11 51 030 Removing and installing/replacing component carrier

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.

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

cardiagn.com



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.

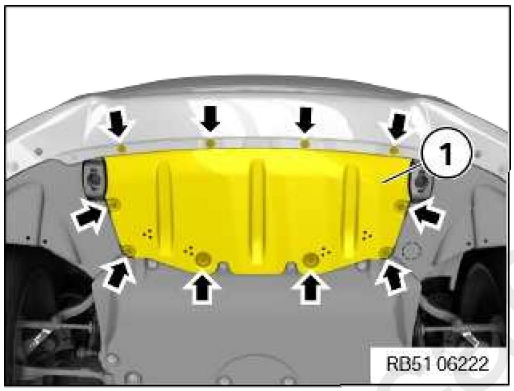
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

2 – Disconnecting all battery earth leads



- See additional information.

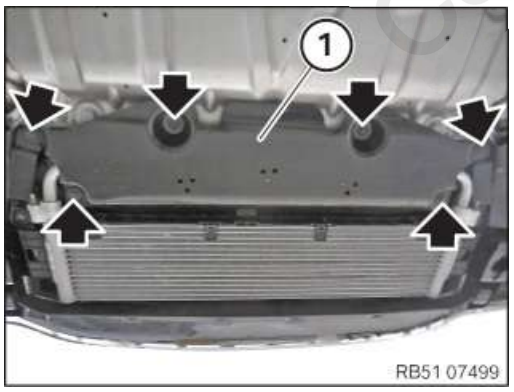
3 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

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

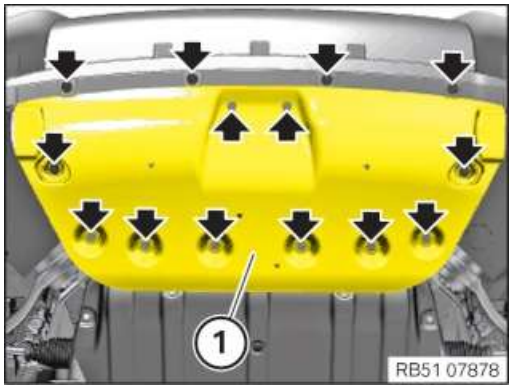


- **Version B:**

  Remove screws (arrows).

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

carsdiagn.com

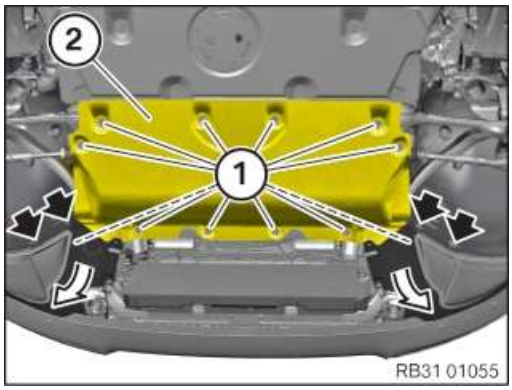


- **Version C:**

  Remove screws (arrows).

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

4 – Remove the underbody protection of the steering gear



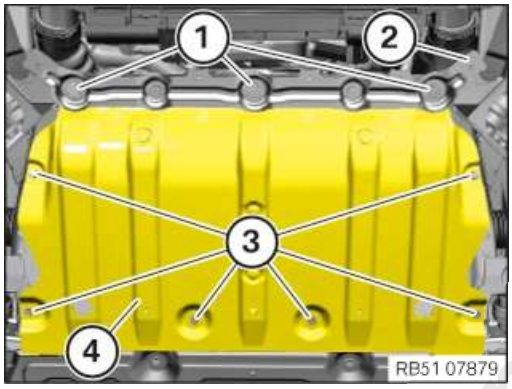
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

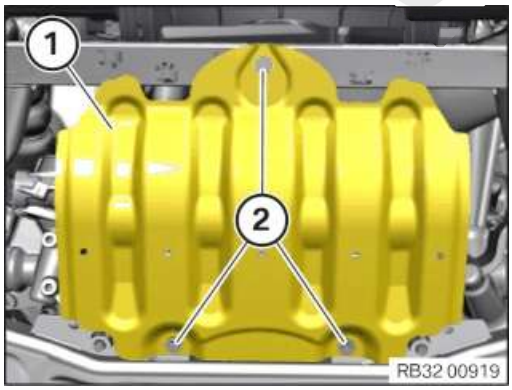
  Loosen screws (3).

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

5 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

6 – Removing the acoustic cover

cardiagn.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.



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

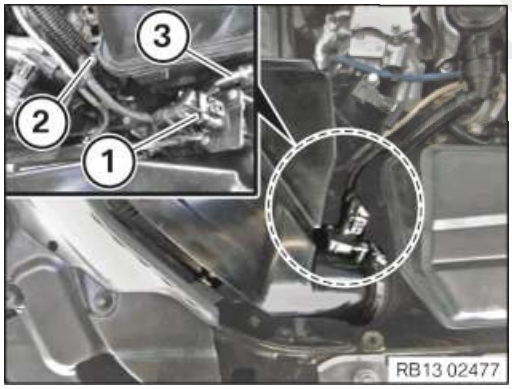
7 – Removing the clean air pipe with the resonator

WARNING

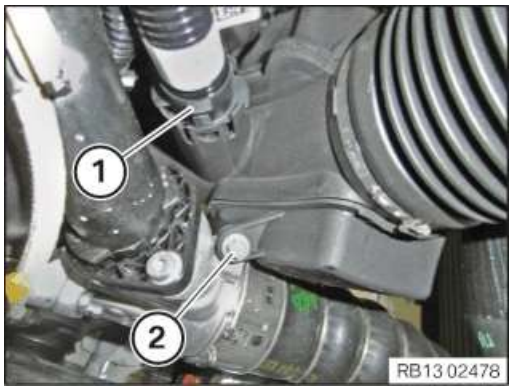
Hot surfaces.

Risk of burning!

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

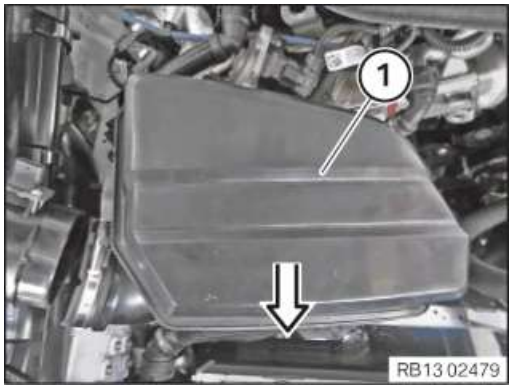


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



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

rdiagn.com



- 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.

8 – Draining the coolant from the high-temperature cooling system

WARNING

Hot fluids.

Risk of scalding!

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

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.

cardiagn.com

TECHNICAL INFORMATION

Life-long fill of coolant!

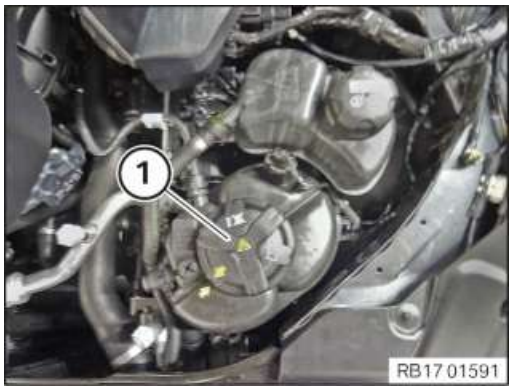
Do not reuse used coolant.

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

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

TECHNICAL INFORMATION

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



- Loosen sealing cap (1).

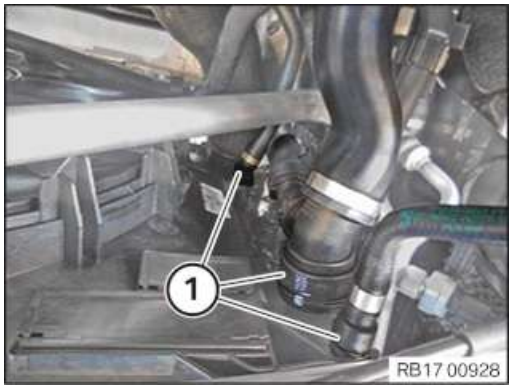
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



NOTICE

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

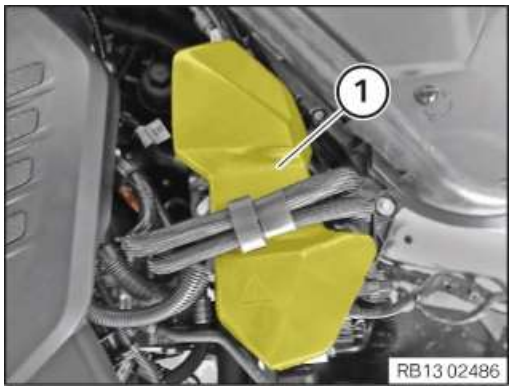
- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.

carolagn.com



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

9 – Remove the cover for the DDE control unit



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

10 – 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

carmagn.com

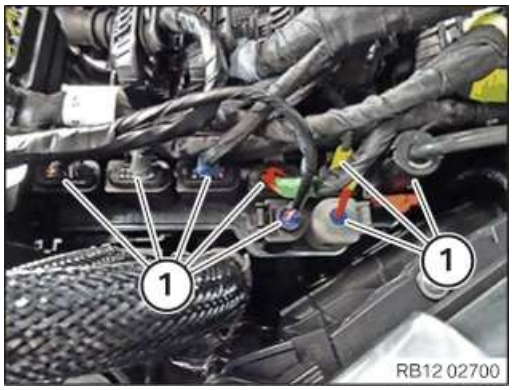
TECHNICAL INFORMATION

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

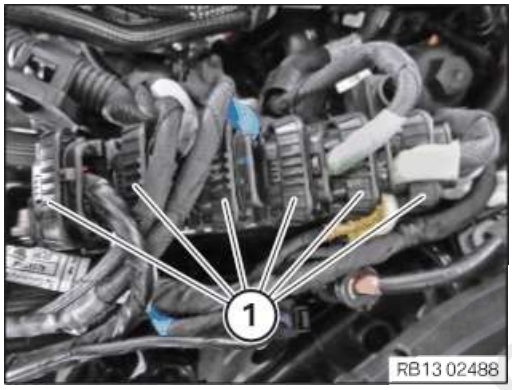
TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.

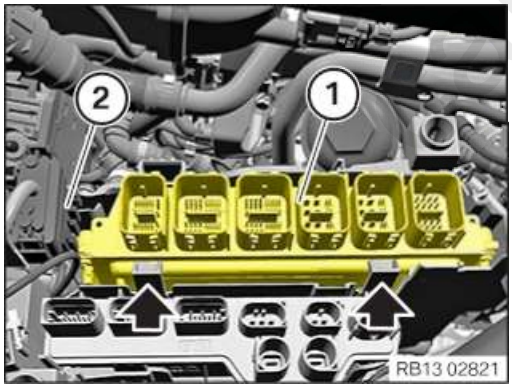
For additional information see: 61 00 ... Programming/encoding control unit(s)



- 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.

11 – Removing the integrated supply module (PDM) partially

Prerequisite

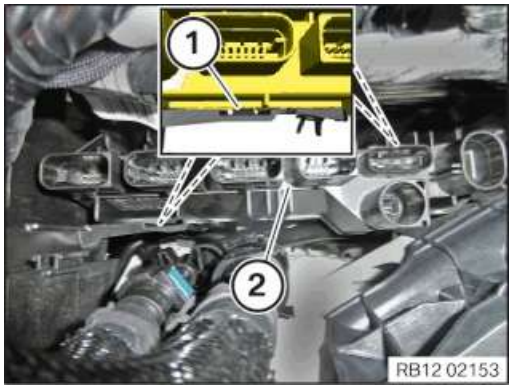
Engine control unit is removed.

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)

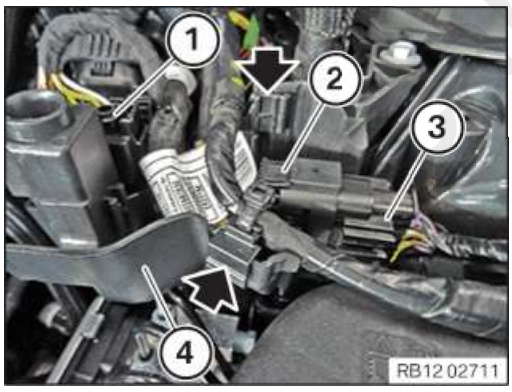


- Loosen the latch mechanisms (1).
- Feed out and remove the integrated supply module (PDM) (2) upwards.

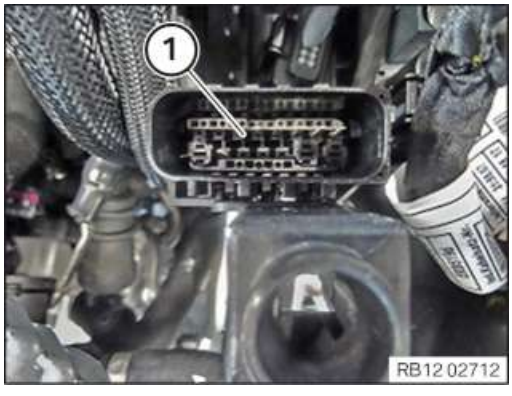
12 – Removing the control unit holder

TECHNICAL INFORMATION

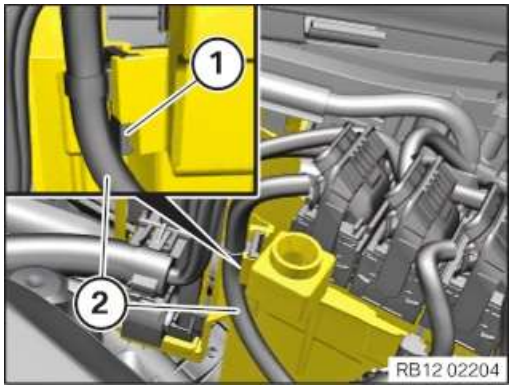
The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.



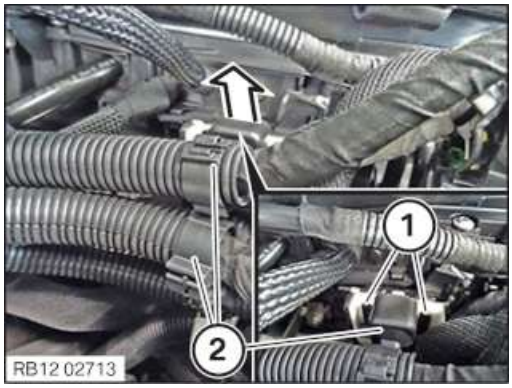
- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Release the connector (3) and disconnect from the control unit holder (4).
- Release the clamps (arrows).



- Unlock plug connection (1) and disconnect.



- Unlock and loosen the cable clip (1).
- Remove the wiring harness section (2) and put to one side.



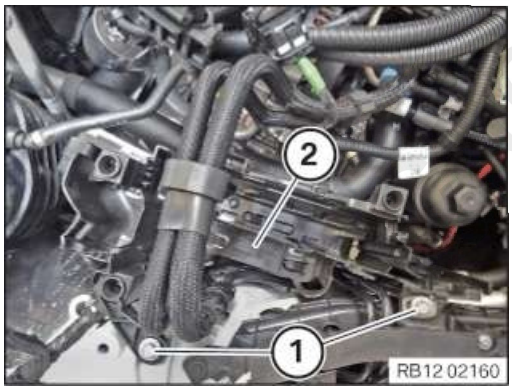
NOTICE

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

- Unlock the locks (1) .
- Guide out the cable clip (2) in the direction of arrow and set aside.



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



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

13 – Releasing the wiring harness section with the starter generator lines partially

rdiagn.com

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

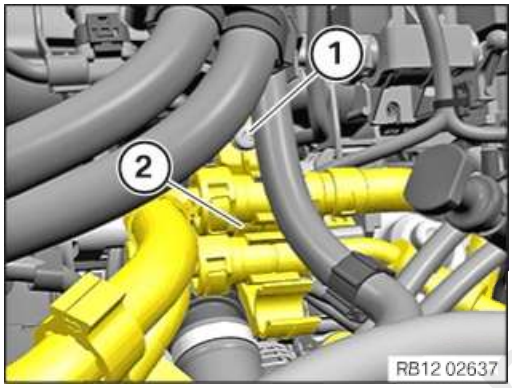
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the 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)

RISK OF DAMAGE

Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

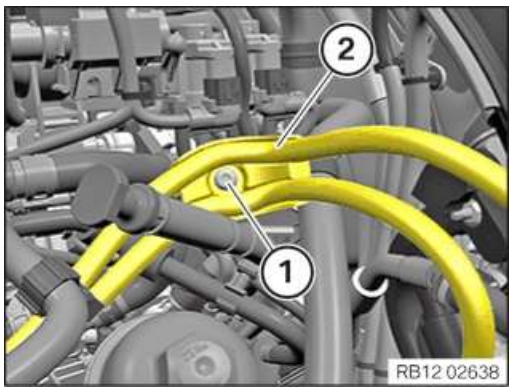
- Do not pull on the wires when disconnecting connectors and plug connections.



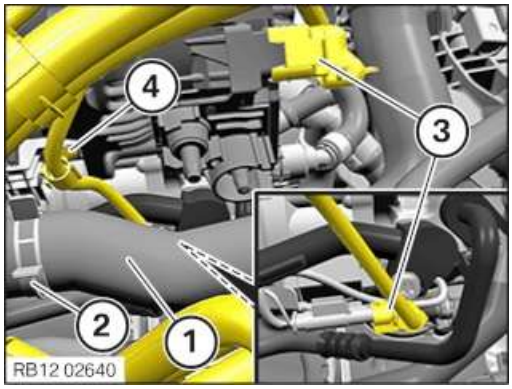
- Release the screw (1).
- Guide out fuel lines (2) and set them aside.



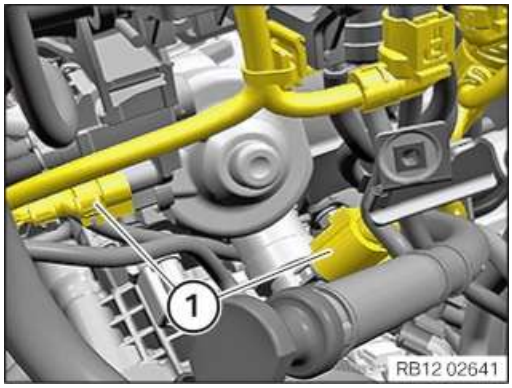
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.
- Loosen clamp (5).
- Thread out holder (2) and set aside.



- 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).



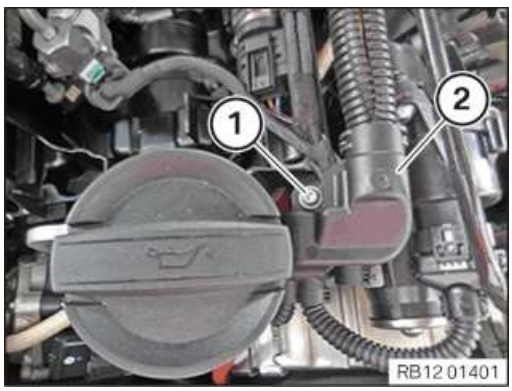
- Unlock and disconnect plug connections (1).



- Unlock and loosen connector (1).

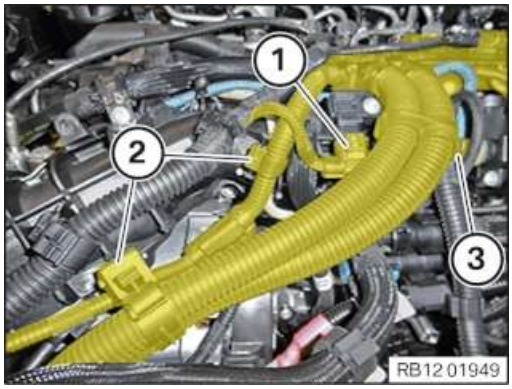


- Unlock plug connection (1) and disconnect.

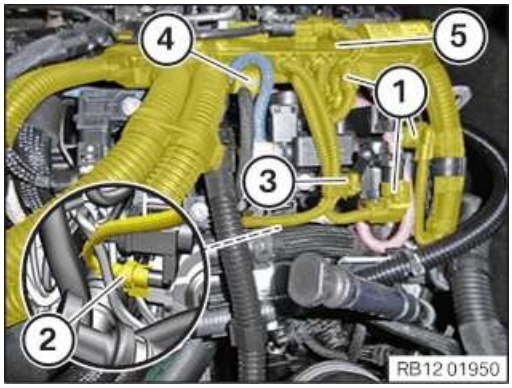


- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.

rdiagn.com



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamp (3).



- Unlock and disconnect the plug connection (1).
- Unlock and disconnect the plug connection (2).
- Loosen clamp (3).
- Loosen screw (4).
- Guide out wiring harness section (5) as far as possible and set it aside.

14 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

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

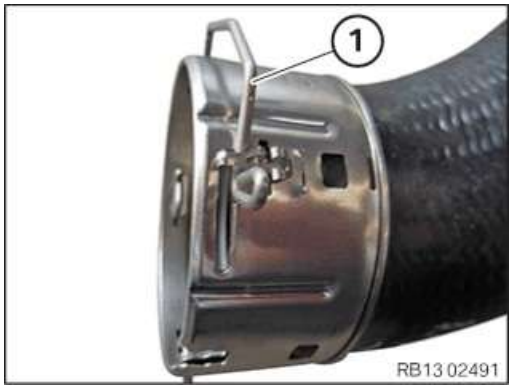
RISK OF DAMAGE

Electrostatic discharge.

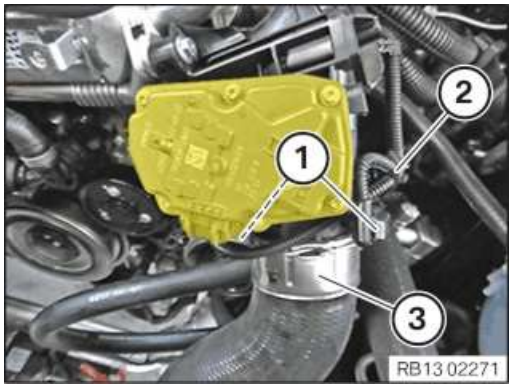
Damage to or destruction of electrical components.

- 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)

cardiagn.com



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

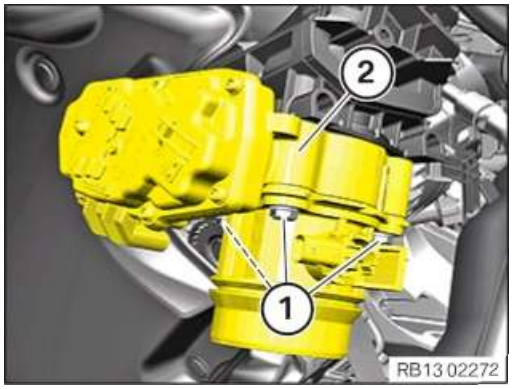


- Unlock and disconnect plug connections (1).

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).

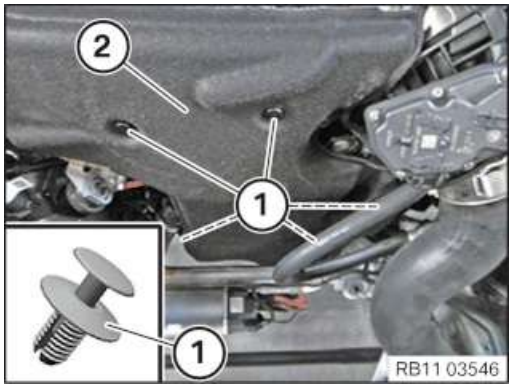
15 – Remove acoustic cover of the front engine

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 – Removing the drive belt for the starter motor generator

cardiagn.com

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

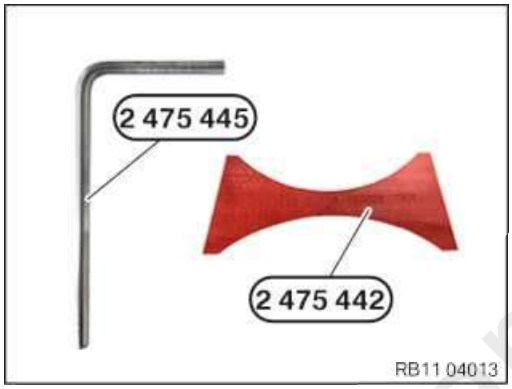
Component with preload.

Danger of injury!

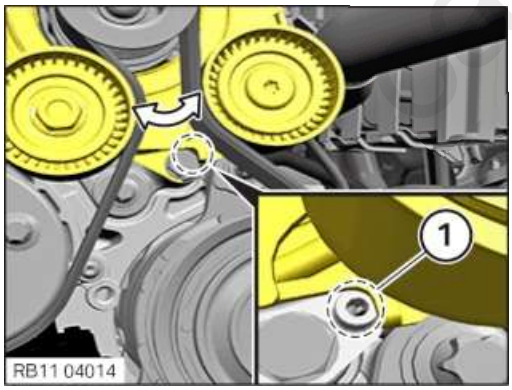
- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

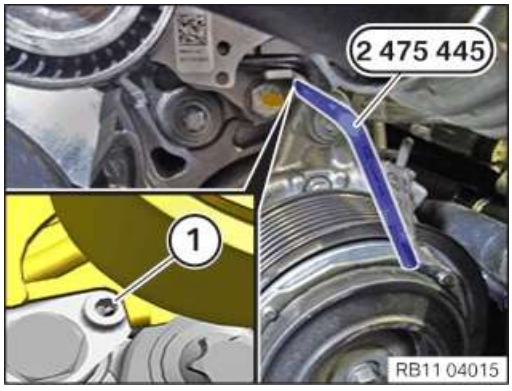
The drive belt must be replaced if contaminated with coolant- and oil residues.



- Prepare the special tool 2 475 442 and the special tool 2 475 445.

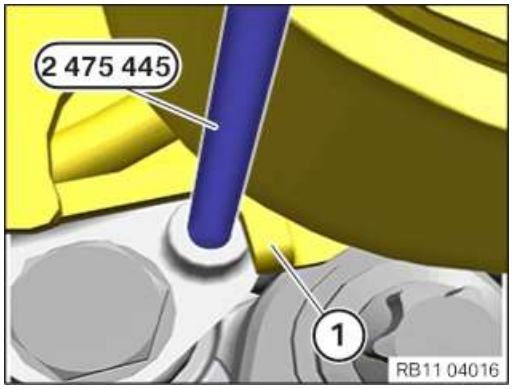


- Position the belt tensioner in the direction of the arrow so that the bore hole is visible in the area (1).

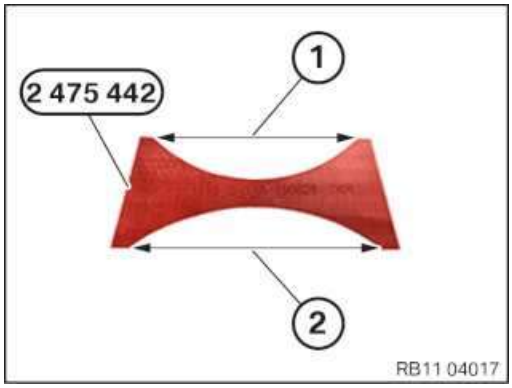


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

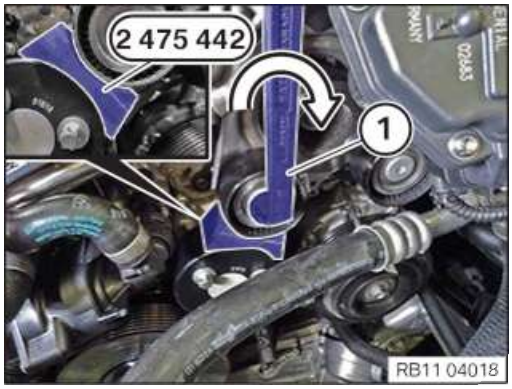
  The special tool 2 475 445 must rest against the starter motor generator.



- Ensure that the belt tensioner (1) is supported on the special tool 2 475 445.



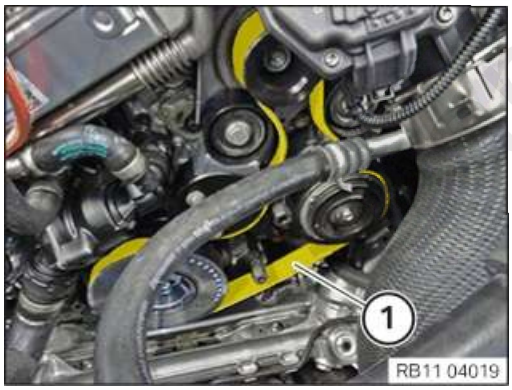
- Ensure that the radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- Ensure that the radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.



TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

- Guide out and remove the drive belt (1) for the starter motor generator.

17 – Removing the starter motor generator

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 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)

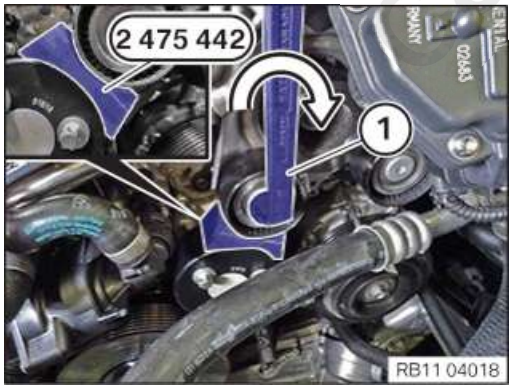
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

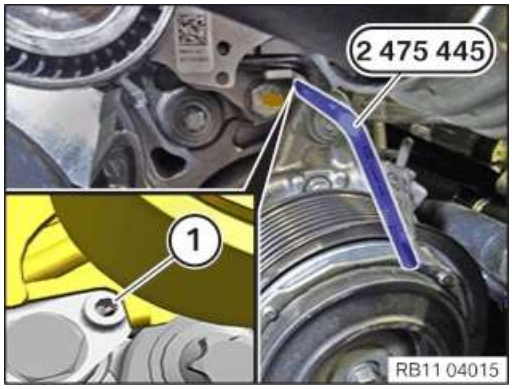


TECHNICAL INFORMATION

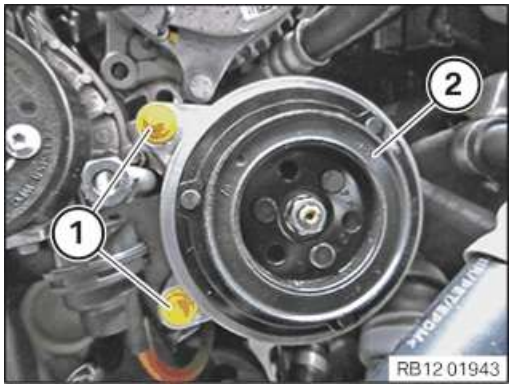
Conduct the following operation with the assistance of a second person.

- Twist the tensioning pulley (1) in the direction of the arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.

carsiagn.com



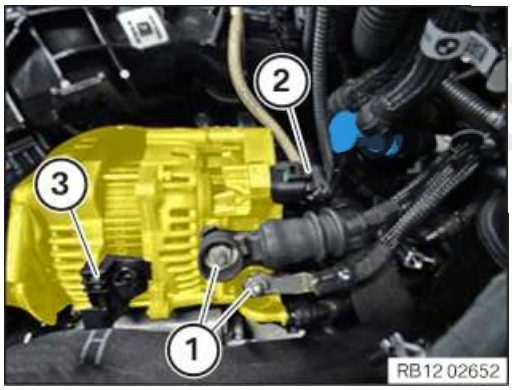
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.



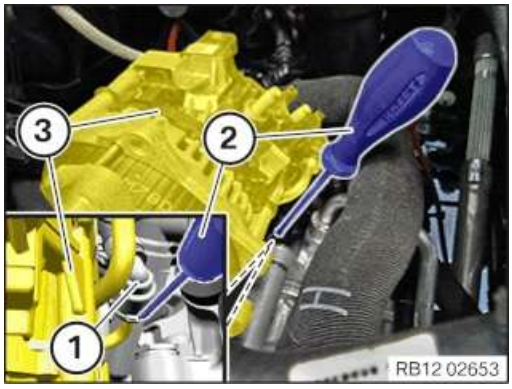
- Loosen screws (1).
- Slide the air conditioning compressor (2) out and set it aside.



- Guide out and remove the lid (1).



- Release nuts (1).
- Unlock plug connection (2) and disconnect.
- Loosen the holder (3).

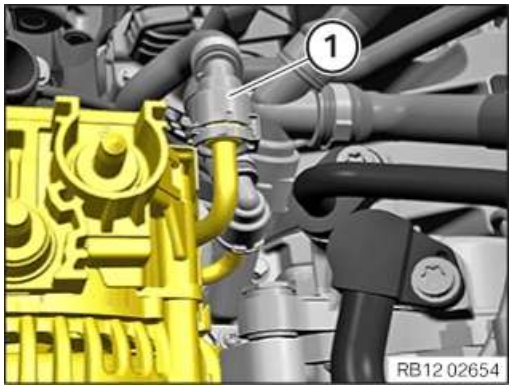


TECHNICAL INFORMATION

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

- Unlock and pull off the coolant line (1) with a screwdriver (2).
- Catch and dispose of escaping coolant.

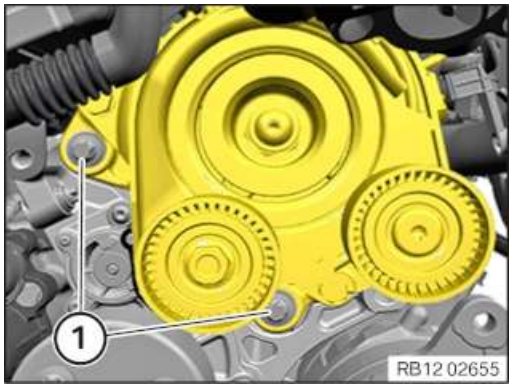
rdiagn.com



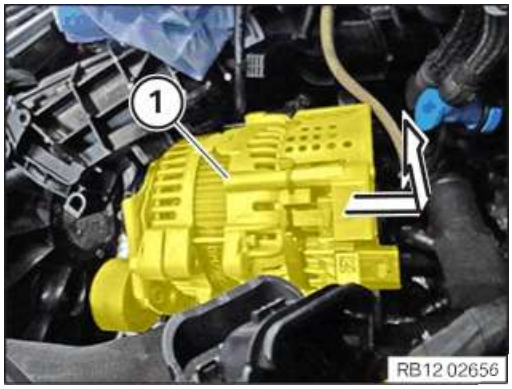
TECHNICAL INFORMATION

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

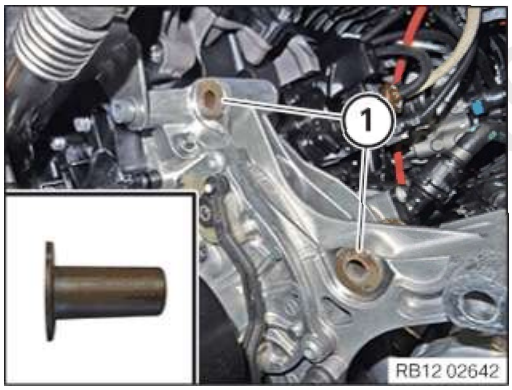
- Unlock and remove the coolant line (1).
- Catch and dispose of escaping coolant.



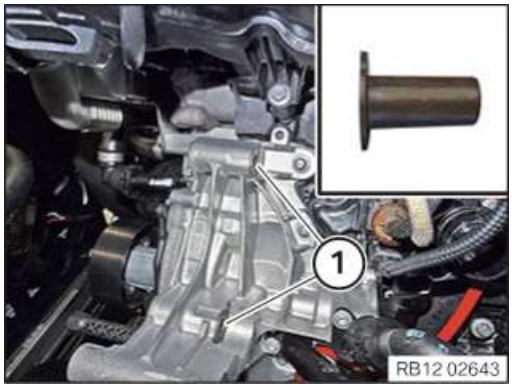
- Loosen screws (1).



- Feed out and remove the starter motor generator (1) in the direction of arrow.



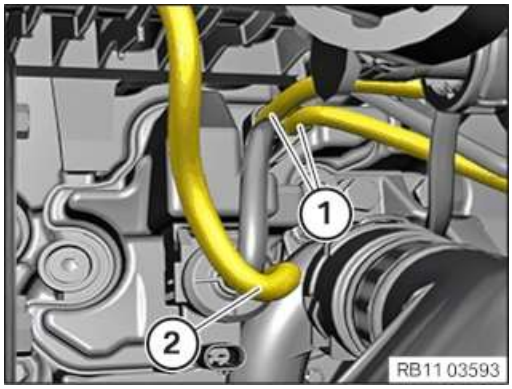
- Feed out and remove the bush (1).



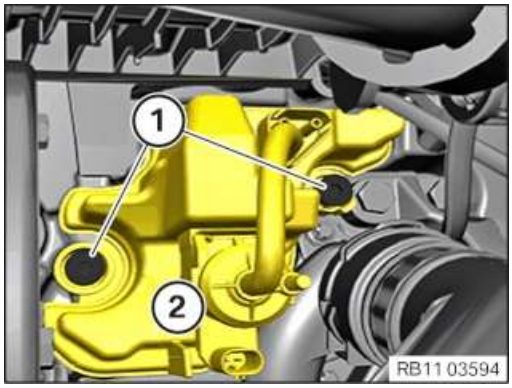
- Feed out and remove the bush (1).

18 – Remove vacuum reservoir

rdiagn.com



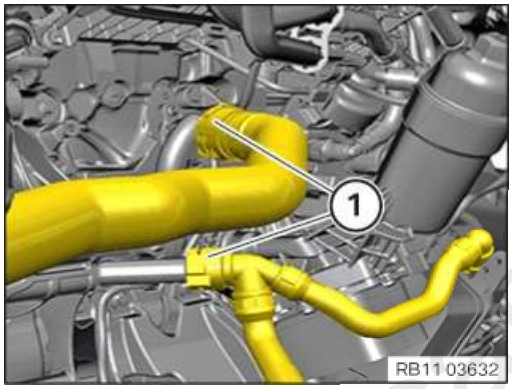
- Pull off vacuum hose (1) from the vacuum reservoir.
- Pull off the vacuum hose (2) from the electric changeover valve.



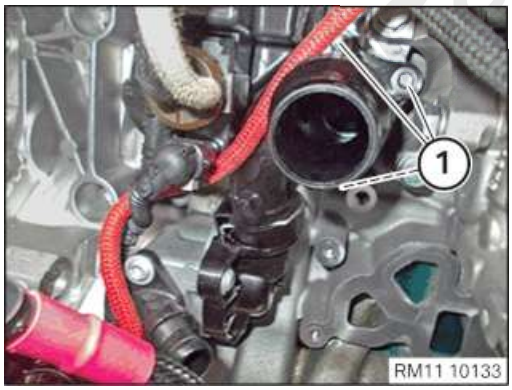
- Loosen screws (1).
- Feed out and remove the vacuum reservoir (2).

MAIN WORK

19 – Removing the component carrier



- Unlock and pull off the coolant hoses (1).

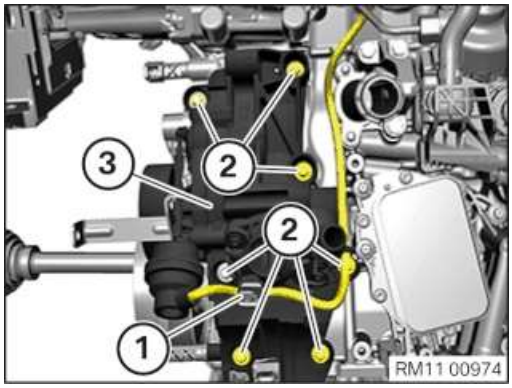


- Loosen screws (1).

carmanualsdiagram.com

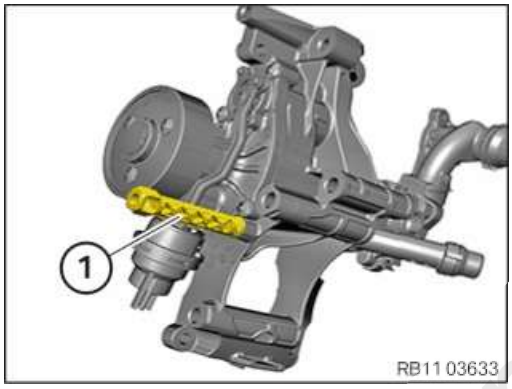


- Loosen the screw (1) below the exhaust-gas recirculation cooler.



- Disconnect the vacuum line (1) from the vacuum unit and detach it from the clamp on the component carrier.
- Loosen screws (2).
- Lift off and remove the component carrier (3) from the crankcase.

20 – When replacing the component carrier: Remounting spacer screw



- Renew the component carrier.

  Parts: Component carrier
- Remount spacer screw (1).

Spacer bolt for mounting the acoustic cover

M8x12	Tightening torque	12 Nm

21 – Installing the component carrier



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.

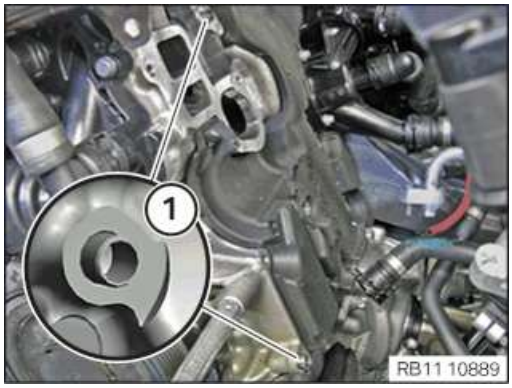
- Clean the sealing surface using special tool 0 495 102 (11 4 470).

aldiagr.com



- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).

Check



- Check the fitting sleeves (1) for damage.

desired state

- The fitting sleeves (1) must not be scratched or deformed.

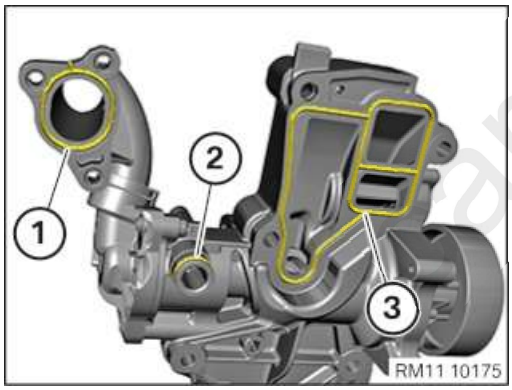
Result

» The fitting sleeves (1) are damaged.

Measure

- Renew fitting sleeves.

  Parts: Fitting sleeves



- Renew the seal (1).

  Parts: Gasket

- Renew O-ring (2).

  Parts: O-ring

- Check the sealing bead (3) for damage.
- Check the height of the sealing bead in reference to the surface.

Height of the sealing bead

	2,0 mm ... 2,5 mm

- If necessary, reapply the sealing bead.

Sealing compound

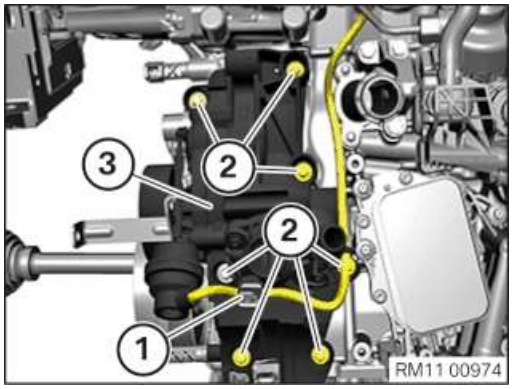
Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

	< 12 min

ardiagn.com



- Renew screws (2).

  Parts: Screws
- Position the component carrier (3) on the crankcase.
- Tighten the screws (2).

Component carrier to crankcase

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

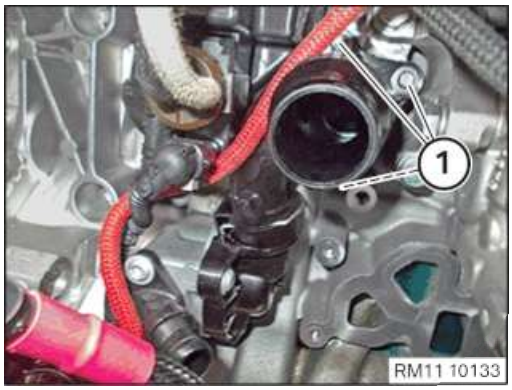
- Connect the vacuum line (1) on the vacuum unit and attach it in the clamp on the component carrier.



- Tighten the screw (1) below the exhaust-gas recirculation cooler.

Exhaust-gas recirculation cooler to cylinder head

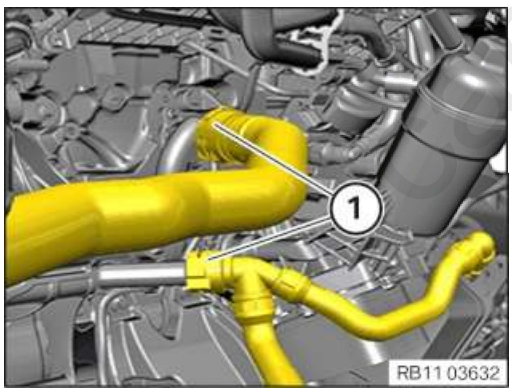
M8x20 / M8x28		Tightening torque	19 Nm



- Tighten the screws (1).

Connecting branch to engine block

M6x25		Tightening torque	8 Nm



TECHNICAL INFORMATION

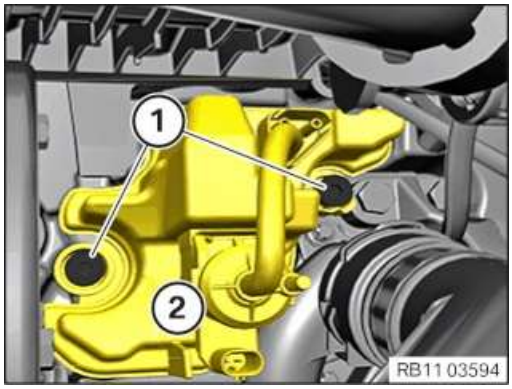
Make sure that the connections are locked correctly. The locks must engage audibly.

- Connect coolant hoses (1) and lock audibly.

POSTPROCESSES

22 – Install vacuum reservoir

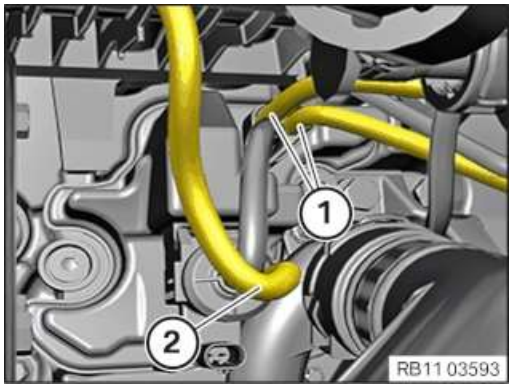
carsdiagn.com



- Insert and install the vacuum reservoir (2).
- Tighten the screws (1).

Vacuum reservoir to crankcase

M6X25		Tightening torque	8 Nm



- Connect vacuum hoses (1) to the vacuum reservoir.
- Connect vacuum hose (2) to the electric changeover valve.

23 – Installing the starter motor generator

CAUTION

Improper routing of the positive battery cable.

Risk of short circuits!

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

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.

▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

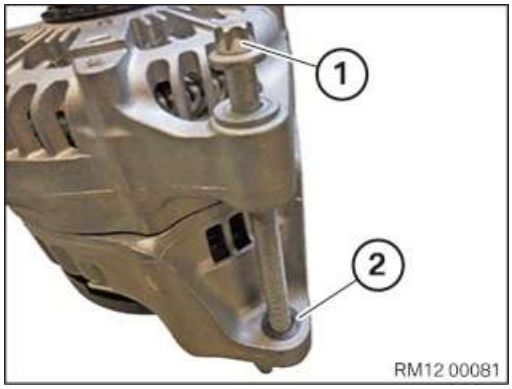
Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

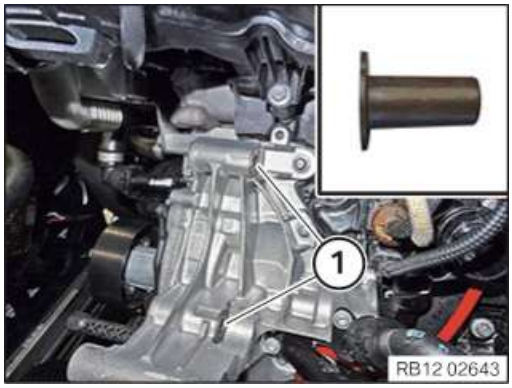
- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

▸ **Prepare for the installation of the alternator**

cardiagn.com



- Screw the screw (1) into the threaded support sleeve (2).
- Slightly press back the threaded support sleeve (2) using the bolt (1).
- Once again unscrew the screw (1) from the threaded support sleeve (2).



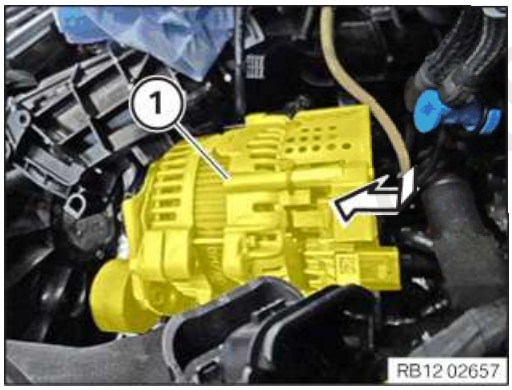
- Renew the bushes (1).

  Parts: Bushes
- Guide in and install the bushes (1).

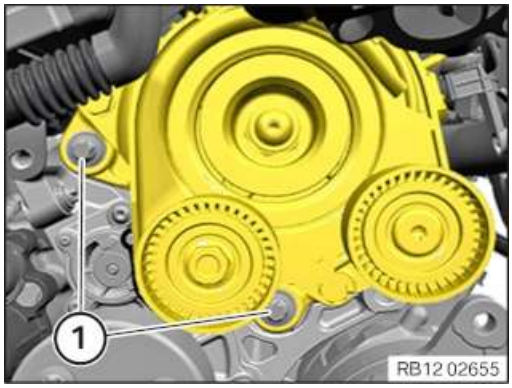


- Renew the bushes (1).

  Parts: Bushes
- Guide in and install the bushes (1).



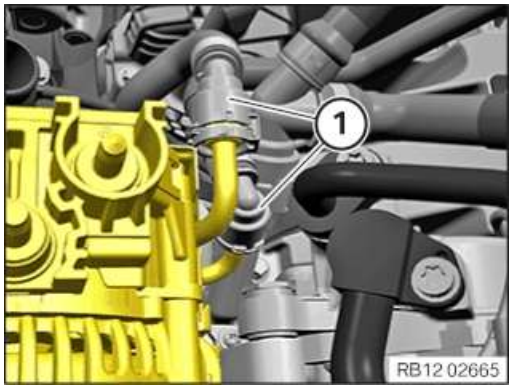
- Guide in and install the starter motor generator (1) in the direction of the arrow.



- Tighten the screws (1).

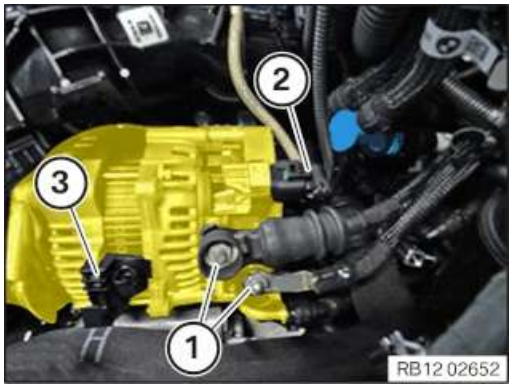
Alternator to component carrier

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm



- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



- Fasten the holder (3).
- Connect connectors (2) and lock.

  The connector (2) must engage audibly.
- Renew nuts (1).

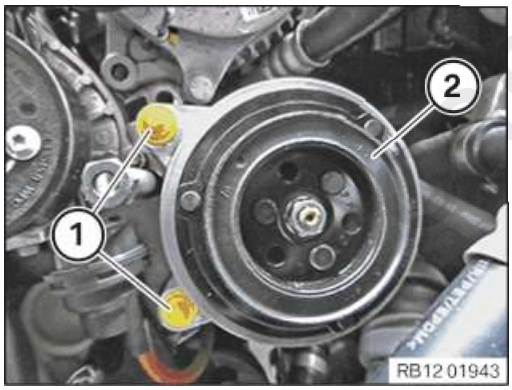
  Parts: Nuts
- Tighten nuts (1).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm



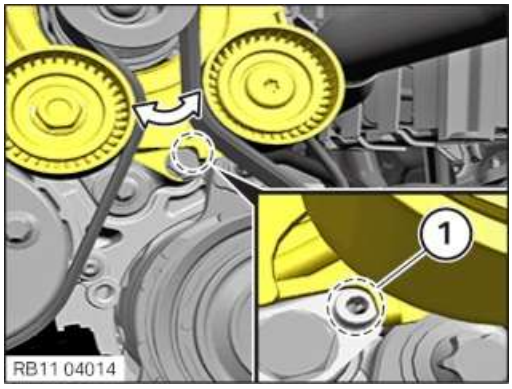
- Guide in and install the lid (1).



- Insert and install the air conditioning compressor (2).
- Tighten the screws (1).

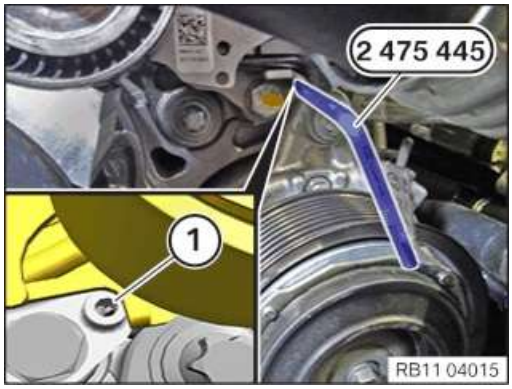
Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm



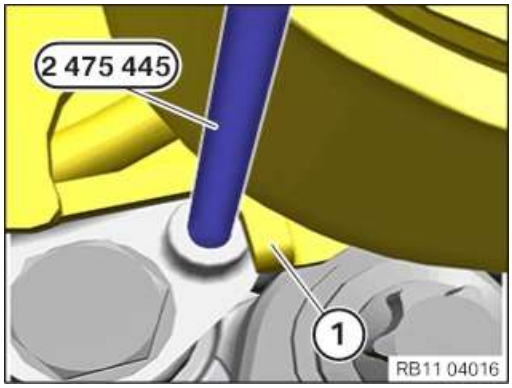
- Position the belt tensioner so that the bore hole is visible in the area (1).

rdiagn.com

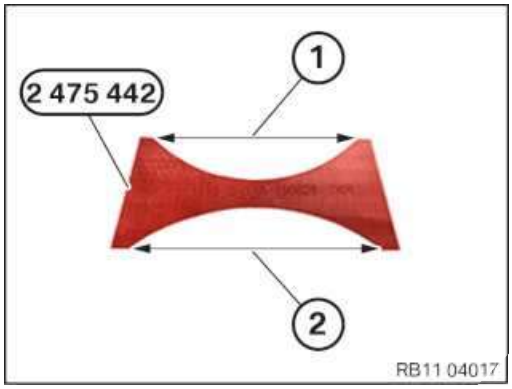


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

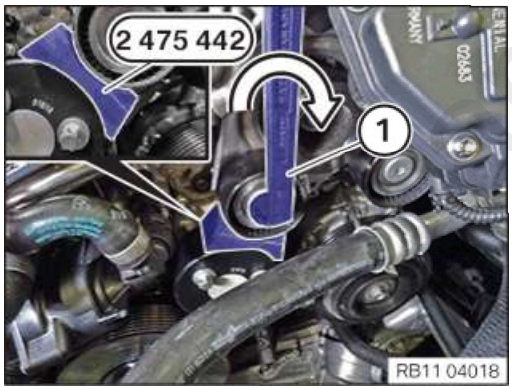
  The special tool 2 475 445 must rest against the starter motor generator.



- The belt tensioner (1) must be supported on the special tool 2 475 445.



- The radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- The radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.



TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.

24 – Installing the drive belt for the starter motor generator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

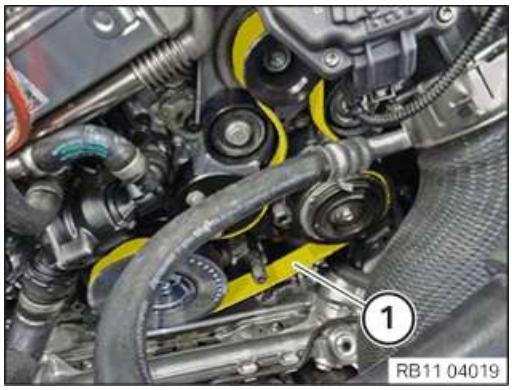
Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

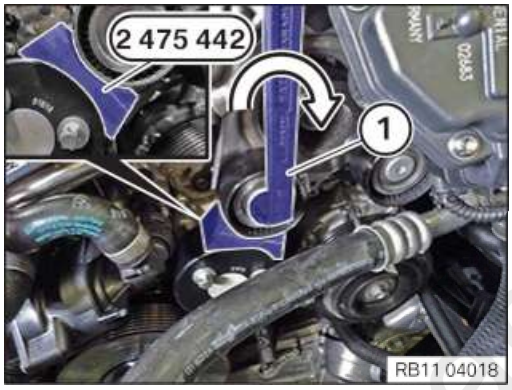
The drive belt must be replaced if contaminated with coolant- and oil residues.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

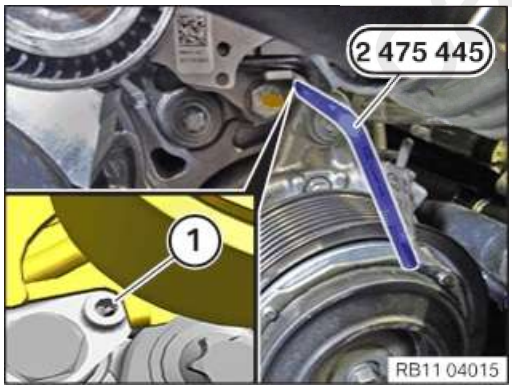
- Feed in and install the drive belt (1) for the starter motor generator.



TECHNICAL INFORMATION

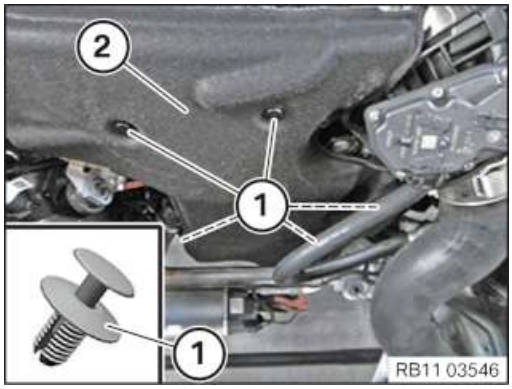
Conduct the following operation with the assistance of a second person.

- Turn the tensioning pulley in (1) in the direction of arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.



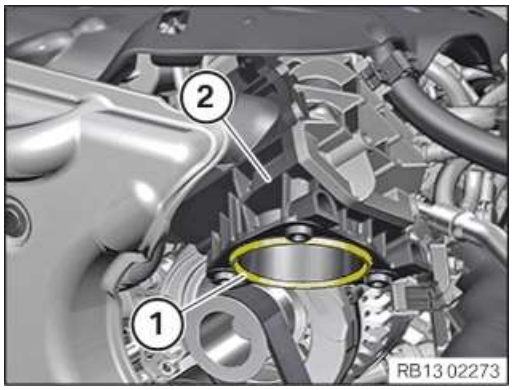
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.

25 – Install acoustic cover for the engine, front



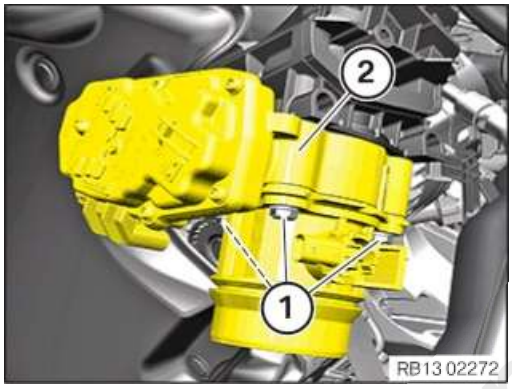
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

26 – 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

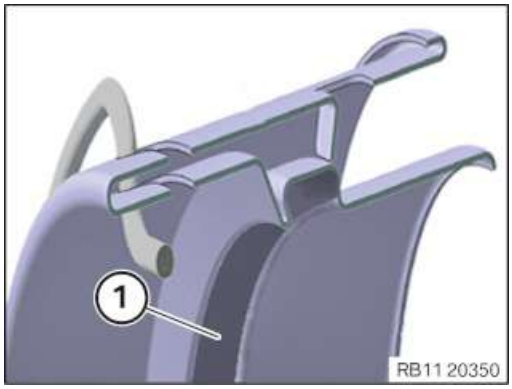


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

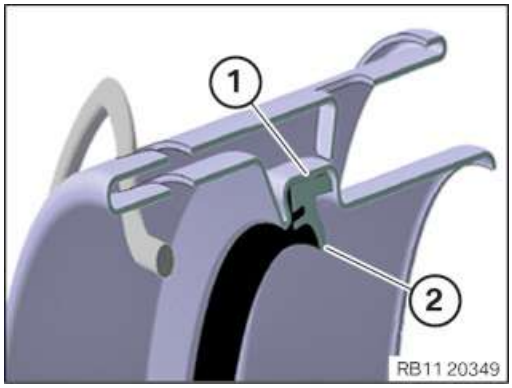
TECHNICAL INFORMATION

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.



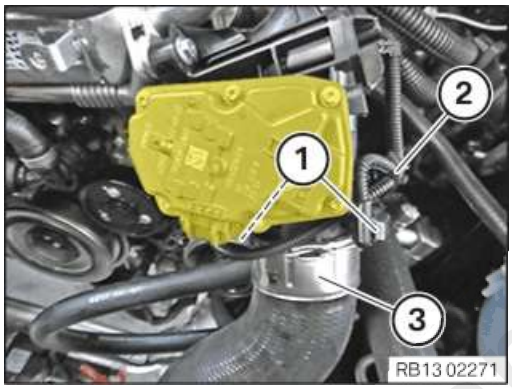
- Renew gasket.

  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.



- Lock clamp (1).

27 – Partially securing the wiring harness section with the starter generator cables

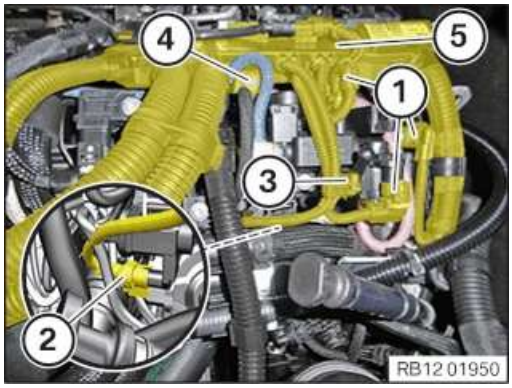
carofign.com

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

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

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



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

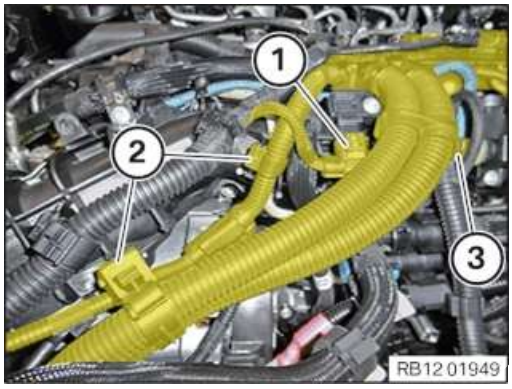
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

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

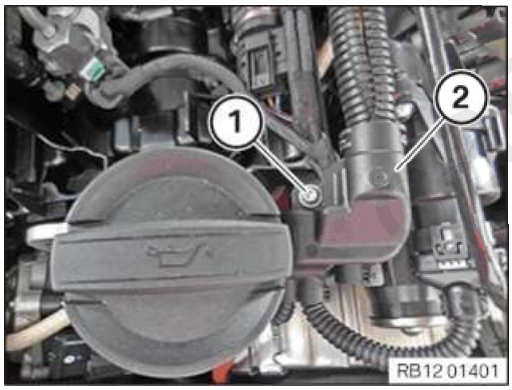
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- 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.

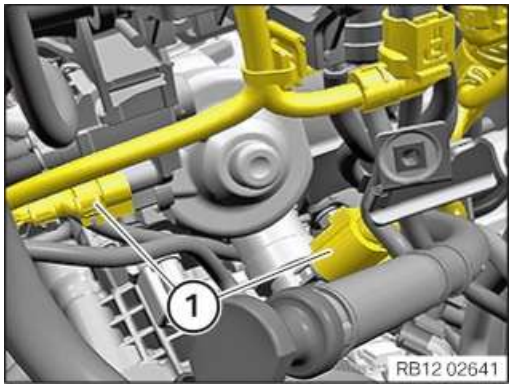
  The connector (1) must engage audibly.

.com



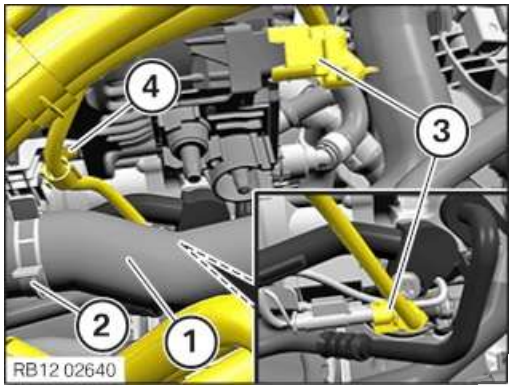
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



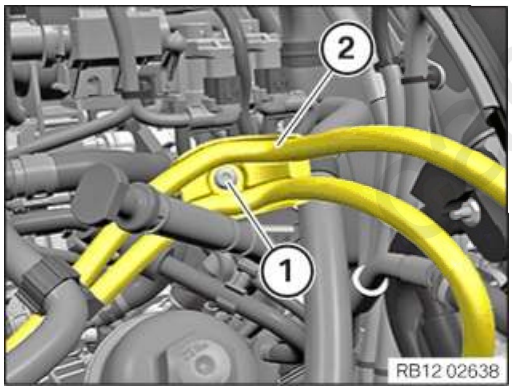
- Connect connectors (1) and lock.

  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).

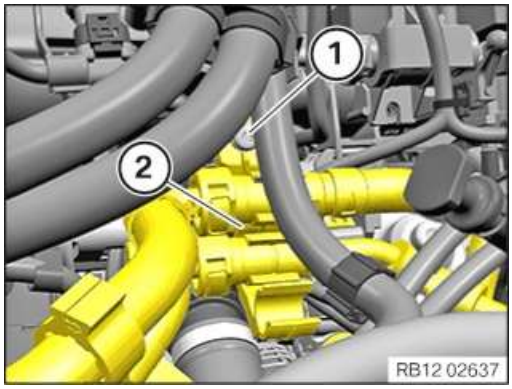
  Parts: Nuts
- Tighten nuts (3) and (2).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm

- Guide in and install the lid (1).

mydiagn.com



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

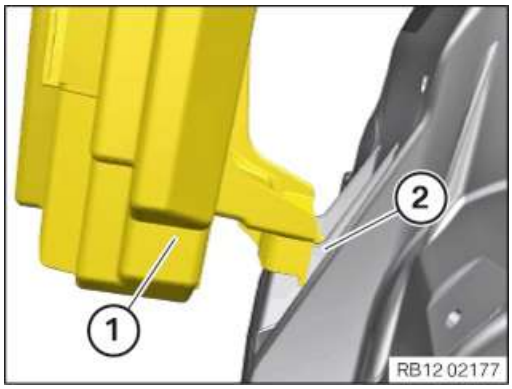
Holder on intake plenum

TS6X20		Tightening torque	5 Nm

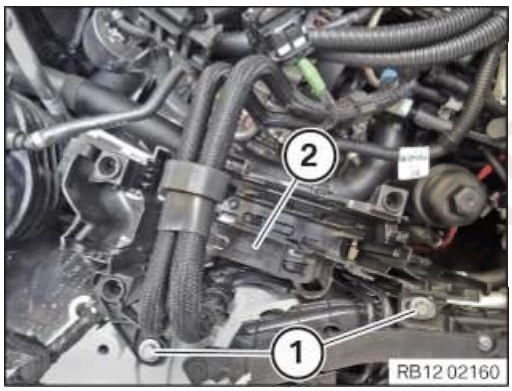
28 – Installing the control unit holder

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.



