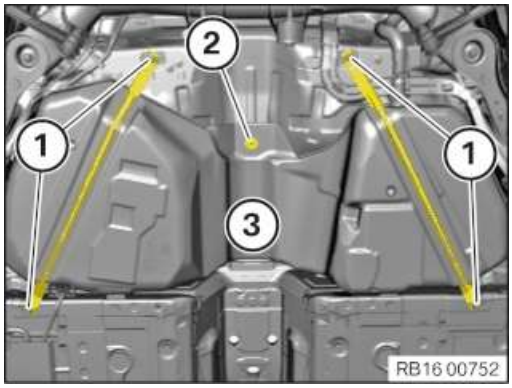
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- Connect and lock the snap fastener (1).
- Clip the feed line (3) into the holder (2).

POSTPROCESSES

17 – Install fuel tank



- Raise the fuel tank (3) while feeding the fuel filler neck breather pipe through the rear axle support.
- Guide the fuel filler neck breather pipe through the body into the wheel arch.
- Raise the fuel tank (3) to the installation position while paying attention to the installation position of the fuel filler neck breather pipe.
- Renew nut (2).

  Parts: Nut
- Fit nut (2) and tighten.

Fuel tank to body

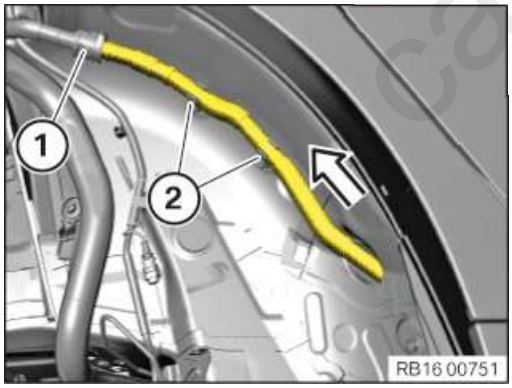
Nut M8	Renew nut.	Tightening torque	19 Nm

- Renew screws (1).

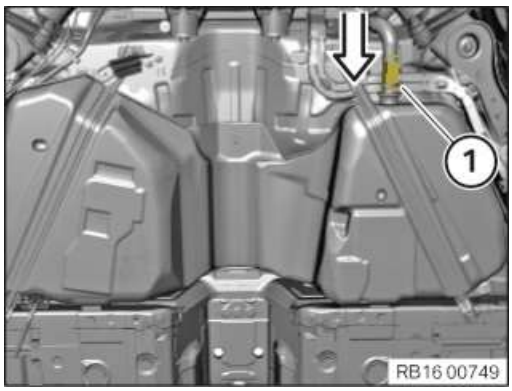
  Parts: Bolts
- Mount the retaining straps and position and tighten the screws (1).

Fuel tank retaining strap to body

M8 screw	Renew screws.	Tightening torque	19 Nm



- Attach the fuel filler neck breather pipe in the brackets (1).
- Position snap fastener (2) and lock.



- Mount rubber hose on fuel tank in direction of arrow.
- Renew the hose clamp (1).

  Parts: Hose clamp
- Position hose clamp (1) and tighten.

Filling hose on fuel tank

Hose clamp	Replace hose clamp.	Tightening torque	4 Nm

18 – Removing delivery unit (vehicles without stationary heating system)

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18 – Removing delivery unit (vehicles without stationary heating system)

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

TECHNICAL INFORMATION

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

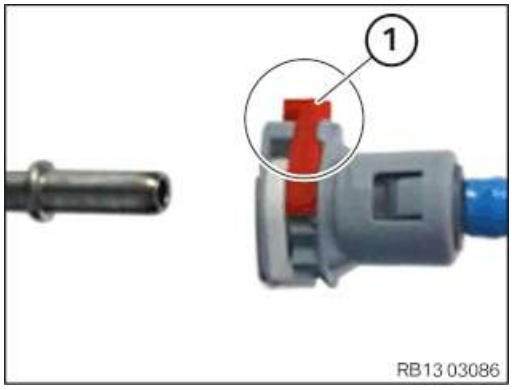
TECHNICAL INFORMATION

All the new delivery units are delivered in equipment specification **with** auxiliary heating.
For these vehicles, the connection on the flange lid must be closed with a lock.
The lock must be ordered separately, refer to Electronic Parts Catalogue.

▸ **Connecting and locking the fuel line with a snap fastener**

TECHNICAL INFORMATION

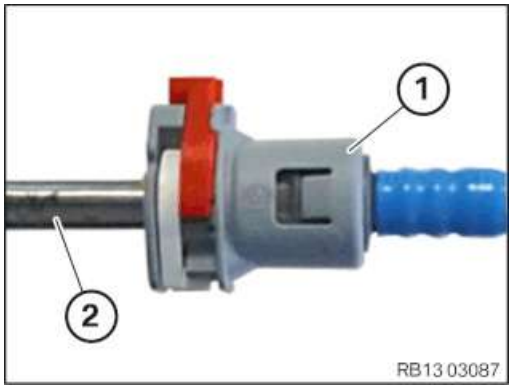
No tools may be used to unlock/lock and disconnect/connect the fuel line with a snap fastener manufactured by Hutchinson.



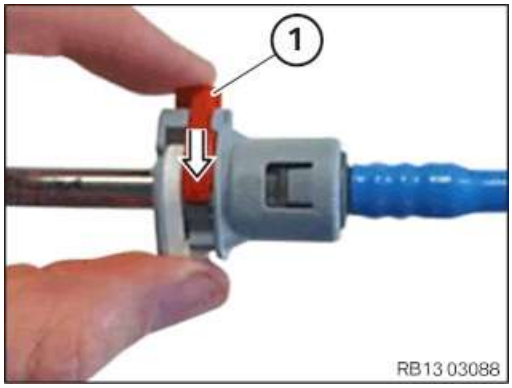
- **Installing a new fuel line:**

  When installing a new fuel line make sure lock (1) protrudes.

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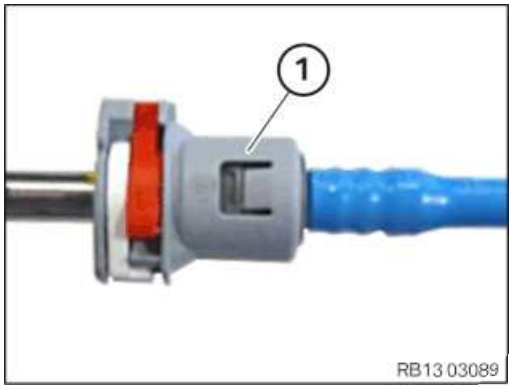


- Insert fuel line (2) into fuel line (1).
- Slide fuel line (2) into fuel line (1) by clicking the first white lock.



- Lock red lock (1) in direction of arrow.

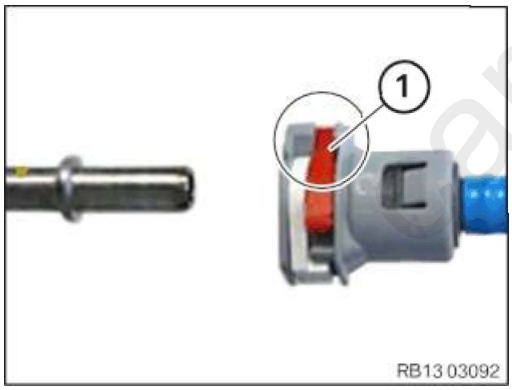
  Lock (1) can only be locked when the fuel lines are correctly connected.



- Check that snap fastener (1) locks correctly into place.

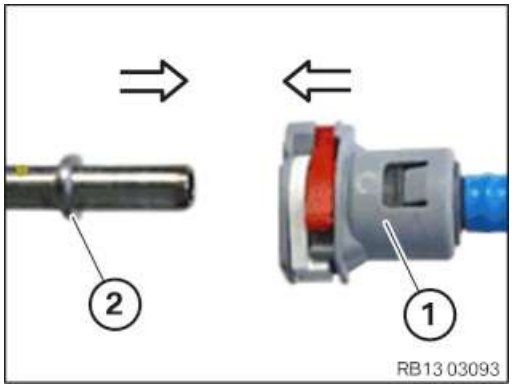
  The snap fastener must felt and heard to engage.

  A tensile test is **not** permitted.



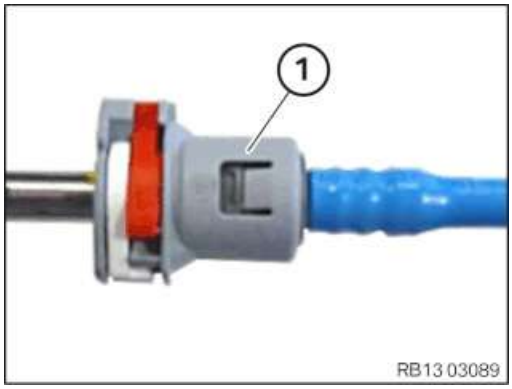
- **Installing a previous fuel line:**

  When an already mounted fuel line is installed, the red lock (1) is already pressed down.



- Push fuel line (2) and fuel line (1) together in direction of arrow until both locks are heard to lock.

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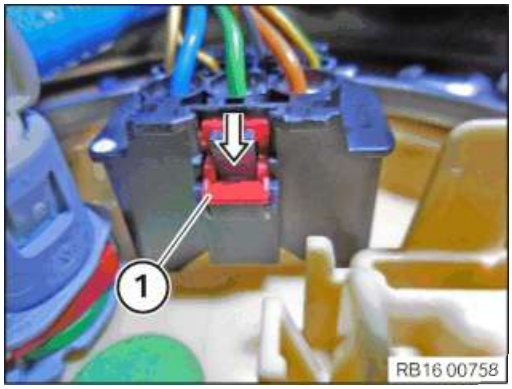
- Check that snap fastener (1) locks correctly into place.

  The snap fastener must felt and heard to engage.

  A tensile test is **not** permitted.



- Connect and lock the snap fasteners (1).



- Connect connector.
- Lock retaining tab (1) in the direction of the arrow.



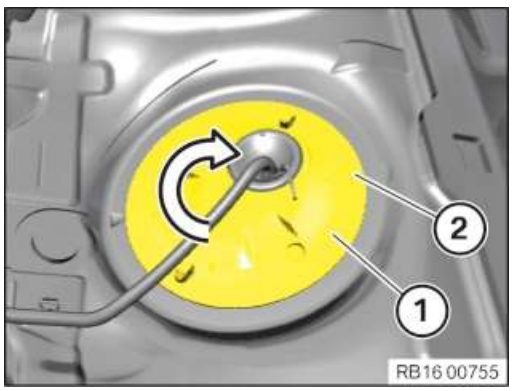
- Renew the sealing cap of the floor panel.

  Parts: Sealing cap of the floor panel

  There is a risk of leakage if the sealing cap of the floor panel is reused.
- Coat seal in area (1)using lubricant (see Electronic Parts Catalogue).

Assembly aids

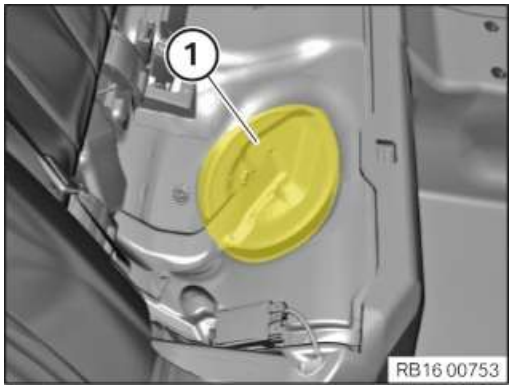
Lubricants G14	900 ml, Can	83232360412



- Install the sealing cap (1) and seal it in the direction of arrow.

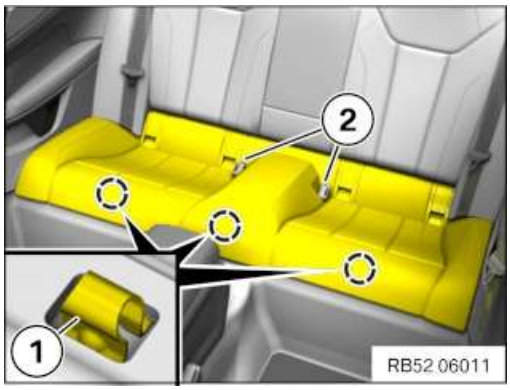
  Mark (2) must point to the front in the direction of travel.

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- Seal the insulating mat in the area (1).

19 – Installing the rear seat bench

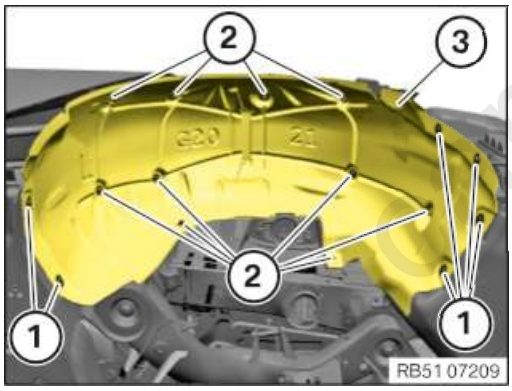


- Feed in the seat belt buckles (2).
- Position the rear seat bench and clip into the clamps (1).

20 – Removing the rear wheel arch cover

NOTICE

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



- Guide the wheel arch cover (3) in.
- Tighten the screws (1).
- Tighten nuts (2).

Wheel arch cover

Screw		3 Nm
Plastic nut		2,6 Nm

21 – Mounting the rear right wheel

▸ **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.

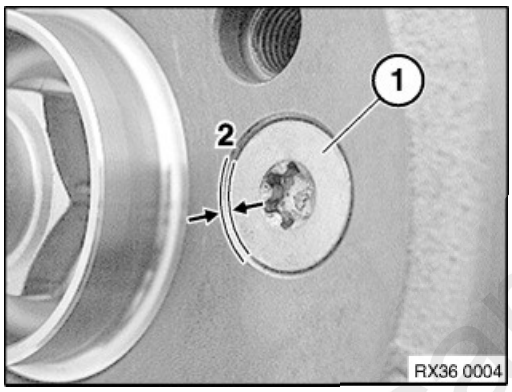
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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).



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

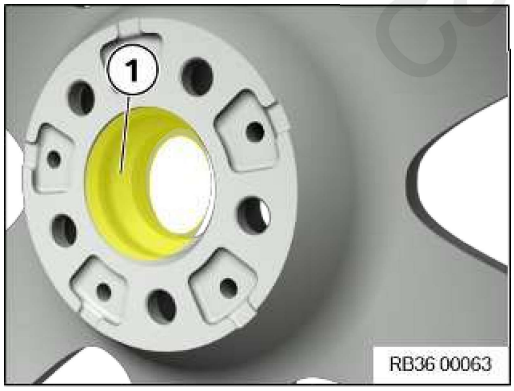
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

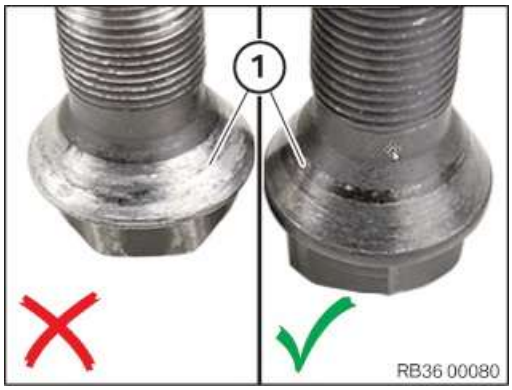
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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 the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) 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.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

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22 – Completely installing the propeller shaft

RISK OF DAMAGE

Damage to the propeller shaft during installation.

Non-observance of the installation guidelines for the propeller shaft on the rear axle differential may cause severe damage.

- Always renew the recessed nut on the rear axle differential. Screw locking must be available.
- Strictly observe a hardening time of minimum 3 h after screwing the recessed nut. The hardening time may be longer at lower temperatures.

- Observe following installation sequence:
  - Position propeller shaft on transmission.
  - Position the propeller shaft at the rear axle differential.
  - Position centre mount.
- Observe the following screwing sequence:
  - Insert nut
  - Flexible disc to transmission
  - Centre mount



- Check the centring (arrow) for damage and renew if necessary.



- Apply a thin coat of grease to the soft centring (1), if necessary.

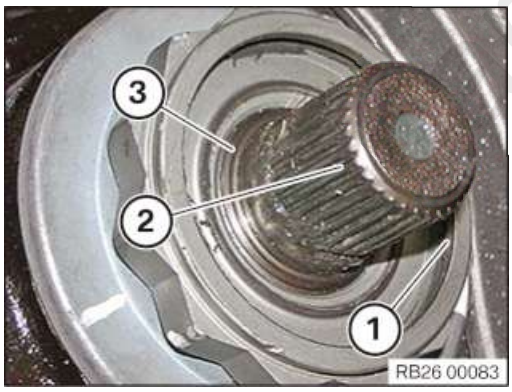
Expendable materials

Lubricating grease Olistamoly 2 LN 584 LO	100 g, Tube	83 19 0 447 919

Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754

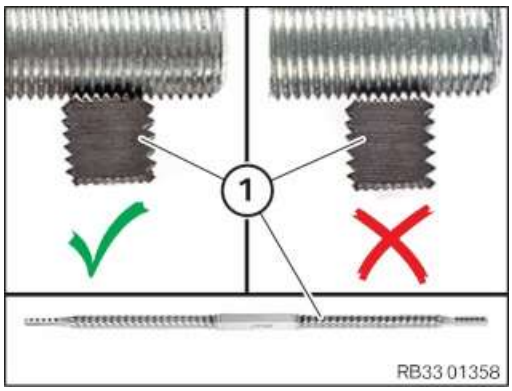
- Hard centring (2) must **not** be greased.



- Clean all residue from the insert collar (1) of the flange nut and the gearing on the bevel pinion (2) and degrease them.
- Top up the collar insert (1)with grease.

Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754



- Use a thread file (1) to remove the adhesive residue on the thread.

  Make sure that the thread pitch is correct!

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RISK OF DAMAGE

Damage to the output flange.

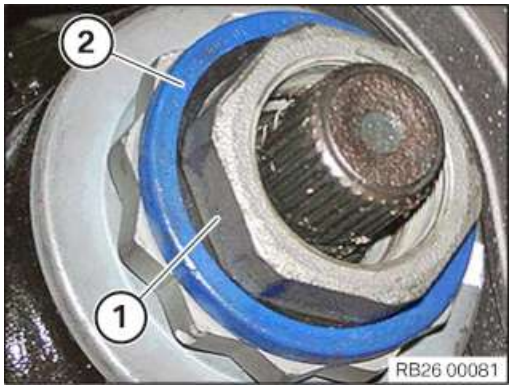
Failure to observe the greasing specifications may lead to damage on the output flange.

- Do not contaminate the thread of the output flange with grease.

- Clean thread (1) of flange off adhesive residue.
- Clean gearing (2).
- Grease gearing (2).

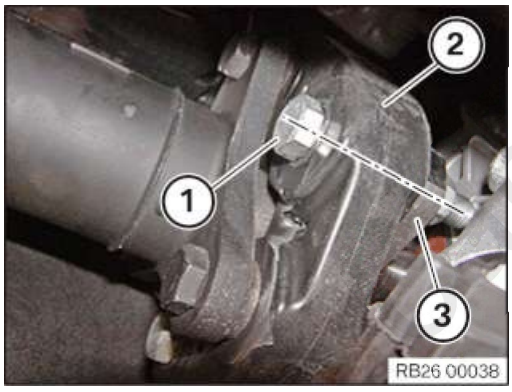
Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754



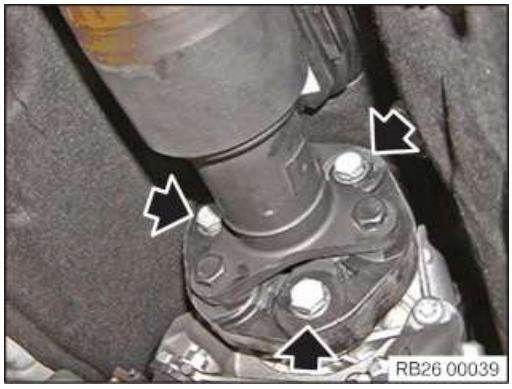
- Renew the seal, recessed nut (1) and the retaining ring (2).

  Parts: Seal, recessed nut, retaining ring
- Insert recessed nut (1) including gasket into collar insert of the flange nut.
- Mount the retaining ring (2).



- It is imperative to reassemble the three-hole flange (3) with the flexible disc (2) in the same position in order to avoid humming noise of the drivetrain after reinstalling the propeller shaft.
- Renew ZNS screws and the self-locking nuts (1).

  Parts: ZNS screws, self-locking nuts

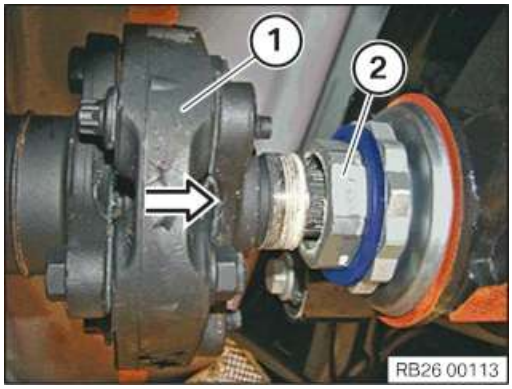


- Position the screws and nuts (arrows).
- Tighten the screws.

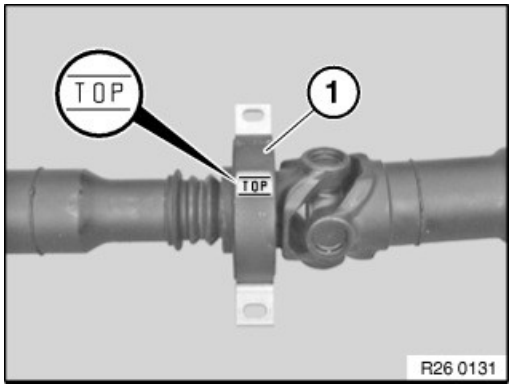
Front flexible disc to propeller shaft

M12	Renew screws. Comply with jointing torque and angle of rotation. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

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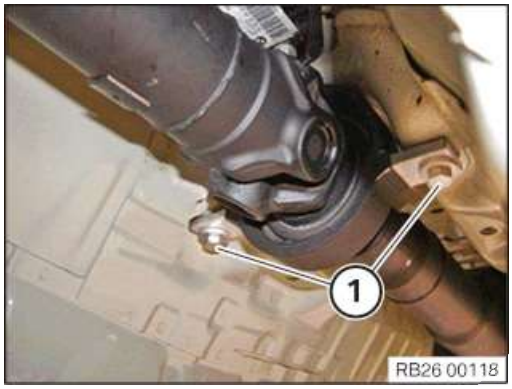


- Push the propeller shaft (1) in the direction of the arrow against the recessed nut (2) up to the limit position.
- Manually screw on and tighten the recessed nut (2) onto the propeller shaft (1) by a minimum of two threads.

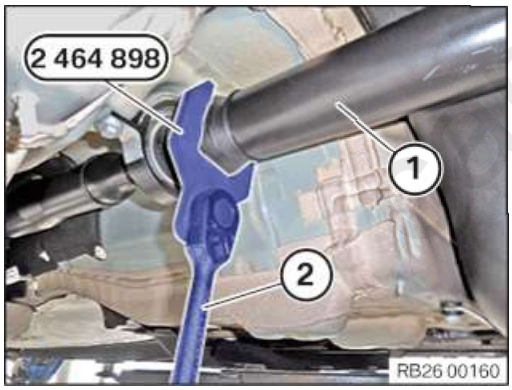


- **Version with the TOP designation:**

  The centre mount (1) must be installed with the TOP marking at the top in the gearbox tunnel.

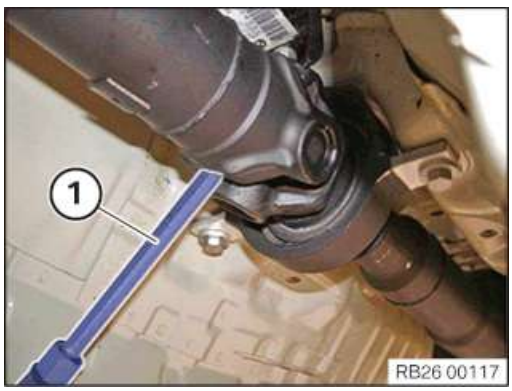


- Position centre mount.
- Position screws (1).



- **Version with a narrow universal joint:**

  Using the special tool 2 464 898 and a suitable tool (2), secure the propeller shaft (1) to the centre universal joint against twisting.



- **Version with a broad universal joint:**

  Secure the propeller shaft against twisting at the central universal joint using a suitable tool (1).

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RISK OF DAMAGE

Damage to the flange nut.

Failure to observe the installation specifications may lead to serious damage to the flange nut and the rear axle differential.

- Do not use the double hexagon flange nut as counter support.
- Screw in the recessed nut within 5 minutes.

- Screw in the recessed nut **counter-clockwise, see direction of arrow** with special tools 0 495 554 (33 5 070) and .

  The recessed nut must be screwed in within 5 min .

Propeller shaft on the rear axle differential

Insert nut	Replace insert nut.	Tightening torque	100 Nm

- **After the propeller shaft is installed and the recessed nut is screwed in, strictly observe a hardening time of minimum 3 hours.**

  Do not move or push the vehicle during this time!

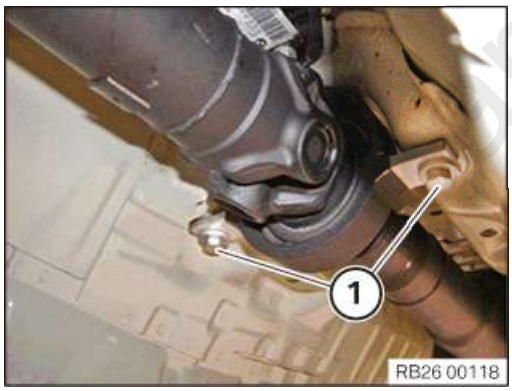


- Brace mounting bolts of flexible disc on nut and tighten by screw.