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



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

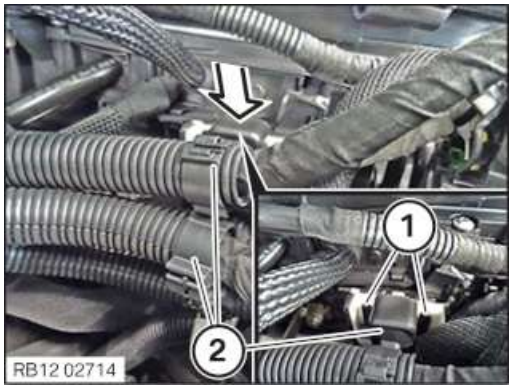
Control unit holder

M6		Tightening torque	8 Nm



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

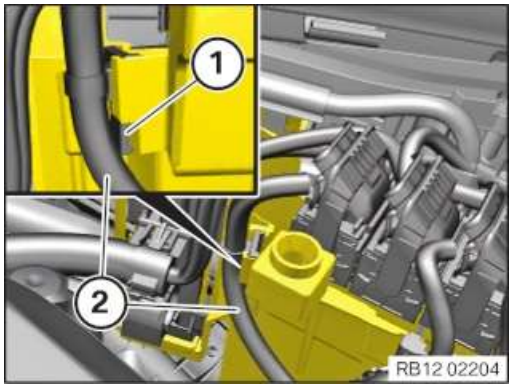
  Lock (arrow) must audibly engage.



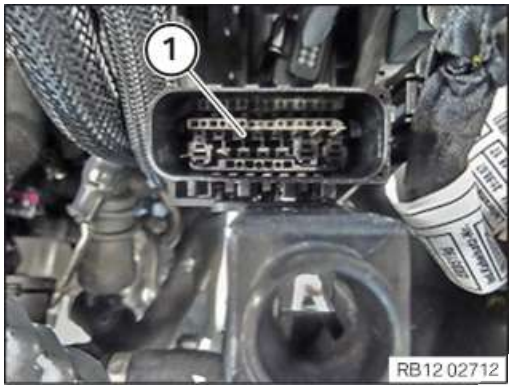
NOTICE

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

- Guide in cable clip (2) in the direction of the arrow and install it.
- Ensure that the locks (1)engage audibly.

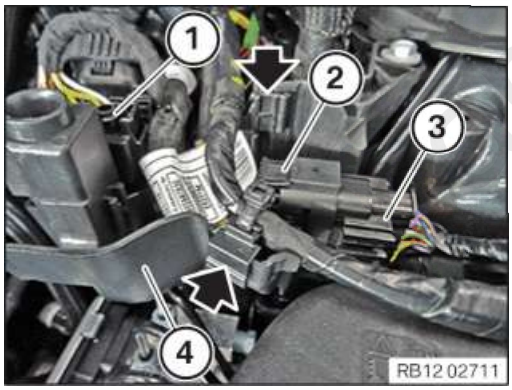


- Guide in the wiring harness section (2) and install.
- Connect and lock the cable clip (1).



- 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.

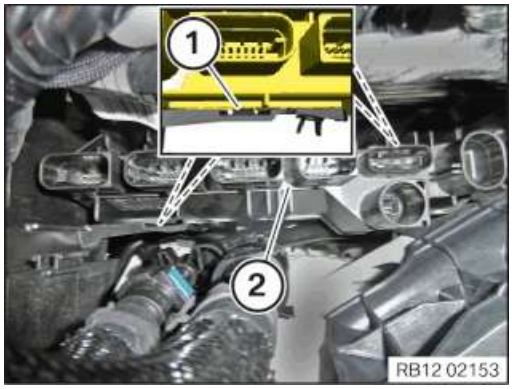
  The connector (1) must engage audibly.
- Secure the clamps (arrows).

29 – Installing the integrated supply module (PDM) partially

Prerequisite

Engine control unit has been removed.

rdiagn.com



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

  The latch mechanisms (1) must engage audibly.

30 – 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

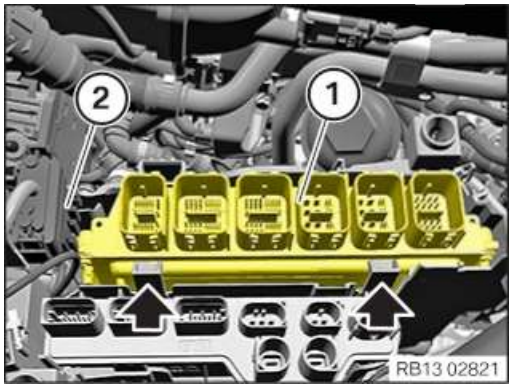
TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.

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

TECHNICAL INFORMATION

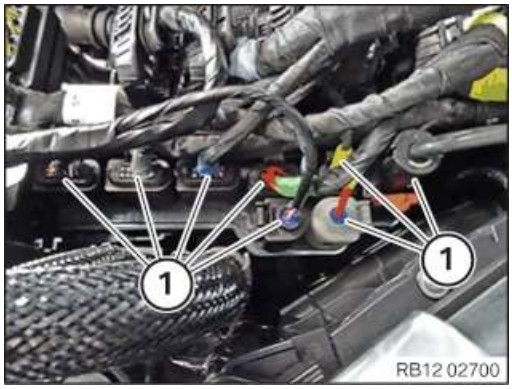
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Make sure that the plug connection (2) does not get damaged.
- Insert the DDE control unit (1) **carefully** and install it.

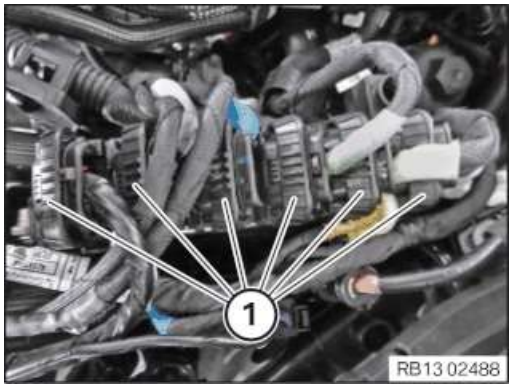
  The latch mechanisms (arrows) must engage audibly.

cardiagn.com



- Connect connectors (1) and lock.

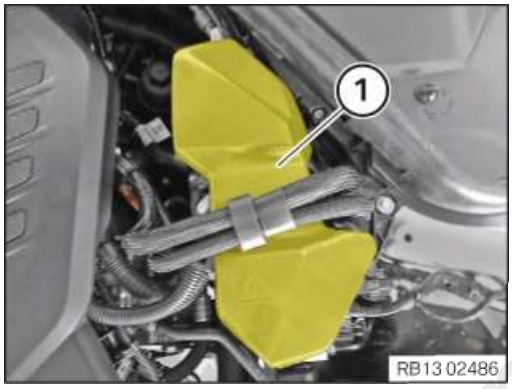
  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

31 – Install the cover for the DDE control unit

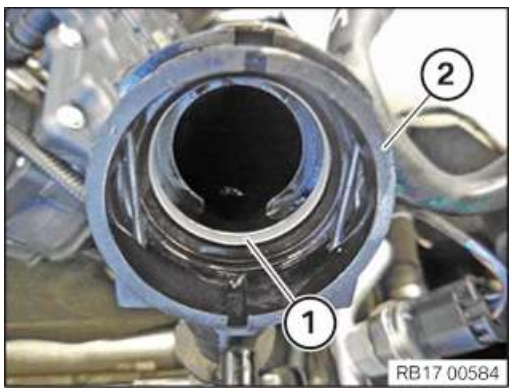


- Insert and install cover (1) into guides.

32 – Connecting the coolant lines

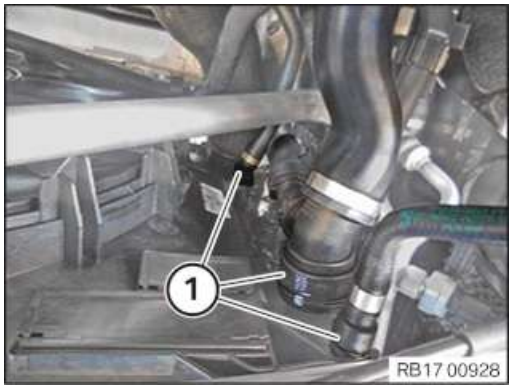
TECHNICAL INFORMATION

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



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

cardiagn.com

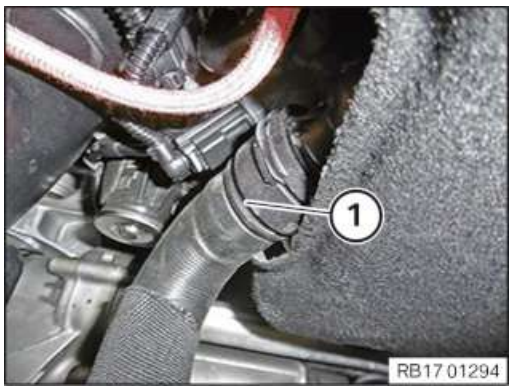


NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



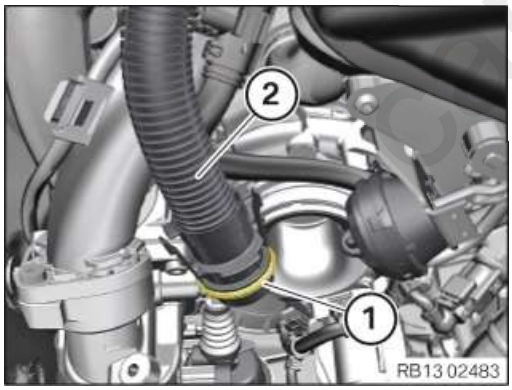
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

33 – Installing the clean air pipe with resonator



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

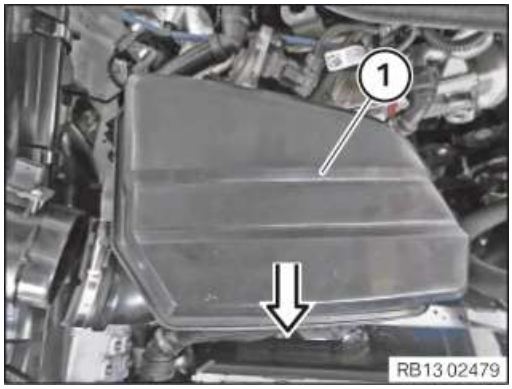


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

cardiagn.com

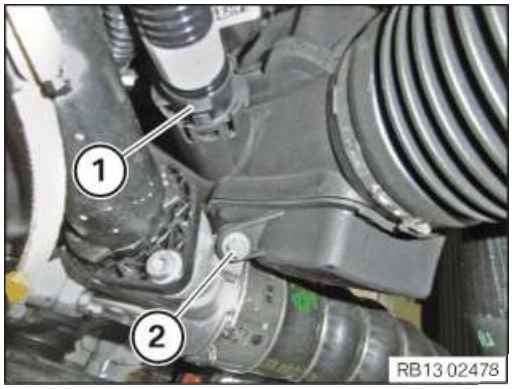


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

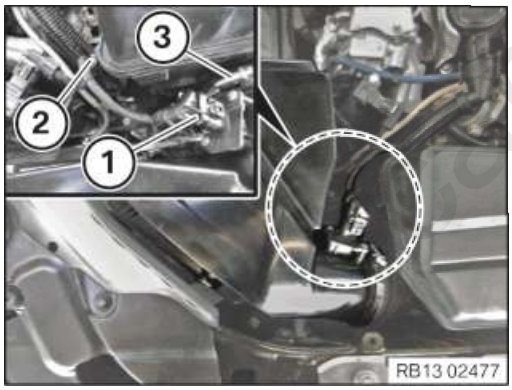
  The clamp (1) must engage audibly.



- 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 – Install acoustic cover

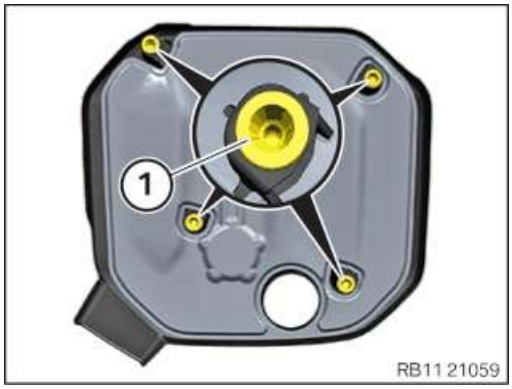
RISK OF DAMAGE

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.

cardiagn.com



- 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 – Connecting all battery earth leads



- See additional information.

36 – 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.

cardiagn.com



- 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.

37 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

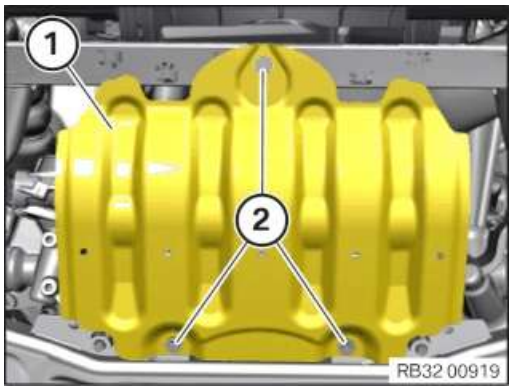
- See additional information.

38 – If installed: Install underbody protection of the steering

cardiagn.com

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

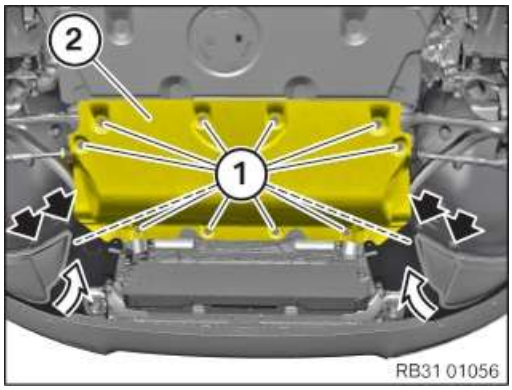
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

39 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

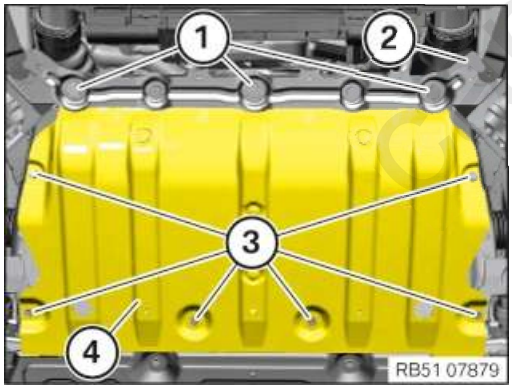
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

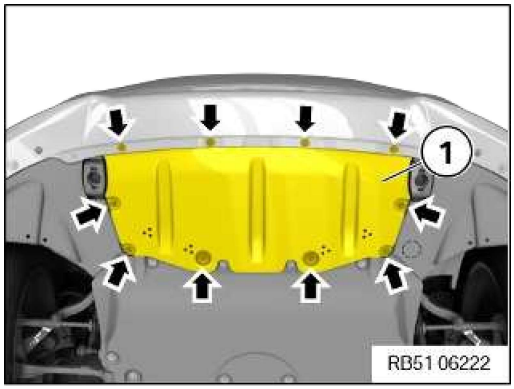
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

40 – Installing the front underbody protection



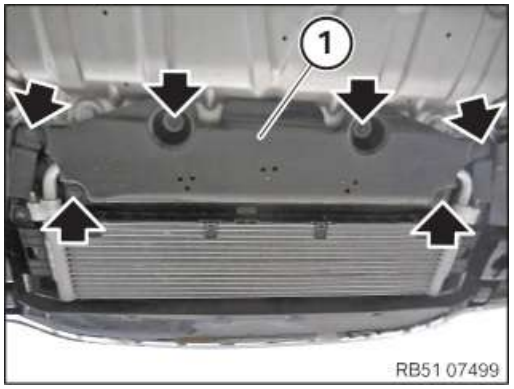
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



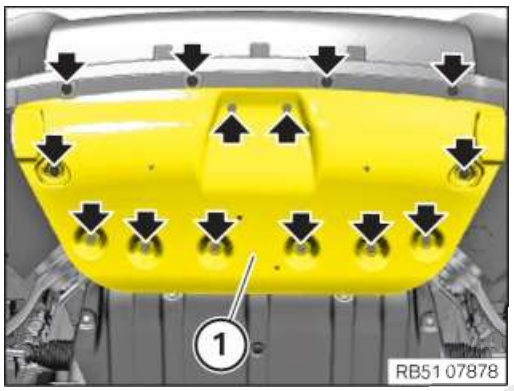
- **Version B:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Spacer bolt for mounting the acoustic cover — Used in step 20

M8x12		Tightening torque	12 Nm

Component carrier to crankcase — Used in step 21

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

Exhaust-gas recirculation cooler to cylinder head — Used in step 21

M8x20 / M8x28		Tightening torque	19 Nm

Connecting branch to engine block — Used in step 21

M6x25		Tightening torque	8 Nm

Vacuum reservoir to crankcase — Used in step 22

M6X25		Tightening torque	8 Nm

cardiagn.com

Alternator to component carrier			Used in step 23
M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

Battery positive lead on the starter motor generator			Used in step 2327
M8		Tightening torque	19 Nm

Air conditioning compressor in component carrier			Used in step 23
M10		Tightening torque	38 Nm

Throttle body to intake plenum			Used in step 26
6x50		Tightening torque	8 Nm

Wiring harness section to manifold			Used in step 27
TS5x20		Tightening torque	3,6 Nm

Wiring harness section to cylinder head cover			Used in step 27
TS5x20		Tightening torque	3,6 Nm

Standard screw connection M6			Used in step 27
M6		Tightening torque	8 Nm

Holder on intake plenum			Used in step 27
TS6X20		Tightening torque	5 Nm

Control unit holder			Used in step 28
M6		Tightening torque	8 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

Negative battery cable to 48-V battery			Used in step 36
Nut M8		Tightening torque	19 Nm

Underbody protection, steering, to front axle support			Used in step 38
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 38
Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 39
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front			Used in step 39
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

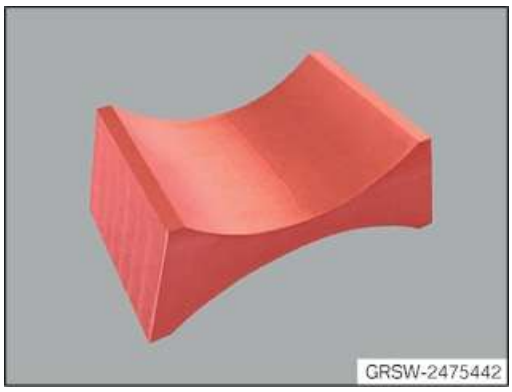
cardiagn.com

Underbody protection front Used in step 40

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

Overview of Special Tools

2 475 442 Removal and installation tool



Common Used in step 16172324

Usage	For removing and installing the drive belt of the ancillary components.
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475445
SI-Number	01 19 19 (668)

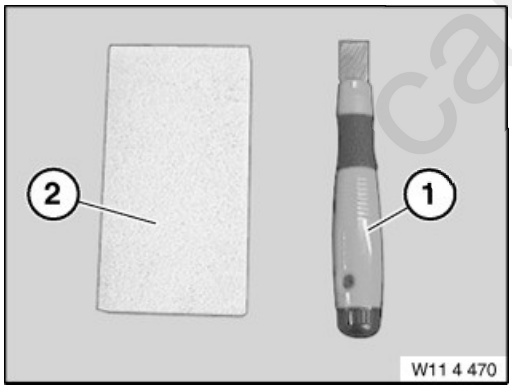
2 475 445 Pin



Common Used in step 16172324

Usage	Tool for drive belt of 48 V ancillary components
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475442 83302475444
SI-Number	01 19 19 (668)

0 495 102 (11 4 470) Tool



Common Used in step 21

Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Overview Technical Data

cardiagn.com

Height of the sealing bead	Used in step 21
	2,0 mm ... 2,5 mm

Processing time of liquid sealing compound	Used in step 21
	< 12 min

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	136

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	1030

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235

carclan.com

61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 20 900 Disconnecting and connecting battery earth lead	235
61 35 ... Notes on ESD protection (Electro Static Discharge)	1011131417
61 35 ... Notes on ESD protection (Electro Static Discharge)	101113141723
61 00 730 Encode/program control unit(s) (after vehicle test)	30
17 00 008 Draining and topping up coolant for high-temperature circuit	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 008 Draining and topping up coolant for high-temperature circuit	37
17 00 008 Draining and topping up coolant for high-temperature circuit	37
17 00 008 Draining and topping up coolant for high-temperature circuit	37
17 00 008 Draining and topping up coolant for high-temperature circuit	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37

cardiagn.com

17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	37
17 00 039 Bleeding cooling system (B37, B47)	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	37
17 00 008 Draining and topping up the high-temperature coolant circuit	37
17 00 008 Draining and topping up the high-temperature coolant circuit	37
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	37
17 00 008 Draining and topping up the high-temperature coolant circuit	37
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	37
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	37
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	37
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 008 Draining and topping up coolant for high-temperature circuit	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	37

cardiagn.com

17 00 008 Draining and topping up coolant for high-temperature circuit 37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 37
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 37

cardiagn.com

11 51 030 Removing and installing/replacing component carrier

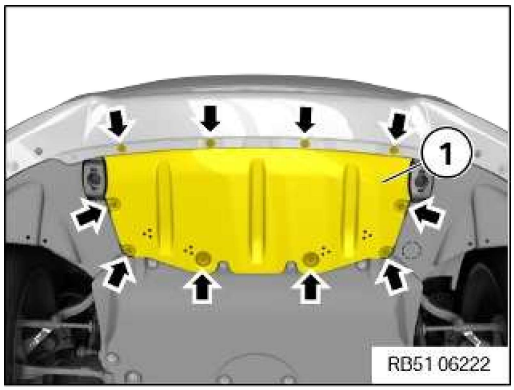
PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

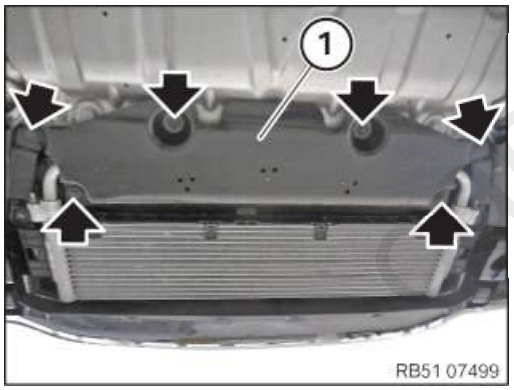
2 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

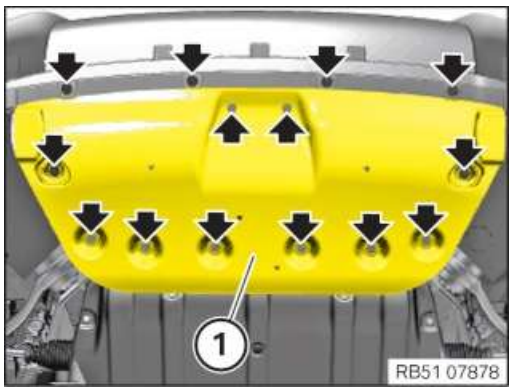
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

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

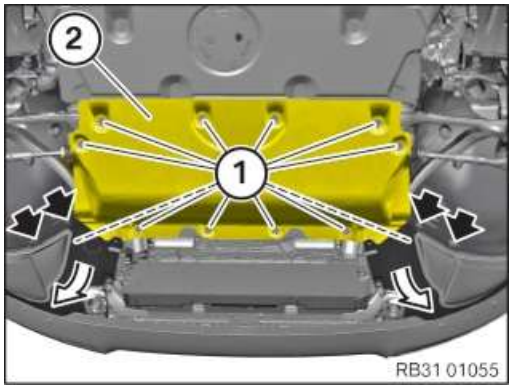


- **Version C:**

  Remove screws (arrows).

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

3 – Remove the underbody protection of the steering gear



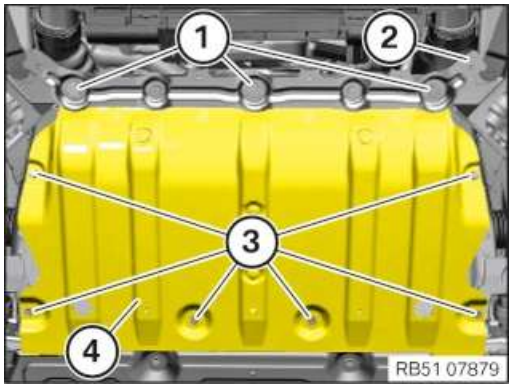
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

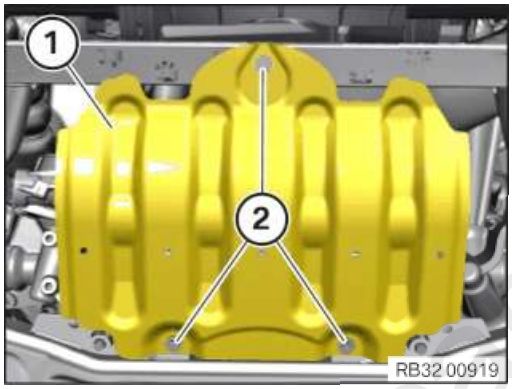
  Loosen screws (3).

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

4 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

5 – 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.

cardiagn.com



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

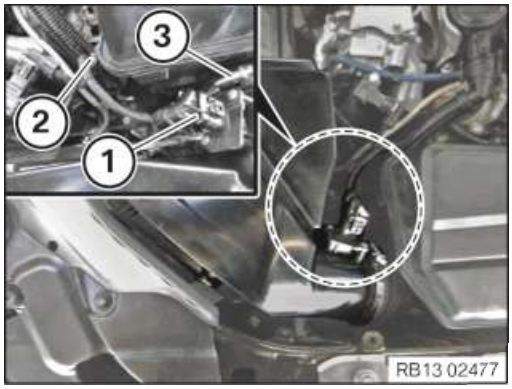
6 – Removing the clean air pipe with the resonator

WARNING

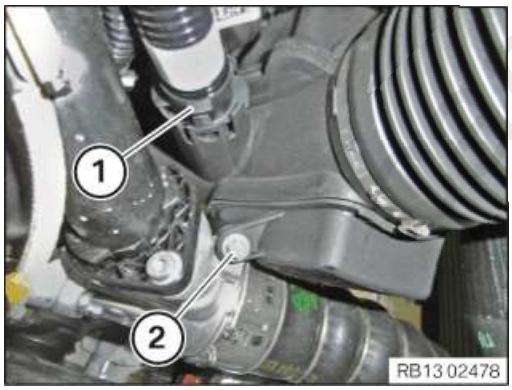
Hot surfaces.

Risk of burning!

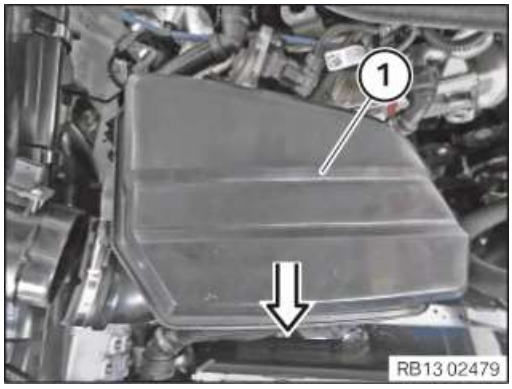
- Perform all work only on components that have cooled down.



- 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.

rdiagn.com



- Unlock and loosen clamp (1).



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

7 – Draining coolant

WARNING

Hot fluids.

Risk of scalding!

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

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

Life-long fill of coolant!

Do not reuse used coolant.

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

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

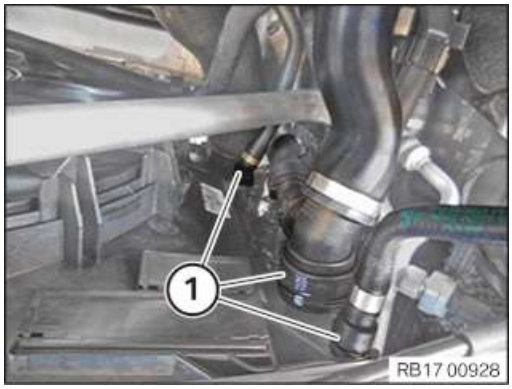
cardiagn.com

TECHNICAL INFORMATION

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



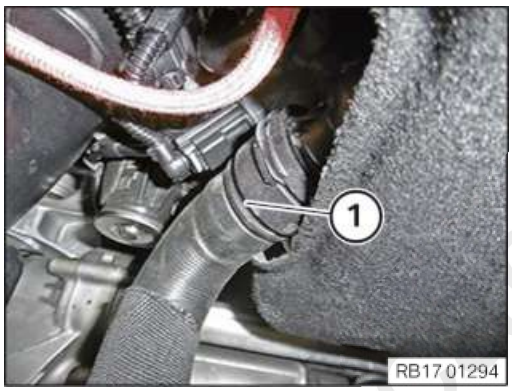
- Loosen sealing cap (1) from the coolant expansion tank.



NOTICE

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

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

8 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

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

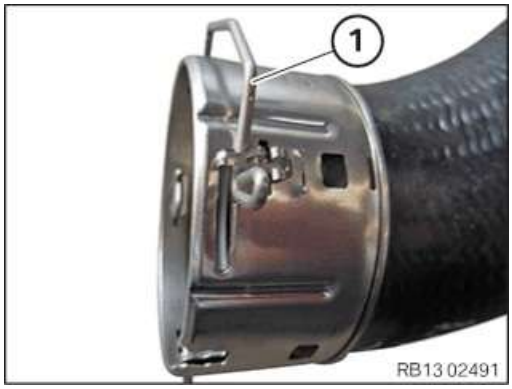
obdiag.com

RISK OF DAMAGE

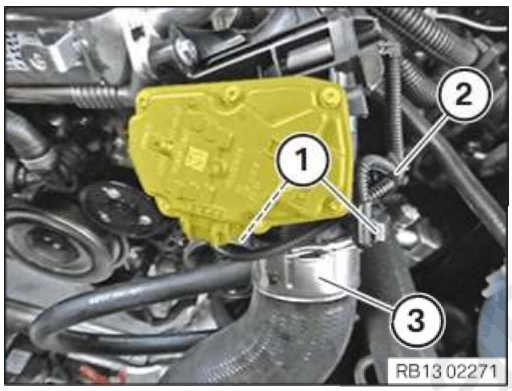
Electrostatic discharge.

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 clamp (1) and engage in this position.

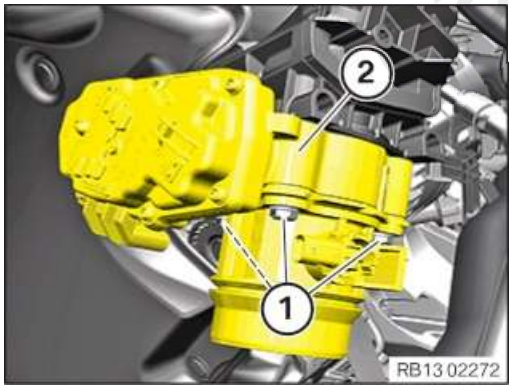


- Unlock and disconnect plug connections (1).

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).

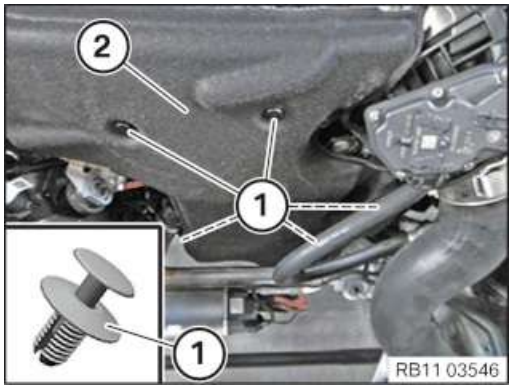
9 – Remove acoustic cover of the front engine

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.

10 – Removing the drive belt for alternator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

Component with preload.

Danger of injury!

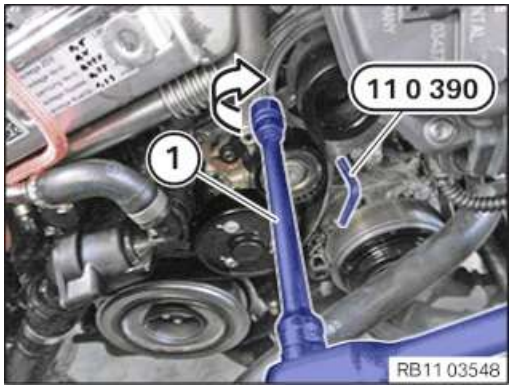
- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

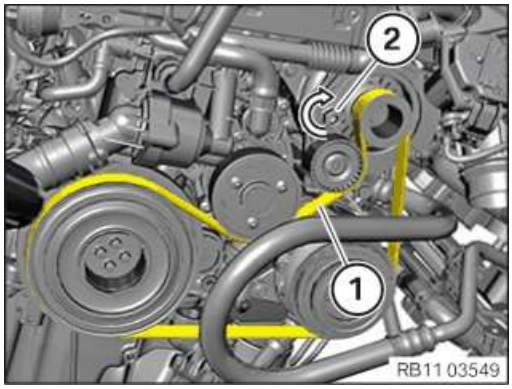
TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.



- If reusing the drive belt for alternator: Mark the direction of rotation.
- Relax the belt tensioner in the direction of the arrow using a standard tool (1).
- Fix the belt tensioner with the special tool 0 496 268 (11 0 390).

cardiagn.com



- Relieve belt tensioner at hexagon head (2) in direction of arrow up to limit position.
- Guide out and remove drive belt for alternator (1).

11 – Removing the alternator

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 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.

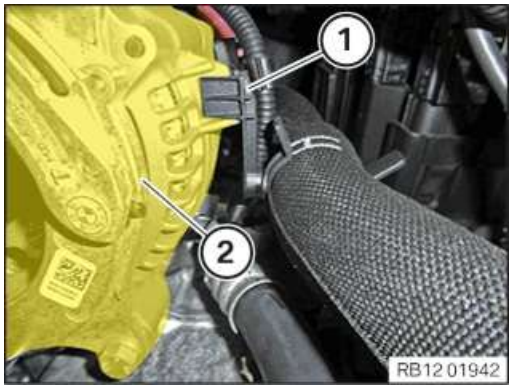
RISK OF DAMAGE

Electrostatic discharge.

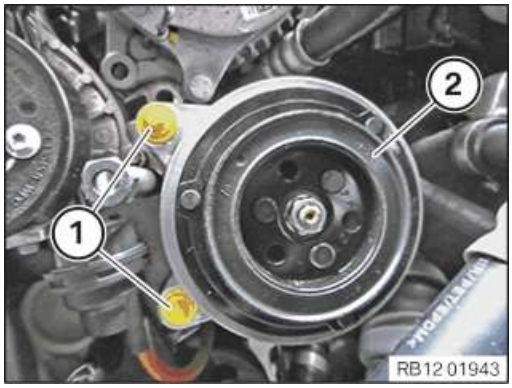
Damage to or destruction of electrical components.

- 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)

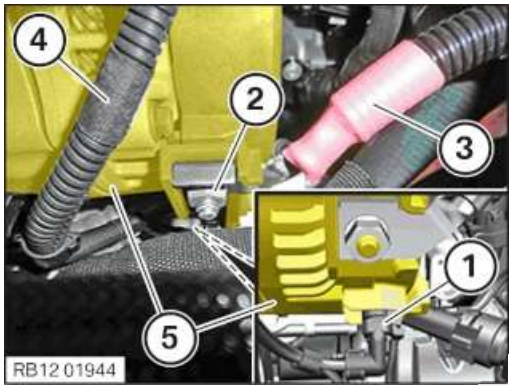
cardiagn.com



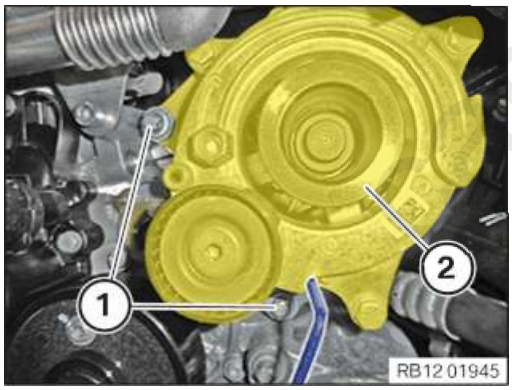
- Release the bracket (1) from the alternator (2).



- Loosen screws (1).
- Slide the air conditioning compressor (2) out and set it aside.

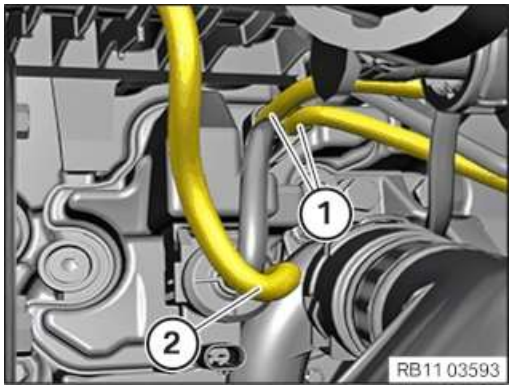


- Unlock the plug connection (1) and disconnect it from the alternator (5).
- Release the nut (2) on the alternator (5).
- Feed out positive battery cable (3) and put to one side.
- Remove the wiring harness section (4) and put to one side.



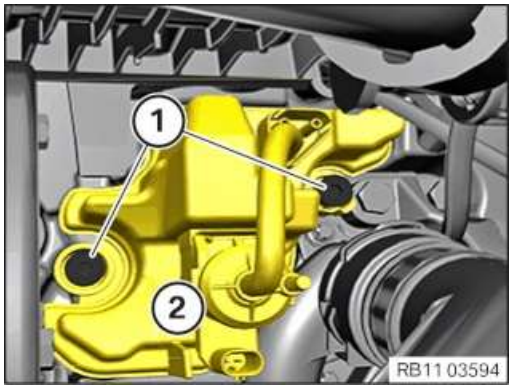
- Loosen screws (1).
- Guide out alternator (2) and remove.

12 – Remove vacuum reservoir



- Pull off vacuum hose (1) from the vacuum reservoir.
- Pull off the vacuum hose (2) from the electric changeover valve.

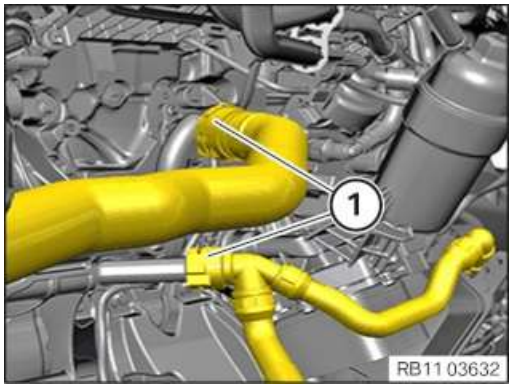
rdiagn.com



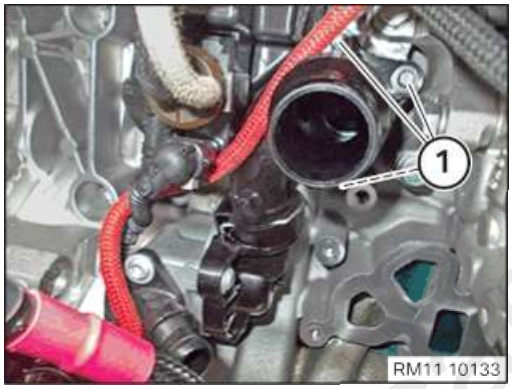
- Loosen screws (1).
- Feed out and remove the vacuum reservoir (2).

MAIN WORK

13 – Removing the component carrier



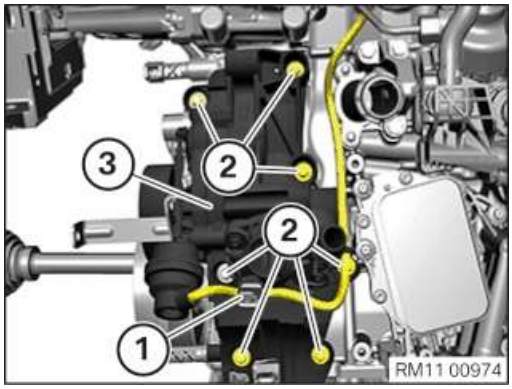
- Unlock and pull off the coolant hoses (1).



- Loosen screws (1).

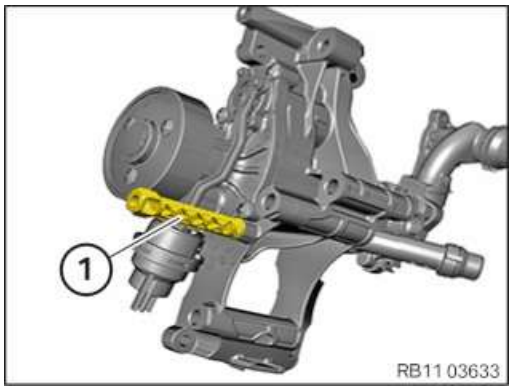


- Loosen the screw (1) below the exhaust-gas recirculation cooler.



- Disconnect the vacuum line (1) from the vacuum unit and detach it from the clamp on the component carrier.
- Loosen screws (2).
- Lift off and remove the component carrier (3) from the crankcase.

14 – When replacing the component carrier: Remounting spacer screw



- Renew the component carrier.

  Parts: Component carrier
- Remount spacer screw (1).

Spacer bolt for mounting the acoustic cover

M8x12		Tightening torque	12 Nm

15 – Installing the component carrier



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.

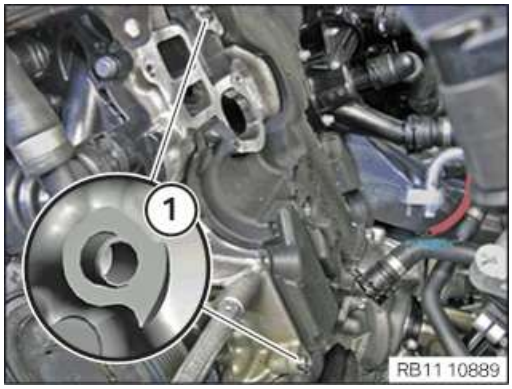
- Clean the sealing surface using special tool 0 495 102 (11 4 470).



- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).

Check

carflag.com



- Check the fitting sleeves (1) for damage.

desired state

- The fitting sleeves (1) must not be scratched or deformed.

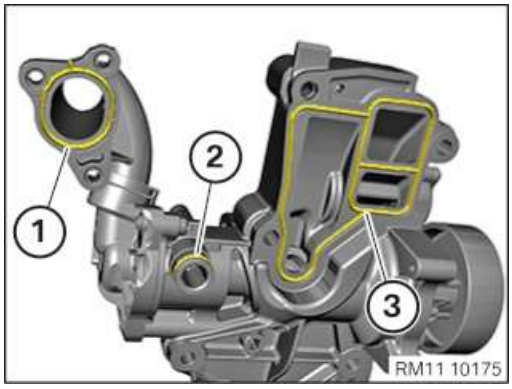
Result

» The fitting sleeves (1) are damaged.

Measure

- Renew fitting sleeves.

  Parts: Fitting sleeves



- Renew the seal (1).

  Parts: Gasket

- Renew O-ring (2).

  Parts: O-ring

- Check the sealing bead (3) for damage.
- Check the height of the sealing bead in reference to the surface.

Height of the sealing bead

	2,0 mm ... 2,5 mm

- If necessary, reapply the sealing bead.

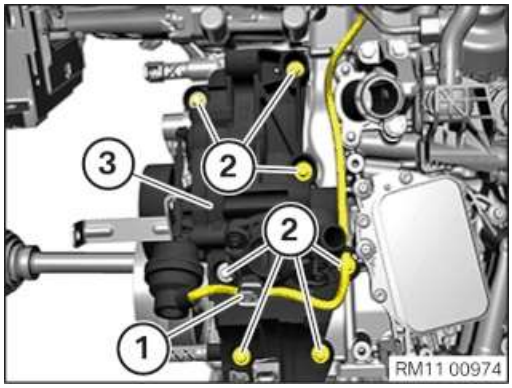
Sealing compound

Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

	< 12 min



- Renew screws (2).

  Parts: Screws

- Position the component carrier (3) on the crankcase.
- Tighten the screws (2).

Component carrier to crankcase

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

- Connect the vacuum line (1) on the vacuum unit and attach it in the clamp on the component carrier.

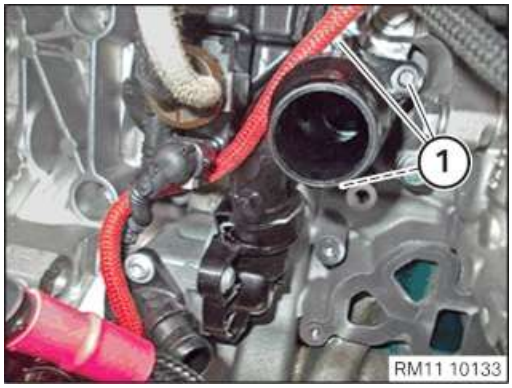
cardiagn.com



- Tighten the screw (1) below the exhaust-gas recirculation cooler.

Exhaust-gas recirculation cooler to cylinder head

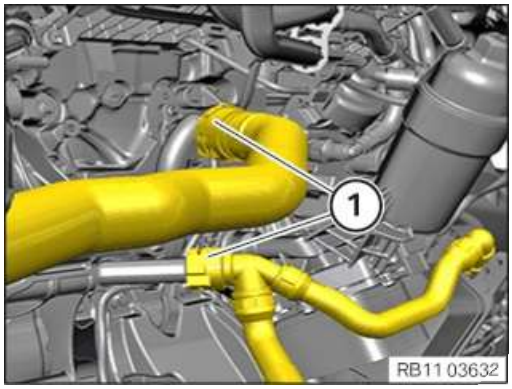
M8x20 / M8x28		Tightening torque	19 Nm



- Tighten the screws (1).

Connecting branch to engine block

M6x25		Tightening torque	8 Nm



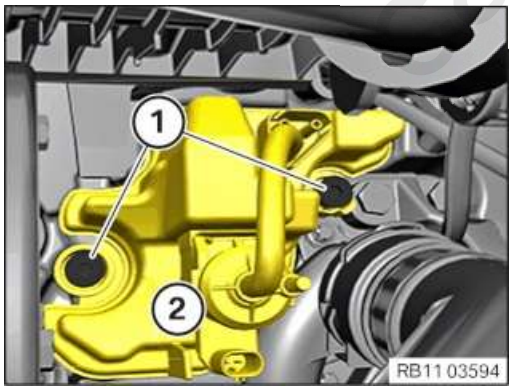
TECHNICAL INFORMATION

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

- Connect coolant hoses (1) and lock audibly.

POSTPROCESSES

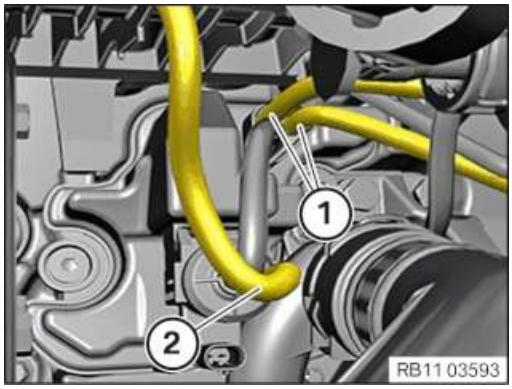
16 – Install vacuum reservoir



- Insert and install the vacuum reservoir (2).
- Tighten the screws (1).

Vacuum reservoir to crankcase

M6X25		Tightening torque	8 Nm



- Connect vacuum hoses (1) to the vacuum reservoir.
- Connect vacuum hose (2) to the electric changeover valve.

17 – Installing the alternator

CAUTION

Improper routing of the positive battery cable.

Risk of short circuits!

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

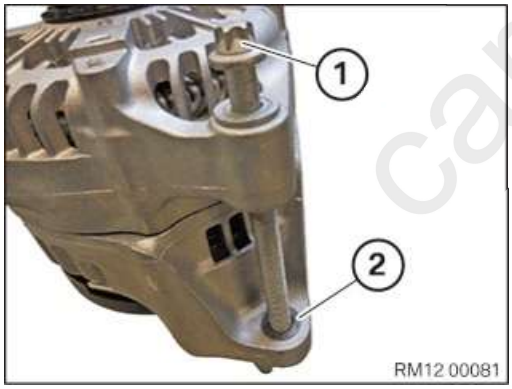
RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

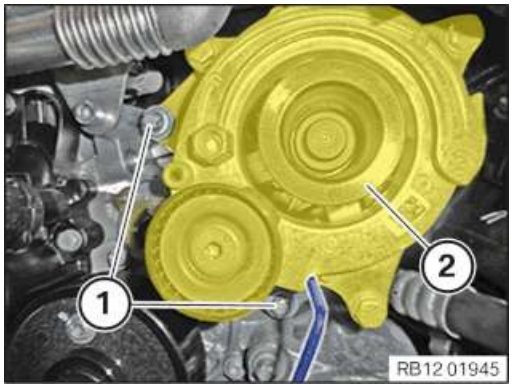
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

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

▸ **Prepare for the installation of the alternator**



- Screw the screw (1) into the threaded support sleeve (2).
- Slightly press back the threaded support sleeve (2) using the bolt (1).
- Once again unscrew the screw (1) from the threaded support sleeve (2).

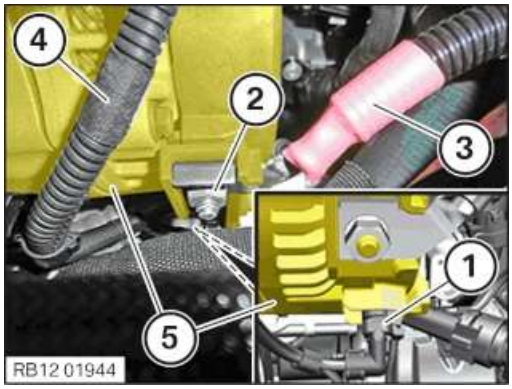


- Insert and install the alternator (2).
- Tighten the screws (1).

Alternator to component carrier

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

cardiagn.com



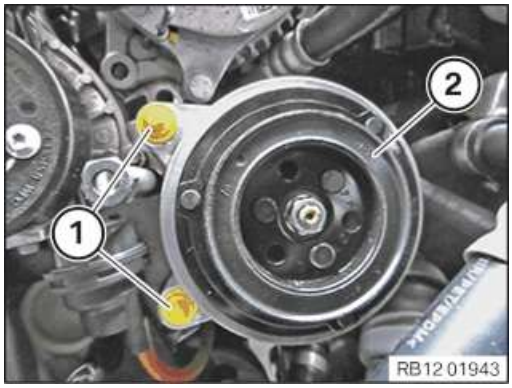
- Guide in the wiring harness section (4) and install.
- Insert and install the positive battery cable (3).
- Tighten the nut (2) on the alternator (5).

Positive battery cable to the alternator

M8		Tightening torque	19 Nm

- Connect the plug (1) with the alternator (5) and lock.

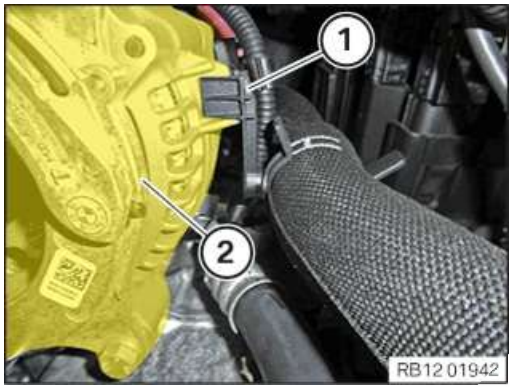
  The connector (1) must engage audibly.



- Insert and install the air conditioning compressor (2).
- Tighten the screws (1).

Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm



- Secure holder (1) to alternator (2).

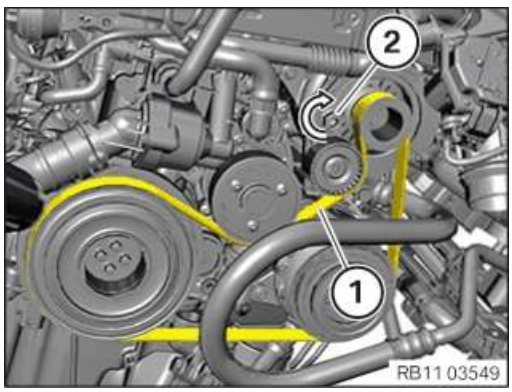
18 – Installing the drive belt for alternator

TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

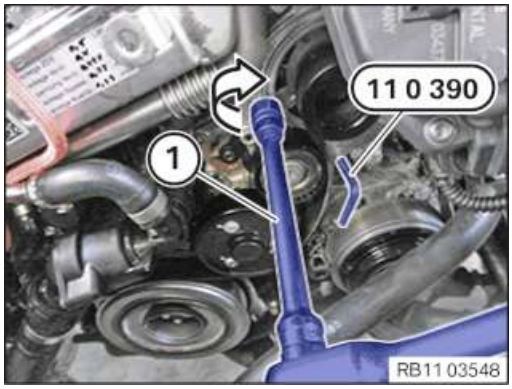
TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.



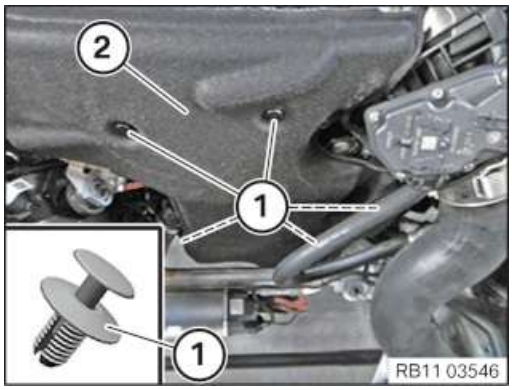
- Check drive belt for alternator (1) for coolant and oil residues and, if necessary, renew it.
- Relieve belt tensioner at hexagon head (2) up to limit position in direction of arrow.
- Install drive belt for alternator (1).

cardiagn.com



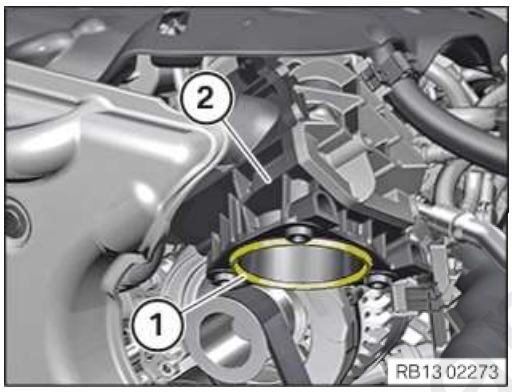
- Increase the preload of the belt tensioner using conventional tool (1) in the direction of arrow until the special tool 0 496 268 (11 0 390) can be removed.
- Remove special tool 0 496 268 (11 0 390).
- Stretch the drive belt for the alternator.

19 – Install acoustic cover for the engine, front



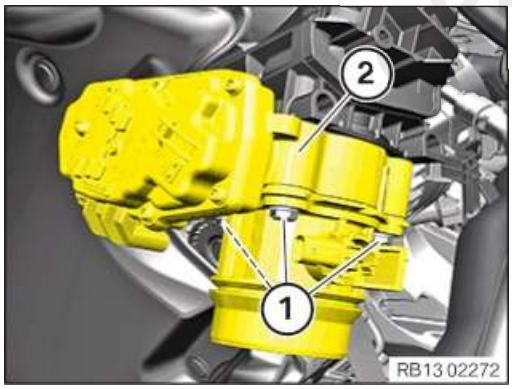
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

20 – 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



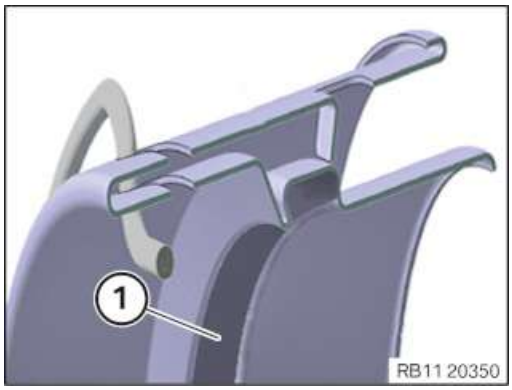
- Check the seal (1) for damage, renew if necessary.

mydiagn.com

▸ **Replacing damaged seal**

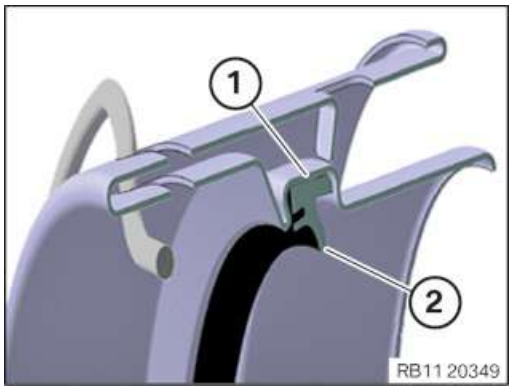
TECHNICAL INFORMATION

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.



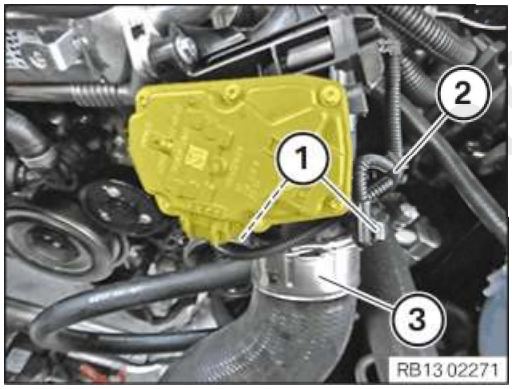
- Renew gasket.

  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.

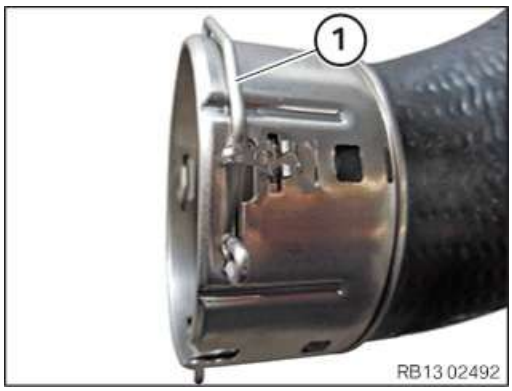
  The pressure pipe (3) must engage audibly.

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.

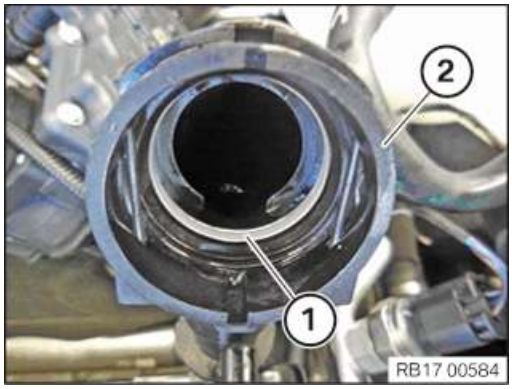
  The connectors (1) must engage audibly.



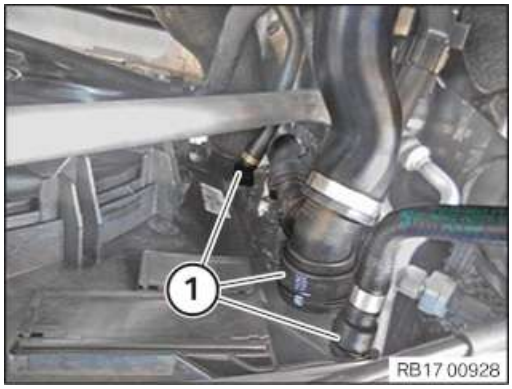
- Lock clamp (1).

TECHNICAL INFORMATION

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



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

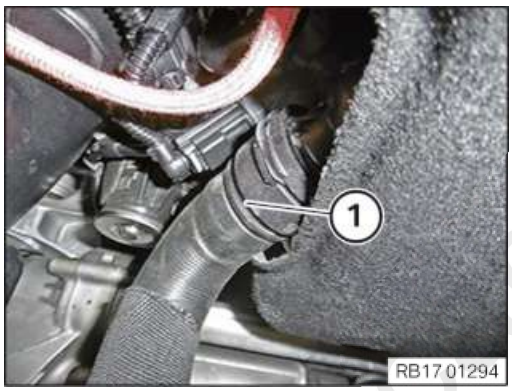


NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



- Connect and lock coolant line (1).

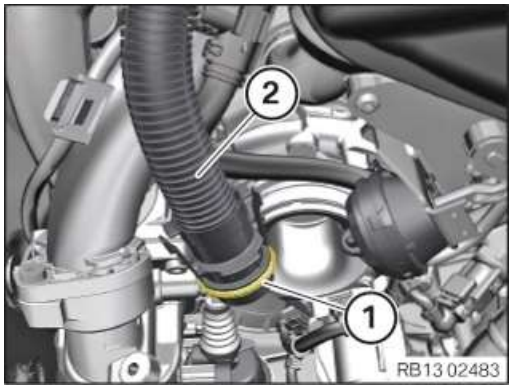
  The coolant line (1) must audibly engage.

22 – Installing the clean air pipe with resonator



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

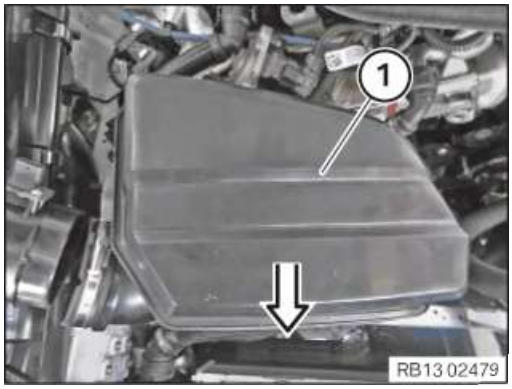
obdiag.com



- 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.

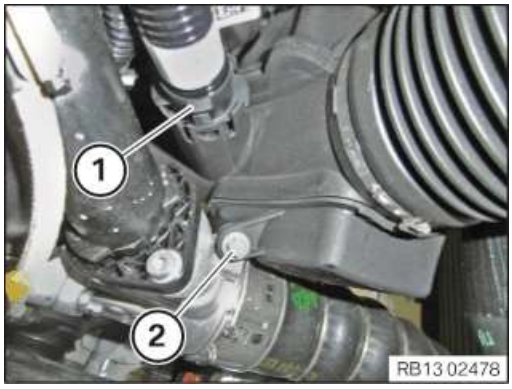


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

  The clamp (1) must engage audibly.

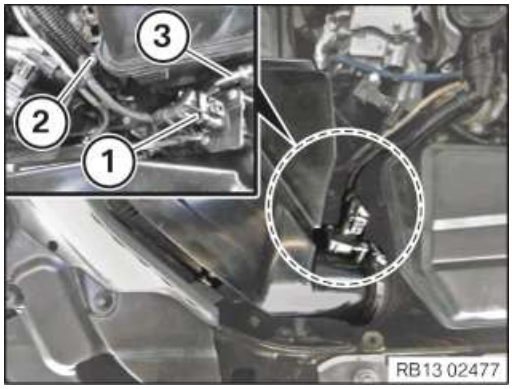


- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm

rdiagn.com



- 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.

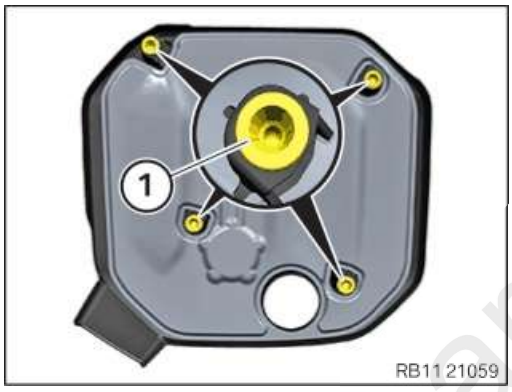
23 – Install acoustic cover

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.

24 – Connecting all battery earth leads

ardiagn.com



- See additional information.