Rear flexible disc to three-hole flange

M12	Renew screws. Jointing torque and angle of rotation must be observed without fail. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

- Secure the special angle of rotation tool 0 490 504 (00 9 120) with the magnets to the vehicle underbody and screw it further depending on the angle of rotation.

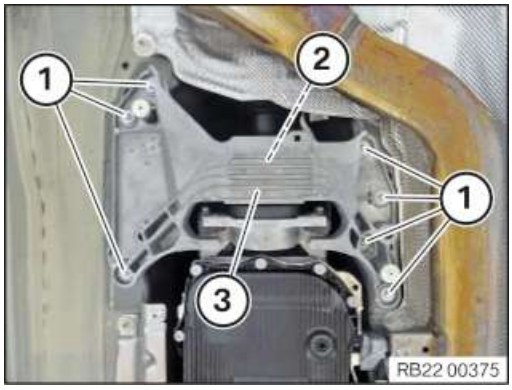


- Tighten the screws (1).

Centre mount to body

M8		Tightening torque	19 Nm

23 – Install transmission cross member.



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

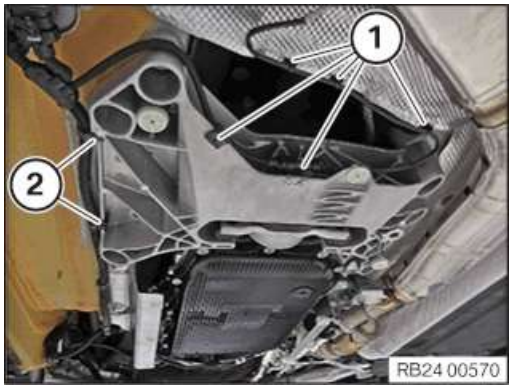
Transmission cross member to body

M8		Tightening torque	19 Nm

- Tighten down screw (2).

Transmission cross member to rubber mounts

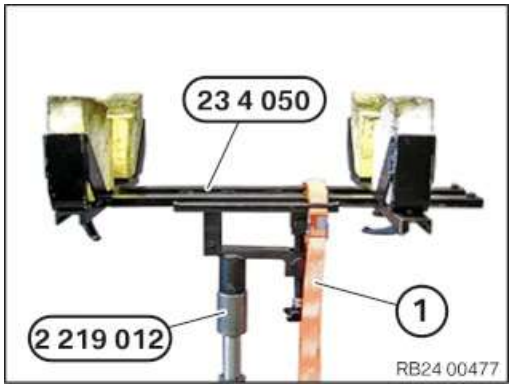
M12		Tightening torque	100 Nm



- **Only B47 and B57:**

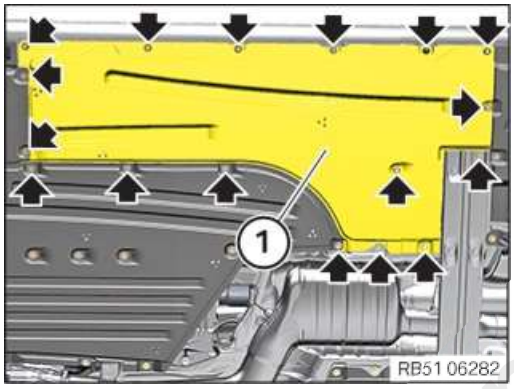
  Install the cable.

  Fasten the cable with clamps (1) and (2).



- 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.

24 – Installing the underbody panelling on the sides

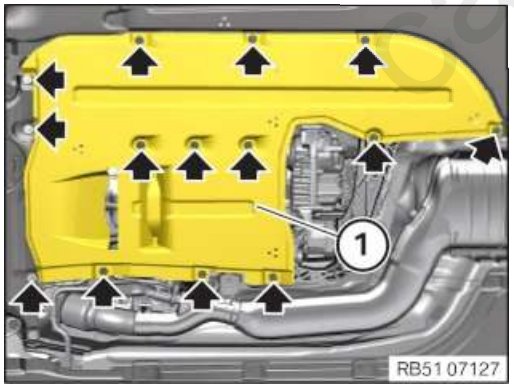


- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

25 – Installing underbody protection at rear



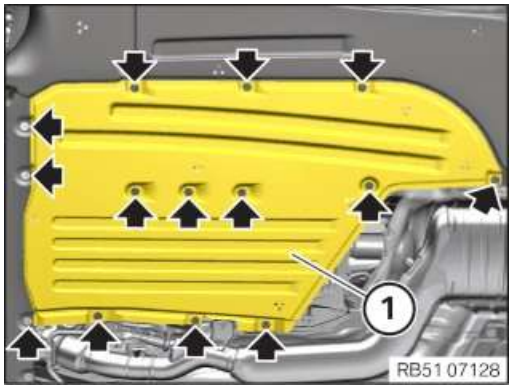
- **Version A:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version B:**

  Insert and install the rear underbody protection (1).

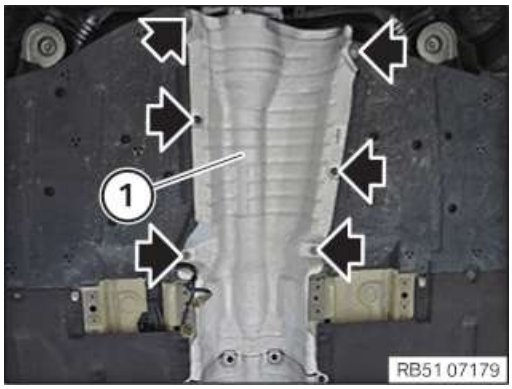
  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

carldiagnet.com

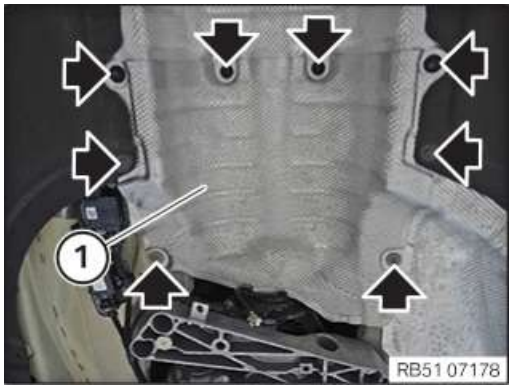
26 – Installing the heat shields



- Install the heat shield (1).
- Tighten the nuts and bolts (arrows).

Heat shield to undercarriage

Screws and nuts		Tightening torque	3 Nm



- Install the heat shield (1).
- Tighten the nuts and bolts (arrows).

Heat shield to undercarriage

Screws and nuts		Tightening torque	3 Nm

27 – Installing the exhaust system

CAUTION

Component with heavy weight.

Danger of injury!

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

CAUTION

Heavy component.

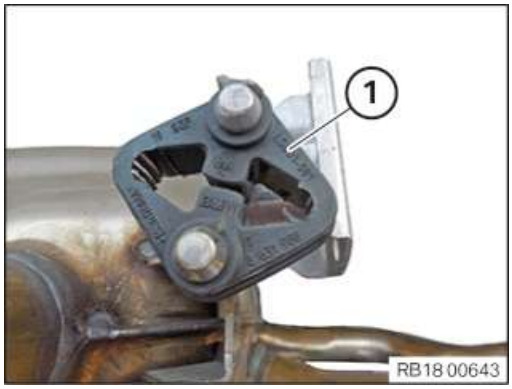
Heavy components can lead to injury or damage.

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

TECHNICAL INFORMATION

Mount the exhaust system in voltage-free state, maintaining the tightening sequence from the rear silencer towards the exhaust manifold.

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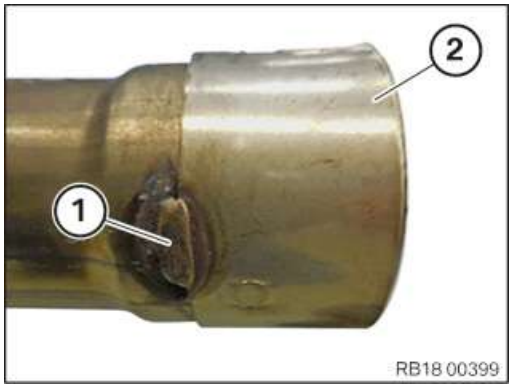


NOTICE

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

- Check all the rubber mounts (1) of the exhaust system for damage.
- Replaced damaged rubber mounts.

  Parts: Rubber mount



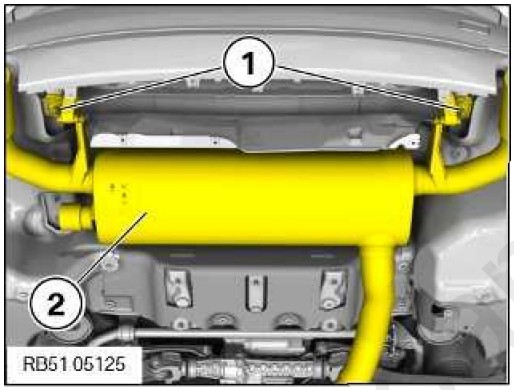
CAUTION

Swarf resulting from sawing or grinding components.

Danger of injury!

- Conduct all work in appropriate personal protective equipment only.
- Wear safety goggles and protective gloves.

- Open the weld seam (1) with a conventional tool.
- Remove the clamp (2).

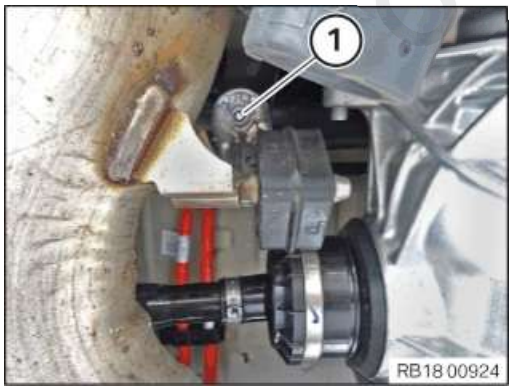


- Insert and install the exhaust system (2).
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Rear silencer to body / bumper support

M8	Replace nuts.	Tightening torque	19 Nm

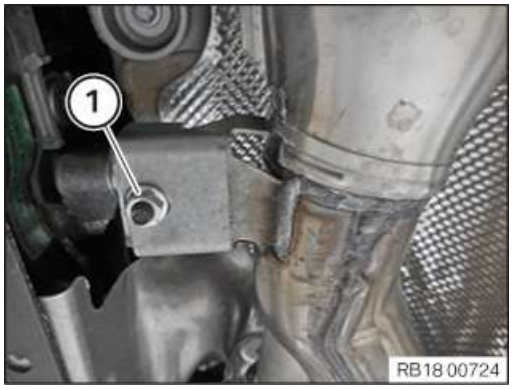


- Renew nut (1) on the rear axle support.

  Parts: Nut
- Tighten nut (1).

Exhaust system to rear axle carrier

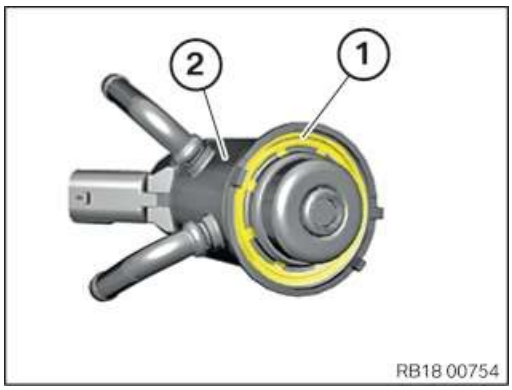
M8 nut		Tightening torque	19 Nm



- Tighten nut (1).

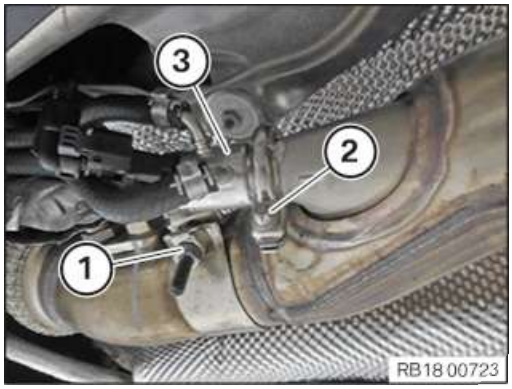
Exhaust system to transmission

M8		Tightening torque	19 Nm



- Renew sealing ring (1) of the SCR metering module (2).

  Parts: Sealing ring



- If necessary, renew clamp (1).

  Parts: Clamp
- Tighten clamp (1).

Exhaust system to diesel particle filter

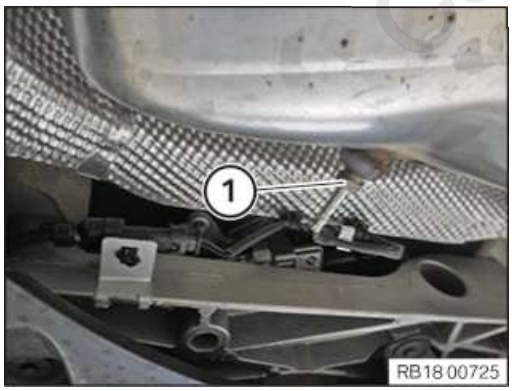
M8	If necessary, renew clamp.	Tightening torque	26 ±2 Nm

- Renew the V-clip (2).

  Parts: V-band clamp
- Install the SCR metering module (3) in the exhaust system.
- Tighten the V-clip (2) of the SCR metering module (3).

SCR metering module V-clip to exhaust system

V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

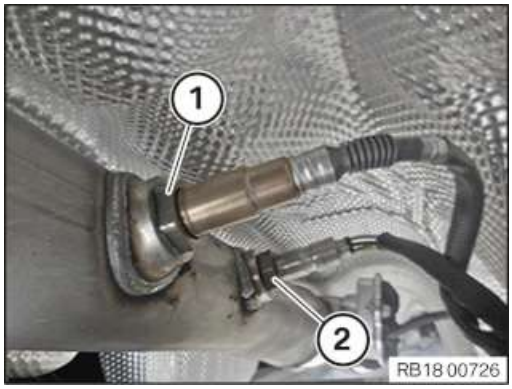


- Install the exhaust temperature sensor (1) in the exhaust system and tighten.

Exhaust-gas temperature sensor upstream of SCR catalytic converter

Sensor		Tightening torque	30 Nm

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- Install the diesel particulate sensor (1) in the exhaust system and tighten.

Diesel particulate sensor to exhaust system

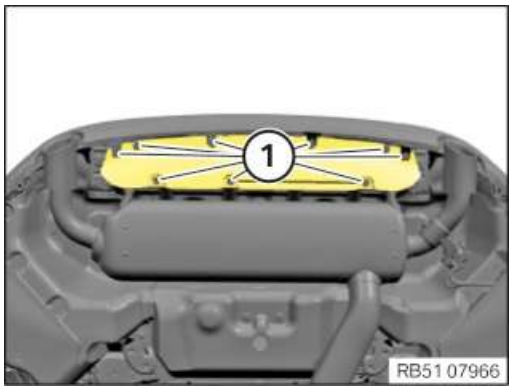
Sensor		Tightening torque	50 Nm

- Install the nitrogen oxide sensor (2) in the exhaust system and tighten.

Nitrogen oxide sensor downstream of SCR catalytic converter

Sensor		Tightening torque	55 Nm

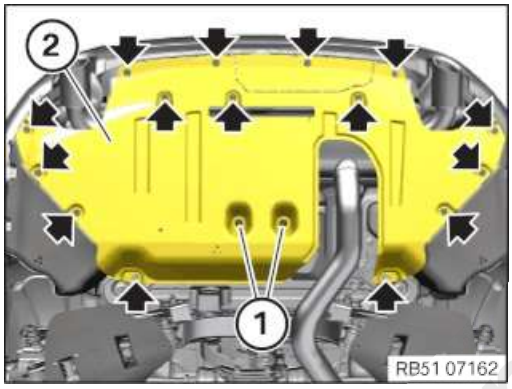
28 – Installing the rear diffuser



- **Version 1:**
- Install the diffuser and tighten the nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser / underbody panelling

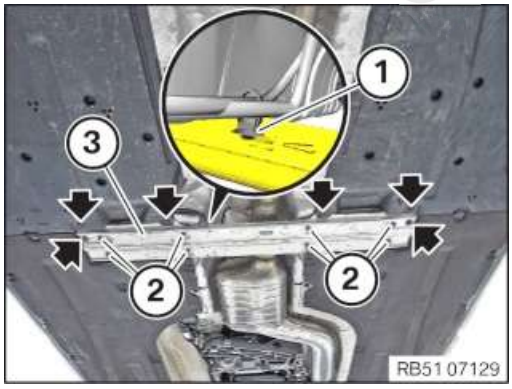
Nuts and screws		Tightening torque	3 Nm

- Tighten nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

29 – Install the connecting supports on the tunnel



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).
- Tighten screws (arrows).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

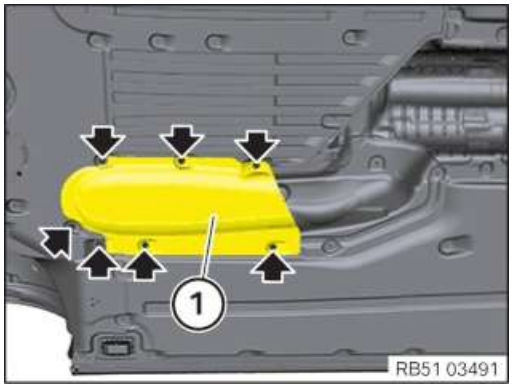
- Secure the clamp (1).

30 – Install the underbody panelling of the transmission on the side

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Insert the underbody panelling (1).
- Tighten screws (arrows).

Underbody panelling

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

31 – Filling the fuel tank



- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Slide the suction hose (1) of the extractor unit about 40 cm into the fuel filler neck. If necessary, slightly turn the suction hose.
- Fill fuel from suction extractor unit.
- After completing the work and before starting the engine for the first time: Fill the fuel tank by the fuel filler neck with a minimum of 5 l of fuel.

Additional Information

Overview of Tightening Torques

Fuel tank to body — Used in step 17

Nut M8	Renew nut.	Tightening torque	19 Nm

Fuel tank retaining strap to body — Used in step 17

M8 screw	Renew screws.	Tightening torque	19 Nm

Filling hose on fuel tank — Used in step 17

Hose clamp	Replace hose clamp.	Tightening torque	4 Nm

Wheel arch cover — Used in step 20

Screw			3 Nm
Plastic nut			2,6 Nm

Brake disc to front wheel hub — Used in step 21

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 21

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts — Used in step 21

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

Front flexible disc to propeller shaft — Used in step 22

M12	Renew screws. Comply with jointing torque and angle of rotation. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

Propeller shaft on the rear axle differential — Used in step 22

Insert nut	Replace insert nut.	Tightening torque	100 Nm

Rear flexible disc to three-hole flange — Used in step 22

M12	Renew screws. Jointing torque and angle of rotation must be observed without fail. Tightening via screw.	Jointing torque Angle of rotation	55 Nm 90 °

Centre mount to body — Used in step 22

M8		Tightening torque	19 Nm

Transmission cross member to body — Used in step 23

M8		Tightening torque	19 Nm

Transmission cross member to rubber mounts — Used in step 23

M12		Tightening torque	100 Nm

Underbody panelling, side — Used in step 2427

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Underbody protection — Used in step 25

Hexagon screw		Tightening torque	3 Nm

Heat shield to undercarriage — Used in step 26

Screws and nuts		Tightening torque	3 Nm

Rear silencer to body / bumper support — Used in step 27

M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to rear axle carrier — Used in step 27

M8 nut		Tightening torque	19 Nm

Exhaust system to transmission — Used in step 27

M8		Tightening torque	19 Nm

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Exhaust system to diesel particle filter — Used in step 27

M8	If necessary, renew clamp.	Tightening torque	26 ±2 Nm

SCR metering module V-clip to exhaust system — Used in step 27

V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

Exhaust-gas temperature sensor upstream of SCR catalytic converter — Used in step 27

Sensor		Tightening torque	30 Nm

Diesel particulate sensor to exhaust system — Used in step 27

Sensor		Tightening torque	50 Nm

Nitrogen oxide sensor downstream of SCR catalytic converter — Used in step 27

Sensor		Tightening torque	55 Nm

Diffuser / underbody panelling — Used in step 28

Nuts and screws		Tightening torque	3 Nm

Connecting support to tunnel — Used in step 29

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Underbody panelling — Used in step 30

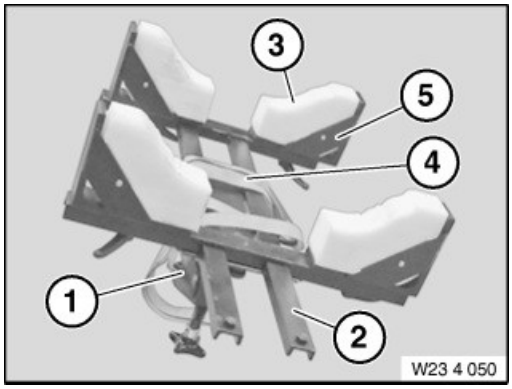
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Overview of Special Tools

0 495 498 (23 4 050) Fixture

Used in step 23

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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 inserts (1 set = 4 pcs.))	
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)		**Fixture** (Fixture for foam insert) Available only as a complete tool set 23 4 050 (83 30 0 495 498) - as of 16.07.12.	

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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2 464 898 Open-end spanner



Common Used in step 922

Usage	Open-end spanner SW50 for disassembly and installation of the propeller shaft on rear axle differential. The silhouette foil is included in the delivery specification.
Included in the tool or work	
Storage location	A7
Replaced by	
In connection with	
SI-Number	01 19 18 (579)

0 495 554 (33 5 070) Extension



Common Used in step 922

Usage	Pull-out extension for 33 5 040, 33 5 050, 33 5 060.
Included in the tool or work	
Storage location	A18
Replaced by	
In connection with	
SI-Number	01 21 06 (300)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 592 (33 5 071)		**Extension** (Extension (1 item)) discontinued, can only be ordered using complete tool	

2 344 011 Tool



Common Used in step 21

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

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



Common	Used in step 22
Usage	For torsion angle adjustment of cylinder head bolts (all engines) And reinforcement plate front axle support E46
Included in the tool or work	
Storage location	A4
Replaced by	
In connection with	
SI-Number	

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Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 10
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



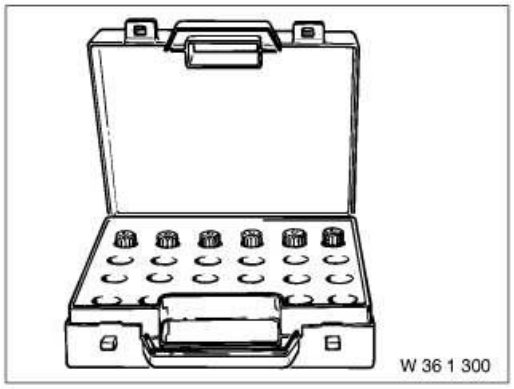
Common	Used in step 10
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 10
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 10
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 10
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 10
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 10
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 10
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
00 02 001 Raising the vehicle using a vehicle lift	1021

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16 14 500 Removing and installing/replacing control unit for the electric fuel pump

RISK OF DAMAGE

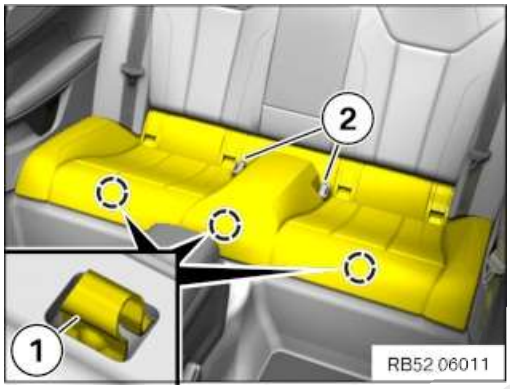
Electrostatic discharge.

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 ... Notes for ESD protection (electrostatic discharge)

PRELIMINARY WORK

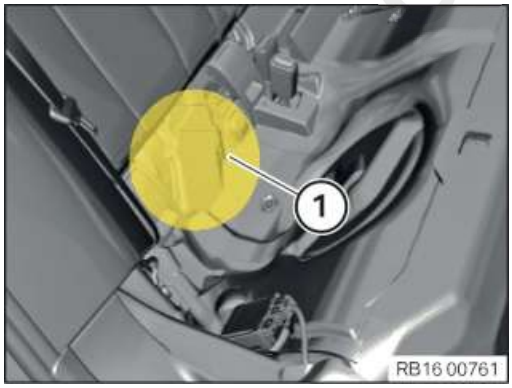
1 – Remove rear seat bench



- Unclip the rear seat bench upwards from clamps (1) and guide out seat belt buckles (2).
- Remove the rear seat bench.

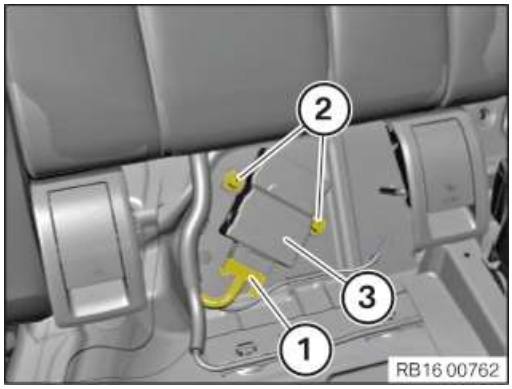
MAIN WORK

2 – Remove the control unit for the fuel pump control electronics



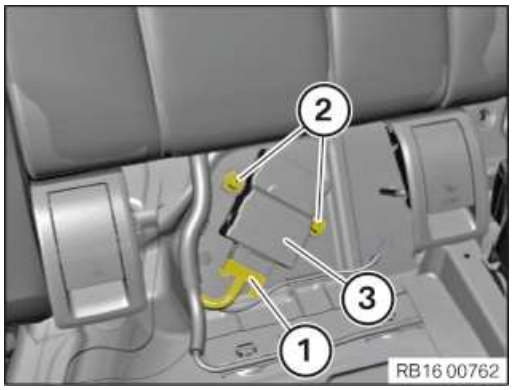
- Expose floor trim in the area (1).

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- Disconnect plug connection (1).
- Release the nuts (2) and remove the control unit (3).

3 – Install the control unit for the fuel pump control electronics



- Install the control unit for the fuel pump control electronics (3).
- Renew nuts (2).

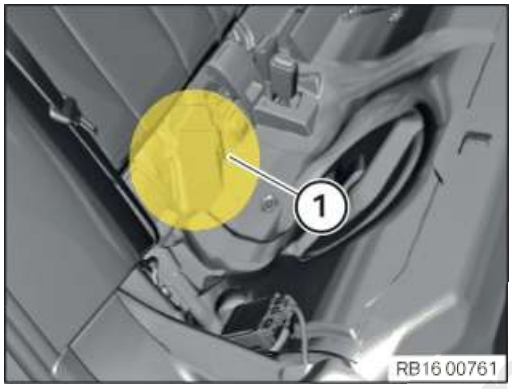
  Parts: Nuts.

  Fit nuts (2) and tighten.

Control unit for electrical fuel pump control on body

	Renew plastic nut.	Tightening torque	4 Nm

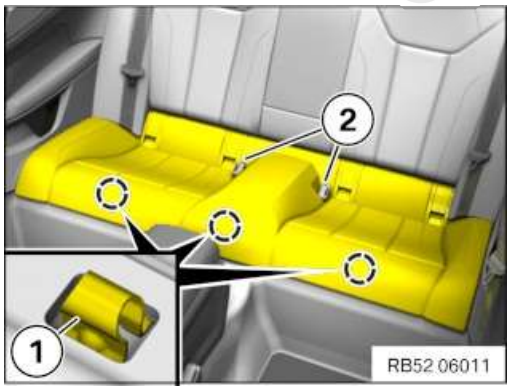
- Connect connector (1).



- Close the floor trims in the area (1).

POSTPROCESSES

4 – Installing the rear seat bench



- Feed in the seat belt buckles (2).
- Position the rear seat bench and clip into the clamps (1).

5 – Putting fuel pump control electronics into operation



- Connect diagnosis and information system.
- Perform fuel pump control electronics start-up.

Additional Information

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Overview of Tightening Torques

Control unit for electrical fuel pump control on body Used in step 3

	Renew plastic nut.	Tightening torque	4 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	

61 35 ... Notes on ESD protection (Electro Static Discharge)

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16 14 090 Removing and installing/replacing delivery unit

PRELIMINARY WORK

1 – Drawing off the fuel tank

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.



- Open fuel filler cap.
- Insert special tool into fuel filler neck.

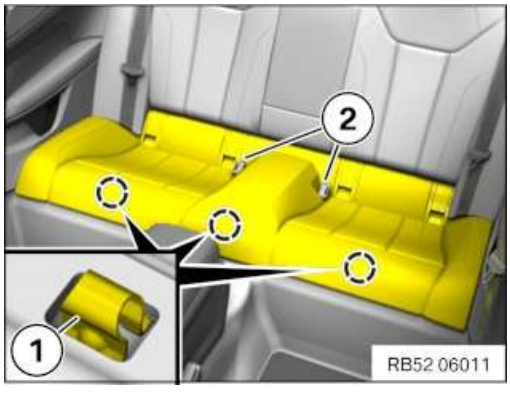
  The special tool has two different diameters for petrol and diesel vehicles.
- Push the suction hose (1) of the extractor unit through the special tool and into the fuel filler neck. If necessary, slightly turn the suction hose.

  For the extractor unit: see BMW service workshop equipment.

  The insertion length of the suction hose is 135 cm.
- Start engine and allow to run, so that the electric fuel pump is running.

  This will ensure that the fuel is pumped by the suction jet pump from the left-hand side of the fuel tank to the right hand-side.
- Draw off fuel with the extractor unit as far as possible. In the process, track the drawing off of the fuel on the fuel gauge in the instrument cluster.

2 – Remove rear seat bench



- Unclip the rear seat bench upwards from clamps (1) and guide out seat belt buckles (2).
- Remove the rear seat bench.

3 – Opening the locking ring (vehicle without auxiliary heating)

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

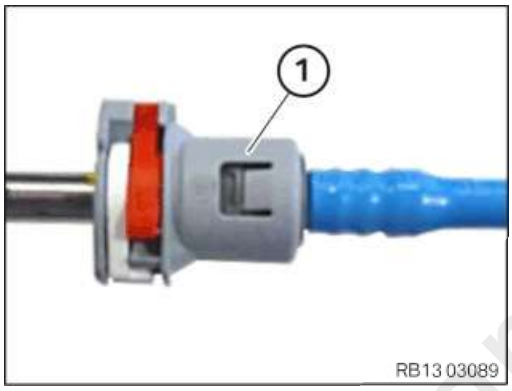
TECHNICAL INFORMATION

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

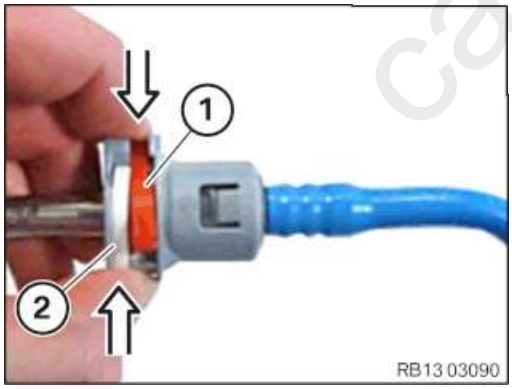
▸ **Unlocking and disconnecting fuel line with a snap fastener**

TECHNICAL INFORMATION

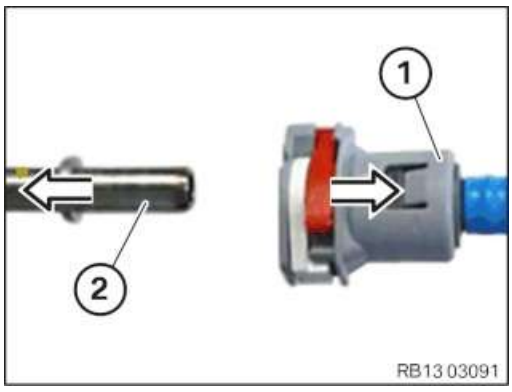
No tools may be used to unlock/lock and disconnect/connect the fuel line with a snap fastener manufactured by Hutchinson.



- Observe the following instruction to unlock snap fastener (1) of the fuel line.

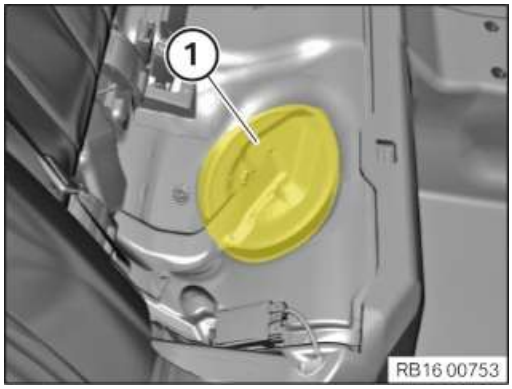


- Press in locks (1) and (2) in direction of arrow.



- Disconnect fuel lines (1) and (2) in direction of arrows.

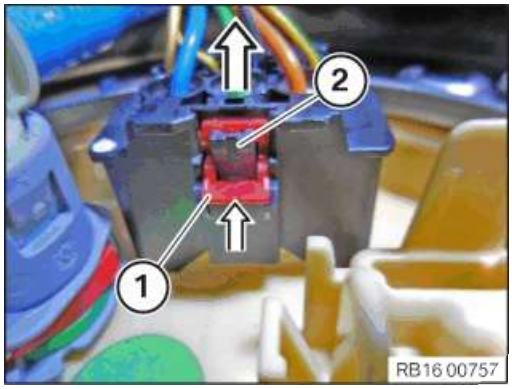
cardiagn.com



- Unfold the insulating mat in the area (1).



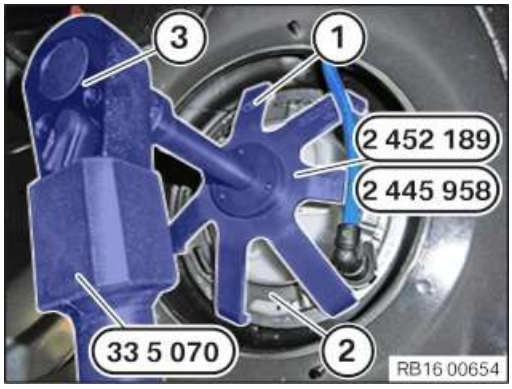
- Turn the sealing cap (1) in the direction of the arrow.



- Unlock the locking tab (1) in the direction of the arrow.
- Operate the tab (2)and pull off the connector housing.



- Unlock and disconnect the snap fasteners (1).

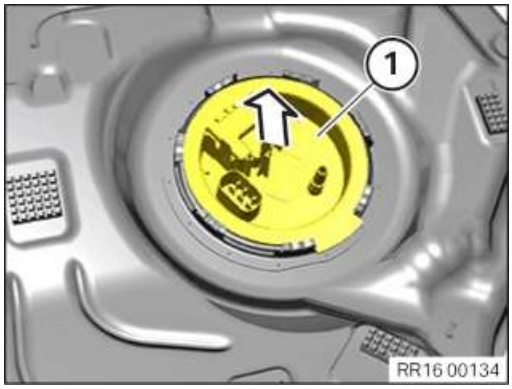


- Fit the special tool 2 452 189 or 2 445 958 (1) on the locking ring (2).
- Connect the special tool 0 495 554 (33 5 070) to a 1/2 inch reversible ratchet head (3) and fit it on the special tool 2 452 189 2 445 958.
- Release locking ring (2) in anti-clockwise direction.

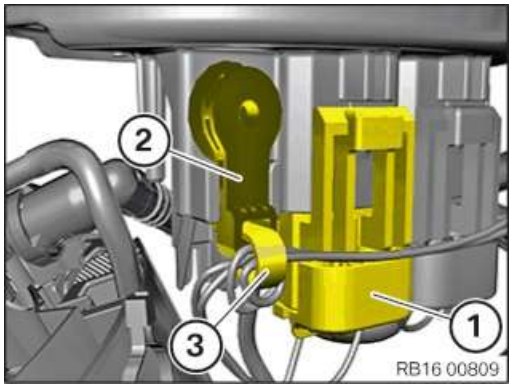
MAIN WORK

4 – Remove delivery unit

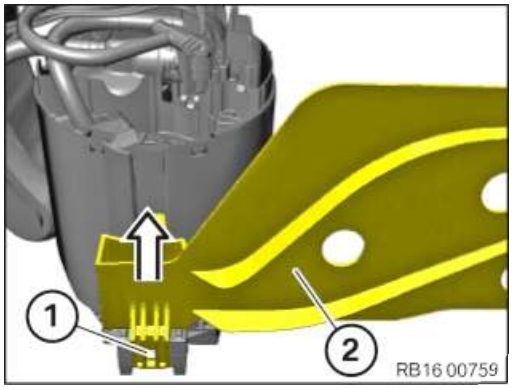
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- Lift flange lid (1) in direction of arrow.



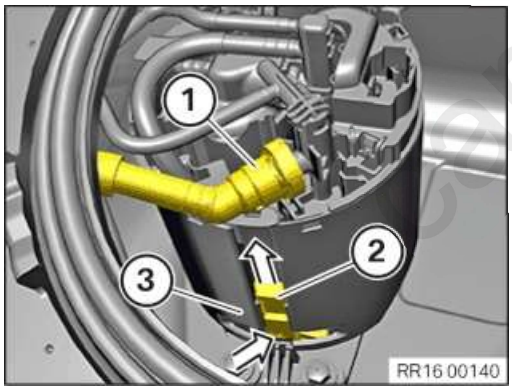
- Disconnect plug connection (1).
- Remove cable holder (2) and sever cable tie (3).



NOTICE

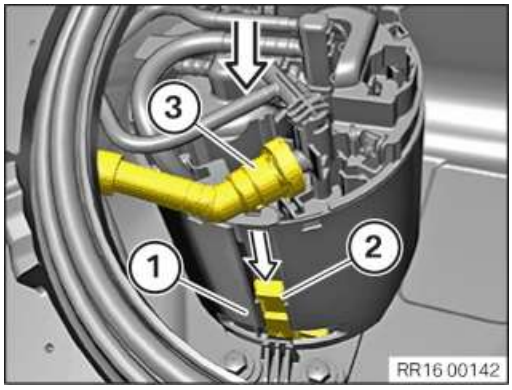
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Unlock the tab (1) and remove the slosh side (2) towards the top.



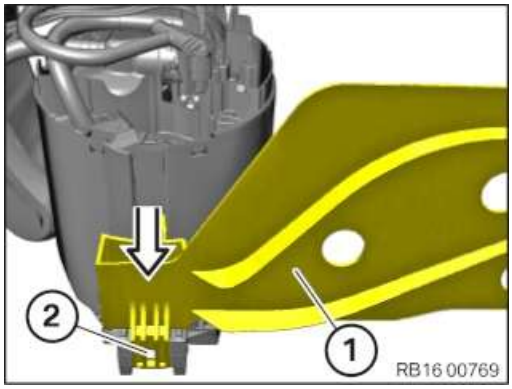
- Unlock and pull off snap fastener (1).
- Unlock lock (2) in direction of arrow from the top.
- Slightly push delivery unit (3) in direction of arrow and feed out to the top.

5 – Installing delivery unit



- Feed in delivery unit (1) in direction of arrow from the top and lock.

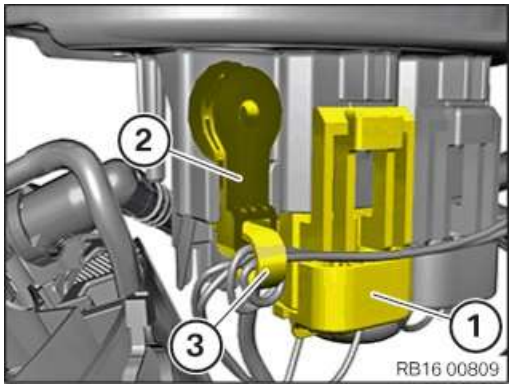
  Ensure the delivery unit is properly locked in the mounting!
- Lock the lock (2) in direction of arrow to the bottom.
- Position snap fastener (3) and lock.



NOTICE

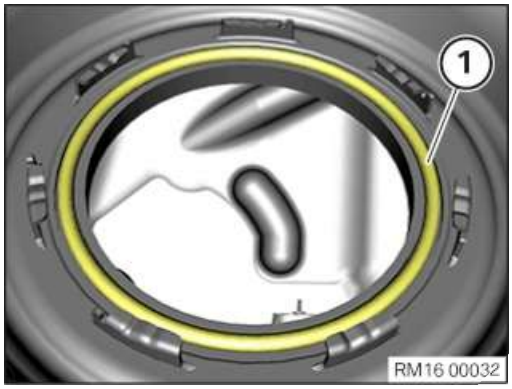
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Insert splash wall (1) from the top and lock tab (2).



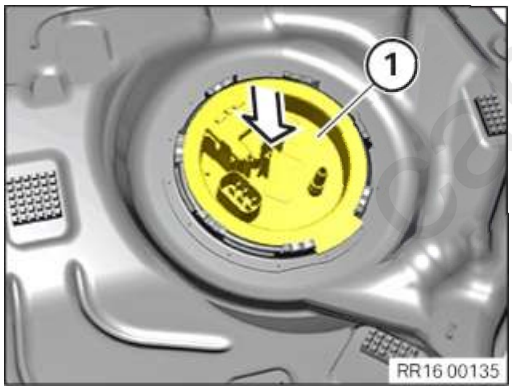
- Connect connector (1).
- Renew cable holder (2) and cable connector (3).

  Parts: Cable holder, cable connector
- Attach cable to the brackets .



- Renew sealing ring (1).

  Parts: Sealing ring



- Mount flange lid (1) in direction of arrow.

POSTPROCESSES

6 – Closing locking ring (vehicles without stationary heating system)

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

TECHNICAL INFORMATION

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

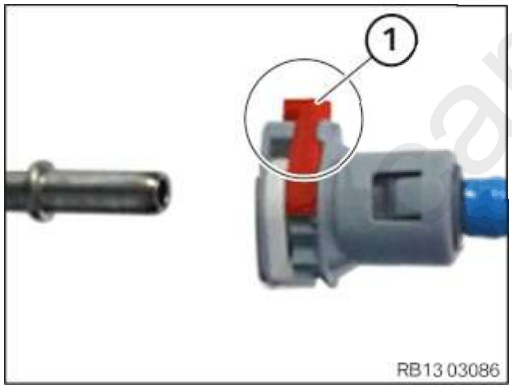
TECHNICAL INFORMATION

All the new delivery units are delivered in equipment specification **with** auxiliary heating.
For these vehicles, the connection on the flange lid must be closed with a lock.
The lock must be ordered separately, refer to Electronic Parts Catalogue.

▸ **Connecting and locking the fuel line with a snap fastener**

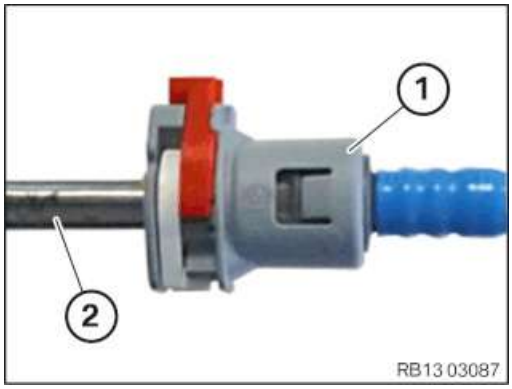
TECHNICAL INFORMATION

No tools may be used to unlock/lock and disconnect/connect the fuel line with a snap fastener manufactured by Hutchinson.



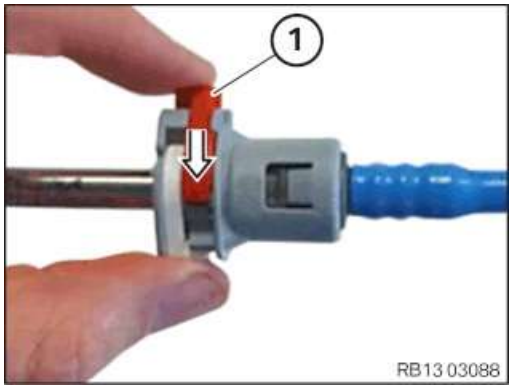
- **Installing a new fuel line:**

  When installing a new fuel line make sure lock (1) protrudes.



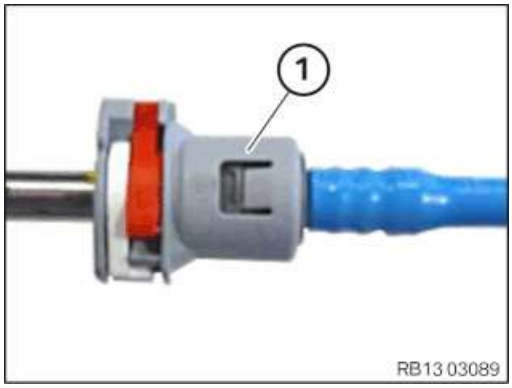
- Insert fuel line (2) into fuel line (1).
- Slide fuel line (2) into fuel line (1) by clicking the first white lock.

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- Lock red lock (1) in direction of arrow.

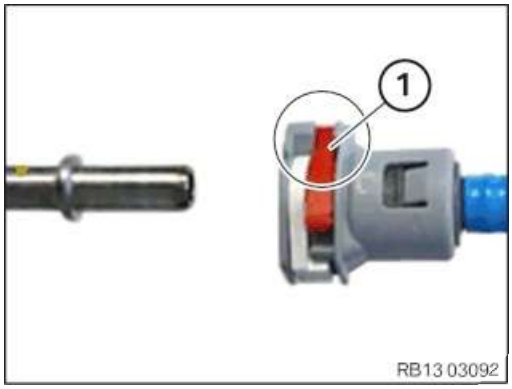
  Lock (1) can only be locked when the fuel lines are correctly connected.



- Check that snap fastener (1) locks correctly into place.

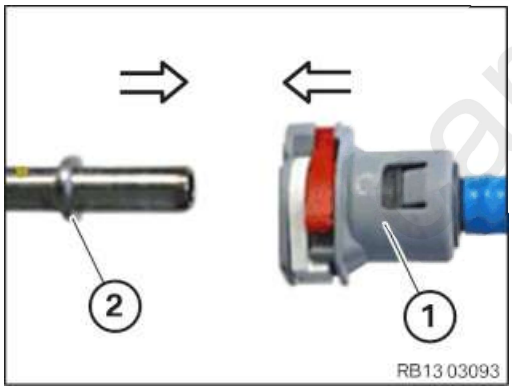
  The snap fastener must felt and heard to engage.

  A tensile test is **not** permitted.

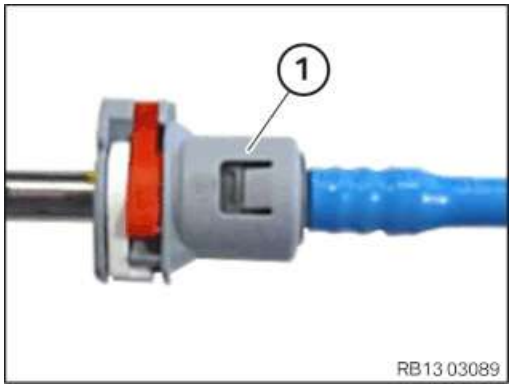


- **Installing a previous fuel line:**

  When an already mounted fuel line is installed, the red lock (1) is already pressed down.



- Push fuel line (2) and fuel line (1) together in direction of arrow until both locks are heard to lock.

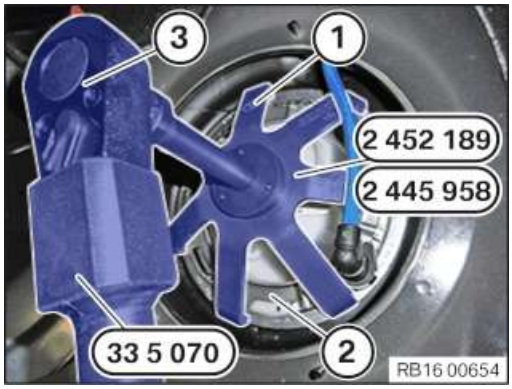


- Check that snap fastener (1) locks correctly into place.

  The snap fastener must felt and heard to engage.

  A tensile test is **not** permitted.

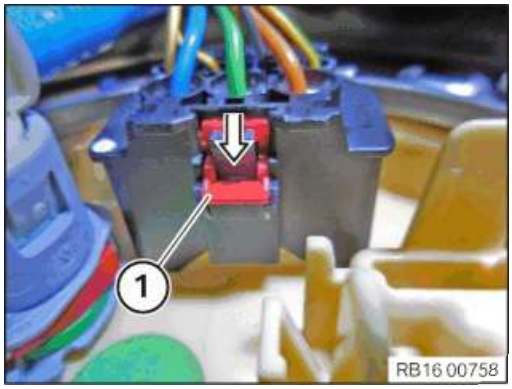
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- Attach the special tool 2 452 189 or 2 445 958 (1) to the locking ring (2).
- Connect the special tool 0 495 554 (33 5 070) to a 1/2 inch reversible ratchet head (3) and fit it on the special tool 2 452 189 2 445 958.
- Tighten locking ring (2) in clockwise direction.
- Make sure that the locking ring to the fuel tank is engaged correctly.



- Connect and lock the snap fasteners (1).



- Connect and lock the connector.
- Lock retaining tab (1) in the direction of the arrow.



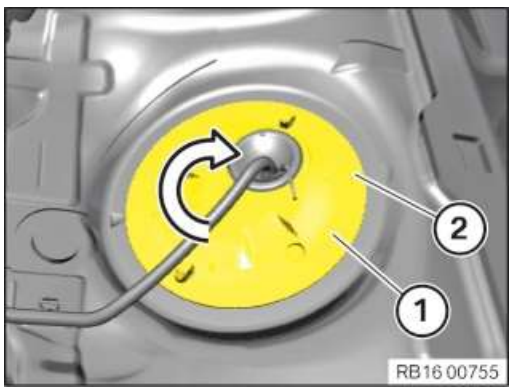
- Renew the sealing cap of the floor panel.

  Parts: Sealing cap of the floor panel

  There is a risk of leakage if the sealing cap of the floor panel is reused.
- Coat seal in area (1)using lubricant (see Electronic Parts Catalogue).

Assembly aids

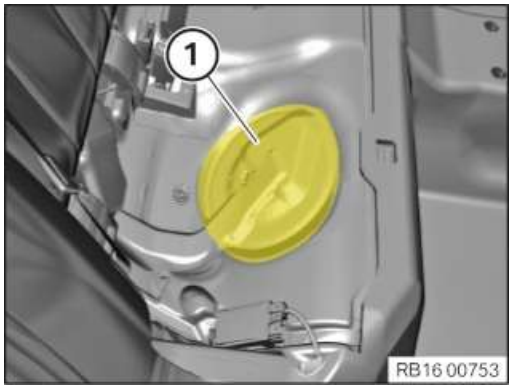
Lubricants G14	900 ml, Can	83232360412



- Lock the sealing cap (1) in the direction of arrow.