25 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

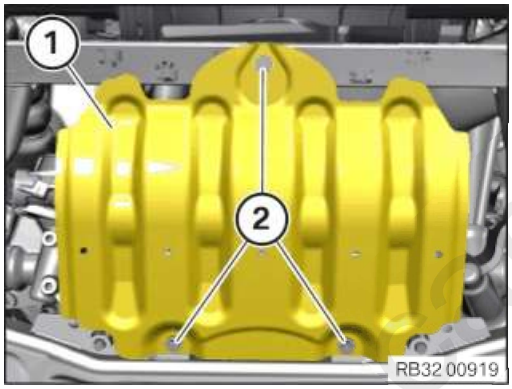
It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

26 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

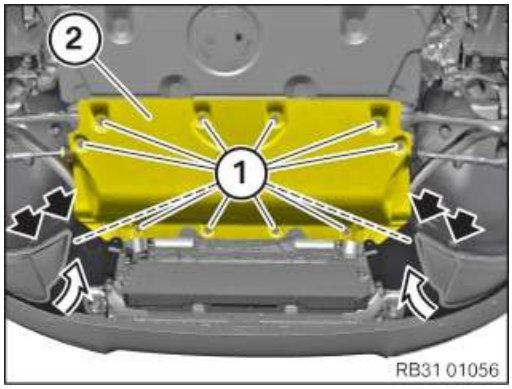
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

27 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

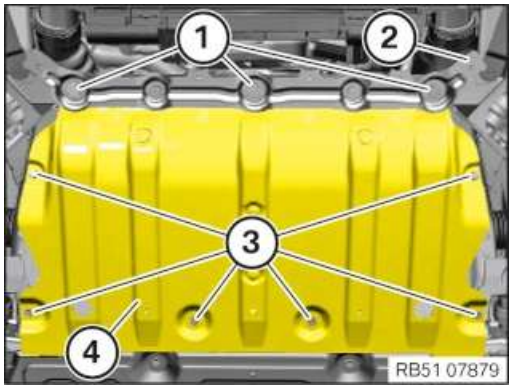
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

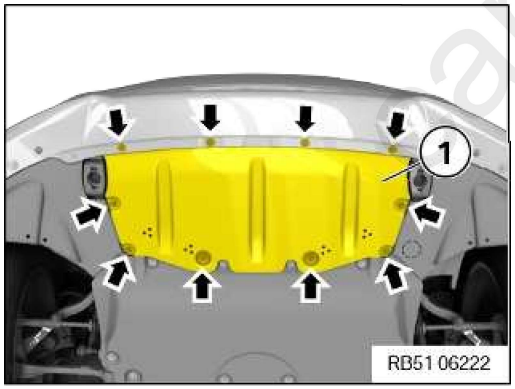
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

28 – Installing the front underbody protection



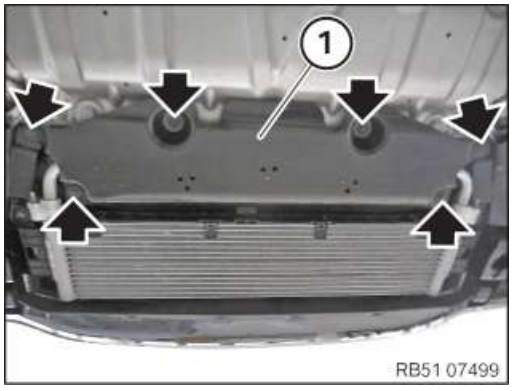
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version B:**

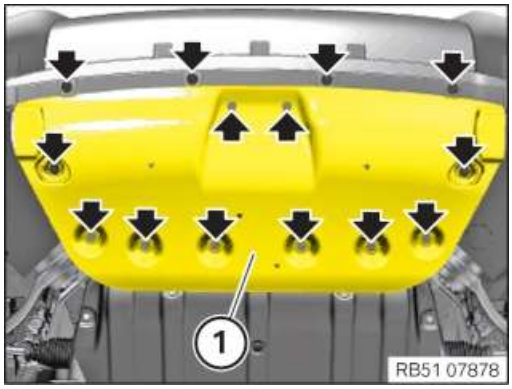
  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

cardiagn.com



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Spacer bolt for mounting the acoustic cover — Used in step 14

M8x12		Tightening torque	12 Nm

Component carrier to crankcase — Used in step 15

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

Exhaust-gas recirculation cooler to cylinder head — Used in step 15

M8x20 / M8x28		Tightening torque	19 Nm

Connecting branch to engine block — Used in step 15

M6x25		Tightening torque	8 Nm

Vacuum reservoir to crankcase — Used in step 16

M6X25		Tightening torque	8 Nm

Alternator to component carrier — Used in step 17

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

Positive battery cable to the alternator — Used in step 17

M8		Tightening torque	19 Nm

Air conditioning compressor in component carrier — Used in step 17

M10		Tightening torque	38 Nm

Throttle body to intake plenum — Used in step 20

6x50		Tightening torque	8 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

cardiagn.com

Underbody protection, steering, to front axle support — Used in step 26

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support — Used in step 26

Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear — Used in step 27

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front — Used in step 27

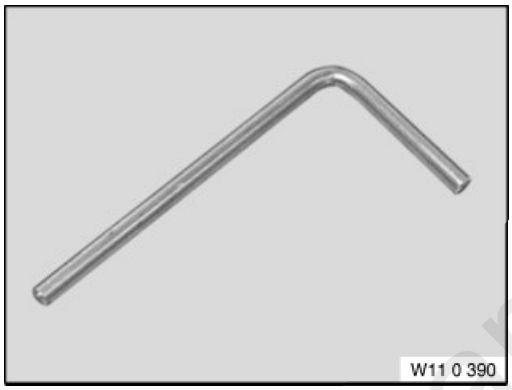
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Underbody protection front — Used in step 28

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

Overview of Special Tools

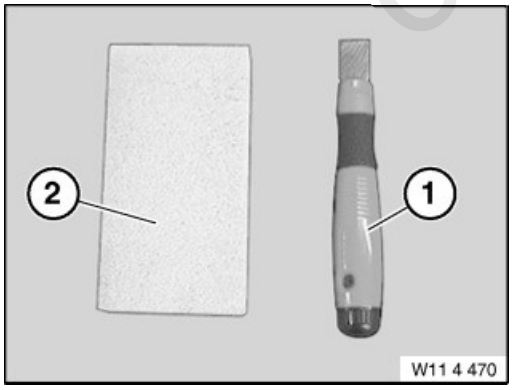
0 496 268 (11 0 390) Pin



Common — Used in step 1018

Usage	(roll pin) For securing new tensioning pulley (poly-V belt)
Included in the tool or work	
Storage location	B24
Replaced by	
In connection with	
SI-Number	01 15 07 (390)

0 495 102 (11 4 470) Tool



Common — Used in step 15

Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

carmagn.com

Overview Technical Data

Height of the sealing bead	Used in step 15
	2,0 mm ... 2,5 mm

Processing time of liquid sealing compound	Used in step 15
	< 12 min

Links

General repair instructions	Used in step

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124

cardiagn.com

61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 20 900 Disconnecting and connecting battery earth lead	124
61 35 ... Notes on ESD protection (Electro Static Discharge)	811
61 35 ... Notes on ESD protection (Electro Static Discharge)	81117
17 00 008 Draining and topping up coolant for high-temperature circuit	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 008 Draining and topping up coolant for high-temperature circuit	25
17 00 008 Draining and topping up coolant for high-temperature circuit	25
17 00 008 Draining and topping up coolant for high-temperature circuit	25
17 00 008 Draining and topping up coolant for high-temperature circuit	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25

cardiagn.com

17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	25
17 00 039 Bleeding cooling system (B37, B47)	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	25
17 00 008 Draining and topping up the high-temperature coolant circuit	25
17 00 008 Draining and topping up the high-temperature coolant circuit	25
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	25
17 00 008 Draining and topping up the high-temperature coolant circuit	25
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	25
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	25
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	25
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 008 Draining and topping up coolant for high-temperature circuit	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25
17 00 008 Draining and topping up coolant for high-temperature circuit	25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	25

carjagn.com

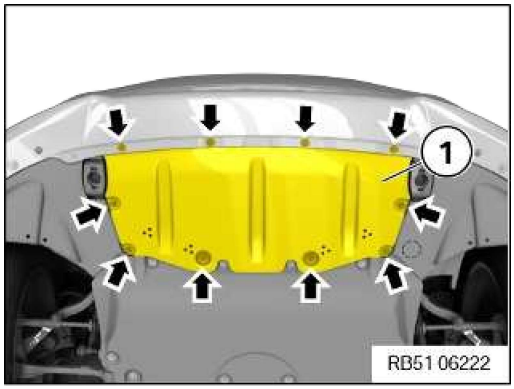
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 25
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 25

cardiagn.com

11 51 000 Removing and installing/replacing the coolant pump

PRELIMINARY WORK

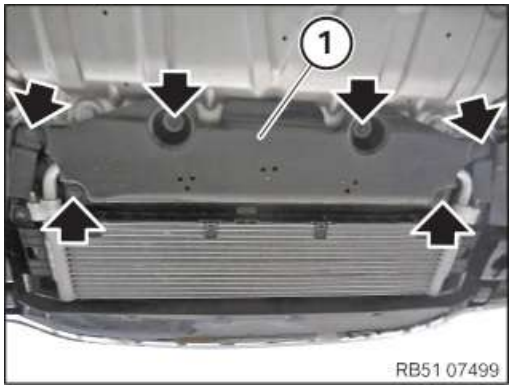
1 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

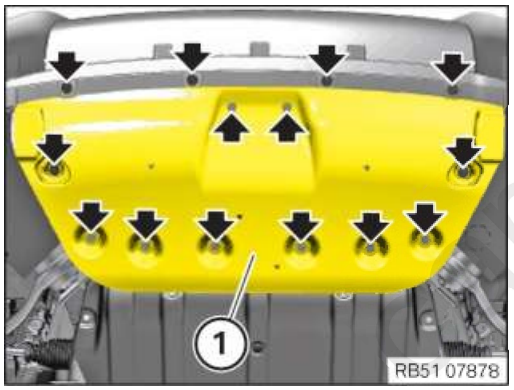
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

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

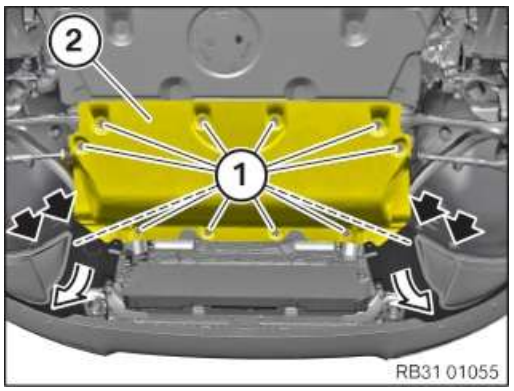


- **Version C:**

  Remove screws (arrows).

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

2 – Remove the underbody protection of the steering gear



- **Version A:**

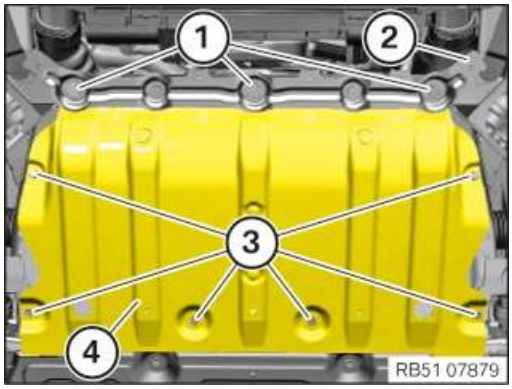
  Unscrew the screws (arrows) of the wheel arch cover on the wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.

mdiagn.com



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

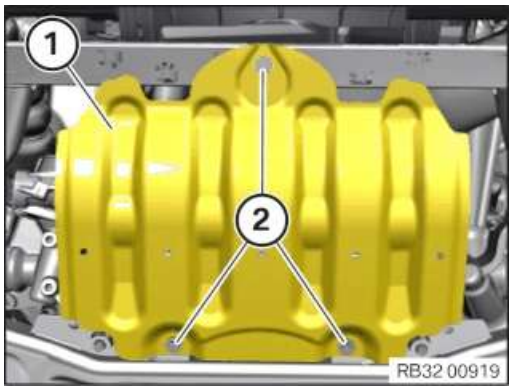
  Loosen screws (3).

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

3 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

4 – 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.

5 – Removing the clean air pipe with the resonator

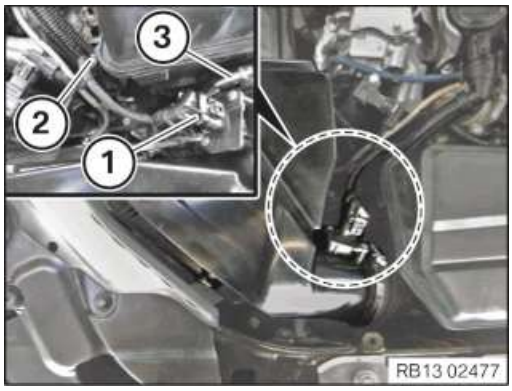
cardiagn.com

WARNING

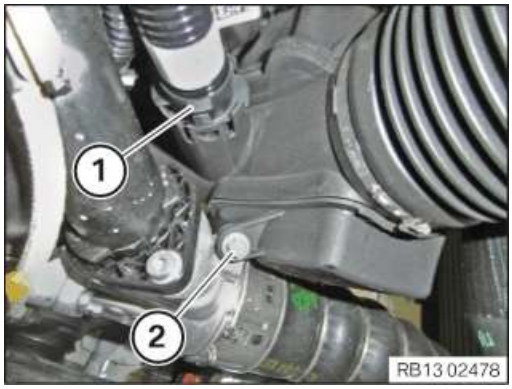
Hot surfaces.

Risk of burning!

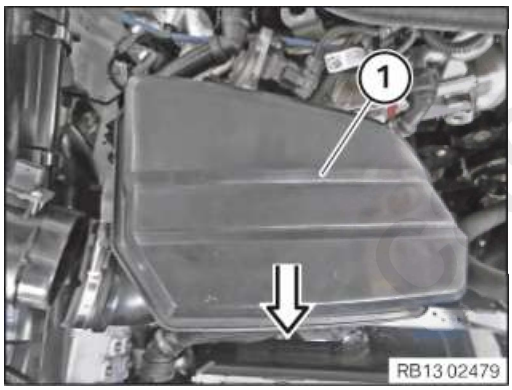
- Perform all work only on components that have cooled down.



- 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).

carldiagn.com



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

6 – Draining the coolant from the high-temperature cooling system

WARNING

Hot fluids.

Risk of scalding!

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

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

Life-long fill of coolant!

Do not reuse used coolant.

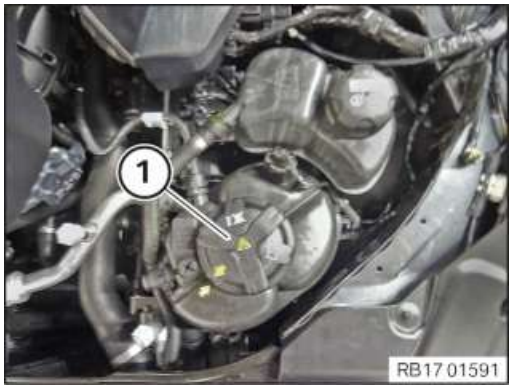
When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

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

TECHNICAL INFORMATION

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

cardiagn.com



- Loosen sealing cap (1).

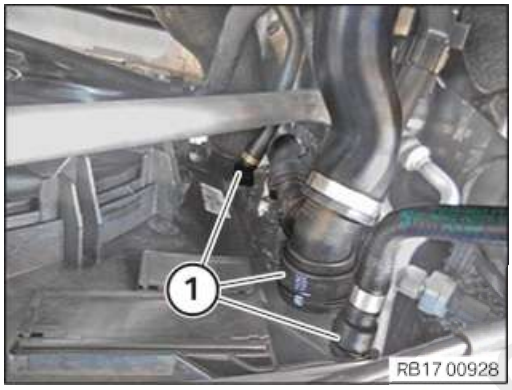
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



NOTICE

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

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

7 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

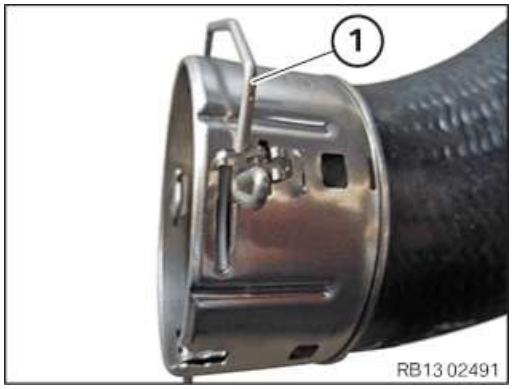
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

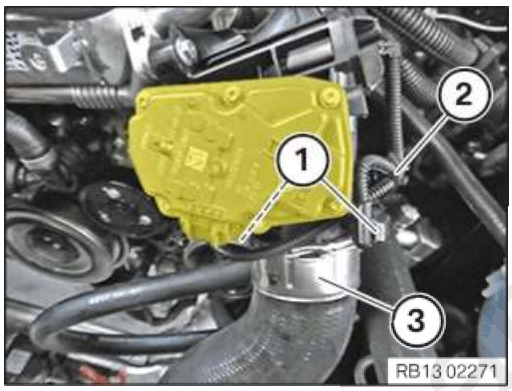
Electrostatic discharge.

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.

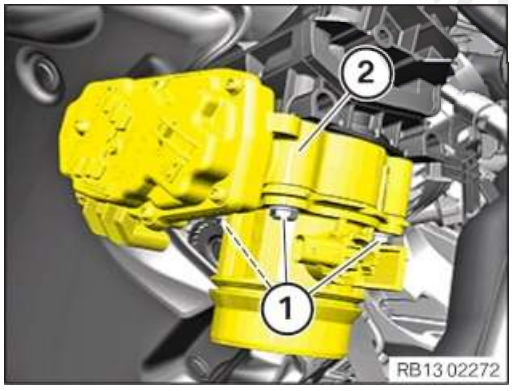


- Unlock and disconnect plug connections (1).

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).

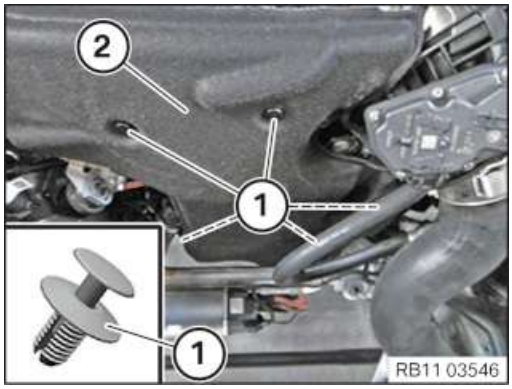
8 – Remove acoustic cover of the front engine

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.

9 – Removing the drive belt for the starter motor generator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

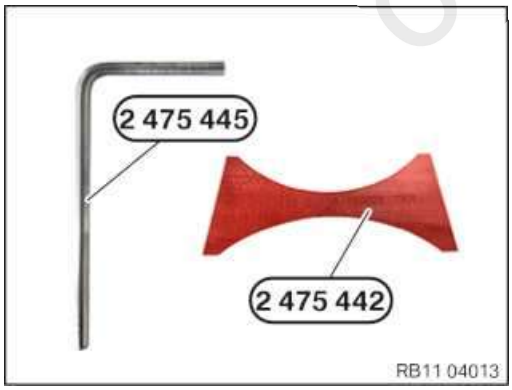
Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

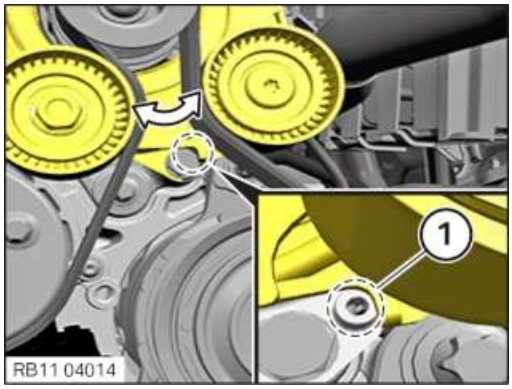
TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.

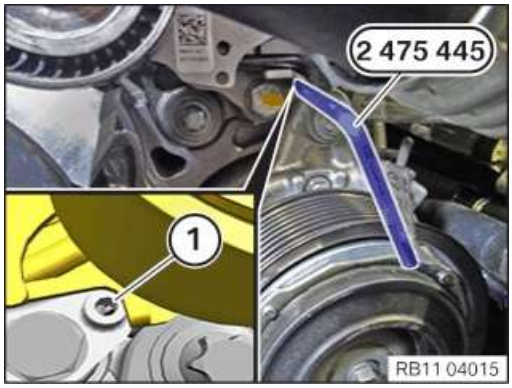


- Prepare the special tool 2 475 442 and the special tool 2 475 445.

cardiagn.com

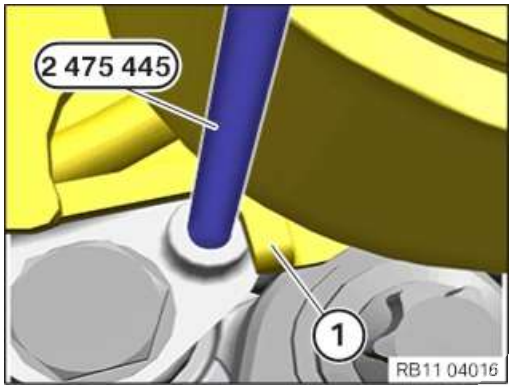


- Position the belt tensioner in the direction of the arrow so that the bore hole is visible in the area (1).

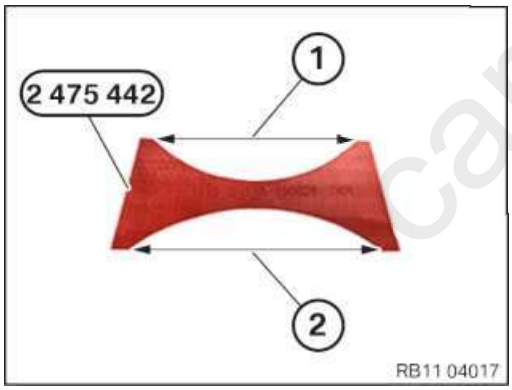


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

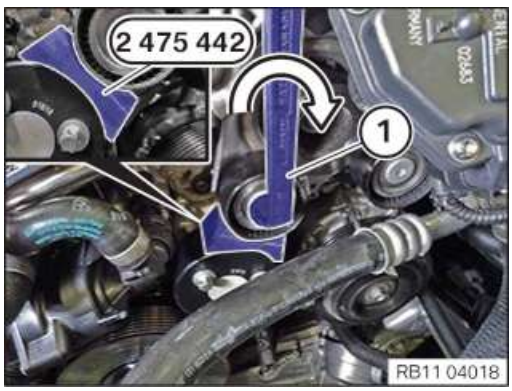
  The special tool 2 475 445 must rest against the starter motor generator.



- Ensure that the belt tensioner (1) is supported on the special tool 2 475 445.



- Ensure that the radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- Ensure that the radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.

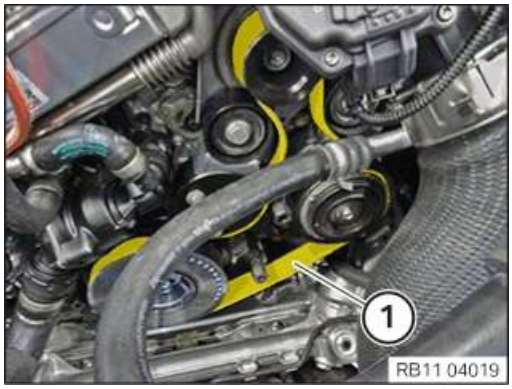


TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.

cardiagn.com



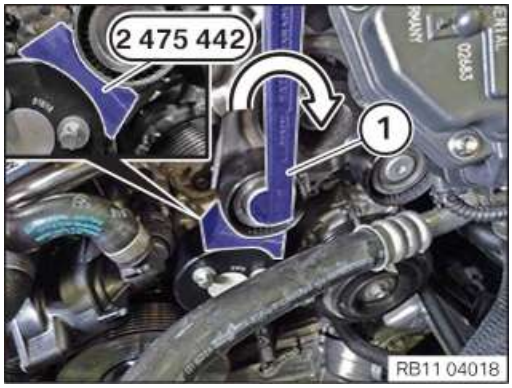
TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

- Guide out and remove the drive belt (1) for the starter motor generator.

MAIN WORK

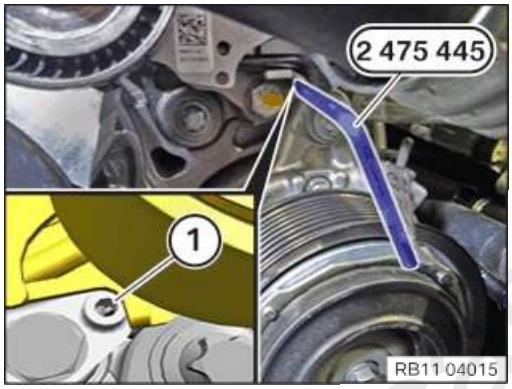
10 – Removing the coolant pump



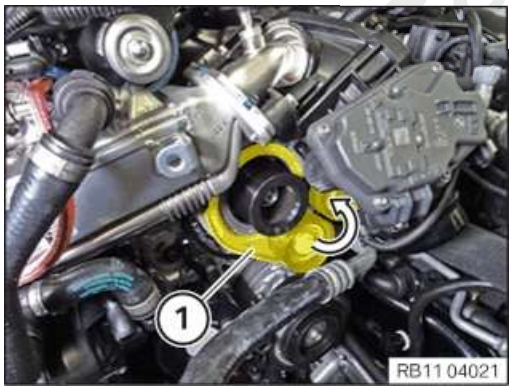
TECHNICAL INFORMATION

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

- Twist the tensioning pulley in (1) in direction of the arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.



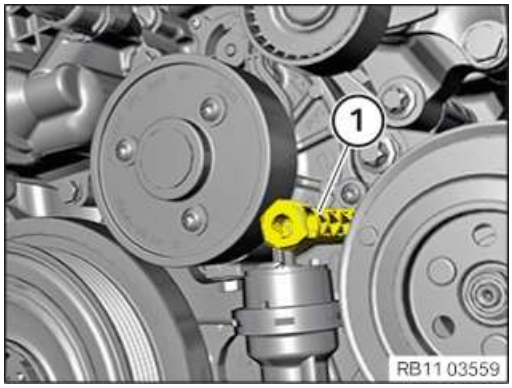
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.



- Turn the belt tensioner (1) in the direction of the arrow until all screws of the coolant pump are accessible.



- Release the vacuum hose (1).



- Release the spacer (1) to mount the acoustic cover.

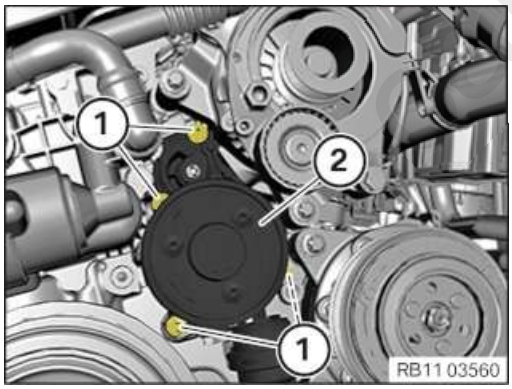
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



- Loosen screws (1).

TECHNICAL INFORMATION

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

- Remove coolant pump (2).

11 – Installing coolant pumps

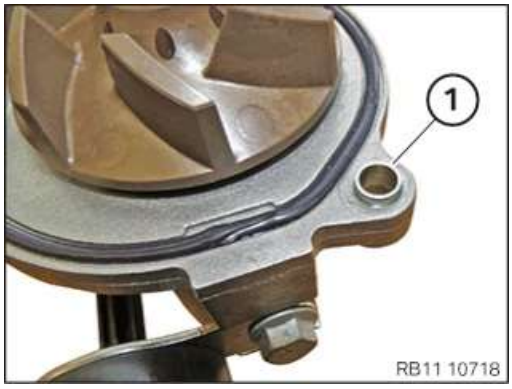


TECHNICAL INFORMATION

Do not use any metal-cutting tools. Otherwise, there is a risk of damage.

- Clean the sealing surface using special tool 0 495 102 (11 4 470).

Check



- Check the fitting sleeve (1) for damage.

desired state

- Fitting sleeve must not be scratched or deformed.

Result

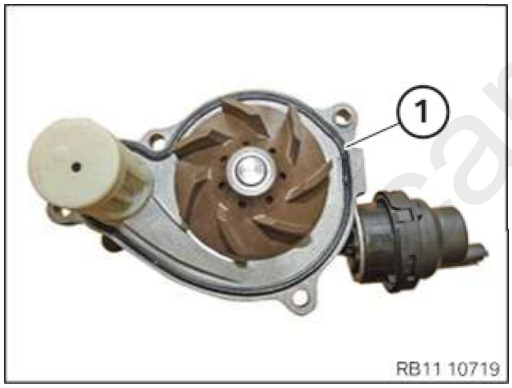
» Fitting sleeve is damaged.

Measure

- Completely renew the coolant pump.

  Parts: Coolant pump

Check



- Check the sealing bead for damage.
- Measure the height of the sealing bead in reference to the surface.

Height of the sealing bead

2,0 mm ... 2,5 mm

Result

» The sealing bead is damaged or the measured dimension deviates.

Measure

- Remove sealing bead.

11 00 ... Overview of consumables (Electronic Parts Catalogue)

cardiagn.com

- Renew the sealing bead.

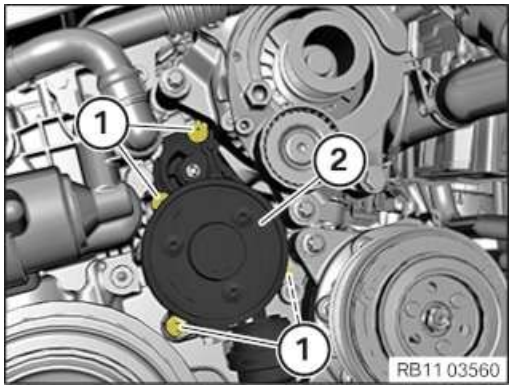
Sealing compound

Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

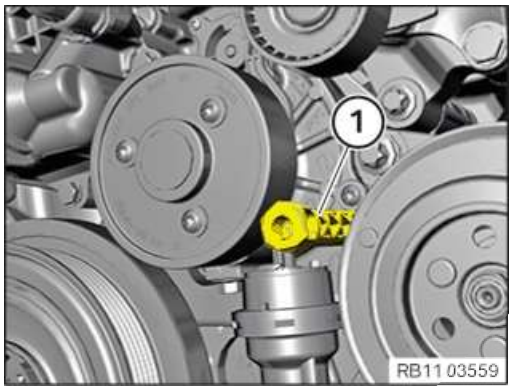
< 12 min



- Position coolant pump (2).
- Tighten the screws (1).

Coolant pump/wiring harness to component carrier

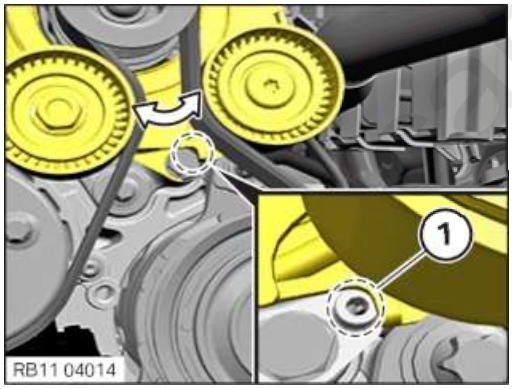
M6x20		Tighteningtorque	8 Nm



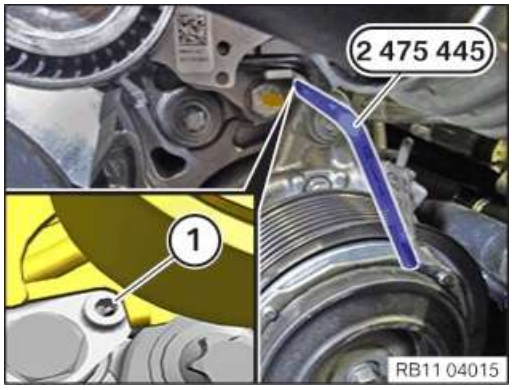
- Tighten the spacer screw (1) to mount the acoustic cover.

Spacer bolt for mounting the acoustic cover

M8x12		Tighteningtorque	12 Nm

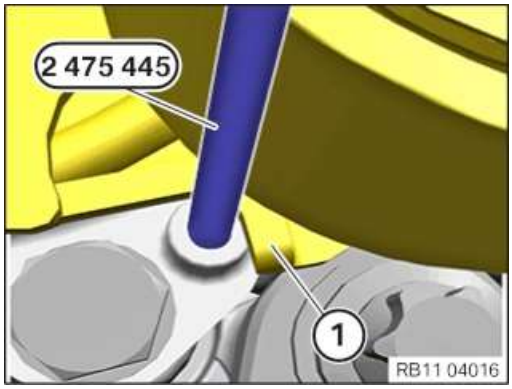


- Position the belt tensioner so that the bore hole is visible in the area (1).

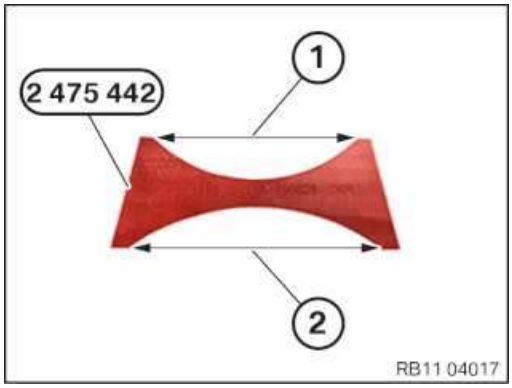


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

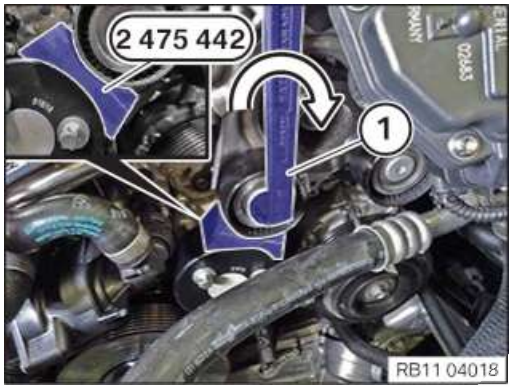
  The special tool 2 475 445 must rest against the starter motor generator.



- Ensure that the belt tensioner (1) is supported on the special tool 2 475 445.



- Ensure that the radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- Make sure that the radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.



TECHNICAL INFORMATION

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

- Twist the tensioning pulley in (1) in direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.

POSTPROCESSES

12 – Installing the drive belt for the starter motor generator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

Component with preload.

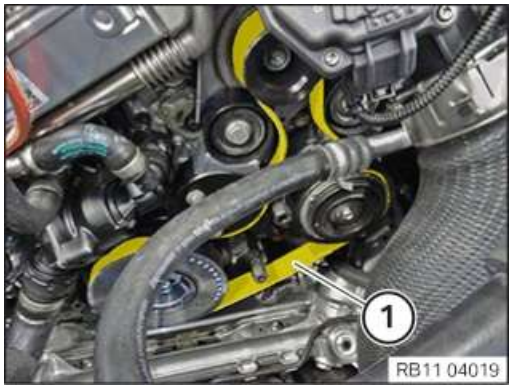
Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

cardiagn.com

TECHNICAL INFORMATION

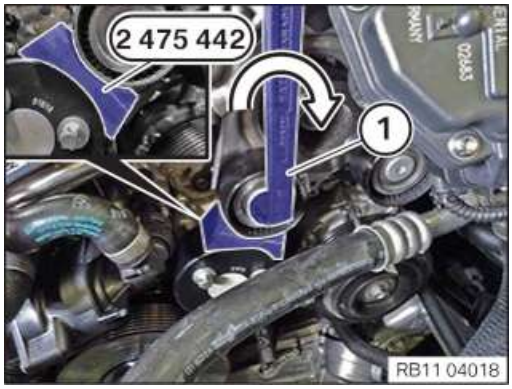
The drive belt must be replaced if contaminated with coolant- and oil residues.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

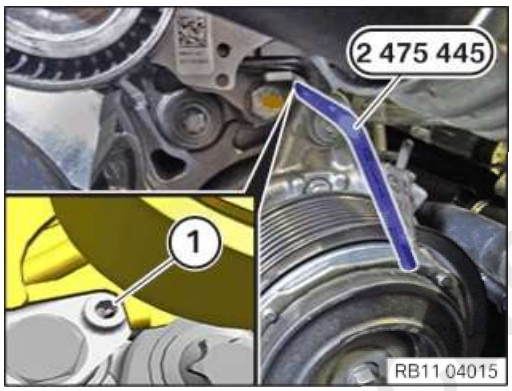
- Feed in and install the drive belt (1) for the starter motor generator.



TECHNICAL INFORMATION

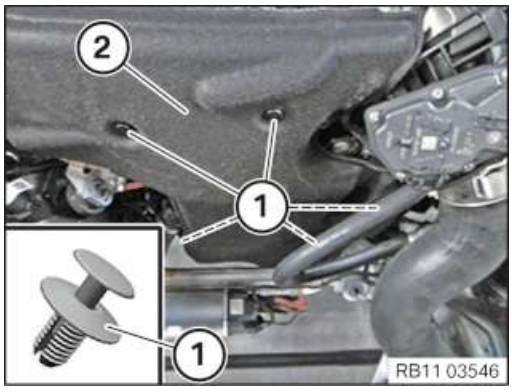
Conduct the following operation with the assistance of a second person.

- Turn the tensioning pulley in (1) in the direction of arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.



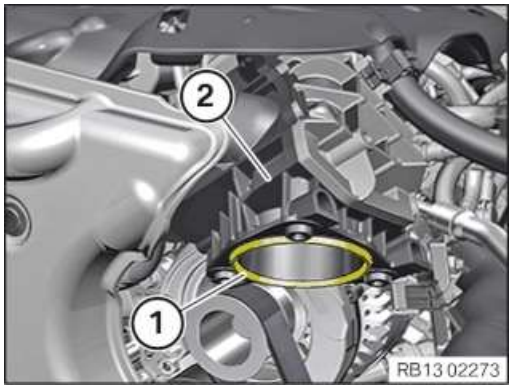
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.

13 – Install acoustic cover for the engine, front



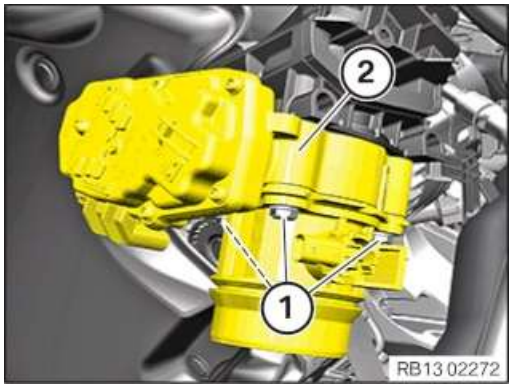
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

14 – 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

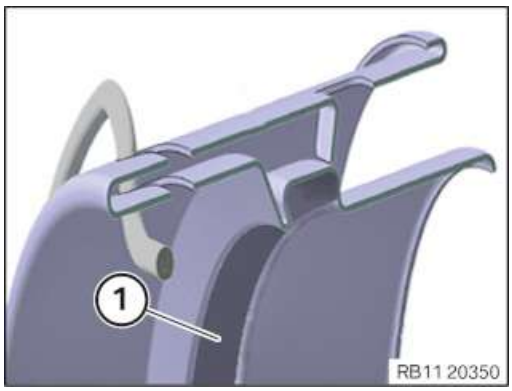


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

TECHNICAL INFORMATION

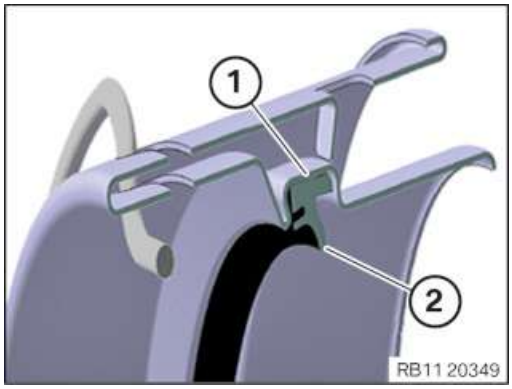
Do not use pointed or sharp-edged tools for the installation and/or removal.



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

  The gasket groove (1) must be clean.

cardiagn.com



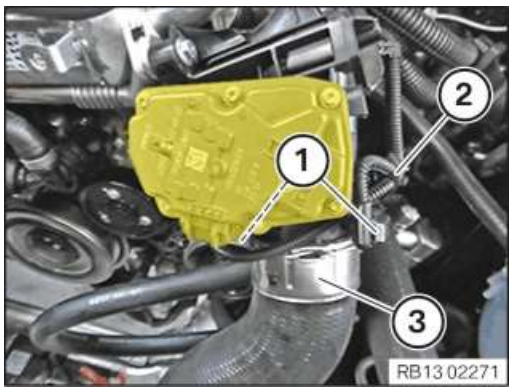
- Renew gasket.

  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.

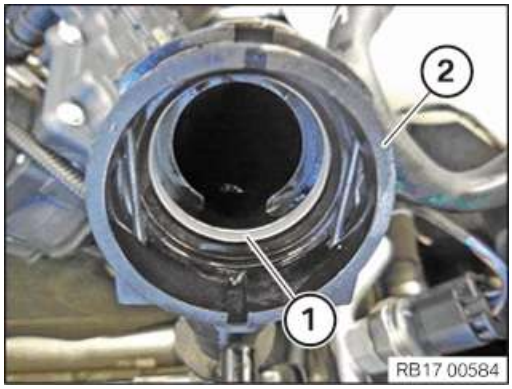


- Lock clamp (1).

15 – Connecting the coolant lines

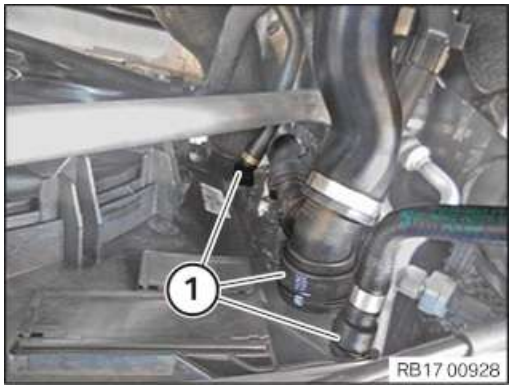
TECHNICAL INFORMATION

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



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

oldiagn.com

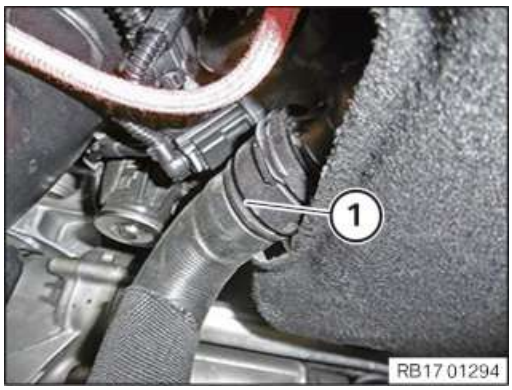


NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



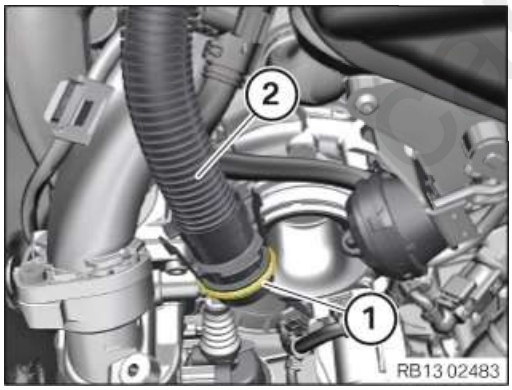
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

16 – Installing the clean air pipe with resonator



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

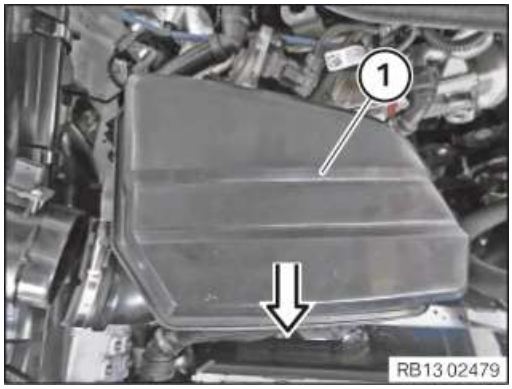


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

cardiagn.com

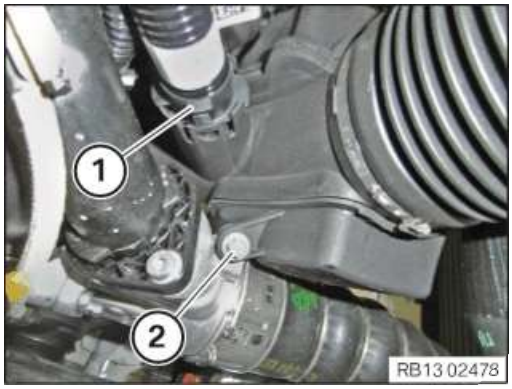


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

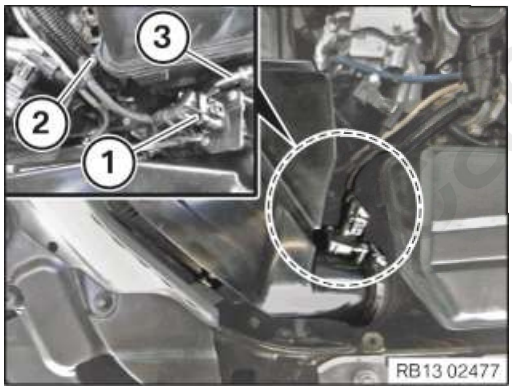
  The clamp (1) must engage audibly.



- 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.

17 – Install acoustic cover

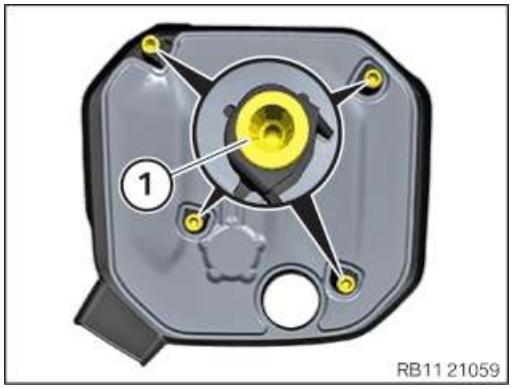
RISK OF DAMAGE

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.

cardiagn.com



- 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.

18 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

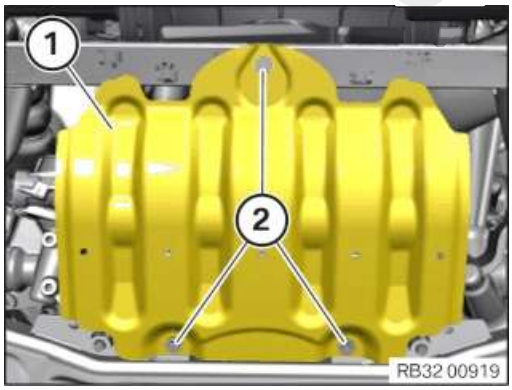
It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

19 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

Underbody protection, steering, to front axle support

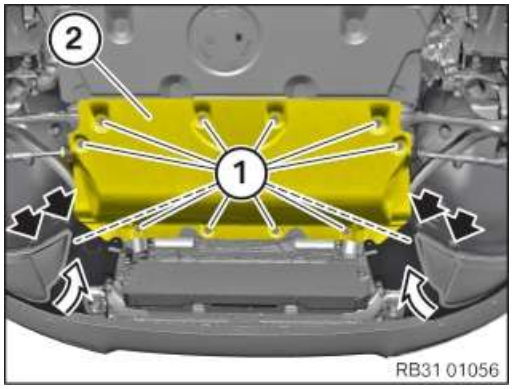
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

20 – Install the underbody protection of the steering gear

cardiagn.com



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

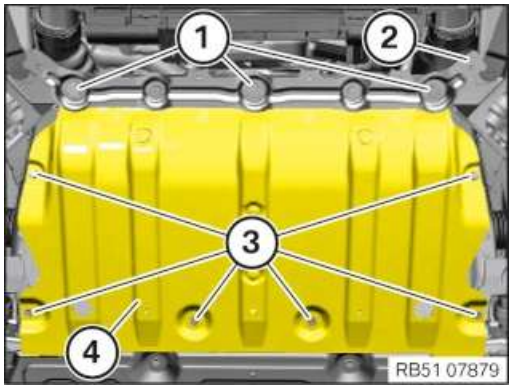
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

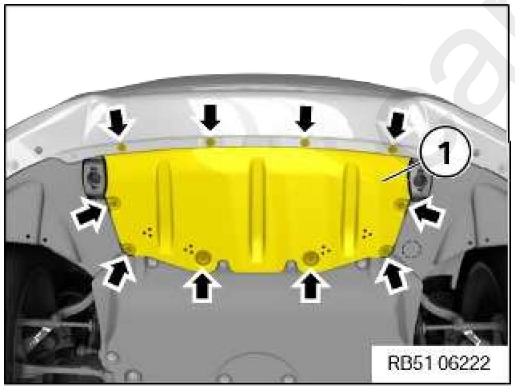
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

21 – Installing the front underbody protection



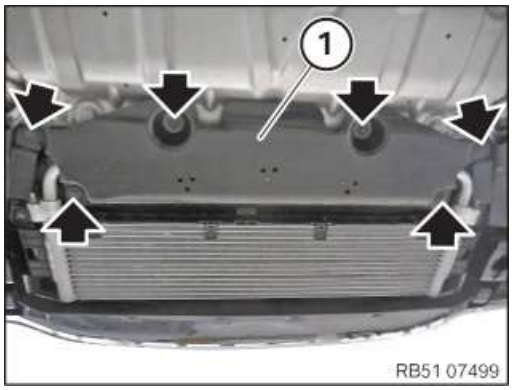
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version B:**

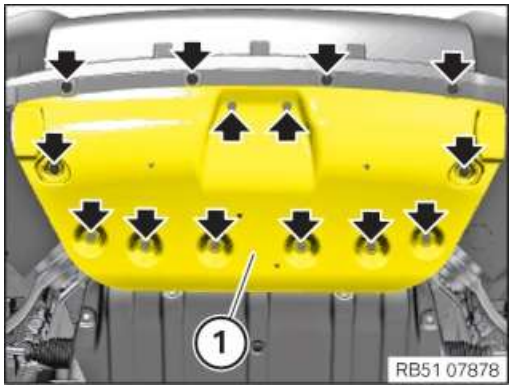
  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

carmanualsonline.com



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Coolant pump/wiring harness to component carrier — Used in step 11

M6x20		Tightening torque	8 Nm

Spacer bolt for mounting the acoustic cover — Used in step 11

M8x12		Tightening torque	12 Nm

Throttle body to intake plenum — Used in step 14

6x50		Tightening torque	8 Nm

Clean air pipe to exhaust turbocharger — Used in step 16

M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing — Used in step 16

Clamp		Tightening torque	3 Nm

Underbody protection, steering, to front axle support — Used in step 19

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support — Used in step 19

Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear — Used in step 20

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front — Used in step 20

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

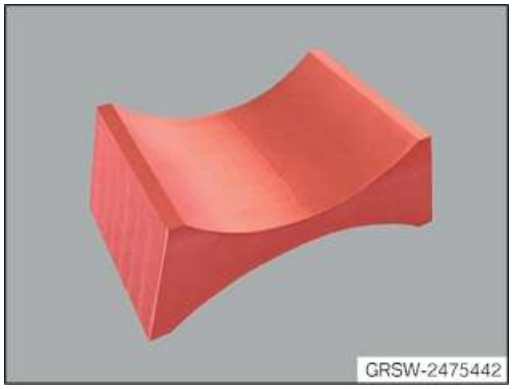
Underbody protection front — Used in step 21

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

Overview of Special Tools

cardiagn.com

2 475 442 Removal and installation tool



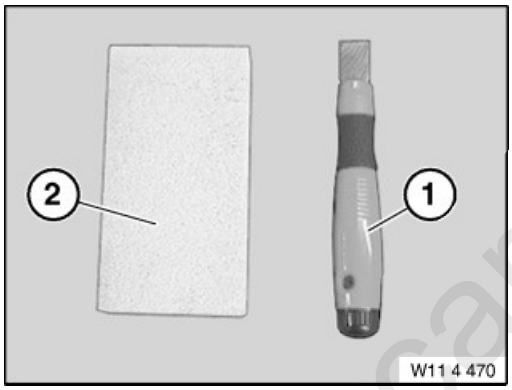
Common	Used in step 9101112
Usage	For removing and installing the drive belt of the ancillary components.
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475445
SI-Number	01 19 19 (668)

2 475 445 Pin



Common	Used in step 9101112
Usage	Tool for drive belt of 48 V ancillary components
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475442 83302475444
SI-Number	01 19 19 (668)

0 495 102 (11 4 470) Tool



Common	Used in step 11
Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Overview Technical Data

Height of the sealing bead — Used in step 11

2,0 mm ... 2,5 mm

Processing time of liquid sealing compound — Used in step 11

< 12 min

carlagn.com

Links

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

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	7
61 35 ... Notes on ESD protection (Electro Static Discharge)	7
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	18
17 00 039 Bleeding cooling system (B37, B47)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18

cardiagn.com

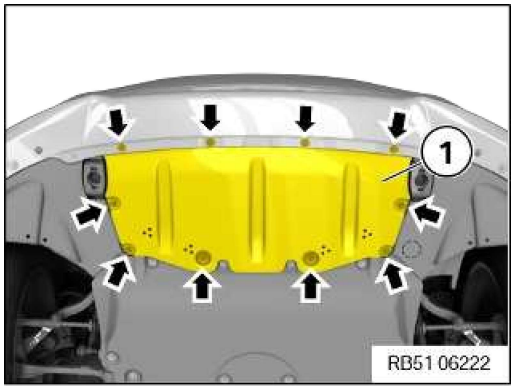
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	18
17 00 008 Draining and topping up the high-temperature coolant circuit	18
17 00 008 Draining and topping up the high-temperature coolant circuit	18
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	18
17 00 008 Draining and topping up the high-temperature coolant circuit	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	18
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18

carmanuals.com

11 51 000 Removing and installing/replacing the coolant pump

PRELIMINARY WORK

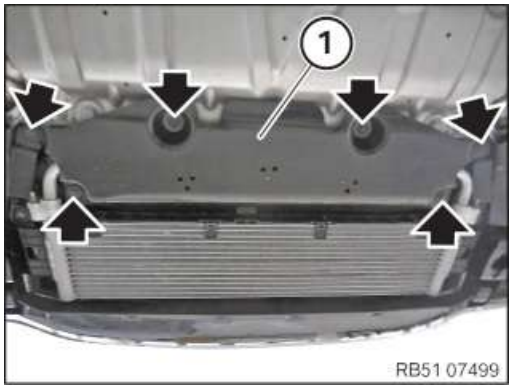
1 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

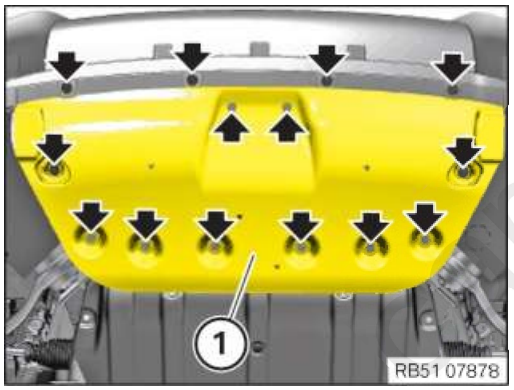
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

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

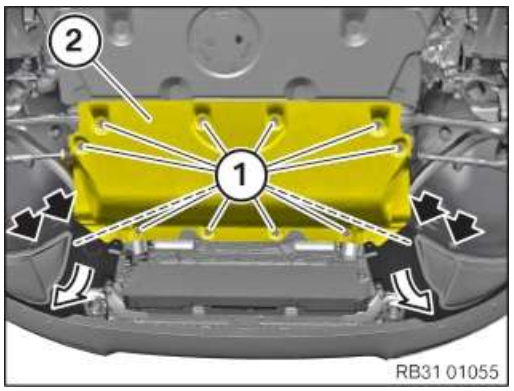


- **Version C:**

  Remove screws (arrows).

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

2 – Remove the underbody protection of the steering gear



- **Version A:**

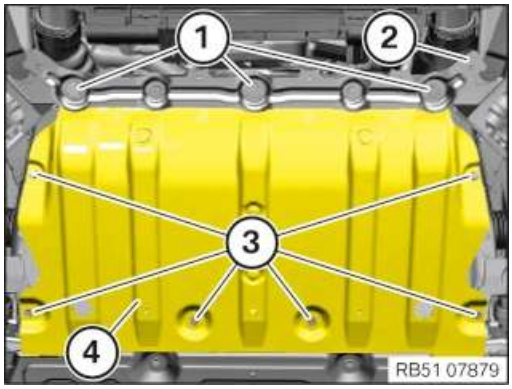
  Unscrew the screws (arrows) of the wheel arch cover on the wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.

mdiagn.com



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

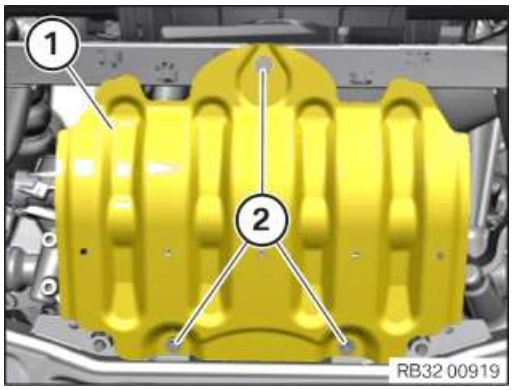
  Loosen screws (3).

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

3 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

4 – 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.

5 – Removing the clean air pipe with the resonator

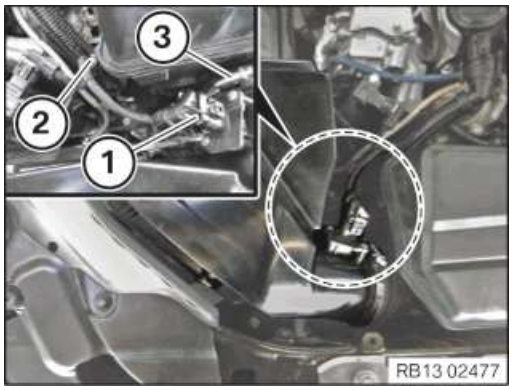
cardiagn.com

WARNING

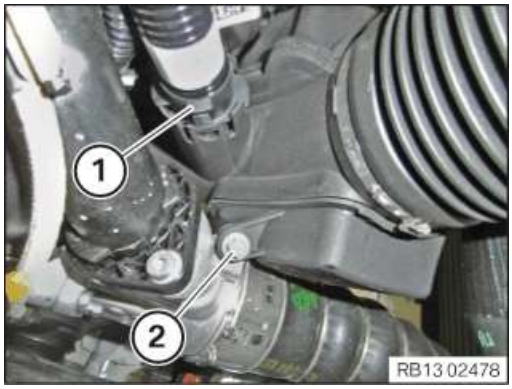
Hot surfaces.

Risk of burning!

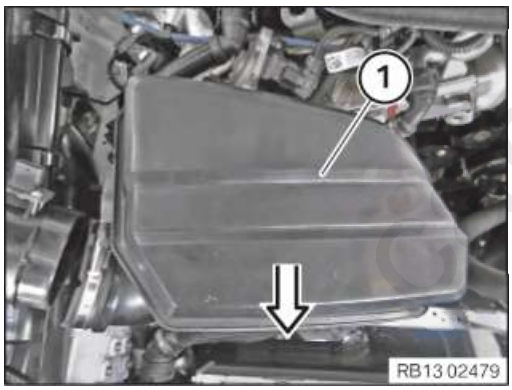
- Perform all work only on components that have cooled down.



- 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).

carldiagn.com



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

6 – Draining coolant

WARNING

Hot fluids.

Risk of scalding!

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

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

Life-long fill of coolant!

Do not reuse used coolant.

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

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

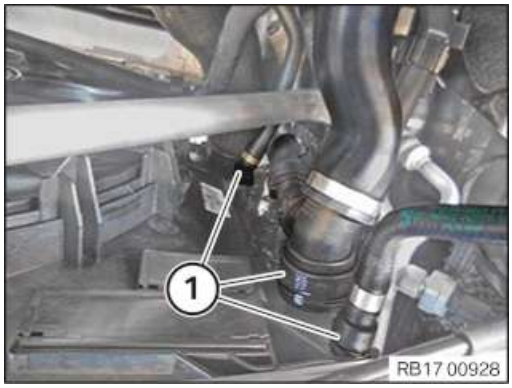
TECHNICAL INFORMATION

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

cardiagn.com



- Loosen sealing cap (1) from the coolant expansion tank.



NOTICE

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

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

7 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

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

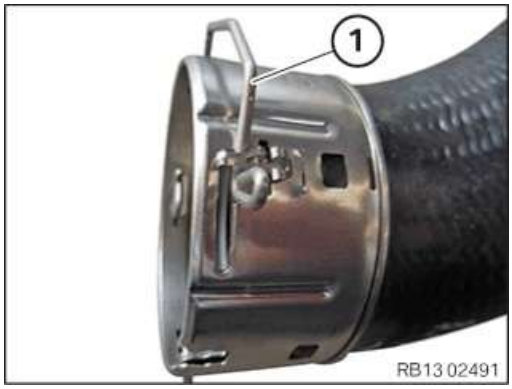
RISK OF DAMAGE

Electrostatic discharge.

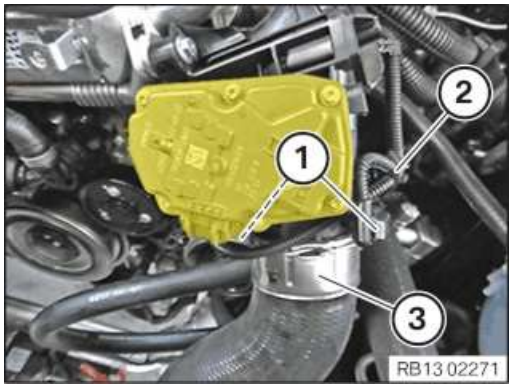
Damage to or destruction of electrical components.

- 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)

cardiagn.com



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

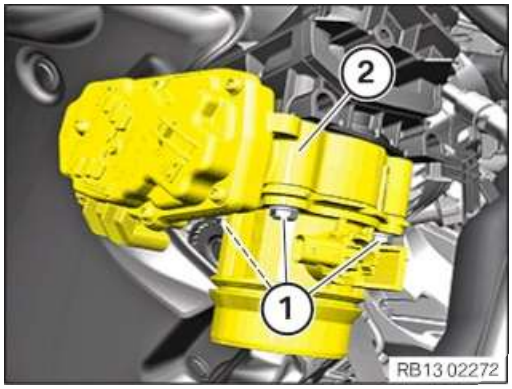


- Unlock and disconnect plug connections (1).

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).

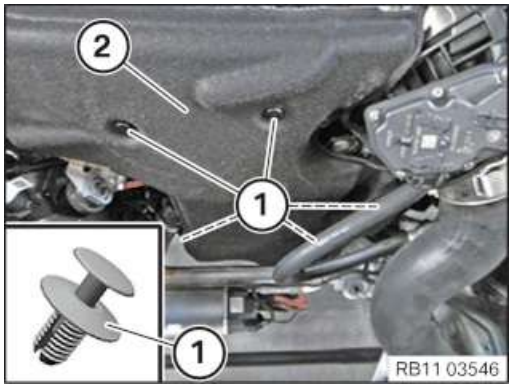
8 – Remove acoustic cover of the front engine

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.

9 – Removing the drive belt for alternator

cardiagn.com

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

Component with preload.

Danger of injury!

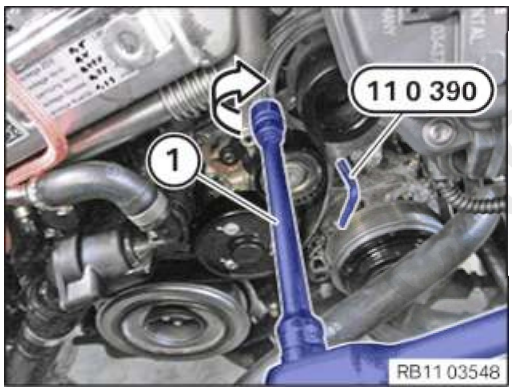
- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

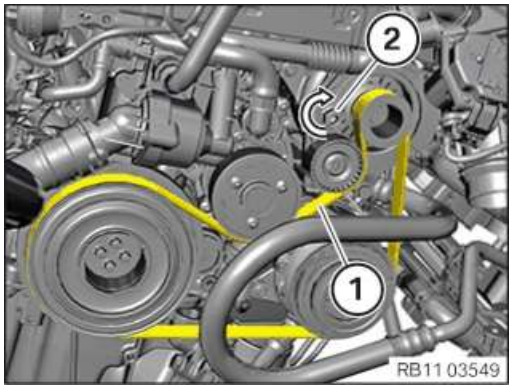
If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.



- If reusing the drive belt for alternator: Mark the direction of rotation.
- Relax the belt tensioner in the direction of the arrow using a standard tool (1).
- Fix the belt tensioner with the special tool 0 496 268 (11 0 390).



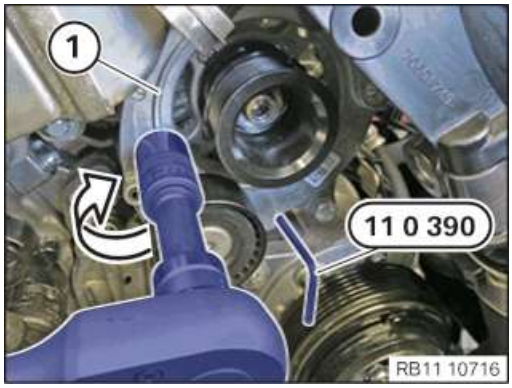
- Relieve belt tensioner at hexagon head (2) in direction of arrow up to limit position.
- Guide out and remove drive belt for alternator (1).

MAIN WORK

10 – Removing the coolant pump



- Pull off vacuum hose (1).



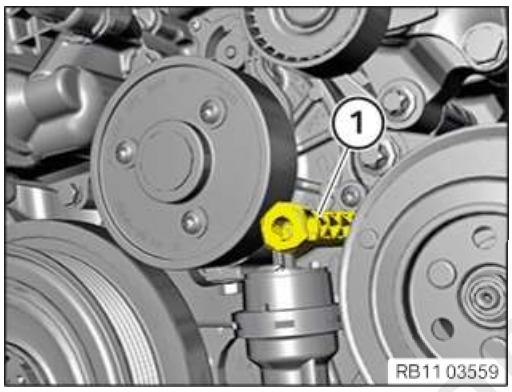
CAUTION

Component with preload.

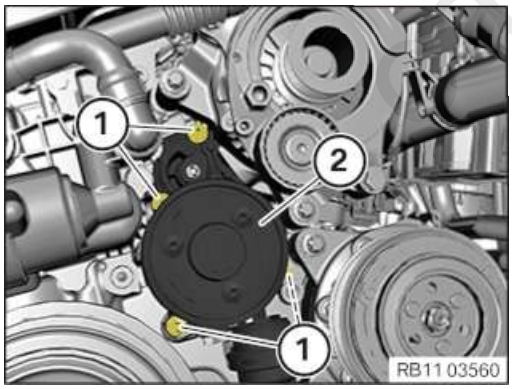
Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

- Increase preload at belt tensioner (1).
- Remove the special tool 0 496 268 (11 0 390) from belt tensioner (1).
- Relieve tension at belt tensioner (1).



- Release the spacer (1) to mount the acoustic cover.



- Loosen screws (1).

TECHNICAL INFORMATION

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

- Remove coolant pump (2).

11 – Installing coolant pumps

partdiagn.com

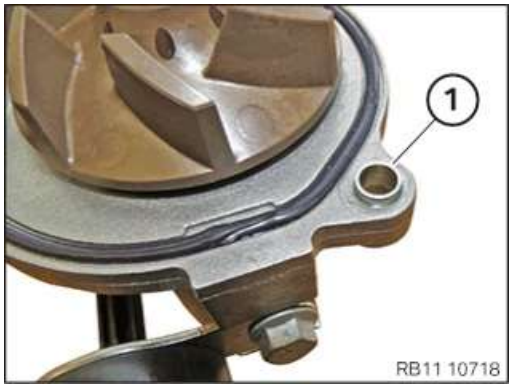


TECHNICAL INFORMATION

Do not use any metal-cutting tools. Otherwise, there is a risk of damage.

- Clean the sealing surface using special tool 0 495 102 (11 4 470).

Check



- Check the fitting sleeve (1) for damage.

desired state

- Fitting sleeve must not be scratched or deformed.

Result

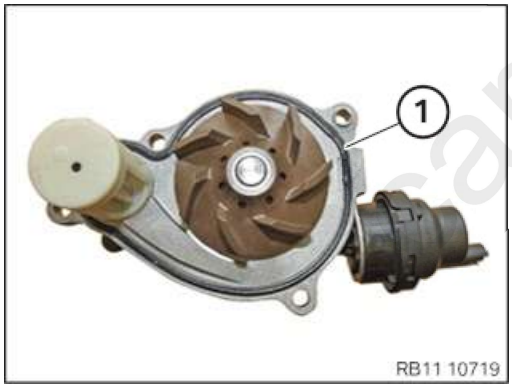
» Fitting sleeve is damaged.

Measure

- Completely renew the coolant pump.

  Parts: Coolant pump

Check



- Check the sealing bead for damage.
- Measure the height of the sealing bead in reference to the surface.

Height of the sealing bead

2,0 mm ... 2,5 mm

Result

» The sealing bead is damaged or the measured dimension deviates.

Measure

- Remove sealing bead.

11 00 ... Overview of consumables (Electronic Parts Catalogue)

cardiagn.com

- Reapply sealing bead.

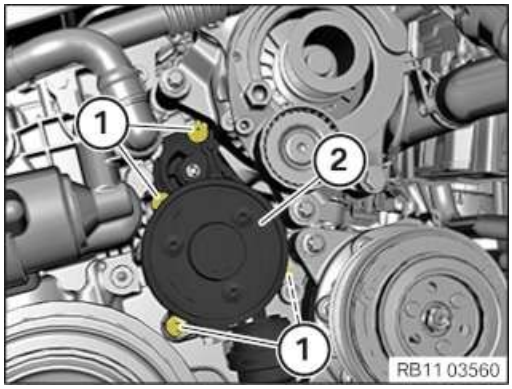
Sealing compound

Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

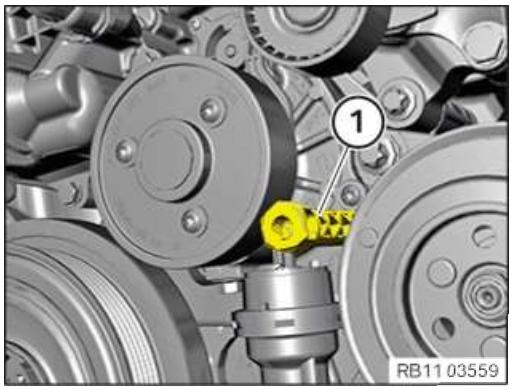
< 12 min



- Position coolant pump (2).
- Tighten the screws (1).

Coolant pump/wiring harness to component carrier

M6x20		Tighten torque	8 Nm



- Tighten the spacer screw (1) to mount the acoustic cover.

Spacer bolt for mounting the acoustic cover

M8x12		Tighten torque	12 Nm



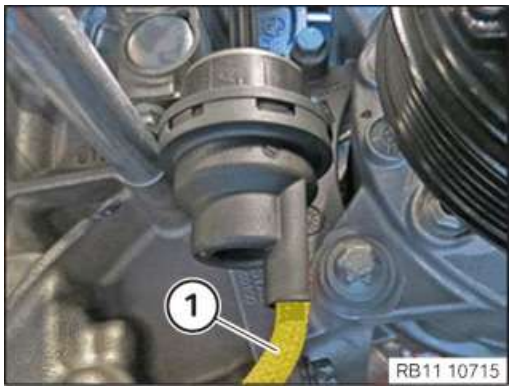
CAUTION

Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

- Increase preload at belt tensioner (1).
- Secure the belt tensioner (1) with the special tool 0 496 268 (11 0 390).



- Connect vacuum hose (1).

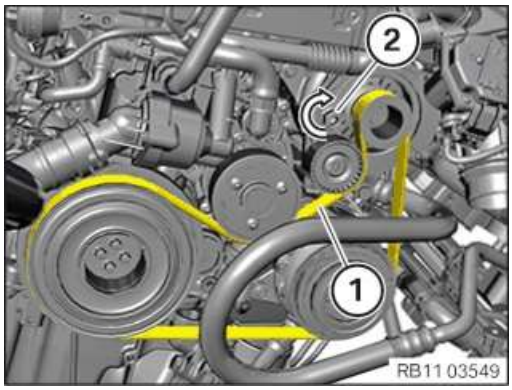
12 – Installing the drive belt for alternator

TECHNICAL INFORMATION

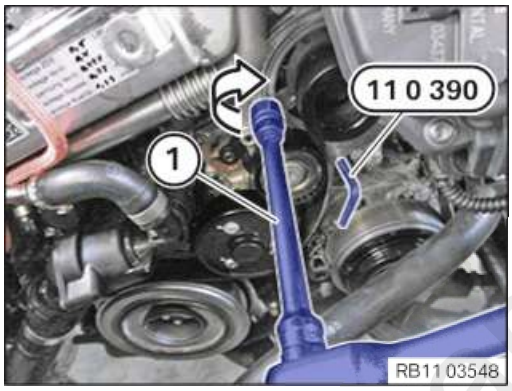
If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.