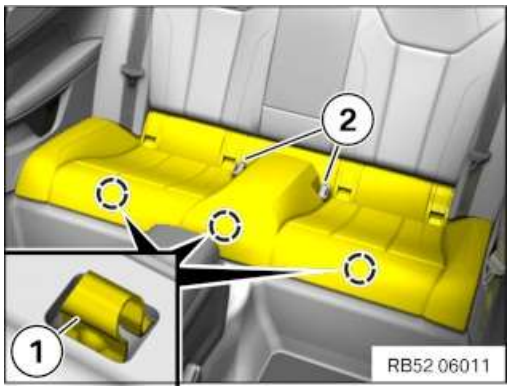
  Mark (2) must point to the front in the direction of travel.

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- Seal the insulating mat in the area (1).

7 – Installing the rear seat bench



- Feed in the seat belt buckles (2).
- Position the rear seat bench and clip into the clamps (1).

8 – Filling the fuel tank



- Insert special tool into fuel filler neck.

  The special tool has two different diameters for petrol and diesel vehicles.
- Slide the suction hose (1) of the extractor unit about 40 cm into the fuel filler neck. If necessary, slightly turn the suction hose.
- Fill fuel from suction extractor unit.
- After completing the work and before starting the engine for the first time: Fill the fuel tank by the fuel filler neck with a minimum of 5 l of fuel.

Additional Information

Overview of Tightening Torques

Overview of Special Tools

2 452 189 Wrench



Common	Used in step 36
Usage	Tank unlocking key large as replacement for 0496321; SWZ applies to ALL derivatives up to mid-year 2017
Included in the tool or work	
Storage location	C5
Replaced by	
In connection with	
SI-Number	01 03 17 (478)

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2 445 958 Wrench



Common Used in step 36

Usage	Tank service flap
Included in the tool or work	
Storage location	A5
Replaced by	
In connection with	
SI-Number	01 03 17 (478)

0 495 554 (33 5 070) Extension



Common Used in step 36

Usage	Pull-out extension for 33 5 040, 33 5 050, 33 5 060.
Included in the tool or work	
Storage location	A18
Replaced by	
In connection with	
SI-Number	01 21 06 (300)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 592 (33 5 071)		**Extension** (Extension (1 item)) discontinued, can only be ordered using complete tool	

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16 19 010 Drawing off SCR active reservoir content

1 – Evacuating the SCR reservoir

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

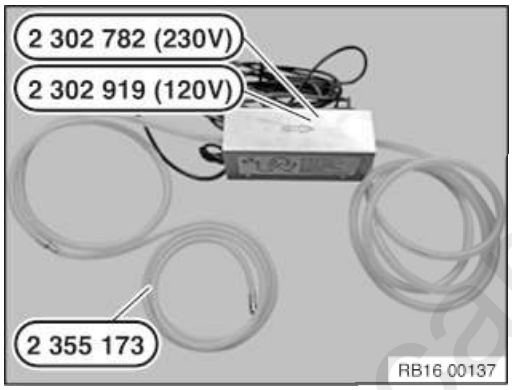
- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

TECHNICAL INFORMATION

Use only lint-free cloths for cleaning the SCR system: WAYPALL cleaning cloths L20 - see BMW Group Parts.

TECHNICAL INFORMATION

After repair work, clean the working area thoroughly with water.
Clean special tools with water after every use.



- Ensure that the right extractor unit is used.

  The special tool 2 302 782 (for 230 V) or the special tool 2 302 919 (for 120 V) must be used.
- Attach the special tool (adapter hose) 2 355 173 on the intake side of the extractor unit.

TECHNICAL INFORMATION

Before starting up the AdBlue extractor unit: Comply with the manufacturer's operating instructions and safety regulations.

- Observe the extraction direction (see arrow on the extractor unit).



- Run in the special tool (adapter hose) 2 355 173 of the extractor unit in the filler neck (1).
- If necessary, turn the suction hose while inserting it.

  The insertion length of the suction hose is 70 cm.

TECHNICAL INFORMATION

Do not reuse the drawn off AdBlue.

- Extract AdBlue.

Additional Information

Overview of Special Tools

2 302 782 Pump



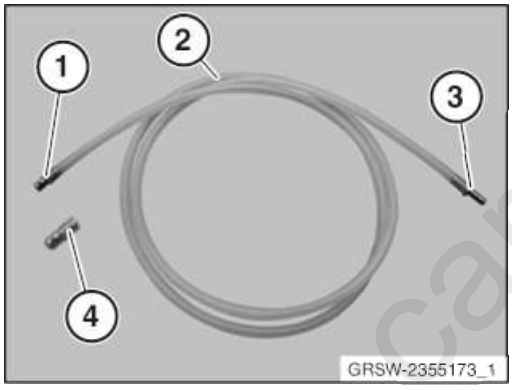
Common	Used in step 1
Usage	AdBlue 230 exhaust pump for the extraction of the urea/water mixture(AdBlue®).
Included in the tool or work	
Storage location	
Replaced by	
In connection with	Special tool 2355173
SI-Number	01 30 11 (767)

2 302 919 Pump



Common	Used in step 1
Usage	AdBlue 110V exhaust pump for the extraction of the urea/water mixture(AdBlue®) from the vehicle-specific expansion tanks.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	Special tool 2355173
SI-Number	01 30 11 (767)

2 355 173 Hose



Common	Used in step 1
Usage	Hose (hose extension) for AdBlue suction pump (81 39 2 302 782 or 81 39 2 302 919). This hose can be used to directly draw off AdBlue® from the “SCR“ active tank on the vehicle.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	WE 2302782
SI-Number	01 12 13 (964)

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16 19 075 Filling SCR reservoir

1 – Filling SCR reservoir

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

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

TECHNICAL INFORMATION

Use only lint-free cloths for cleaning the SCR system: WAYPALL cleaning cloths L20 - see BMW Group Parts.

TECHNICAL INFORMATION

After repair work, clean the working area thoroughly with water.
Clean special tools with water after every use.



- Screw the special tool 2 302 783 with the flatter connection on the fluid tank with the AdBlue.
- Connect the other end of the special tool 2 302 783 to the filler neck of the SCR tank.
- Lift the fluid tank with the AdBlue over the fuel filler neck.
- Fill the SCR tank.
- If the SCR fluid tank is full before the fluid tank with the AdBlue is empty: Position the fluid tank down and unscrew the special tool 2 302 783.
- Ensure that the AdBlue does not leak when unscrewing the special tool 2 302 783.
- If necessary, immediately wash off any leaking AdBlue thoroughly with water.

Additional Information

Overview of Special Tools

2 302 783 Hose



Common	Used in step 1
Usage	Filler hose (hose)) for drip-free filling of AdBlue in SCR vehicles (for all BMW models except E90 US version). (Disposable hose! Order new part in the case of wear!)
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 30 11 (767)

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16 19 020 Removing and installing the active tank SCR

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 ... Raise the vehicle using a vehicle lift.

NOTICE

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

PRELIMINARY WORK

1 – Removing the rear right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



- If several wheels are removed at the same time: 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 the correct adapter from the set of special tools .

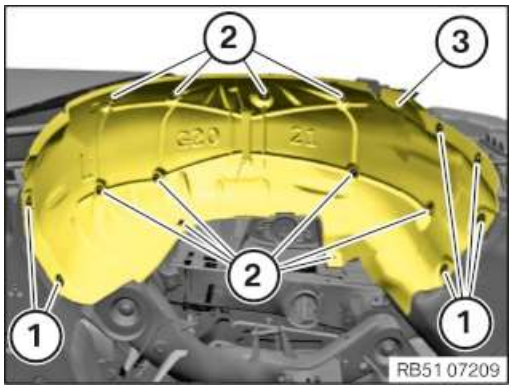
2 – Removing rear wheel arch cover

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2 – Removing rear wheel arch cover

NOTICE

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



- Loosen screws (1).
- Loosen nuts (2).
- Guide the wheel arch cover (3) out.

3 – Lower exhaust system on rear

WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Component with heavy weight.

Danger of injury!

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

CAUTION

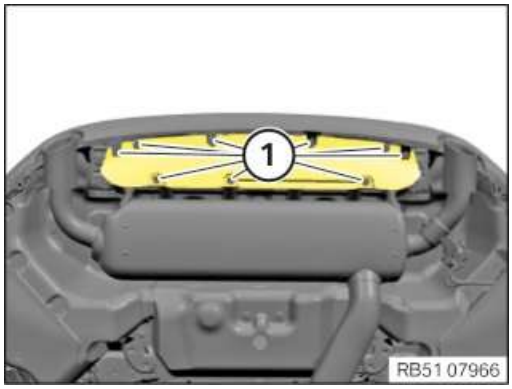
Heavy component.

Heavy components can lead to injury or damage.

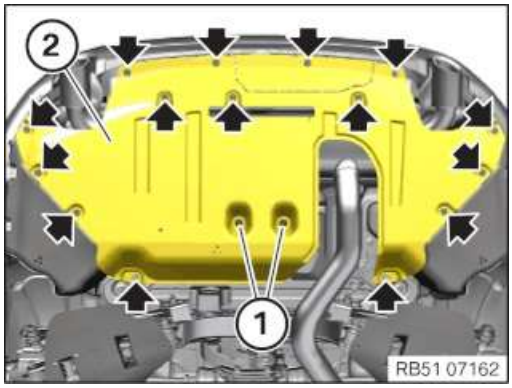
- Remove and install heavy components with the aid of another person/other persons.

▸ **Removing the rear diffuser**

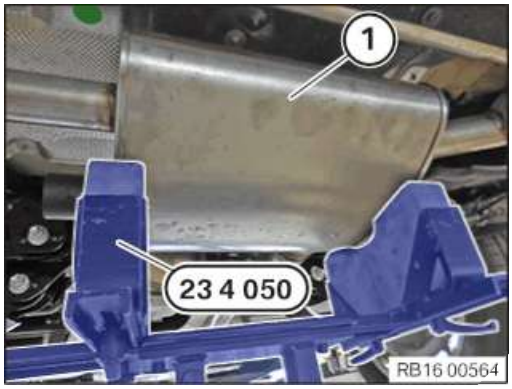
cardiagn.com



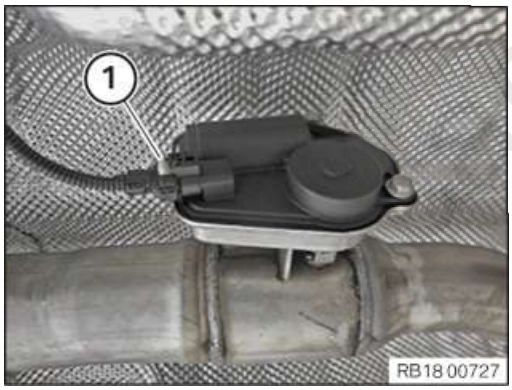
- **Version 1:**
- Release the screws and nuts (1).
- Remove the diffuser.



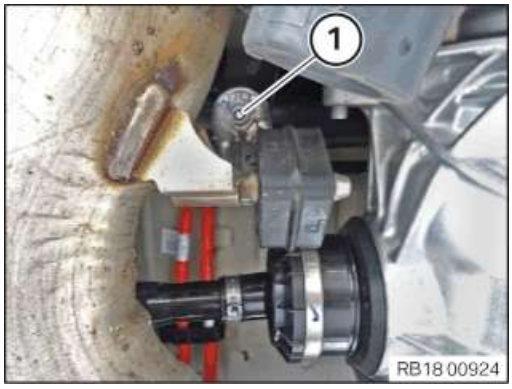
- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).



- Support the rear silencer (1) with the transmission jack and the special tool (mounting) 0 495 498 (23 4 050).

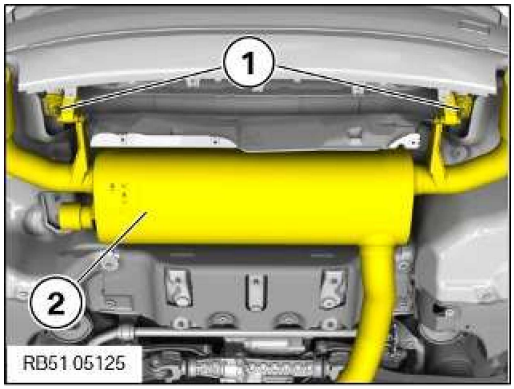


- Unlock the connector (1) and disconnect it from the exhaust flap.



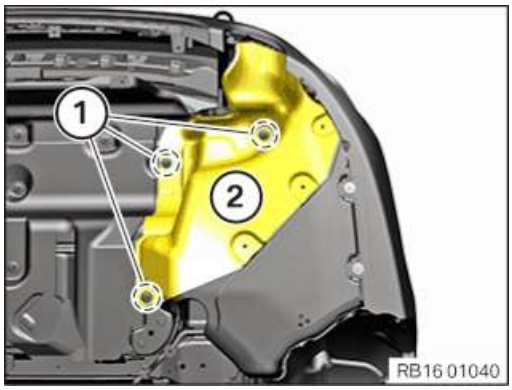
- Release the nut (1) on the rear axle support.

rdiagn.com

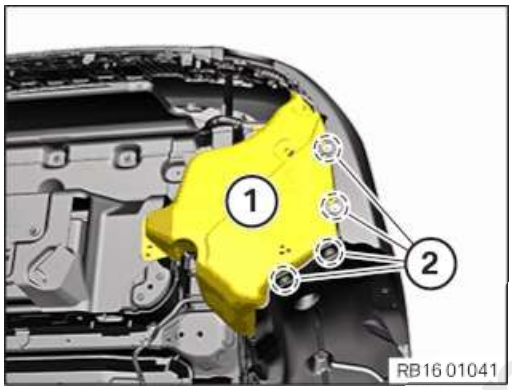


- Loosen nuts (1).
- Lower the exhaust system slightly.

4 – Removing the cover



- Release nuts (1).
- Remove the heat shield (2).



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

MAIN WORK

5 – Removing the active tank

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

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WARNING

Contact with hazardous fluids.

Hazardous to health!

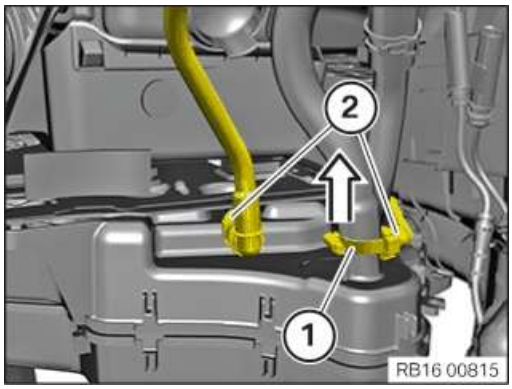
- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

RISK OF DAMAGE

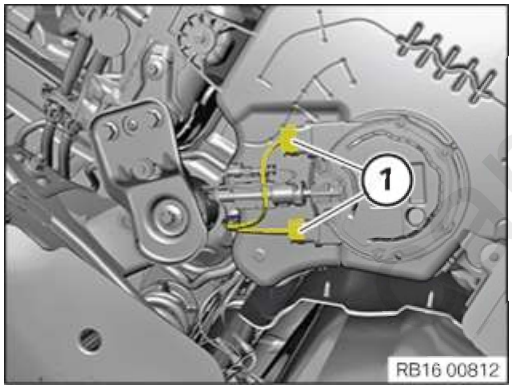
Crystallization of AdBlue due to excess exposure to oxygen.

Damage to wires and components in the SCR system.

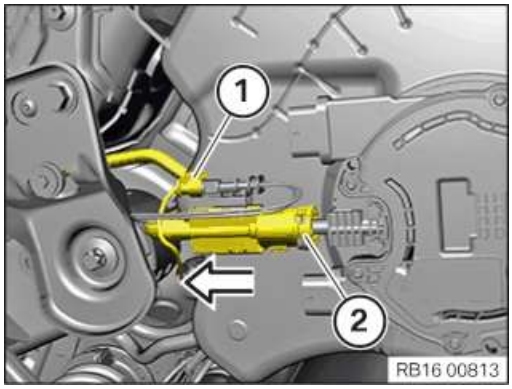
- Carry out work on the SCR system quickly and finish it promptly.



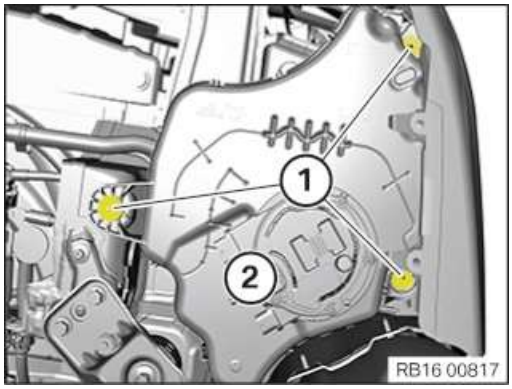
- Loosen the hose clamp (1) and remove the filling hose in the direction of the arrow.
- Unlock and disconnect the snap fasteners (2).



- Disconnect all plug connections (1).



- Remove connectors (1) from the active tank.
- Push the snap fastener (2) toward the delivery unit.
- Next, press the retaining lugs (2) and pull off the snap fastener in the direction of the arrow.



- Support the active tank (2).
- Unscrew the (1) and lower the active tank (2).

6 – Installing active tank

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

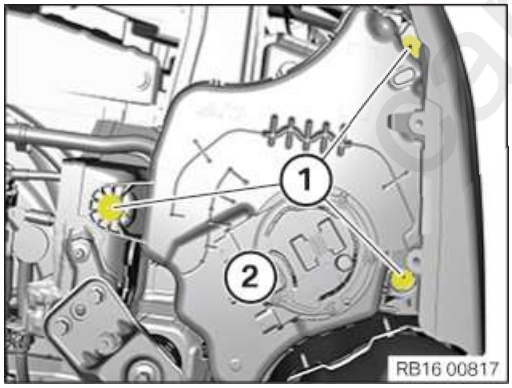
- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

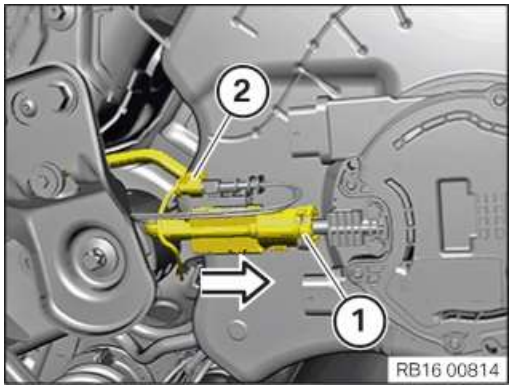
- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.



- Position the active tank (2).
- Place and tighten nuts (1).

SCR reservoir to body

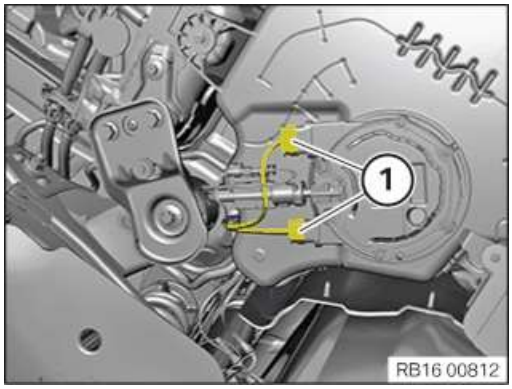
NutM6	Replace nuts.	8 Nm



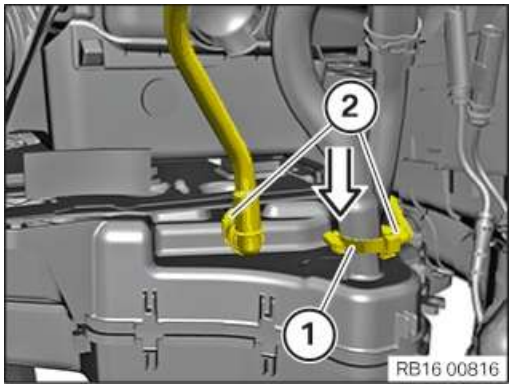
- Position snap fastener (1) and lock.

  Retaining lugs must lock completely.
- Connect connector (2).

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- Connect all connectors (1) .



- Install filling hose in the direction of the arrow.
- Position hose clamp (1) and tighten.

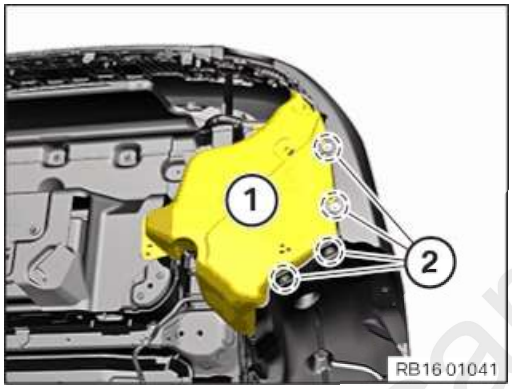
Filling hose SCR reservoir

Hose clamp	Replace hose clamp.	Tightening torque	3 Nm

- Position and lock snap fasteners (2).

POSTPROCESSES

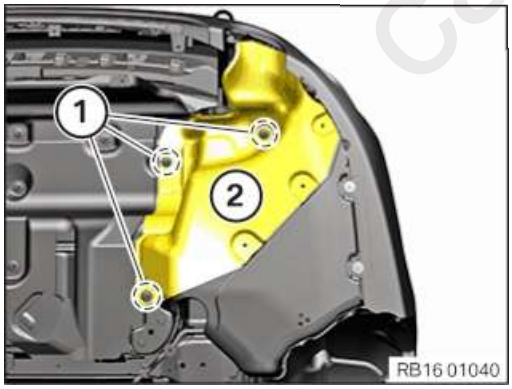
7 – Install the cover



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

Underbody panelling

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



- Install the heat shield (2).
- Tighten nuts (1).

Underbody panelling

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

8 – Installing rear exhaust system

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CAUTION

Component with heavy weight.

Danger of injury!

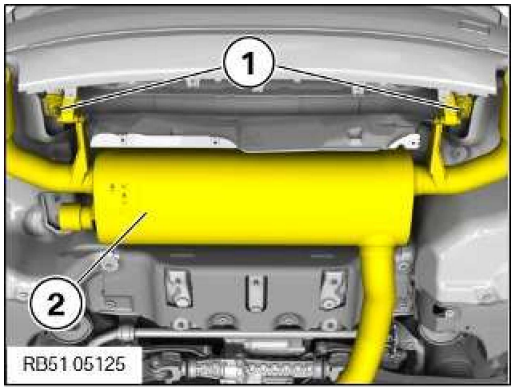
- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

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

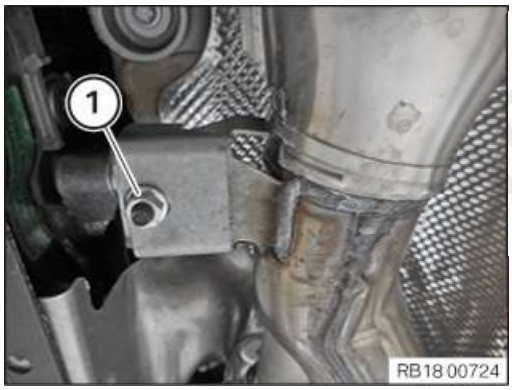


- Lift exhaust system (2).
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Rear silencer to body / bumper support

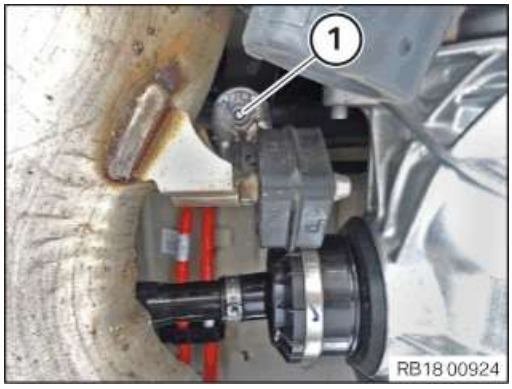
M8	Replace nuts.	Tightening torque	19 Nm



- Tighten nut (1).

Exhaust system to transmission

M8		Tightening torque	19 Nm

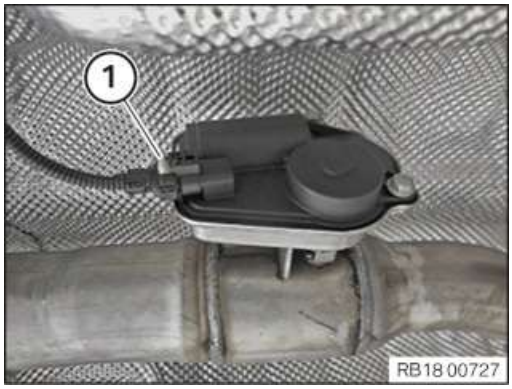


- Renew nut (1) on the rear axle support.

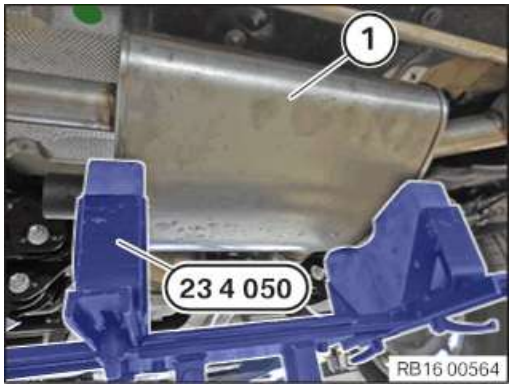
  Parts: Nut
- Tighten nut (1).

Exhaust system to rear axle carrier

M8 nut		Tightening torque	19 Nm

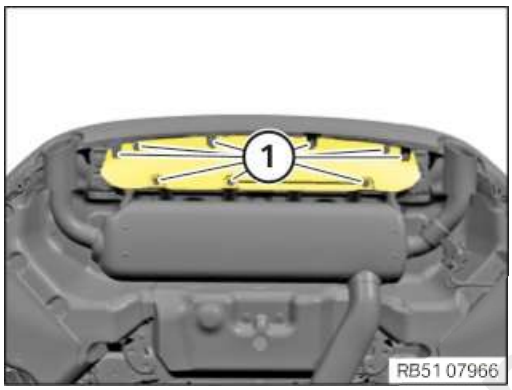


- Connect the connector (1) to the exhaust flap and ensure it audibly locks in place.



- Remove the transmission jack and the special tool (mounting) 0 495 498 (23 4 050) from the rear silencer (1).

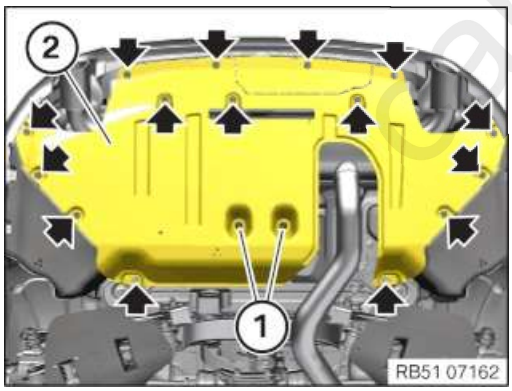
▸ **Installing the rear diffuser**



- **Version 1:**
- Install the diffuser and tighten the nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

- Tighten nuts (1).

Diffuser / underbody panelling

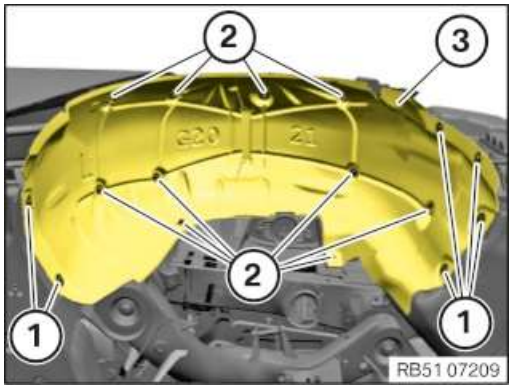
Nuts and screws		Tightening torque	3 Nm

9 – Removing the rear wheel arch cover

NOTICE

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

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- Guide the wheel arch cover (3) in.
- Tighten the screws (1).
- Tighten nuts (2).

Wheel arch cover

Screw		3 Nm
Plastic nut		2,6 Nm

10 – Mounting the rear right wheel

▸ 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.

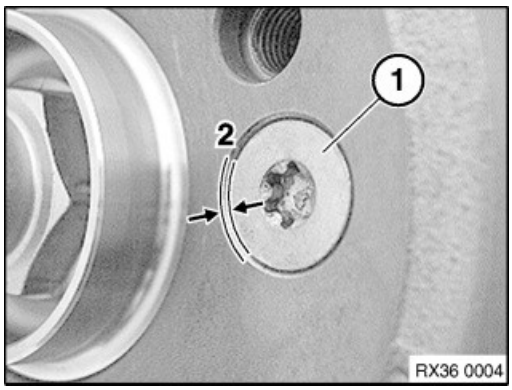
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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).



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

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

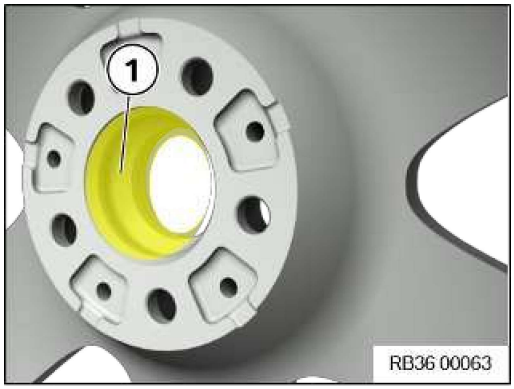
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

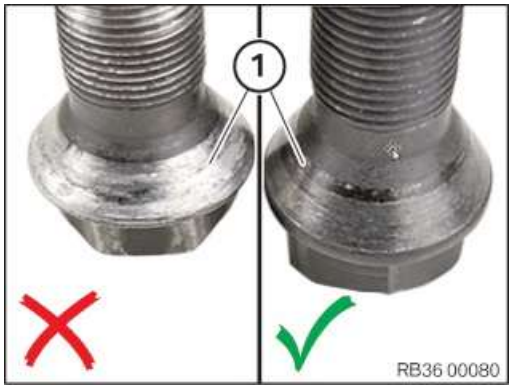
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

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- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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 the corroded wheel bolts (arrows).

  Parts: Wheel bolts

- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) 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.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

11 – Reset the adaptations and adjustments of the SCR system

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- Connect diagnosis system:
  - Service functions
  - Power train
  - Digital Diesel Electronics
  - SCR system
  - SCR system adjustments and adaptations

Additional Information

Overview of Tightening Torques

SCR reservoir to body — Used in step 6

NutM6	Replace nuts.		8 Nm

Filling hose SCR reservoir — Used in step 6

Hose clamp	Replace hose clamp.	Tightening torque	3 Nm

Underbody panelling — Used in step 7

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

Rear silencer to body / bumper support — Used in step 8

M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to transmission — Used in step 8

M8		Tightening torque	19 Nm

Exhaust system to rear axle carrier — Used in step 8

M8 nut		Tightening torque	19 Nm

Diffuser / underbody panelling — Used in step 8

Nuts and screws		Tightening torque	3 Nm

Wheel arch cover — Used in step 9

Screw			3 Nm
Plastic nut			2,6 Nm

Brake disc to front wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

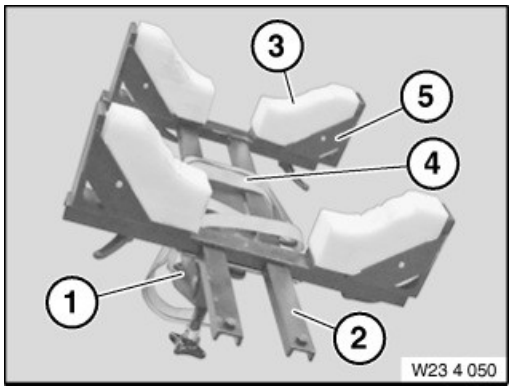
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Wheel bolts Used in step 10

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

Overview of Special Tools

0 495 498 (23 4 050) Fixture



Common Used in step 38

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 inserts (1 set = 4 pcs.))	
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)		**Fixture** (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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2 344 011 Tool



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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
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 1
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 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
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 1
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 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



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

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	110

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16 19 090 Removing and installing/replacing delivery unit

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

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

RISK OF DAMAGE

Crystallization of AdBlue due to excess exposure to oxygen.

Damage to wires and components in the SCR system.

- Carry out work on the SCR system quickly and finish it promptly.

RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

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

TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

Use only lint-free cloths for cleaning the SCR system: WAYPALL cleaning cloths L20 - see BMW Group Parts.

TECHNICAL INFORMATION

After repair work, clean the working area thoroughly with water.

Clean special tools with water after every use.

TECHNICAL INFORMATION

After every disassembly and prior to every installation: Always clean connections and covers of lines transporting AdBlue thoroughly with water.

Close connections and AdBlue carrying lines.

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TECHNICAL INFORMATION

Carry out removal and installation of the SCR pump in a single operation so as to avoid drying out of the AdBlue.

TECHNICAL INFORMATION

Do not touch any exposed contacts inside the SCR unit.

PRELIMINARY WORK

1 – Removing the rear right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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

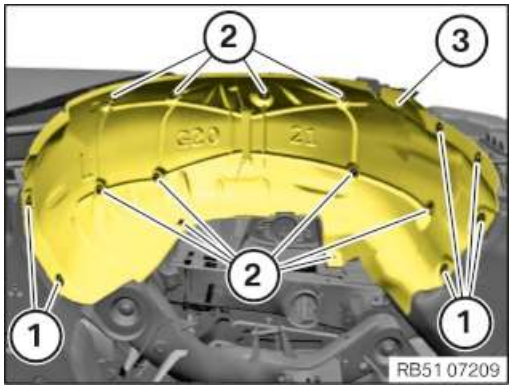


- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing rear wheel arch cover

NOTICE

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



- Loosen screws (1).
- Loosen nuts (2).
- Guide the wheel arch cover (3) out.

3 – Lower exhaust system on rear

WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Component with heavy weight.

Danger of injury!

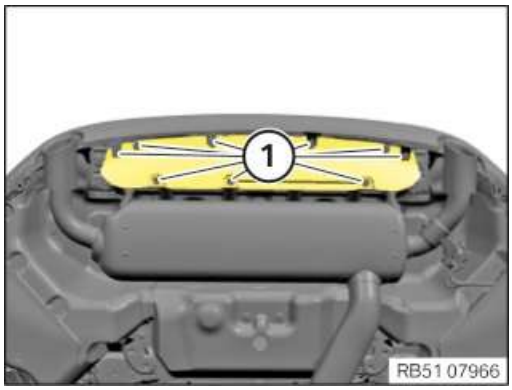
- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

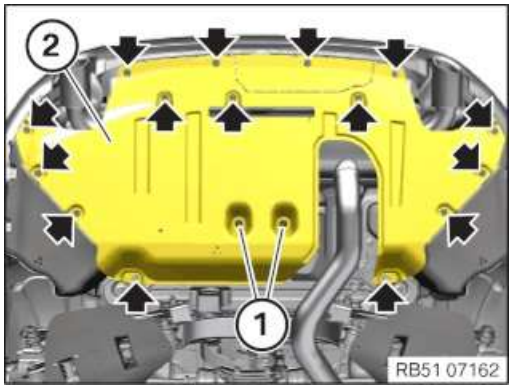
- Remove and install heavy components with the aid of another person/other persons.



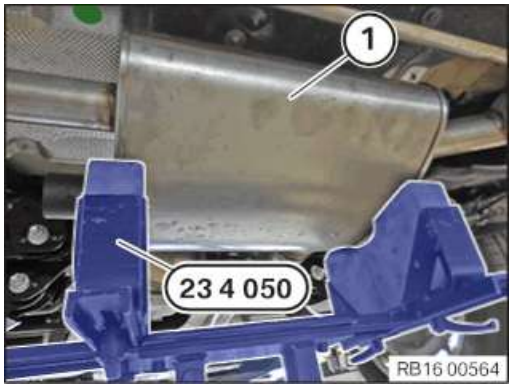
▸ **Removing the rear diffuser**

- **Version 1:**
- Release the screws and nuts (1).
- Remove the diffuser.

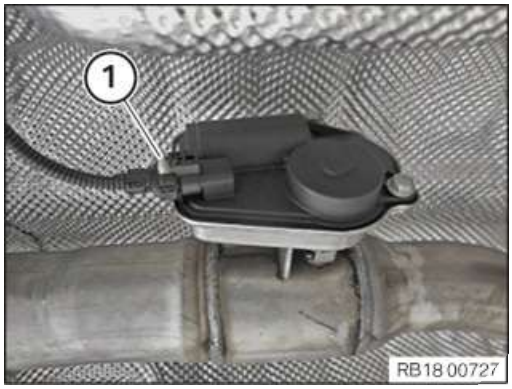
cardiagn.com



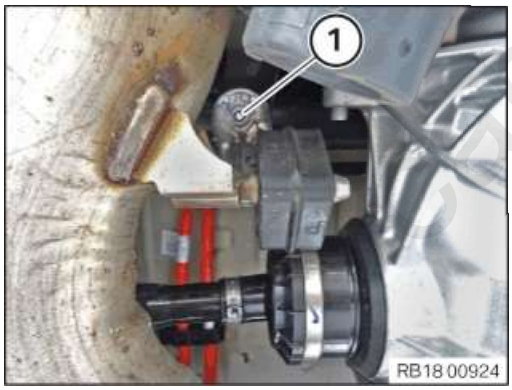
- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).



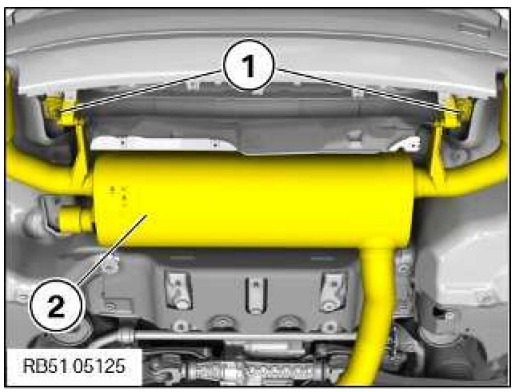
- Support the rear silencer (1) with the transmission jack and the special tool (mounting) 0 495 498 (23 4 050).



- Unlock the connector (1) and disconnect it from the exhaust flap.



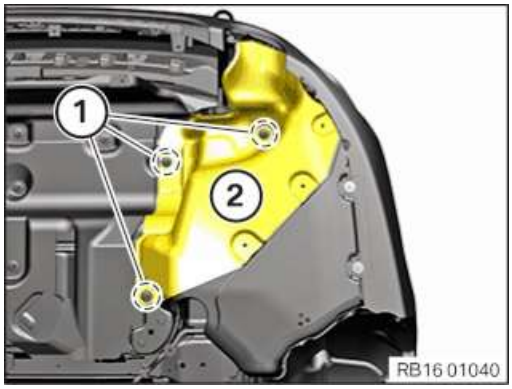
- Release the nut (1) on the rear axle support.



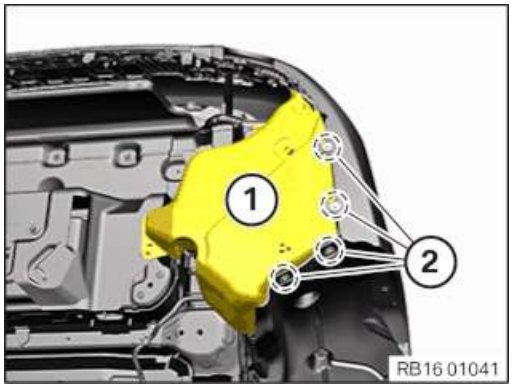
- Loosen nuts (1).
- Lower the exhaust system slightly.

4 – Removing the cover

partdiagn.com

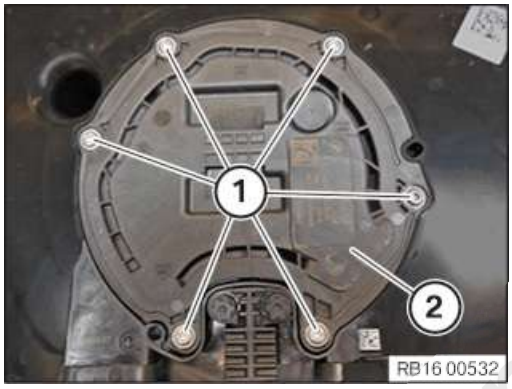


- Release nuts (1).
- Remove the heat shield (2).



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

5 – Removing the service cap for the SCR tank

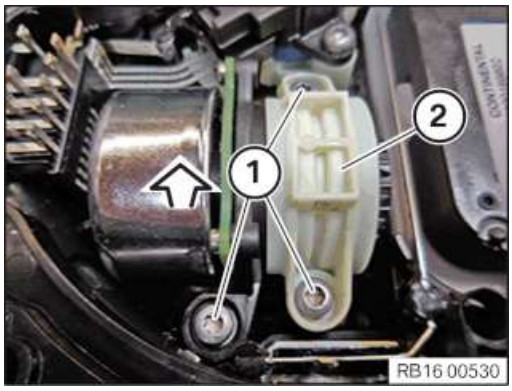


- Loosen screws (1).
- Remove the service cap (2).

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MAIN WORK

6 – Removing the supply pump for the AdBlue



- Release the screws (1) and remove the supply pump downwards in the direction of arrow.

7 – Preparing for the installation of the supply pump for the AdBlue

TECHNICAL INFORMATION

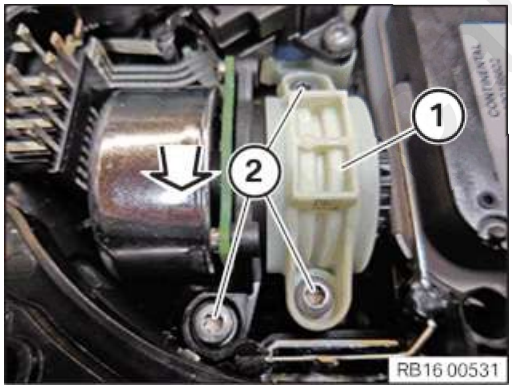
Maintain conditions of absolute cleanliness.



- Renew the sealing rings (1).

  Parts: Sealing ring
- Put sealing rings (1) on the supply pump.

8 – Installing the supply pump for the AdBlue



- Install and position the supply pump (1) in the direction of arrow.
- Renew screws (2).

  Parts: Screws
- Insert screws (2) and tighten.

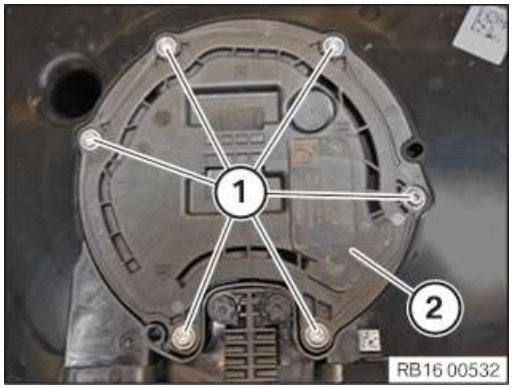
Pre-supply pump to pump body

M4 screw	Renew screws.	2 Nm

POSTPROCESSES

9 – Installing the service cap for the SCR tank

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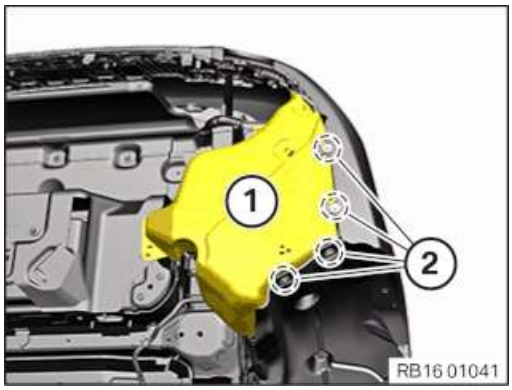
- Renew the bolts (1) and the service cap (2).

  Parts: Screws, service cap
- Position service cap (2).
- Fit the screws (1) and tighten them crosswise.

Service cap on the SCR tank

M4 screw	Renew screws and service cap.	Tightening torque	2 Nm

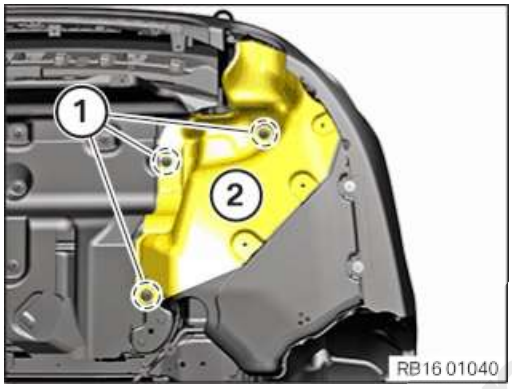
10 – Install the cover



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

Underbody panelling

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



- Install the heat shield (2).
- Tighten nuts (1).

Underbody panelling

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

11 – Installing rear exhaust system

CAUTION

Component with heavy weight.

Danger of injury!

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

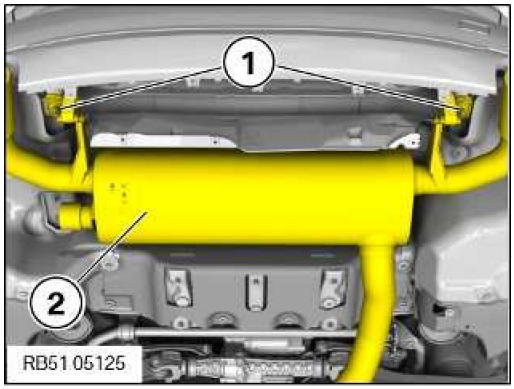
CAUTION

Heavy component.

Heavy components can lead to injury or damage.

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

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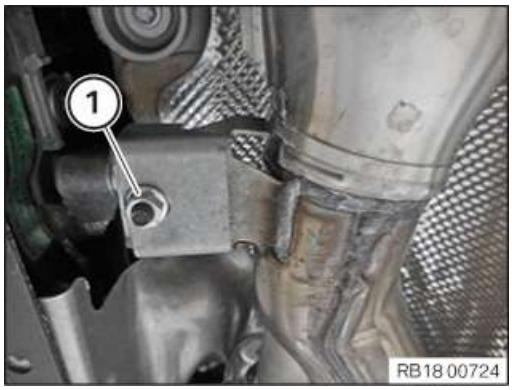


- Lift exhaust system (2).
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Rear silencer to body / bumper support

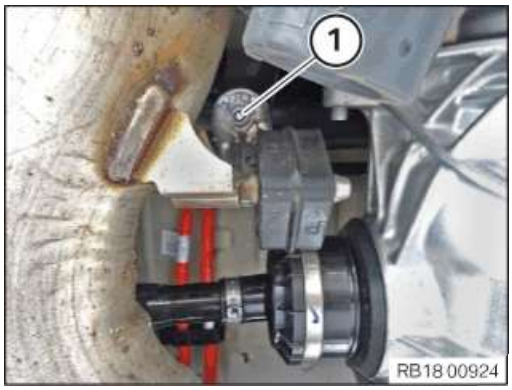
M8	Replace nuts.	Tightening torque	19 Nm



- Tighten nut (1).

Exhaust system to transmission

M8		Tightening torque	19 Nm

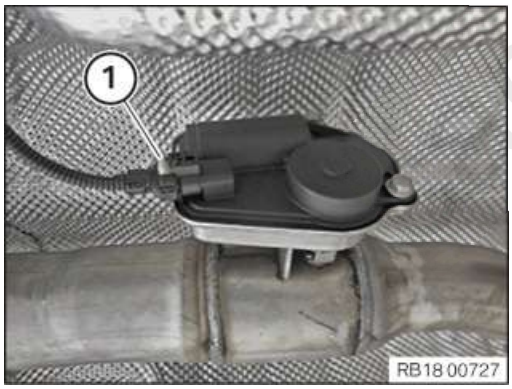


- Renew nut (1) on the rear axle support.

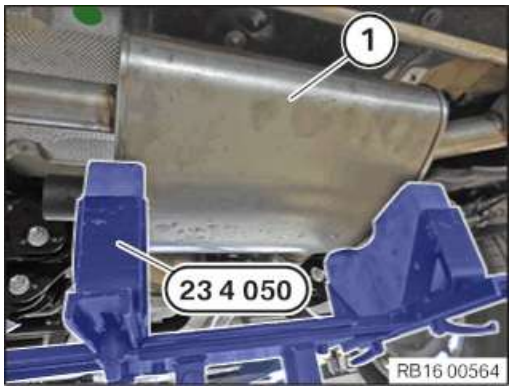
  Parts: Nut
- Tighten nut (1).

Exhaust system to rear axle carrier

M8 nut		Tightening torque	19 Nm



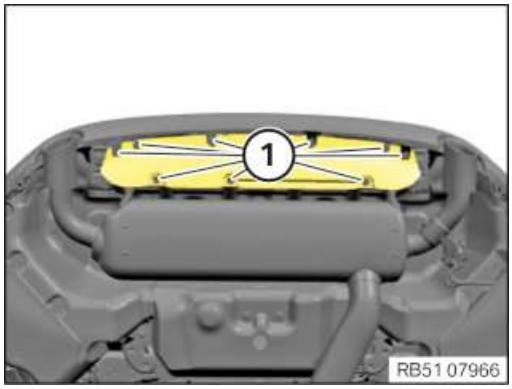
- Connect the connector (1) to the exhaust flap and ensure it audibly locks in place.



- Remove the transmission jack and the special tool (mounting) 0 495 498 (23 4 050) from the rear silencer (1).

▸ **Installing the rear diffuser**

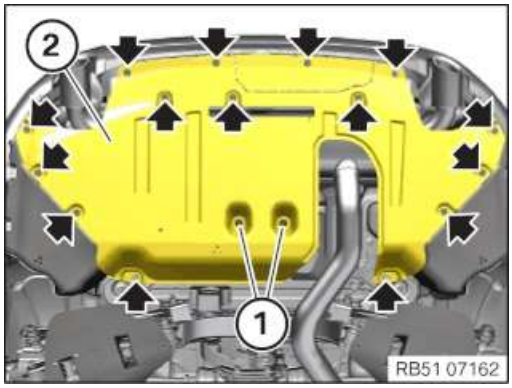
rdiagn.com



- **Version 1:**
- Install the diffuser and tighten the nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

- Tighten nuts (1).

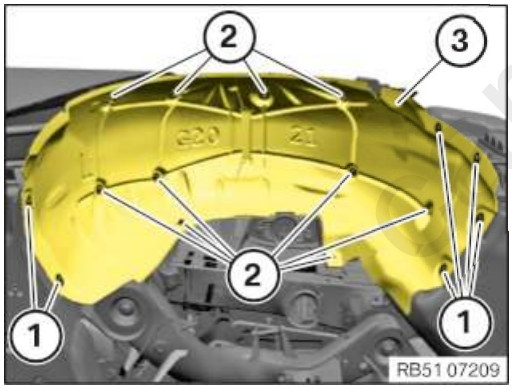
Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

12 – Removing the rear wheel arch cover

NOTICE

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



- Guide the wheel arch cover (3) in.
- Tighten the screws (1).
- Tighten nuts (2).