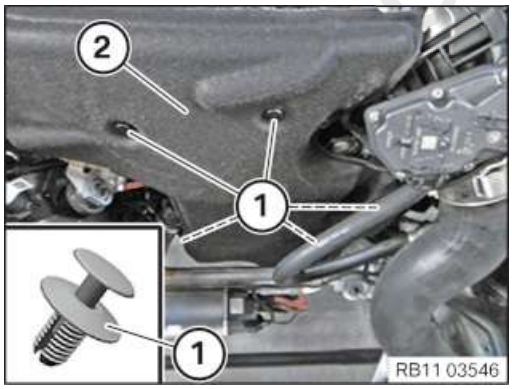


- Check drive belt for alternator (1) for coolant and oil residues and, if necessary, renew it.
- Relieve belt tensioner at hexagon head (2) up to limit position in direction of arrow.
- Install drive belt for alternator (1).



- Increase the preload of the belt tensioner using conventional tool (1) in the direction of arrow until the special tool 0 496 268 (11 0 390) can be removed.
- Remove special tool 0 496 268 (11 0 390).
- Stretch the drive belt for the alternator.

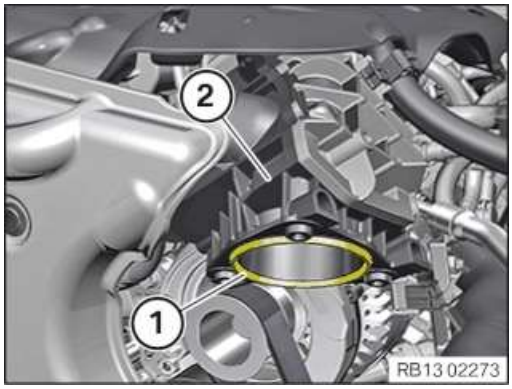
13 – Install acoustic cover for the engine, front



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

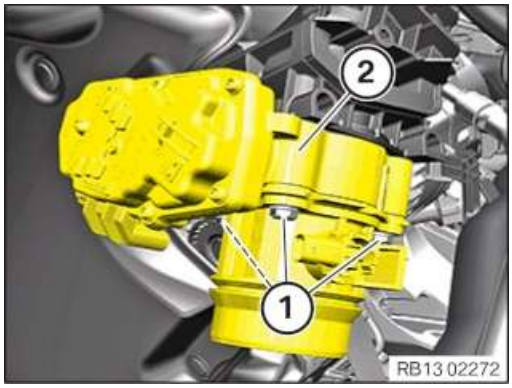
14 – Installing the throttle body

carldiagn.com



- 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

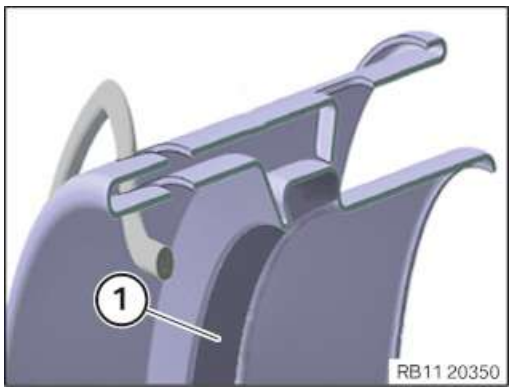


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

TECHNICAL INFORMATION

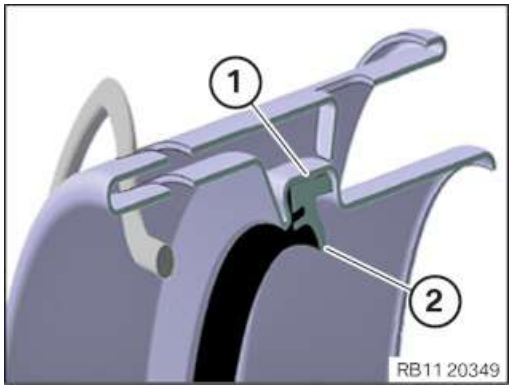
Do not use pointed or sharp-edged tools for the installation and/or removal.



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

  The gasket groove (1) must be clean.

cardiagn.com



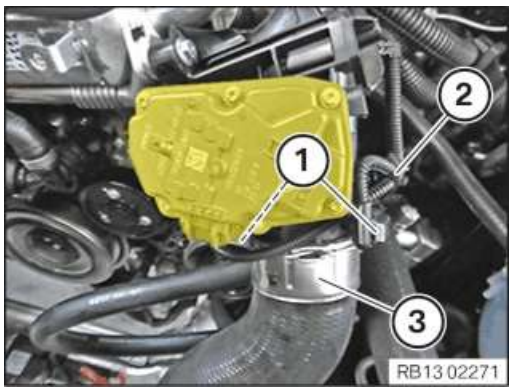
- Renew gasket.

  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.

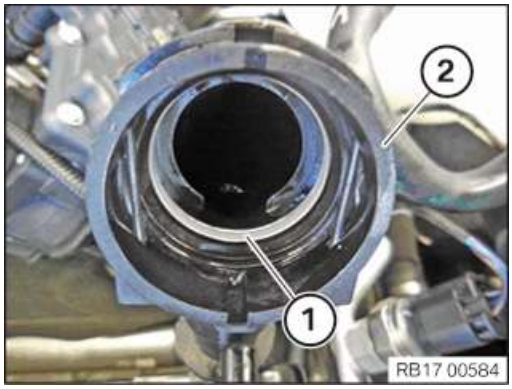


- Lock clamp (1).

15 – Connecting the coolant lines

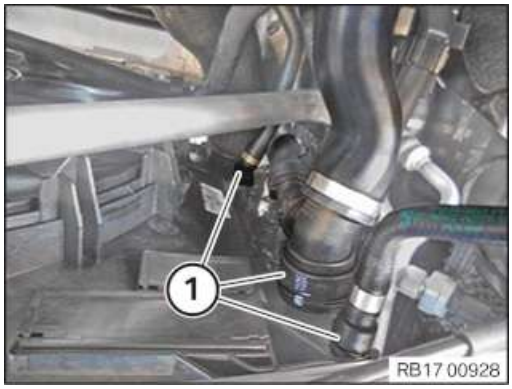
TECHNICAL INFORMATION

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



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

oldiagn.com

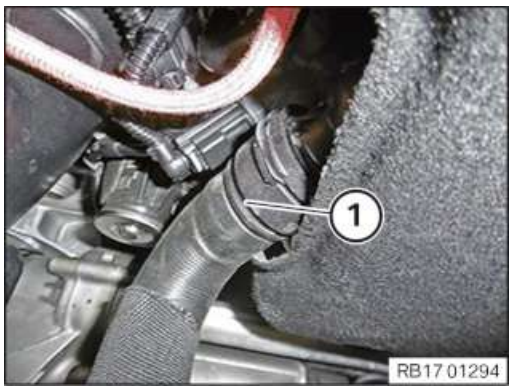


NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



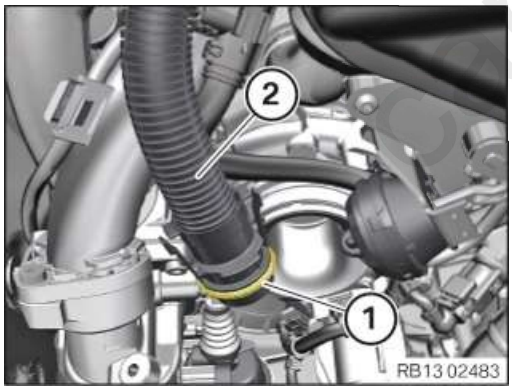
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

16 – Installing the clean air pipe with resonator



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

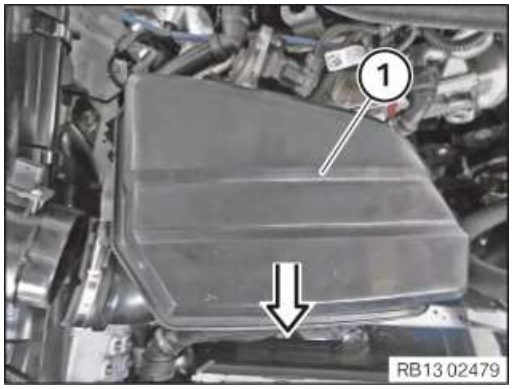


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

carsdiagn.com

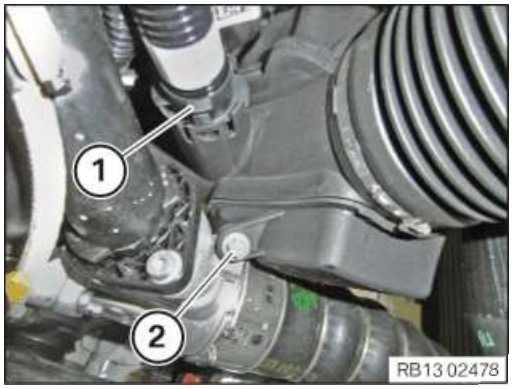


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

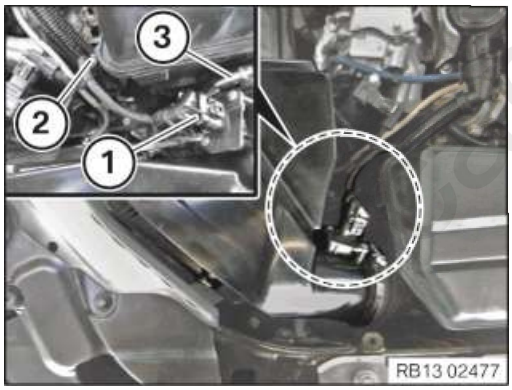
  The clamp (1) must engage audibly.



- 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.

17 – Install acoustic cover

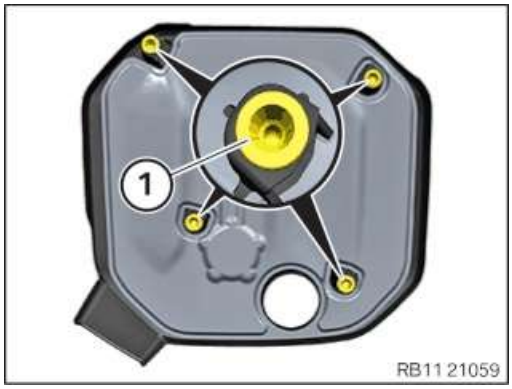
RISK OF DAMAGE

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.

cardiagn.com



- 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.

18 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

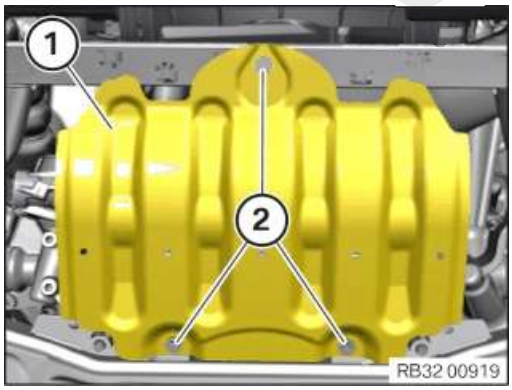
It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

19 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

Underbody protection, steering, to front axle support

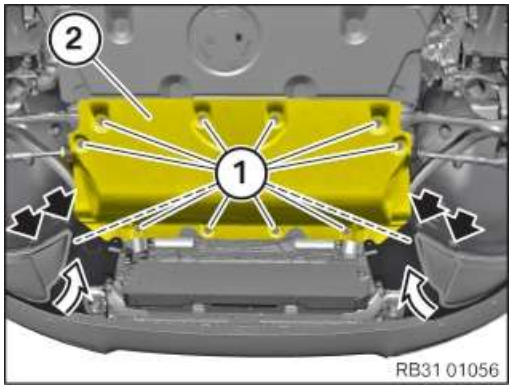
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

20 – Install the underbody protection of the steering gear

cardiagn.com



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

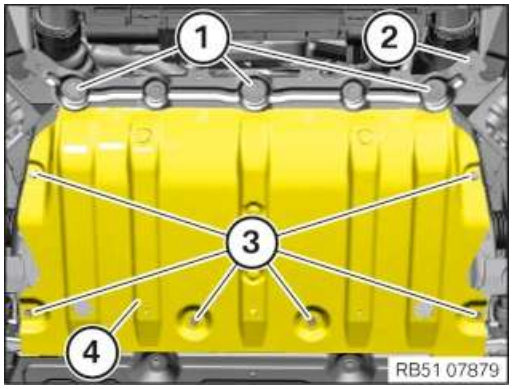
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

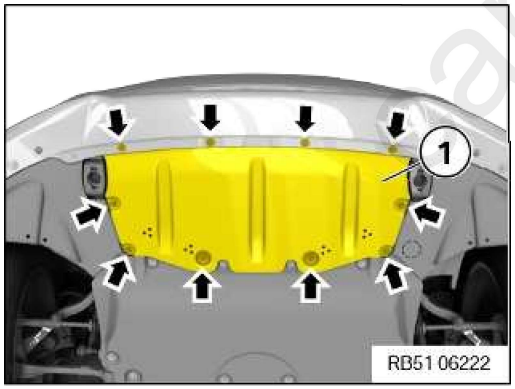
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

21 – Installing the front underbody protection



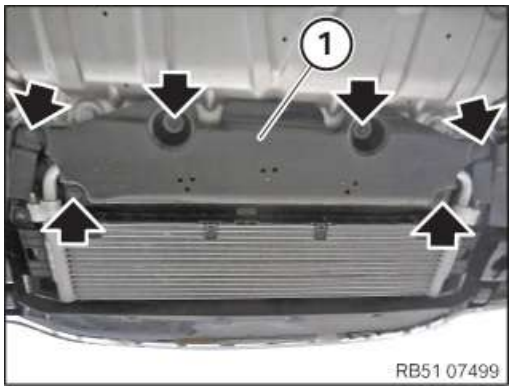
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version B:**

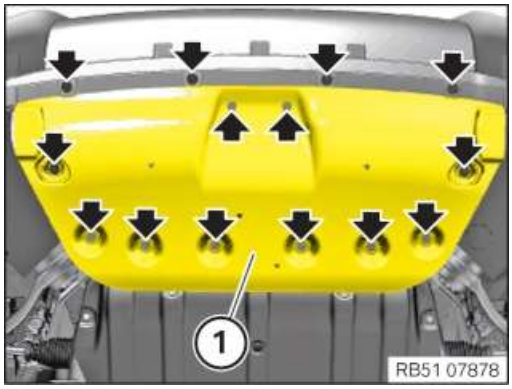
  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

carmanualsonline.com



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Coolant pump/wiring harness to component carrier — Used in step 11

M6x20		Tightening torque	8 Nm

Spacer bolt for mounting the acoustic cover — Used in step 11

M8x12		Tightening torque	12 Nm

Throttle body to intake plenum — Used in step 14

6x50		Tightening torque	8 Nm

Clean air pipe to exhaust turbocharger — Used in step 16

M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing — Used in step 16

Clamp		Tightening torque	3 Nm

Underbody protection, steering, to front axle support — Used in step 19

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support — Used in step 19

Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear — Used in step 20

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front — Used in step 20

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

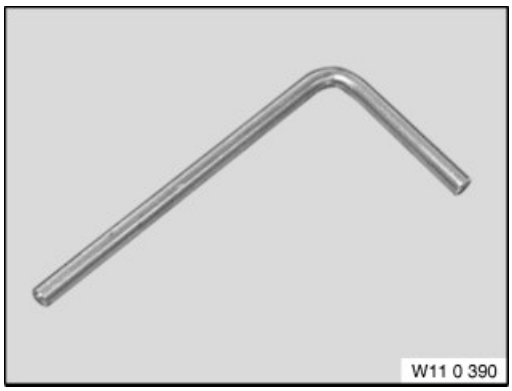
Underbody protection front — Used in step 21

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

Overview of Special Tools

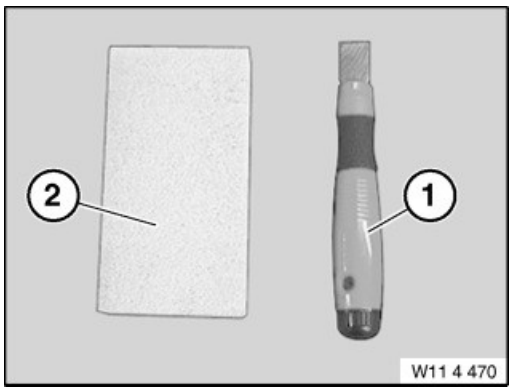
cardiagn.com

0 496 268 (11 0 390) Pin



Common	Used in step 9101112
Usage	(roll pin) For securing new tensioning pulley (poly-V belt)
Included in the tool or work	
Storage location	B24
Replaced by	
In connection with	
SI-Number	01 15 07 (390)

0 495 102 (11 4 470) Tool



Common	Used in step 11
Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Overview Technical Data

Height of the sealing bead	Used in step 11
	2,0 mm ... 2,5 mm

Processing time of liquid sealing compound	Used in step 11
	< 12 min

Links

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

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	7
61 35 ... Notes on ESD protection (Electro Static Discharge)	7
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18

cardiagn.com

17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	18
17 00 039 Bleeding cooling system (B37, B47)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	18
17 00 008 Draining and topping up the high-temperature coolant circuit	18
17 00 008 Draining and topping up the high-temperature coolant circuit	18
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	18
17 00 008 Draining and topping up the high-temperature coolant circuit	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18

carjiagn.com

17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	18
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 008 Draining and topping up coolant for high-temperature circuit	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	18

cardiagn.com

11 53 942 Removing and installing (replacing) the connecting branch on the engine block (Draining and topping up coolant, see 17 00 ...)

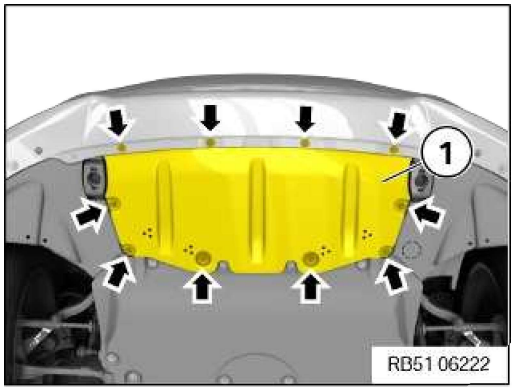
PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

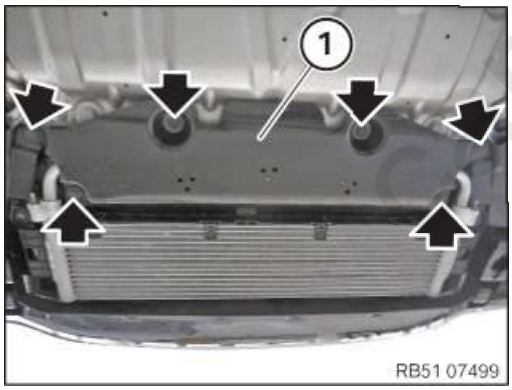
2 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

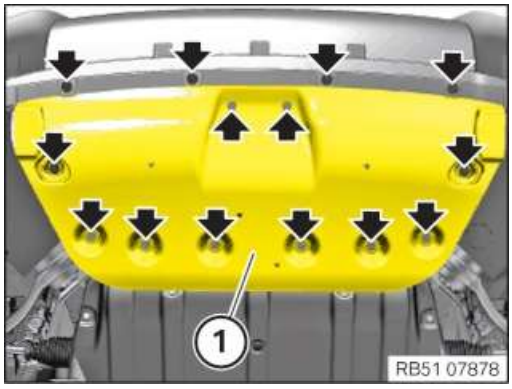
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

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

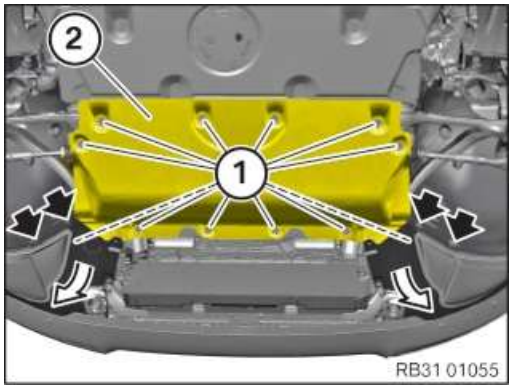


- **Version C:**

  Remove screws (arrows).

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

3 – Remove the underbody protection of the steering gear



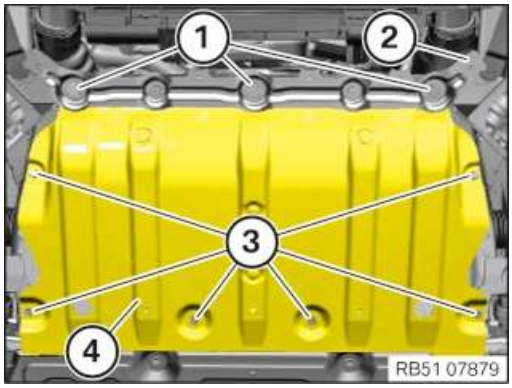
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

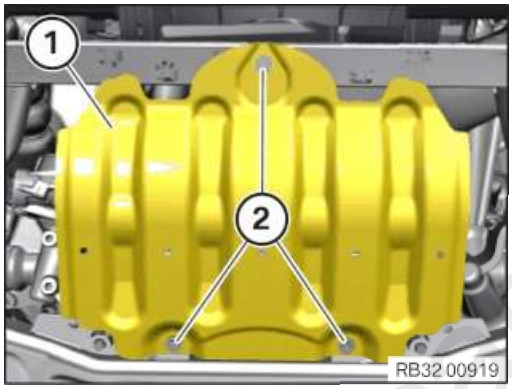
  Loosen screws (3).

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

4 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

5 – 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.

cardiagn.com



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

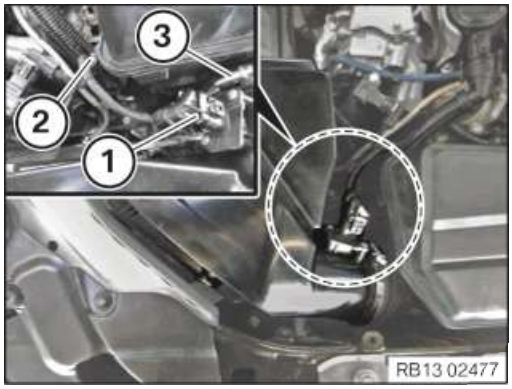
6 – Removing the clean air pipe with the resonator

WARNING

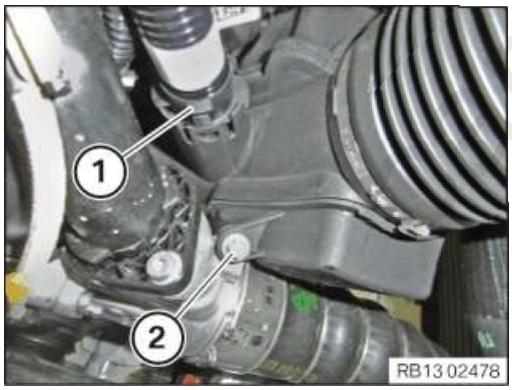
Hot surfaces.

Risk of burning!

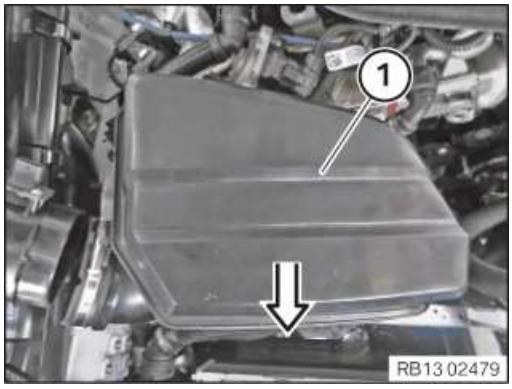
- Perform all work only on components that have cooled down.



- 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.

rdiagn.com



- Unlock and loosen clamp (1).



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

7 – Draining coolant

WARNING

Hot fluids.

Risk of scalding!

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

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

Life-long fill of coolant!

Do not reuse used coolant.

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

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

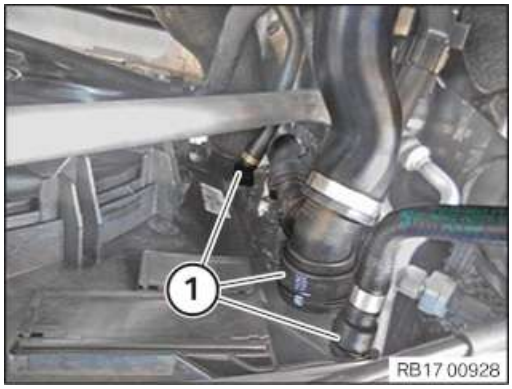
cardiagn.com

TECHNICAL INFORMATION

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



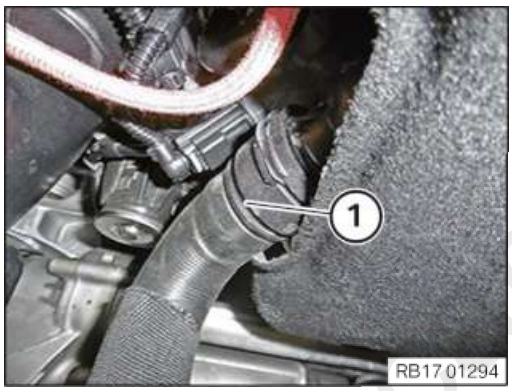
- Loosen sealing cap (1) from the coolant expansion tank.



NOTICE

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

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

8 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

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

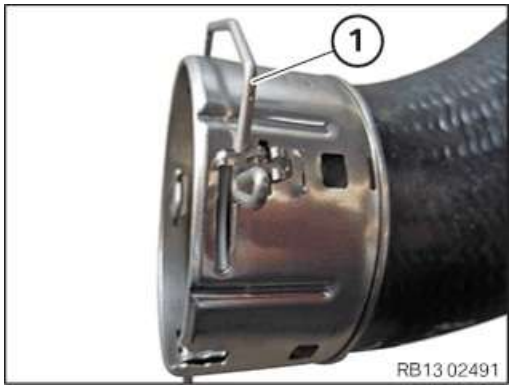
obdiag.com

RISK OF DAMAGE

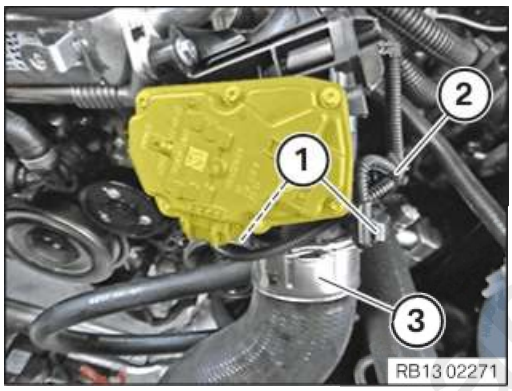
Electrostatic discharge.

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 clamp (1) and engage in this position.

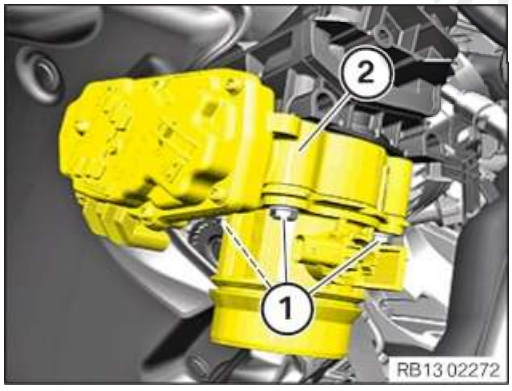


- Unlock and disconnect plug connections (1).

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).

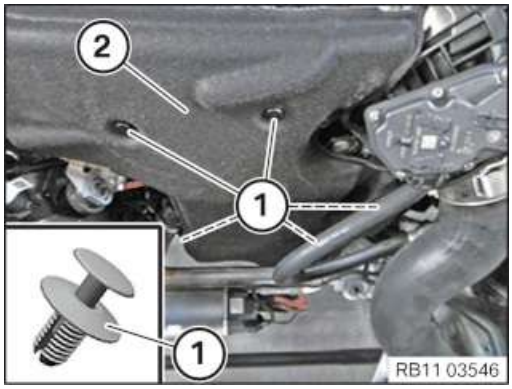
9 – Remove acoustic cover of the front engine

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.

10 – Removing the drive belt for alternator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

Component with preload.

Danger of injury!

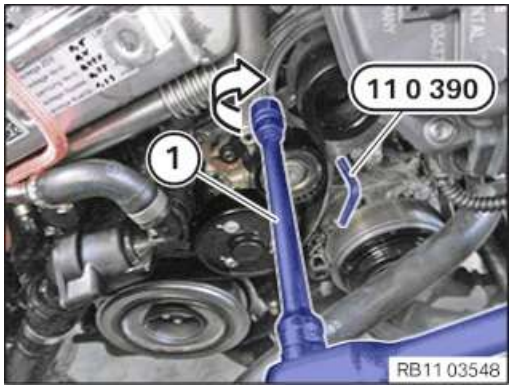
- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

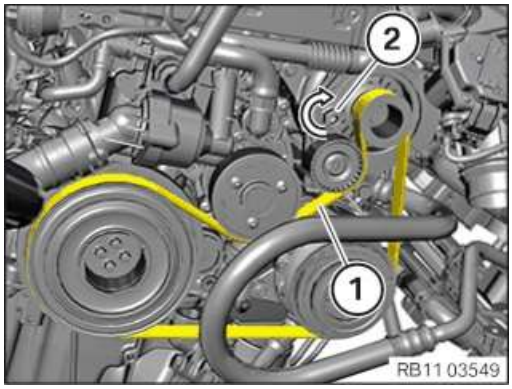
TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.



- If reusing the drive belt for alternator: Mark the direction of rotation.
- Relax the belt tensioner in the direction of the arrow using a standard tool (1).
- Fix the belt tensioner with the special tool 0 496 268 (11 0 390).

cardiagn.com



- Relieve belt tensioner at hexagon head (2) in direction of arrow up to limit position.
- Guide out and remove drive belt for alternator (1).

11 – Removing the alternator

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 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.

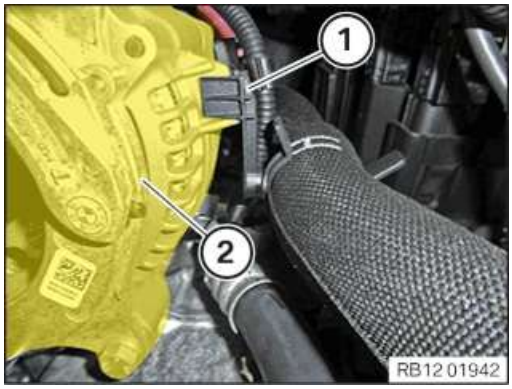
RISK OF DAMAGE

Electrostatic discharge.

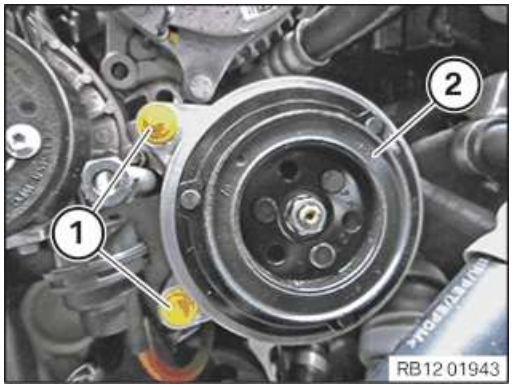
Damage to or destruction of electrical components.

- 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)

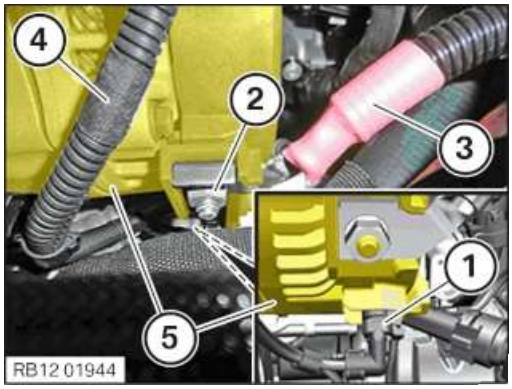
cardiagn.com



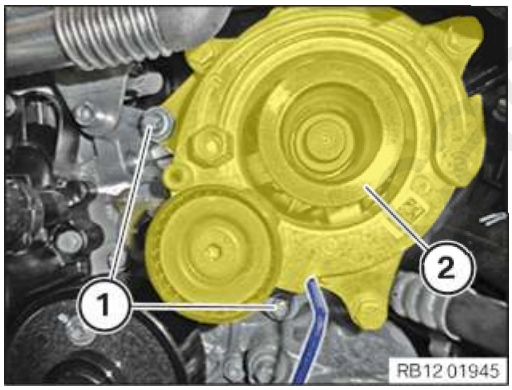
- Release the bracket (1) from the alternator (2).



- Loosen screws (1).
- Slide the air conditioning compressor (2) out and set it aside.

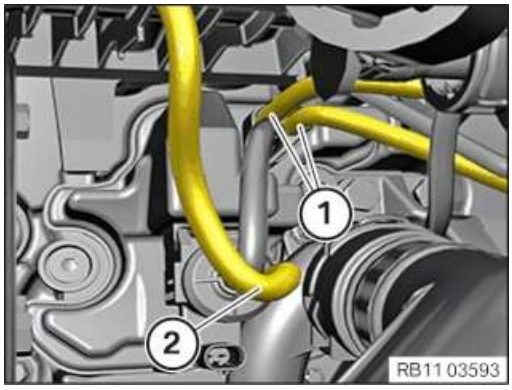


- Unlock the plug connection (1) and disconnect it from the alternator (5).
- Release the nut (2) on the alternator (5).
- Feed out positive battery cable (3) and put to one side.
- Remove the wiring harness section (4) and put to one side.



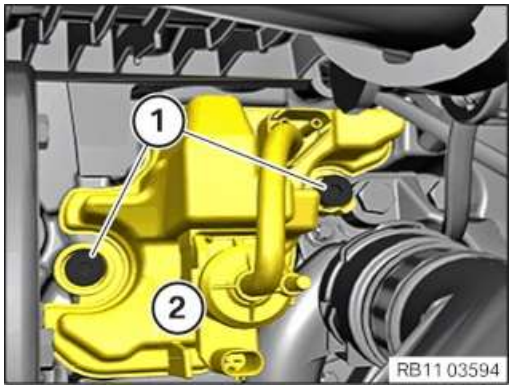
- Loosen screws (1).
- Guide out alternator (2) and remove.

12 – Remove vacuum reservoir



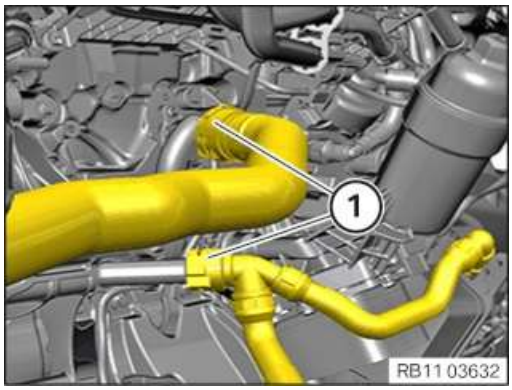
- Pull off vacuum hose (1) from the vacuum reservoir.
- Pull off the vacuum hose (2) from the electric changeover valve.

rdiagn.com

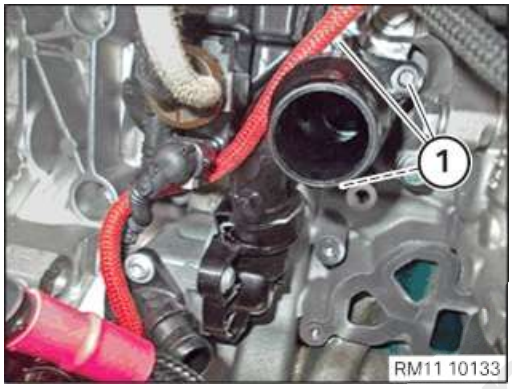


- Loosen screws (1).
- Feed out and remove the vacuum reservoir (2).

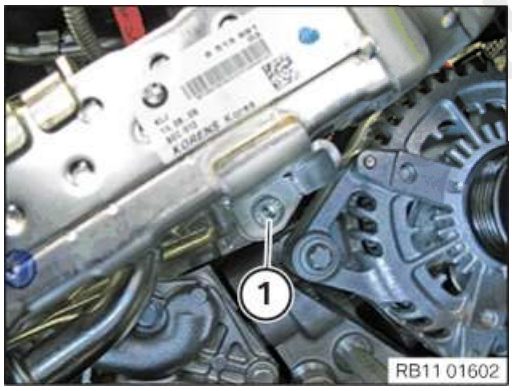
13 – Removing the component carrier



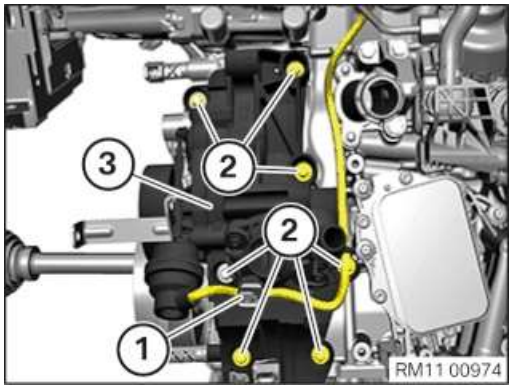
- Unlock and pull off the coolant hoses (1).



- Loosen screws (1).



- Loosen the screw (1) below the exhaust-gas recirculation cooler.



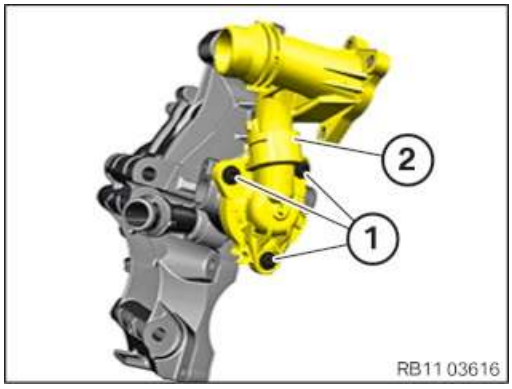
- Disconnect the vacuum line (1) from the vacuum unit and detach it from the clamp on the component carrier.
- Loosen screws (2).
- Lift off and remove the component carrier (3) from the crankcase.

cardiagn.com

14 – Removing the secondary coolant thermostat

TECHNICAL INFORMATION

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



- Loosen screws (1).
- Guide out and remove the connecting branch (2).

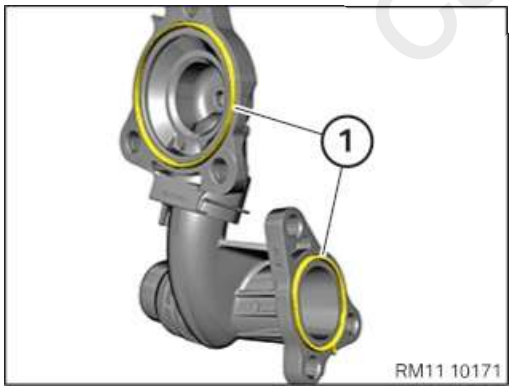


- Removing the secondary coolant thermostat.
- Ensure that the guide (1) is present on the secondary coolant thermostat.

15 – Installing the secondary coolant thermostat

TECHNICAL INFORMATION

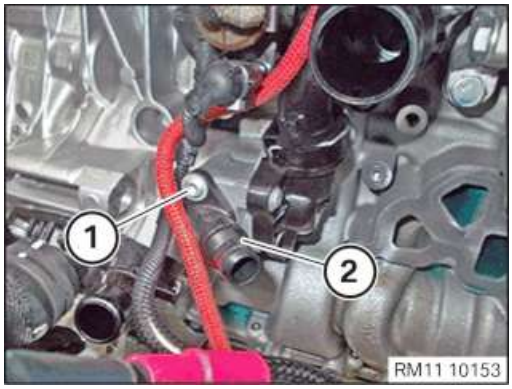
The sealing surfaces must be free from oils, grease and cleaning agents.



- Replace the seals (1).

  Parts: Seals

cardiagn.com



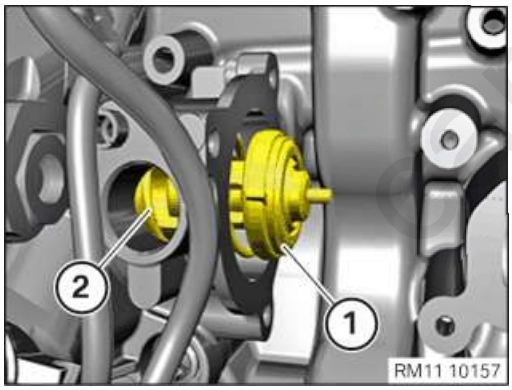
- Loosen screw (1).
- Guide out and remove the connecting branch (2).



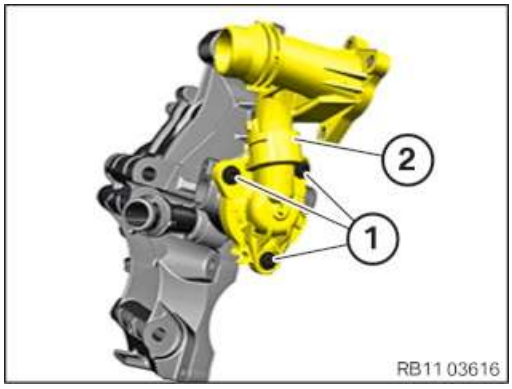
- Ensure that the guide (1) is present on the secondary coolant thermostat.
- Replace the coolant thermostat if the guide (1) is damaged or missing.



- Position the coolant thermostat (1) in the connecting branch.
- When positioning the thermostat, one must make sure that the guide of the coolant thermostat (1)sits correctly in the housing (2).



- Position the coolant thermostat (1) in the component carrier.
- Fasten the coolant thermostat through the opening (2).



- Feed the coolant thermostat with the connecting branches (2) into the component carrier and install it.
- Tighten the screws (1).

Connecting branch to component carrier

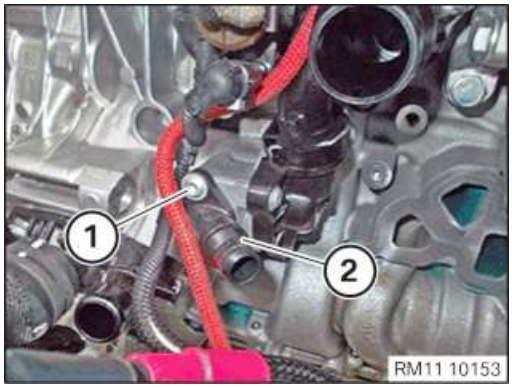
M6x20		Tightening torque	8 Nm

erdiagn.com



- Renew the O-ring (1) on the connecting branch.

  Parts: O-ring



- Insert connecting branch (2) and install.
- Tighten down screw (1).

Connecting branch to component carrier

M6x20		Tightening torque	8 Nm

POSTPROCESSES

16 – Installing the component carrier



RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

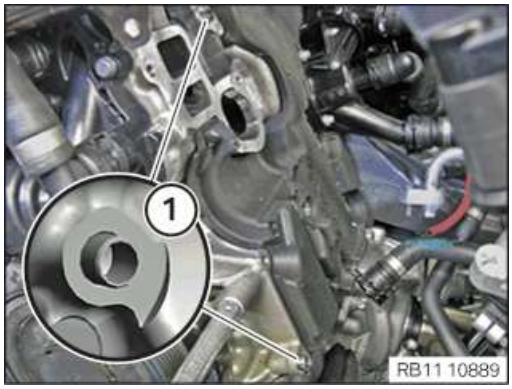
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

- Clean the sealing surface using special tool 0 495 102 (11 4 470).



- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).

Check



- Check the fitting sleeves (1) for damage.

desired state

- The fitting sleeves (1) must not be scratched or deformed.

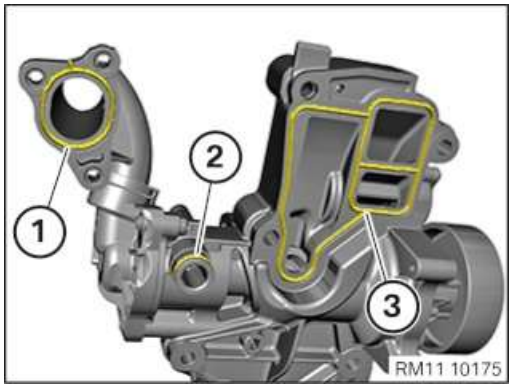
Result

» The fitting sleeves (1) are damaged.

Measure

- Renew fitting sleeves.

  Parts: Fitting sleeves



- Renew the seal (1).

  Parts: Gasket

- Renew O-ring (2).

  Parts: O-ring

- Check the sealing bead (3) for damage.
- Check the height of the sealing bead in reference to the surface.

Height of the sealing bead

	2,0 mm ... 2,5 mm

- If necessary, reapply the sealing bead.

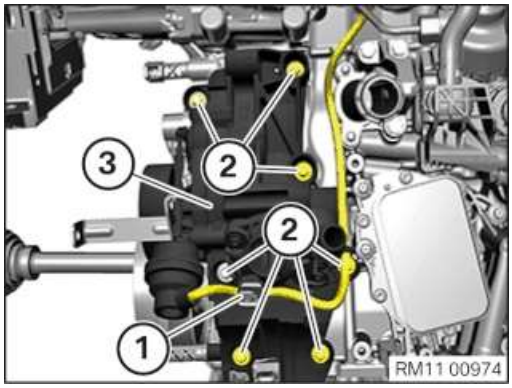
Sealing compound

Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

	< 12 min



- Renew screws (2).

  Parts: Screws

- Position the component carrier (3) on the crankcase.
- Tighten the screws (2).

Component carrier to crankcase

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

- Connect the vacuum line (1) on the vacuum unit and attach it in the clamp on the component carrier.

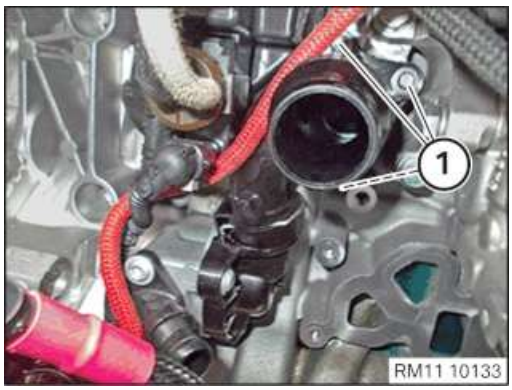
cardiagn.com



- Tighten the screw (1) below the exhaust-gas recirculation cooler.

Exhaust-gas recirculation cooler to cylinder head

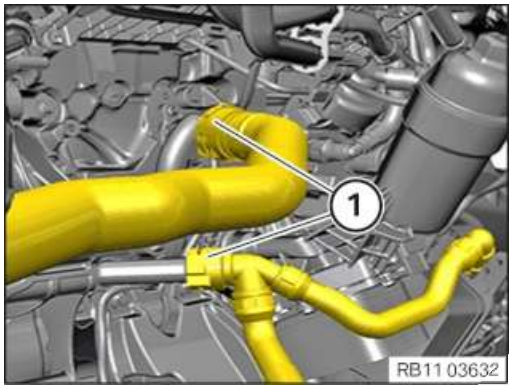
M8x20 / M8x28		Tightening torque	19 Nm



- Tighten the screws (1).

Connecting branch to engine block

M6x25		Tightening torque	8 Nm

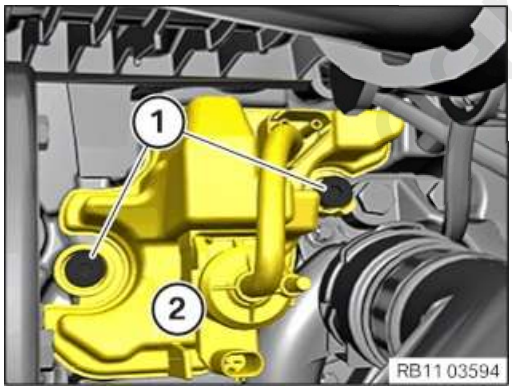


TECHNICAL INFORMATION

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

- Connect coolant hoses (1) and lock audibly.

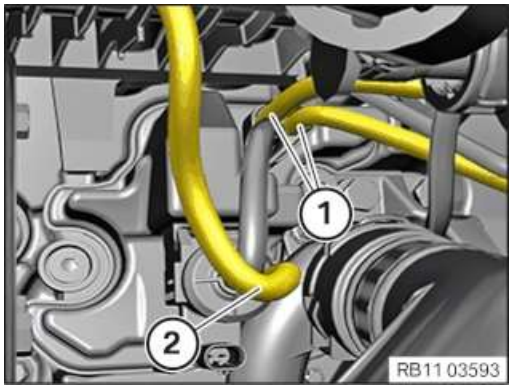
17 – Install vacuum reservoir



- Insert and install the vacuum reservoir (2).
- Tighten the screws (1).

Vacuum reservoir to crankcase

M6X25		Tightening torque	8 Nm



- Connect vacuum hoses (1) to the vacuum reservoir.
- Connect vacuum hose (2) to the electric changeover valve.

18 – Installing the alternator

CAUTION

Improper routing of the positive battery cable.

Risk of short circuits!

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

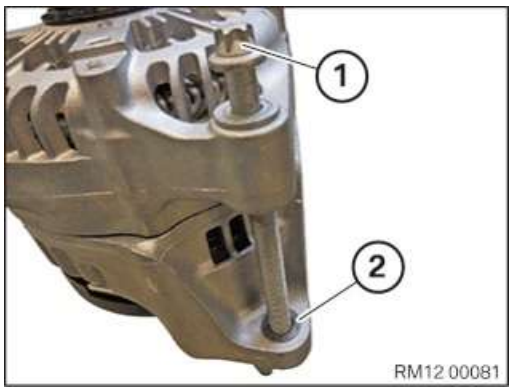
RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

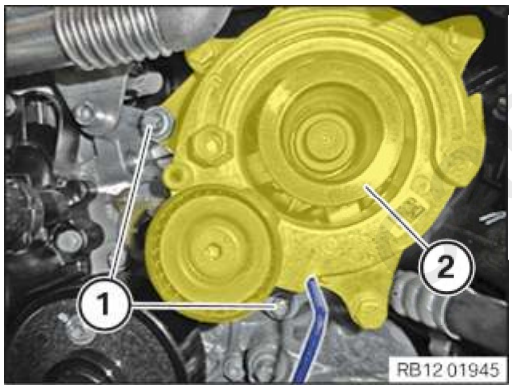
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

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

▸ **Prepare for the installation of the alternator**



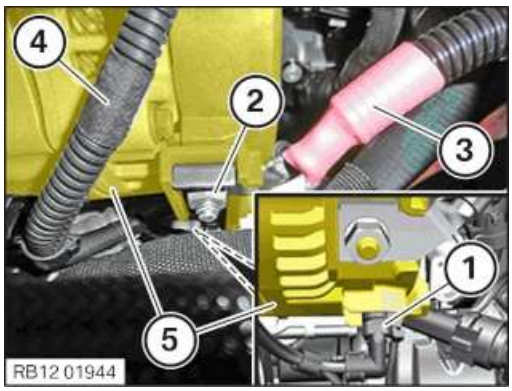
- Screw the screw (1) into the threaded support sleeve (2).
- Slightly press back the threaded support sleeve (2) using the bolt (1).
- Once again unscrew the screw (1) from the threaded support sleeve (2).



- Insert and install the alternator (2).
- Tighten the screws (1).

Alternator to component carrier

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm



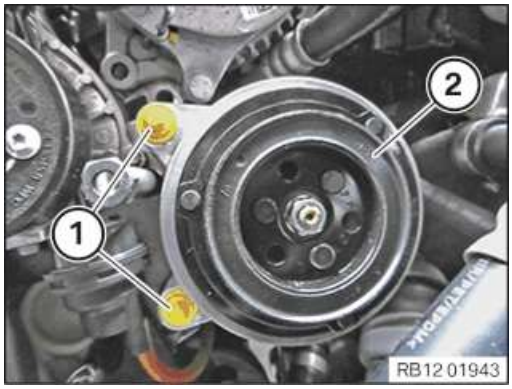
- Guide in the wiring harness section (4) and install.
- Insert and install the positive battery cable (3).
- Tighten the nut (2) on the alternator (5).

Positive battery cable to the alternator

M8		Tightening torque	19 Nm

- Connect the plug (1) with the alternator (5) and lock.

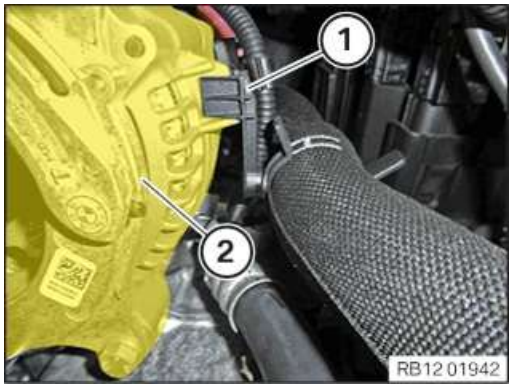
  The connector (1) must engage audibly.



- Insert and install the air conditioning compressor (2).
- Tighten the screws (1).

Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm



- Secure holder (1) to alternator (2).

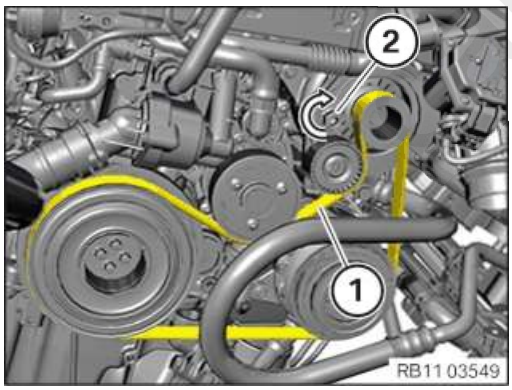
19 – Installing the drive belt for alternator

TECHNICAL INFORMATION

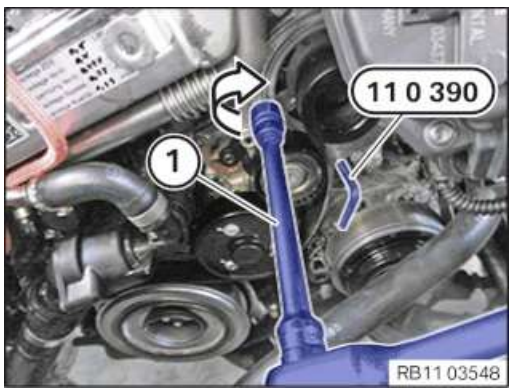
If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.

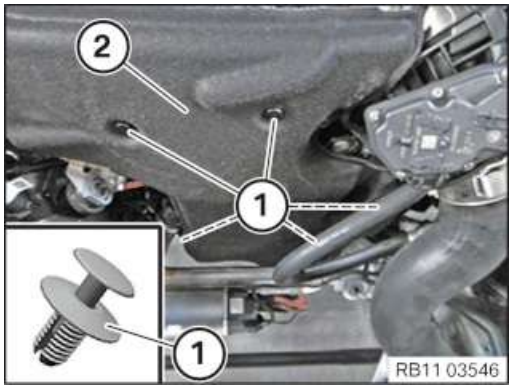


- Check drive belt for alternator (1) for coolant and oil residues and, if necessary, renew it.
- Relieve belt tensioner at hexagon head (2) up to limit position in direction of arrow.
- Install drive belt for alternator (1).



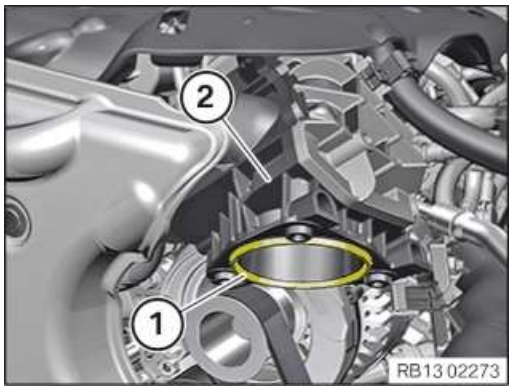
- Increase the preload of the belt tensioner using conventional tool (1) in the direction of arrow until the special tool 0 496 268 (11 0 390) can be removed.
- Remove special tool 0 496 268 (11 0 390).
- Stretch the drive belt for the alternator.

20 – Install acoustic cover for the engine, front



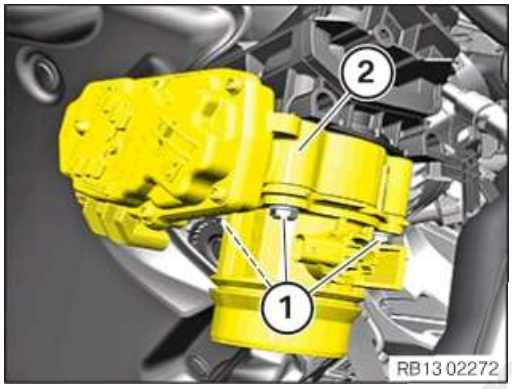
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

21 – 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

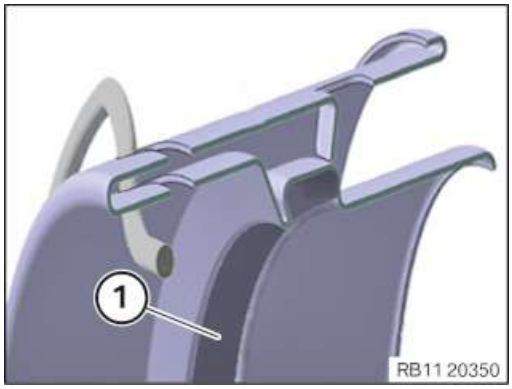


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

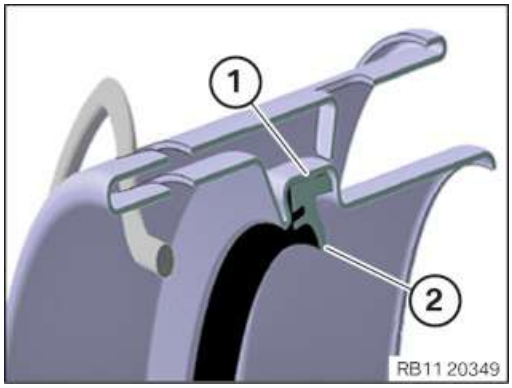
TECHNICAL INFORMATION

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.



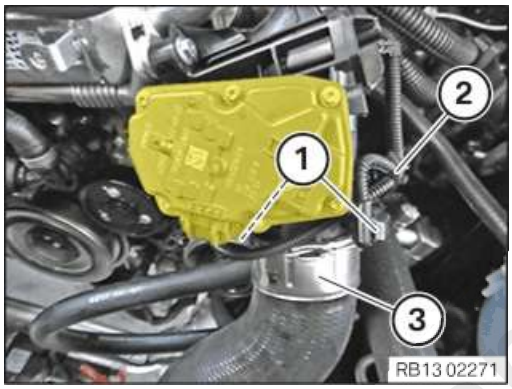
- Renew gasket.

  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.



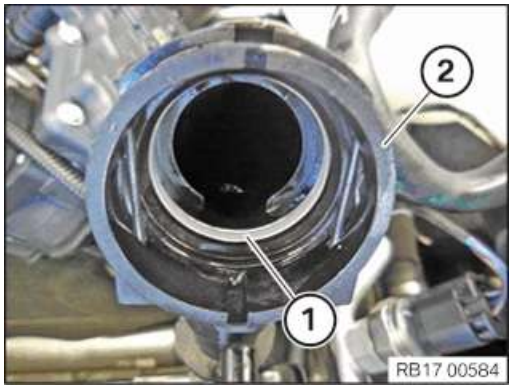
- Lock clamp (1).

22 – Connecting the coolant lines

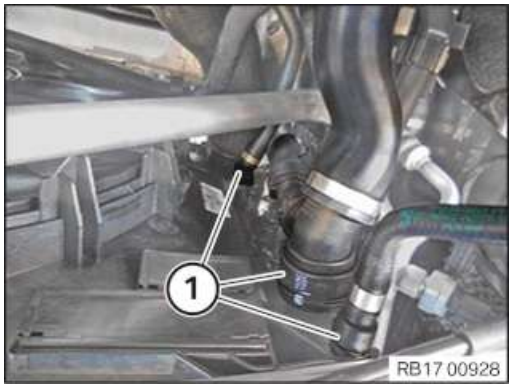
TECHNICAL INFORMATION

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

carmanuals.com



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



NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



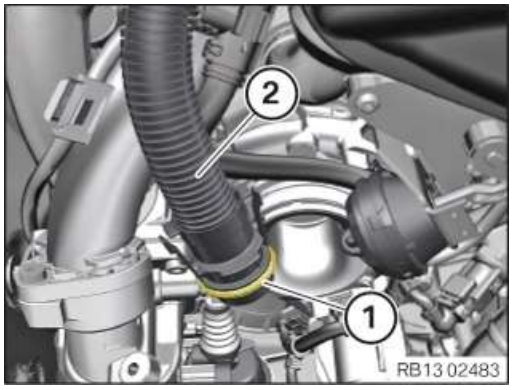
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

23 – Installing the clean air pipe with resonator



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

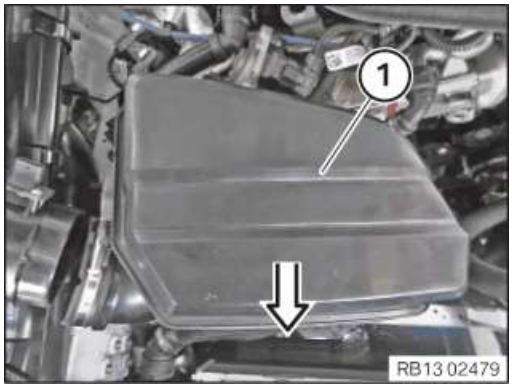


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.

rdiagn.com



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

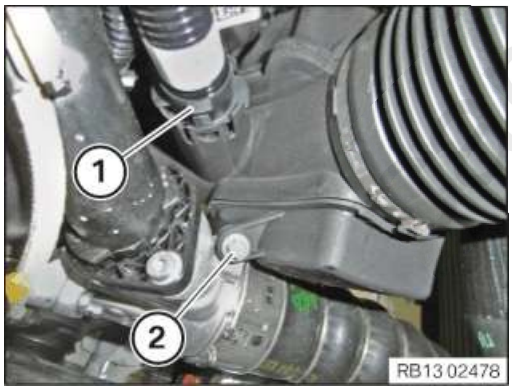


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

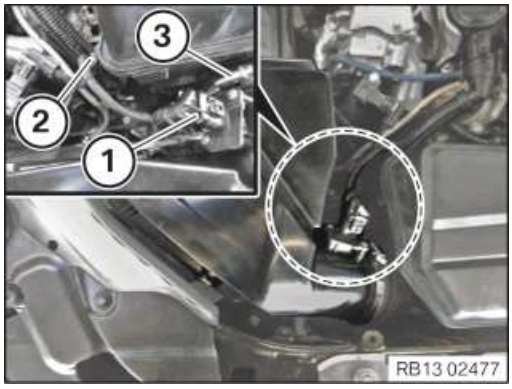
  The clamp (1) must engage audibly.



- 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.

24 – Install acoustic cover

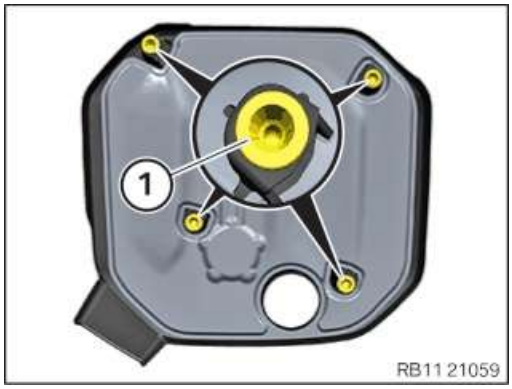
fdiagn.com

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.

25 – Connecting all battery earth leads



- See additional information.

26 – Filling and bleed the high-temperature coolant circuit

cardiagn.com



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.

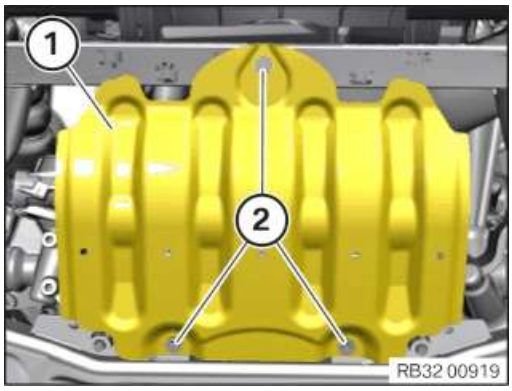
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

27 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

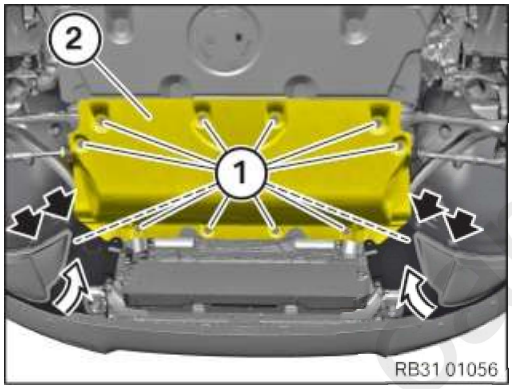
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

28 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

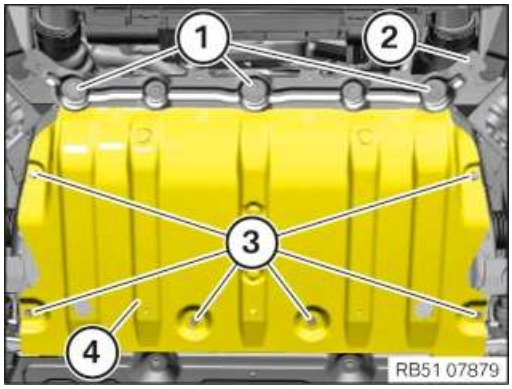
- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

carlagn.com



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

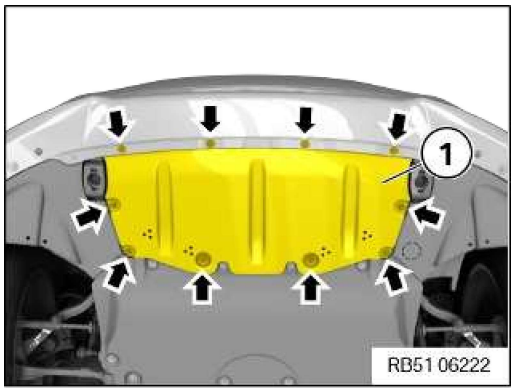
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

29 – Installing the front underbody protection



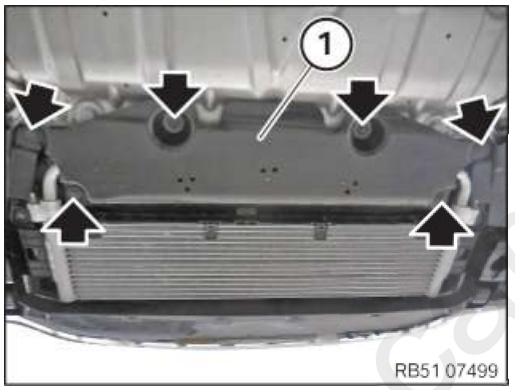
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



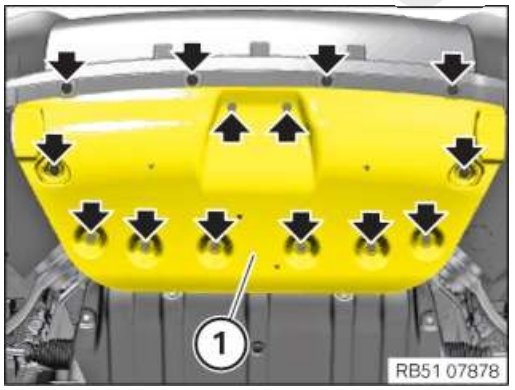
- **Version B:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Connecting branch to component carrier Used in step 15

M6x20		Tightening torque	8 Nm

carmagn.com

Component carrier to crankcase			Used in step 16
M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

Exhaust-gas recirculation cooler to cylinder head			Used in step 16
M8x20 / M8x28		Tightening torque	19 Nm

Connecting branch to engine block			Used in step 16
M6x25		Tightening torque	8 Nm

Vacuum reservoir to crankcase			Used in step 17
M6X25		Tightening torque	8 Nm

Alternator to component carrier			Used in step 18
M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

Positive battery cable to the alternator			Used in step 18
M8		Tightening torque	19 Nm

Air conditioning compressor in component carrier			Used in step 18
M10		Tightening torque	38 Nm

Throttle body to intake plenum			Used in step 21
6x50		Tightening torque	8 Nm

Clean air pipe to exhaust turbocharger			Used in step 23
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 23
Clamp		Tightening torque	3 Nm

Underbody protection, steering, to front axle support			Used in step 27
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 27
Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 28
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

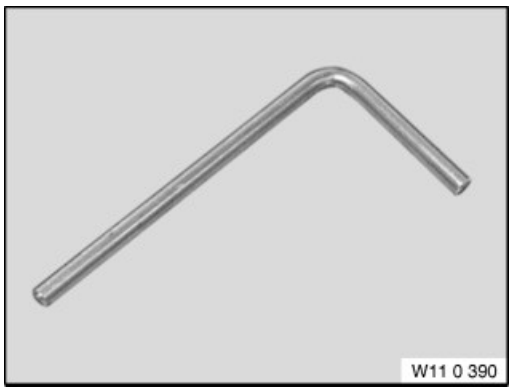
Wheel arch trim panel, front			Used in step 28
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Underbody protection front			Used in step 29
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

cardiagn.com

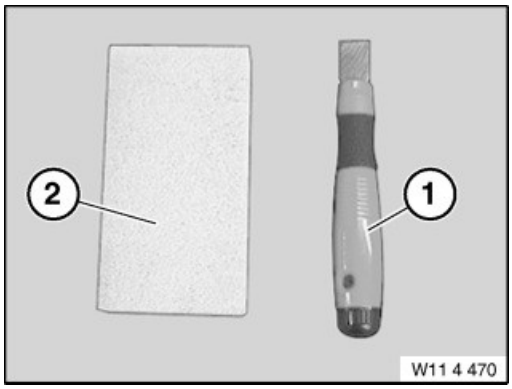
Overview of Special Tools

0 496 268 (11 0 390) Pin



Common	Used in step 1019
Usage	(roll pin) For securing new tensioning pulley (poly-V belt)
Included in the tool or work	
Storage location	B24
Replaced by	
In connection with	
SI-Number	01 15 07 (390)

0 495 102 (11 4 470) Tool



Common	Used in step 16
Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Overview Technical Data

Height of the sealing bead	Used in step 16
	2,0 mm ... 2,5 mm

Processing time of liquid sealing compound	Used in step 16
	< 12 min

Links

General repair instructions	Used in step

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125

cardiagn.com

61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 35 ... Notes on ESD protection (Electro Static Discharge)	811
61 35 ... Notes on ESD protection (Electro Static Discharge)	81118

cardiagn.com

17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	26
17 00 039 Bleeding cooling system (B37, B47)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	26
17 00 008 Draining and topping up the high-temperature coolant circuit	26
17 00 008 Draining and topping up the high-temperature coolant circuit	26
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	26
17 00 008 Draining and topping up the high-temperature coolant circuit	26

cardiagn.com

17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	26
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26

carmagn.com

11 53 942 Removing and installing (replacing) the connecting branch on the engine block (Draining and topping up coolant, see 17 00 ...)