Wheel arch cover

Screw		3 Nm
Plastic nut		2,6 Nm

13 – Mounting the rear right wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

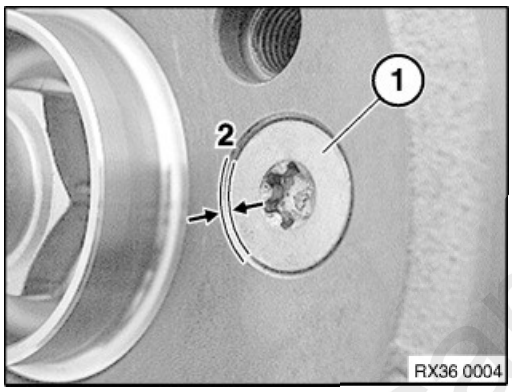
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

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



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

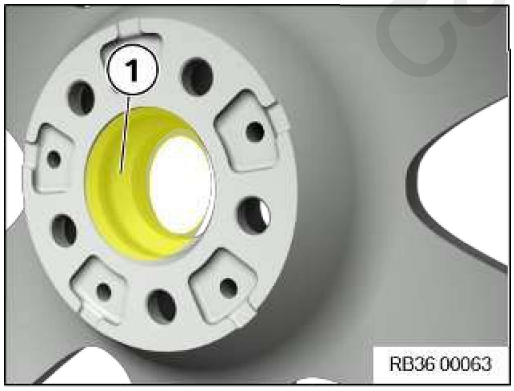
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

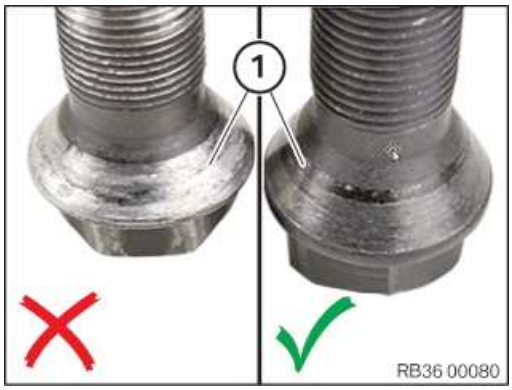
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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 the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) 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.	Tightening torque	140 Nm
	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.	Check	140 Nm

14 – Putting the SCR tank system into operation



- Connect diagnosis and information system.
- Carry out start-up of the SCR tank system.
- Reset adaptations and adjustments in the SCR system.

Additional Information

Overview of Tightening Torques

Pre-supply pump to pump body — Used in step 8

M4 screw	Renew screws.	2 Nm

Service cap on the SCR tank — Used in step 9

M4 screw	Renew screws and service cap.	Tightening torque	2 Nm

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Underbody panelling			Used in step 10
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Rear silencer to body / bumper support			Used in step 11
M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to transmission			Used in step 11
M8		Tightening torque	19 Nm

Exhaust system to rear axle carrier			Used in step 11
M8 nut		Tightening torque	19 Nm

Diffuser / underbody panelling			Used in step 11
Nuts and screws		Tightening torque	3 Nm

Wheel arch cover			Used in step 12
Screw			3 Nm
Plastic nut			2,6 Nm

Brake disc to front wheel hub			Used in step 13
M8	Renew screw.	Tightening torque	16 Nm

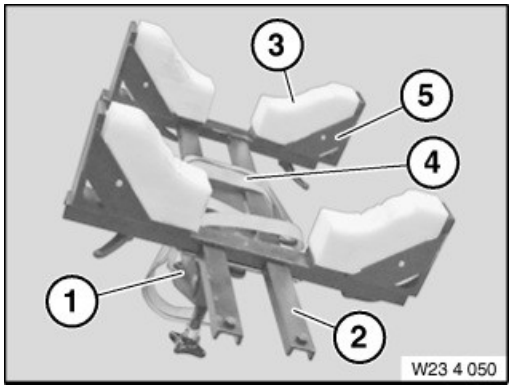
Brake disc to rear wheel hub			Used in step 13
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 13
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

Overview of Special Tools

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0 495 498 (23 4 050) Fixture



Common

Used in step 311

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 inserts (1 set = 4 pcs.))	
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)		**Fixture** (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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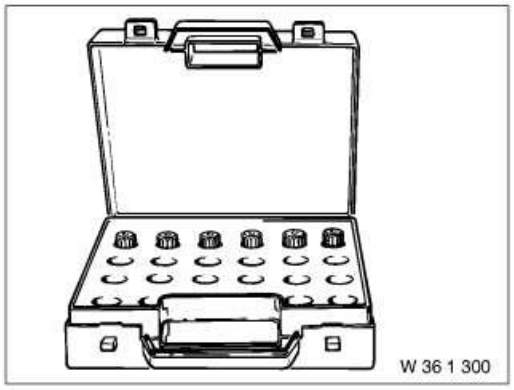
2 344 011 Tool



Common	Used in step 13
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
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 1
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 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
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 1
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 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



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

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	113

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16 19 005 Removing and installing/replacing metering line for Selective Catalytic Reduction (SCR)

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 ... Raise the vehicle using a vehicle lift.

PRELIMINARY WORK

1 – Lower exhaust system on rear

WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Component with heavy weight.

Danger of injury!

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

CAUTION

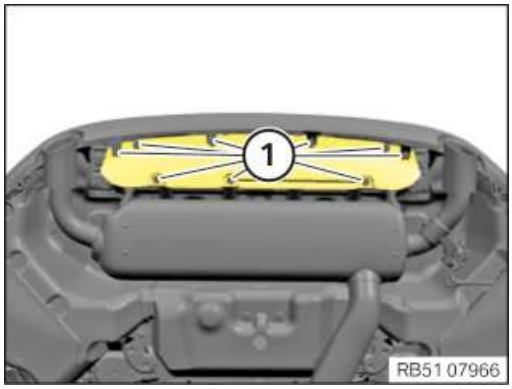
Heavy component.

Heavy components can lead to injury or damage.

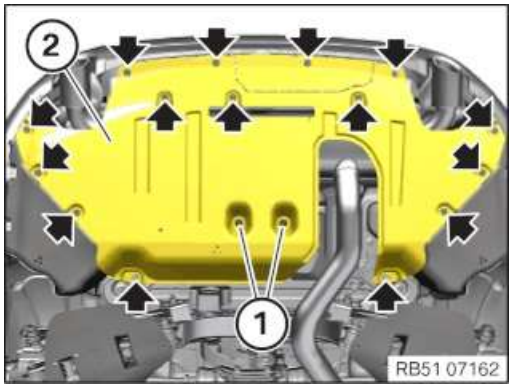
- Remove and install heavy components with the aid of another person/other persons.

▸ **Removing the rear diffuser**

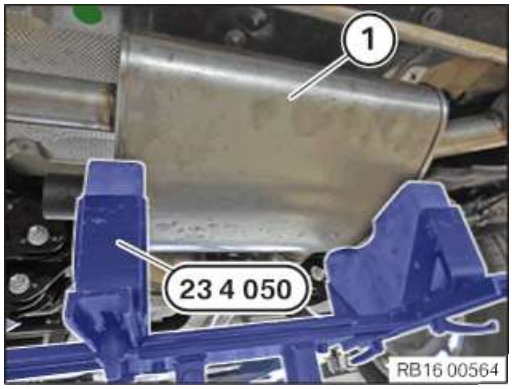
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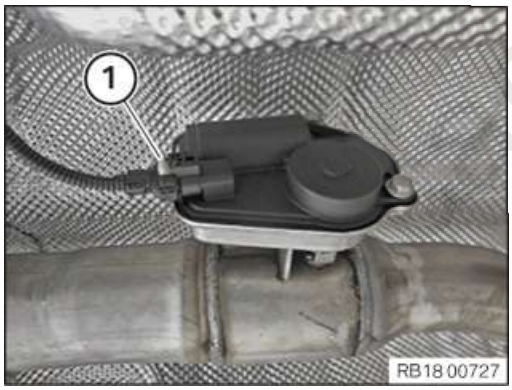
- **Version 1:**
- Release the screws and nuts (1).
- Remove the diffuser.



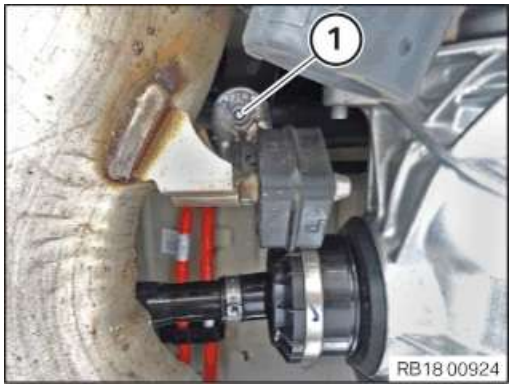
- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).



- Support the rear silencer (1) with the transmission jack and the special tool (mounting) 0 495 498 (23 4 050).

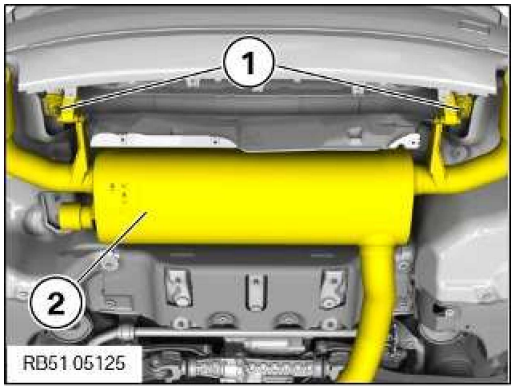


- Unlock the connector (1) and disconnect it from the exhaust flap.



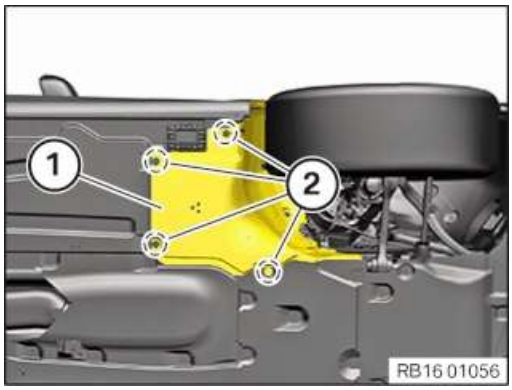
- Release the nut (1) on the rear axle support.

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- Loosen nuts (1).
- Lower the exhaust system slightly.

2 – Removing the rear section of the front right wheel arch trim panel partially



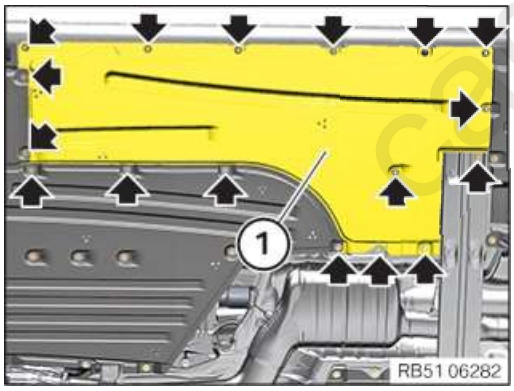
- Loosen screws (2).
- Carefully open the trim panel (1).

3 – Remove side right underbody panelling

NOTICE

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

▸ **Remove side underbody panelling**



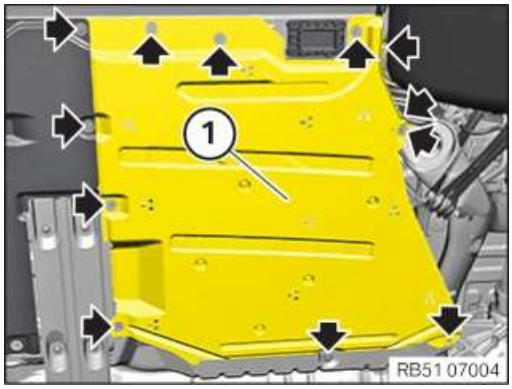
- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

4 – Remove right tank cover

NOTICE

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

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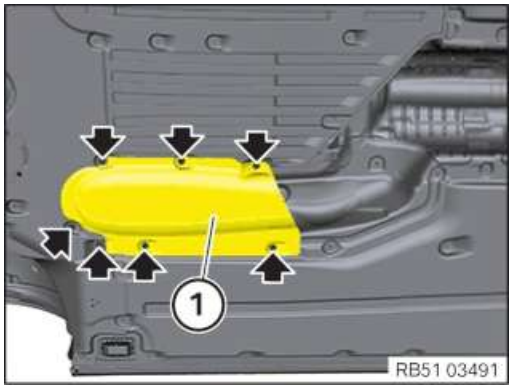


- Release all bolts (arrows).
- Remove the tank cover (1).

5 – Remove the underbody panelling of the transmission on the side

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Remove screws (arrows).
- Remove the underbody panelling (1).

MAIN WORK

6 – Removing the metering line

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

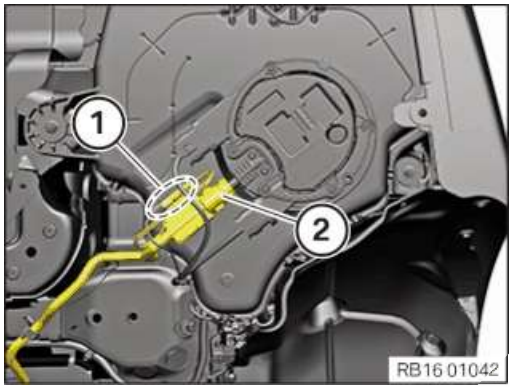
cardiagn.com



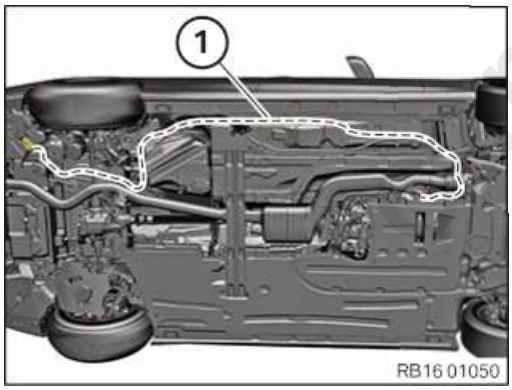
- Unclip clip (1).
- Remove heat protection (2).



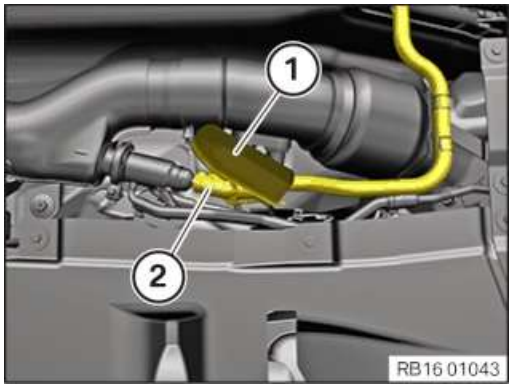
- Unlock and disconnect snap fastener (1).



- Unlock plug connection (1) and disconnect.
- Unlock and disconnect snap fastener (2).



- Unclip and remove the metering line (1) along the dotted line.



- Remove the heat protection shield (1).
- Unlock and disconnect snap fastener (2).

7 – Installing the metering line

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

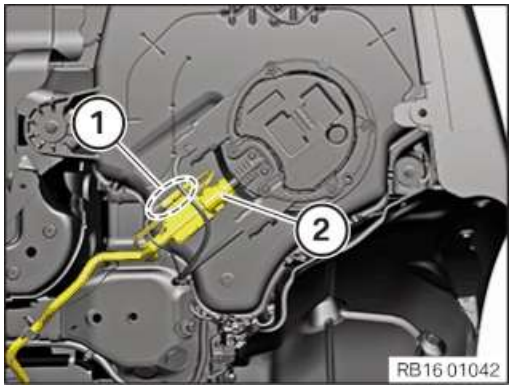
- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.



- Connect snap fastener (1) and lock.

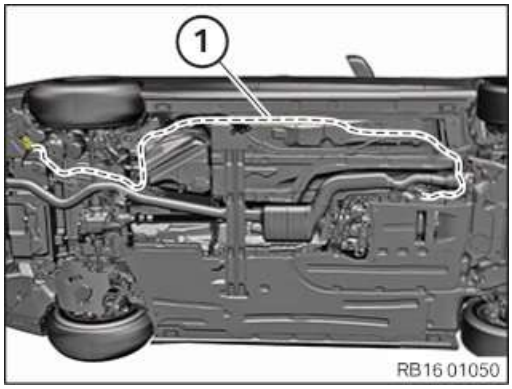


- Install the heat protection (2).
- Clip in clip (1).

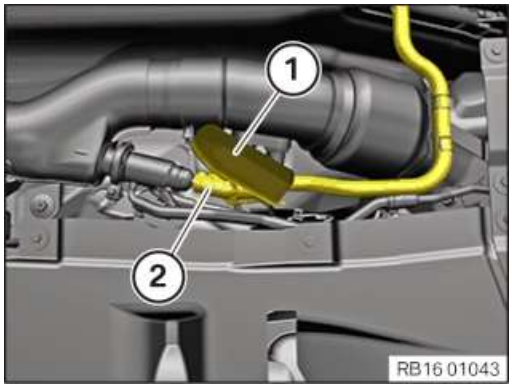


- Connect connectors (1) and lock.
- Connect snap fastener (2) and lock.

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- install and clip in the metering line (1) along the dotted line.



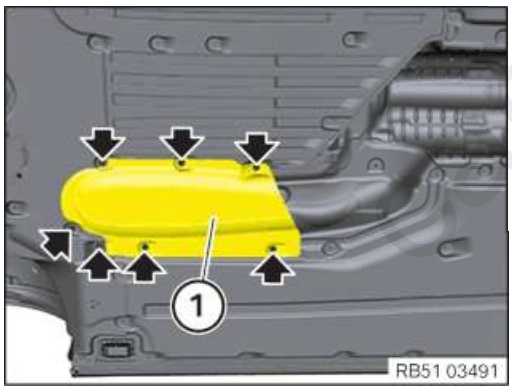
- Connect snap fastener (2) and lock.
- Install the heat protection shield (1).

POSTPROCESSES

8 – Install the underbody panelling of the transmission on the side

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Insert the underbody panelling (1).
- Tighten screws (arrows).

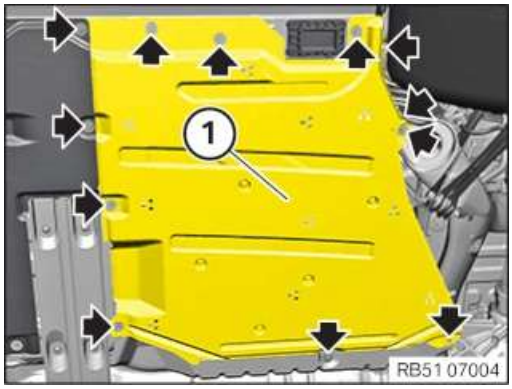
Underbody panelling

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

9 – Install tank cover on right

NOTICE

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



- Position the tank cover (1).
- Tighten all bolts (arrows).

Underbody panelling

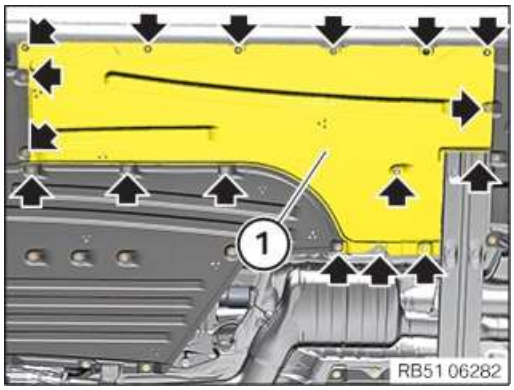
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

10 – Installing the underbody panelling on the right side

NOTICE

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

▸ **Installing the underbody panelling on the sides**

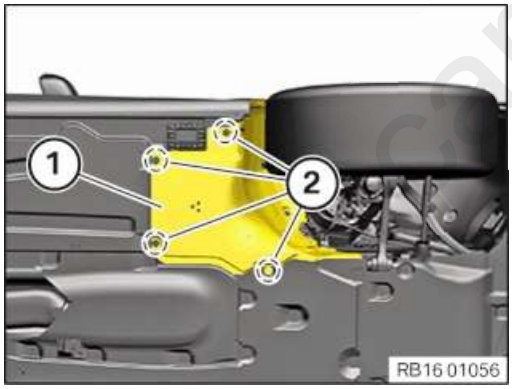


- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

11 – Partially installing the rear section of the front right wheel arch trim panel



- Close the trim panel (1).
- Tighten the screws (2).

Underbody panelling

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

12 – Installing rear exhaust system

CAUTION

Component with heavy weight.

Danger of injury!

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

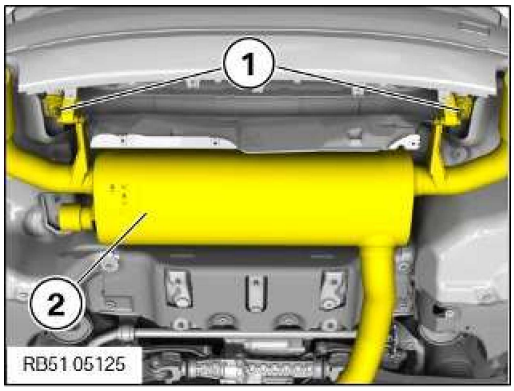
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CAUTION

Heavy component.

Heavy components can lead to injury or damage.

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

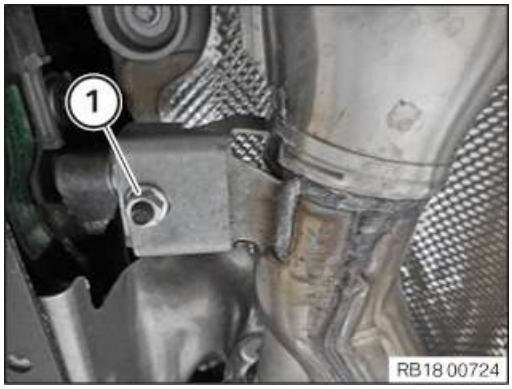


- Lift exhaust system (2).
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Rear silencer to body / bumper support

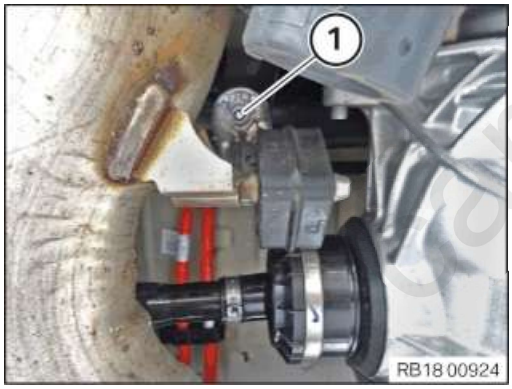
M8	Replace nuts.	Tightening torque	19 Nm



- Tighten nut (1).

Exhaust system to transmission

M8		Tightening torque	19 Nm

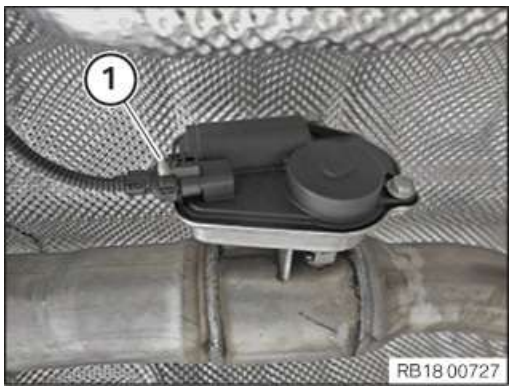


- Renew nut (1) on the rear axle support.

  Parts: Nut
- Tighten nut (1).

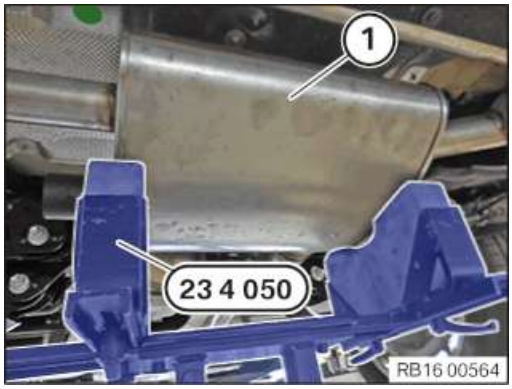
Exhaust system to rear axle carrier

M8 nut		Tightening torque	19 Nm



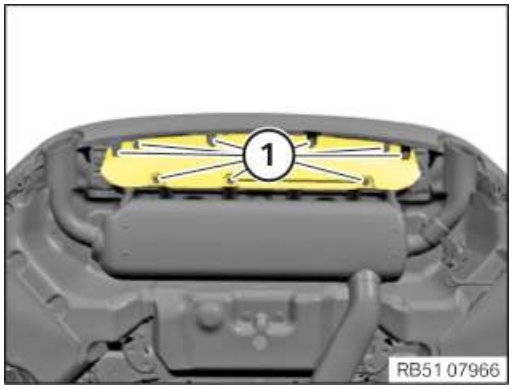
- Connect the connector (1) to the exhaust flap and ensure it audibly locks in place.

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- Remove the transmission jack and the special tool (mounting) 0 495 498 (23 4 050) from the rear silencer (1).

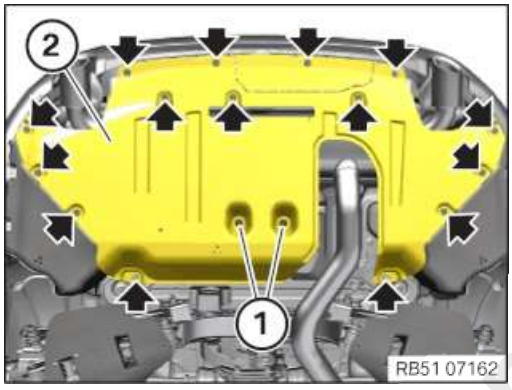
▸ **Installing the rear diffuser**



- **Version 1:**
- Install the diffuser and tighten the nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

- Tighten nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

Additional Information

Overview of Tightening Torques

Underbody panelling — Used in step 8911

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

Underbody panelling, side — Used in step 10

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Rear silencer to body / bumper support — Used in step 12

M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to transmission — Used in step 12

M8		Tightening torque	19 Nm

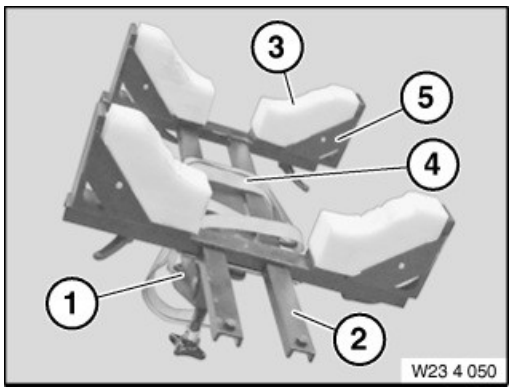
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Exhaust system to rear axle carrier			Used in step 12
M8 nut		Tightening torque	19 Nm

Diffuser / underbody panelling			Used in step 12
Nuts and screws		Tightening torque	3 Nm

Overview of Special Tools

0 495 498 (23 4 050) Fixture



Common		Used in step 112
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 inserts (1 set = 4 pcs.))	
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)		**Fixture** (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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16 19 190 Removing and installing/replacing the filler pipe for SCR passive tank

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 ... Raise the vehicle using a vehicle lift.

NOTICE

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

PRELIMINARY WORK

1 – Removing the rear right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



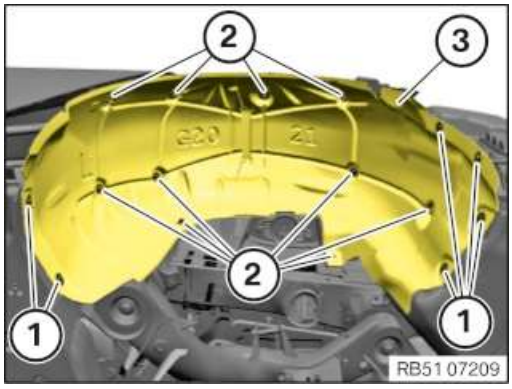
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

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2 – Removing rear wheel arch cover

NOTICE

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



- Loosen screws (1).
- Loosen nuts (2).
- Guide the wheel arch cover (3) out.

3 – Lower exhaust system on rear

WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Component with heavy weight.

Danger of injury!

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

CAUTION

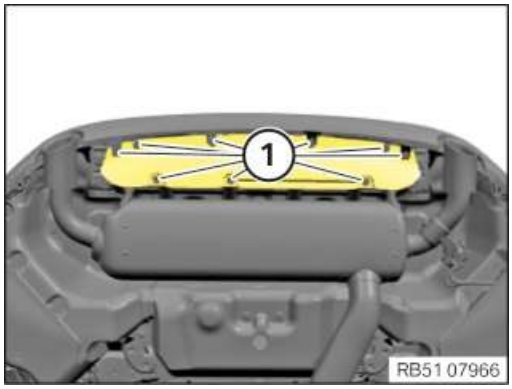
Heavy component.

Heavy components can lead to injury or damage.

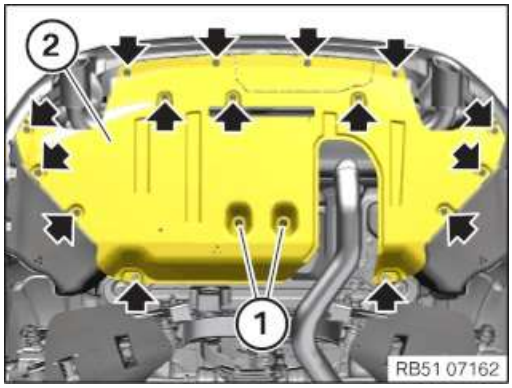
- Remove and install heavy components with the aid of another person/other persons.

▸ **Removing the rear diffuser**

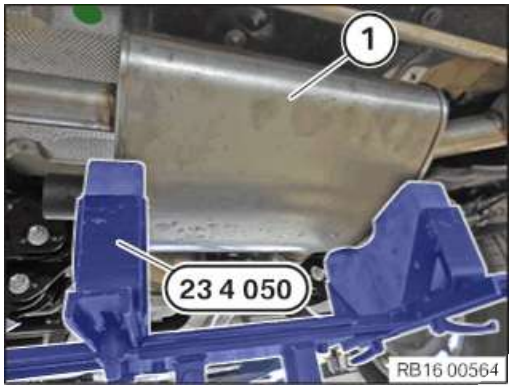
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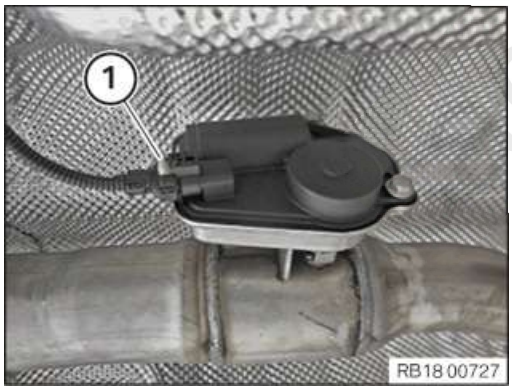
- **Version 1:**
- Release the screws and nuts (1).
- Remove the diffuser.



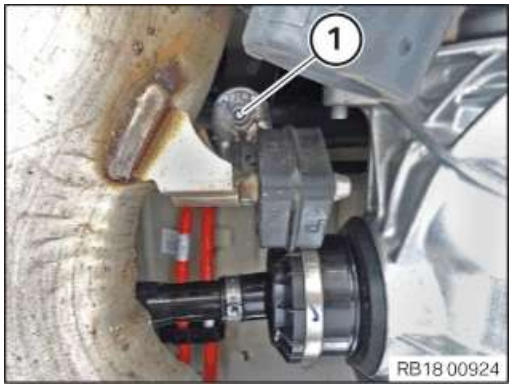
- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).



- Support the rear silencer (1) with the transmission jack and the special tool (mounting) 0 495 498 (23 4 050).

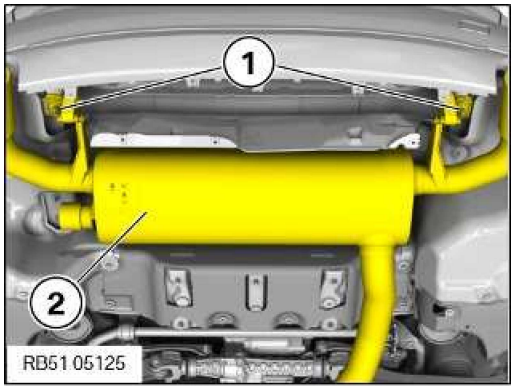


- Unlock the connector (1) and disconnect it from the exhaust flap.



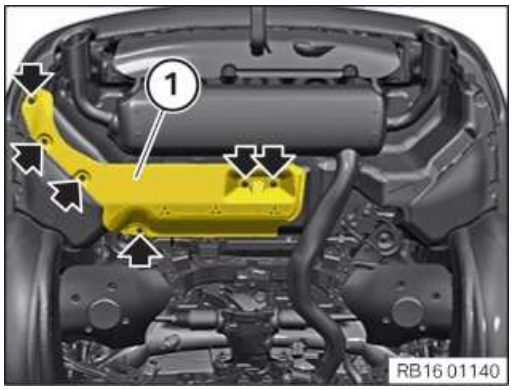
- Release the nut (1) on the rear axle support.

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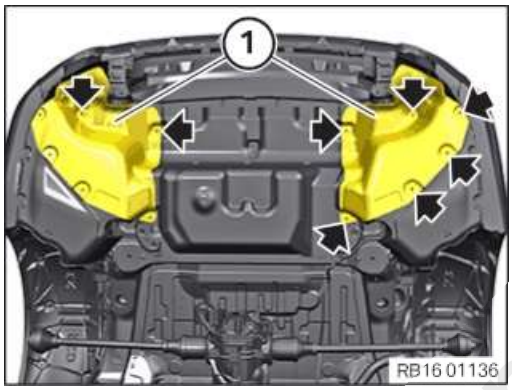


- Loosen nuts (1).
- Lower the exhaust system slightly.

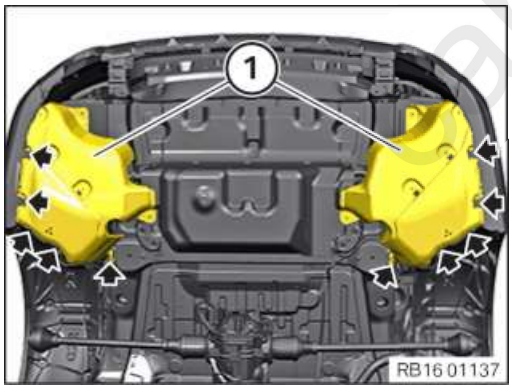
4 – Remove the heat protection



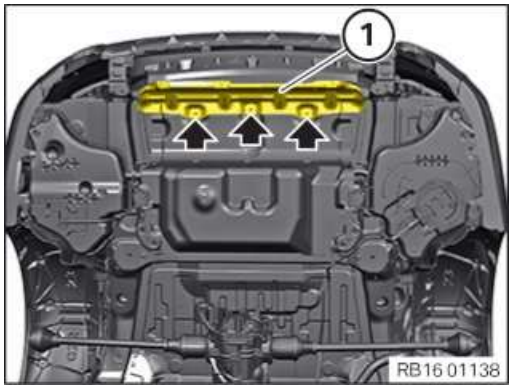
- Loosen nuts and bolts (arrows).
- Remove the cover (1).



- Loosen nuts and bolts (arrows).
- Remove the heat protection shield (1).

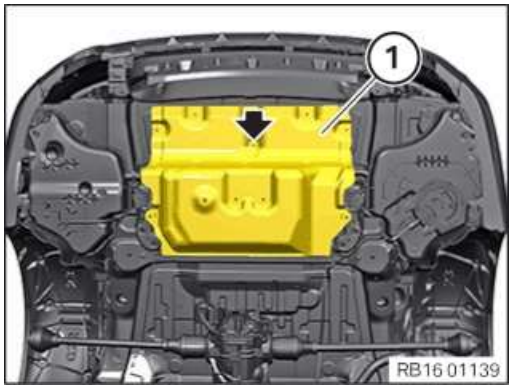


- Loosen nuts and bolts (arrows).
- Remove covers (1).



- Unscrew the nuts (arrows).
- Remove the heat protection (1).

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- Unscrew the nut (arrow).
- Remove the heat protection (1).

5 – Removing the active tank

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

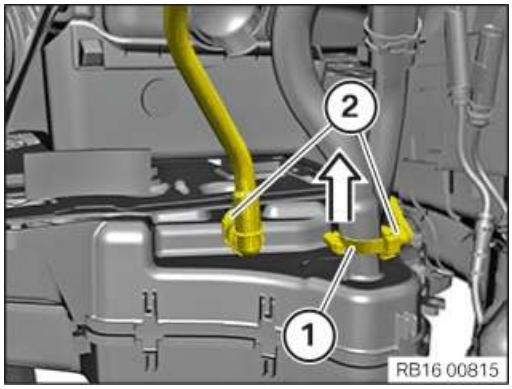
- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

RISK OF DAMAGE

Crystallization of AdBlue due to excess exposure to oxygen.

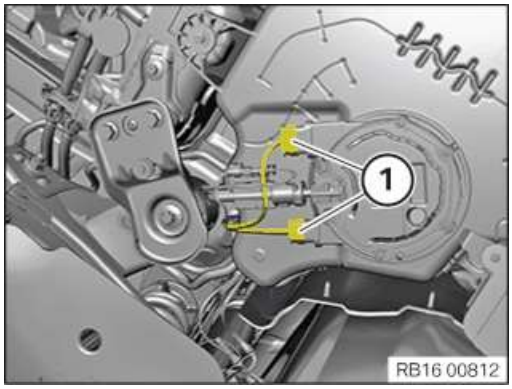
Damage to wires and components in the SCR system.

- Carry out work on the SCR system quickly and finish it promptly.

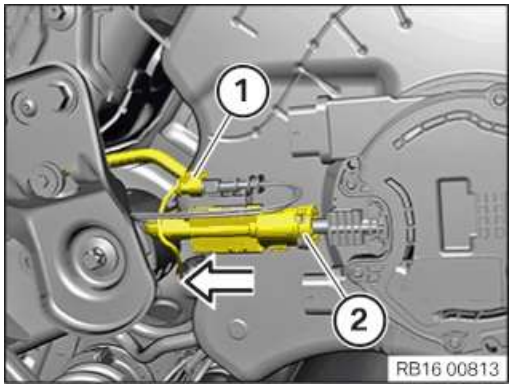


- Loosen the hose clamp (1) and remove the filling hose in the direction of the arrow.
- Unlock and disconnect the snap fasteners (2).

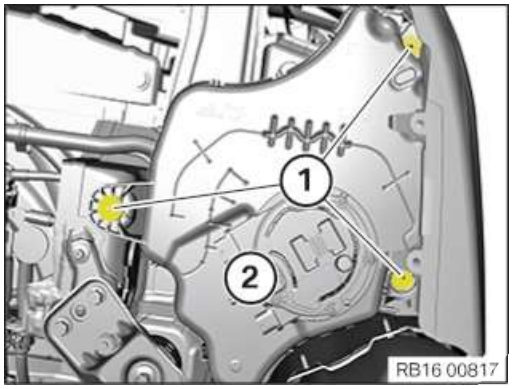
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- Disconnect all plug connections (1).



- Remove connectors (1) from the active tank.
- Push the snap fastener (2) toward the delivery unit.
- Next, press the retaining lugs (2) and pull off the snap fastener in the direction of the arrow.



- Support the active tank (2).
- Unscrew the (1) and lower the active tank (2).

MAIN WORK

6 – Removing the filler pipe to the passive tank

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

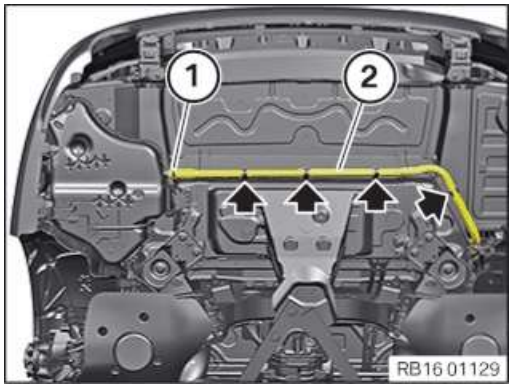
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RISK OF DAMAGE

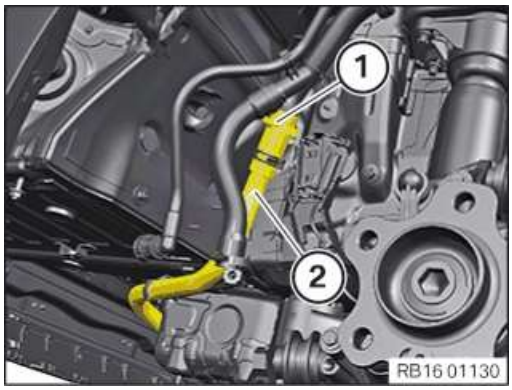
Crystallization of AdBlue due to excess exposure to oxygen.

Damage to wires and components in the SCR system.

- Carry out work on the SCR system quickly and finish it promptly.



- Loosen clamp (1).
- Unclip the filler pipe (2) at the holders (arrows).



- Release the clamp (1) and remove the filler pipe (2).

7 – Installing filler pipe for passive tank

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

Hazardous to health!

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

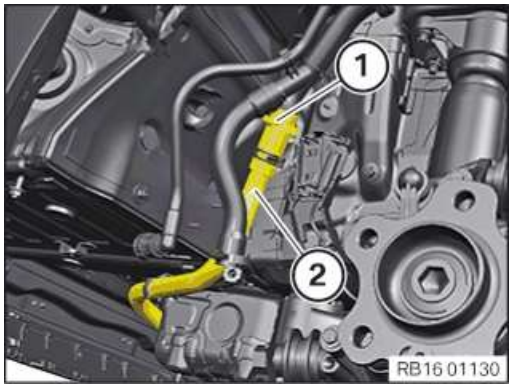
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RISK OF DAMAGE

Crystallization of AdBlue due to excess exposure to oxygen.

Damage to wires and components in the SCR system.

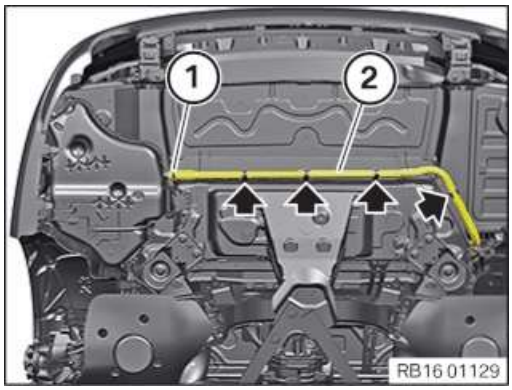
- Carry out work on the SCR system quickly and finish it promptly.



- Install filler pipe (2) and tighten circlip (1).

Hose clamp

Hose clamp		Tightening torque	3.5 Nm



- Install the filler pipe (2) and clip it in the holders (arrows).
- Tighten clamp (1).

Hose clamp

Hose clamp		Tightening torque	3.5 Nm

POSTPROCESSES

8 – Installing active tank

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

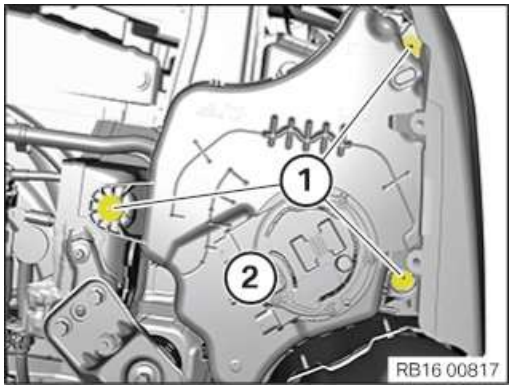
WARNING

Contact with hazardous fluids.

Hazardous to health!

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

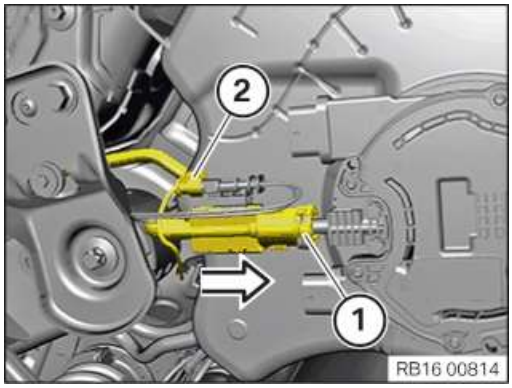
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- Position the active tank (2).
- Place and tighten nuts (1).

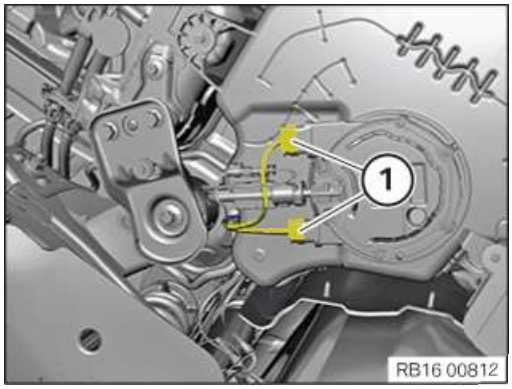
SCR reservoir to body

NutM6	Replace nuts.	8 Nm

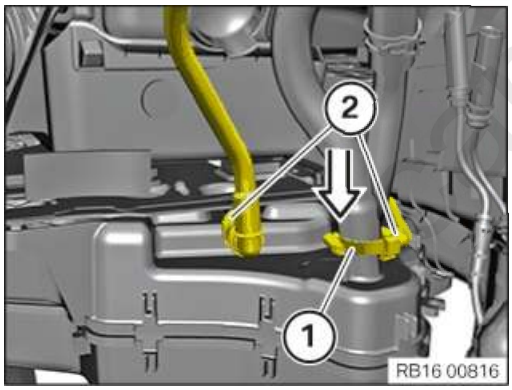


- Position snap fastener (1) and lock.

  Retaining lugs must lock completely.
- Connect connector (2).



- Connect all connectors (1) .



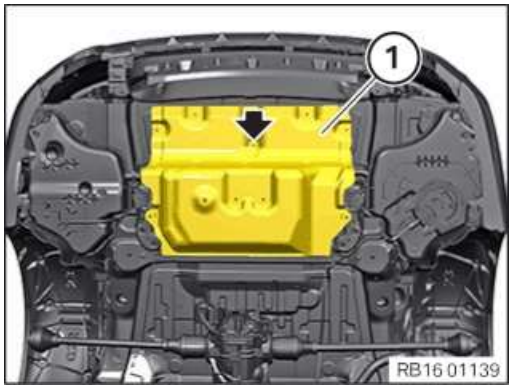
- Install filling hose in the direction of the arrow.
- Position hose clamp (1) and tighten.

Filling hose SCR reservoir

Hose clamp	Replace hose clamp.	Tightening torque	3 Nm

- Position and lock snap fasteners (2).

9 – Install the heat protection

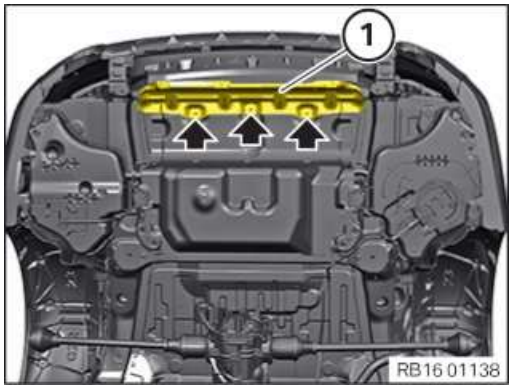


- Install the heat protection shield (1).
- Tighten the nut (arrow).

Underbody panelling on body

Plastic nut		Tightening torque	2,6 Nm

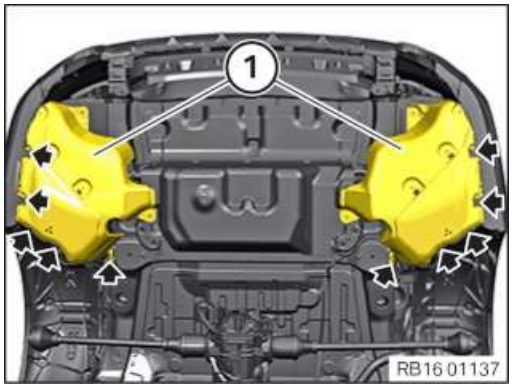
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- Install the heat protection shield (1).
- Tighten the nuts (arrows).

Underbody panelling on body

Plastic nut		Tightening torque	2,6 Nm



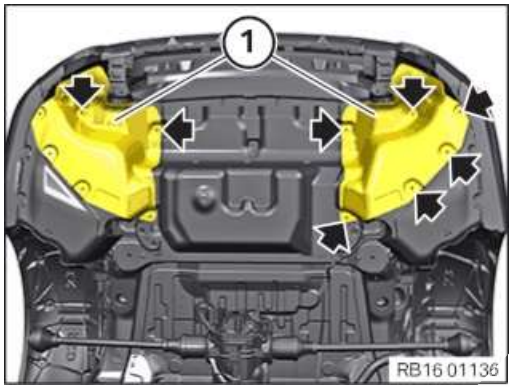
- Install covers (1).
- Tighten nuts and bolts (arrows).

Underbody panelling on body

Hexagon screw		Tightening torque	2,6 Nm

Underbody panelling on body

Plastic nut		Tightening torque	2,6 Nm



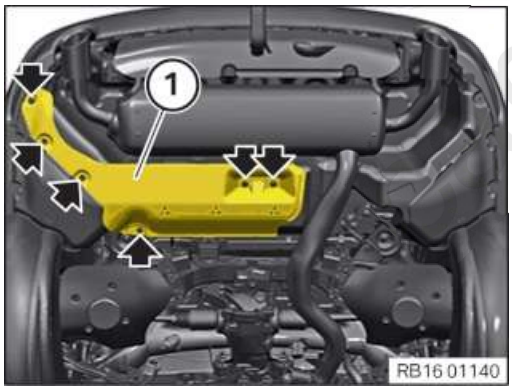
- Install the heat protection shield (1).
- Tighten nuts and bolts (arrows).

Underbody panelling on body

Hexagon screw		Tightening torque	2,6 Nm

Underbody panelling on body

Plastic nut		Tightening torque	2,6 Nm



- Install the cover (1).
- Tighten nuts and bolts (arrows).

Underbody panelling on body

Hexagon screw		Tightening torque	2,6 Nm

Underbody panelling on body

Plastic nut		Tightening torque	2,6 Nm

10 – Installing rear exhaust system

CAUTION

Component with heavy weight.

Danger of injury!