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.

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.

cardiagn.com



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.

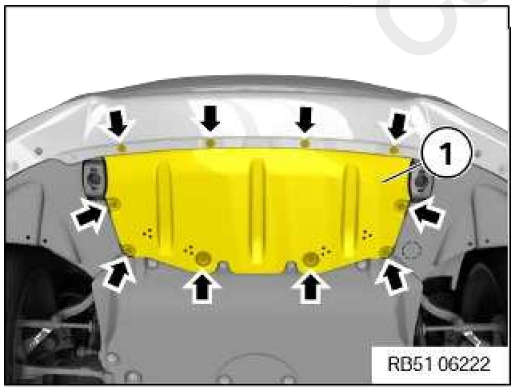
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

2 – Disconnecting all battery earth leads



- See additional information.

3 – Removing the front underbody protection

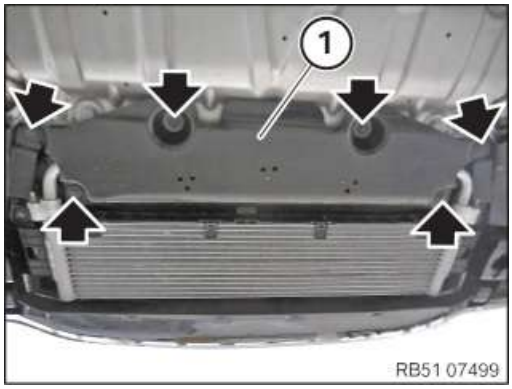


- **Version A:**

  Remove screws (arrows).

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

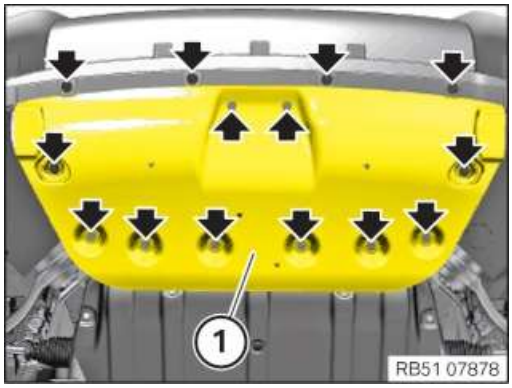
cardiagn.com



- **Version B:**

  Remove screws (arrows).

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

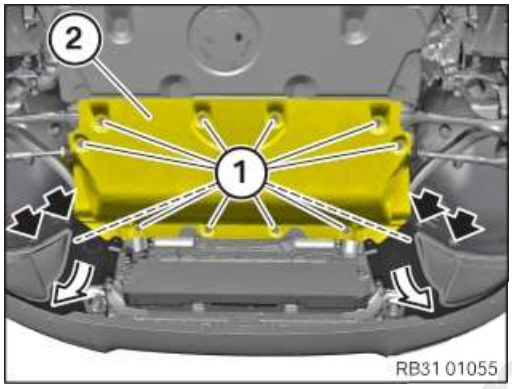


- **Version C:**

  Remove screws (arrows).

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

4 – Remove the underbody protection of the steering gear



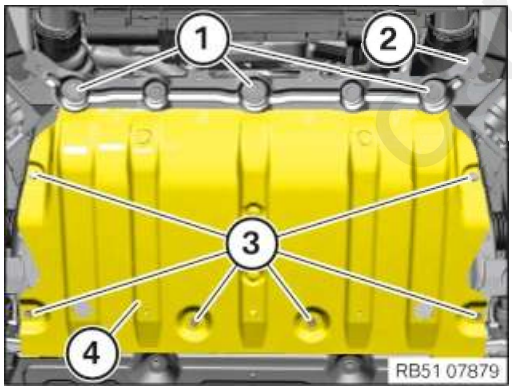
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

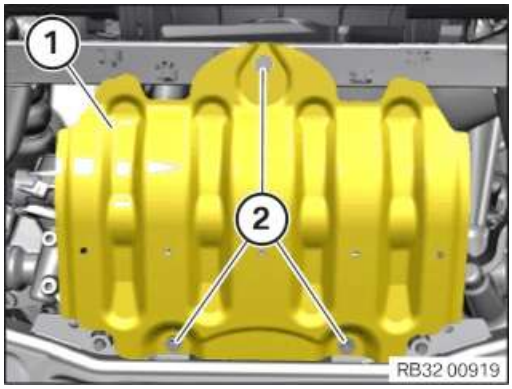
  Loosen screws (3).

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

5 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

6 – 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.

7 – Removing the clean air pipe with the resonator

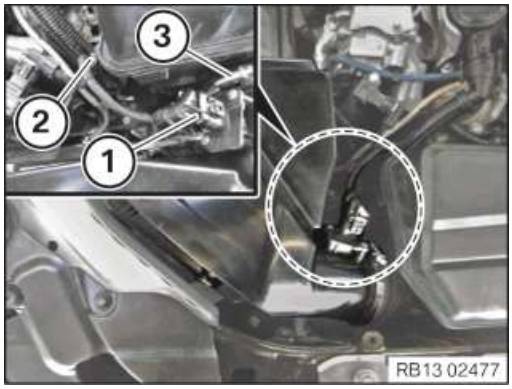
WARNING

Hot surfaces.

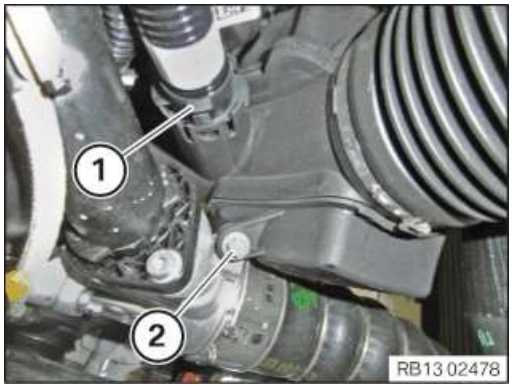
Risk of burning!

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

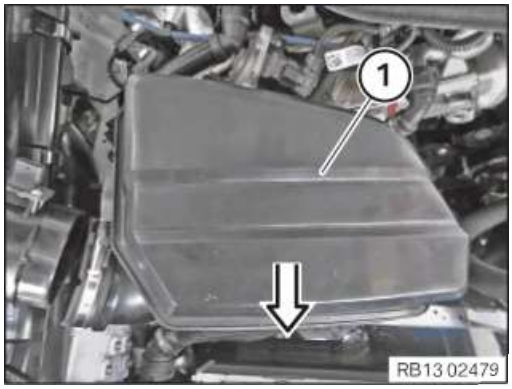
cardiagn.com



- 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.

8 – Draining the coolant from the high-temperature cooling system

rdiagn.com

WARNING

Hot fluids.

Risk of scalding!

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

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

Life-long fill of coolant!

Do not reuse used coolant.

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

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

TECHNICAL INFORMATION

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



- Loosen sealing cap (1).

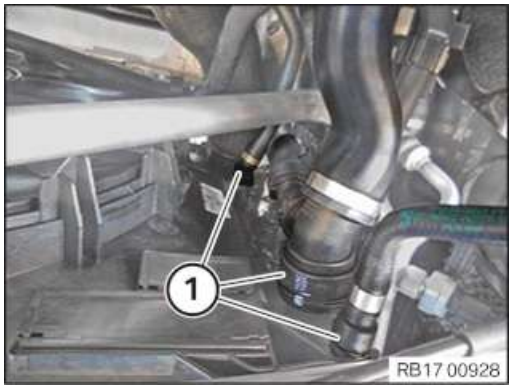
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



NOTICE

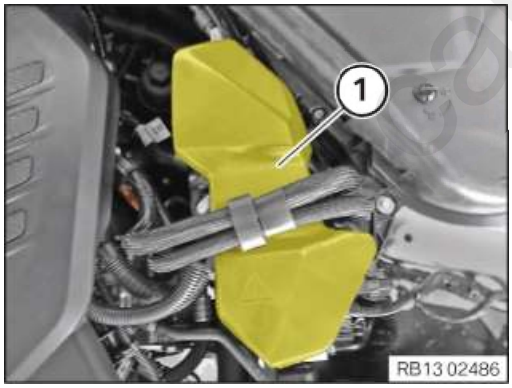
Schematic diagram is for example purposes. Some parts may differ in certain details.

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

9 – Remove the cover for the DDE control unit



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

10 – 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

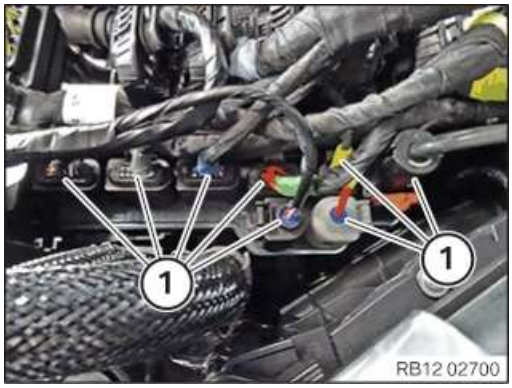
TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

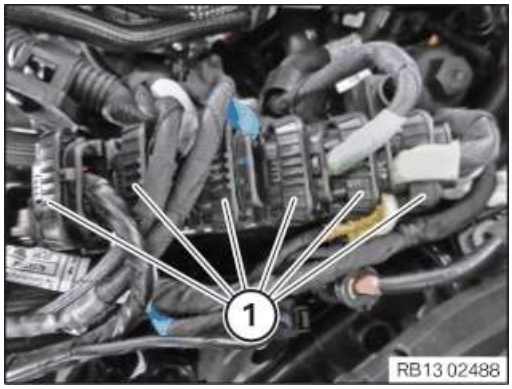
Control unit must be programmed after it is replaced.

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

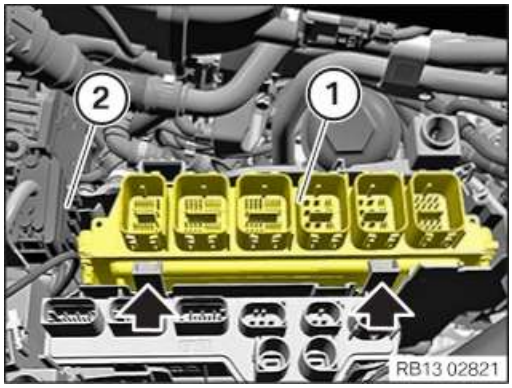


- Unlock plug connections (1) and disconnect.

cardiagn.com



- 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.

11 – Removing the integrated supply module (PDM) partially

Prerequisite

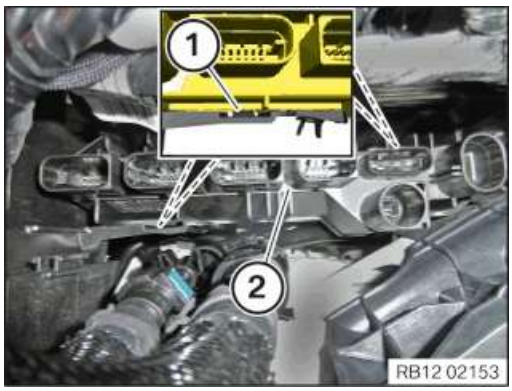
Engine control unit is removed.

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)



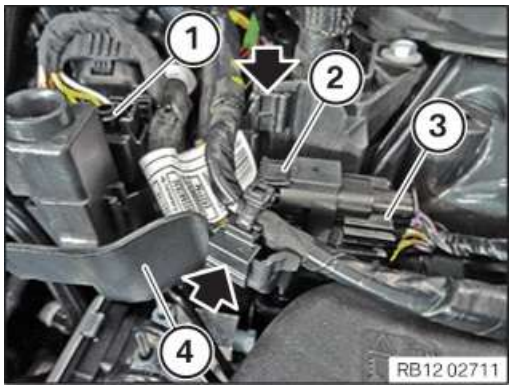
- Loosen the latch mechanisms (1).
- Feed out and remove the integrated supply module (PDM) (2) upwards.

12 – Removing the control unit holder

cardiagn.com

TECHNICAL INFORMATION

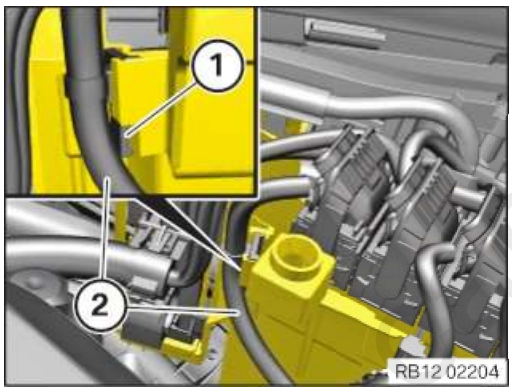
The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.



- Unlock 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).



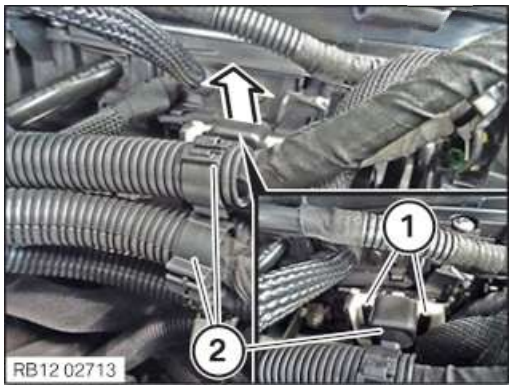
- Unlock plug connection (1) and disconnect.



- Unlock and loosen the cable clip (1).
- Remove the wiring harness section (2) and put to one side.

NOTICE

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

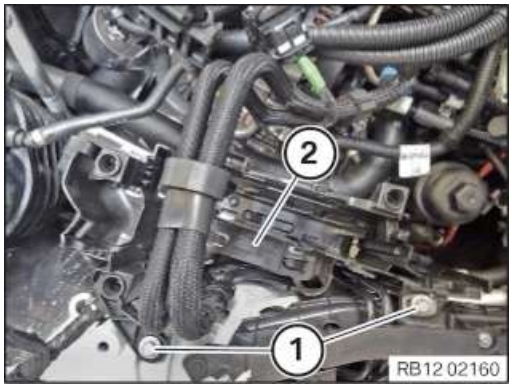


- Unlock the locks (1) .
- Guide out the cable clip (2) in the direction of arrow and set aside.

.com



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



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

13 – Releasing the wiring harness section with the starter generator lines partially

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

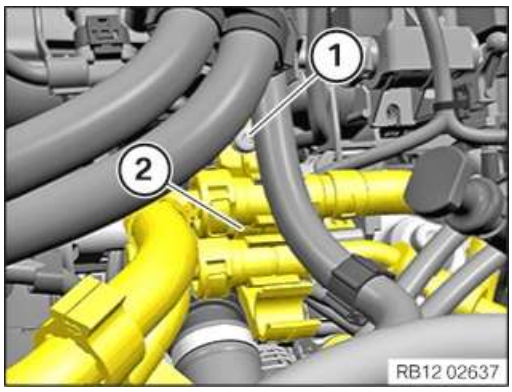
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the 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.

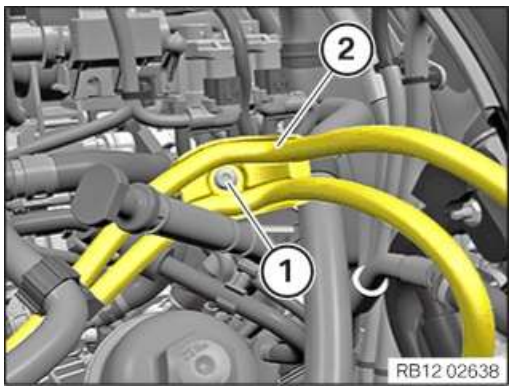


- Release the screw (1).
- Guide out fuel lines (2) and set them aside.

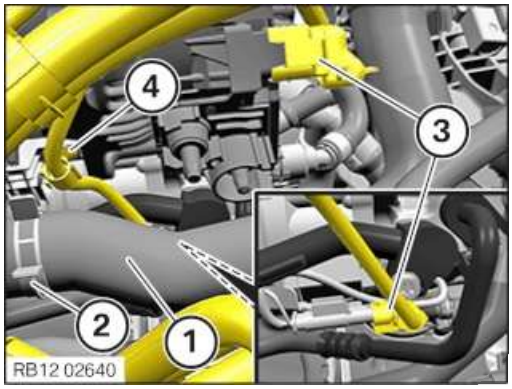
carlagn.com



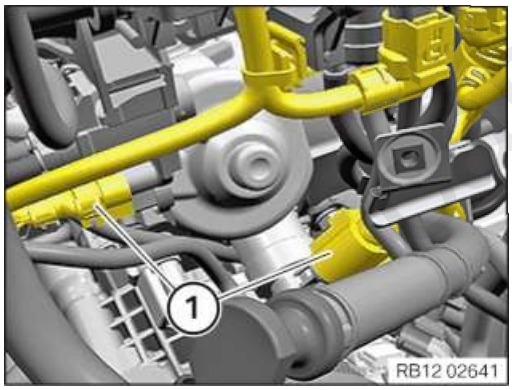
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.
- Loosen clamp (5).
- Thread out holder (2) and set aside.



- 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).



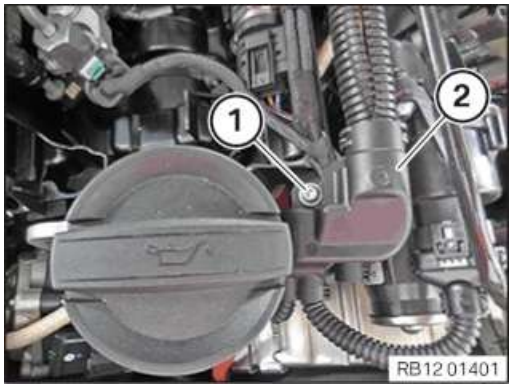
- Unlock and disconnect plug connections (1).



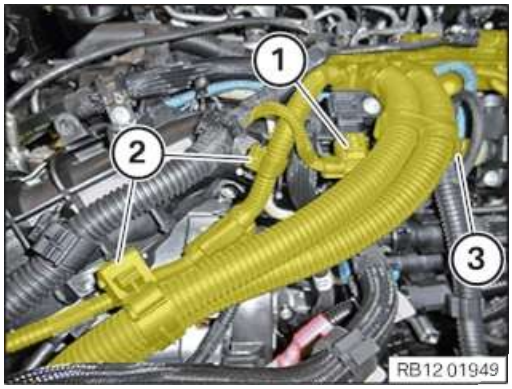
- Unlock and loosen connector (1).



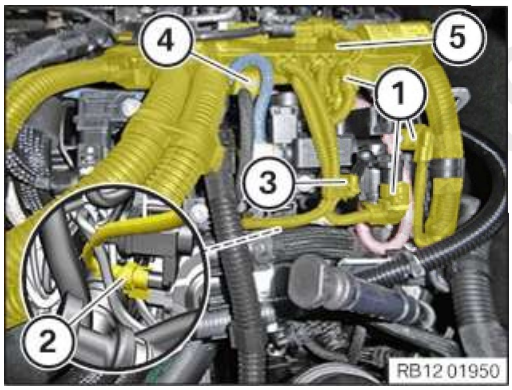
- Unlock plug connection (1) and disconnect.



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



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamp (3).



- Unlock and disconnect the plug connection (1).
- Unlock and disconnect the plug connection (2).
- Loosen clamp (3).
- Loosen screw (4).
- Guide out wiring harness section (5) as far as possible and set it aside.

14 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

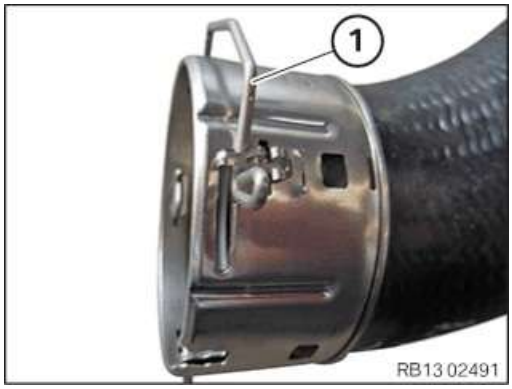
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

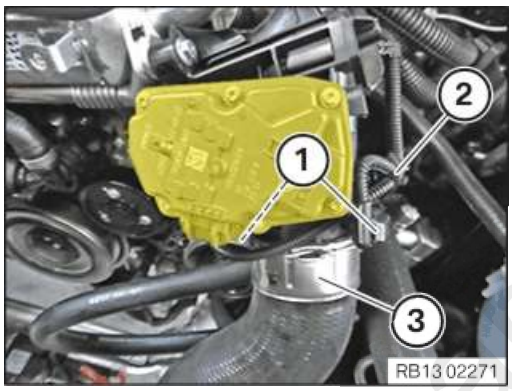
Electrostatic discharge.

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.

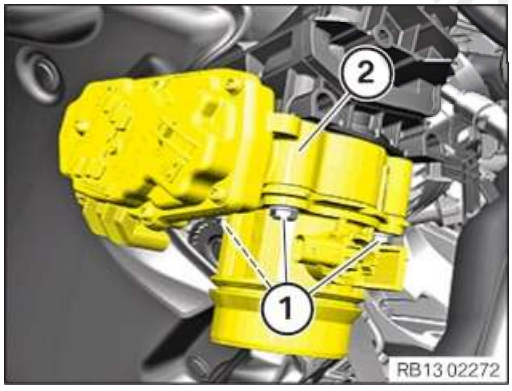


- Unlock and disconnect plug connections (1).

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).

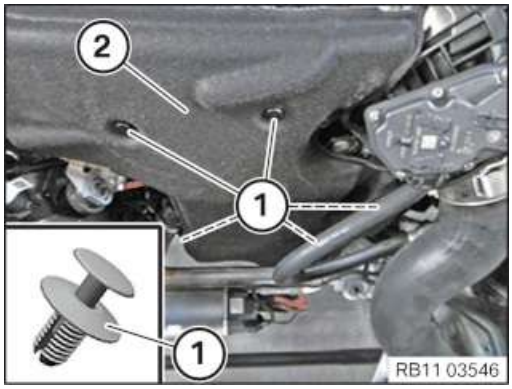
15 – Remove acoustic cover of the front engine

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 – Removing the drive belt for the starter motor generator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

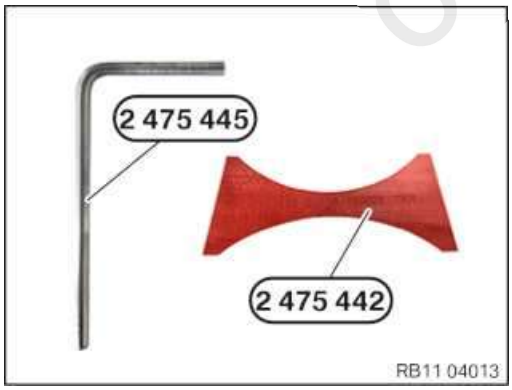
Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

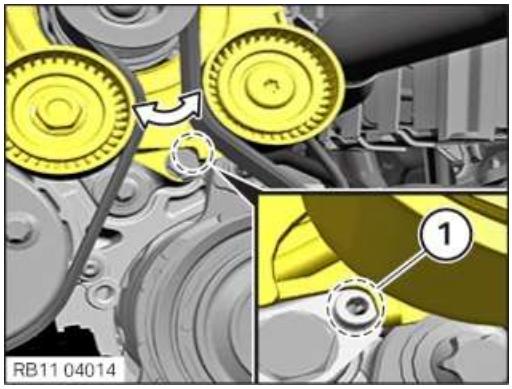
TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.

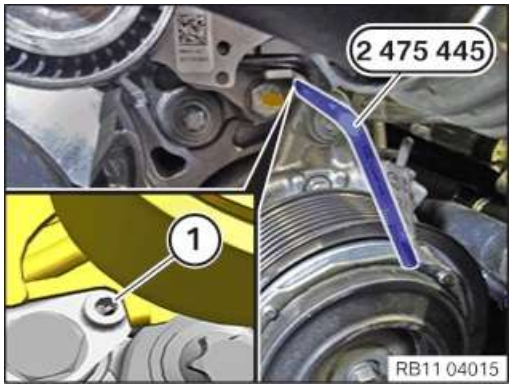


- Prepare the special tool 2 475 442 and the special tool 2 475 445.

cardiagn.com

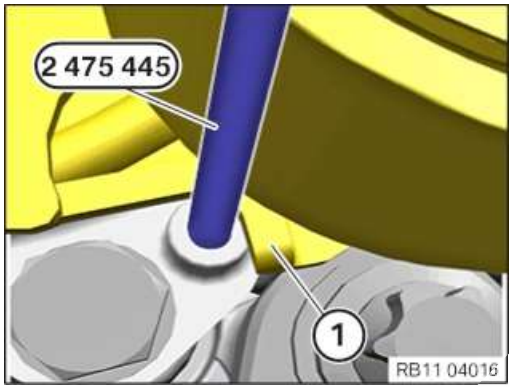


- Position the belt tensioner in the direction of the arrow so that the bore hole is visible in the area (1).

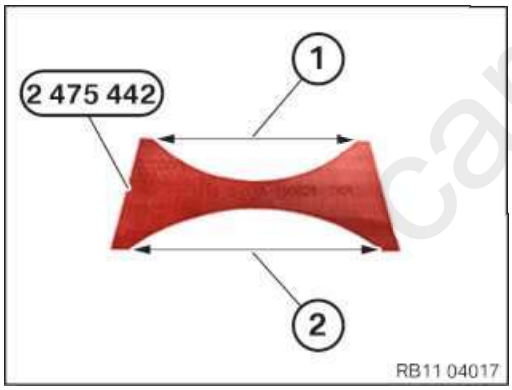


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

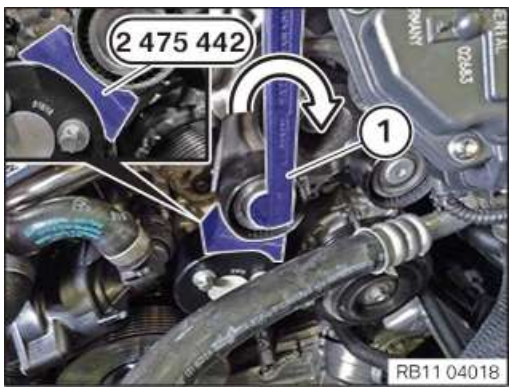
  The special tool 2 475 445 must rest against the starter motor generator.



- Ensure that the belt tensioner (1) is supported on the special tool 2 475 445.



- Ensure that the radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- Ensure that the radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.

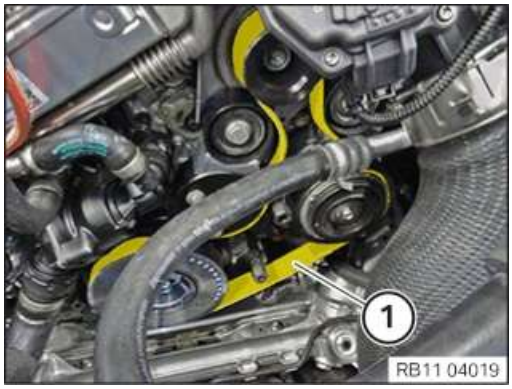


TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.

cardiagn.com



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

- Guide out and remove the drive belt (1) for the starter motor generator.

17 – Removing the starter motor generator

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 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)

▸ **Avoiding damage to the starter generator due to escaping coolant**

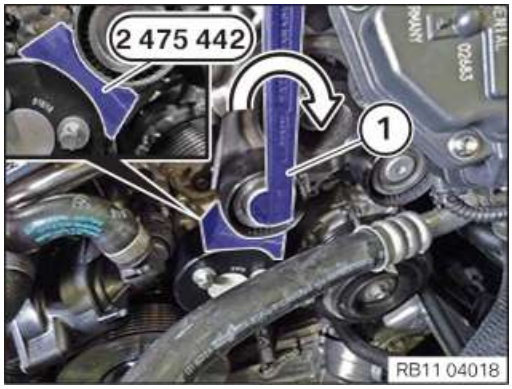
cardiagn.com

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

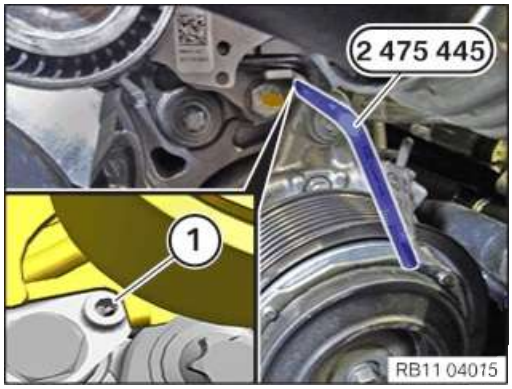
- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



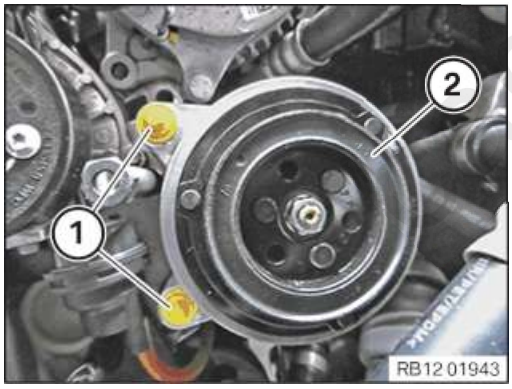
TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.



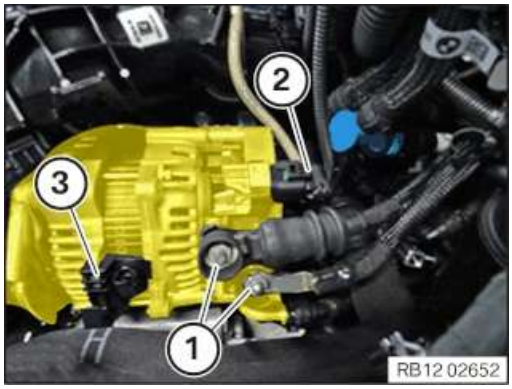
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.



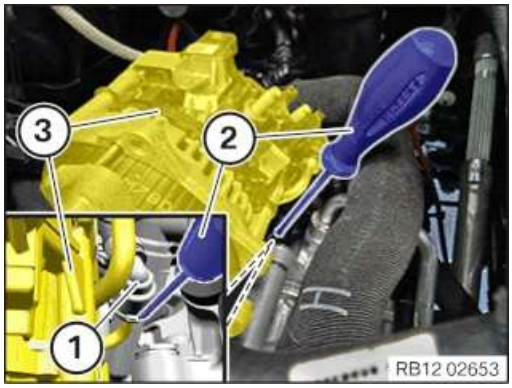
- Loosen screws (1).
- Slide the air conditioning compressor (2) out and set it aside.



- Guide out and remove the lid (1).



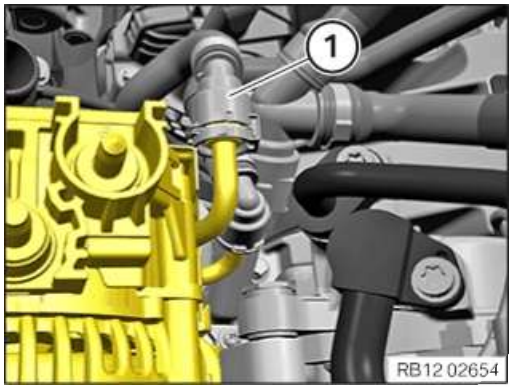
- Release nuts (1).
- Unlock plug connection (2) and disconnect.
- Loosen the holder (3).



TECHNICAL INFORMATION

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

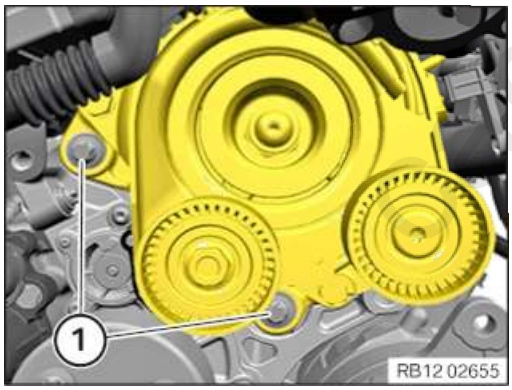
- Unlock and pull off the coolant line (1) with a screwdriver (2).
- Catch and dispose of escaping coolant.



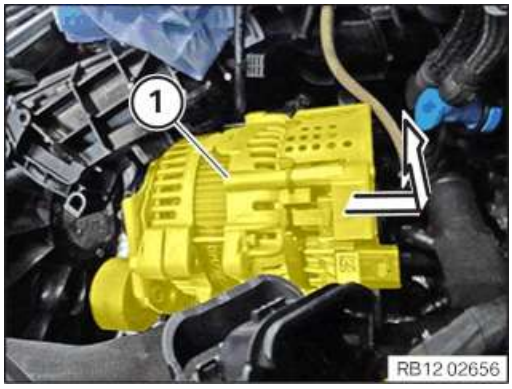
TECHNICAL INFORMATION

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

- Unlock and remove the coolant line (1).
- Catch and dispose of escaping coolant.



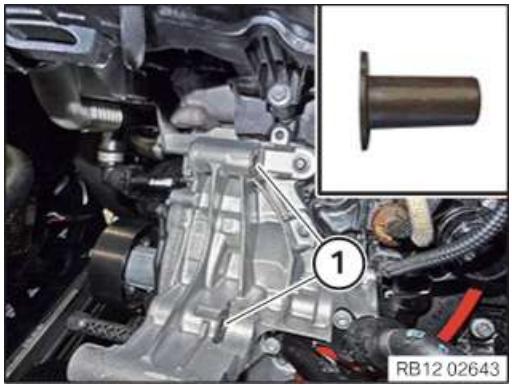
- Loosen screws (1).



- Feed out and remove the starter motor generator (1) in the direction of arrow.

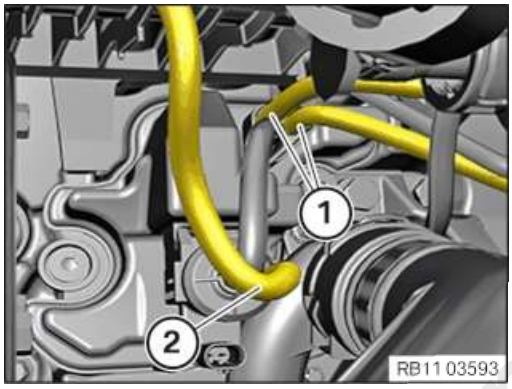


- Feed out and remove the bush (1).

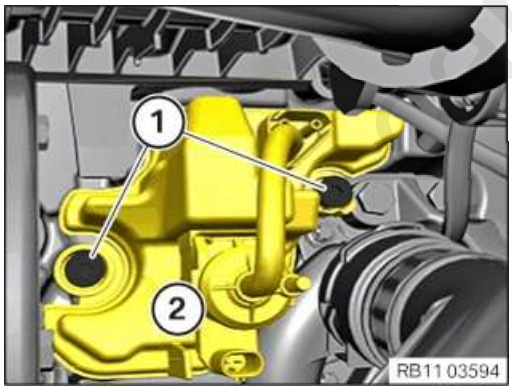


- Feed out and remove the bush (1).

18 – Remove vacuum reservoir

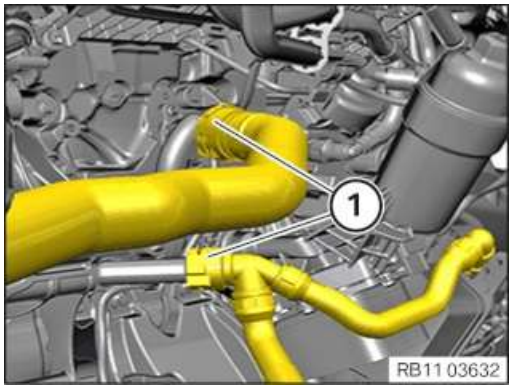


- Pull off vacuum hose (1) from the vacuum reservoir.
- Pull off the vacuum hose (2) from the electric changeover valve.

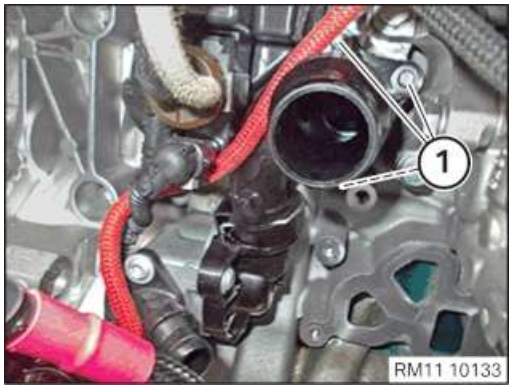


- Loosen screws (1).
- Feed out and remove the vacuum reservoir (2).

19 – Removing the component carrier



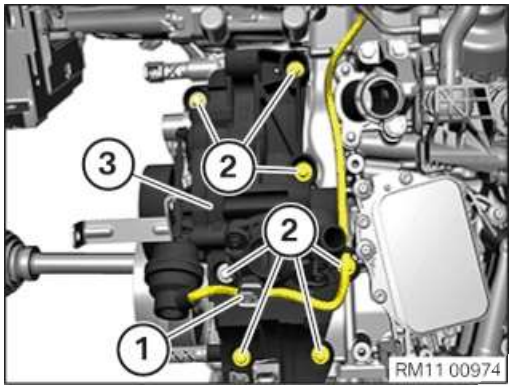
- Unlock and pull off the coolant hoses (1).



- Loosen screws (1).



- Loosen the screw (1) below the exhaust-gas recirculation cooler.



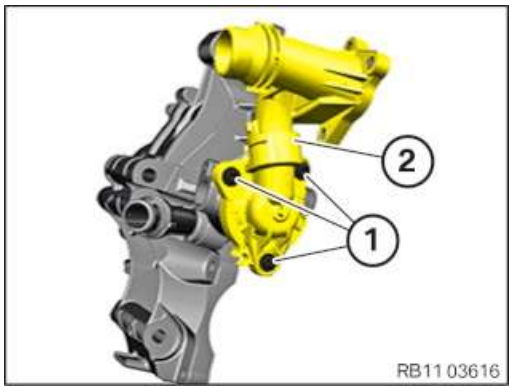
- Disconnect the vacuum line (1) from the vacuum unit and detach it from the clamp on the component carrier.
- Loosen screws (2).
- Lift off and remove the component carrier (3) from the crankcase.

MAIN WORK

20 – Removing the secondary coolant thermostat

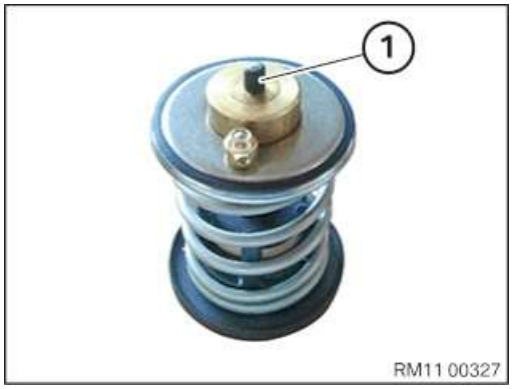
TECHNICAL INFORMATION

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



- Loosen screws (1).
- Guide out and remove the connecting branch (2).

cardiagn.com

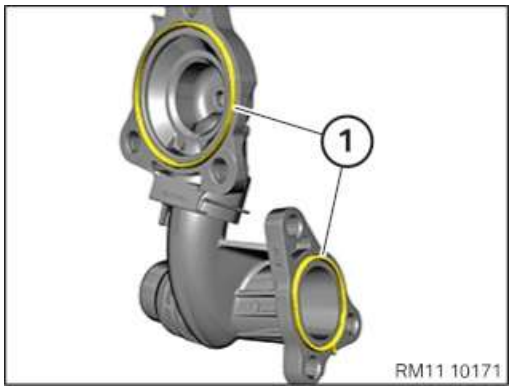


- Removing the secondary coolant thermostat.
- Ensure that the guide (1) is present on the secondary coolant thermostat.

21 – Installing the secondary coolant thermostat

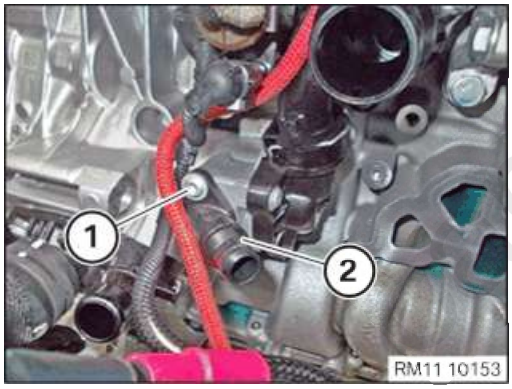
TECHNICAL INFORMATION

The sealing surfaces must be free from oils, grease and cleaning agents.

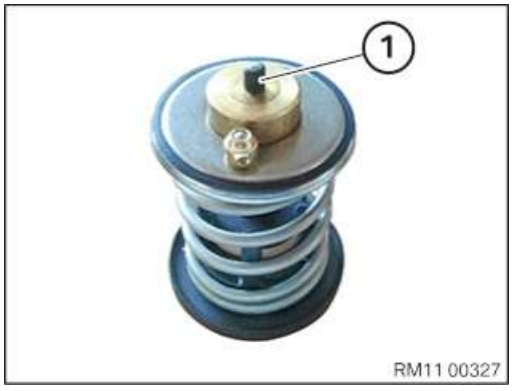


- Replace the seals (1).

  Parts: Seals



- Loosen screw (1).
- Guide out and remove the connecting branch (2).

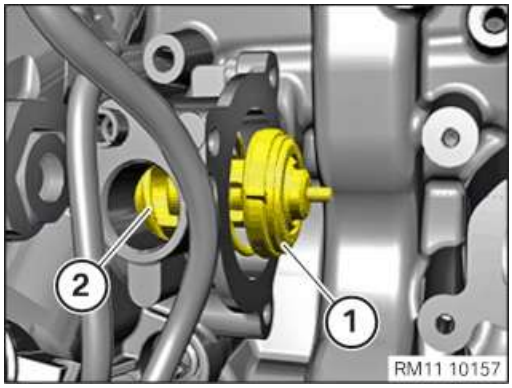


- Ensure that the guide (1) is present on the secondary coolant thermostat.
- Replace the coolant thermostat if the guide (1) is damaged or missing.

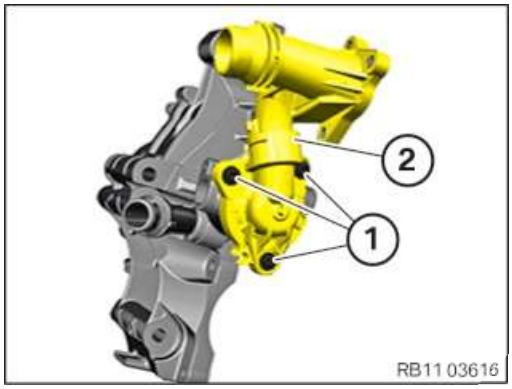
.com



- Position the coolant thermostat (1) in the connecting branch.
- When positioning the thermostat, one must make sure that the guide of the coolant thermostat (1)sits correctly in the housing (2).



- Position the coolant thermostat (1) in the component carrier.
- Fasten the coolant thermostat through the opening (2).



- Feed the coolant thermostat with the connecting branches (2) into the component carrier and install it.
- Tighten the screws (1).

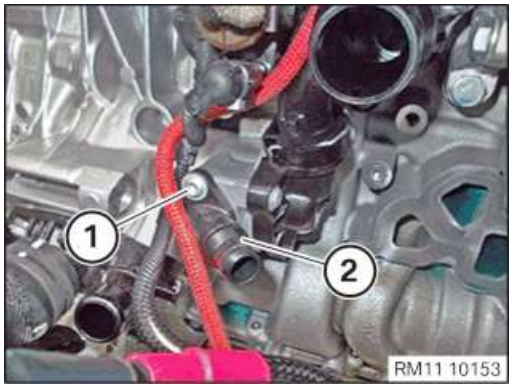
Connecting branch to component carrier

M6x20		Tightening torque	8 Nm



- Renew the O-ring (1) on the connecting branch.

  Parts: O-ring



- Insert connecting branch (2) and install.
- Tighten down screw (1).

Connecting branch to component carrier

M6x20		Tightening torque	8 Nm

POSTPROCESSES

22 – Installing the component carrier

cardiagn.com



RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

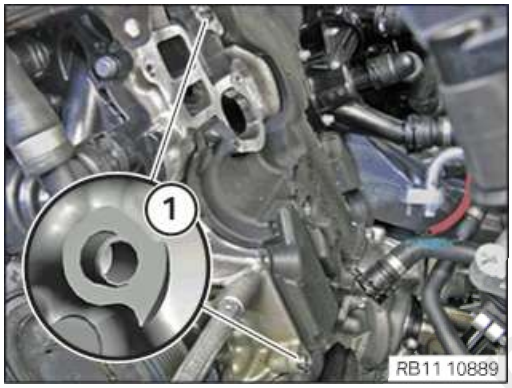
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

- Clean the sealing surface using special tool 0 495 102 (11 4 470).



- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).

Check



- Check the fitting sleeves (1) for damage.

desired state

- The fitting sleeves (1) must not be scratched or deformed.

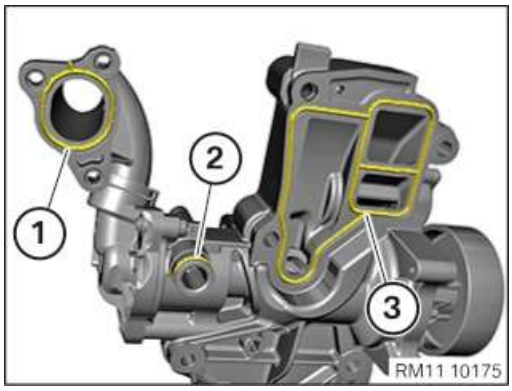
Result

» The fitting sleeves (1) are damaged.

Measure

- Renew fitting sleeves.

  Parts: Fitting sleeves



- Renew the seal (1).

  Parts: Gasket

- Renew O-ring (2).

  Parts: O-ring

- Check the sealing bead (3) for damage.
- Check the height of the sealing bead in reference to the surface.

Height of the sealing bead

	2,0 mm ... 2,5 mm

cardiagn.com

- If necessary, reapply the sealing bead.

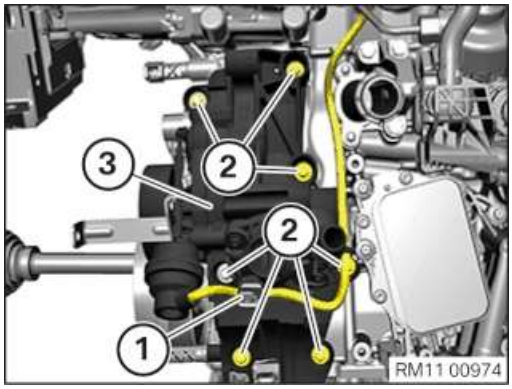
Sealing compound

Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

< 12 min



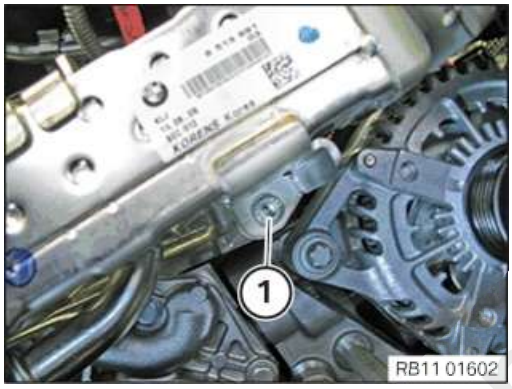
- Renew screws (2).

  Parts: Screws
- Position the component carrier (3) on the crankcase.
- Tighten the screws (2).

Component carrier to crankcase

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

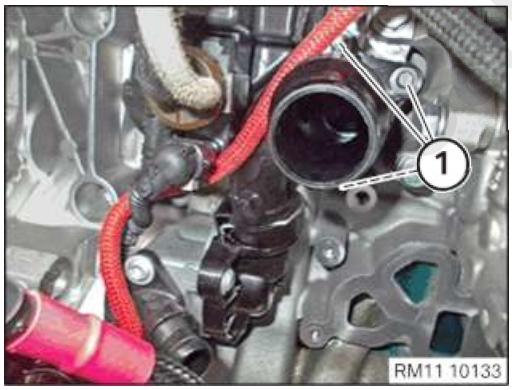
- Connect the vacuum line (1) on the vacuum unit and attach it in the clamp on the component carrier.



- Tighten the screw (1) below the exhaust-gas recirculation cooler.

Exhaust-gas recirculation cooler to cylinder head

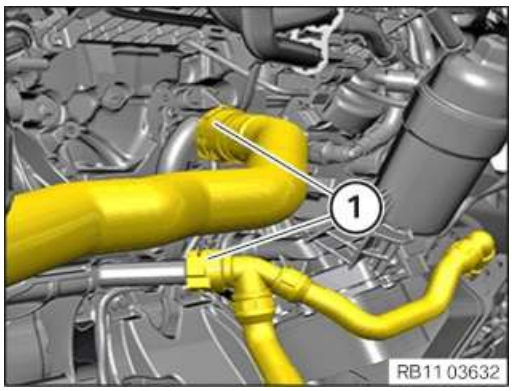
M8x20 / M8x28		Tightening torque	19 Nm



- Tighten the screws (1).

Connecting branch to engine block

M6x25		Tightening torque	8 Nm

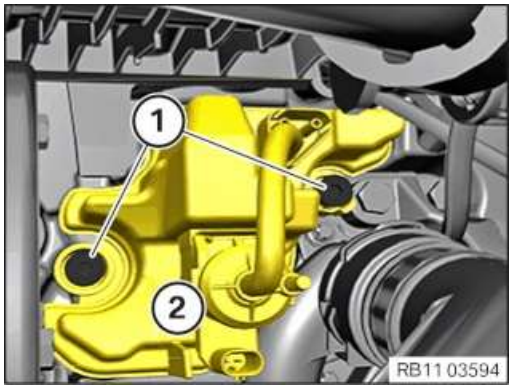


TECHNICAL INFORMATION

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

- Connect coolant hoses (1) and lock audibly.

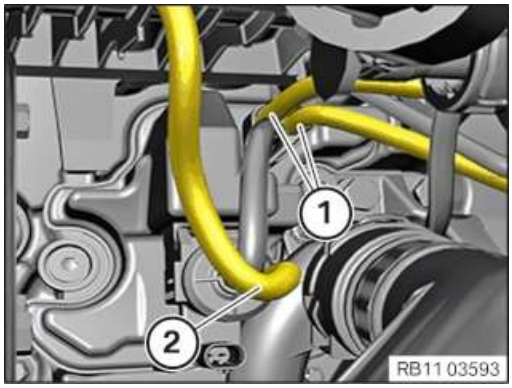
diagn.com



- Insert and install the vacuum reservoir (2).
- Tighten the screws (1).

Vacuum reservoir to crankcase

M6X25		Tightening torque	8 Nm



- Connect vacuum hoses (1) to the vacuum reservoir.
- Connect vacuum hose (2) to the electric changeover valve.

24 – Installing the starter motor generator

CAUTION

Improper routing of the positive battery cable.

Risk of short circuits!

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

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.

▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

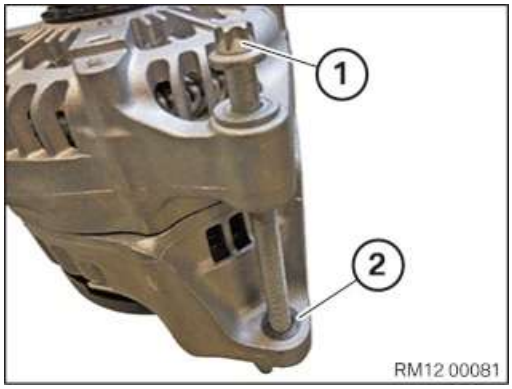
Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

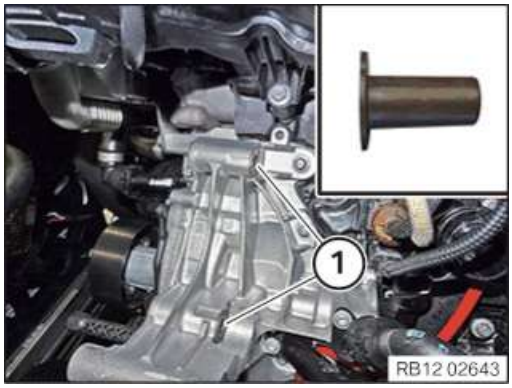
- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

▸ **Prepare for the installation of the alternator**

cardiagn.com



- Screw the screw (1) into the threaded support sleeve (2).
- Slightly press back the threaded support sleeve (2) using the bolt (1).
- Once again unscrew the screw (1) from the threaded support sleeve (2).



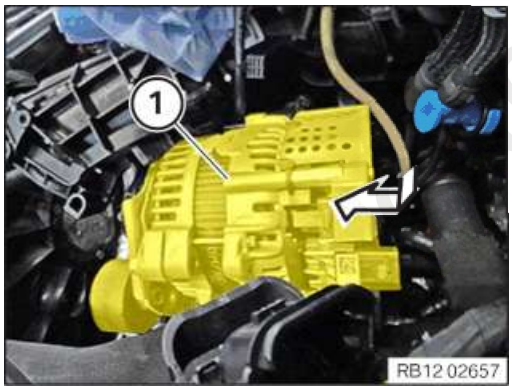
- Renew the bushes (1).

  Parts: Bushes
- Guide in and install the bushes (1).

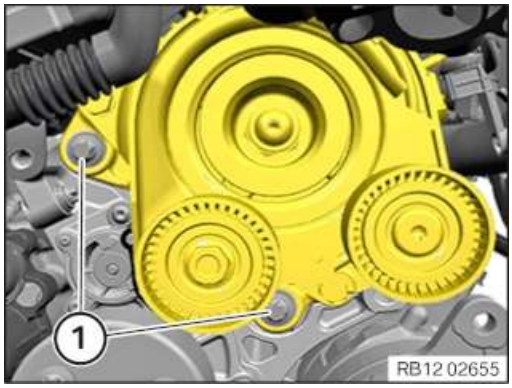


- Renew the bushes (1).

  Parts: Bushes
- Guide in and install the bushes (1).



- Guide in and install the starter motor generator (1) in the direction of the arrow.

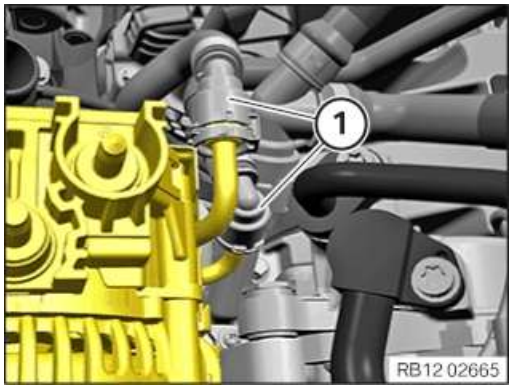


- Tighten the screws (1).

Alternator to component carrier

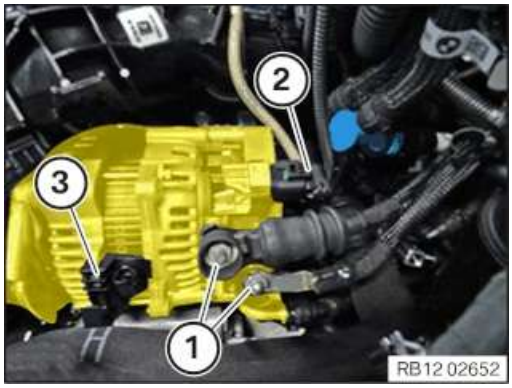
M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

rdiagn.com



- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



- Fasten the holder (3).
- Connect connectors (2) and lock.

  The connector (2) must engage audibly.
- Renew nuts (1).

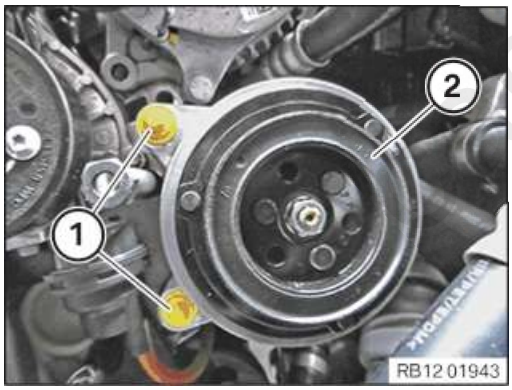
  Parts: Nuts
- Tighten nuts (1).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm



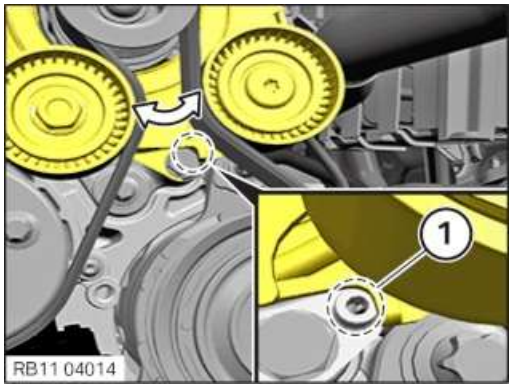
- Guide in and install the lid (1).



- Insert and install the air conditioning compressor (2).
- Tighten the screws (1).

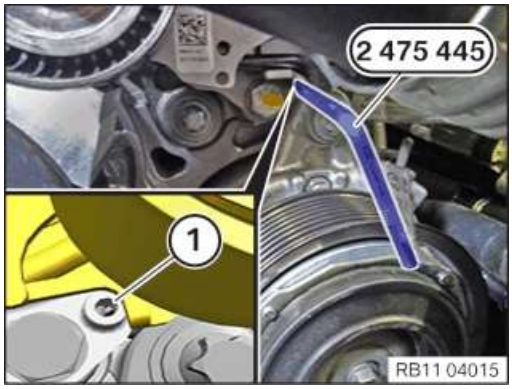
Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm



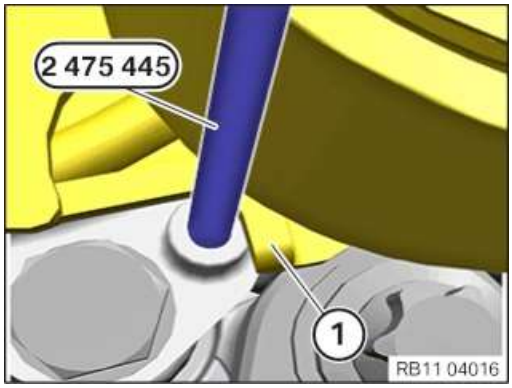
- Position the belt tensioner so that the bore hole is visible in the area (1).

rdiagn.com

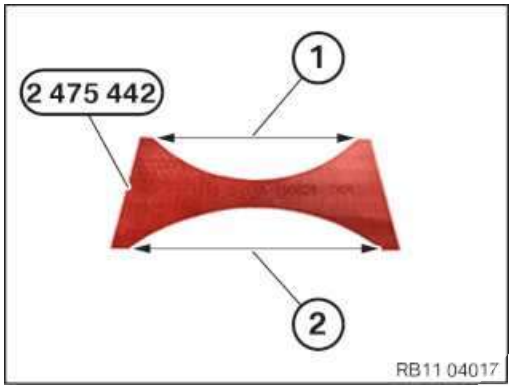


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

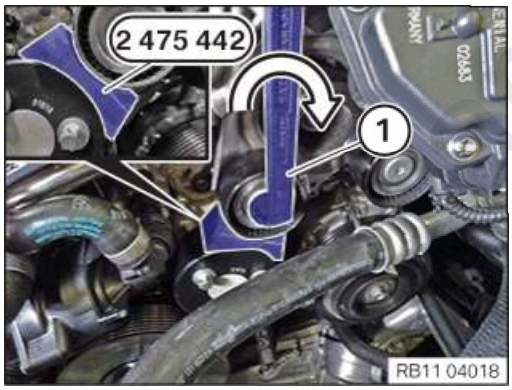
  The special tool 2 475 445 must rest against the starter motor generator.



- The belt tensioner (1) must be supported on the special tool 2 475 445.



- The radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- The radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.



TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.

25 – Installing the drive belt for the starter motor generator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

mdiagn.com

CAUTION

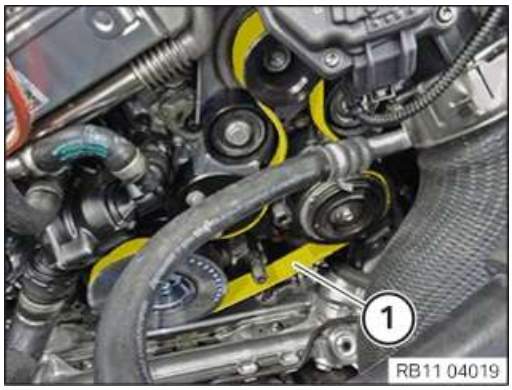
Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

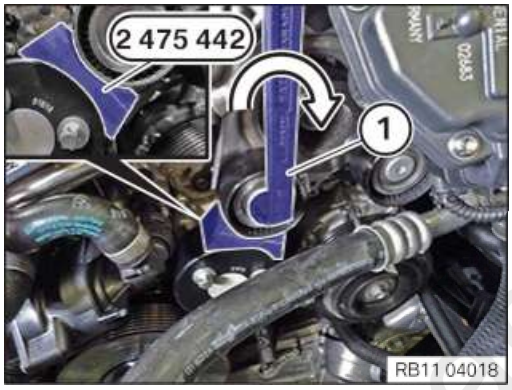
The drive belt must be replaced if contaminated with coolant- and oil residues.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

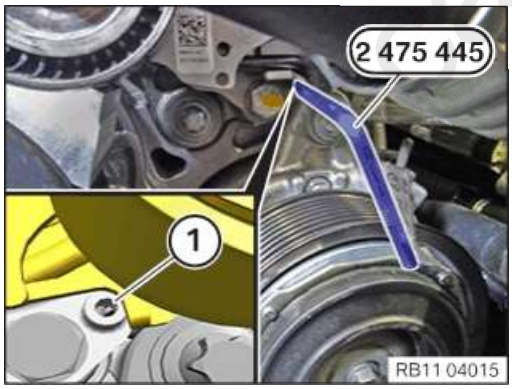
- Feed in and install the drive belt (1) for the starter motor generator.



TECHNICAL INFORMATION

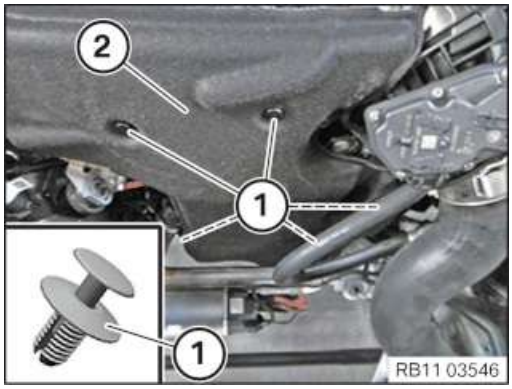
Conduct the following operation with the assistance of a second person.

- Turn the tensioning pulley in (1) in the direction of arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.



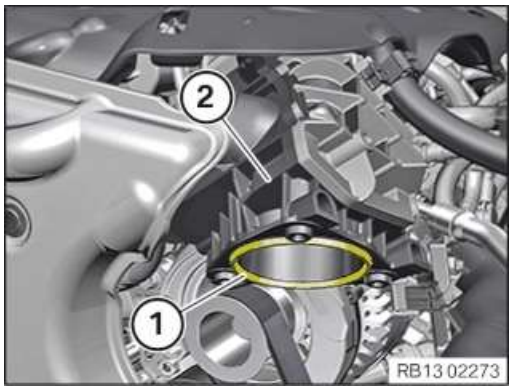
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.

26 – Install acoustic cover for the engine, front



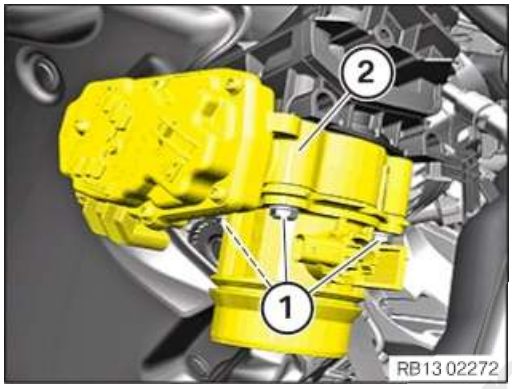
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

27 – 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

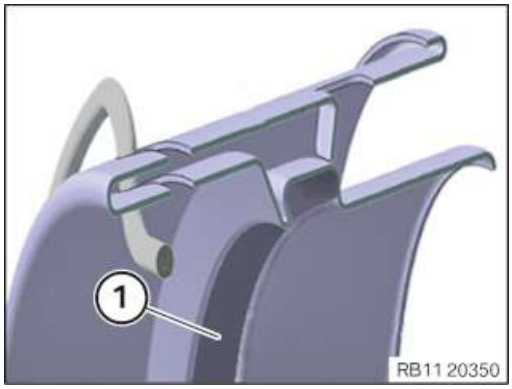


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

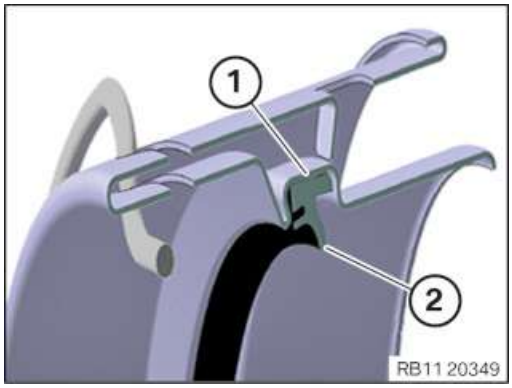
TECHNICAL INFORMATION

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.



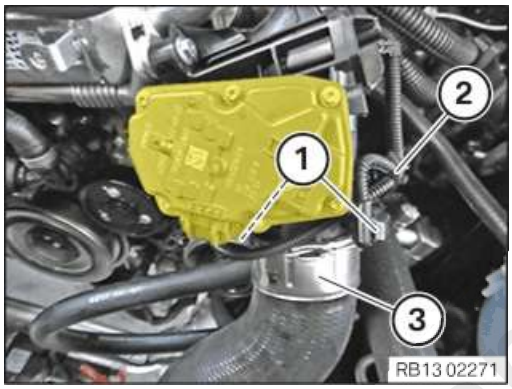
- Renew gasket.

  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.



- Lock clamp (1).