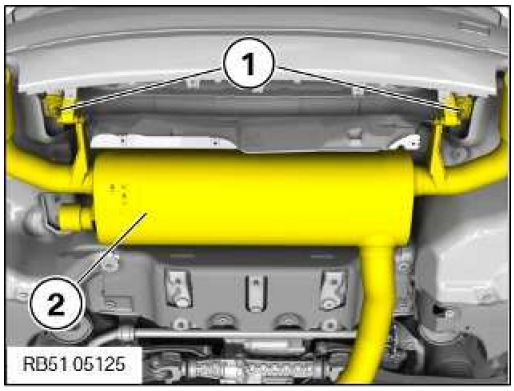
- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

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

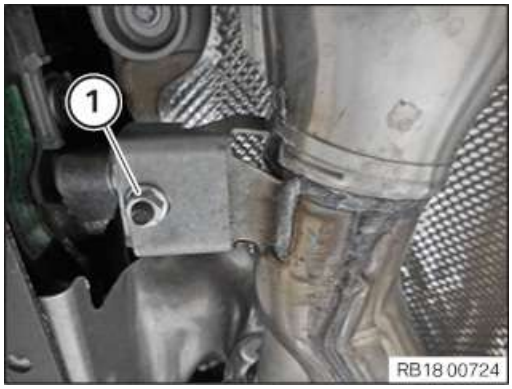


- Lift exhaust system (2).
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Rear silencer to body / bumper support

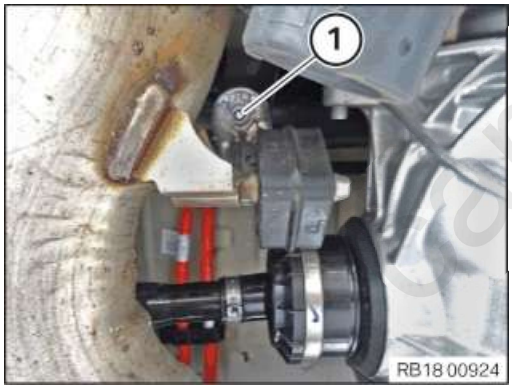
M8	Replace nuts.	Tightening torque	19 Nm



- Tighten nut (1).

Exhaust system to transmission

M8		Tightening torque	19 Nm

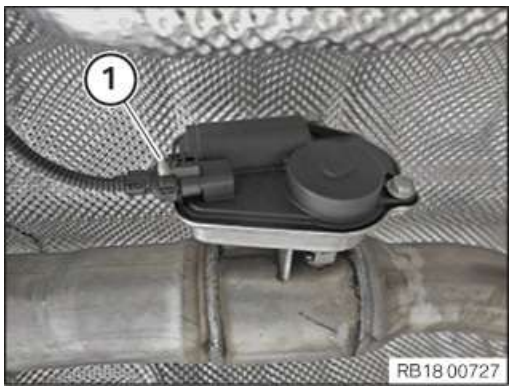


- Renew nut (1) on the rear axle support.

  Parts: Nut
- Tighten nut (1).

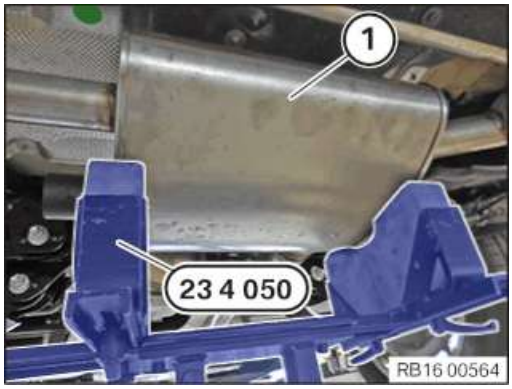
Exhaust system to rear axle carrier

M8 nut		Tightening torque	19 Nm



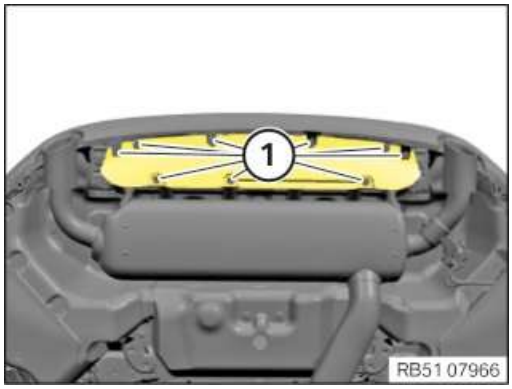
- Connect the connector (1) to the exhaust flap and ensure it audibly locks in place.

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- Remove the transmission jack and the special tool (mounting) 0 495 498 (23 4 050) from the rear silencer (1).

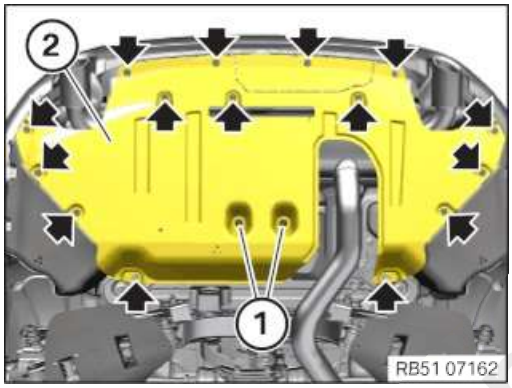
▸ **Installing the rear diffuser**



- **Version 1:**
- Install the diffuser and tighten the nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

- Tighten nuts (1).

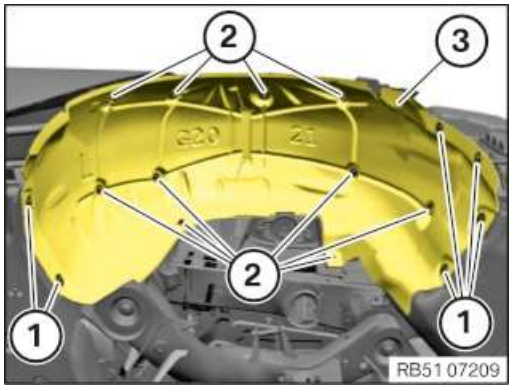
Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

11 – Removing the rear wheel arch cover

NOTICE

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



- Guide the wheel arch cover (3) in.
- Tighten the screws (1).
- Tighten nuts (2).

Wheel arch cover

Screw		3 Nm
Plastic nut		2,6 Nm

12 – Mounting the rear right wheel

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▸ 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.

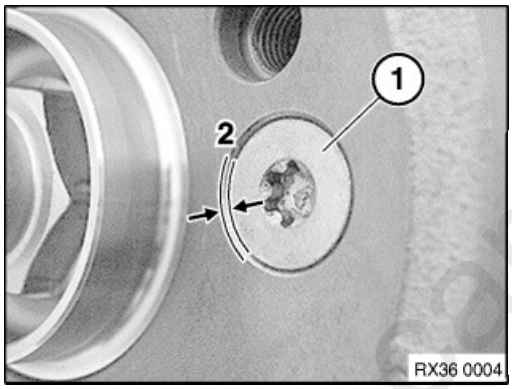
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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).



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

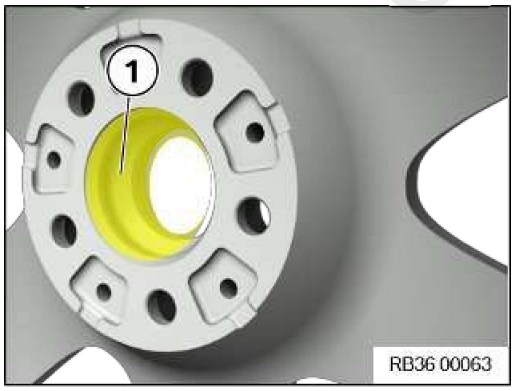
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- 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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against 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



TECHNICAL INFORMATION

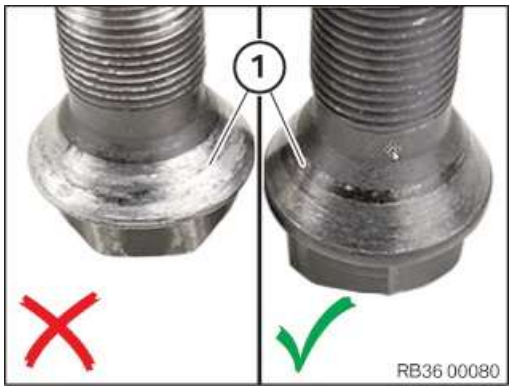
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



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 the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) 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.	Tightening torque	140 Nm
	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.	Check	140 Nm

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Additional Information

Overview of Tightening Torques

Hose clamp — Used in step 7

Hose clamp		Tightening torque	3.5 Nm

SCR reservoir to body — Used in step 8

NutM6	Replace nuts.		8 Nm

Filling hose SCR reservoir — Used in step 8

Hose clamp	Replace hose clamp.	Tightening torque	3 Nm

Underbody panelling on body — Used in step 9

Plastic nut		Tightening torque	2,6 Nm

Underbody panelling on body — Used in step 9

Hexagon screw		Tightening torque	2,6 Nm

Rear silencer to body / bumper support — Used in step 10

M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to transmission — Used in step 10

M8		Tightening torque	19 Nm

Exhaust system to rear axle carrier — Used in step 10

M8 nut		Tightening torque	19 Nm

Diffuser / underbody panelling — Used in step 10

Nuts and screws		Tightening torque	3 Nm

Wheel arch cover — Used in step 11

Screw			3 Nm
Plastic nut			2,6 Nm

Brake disc to front wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 12

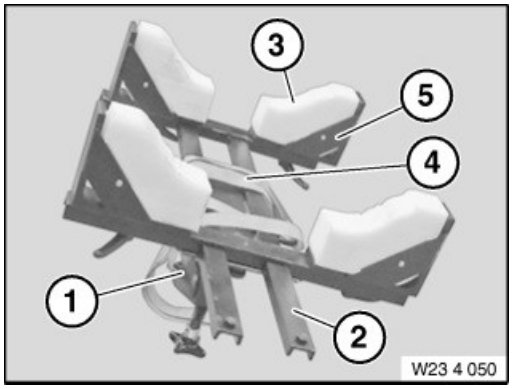
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening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

Overview of Special Tools

0 495 498 (23 4 050) Fixture

Used in step 310

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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 inserts (1 set = 4 pcs.))	
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)		**Fixture** (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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2 344 011 Tool



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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
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 1
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 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
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 1
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 1
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 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



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

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Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	112

16 19 851 Replacing the control unit for SCR

Prerequisite

- Drive-ready state is switched off.

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 ... Notes for ESD protection (electrostatic discharge)

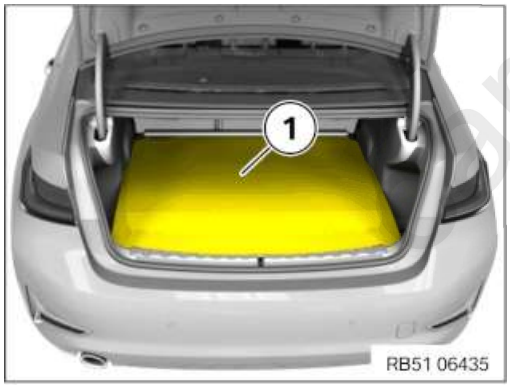
PRELIMINARY WORK

1 – Removing the luggage compartment floor trim panel

▸ **Removing the luggage compartment floor trim panel**

NOTICE

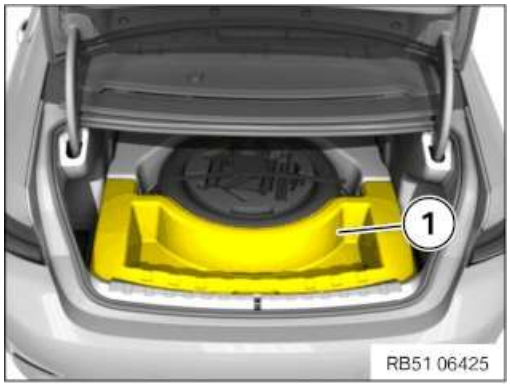
Schematic diagram is for example purposes. Some parts may differ in certain details.



- Remove luggage compartment floor trim panel (1).

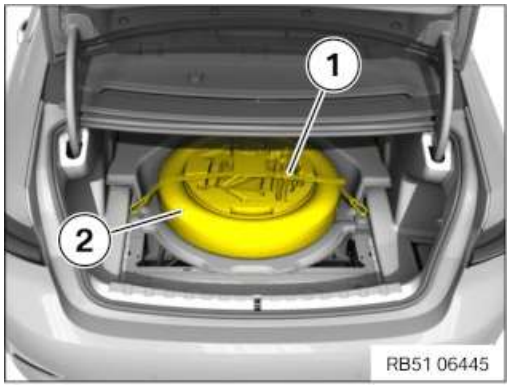
2 – If installed: Removing the compact spare wheel

▸ **Removing rear luggage compartment well**



- Remove rear luggage compartment well (1).

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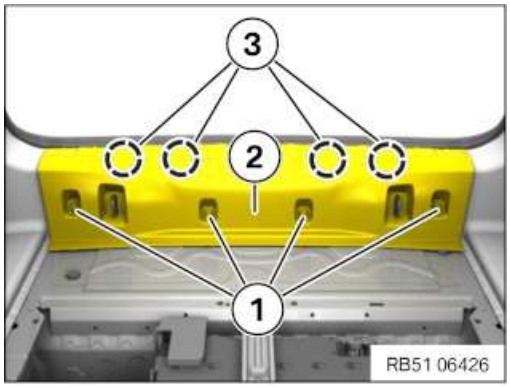


- Open buckle on seat belt strap (1) and set it aside.
- Remove emergency wheel (2) with the insert.

3 – Removing the loading edge trim

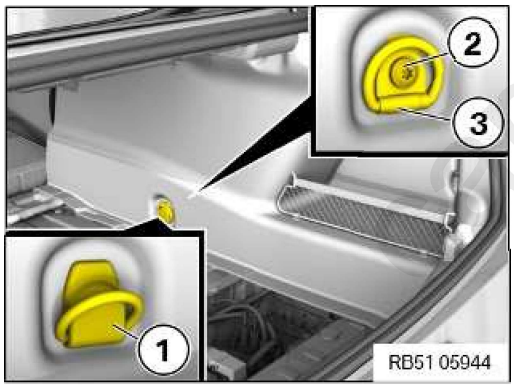
NOTICE

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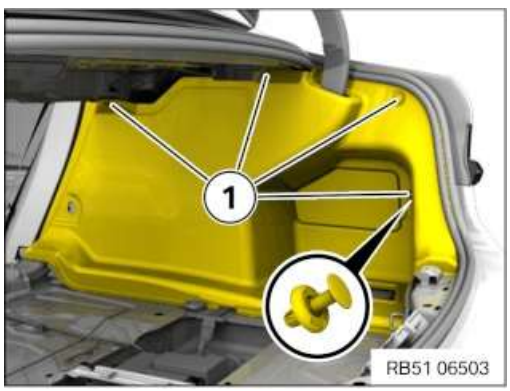


- Loosen the expanding rivet (1).
- Unclip loading edge trim(2) upwards from latch mechanisms (3).
- Guide out and remove loading edge trim (2) under the sealing lip of the tailgate seal.

4 – Removing right luggage compartment wheel arch trim panel



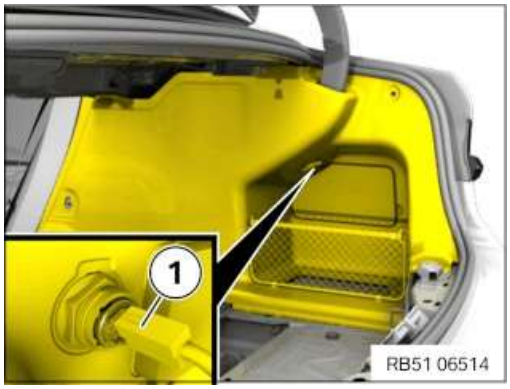
- Remove the cover (1).
- Loosen screw (2).
- Remove the lashing eye (3).



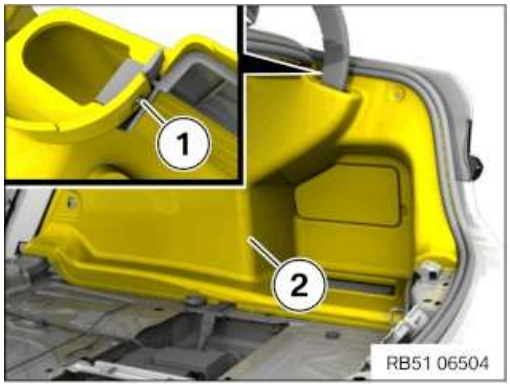
- Reposition the right rear seat backrest.
- Loosen the expanding rivet (1).

▸ If installed: Disconnect plug connection of the 12 V connection (additional work with storage package equipment specification)

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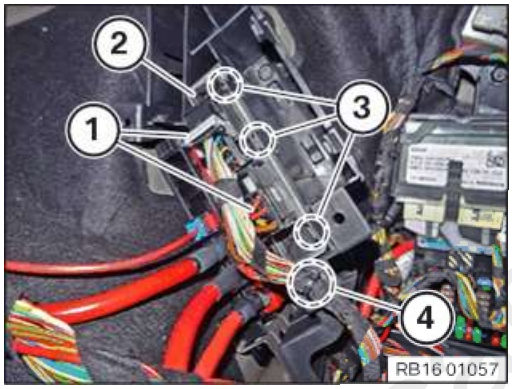
- Unlock and disconnect the plug connection (1) of the 12 V power socket.



- Press the tab for luggage compartment wheel arch trim panel (2) on the outer side of the hinge to the front using the stop on trim (1).
- Guide out luggage compartment wheel arch trim panel (2) under the sealing lip for the tailgate and the side trim panel in the rear passenger compartment.
- Remove luggage compartment wheel arch trim panel (2).

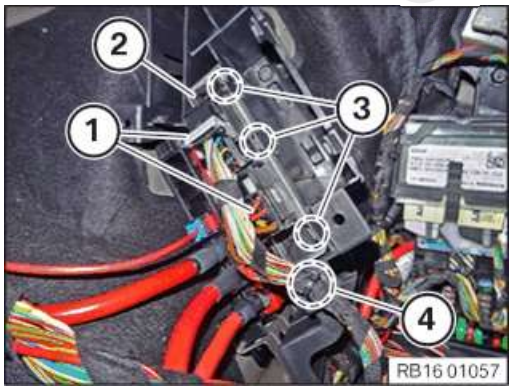
MAIN WORK

5 – Removing the SCR control unit



- Loosen the cable clip (4).
- Release the control unit holder (3).
- Remove the SCR control unit (2).
- Unlock plug connections (1) and disconnect.

6 – Install the SCR control unit



- Connect connectors (1) and lock.
- Install the SCR control unit (2).
- Secure the SCR control unit (2) with the control unit holders (3).
- Fasten the cable clip (4).

POSTPROCESSES

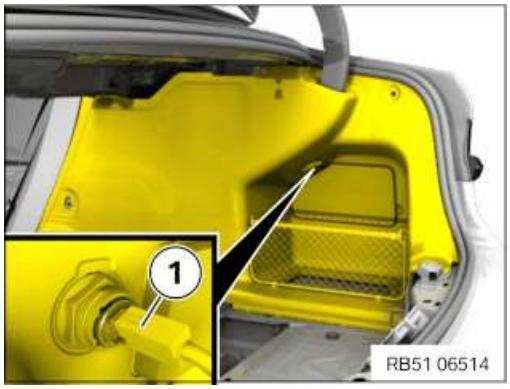
7 – Installing the luggage compartment wheel arch trim panel on the right

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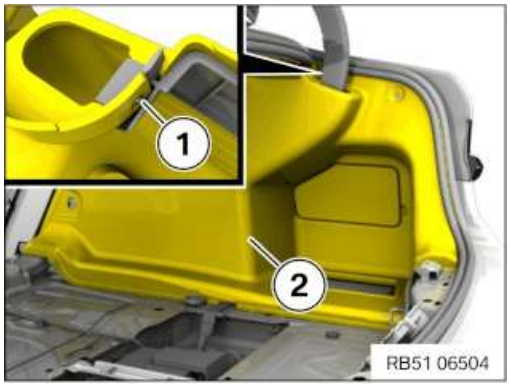
NOTICE

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

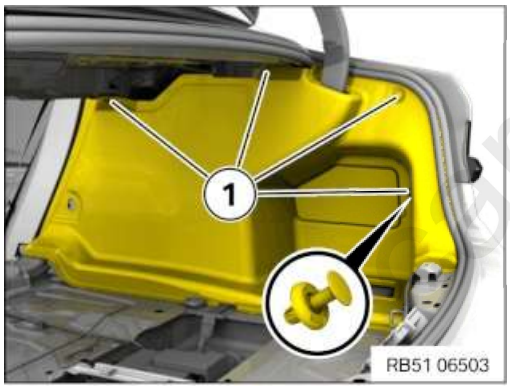
▸ If installed: Connecting plug of the 12 V power socket (additional work for equipment specification with storage package)



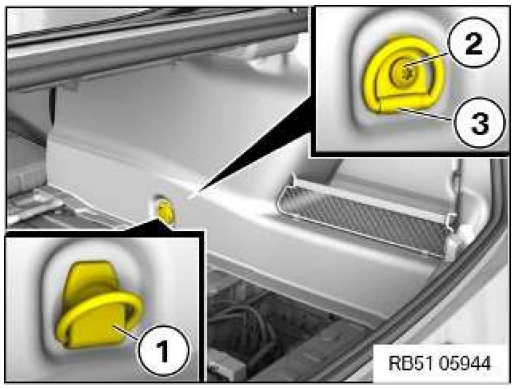
- Connect and lock connector (1) of the 12 V power socket.



- Feed luggage compartment wheel arch trim panel (2) under the side trim panel in the rear passenger compartment and the sealing lip for the tailgate.
- Feed the tab of the luggage compartment wheel arch trim panel (2) on the outer side of the hinge into the stop on the trim (1).



- Secure expanding rivet (1).
- Raise the right rear seat backrest.



- Position the lashing eye (3).
- Tighten down screw (2).

Lashing eye to body

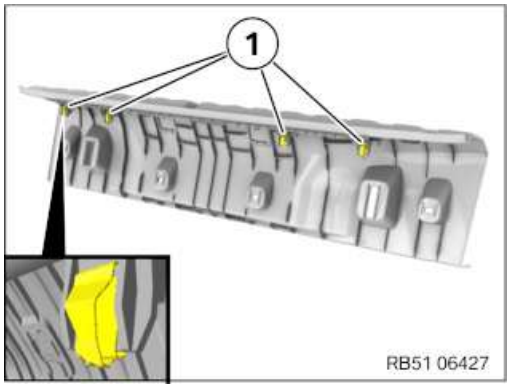
	Tightening torque	19 Nm

- Install the cover (1) .

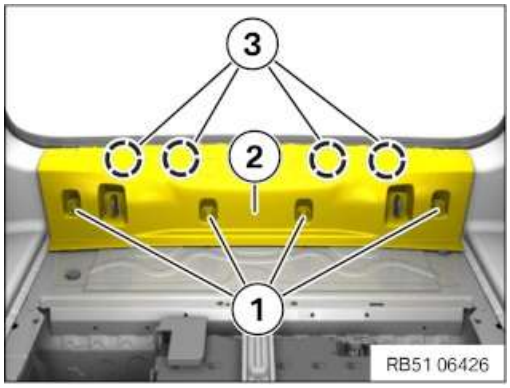
8 – Installing loading edge trim

NOTICE

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

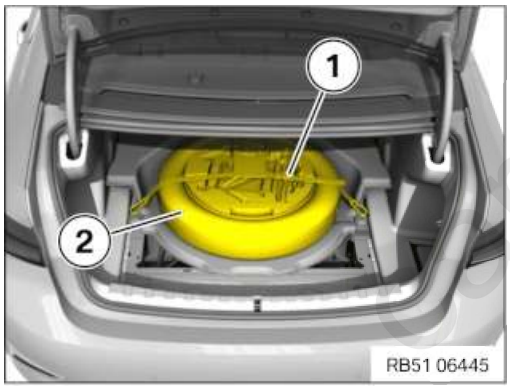


- Check the clamps (1) for damage and renew if necessary.



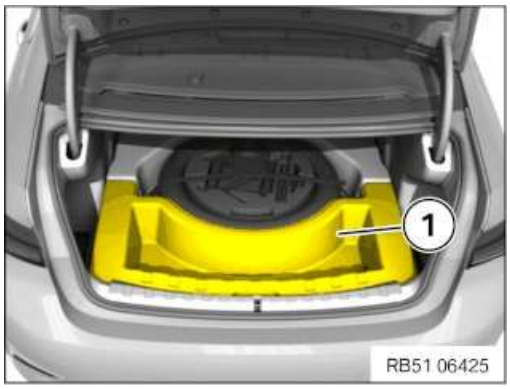
- Insert the loading edge trim (2) under the sealing lip of the tailgate seal.
- Fit the trim of the loading edge (2) at the latch mechanisms (3) and clip it in to the bottom.
- Secure expanding rivet (1).

9 – If installed: Install the emergency wheel



- Install the emergency wheel (2) with the insert.
- Position the seat belt strap above the emergency wheel and close the buckle on the seat belt strap (1).

▸ **Installing rear luggage compartment well**



- Install rear luggage compartment well (1).

10 – Installing the luggage compartment floor trim panel

▸ **Installing the luggage compartment floor trim panel**

NOTICE

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



- Insert the luggage compartment floor trim panel (1).

11 – Program/encode the control unit for SCR exhaust emission system

- ▶ **Encode/program control unit(s)**
- **Replacement**.
- **This task is not included in this flat rate unit item.**

- ▷ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

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

◁

Additional Information

Overview of Tightening Torques

Lashing eye to body		Used in step 7
	Tightening torque	19 Nm

Links

Repair instructions	**Used in step**
61 35 ... Notes on ESD protection (Electro Static Discharge)	
61 35 ... Notes on ESD protection (Electro Static Discharge)	

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64 00 ... Information on using cleaning agent/paints (personal protection equipment)



Warning!

Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!

Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!



Important!

Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct sunlight.
- Always keep an eye douche on hand, change the water regularly (once a month).



Important!

Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations



Important!

Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.



Important!

Follow hazard warnings and wear personal protection equipment!

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First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.
- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapours ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.



Recycling:

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

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