28 – Partially securing the wiring harness section with the starter generator cables

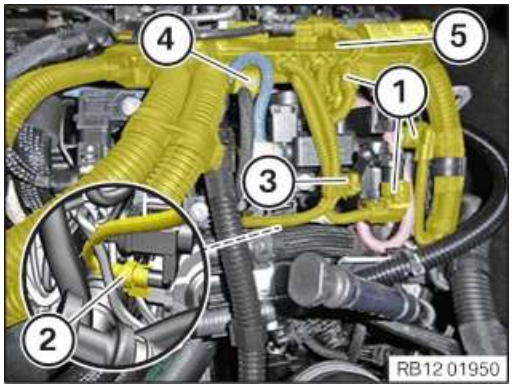
carmanuals.com

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

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

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



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

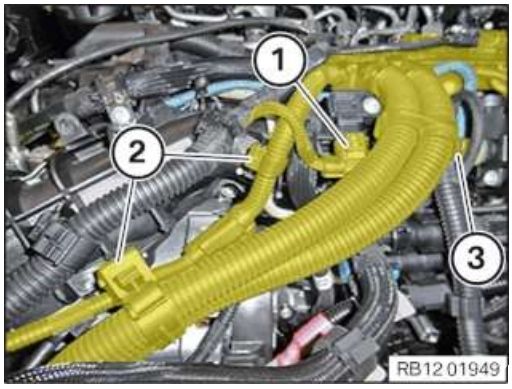
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

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

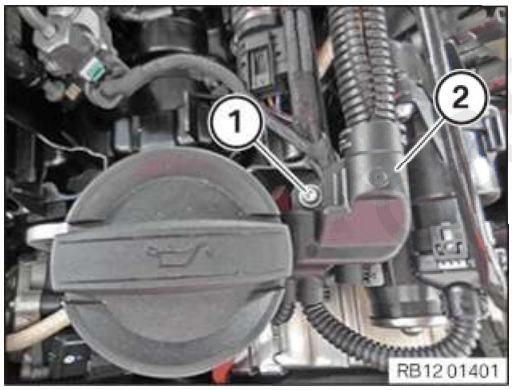
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- 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.

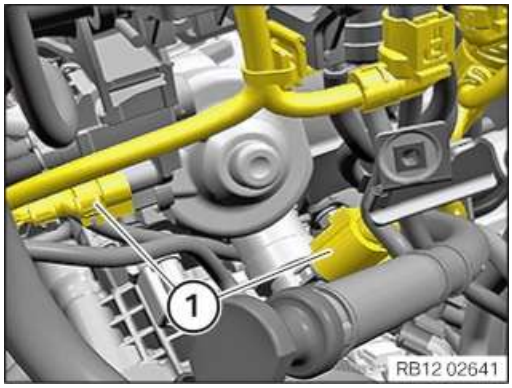
  The connector (1) must engage audibly.

.com



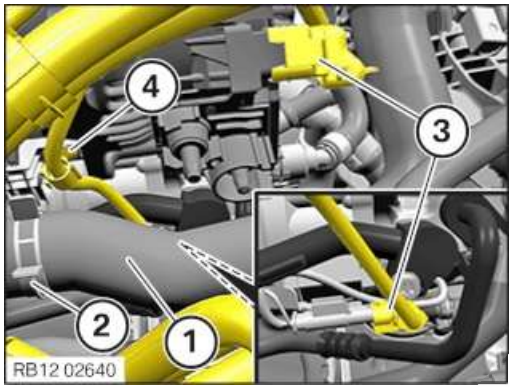
- Connect the connector (1) and lock it.

  The connector (1) must engage audibly.



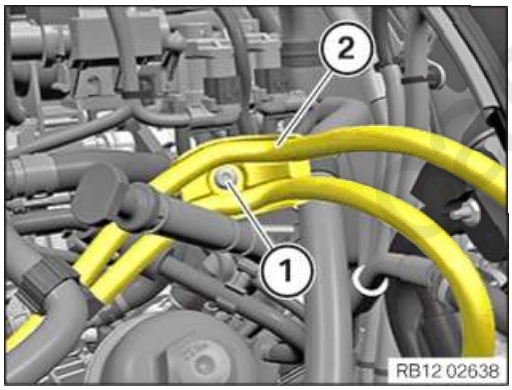
- Connect connectors (1) and lock.

  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).

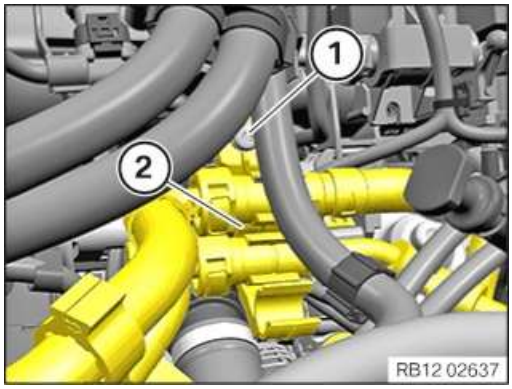
  Parts: Nuts
- Tighten nuts (3) and (2).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm

- Guide in and install the lid (1).

mydiagn.com



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

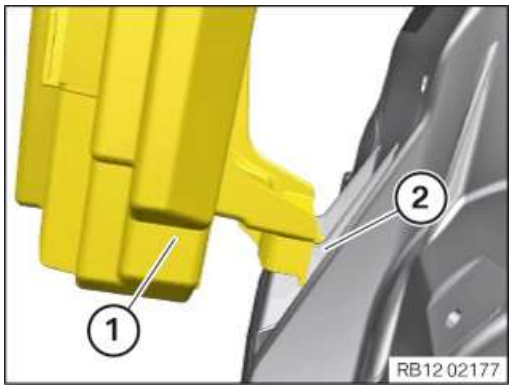
Holder on intake plenum

TS6X20		Tightening torque	5 Nm

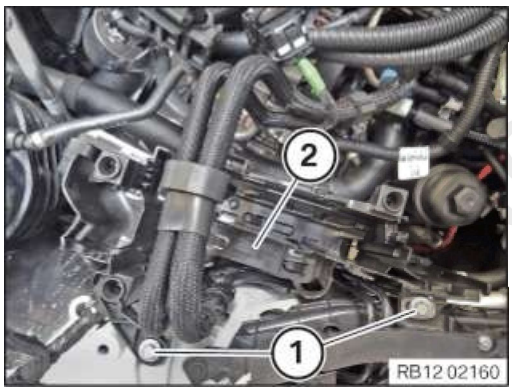
29 – Installing the control unit holder

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.



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



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

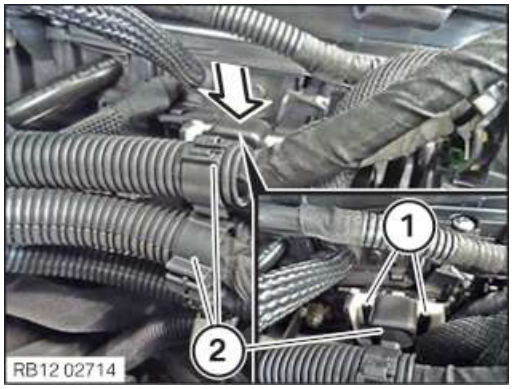
Control unit holder

M6		Tightening torque	8 Nm



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

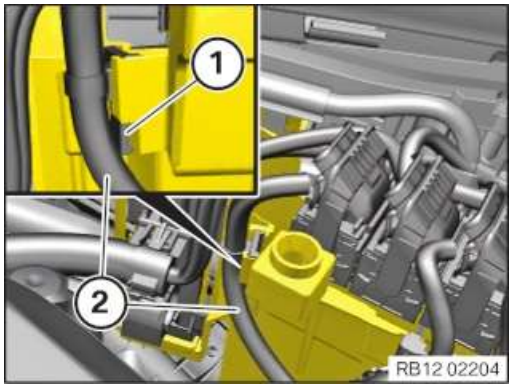
  Lock (arrow) must audibly engage.



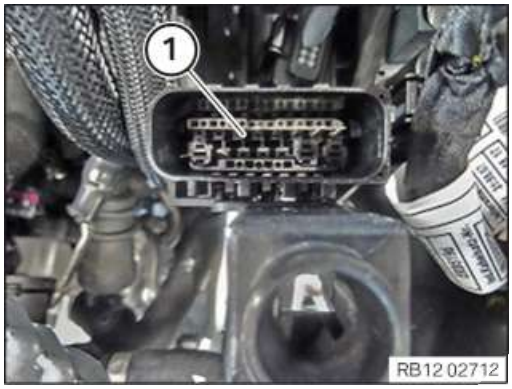
NOTICE

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

- Guide in cable clip (2) in the direction of the arrow and install it.
- Ensure that the locks (1)engage audibly.

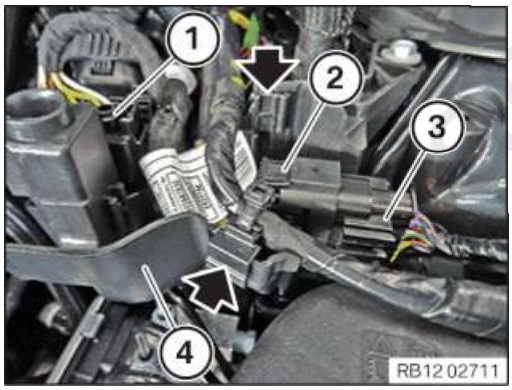


- Guide in the wiring harness section (2) and install.
- Connect and lock the cable clip (1).



- 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.

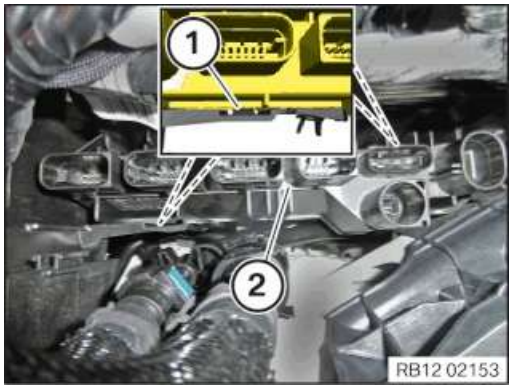
  The connector (1) must engage audibly.
- Secure the clamps (arrows).

30 – Installing the integrated supply module (PDM) partially

Prerequisite

Engine control unit has been removed.

rdiagn.com



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

  The latch mechanisms (1) must engage audibly.

31 – 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

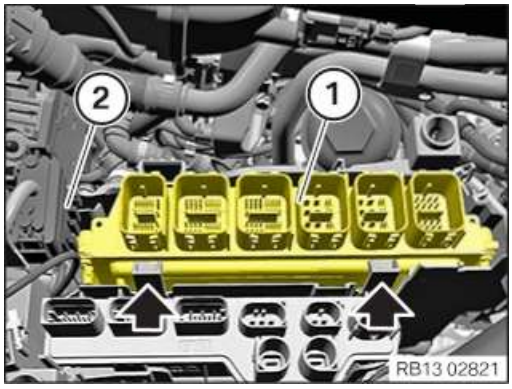
TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.

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

TECHNICAL INFORMATION

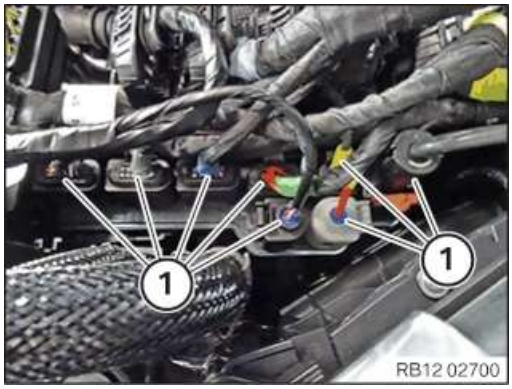
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Make sure that the plug connection (2) does not get damaged.
- Insert the DDE control unit (1) **carefully** and install it.

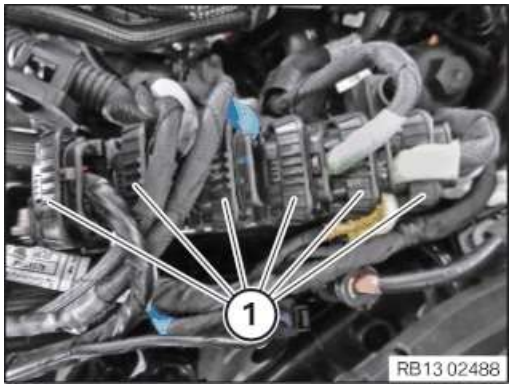
  The latch mechanisms (arrows) must engage audibly.

cardiagn.com



- Connect connectors (1) and lock.

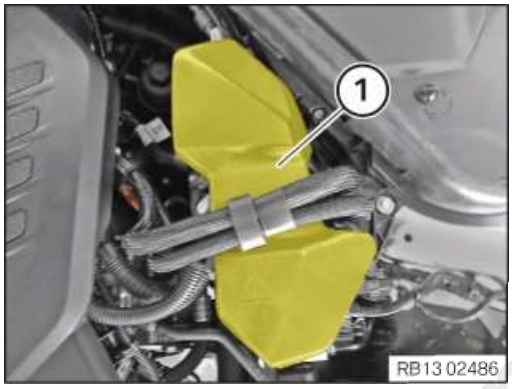
  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

32 – Install the cover for the DDE control unit

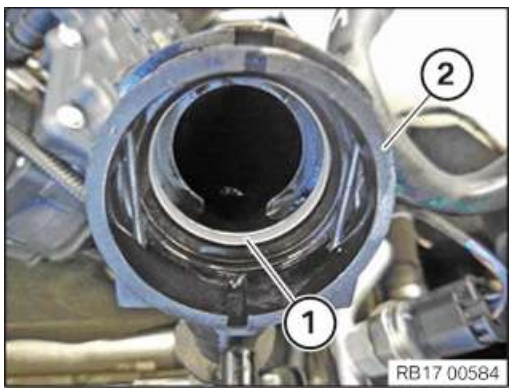


- Insert and install cover (1) into guides.

33 – Connecting the coolant lines

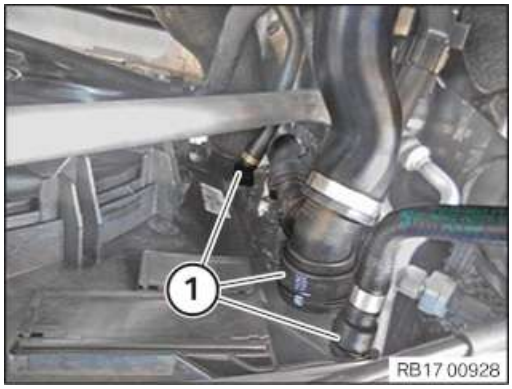
TECHNICAL INFORMATION

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



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

cardiagn.com

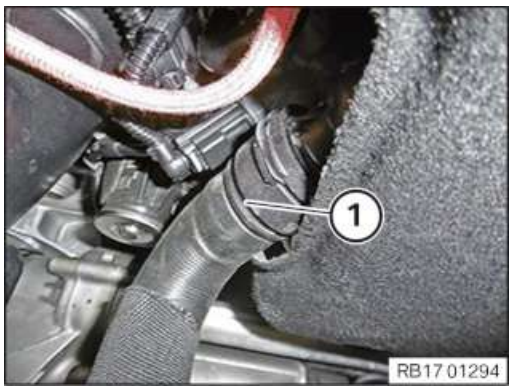


NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



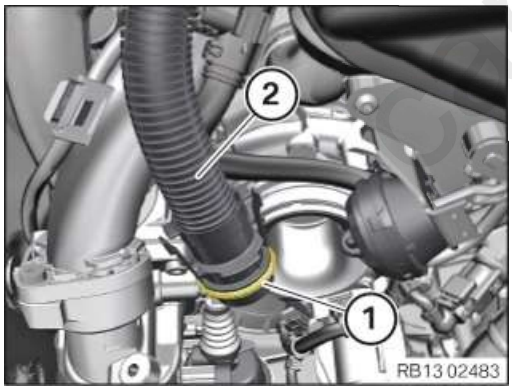
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

34 – Installing the clean air pipe with resonator



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

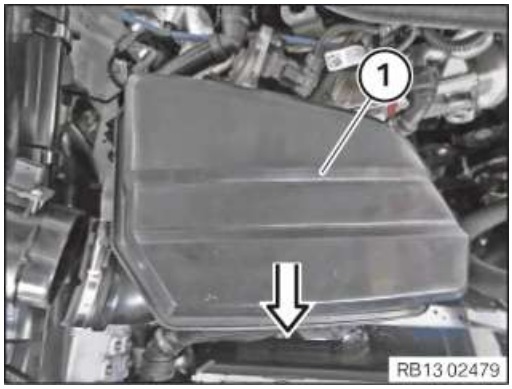


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



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

cardiagn.com

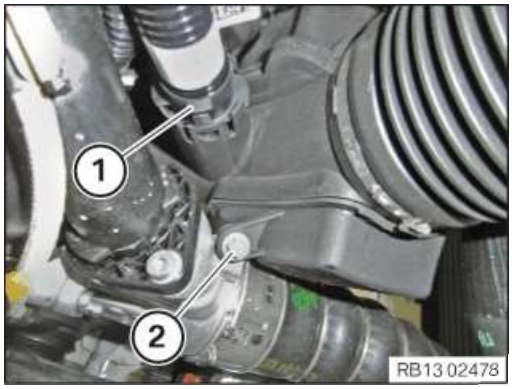


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

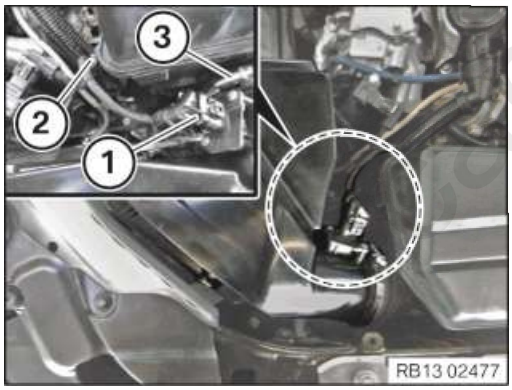
  The clamp (1) must engage audibly.



- 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.

35 – Install acoustic cover

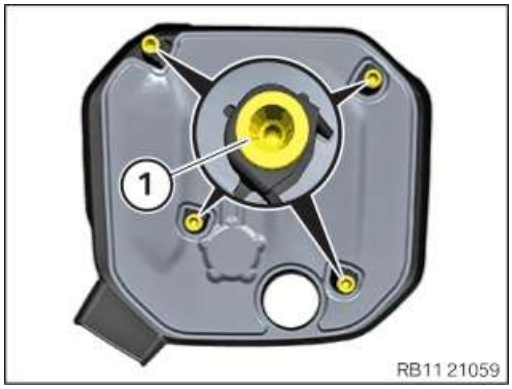
RISK OF DAMAGE

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.

cardiagn.com



- 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.

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.

cardiagn.com



- 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 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

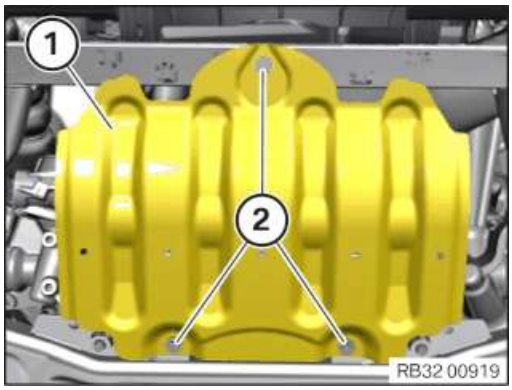
- See additional information.

39 – If installed: Install underbody protection of the steering

cardiagn.com

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

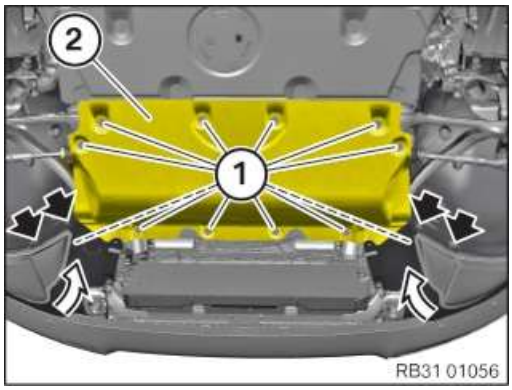
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

40 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

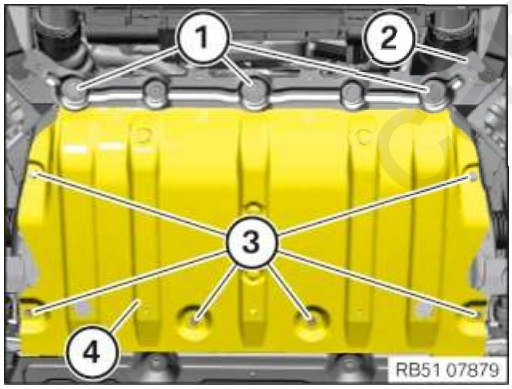
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

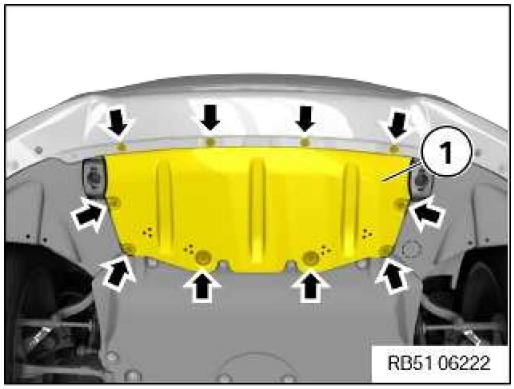
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

41 – Installing the front underbody protection



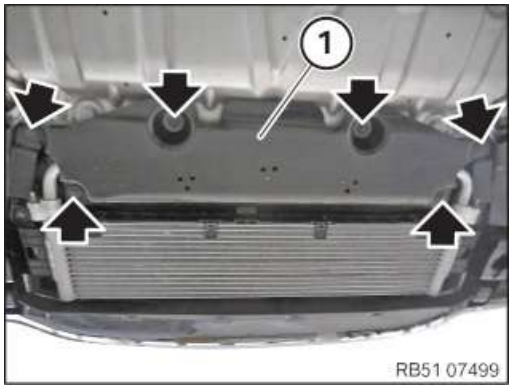
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



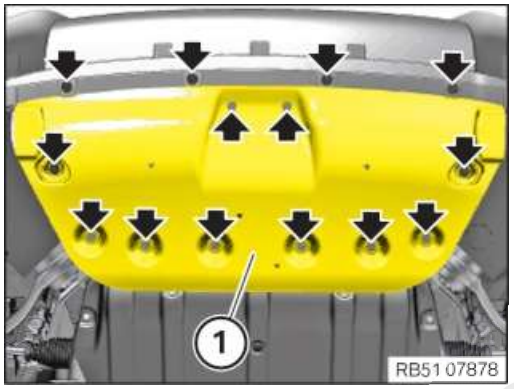
- **Version B:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Connecting branch to component carrier — Used in step 21

M6x20		Tightening torque	8 Nm

Component carrier to crankcase — Used in step 22

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

Exhaust-gas recirculation cooler to cylinder head — Used in step 22

M8x20 / M8x28		Tightening torque	19 Nm

Connecting branch to engine block — Used in step 22

M6x25		Tightening torque	8 Nm

Vacuum reservoir to crankcase — Used in step 23

M6X25		Tightening torque	8 Nm

cardiagn.com

Alternator to component carrier			Used in step 24
M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

Battery positive lead on the starter motor generator			Used in step 2428
M8		Tightening torque	19 Nm

Air conditioning compressor in component carrier			Used in step 24
M10		Tightening torque	38 Nm

Throttle body to intake plenum			Used in step 27
6x50		Tightening torque	8 Nm

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

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

Control unit holder			Used in step 29
M6		Tightening torque	8 Nm

Clean air pipe to exhaust turbocharger			Used in step 34
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 34
Clamp		Tightening torque	3 Nm

Negative battery cable to 48-V battery			Used in step 37
Nut M8		Tightening torque	19 Nm

Underbody protection, steering, to front axle support			Used in step 39
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 39
Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 40
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front			Used in step 40
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

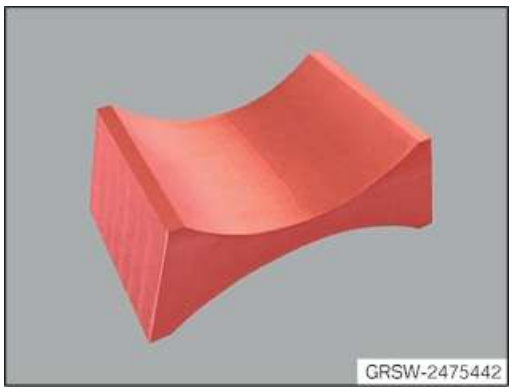
cardiagn.com

Underbody protection front Used in step 41

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

Overview of Special Tools

2 475 442 Removal and installation tool



Common Used in step 16172425

Usage	For removing and installing the drive belt of the ancillary components.
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475445
SI-Number	01 19 19 (668)

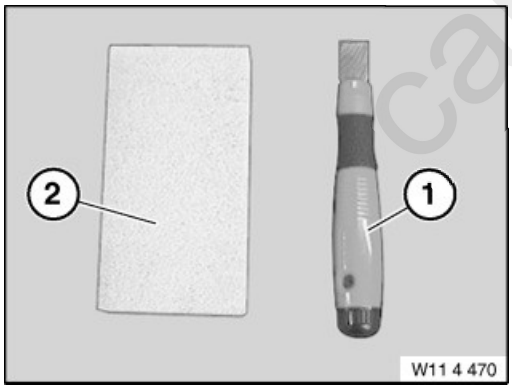
2 475 445 Pin



Common Used in step 16172425

Usage	Tool for drive belt of 48 V ancillary components
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475442 83302475444
SI-Number	01 19 19 (668)

0 495 102 (11 4 470) Tool



Common Used in step 22

Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Overview Technical Data

cardiagn.com

Height of the sealing bead	Used in step 22
	2,0 mm ... 2,5 mm

Processing time of liquid sealing compound	Used in step 22
	< 12 min

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	137

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	1031

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236

carclan.com

61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 35 ... Notes on ESD protection (Electro Static Discharge)	1011131417
61 35 ... Notes on ESD protection (Electro Static Discharge)	101113141724
61 00 730 Encode/program control unit(s) (after vehicle test)	31
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38

cardiagn.com

17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	38
17 00 039 Bleeding cooling system (B37, B47)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	38
17 00 008 Draining and topping up the high-temperature coolant circuit	38
17 00 008 Draining and topping up the high-temperature coolant circuit	38
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	38
17 00 008 Draining and topping up the high-temperature coolant circuit	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	38
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38

cardiagn.com

17 00 008 Draining and topping up coolant for high-temperature circuit 38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 38

cardiagn.com

11 53 000 Removing and installing/replacing coolant thermostat

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

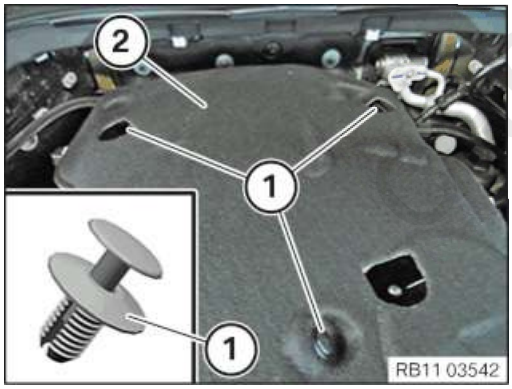
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- 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.

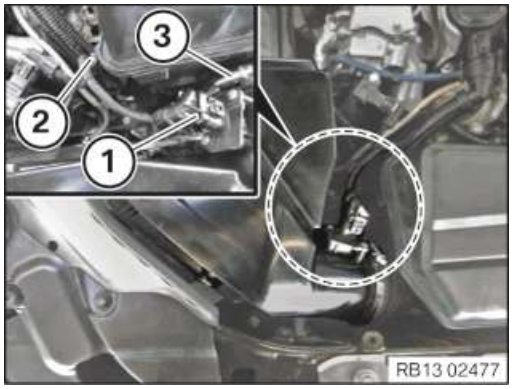
3 – Removing the clean air pipe with the resonator

WARNING

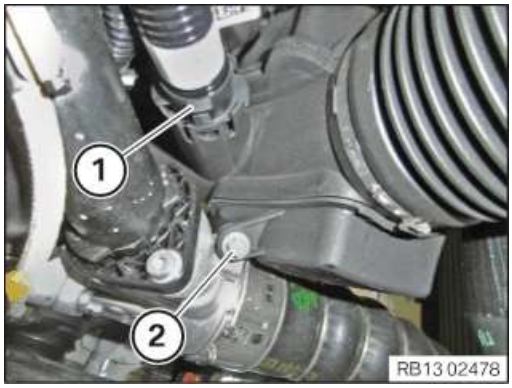
Hot surfaces.

Risk of burning!

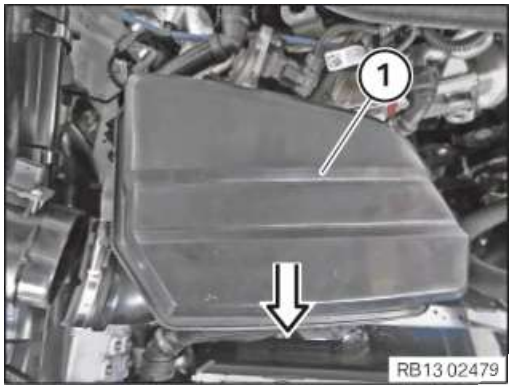
- Perform all work only on components that have cooled down.



- 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.

4 – Remove acoustic cover of the front engine

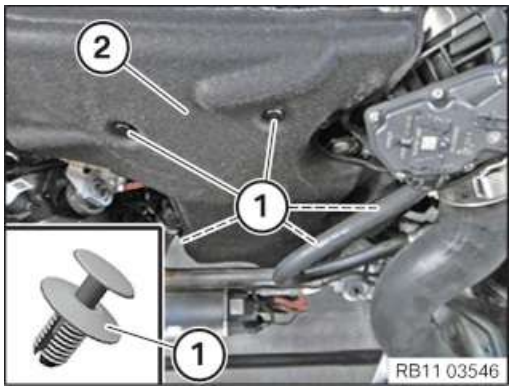
rdiagn.com

WARNING

Hot surfaces.

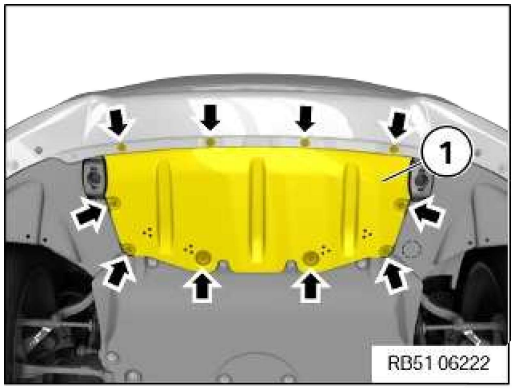
Risk of burning!

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



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

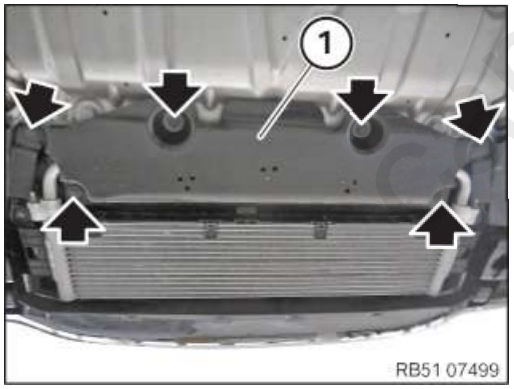
5 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

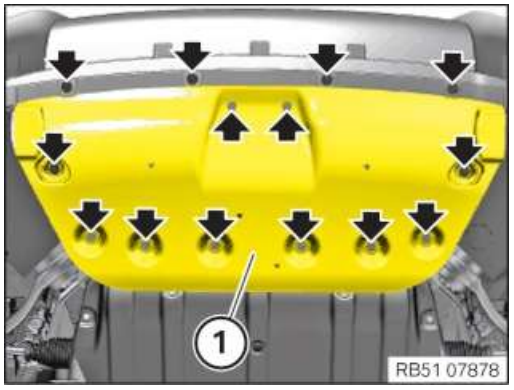
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

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

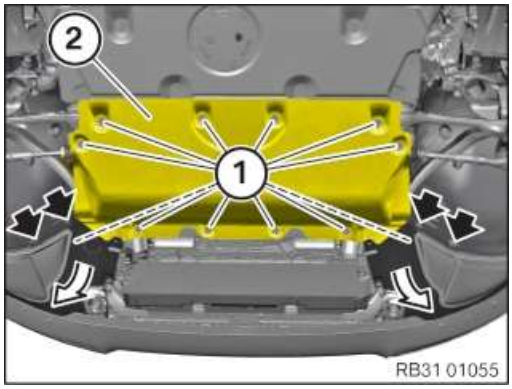


- **Version C:**

  Remove screws (arrows).

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

6 – Remove the underbody protection of the steering gear



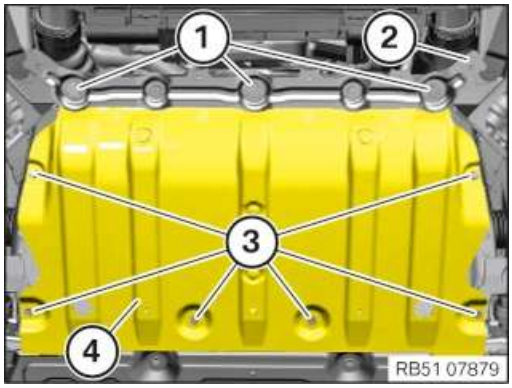
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

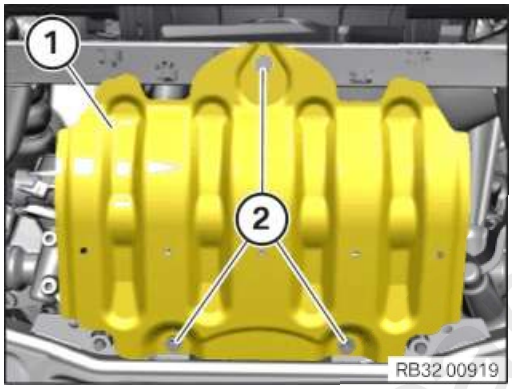
  Loosen screws (3).

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

7 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

8 – Draining the coolant from the high-temperature cooling system

WARNING

Hot fluids.

Risk of scalding!

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

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.

cardiagn.com

TECHNICAL INFORMATION

Life-long fill of coolant!

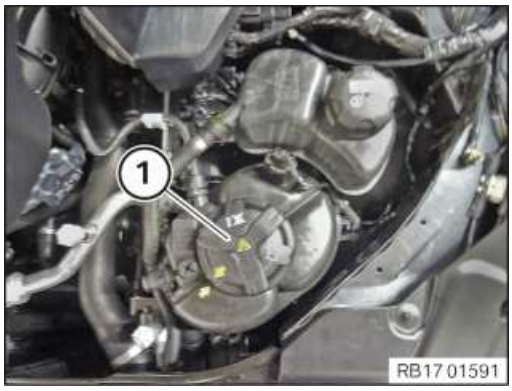
Do not reuse used coolant.

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

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

TECHNICAL INFORMATION

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



- Loosen sealing cap (1).

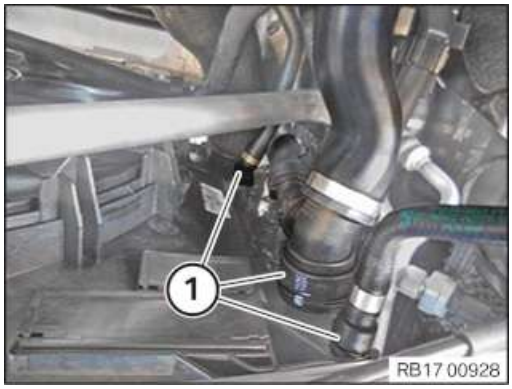
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



NOTICE

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

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.

carolagn.com



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

9 – Removing the exhaust-gas recirculation cooler

▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

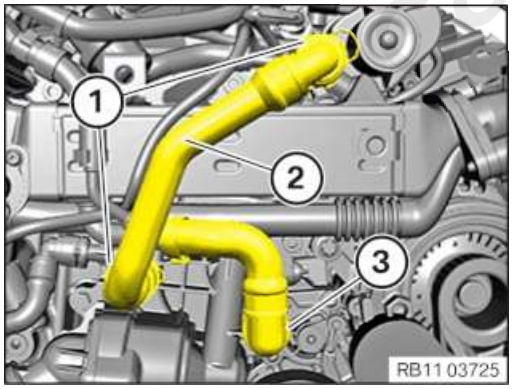
Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



- **Version A:**

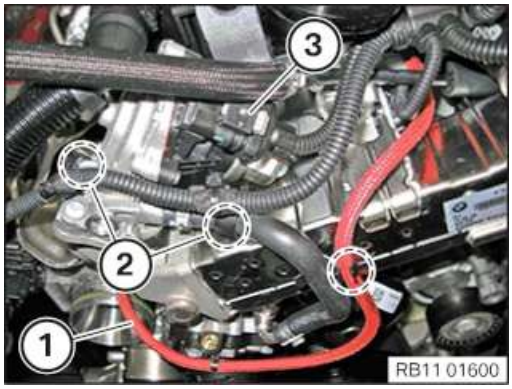
  Unlock and pull off coolant lines (1).



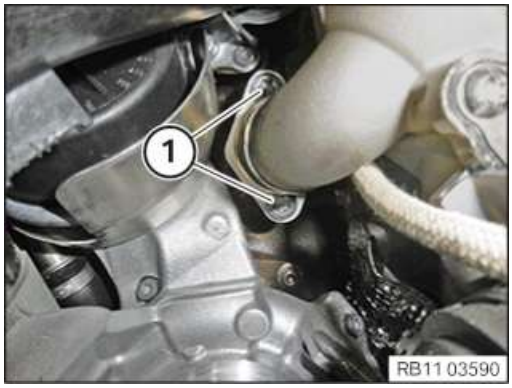
- **Version B:**

  Unlock locks (1) and remove thee coolant line (2).

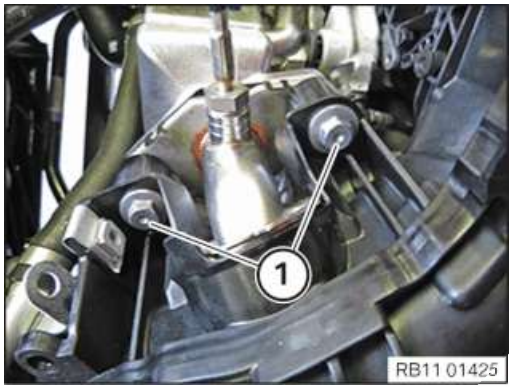
  Unlock coolant line (3) and pull it off the thermostat.



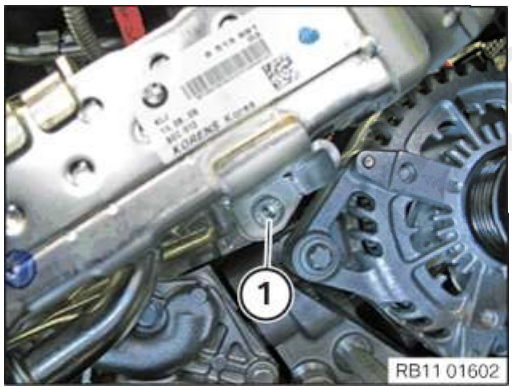
- Loosen the vacuum line (1) from the exhaust-gas recirculation cooler and detach in the highlighted area.
- Loosen the vehicle wiring harness from the exhaust-gas recirculation valve and the coolant line at the clips (2).
- Unlock and disconnect the connector (3) at the exhaust-gas recirculation valve.



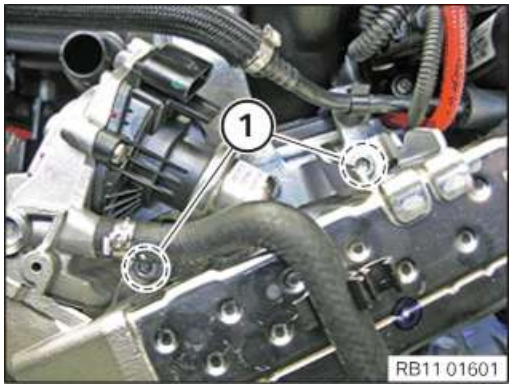
- Release the bolts (1) from the exhaust-gas recirculation cooler.



- Loosen the screws (1) on the intake system.



- Loosen the screw (1) below the exhaust-gas recirculation cooler.



- Loosen screws (1).
- Remove exhaust-gas recirculation cooler.

mdiagn.com

TECHNICAL INFORMATION

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

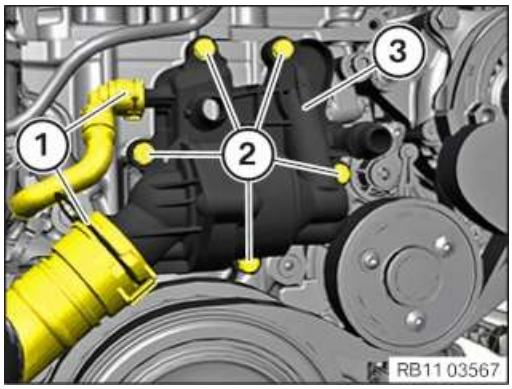
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

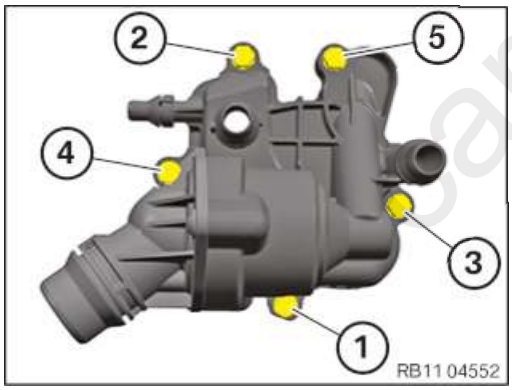
- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



- Unlock and pull off coolant lines (1).
- Loosen screws (2).
- Remove the thermostat housing (3) with the coolant thermostat.

11 – Installing the coolant thermostat

Tightening sequence for coolant thermostat

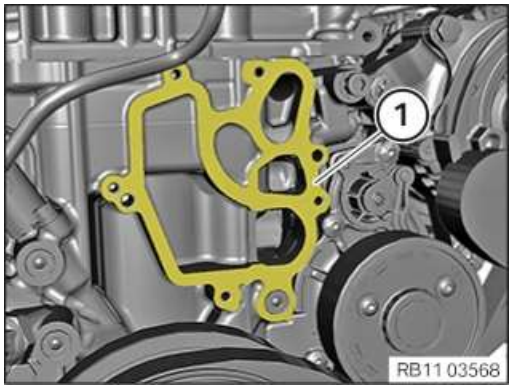


1 - 5 Screws on the coolant thermostat

TECHNICAL INFORMATION

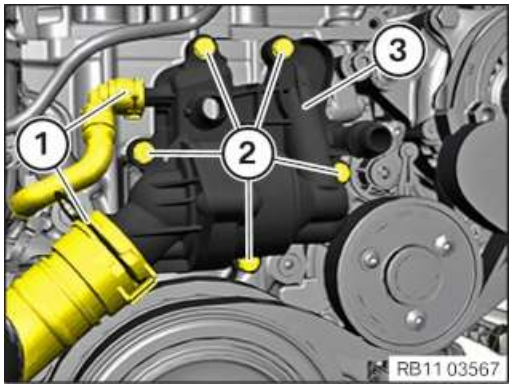
Make sure that the connections are locked correctly. The locks must engage audibly.

cardiagn.com

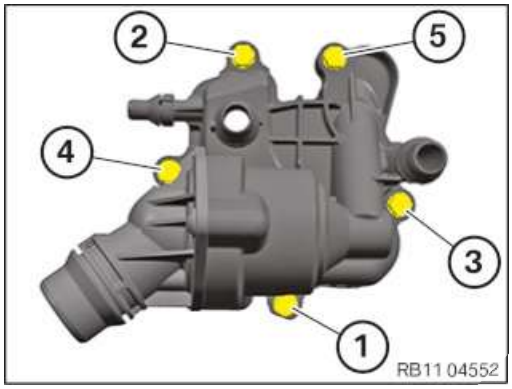


- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).
- If the coolant thermostat is being reused, renew the seal.

  Parts: Gasket



- Install the coolant thermostat (3).
- Tighten screws (2) hand-tight.
- Connect and audibly lock coolant lines (1).



- Tighten screws in the sequence (1) to (5).

Coolant thermostat to cylinder head

M6x30		Tightening torque	8 Nm

POSTPROCESSES

12 – Installing the exhaust-gas recirculation cooler

▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

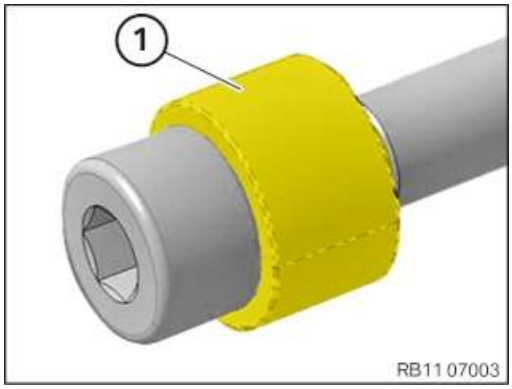
Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

▸ **Installing the exhaust-gas recirculation cooler**

Check

cardiagn.com



- Check whether the screws **with 10mm** sleeves (1) are available.

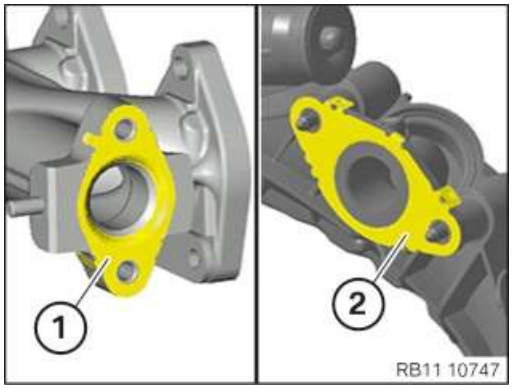
Result

» Screws **without** sleeves (1) are available.

Measure

- Renew screws.

  Parts: Screws (part number 9 886 429)

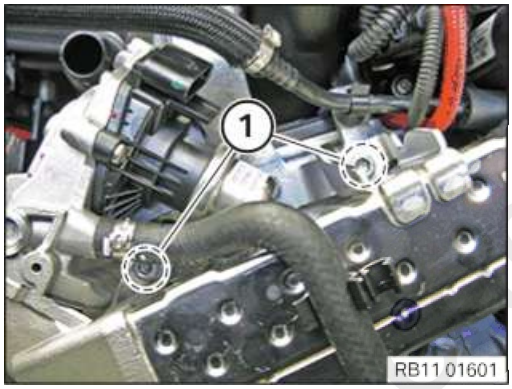


- Renew the seal (1) between the exhaust manifold and the exhaust-gas recirculation cooler.

  Parts: Gasket

- Renew the seal (2) between exhaust-gas recirculation cooler and intake air plenum.

  Parts: Gasket



TECHNICAL INFORMATION

When assembling, it is essential to observe screwing sequences and tightening torques.

Non-observance of these requirements may result in leaks and damage.

- Tighten the screws (1) and subsequently release them again.

Exhaust-gas recirculation cooler to cylinder head

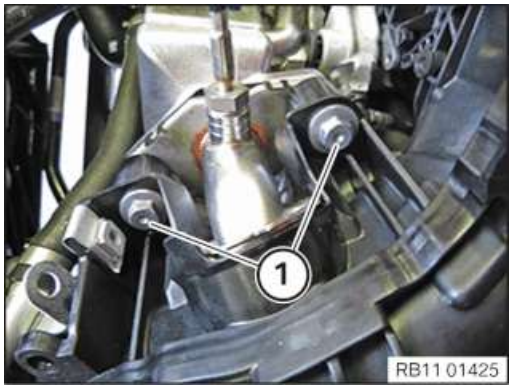
M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °



- Tighten the screw (1) under the exhaust-gas recirculation cooler and then release again.

Exhaust-gas recirculation cooler to cylinder head

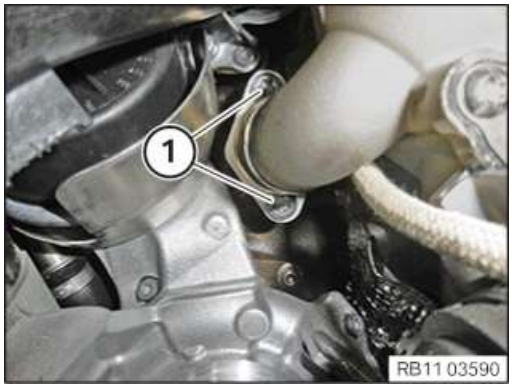
M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °



- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

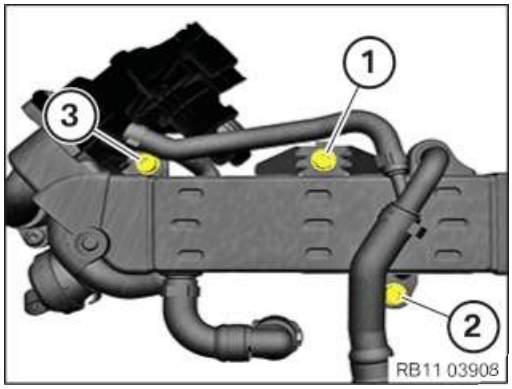
		Tightening torque	10 Nm



- Tighten the screws (1).

Exhaust-gas recirculation cooler to exhaust manifold

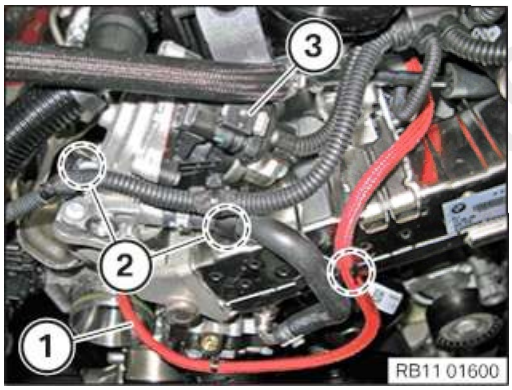
M8x28	Replace screws	Tightening torque	32 Nm



- Tighten screws in the order (1) to (3).

Exhaust-gas recirculation cooler to cylinder head

M8x20 / M8x28		Tightening torque	19 Nm



- Connect the connector (3) to the exhaust-gas recirculation valve.
- Attach the vehicle wiring harness to the clips (2) at the exhaust-gas recirculation valve and at the coolant line.
- Connect the vacuum line (1) to the exhaust-gas recirculation cooler and attach in the highlighted area.



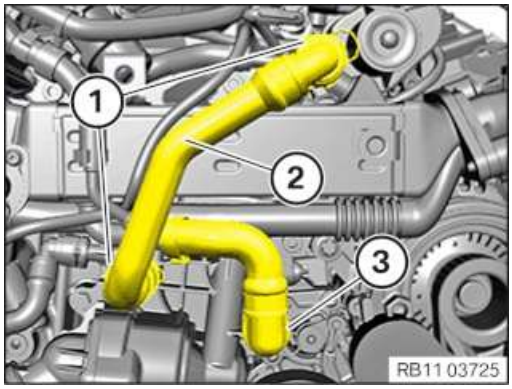
TECHNICAL INFORMATION

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

- **Version A:**

  Connect and audibly lock coolant lines (1).

rdiagn.com



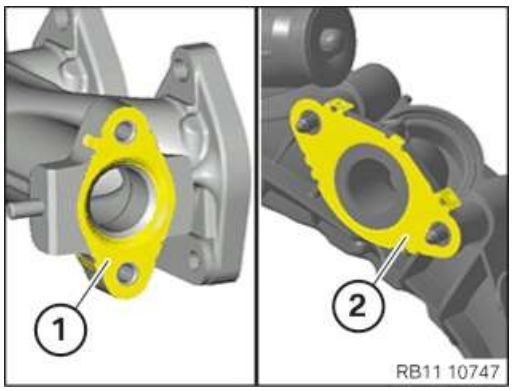
TECHNICAL INFORMATION

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

- **Version B:**

  Connect and audibly lock coolant lines (3).
- Install the coolant line (2).
- Audibly lock the locks (1).

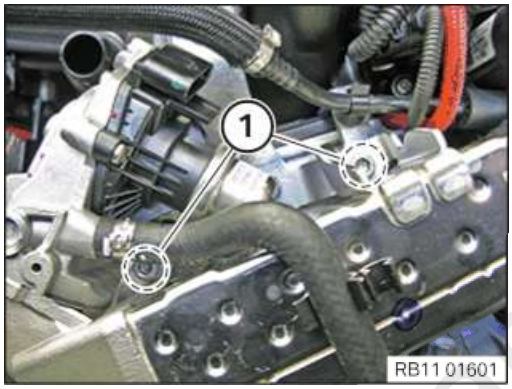
▸ **Installing the exhaust-gas recirculation cooler**



- Renew the seal (1) between the exhaust manifold and the exhaust-gas recirculation cooler.

  Parts: Gasket
- Renew the seal (2) between exhaust-gas recirculation cooler and intake air plenum.

  Parts: Gasket



TECHNICAL INFORMATION

When assembling, it is essential to observe screwing sequences and tightening torques.

Non-observance of these requirements may result in leaks and damage.

- Install the exhaust-gas recirculation cooler and fasten with screws (1).
- Tighten the screws (1) and subsequently release them again.

Exhaust-gas recirculation cooler to cylinder head

M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °

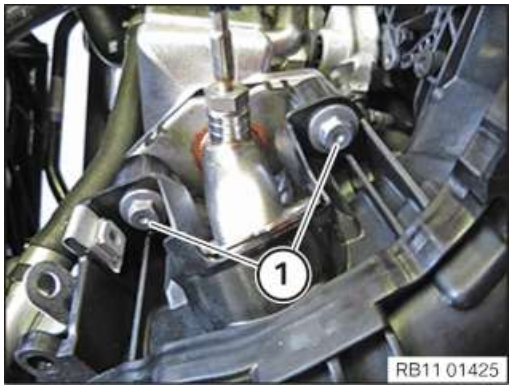


- Tighten the screw (1) under the exhaust-gas recirculation cooler and then release again.

Exhaust-gas recirculation cooler to cylinder head

M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °

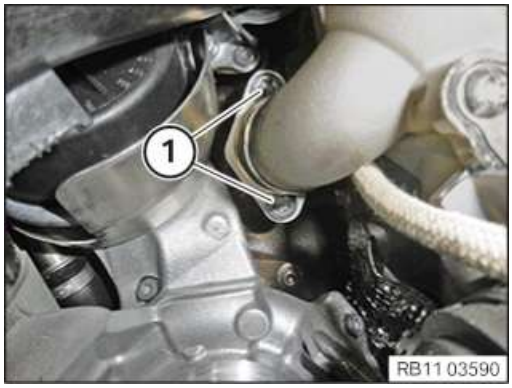
cardiag.com



- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

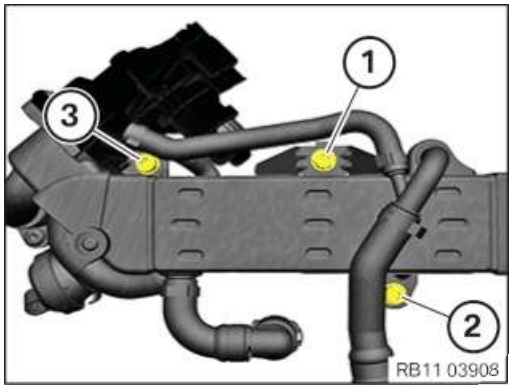
		Tightening torque	10 Nm



- Tighten the screws (1).

Exhaust-gas recirculation cooler to exhaust manifold

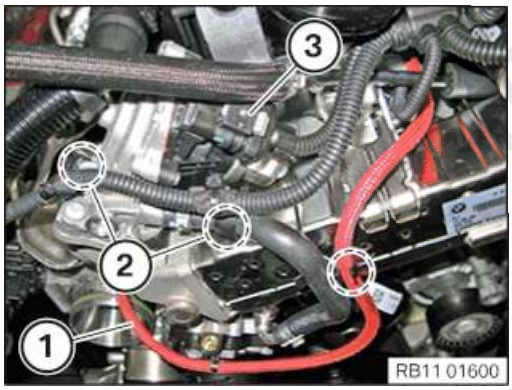
M8x28	Replace screws	Tightening torque	32 Nm



- Tighten screws in the order (1) to (3).

Exhaust-gas recirculation cooler to cylinder head

M8x20 / M8x28		Tightening torque	19 Nm



- Connect the connector (3) to the exhaust-gas recirculation valve.
- Attach the vehicle wiring harness to the clips (2) at the exhaust-gas recirculation valve and at the coolant line.
- Connect the vacuum line (1) to the exhaust-gas recirculation cooler and attach in the highlighted area.



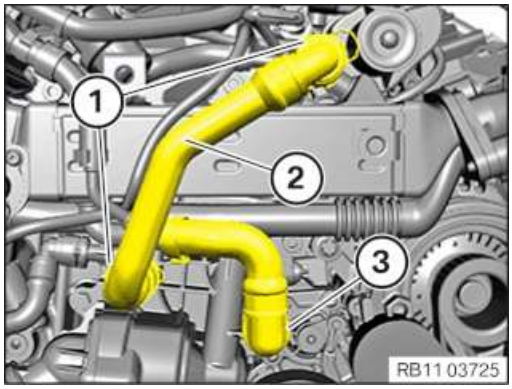
TECHNICAL INFORMATION

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

- **Version A:**

  Connect and audibly lock coolant lines (1).

rdiagn.com



TECHNICAL INFORMATION

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

- **Version B:**

  Connect and audibly lock coolant lines (3).

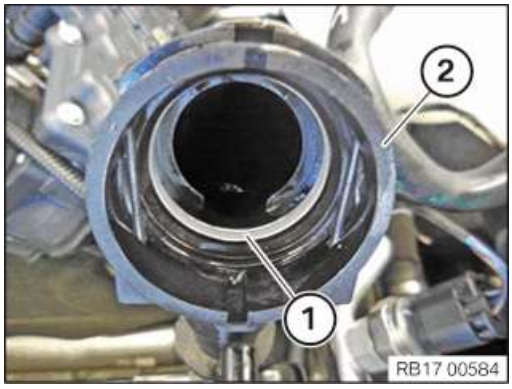
  Install the coolant line (2).

  Audibly lock the locks (1).

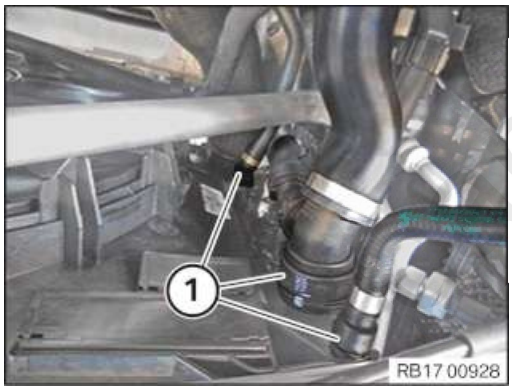
13 – Connecting the coolant lines

TECHNICAL INFORMATION

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



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



NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



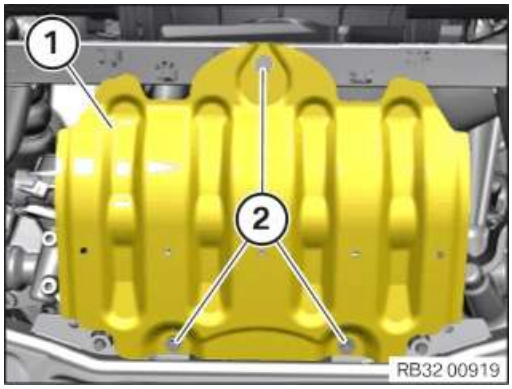
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

14 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

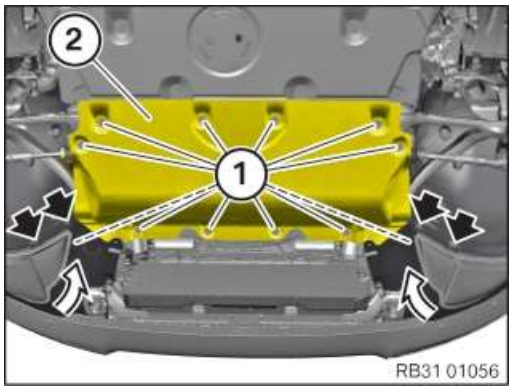
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

15 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

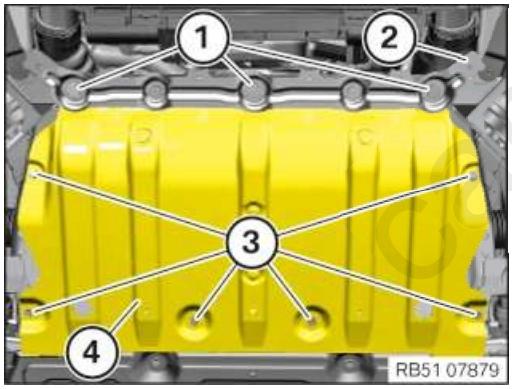
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

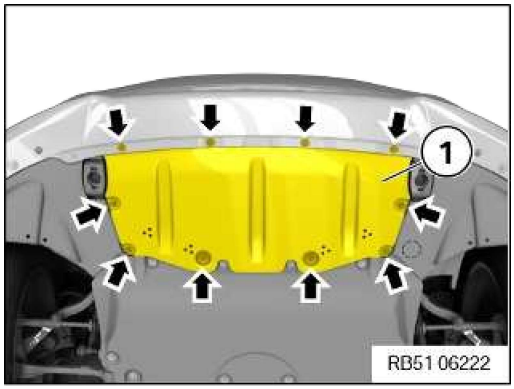
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

16 – Installing the front underbody protection



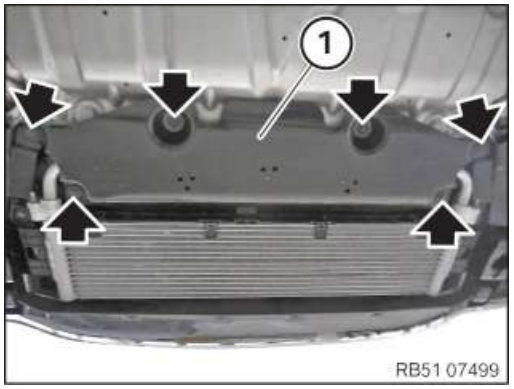
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



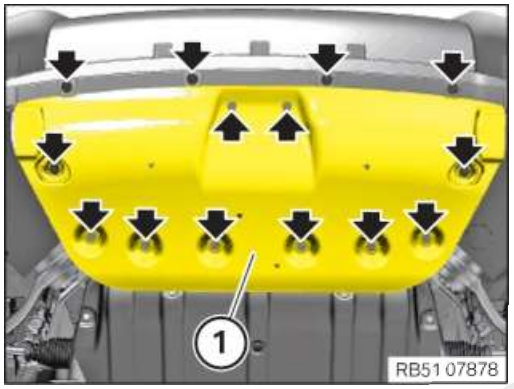
- **Version B:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version C:**

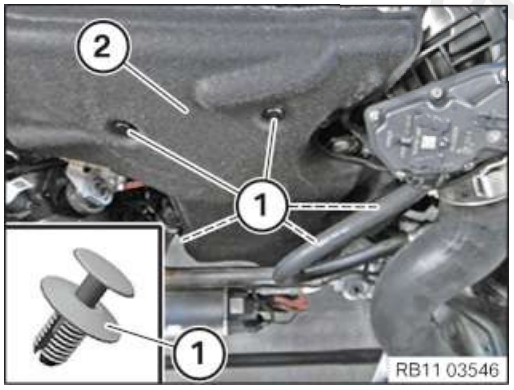
  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

17 – Install acoustic cover for the engine, front

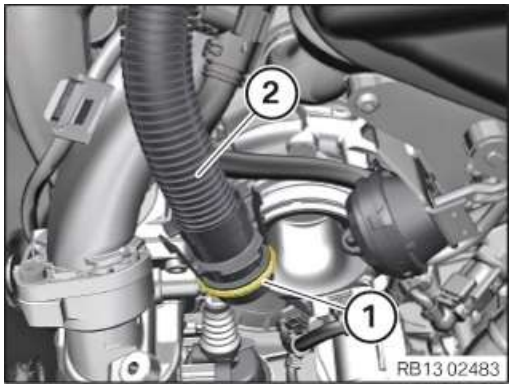


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

18 – Installing the clean air pipe with resonator



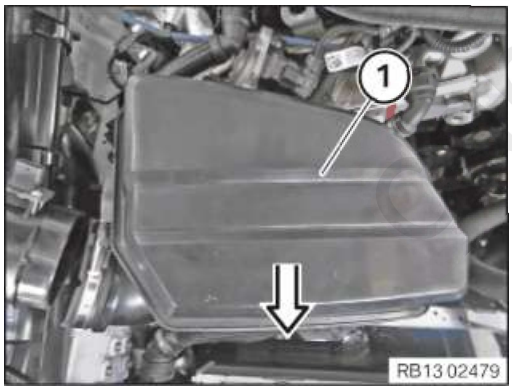
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- 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.



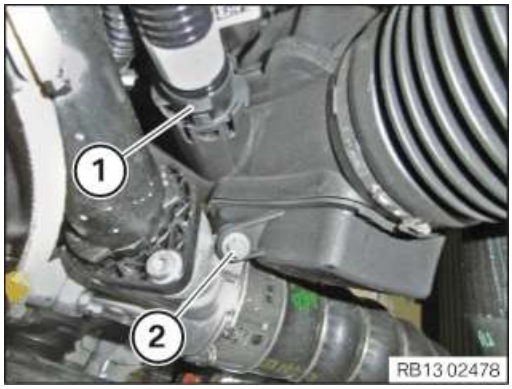
- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

  The clamp (1) must engage audibly.

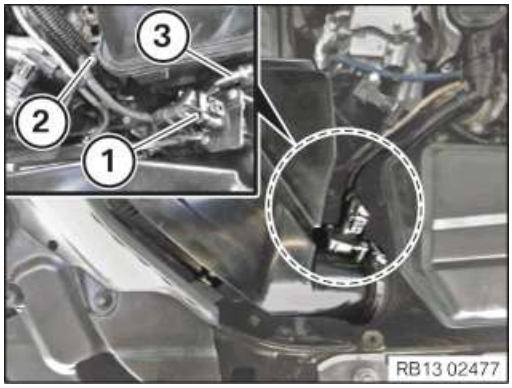
.com



- 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).

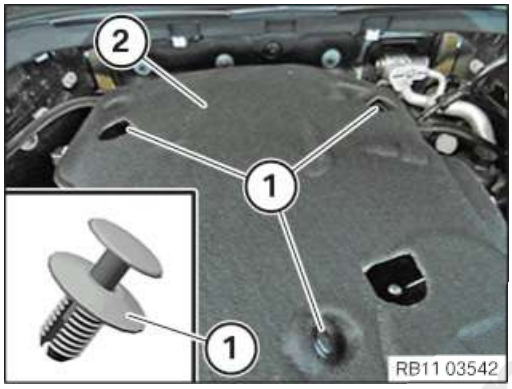
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

  The connector (1) must engage audibly.

19 – 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) .

20 – Install acoustic cover

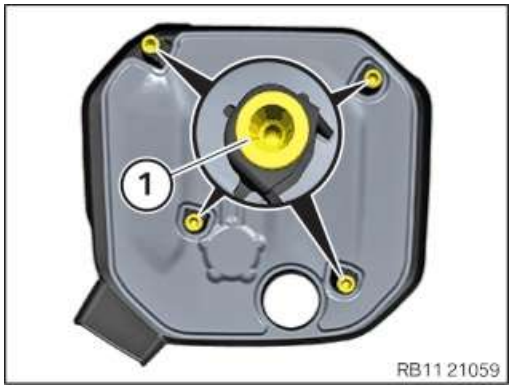
RISK OF DAMAGE

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.

cardiagn.com



- 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.

21 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Coolant thermostat to cylinder head — Used in step 11

M6x30		Tightening torque	8 Nm

Exhaust-gas recirculation cooler to cylinder head — Used in step 12

M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °

Exhaust-gas recirculation cooler to intake plenum — Used in step 12

		Tightening torque	10 Nm

Exhaust-gas recirculation cooler to exhaust manifold — Used in step 12

M8x28	Replace screws	Tightening torque	32 Nm

Exhaust-gas recirculation cooler to cylinder head — Used in step 12

M8x20 / M8x28		Tightening torque	19 Nm

cardiagn.com

Underbody protection, steering, to front axle support			Used in step 14
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 14
Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 15
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front			Used in step 15
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

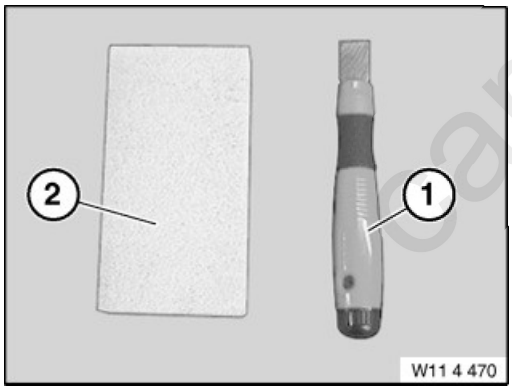
Underbody protection front			Used in step 16
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Clean air pipe to exhaust turbocharger			Used in step 18
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 18
Clamp		Tightening torque	3 Nm

Overview of Special Tools

0 495 102 (11 4 470) Tool



Common		Used in step 11
Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.	
Included in the tool or work		
Storage location	C52	
Replaced by		
In connection with		
SI-Number	01 17 04 (130)	

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Links

Repair instructions	Used in step
17 00 008 Draining and topping up coolant for high-temperature circuit	21

cardiagn.com

17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 008 Draining and topping up coolant for high-temperature circuit 21
17 00 008 Draining and topping up coolant for high-temperature circuit 21
17 00 008 Draining and topping up coolant for high-temperature circuit 21
17 00 008 Draining and topping up coolant for high-temperature circuit 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature) 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Bleeding the cooling system (B36, B38, B46, B48) 21
17 00 039 Bleeding cooling system (B37, B47) 21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool 21
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48) 21
17 00 008 Draining and topping up the high-temperature coolant circuit 21
17 00 008 Draining and topping up the high-temperature coolant circuit 21
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM 21
17 00 008 Draining and topping up the high-temperature coolant circuit 21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures) 21

cardiagn.com

17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	21
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21

cardiagn.com

11 53 000 Removing and installing/replacing coolant thermostat

PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

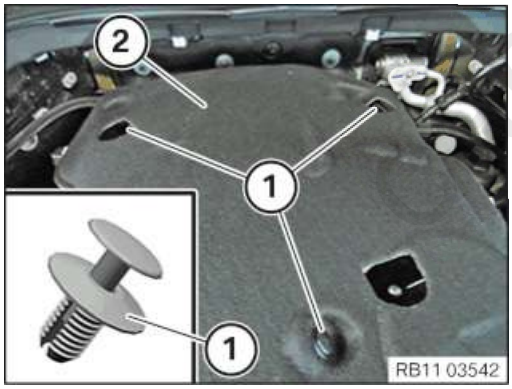
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- 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.

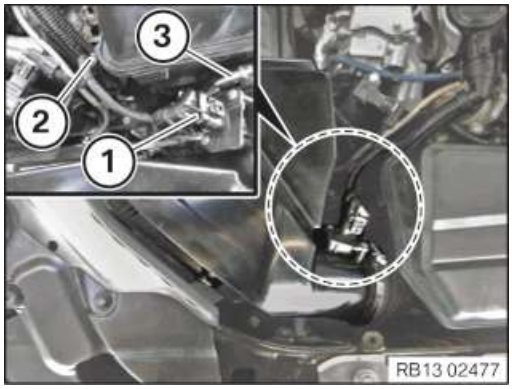
3 – Removing the clean air pipe with the resonator

WARNING

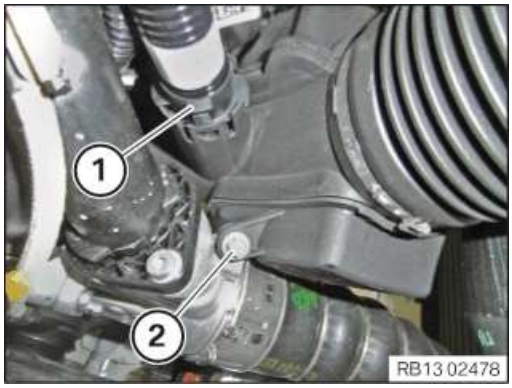
Hot surfaces.

Risk of burning!

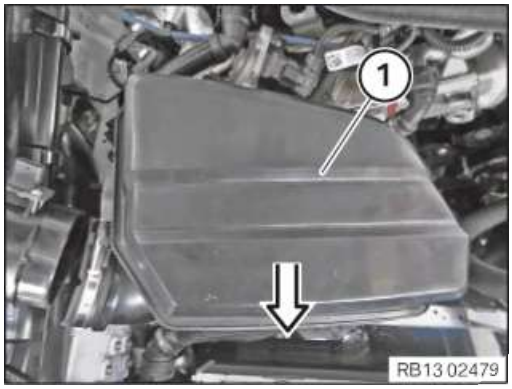
- Perform all work only on components that have cooled down.



- 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.

4 – Remove acoustic cover of the front engine

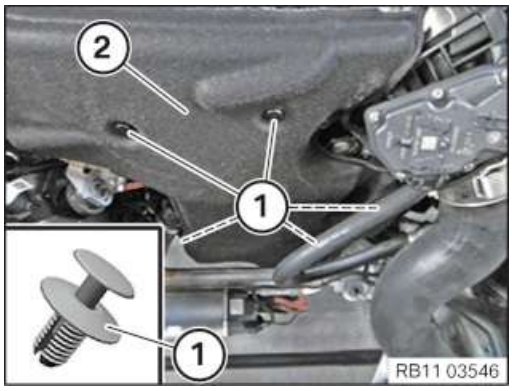
rdiagn.com

WARNING

Hot surfaces.

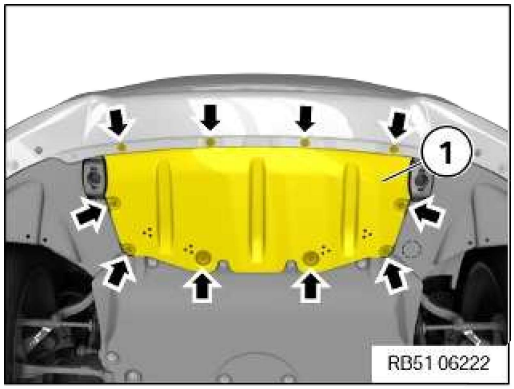
Risk of burning!

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



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

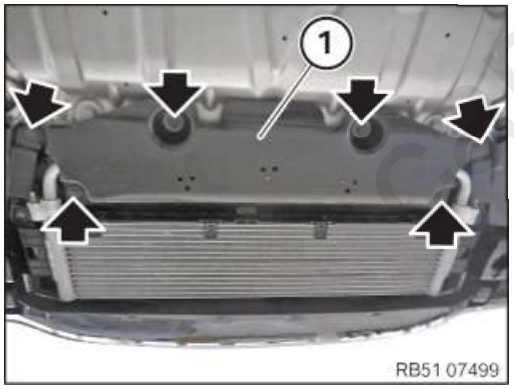
5 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

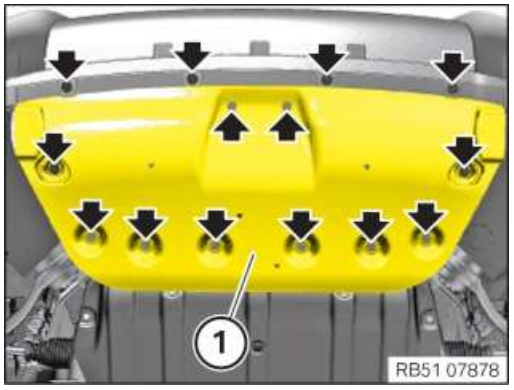
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

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

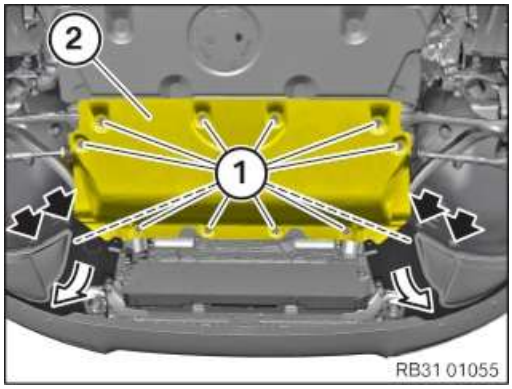


- **Version C:**

  Remove screws (arrows).

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

6 – Remove the underbody protection of the steering gear



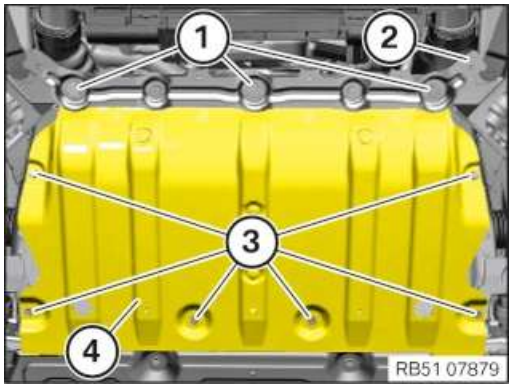
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

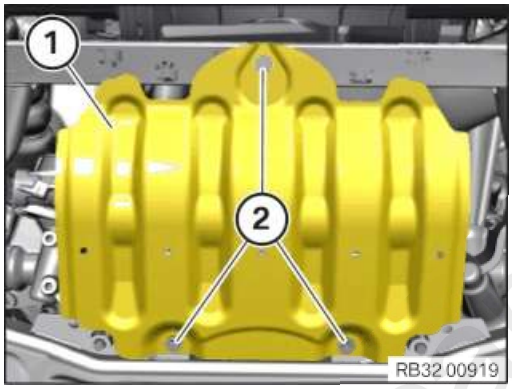
  Loosen screws (3).

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

7 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

8 – Draining coolant

WARNING

Hot fluids.

Risk of scalding!

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

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.

cardiagn.com

TECHNICAL INFORMATION

Life-long fill of coolant!

Do not reuse used coolant.

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

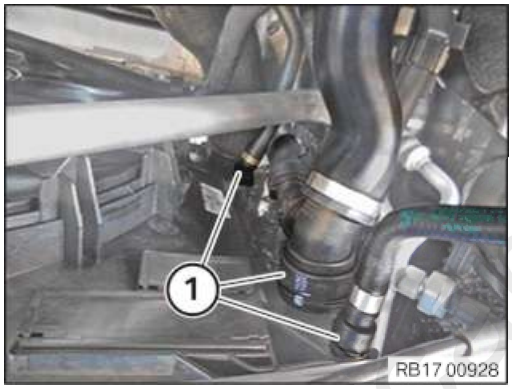
In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

TECHNICAL INFORMATION

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



- Loosen sealing cap (1) from the coolant expansion tank.



NOTICE

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

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

9 – Removing the exhaust-gas recirculation cooler

▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

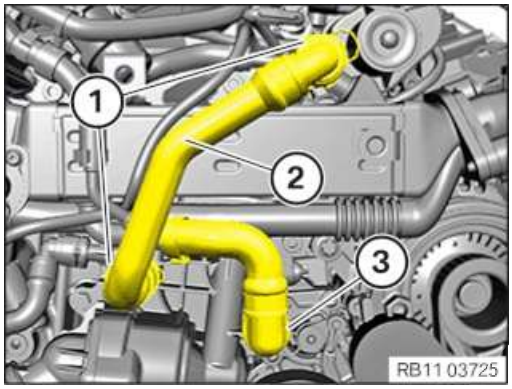
Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



- **Version A:**

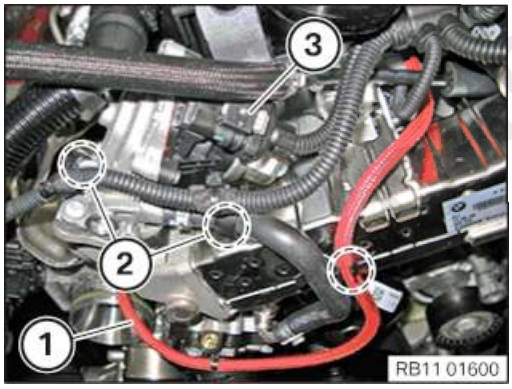
  Unlock and pull off coolant lines (1).



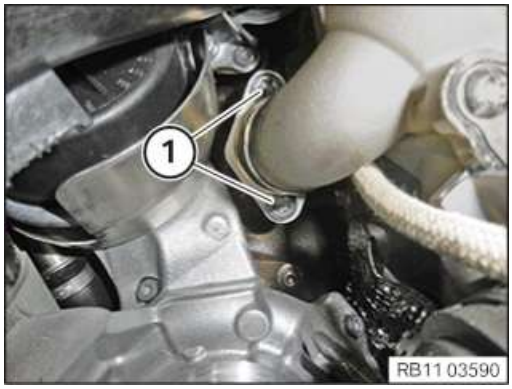
- **Version B:**

  Unlock locks (1) and remove thee coolant line (2).

  Unlock coolant line (3) and pull it off the thermostat.

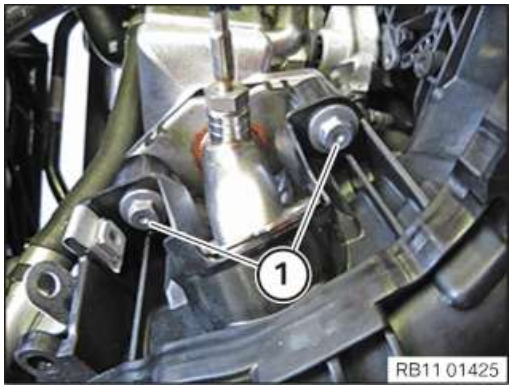


- Loosen the vacuum line (1) from the exhaust-gas recirculation cooler and detach in the highlighted area.
- Loosen the vehicle wiring harness from the exhaust-gas recirculation valve and the coolant line at the clips (2).
- Unlock and disconnect the connector (3) at the exhaust-gas recirculation valve.



- Release the bolts (1) from the exhaust-gas recirculation cooler.

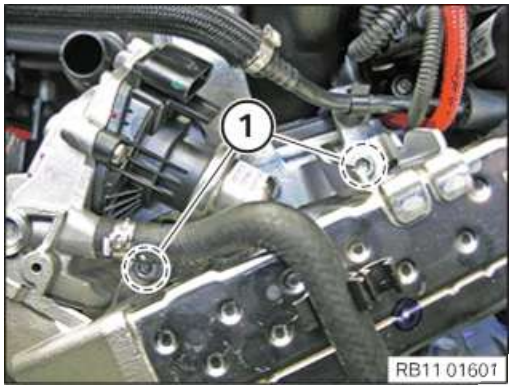
fordiagn.com



- Loosen the screws (1) on the intake system.



- Loosen the screw (1) below the exhaust-gas recirculation cooler.



- Loosen screws (1).
- Remove exhaust-gas recirculation cooler.

MAIN WORK

10 – Removing the coolant thermostat

TECHNICAL INFORMATION

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

▸ **Avoiding damage to the starter generator due to escaping coolant**

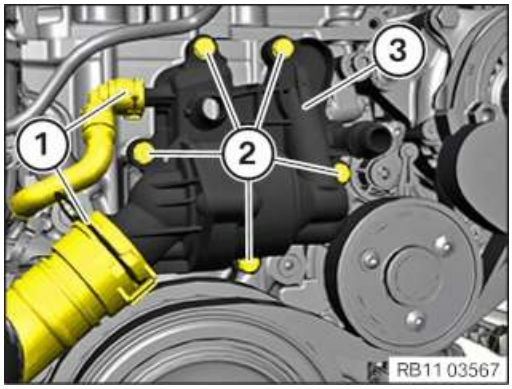
RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

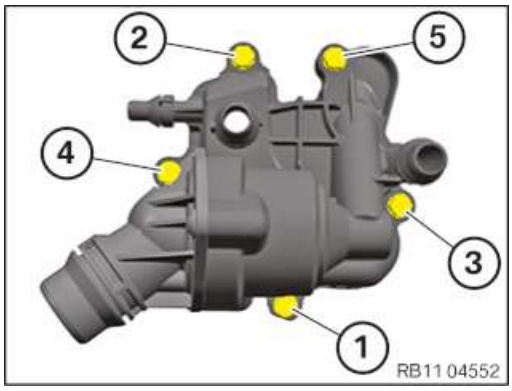
cardiagn.com



- Unlock and pull off coolant lines (1).
- Loosen screws (2).
- Remove the thermostat housing (3) with the coolant thermostat.

11 – Installing the coolant thermostat

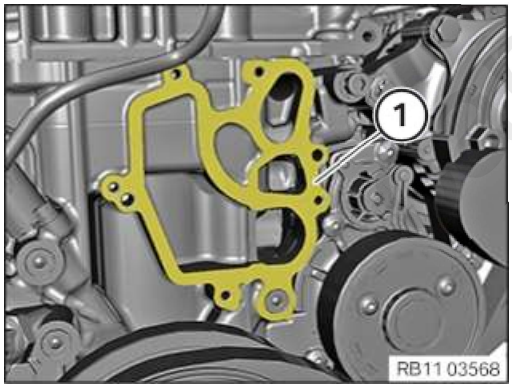
Tightening sequence for coolant thermostat



1 - 5 Screws on the coolant thermostat

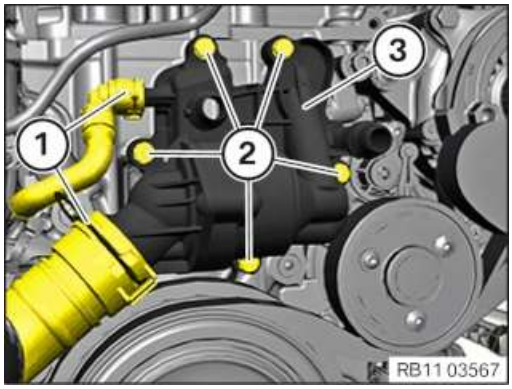
TECHNICAL INFORMATION

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



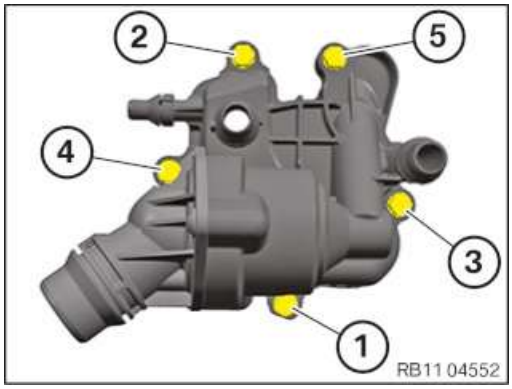
- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).
- If the coolant thermostat is being reused, renew the seal.

  Parts: Gasket



- Install the coolant thermostat (3).
- Tighten screws (2) hand-tight.
- Connect and audibly lock coolant lines (1).

mdiagn.com



- Tighten screws in the sequence (1) to (5).

Coolant thermostat to cylinder head

M6x30		Tightening torque	8 Nm

POSTPROCESSES

12 – Installing the exhaust-gas recirculation cooler

▸ **Avoiding damage to the starter generator due to escaping coolant**

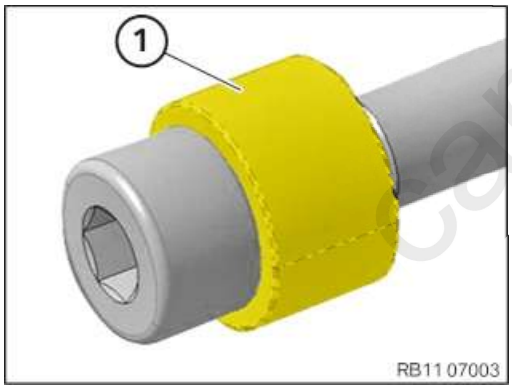
RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

▸ **Installing the exhaust-gas recirculation cooler**



Check

- Check whether the screws **with 10mm** sleeves (1) are available.

Result

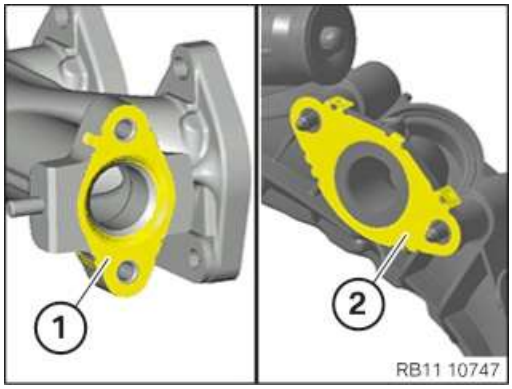
» Screws **without** sleeves (1) are available.

Measure

- Renew screws.

  Parts: Screws (part number 9 886 429)

cardiagn.com

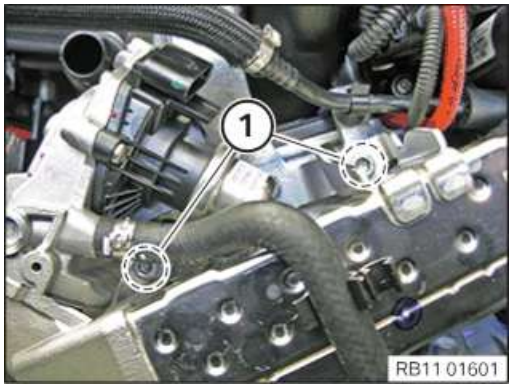


- Renew the seal (1) between the exhaust manifold and the exhaust-gas recirculation cooler.

  Parts: Gasket

- Renew the seal (2) between exhaust-gas recirculation cooler and intake air plenum.

  Parts: Gasket



TECHNICAL INFORMATION

When assembling, it is essential to observe screwing sequences and tightening torques.

Non-observance of these requirements may result in leaks and damage.

- Tighten the screws (1) and subsequently release them again.

Exhaust-gas recirculation cooler to cylinder head

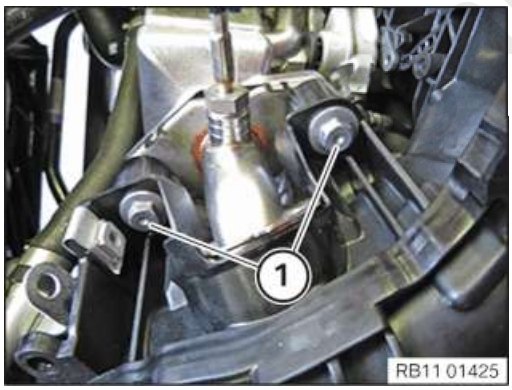
M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °



- Tighten the screw (1) under the exhaust-gas recirculation cooler and then release again.

Exhaust-gas recirculation cooler to cylinder head

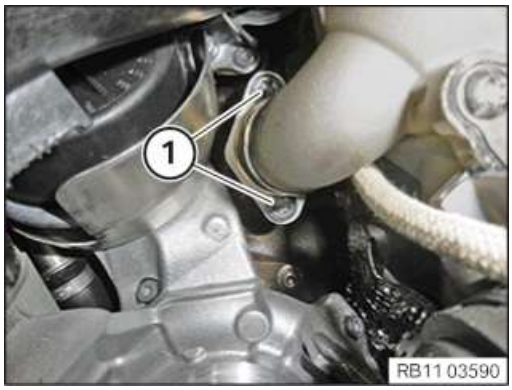
M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °



- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

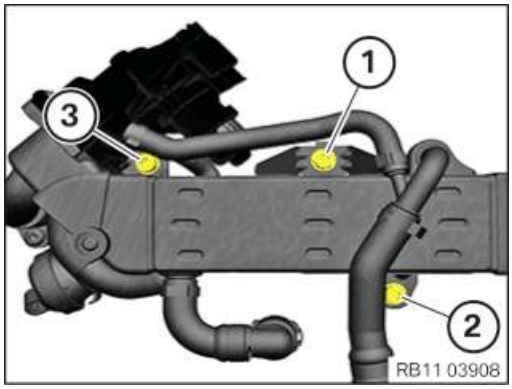
		Tightening torque	10 Nm



- Tighten the screws (1).

Exhaust-gas recirculation cooler to exhaust manifold

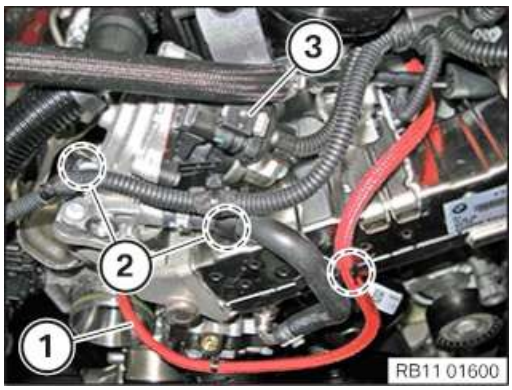
M8x28	Replace screws	Tightening torque	32 Nm



- Tighten screws in the order (1) to (3).

Exhaust-gas recirculation cooler to cylinder head

M8x20 / M8x28		Tightening torque	19 Nm



- Connect the connector (3) to the exhaust-gas recirculation valve.
- Attach the vehicle wiring harness to the clips (2) at the exhaust-gas recirculation valve and at the coolant line.
- Connect the vacuum line (1) to the exhaust-gas recirculation cooler and attach in the highlighted area.

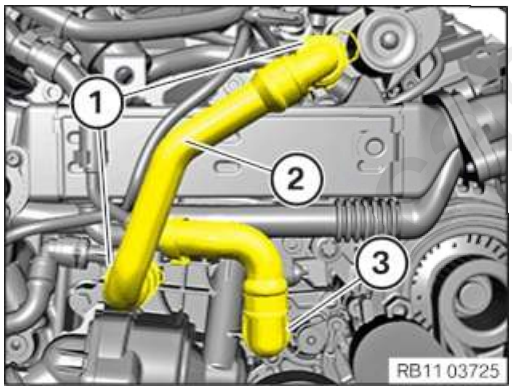


TECHNICAL INFORMATION

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

- **Version A:**

  Connect and audibly lock coolant lines (1).



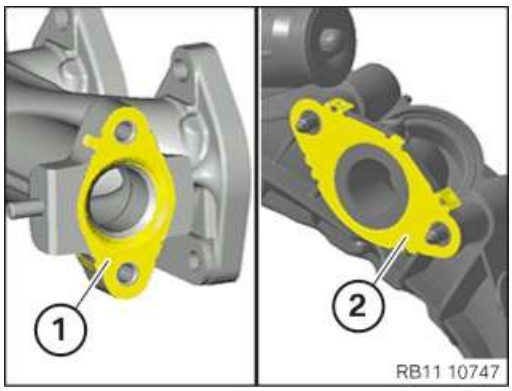
TECHNICAL INFORMATION

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

- **Version B:**

  Connect and audibly lock coolant lines (3).
- Install the coolant line (2).
- Audibly lock the locks (1).

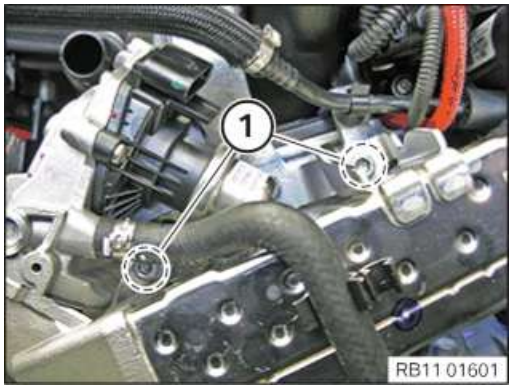
▸ Installing the exhaust-gas recirculation cooler



- Renew the seal (1) between the exhaust manifold and the exhaust-gas recirculation cooler.

  Parts: Gasket
- Renew the seal (2) between exhaust-gas recirculation cooler and intake air plenum.

  Parts: Gasket



TECHNICAL INFORMATION

When assembling, it is essential to observe screwing sequences and tightening torques.

Non-observance of these requirements may result in leaks and damage.

- Install the exhaust-gas recirculation cooler and fasten with screws (1).
- Tighten the screws (1) and subsequently release them again.

Exhaust-gas recirculation cooler to cylinder head

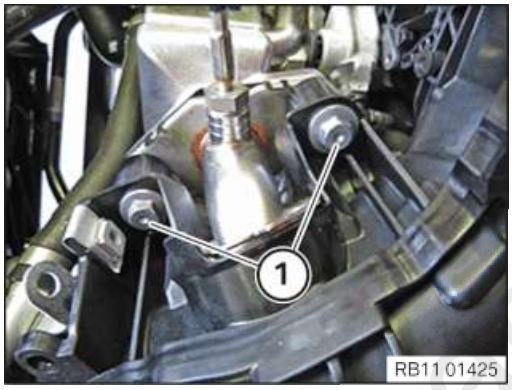
M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °



- Tighten the screw (1) under the exhaust-gas recirculation cooler and then release again.

Exhaust-gas recirculation cooler to cylinder head

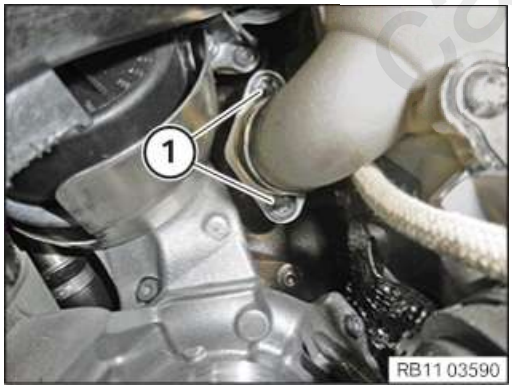
M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °



- Tighten the screws (1).

Exhaust-gas recirculation cooler to intake plenum

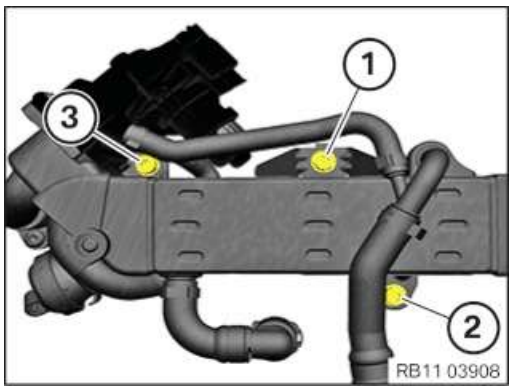
		Tightening torque	10 Nm



- Tighten the screws (1).

Exhaust-gas recirculation cooler to exhaust manifold

M8x28	Replace screws	Tightening torque	32 Nm

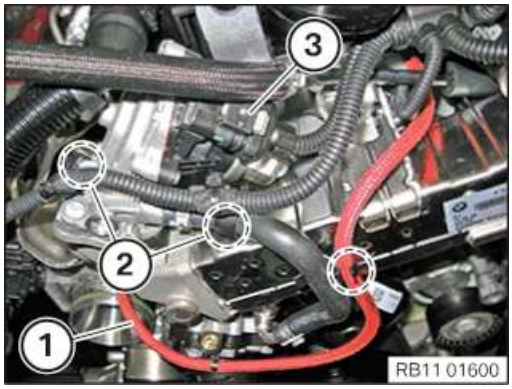


- Tighten screws in the order (1) to (3).

Exhaust-gas recirculation cooler to cylinder head

M8x20 / M8x28		Tightening torque	19 Nm

carldiag.com



- Connect the connector (3) to the exhaust-gas recirculation valve.
- Attach the vehicle wiring harness to the clips (2) at the exhaust-gas recirculation valve and at the coolant line.
- Connect the vacuum line (1) to the exhaust-gas recirculation cooler and attach in the highlighted area.

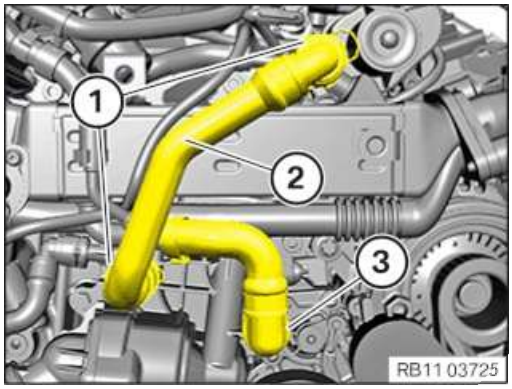


TECHNICAL INFORMATION

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

- **Version A:**

  Connect and audibly lock coolant lines (1).



TECHNICAL INFORMATION

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

- **Version B:**

  Connect and audibly lock coolant lines (3).

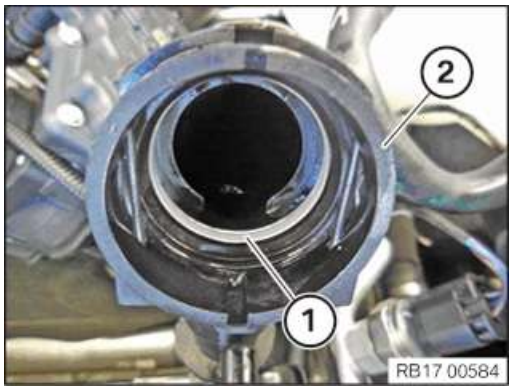
  Install the coolant line (2).

  Audibly lock the locks (1).

13 – Connecting the coolant lines

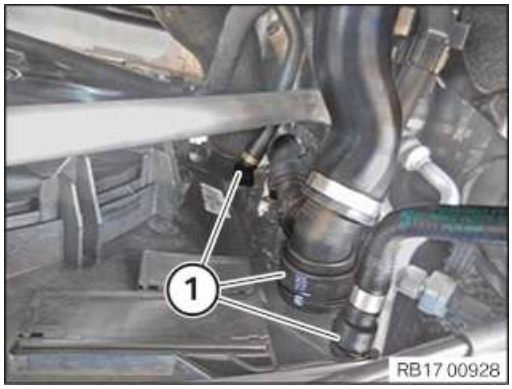
TECHNICAL INFORMATION

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



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

cardiagn.com

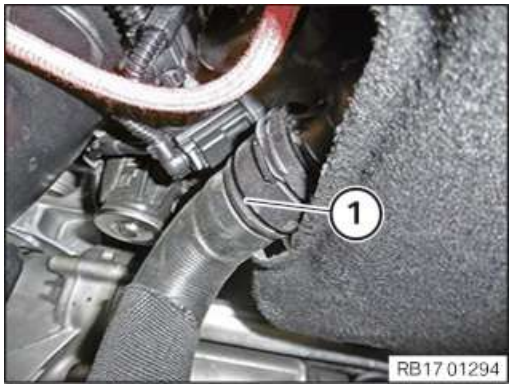


NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



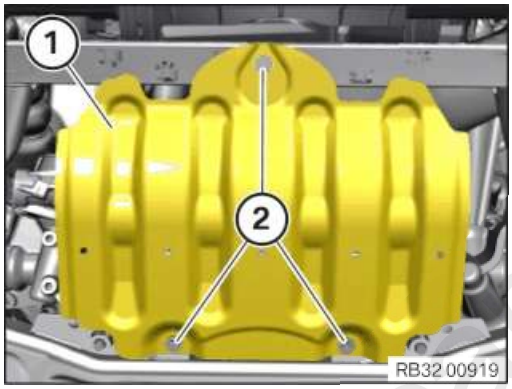
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

14 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

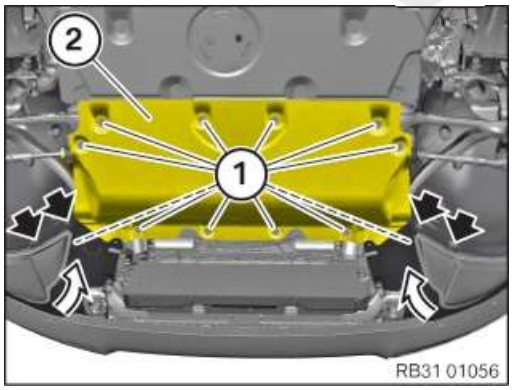
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

15 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

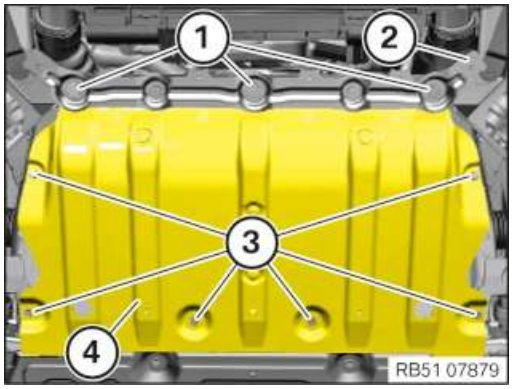
- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

carmanuals.com



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

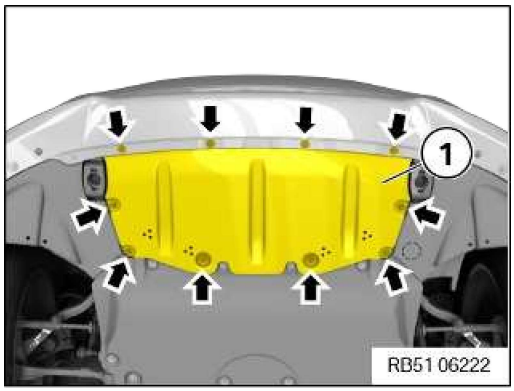
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

16 – Installing the front underbody protection



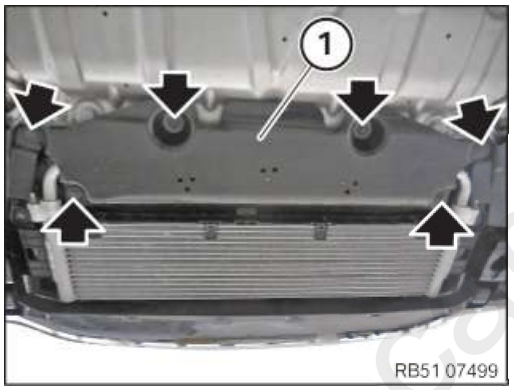
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



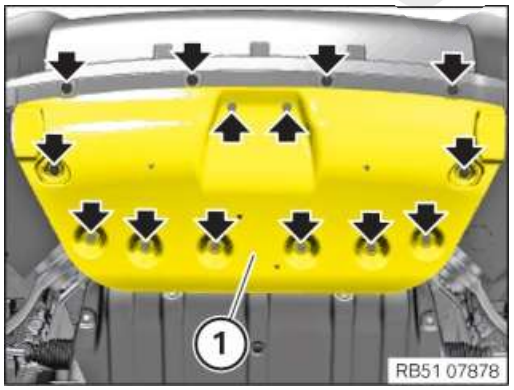
- **Version B:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version C:**

  Feed in and install front underbody protection (1).

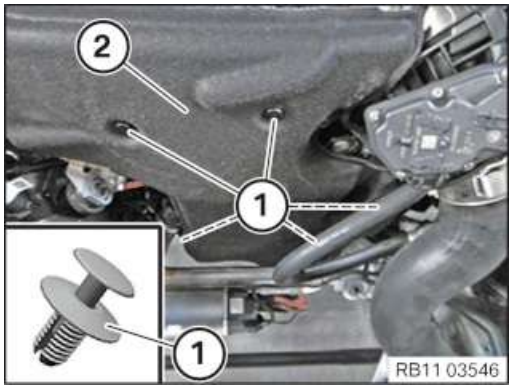
  Tighten screws (arrows).

Underbody protection front

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

17 – Install acoustic cover for the engine, front

carmagn.com

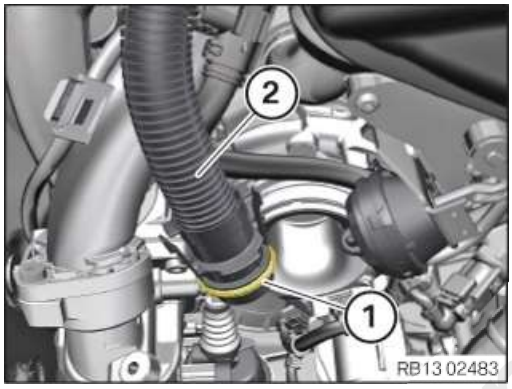


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

18 – Installing the clean air pipe with resonator



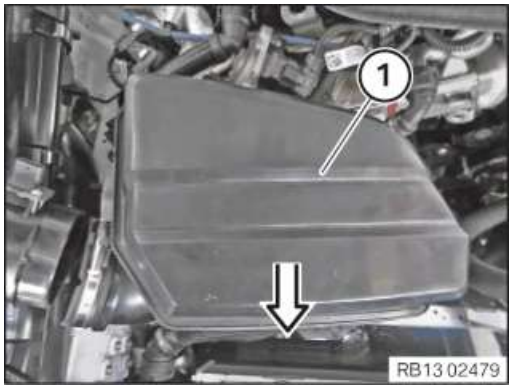
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- 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.



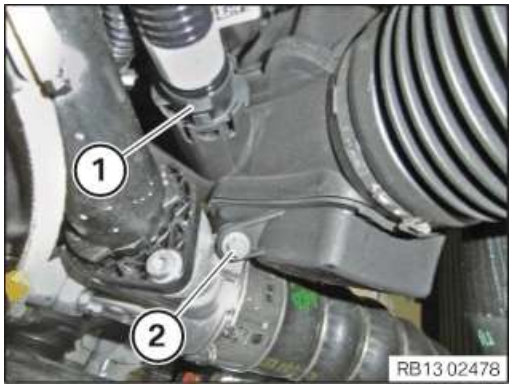
- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

.diagn.com



- Attach and lock the clamp (1).

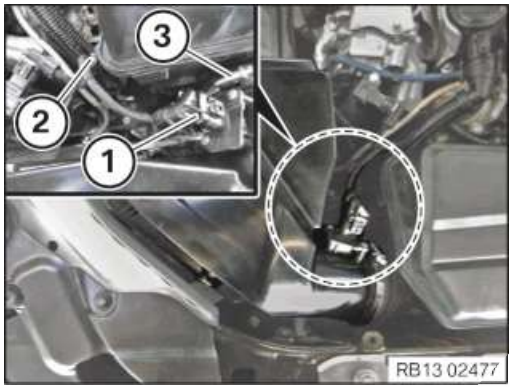
  The clamp (1) must engage audibly.



- 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).

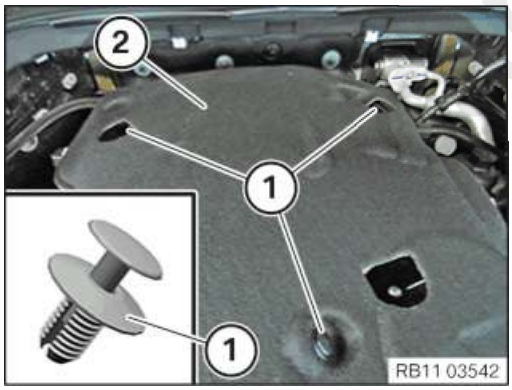
Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

  The connector (1) must engage audibly.

19 – 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) .

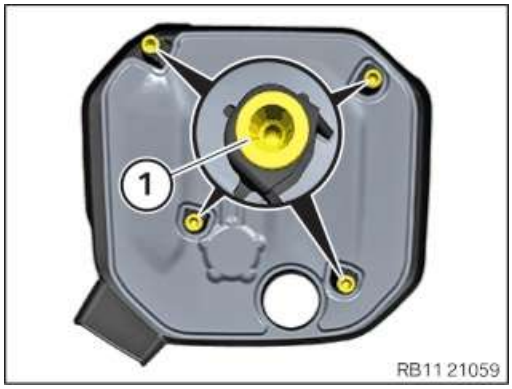
20 – Install acoustic cover

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.

21 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Coolant thermostat to cylinder head Used in step 11

M6x30		Tightening torque	8 Nm

cardiagn.com

Exhaust-gas recirculation cooler to cylinder head			Used in step 12
M8x20 / M8x28		Tightening torque	5 Nm
		Release angle	90 °

Exhaust-gas recirculation cooler to intake plenum			Used in step 12
		Tightening torque	10 Nm

Exhaust-gas recirculation cooler to exhaust manifold			Used in step 12
M8x28	Replace screws	Tightening torque	32 Nm

Exhaust-gas recirculation cooler to cylinder head			Used in step 12
M8x20 / M8x28		Tightening torque	19 Nm

Underbody protection, steering, to front axle support			Used in step 14
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 14
Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 15
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front			Used in step 15
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Underbody protection front			Used in step 16
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

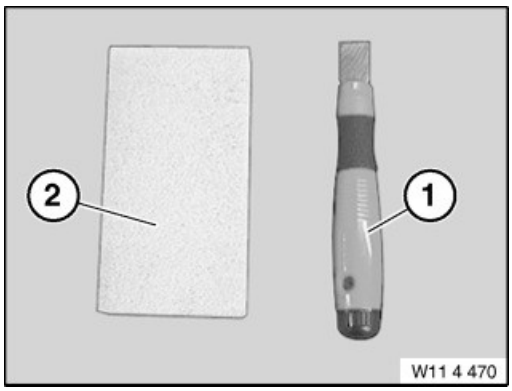
Clean air pipe to exhaust turbocharger			Used in step 18
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 18
Clamp		Tightening torque	3 Nm

Overview of Special Tools

cardiagn.com

0 495 102 (11 4 470) Tool



Common Used in step 11

Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

cardiagn.com

Links

Repair instructions	Used in step
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21

17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	21
17 00 039 Bleeding cooling system (B37, B47)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	21
17 00 008 Draining and topping up the high-temperature coolant circuit	21
17 00 008 Draining and topping up the high-temperature coolant circuit	21
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	21
17 00 008 Draining and topping up the high-temperature coolant circuit	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	21

cardiagn.com

17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	21
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 008 Draining and topping up coolant for high-temperature circuit	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	21

cardiagn.com

11 53 002 Removing and installing/replacing the secondary coolant thermostat

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.

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

cardiagn.com



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.

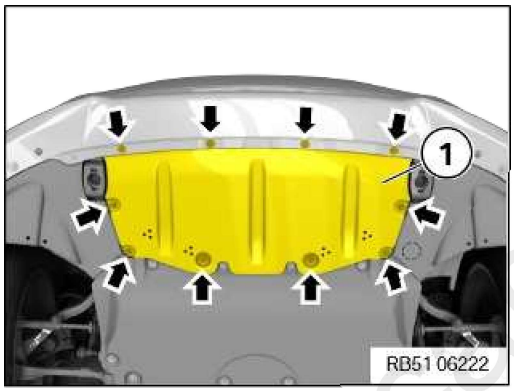
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

2 – Disconnecting all battery earth leads



- See additional information.

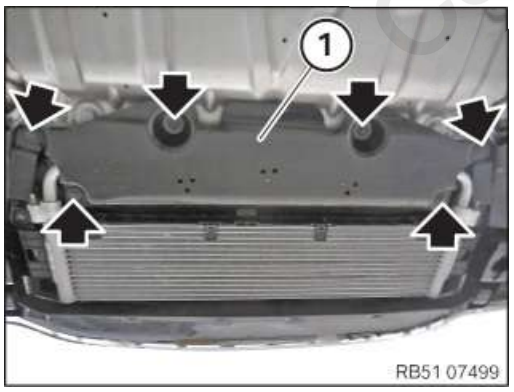
3 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

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

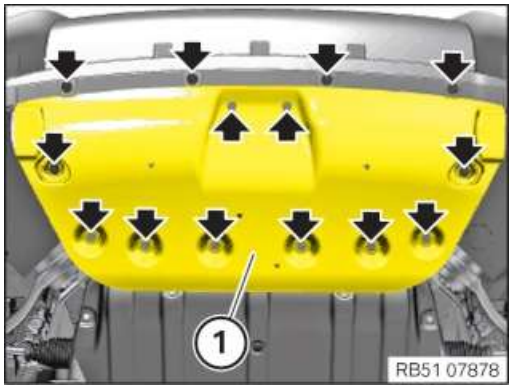


- **Version B:**

  Remove screws (arrows).

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

carsdiagn.com

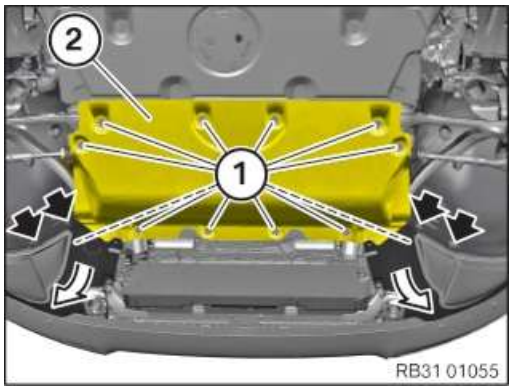


- **Version C:**

  Remove screws (arrows).

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

4 – Remove the underbody protection of the steering gear



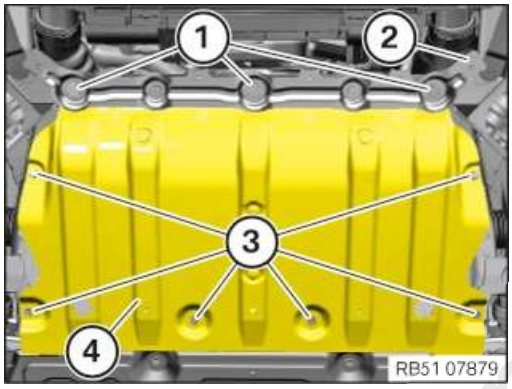
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

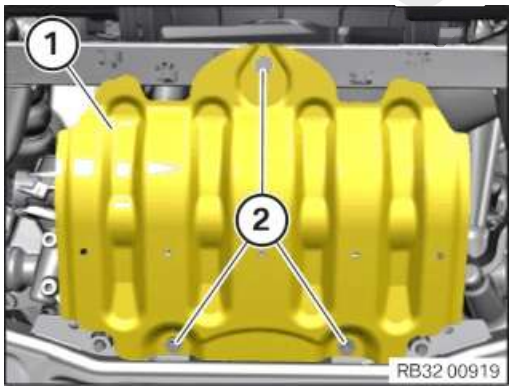
  Loosen screws (3).

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

5 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

6 – Removing the acoustic cover

cardiagn.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.



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

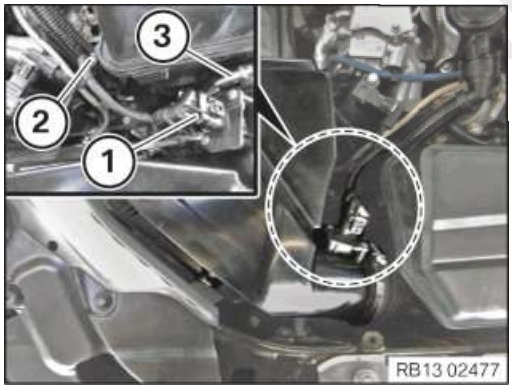
7 – Removing the clean air pipe with the resonator

WARNING

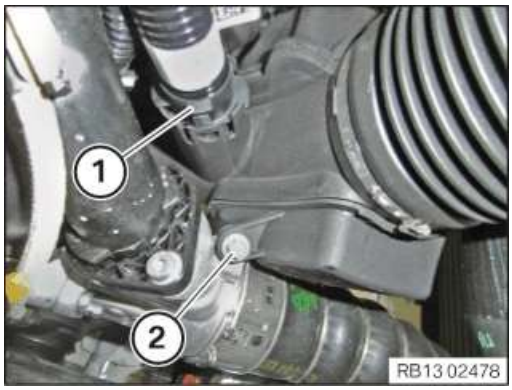
Hot surfaces.

Risk of burning!

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

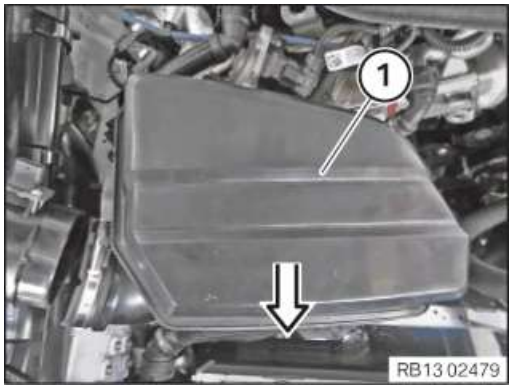


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



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

rdiagn.com



- 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.

8 – Draining the coolant from the high-temperature cooling system

WARNING

Hot fluids.

Risk of scalding!

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

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.

cardiagn.com

TECHNICAL INFORMATION

Life-long fill of coolant!

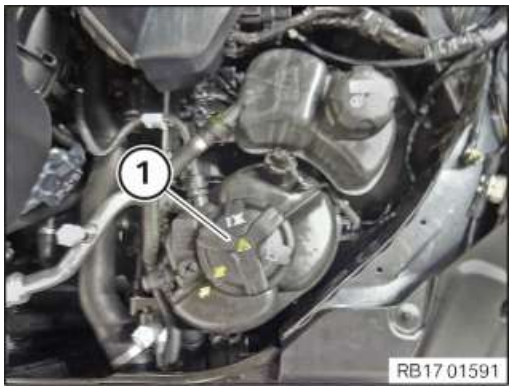
Do not reuse used coolant.

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

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

TECHNICAL INFORMATION

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



- Loosen sealing cap (1).

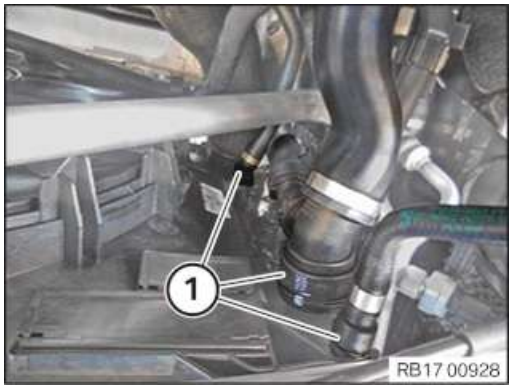
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.



NOTICE

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

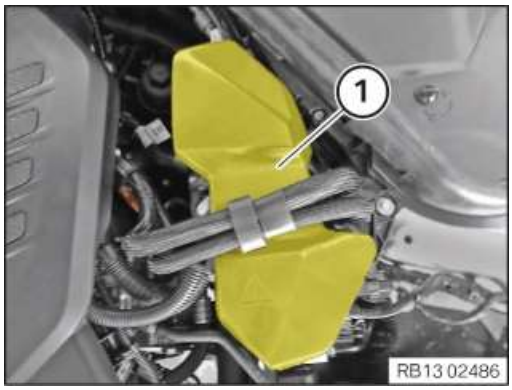
- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.

carolagn.com



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

9 – Remove the cover for the DDE control unit



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

10 – 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

carmagn.com

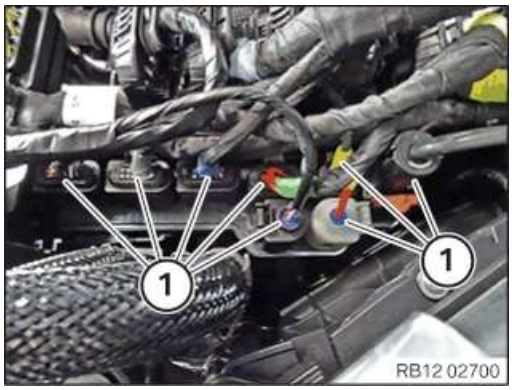
TECHNICAL INFORMATION

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

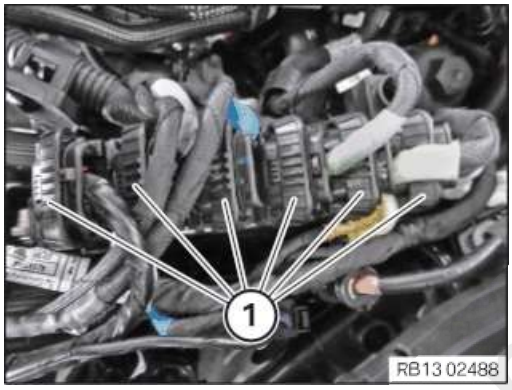
TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.

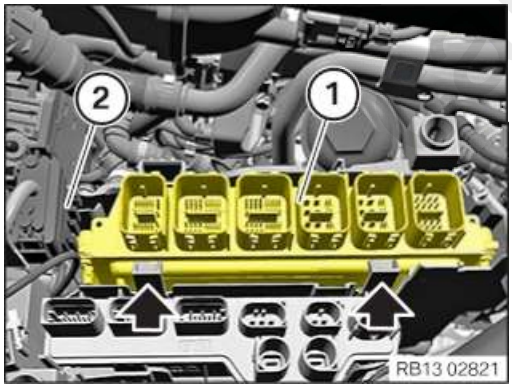
For additional information see: 61 00 ... Programming/encoding control unit(s)



- 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.

11 – Removing the integrated supply module (PDM) partially

Prerequisite

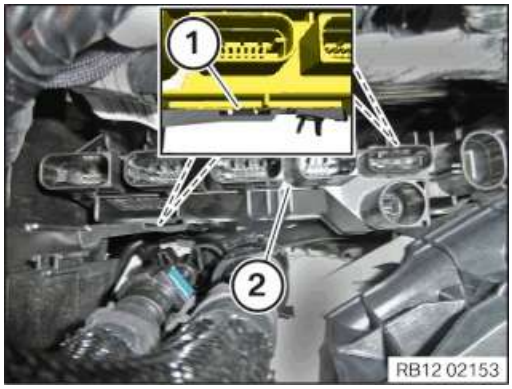
Engine control unit is removed.

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)

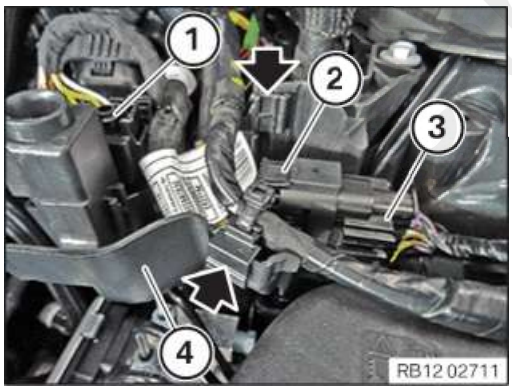


- Loosen the latch mechanisms (1).
- Feed out and remove the integrated supply module (PDM) (2) upwards.

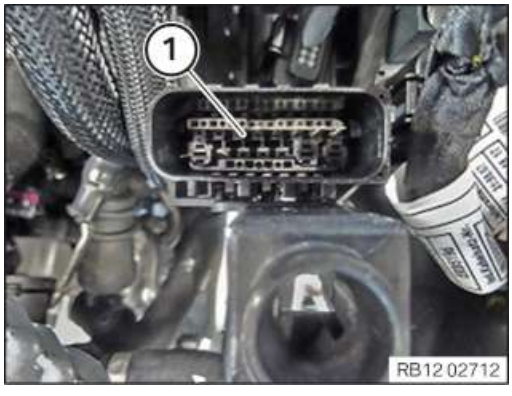
12 – Removing the control unit holder

TECHNICAL INFORMATION

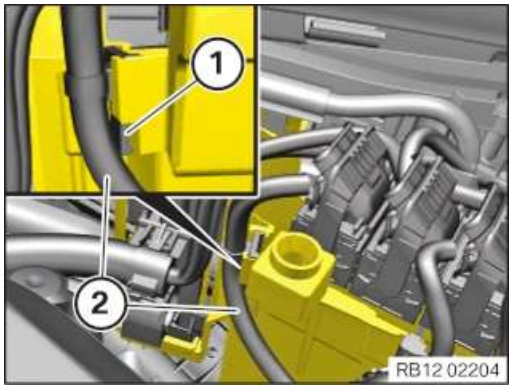
The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.



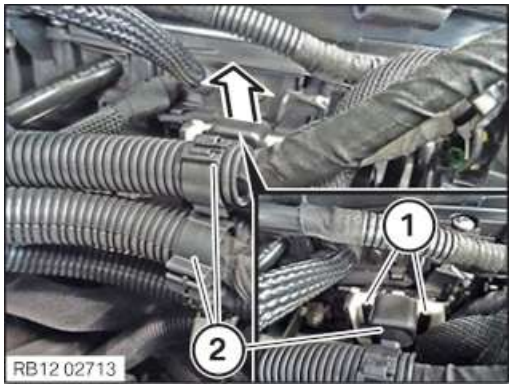
- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Release the connector (3) and disconnect from the control unit holder (4).
- Release the clamps (arrows).



- Unlock plug connection (1) and disconnect.



- Unlock and loosen the cable clip (1).
- Remove the wiring harness section (2) and put to one side.



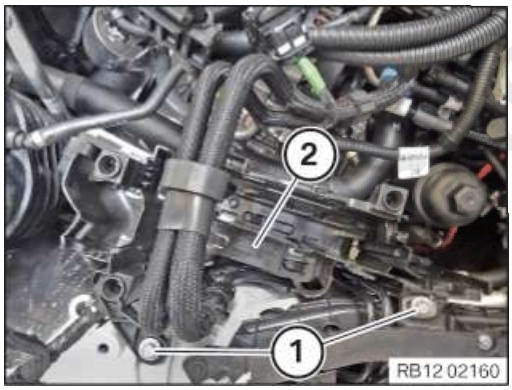
NOTICE

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

- Unlock the locks (1) .
- Guide out the cable clip (2) in the direction of arrow and set aside.



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



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

13 – Releasing the wiring harness section with the starter generator lines partially

rdiagn.com

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

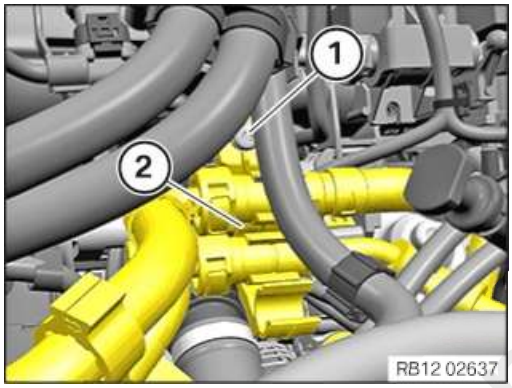
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the 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)

RISK OF DAMAGE

Damage to wires when disconnecting connectors and plug connections.

Sheared wires can cause a short circuit.

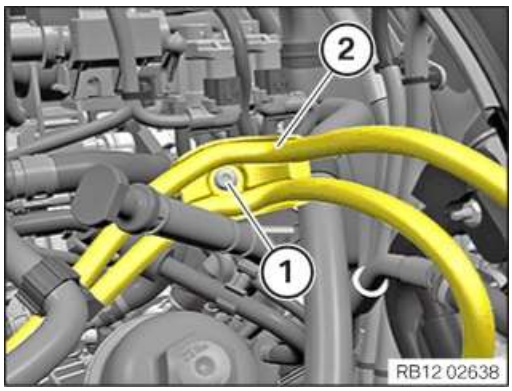
- Do not pull on the wires when disconnecting connectors and plug connections.



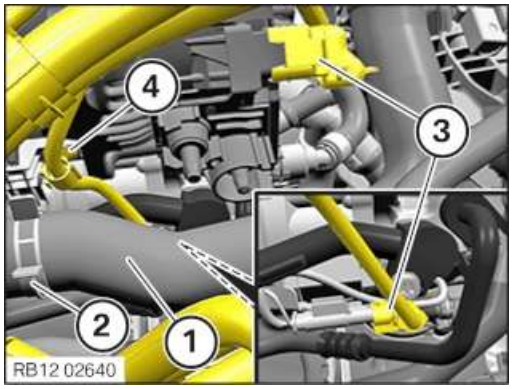
- Release the screw (1).
- Guide out fuel lines (2) and set them aside.



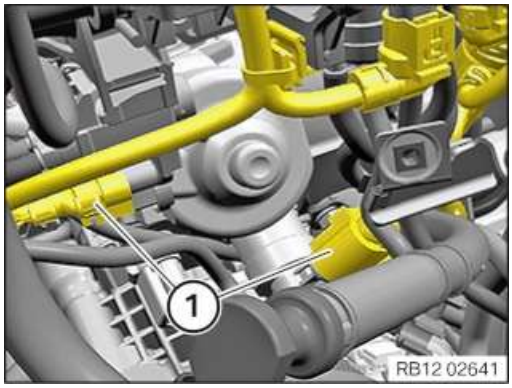
- Guide out and remove the lid (1).
- Release the nuts (2) and (3).
- Feed out positive battery cables (4) and place to one side.
- Loosen clamp (5).
- Thread out holder (2) and set aside.



- 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).



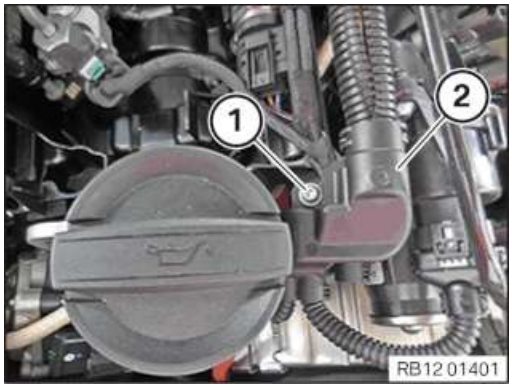
- Unlock and disconnect plug connections (1).



- Unlock and loosen connector (1).

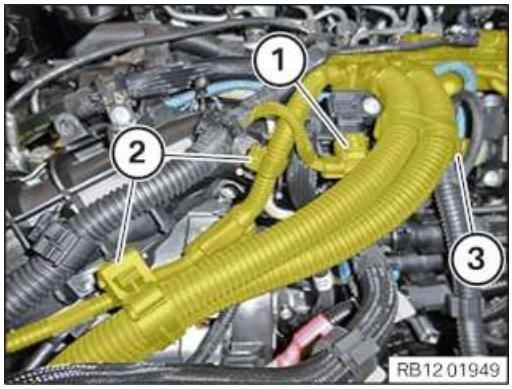


- Unlock plug connection (1) and disconnect.

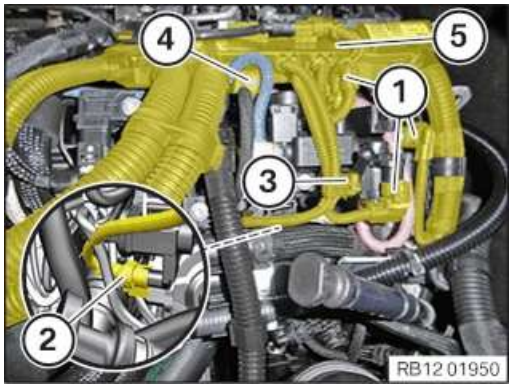


- Loosen screw (1).
- Remove the wiring harness section (2) and put to one side.

rdiagn.com



- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Loosen clamp (3).



- Unlock and disconnect the plug connection (1).
- Unlock and disconnect the plug connection (2).
- Loosen clamp (3).
- Loosen screw (4).
- Guide out wiring harness section (5) as far as possible and set it aside.

14 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

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

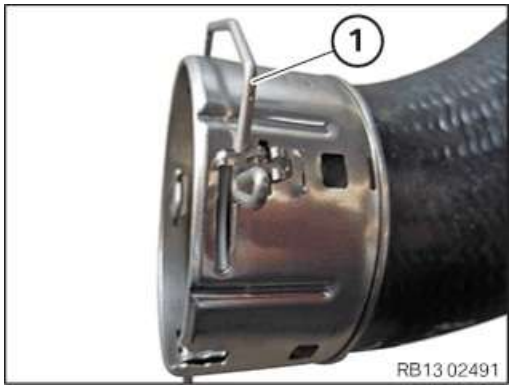
RISK OF DAMAGE

Electrostatic discharge.

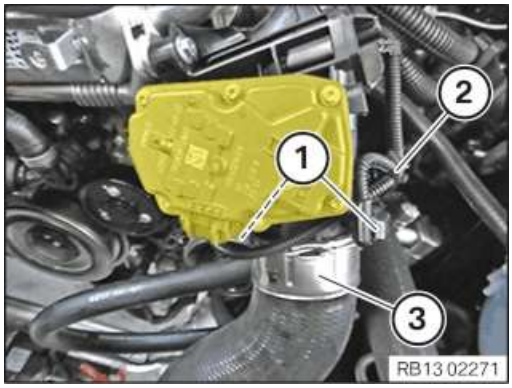
Damage to or destruction of electrical components.

- 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)

cardiagn.com



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

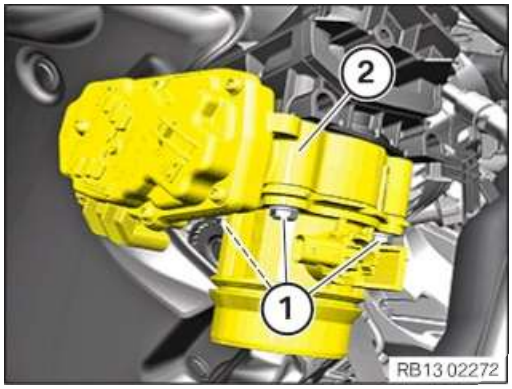


- Unlock and disconnect plug connections (1).

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).

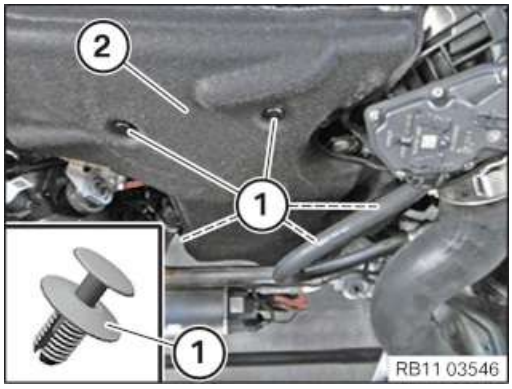
15 – Remove acoustic cover of the front engine

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 – Removing the drive belt for the starter motor generator

cardiagn.com

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

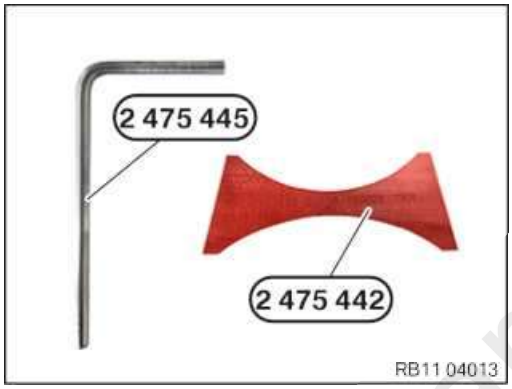
Component with preload.

Danger of injury!

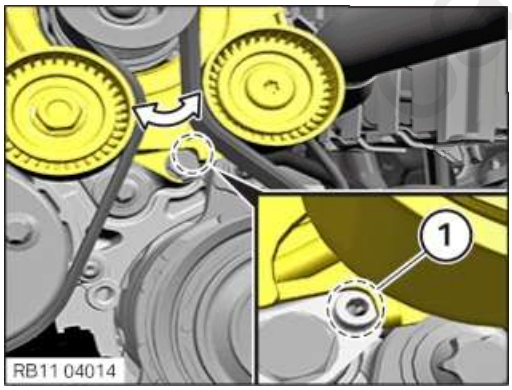
- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

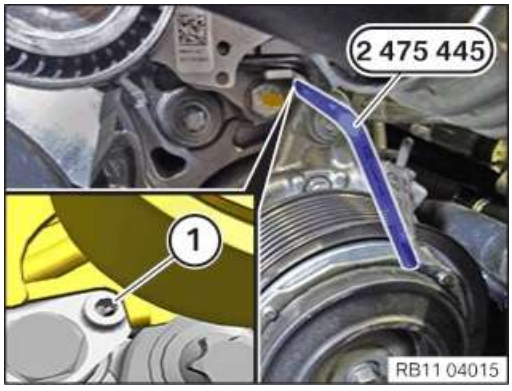
The drive belt must be replaced if contaminated with coolant- and oil residues.



- Prepare the special tool 2 475 442 and the special tool 2 475 445.

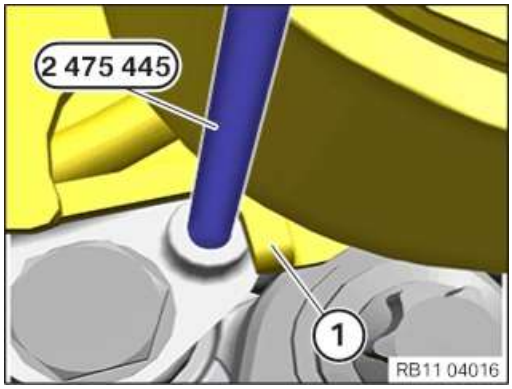


- Position the belt tensioner in the direction of the arrow so that the bore hole is visible in the area (1).

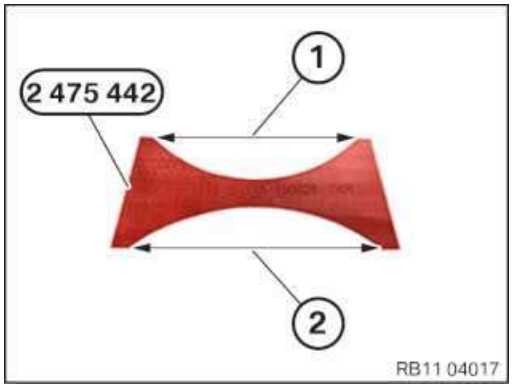


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

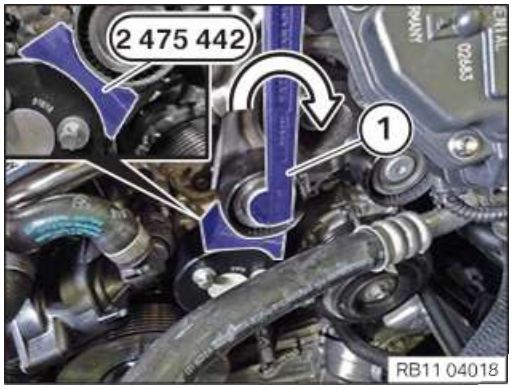
  The special tool 2 475 445 must rest against the starter motor generator.



- Ensure that the belt tensioner (1) is supported on the special tool 2 475 445.



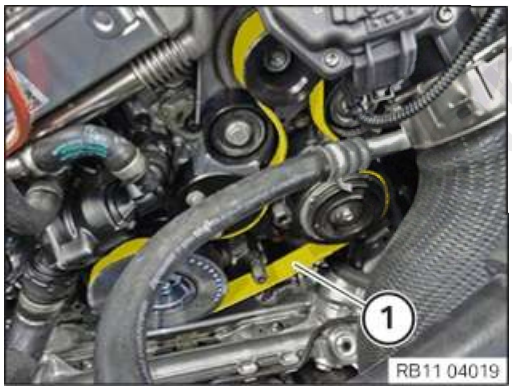
- Ensure that the radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- Ensure that the radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.



TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

- Guide out and remove the drive belt (1) for the starter motor generator.

17 – Removing the starter motor generator

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 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)

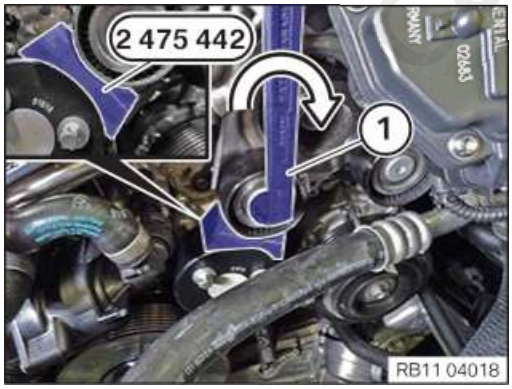
▸ **Avoiding damage to the starter generator due to escaping coolant**

RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

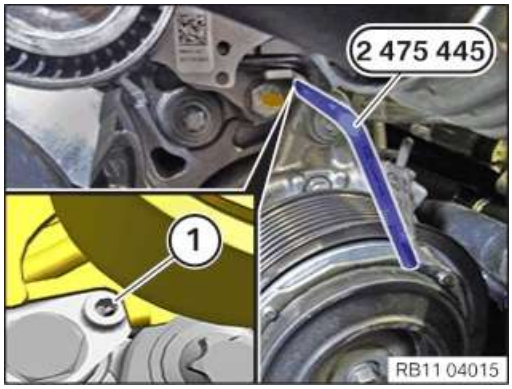


TECHNICAL INFORMATION

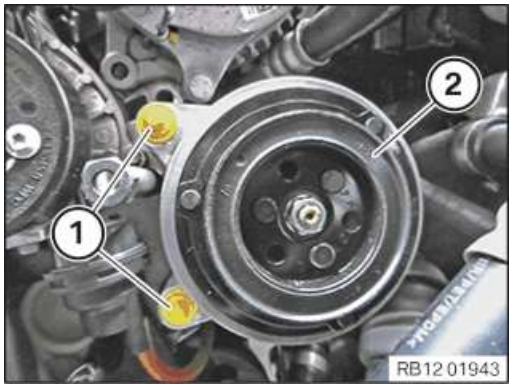
Conduct the following operation with the assistance of a second person.

- Twist the tensioning pulley (1) in the direction of the arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.

carsiagn.com



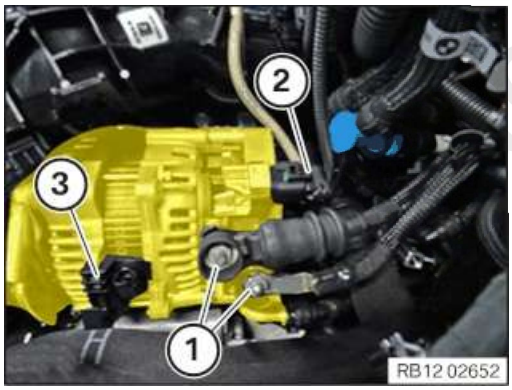
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.



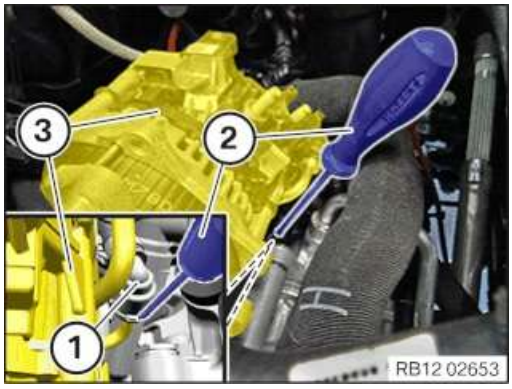
- Loosen screws (1).
- Slide the air conditioning compressor (2) out and set it aside.



- Guide out and remove the lid (1).



- Release nuts (1).
- Unlock plug connection (2) and disconnect.
- Loosen the holder (3).

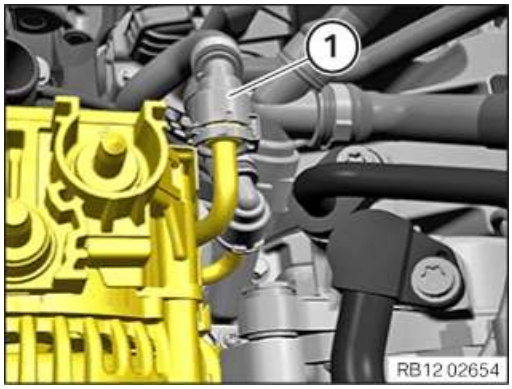


TECHNICAL INFORMATION

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

- Unlock and pull off the coolant line (1) with a screwdriver (2).
- Catch and dispose of escaping coolant.

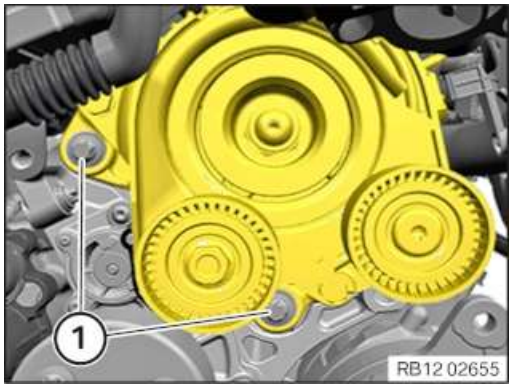
rdiagn.com



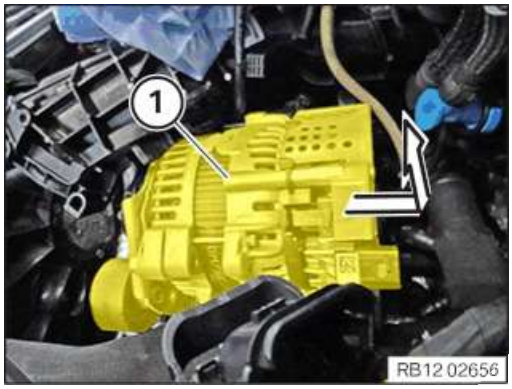
TECHNICAL INFORMATION

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

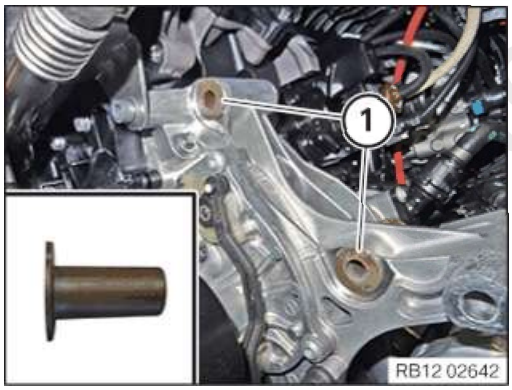
- Unlock and remove the coolant line (1).
- Catch and dispose of escaping coolant.



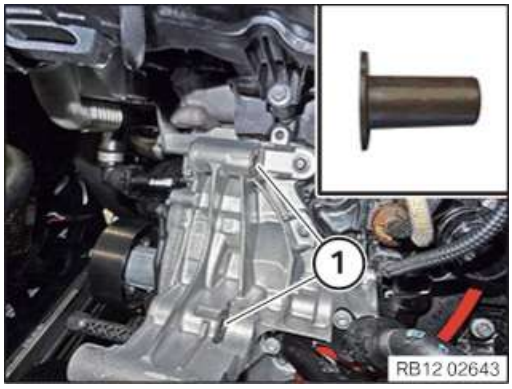
- Loosen screws (1).



- Feed out and remove the starter motor generator (1) in the direction of arrow.



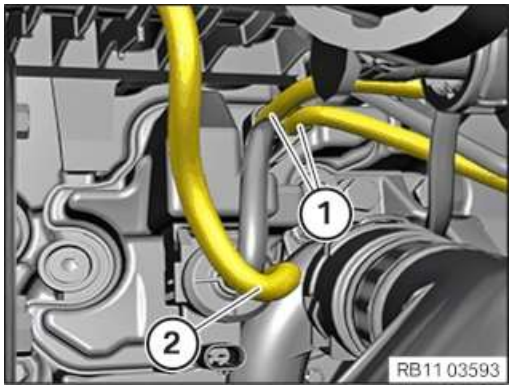
- Feed out and remove the bush (1).



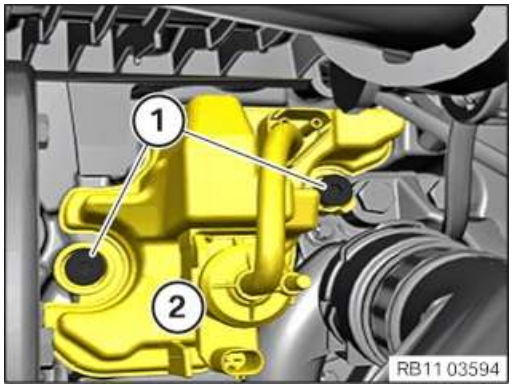
- Feed out and remove the bush (1).

18 – Remove vacuum reservoir

rdiagn.com

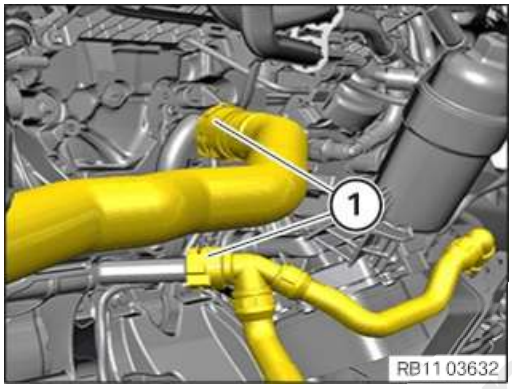


- Pull off vacuum hose (1) from the vacuum reservoir.
- Pull off the vacuum hose (2) from the electric changeover valve.

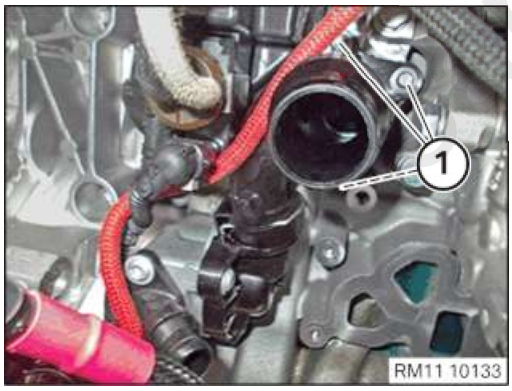


- Loosen screws (1).
- Feed out and remove the vacuum reservoir (2).

19 – Removing the component carrier



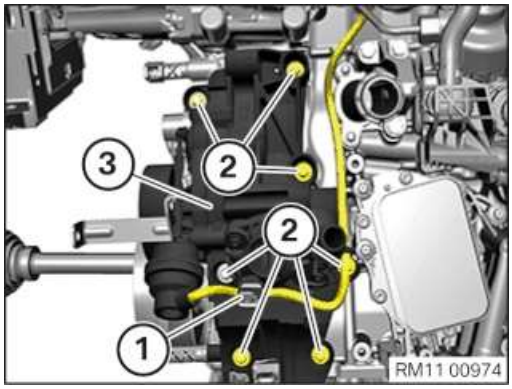
- Unlock and pull off the coolant hoses (1).



- Loosen screws (1).



- Loosen the screw (1) below the exhaust-gas recirculation cooler.



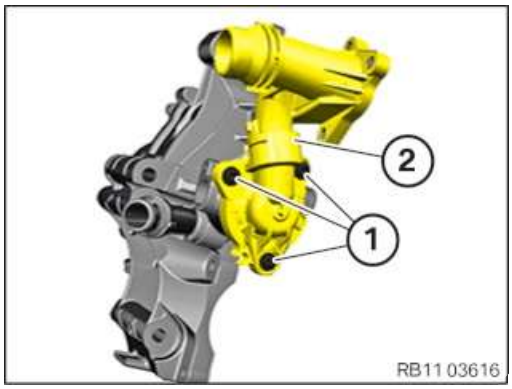
- Disconnect the vacuum line (1) from the vacuum unit and detach it from the clamp on the component carrier.
- Loosen screws (2).
- Lift off and remove the component carrier (3) from the crankcase.

MAIN WORK

20 – Removing the secondary coolant thermostat

TECHNICAL INFORMATION

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



- Loosen screws (1).
- Guide out and remove the connecting branch (2).



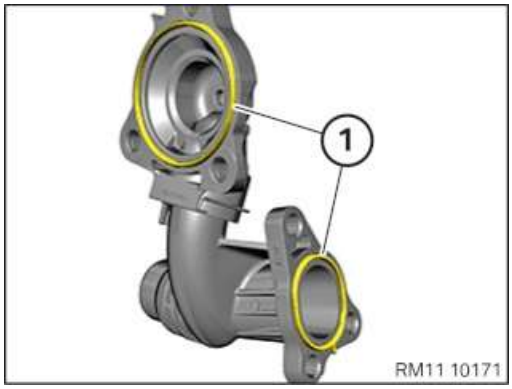
- Removing the secondary coolant thermostat.
- Ensure that the guide (1) is present on the secondary coolant thermostat.

21 – Installing the secondary coolant thermostat

TECHNICAL INFORMATION

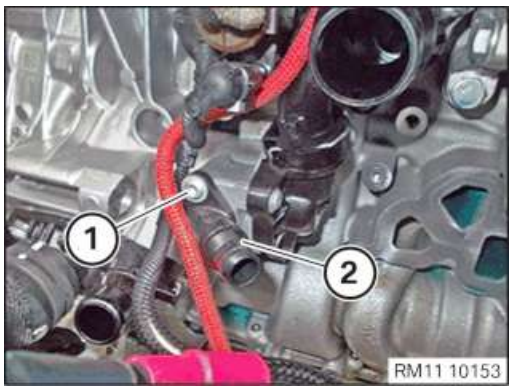
The sealing surfaces must be free from oils, grease and cleaning agents.

cardiagn.com

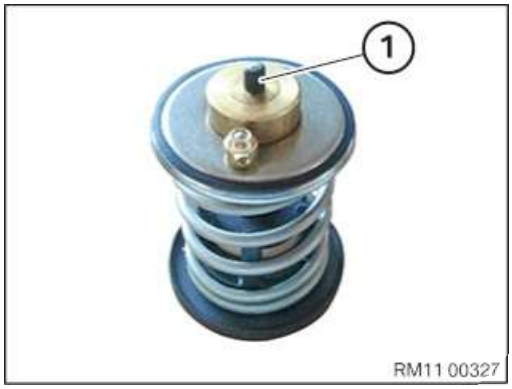


- Replace the seals (1).

  Parts: Seals



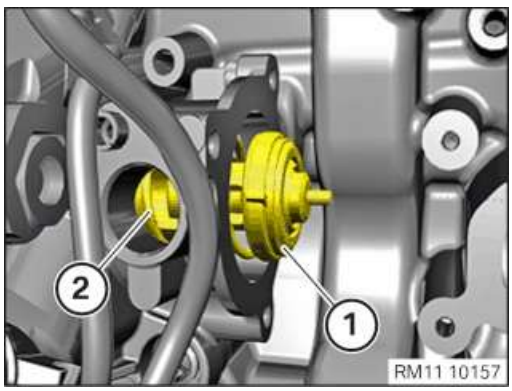
- Loosen screw (1).
- Guide out and remove the connecting branch (2).



- Ensure that the guide (1) is present on the secondary coolant thermostat.
- Replace the coolant thermostat if the guide (1) is damaged or missing.

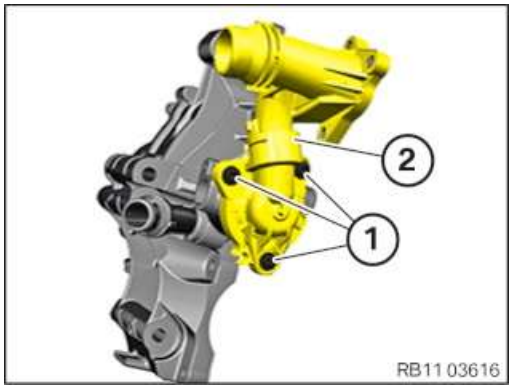


- Position the coolant thermostat (1) in the connecting branch.
- When positioning the thermostat, one must make sure that the guide of the coolant thermostat (1)sits correctly in the housing (2).



- Position the coolant thermostat (1) in the component carrier.
- Fasten the coolant thermostat through the opening (2).

cardiagn.com



- Feed the coolant thermostat with the connecting branches (2) into the component carrier and install it.
- Tighten the screws (1).

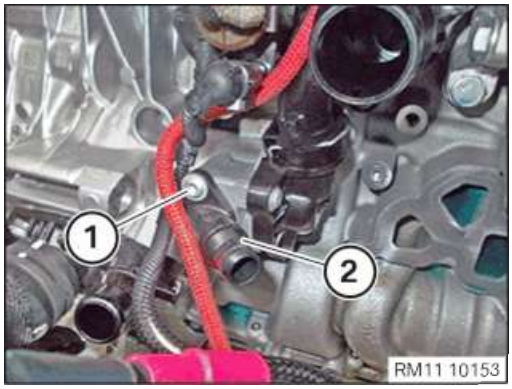
Connecting branch to component carrier

M6x20		Tightening torque	8 Nm



- Renew the O-ring (1) on the connecting branch.

  Parts: O-ring



- Insert connecting branch (2) and install.
- Tighten down screw (1).

Connecting branch to component carrier

M6x20		Tightening torque	8 Nm

POSTPROCESSES

22 – Installing the component carrier



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.

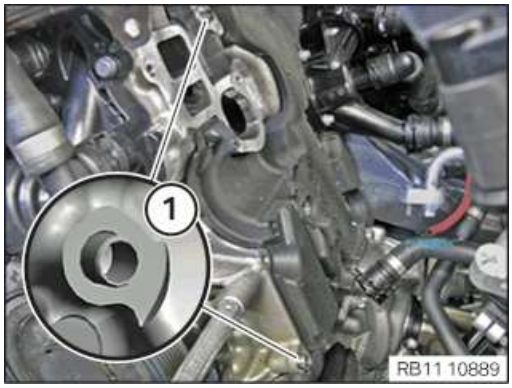
- Clean the sealing surface using special tool 0 495 102 (11 4 470).

cardiagn.com



- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).

Check



- Check the fitting sleeves (1) for damage.

desired state

- The fitting sleeves (1) must not be scratched or deformed.

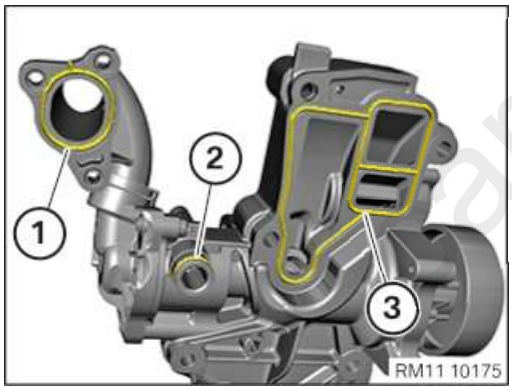
Result

» The fitting sleeves (1) are damaged.

Measure

- Renew fitting sleeves.

  Parts: Fitting sleeves



- Renew the seal (1).

  Parts: Gasket

- Renew O-ring (2).

  Parts: O-ring

- Check the sealing bead (3) for damage.
- Check the height of the sealing bead in reference to the surface.

Height of the sealing bead

	2,0 mm ... 2,5 mm

- If necessary, reapply the sealing bead.

Sealing compound

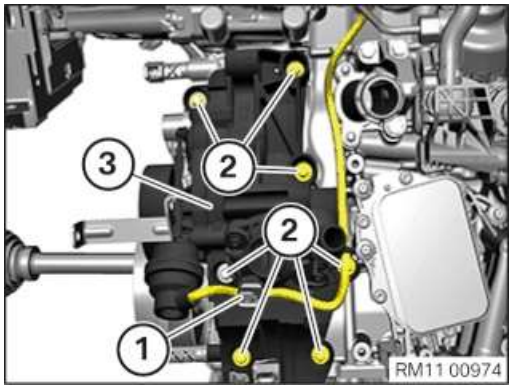
Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

	< 12 min

ardiagn.com



- Renew screws (2).

  Parts: Screws
- Position the component carrier (3) on the crankcase.
- Tighten the screws (2).

Component carrier to crankcase

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

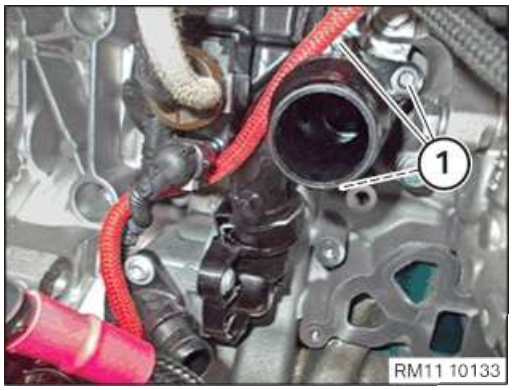
- Connect the vacuum line (1) on the vacuum unit and attach it in the clamp on the component carrier.



- Tighten the screw (1) below the exhaust-gas recirculation cooler.

Exhaust-gas recirculation cooler to cylinder head

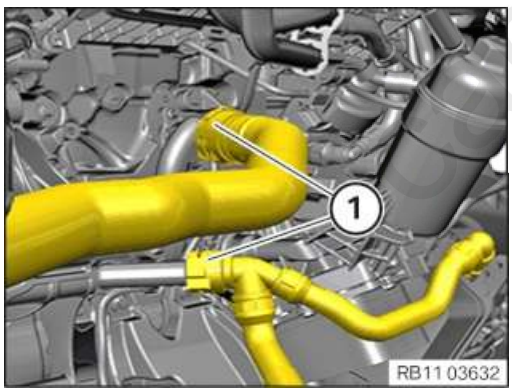
M8x20 / M8x28		Tightening torque	19 Nm



- Tighten the screws (1).

Connecting branch to engine block

M6x25		Tightening torque	8 Nm

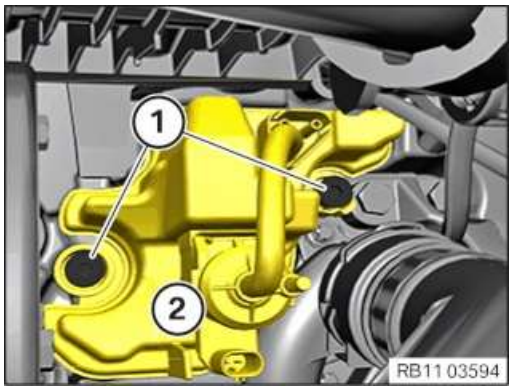


TECHNICAL INFORMATION

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

- Connect coolant hoses (1) and lock audibly.

23 – Install vacuum reservoir

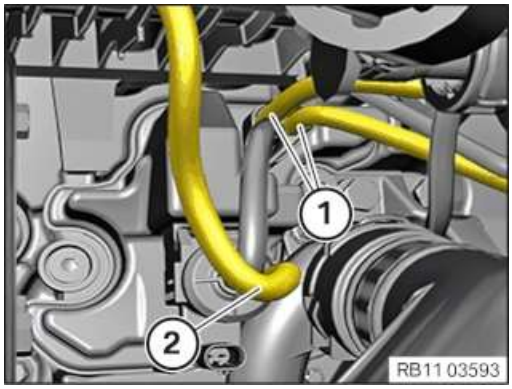


- Insert and install the vacuum reservoir (2).
- Tighten the screws (1).

Vacuum reservoir to crankcase

M6X25		Tightening torque	8 Nm

cardiag.com



- Connect vacuum hoses (1) to the vacuum reservoir.
- Connect vacuum hose (2) to the electric changeover valve.

24 – Installing the starter motor generator

CAUTION

Improper routing of the positive battery cable.

Risk of short circuits!

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

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.

▸ **Avoiding damage to the starter generator due to escaping coolant**

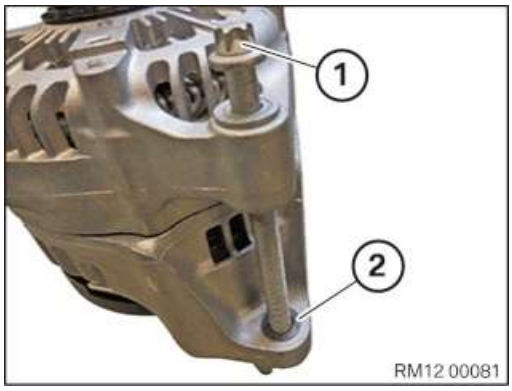
RISK OF DAMAGE

Escaping coolant on the starter generator.

Damage and operating failure of the starter generator.

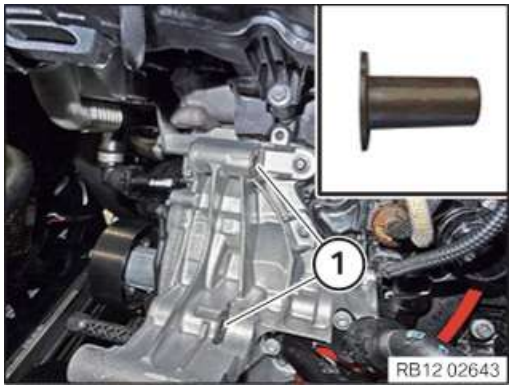
- Cover the starter generator with suitable, watertight auxiliary materials.
- Close off line connections with seal plugs.
- If necessary: Flush the leaked coolant from the starter generator with at least 1 l water.

▸ **Prepare for the installation of the alternator**



- Screw the screw (1) into the threaded support sleeve (2).
- Slightly press back the threaded support sleeve (2) using the bolt (1).
- Once again unscrew the screw (1) from the threaded support sleeve (2).

cardiagn.com



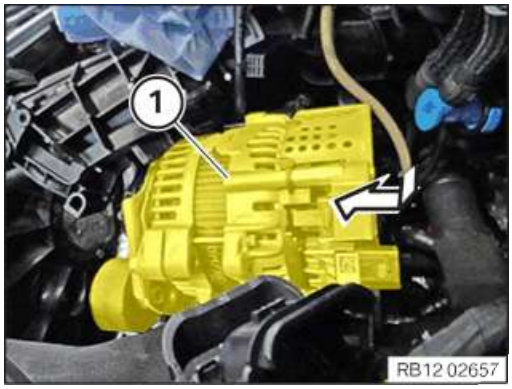
- Renew the bushes (1).

  Parts: Bushes
- Guide in and install the bushes (1).

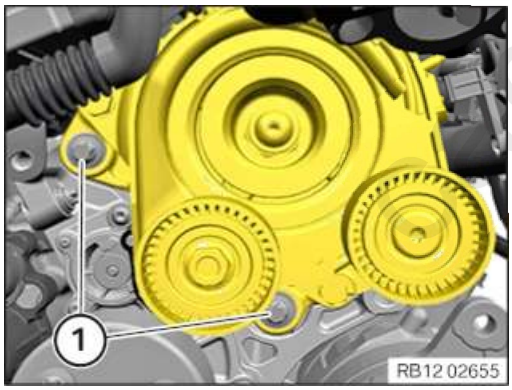


- Renew the bushes (1).

  Parts: Bushes
- Guide in and install the bushes (1).



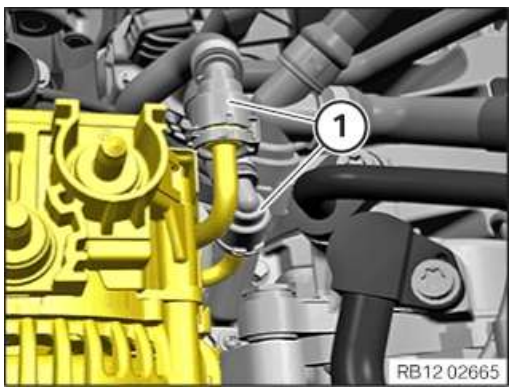
- Guide in and install the starter motor generator (1) in the direction of the arrow.



- Tighten the screws (1).

Alternator to component carrier

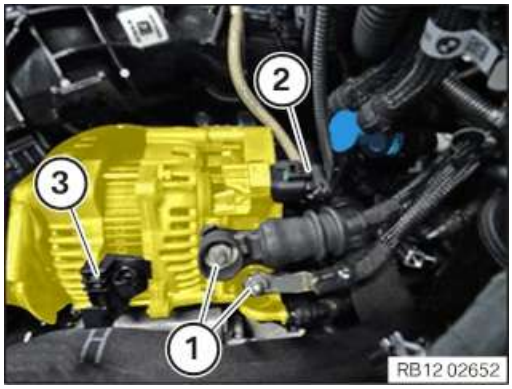
M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm



- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.

.com



- Fasten the holder (3).
- Connect connectors (2) and lock.

  The connector (2) must engage audibly.
- Renew nuts (1).

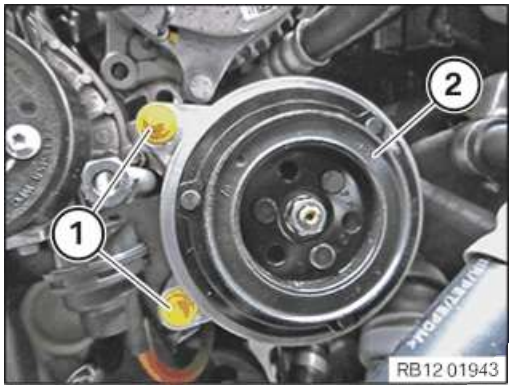
  Parts: Nuts
- Tighten nuts (1).

Battery positive lead on the starter motor generator

M8		Tightening torque	19 Nm



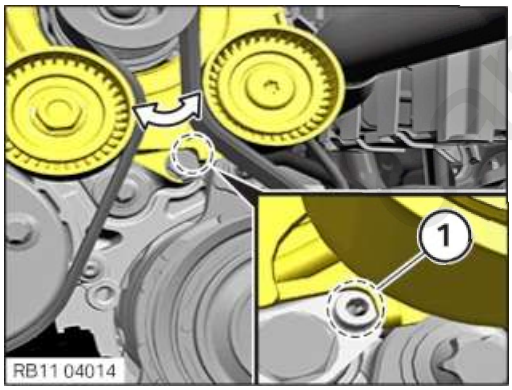
- Guide in and install the lid (1).



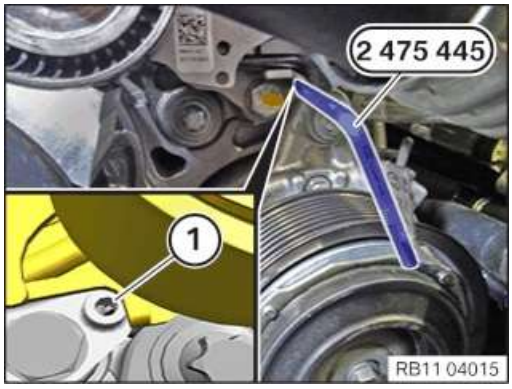
- Insert and install the air conditioning compressor (2).
- Tighten the screws (1).

Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm



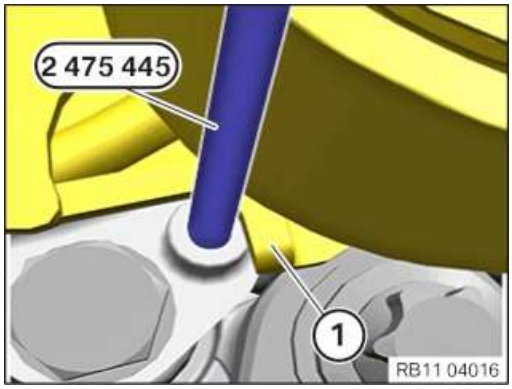
- Position the belt tensioner so that the bore hole is visible in the area (1).



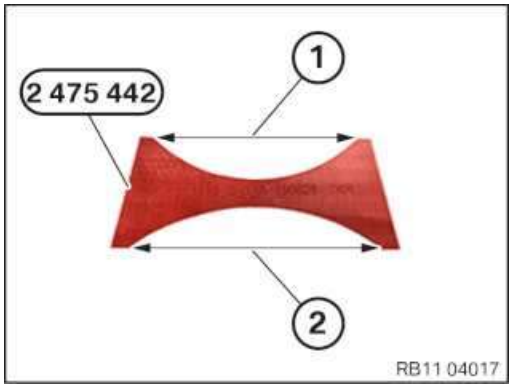
- Guide in the special tool 2 475 445 and install it in the bore hole (1).

  The special tool 2 475 445 must rest against the starter motor generator.

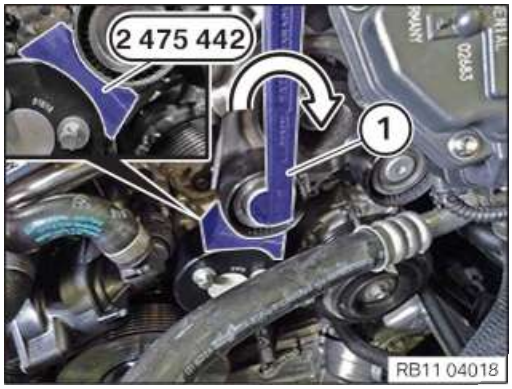
ardiagn.com



- The belt tensioner (1) must be supported on the special tool 2 475 445.



- The radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- The radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.



TECHNICAL INFORMATION

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

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.

25 – Installing the drive belt for the starter motor generator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

Component with preload.

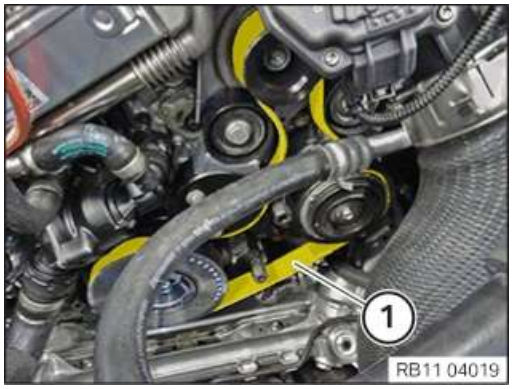
Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

cardiagn.com

TECHNICAL INFORMATION

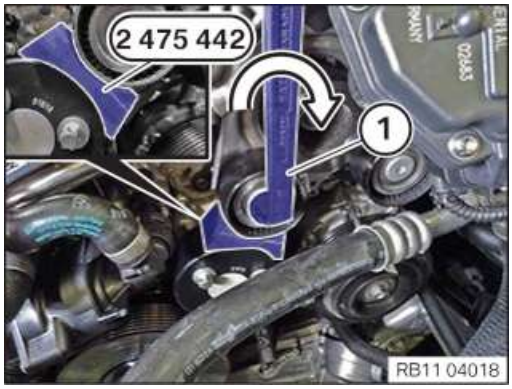
The drive belt must be replaced if contaminated with coolant- and oil residues.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

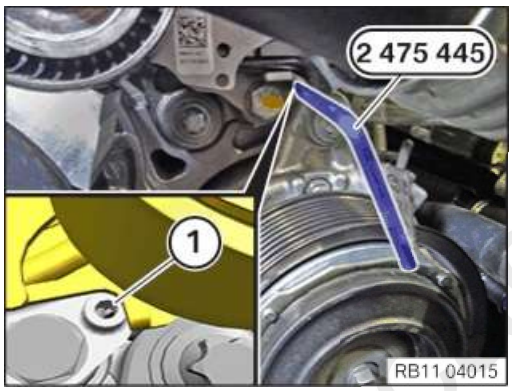
- Feed in and install the drive belt (1) for the starter motor generator.



TECHNICAL INFORMATION

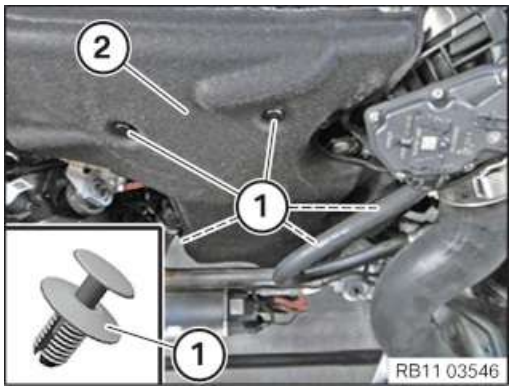
Conduct the following operation with the assistance of a second person.

- Turn the tensioning pulley in (1) in the direction of arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.



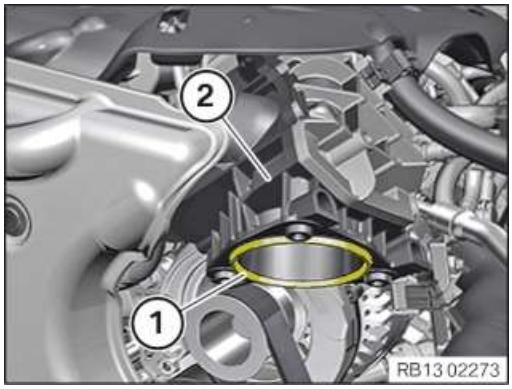
- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.

26 – Install acoustic cover for the engine, front



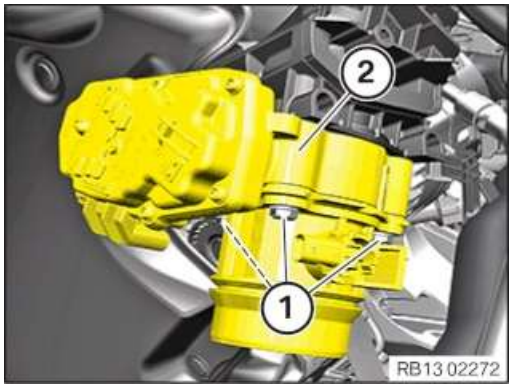
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

27 – 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

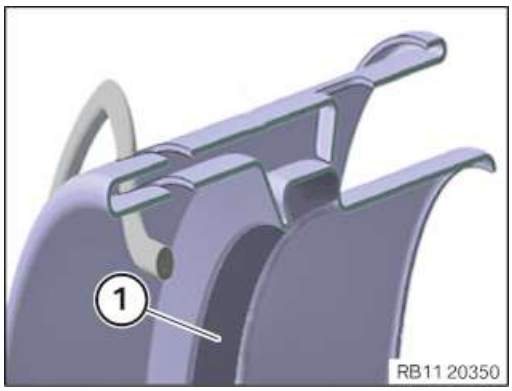


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

TECHNICAL INFORMATION

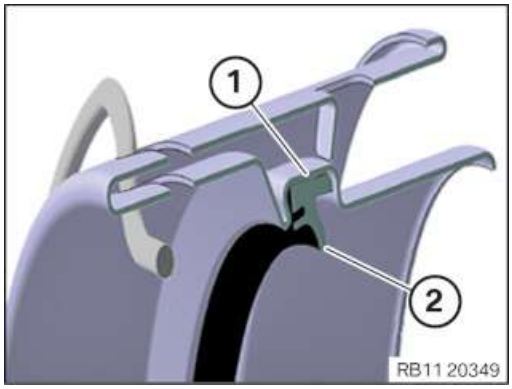
Do not use pointed or sharp-edged tools for the installation and/or removal.



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

  The gasket groove (1) must be clean.

cardiagn.com



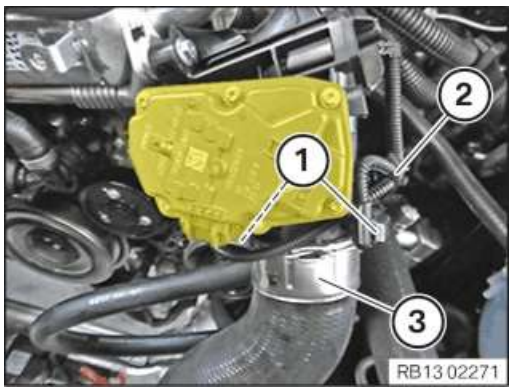
- Renew gasket.

  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).

28 – Partially securing the wiring harness section with the starter generator cables

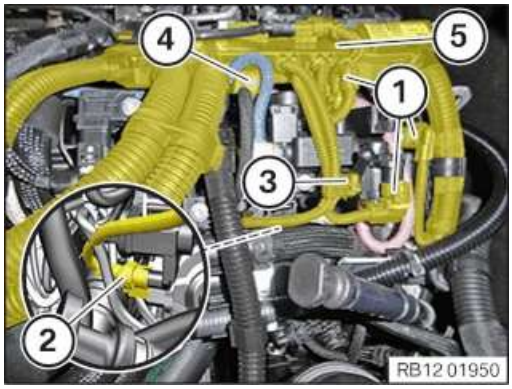
RISK OF DAMAGE

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.

carldiagn.com



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

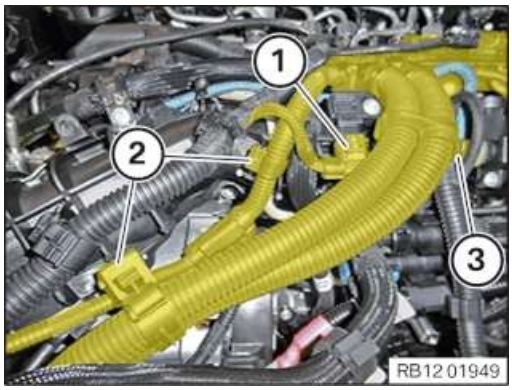
Wiring harness section to manifold

TS5x20		Tightening torque	3,6 Nm

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

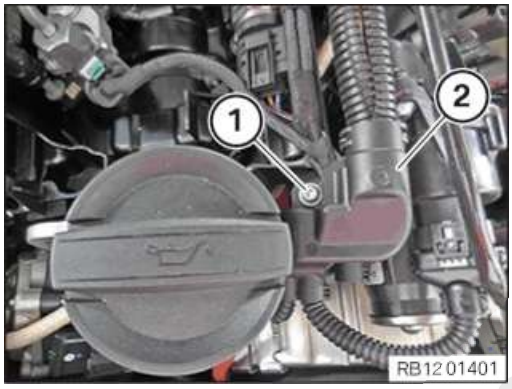
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- 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.

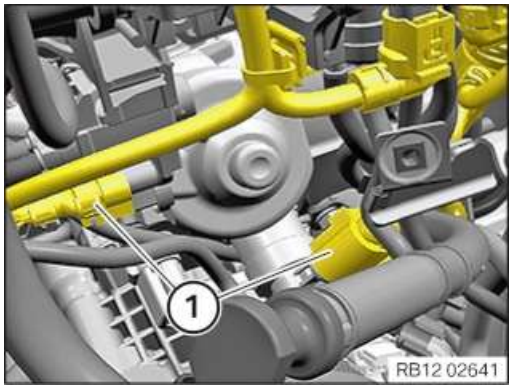
  The connector (1) must engage audibly.



- Connect the connector (1) and lock it.

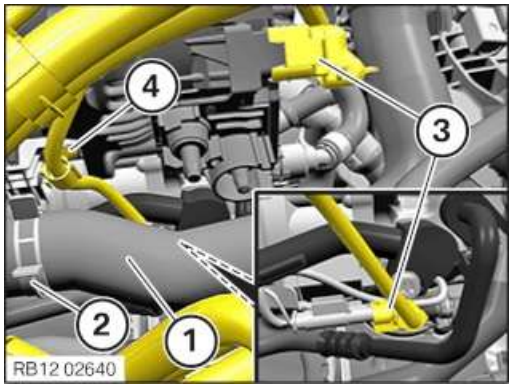
  The connector (1) must engage audibly.

mdiagn.com



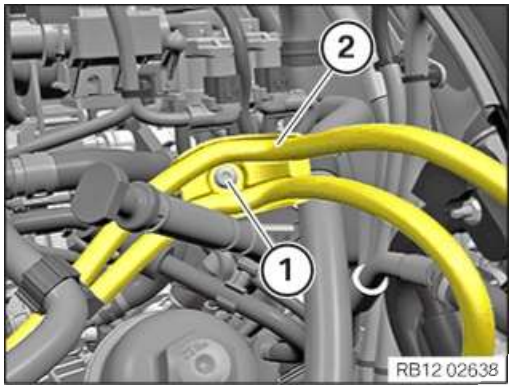
- Connect connectors (1) and lock.

  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



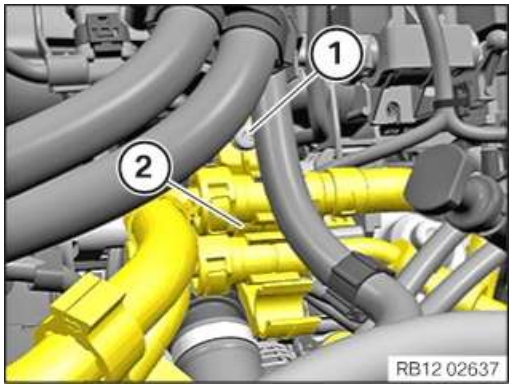
- Feed in and install the positive battery cable (4).
- Feed in and position the positive battery cables (4) .
- Renew the nuts (3) and (2).

  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

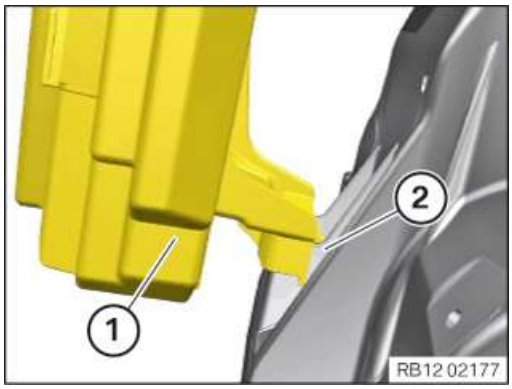
TS6X20		Tightening torque	5 Nm

29 – Installing the control unit holder

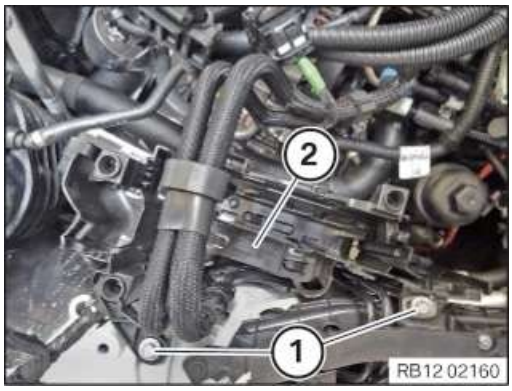
rdiagn.com

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.



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



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

Control unit holder

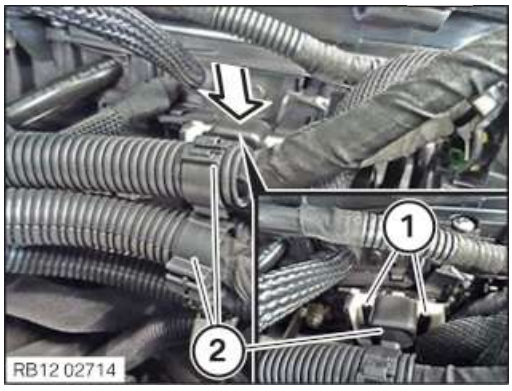
M6		Tightening torque	8 Nm



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

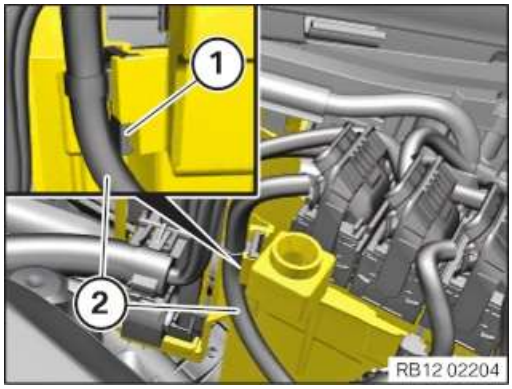
NOTICE

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

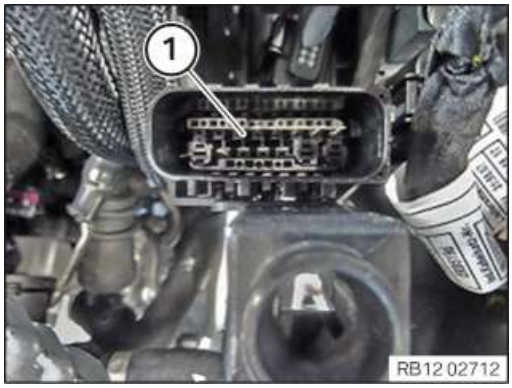


- Guide in cable clip (2) in the direction of the arrow and install it.
- Ensure that the locks (1)engage audibly.

cardiag.com

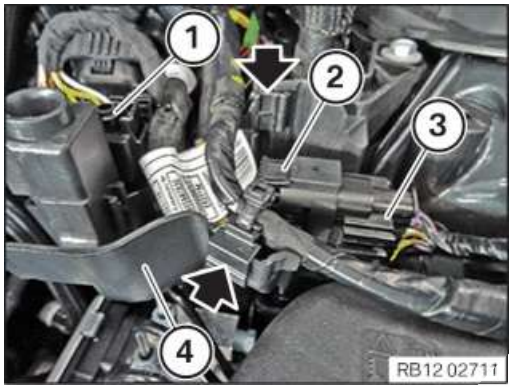


- Guide in the wiring harness section (2) and install.
- Connect and lock the cable clip (1).



- 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.

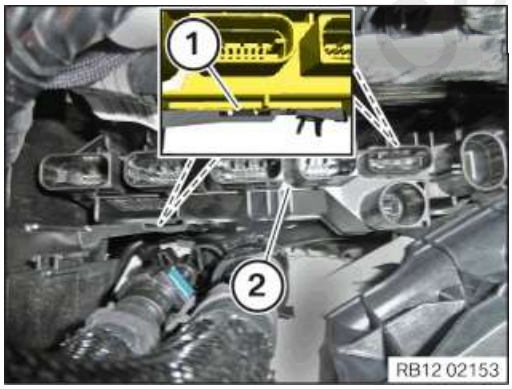
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure the clamps (arrows).

30 – Installing the integrated supply module (PDM) partially

Prerequisite

Engine control unit has been removed.



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

  The latch mechanisms (1) must engage audibly.

31 – 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

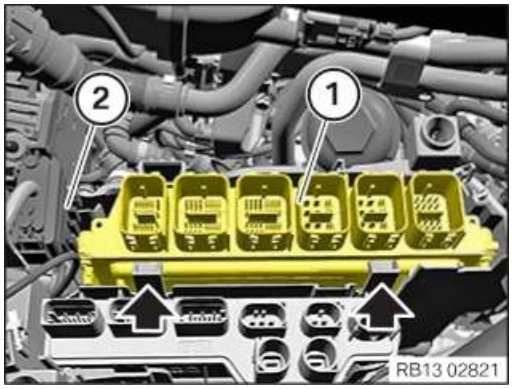
Follow instructions for removing and installing control units.
For additional information see: 12 00 ... Notes on removal and installation of control units

TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.
For additional information see: 61 00 ... Programming/encoding control unit(s)

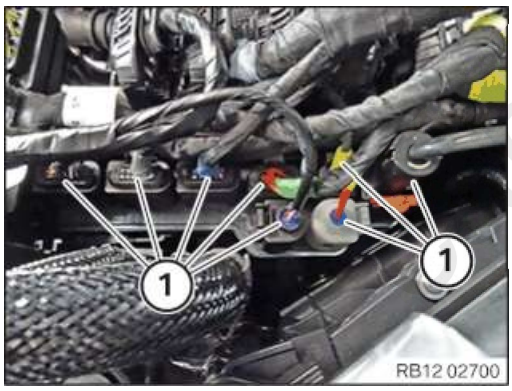
TECHNICAL INFORMATION

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



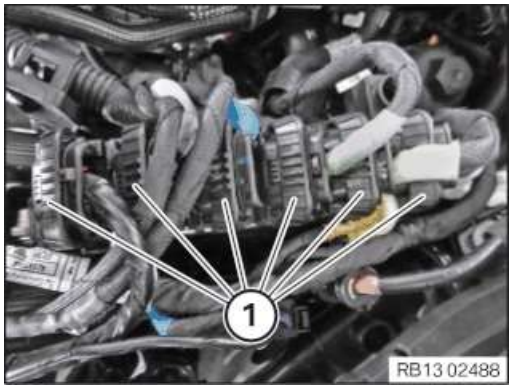
- Make sure that the plug connection (2) does not get damaged.
- Insert the DDE control unit (1) **carefully** and install it.

  The latch mechanisms (arrows) must engage audibly.



- Connect connectors (1) and lock.

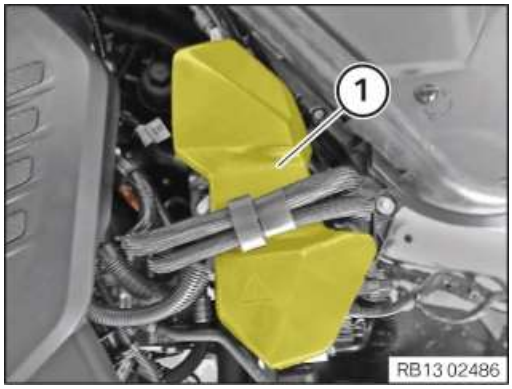
  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

32 – Install the cover for the DDE control unit

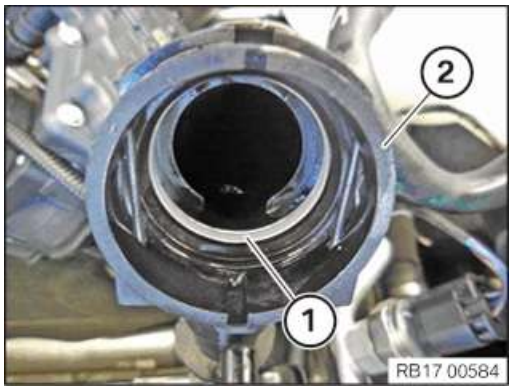


- Insert and install cover (1) into guides.

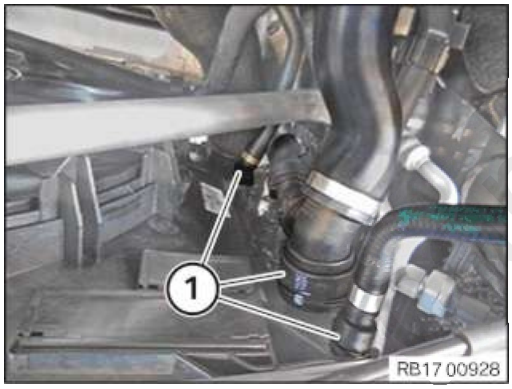
33 – Connecting the coolant lines

TECHNICAL INFORMATION

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



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

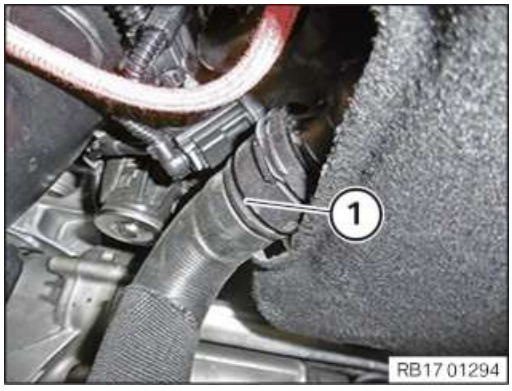


NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



- Connect and lock coolant line (1).

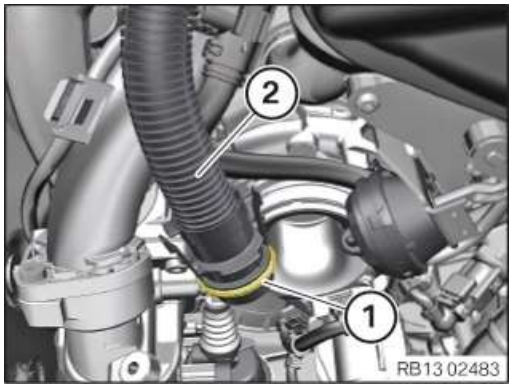
  The coolant line (1) must audibly engage.

34 – Installing the clean air pipe with resonator

ifdiagn.com



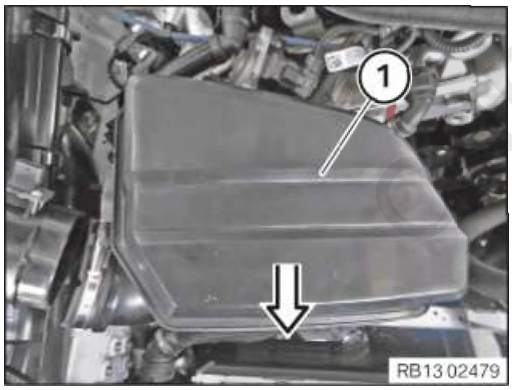
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- 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.



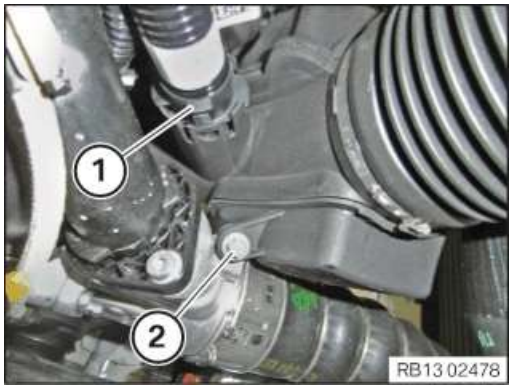
- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

  The clamp (1) must engage audibly.

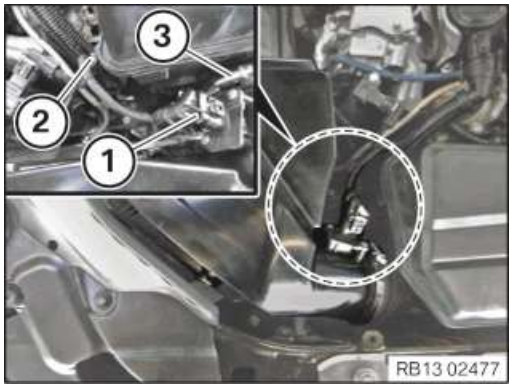
.com



- 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.

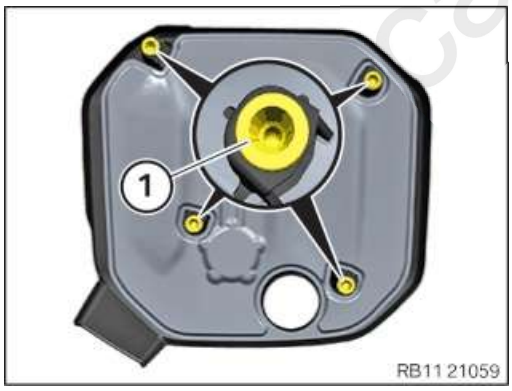
35 – Install acoustic cover

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.

cardiagn.com

36 – Connecting all battery earth leads



- See additional information.

37 – Activating the 48 V electrical system

Prerequisite

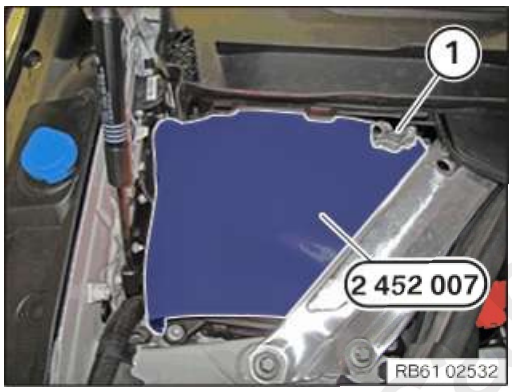
Ignition is switched off.

RISK OF DAMAGE

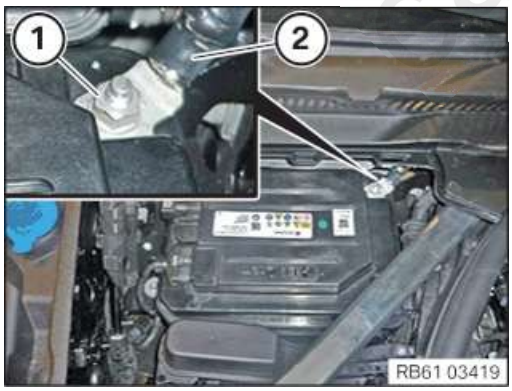
Damage to 48-V battery

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 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

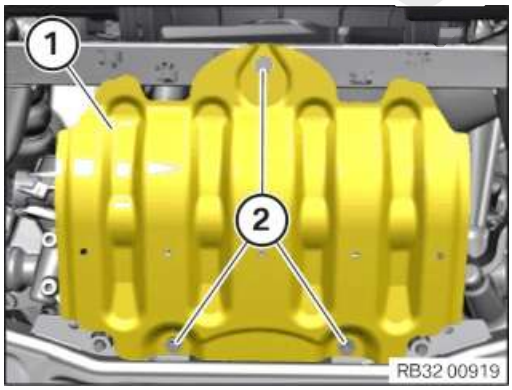
It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

39 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

Underbody protection, steering, to front axle support

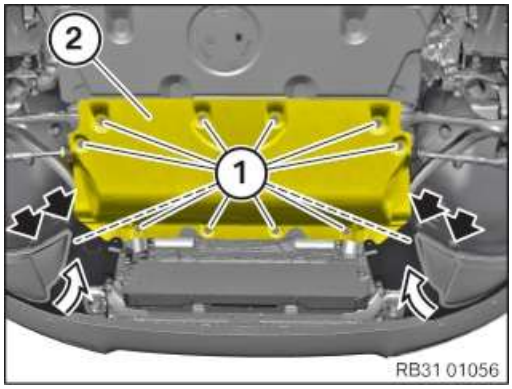
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

40 – Install the underbody protection of the steering gear

cardiagn.com



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

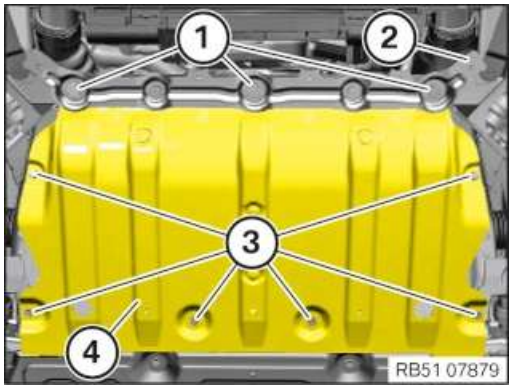
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

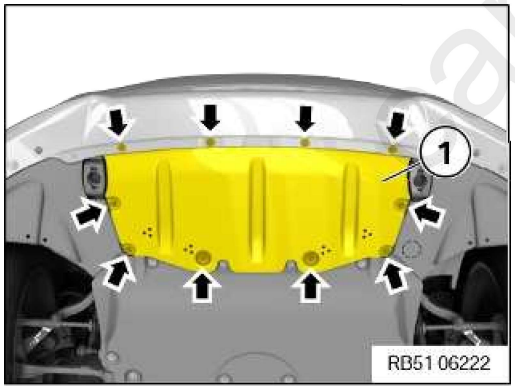
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

41 – Installing the front underbody protection



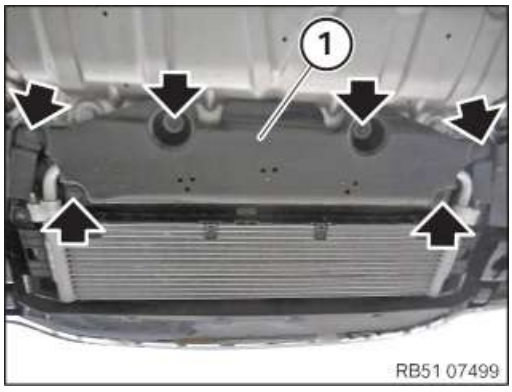
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version B:**

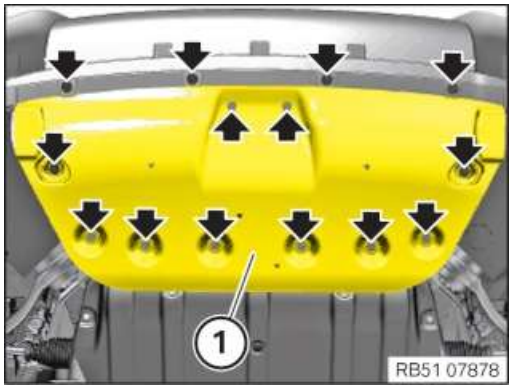
  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

carmanualsonline.com



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Connecting branch to component carrier — Used in step 21

M6x20		Tightening torque	8 Nm

Component carrier to crankcase — Used in step 22

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

Exhaust-gas recirculation cooler to cylinder head — Used in step 22

M8x20 / M8x28		Tightening torque	19 Nm

Connecting branch to engine block — Used in step 22

M6x25		Tightening torque	8 Nm

Vacuum reservoir to crankcase — Used in step 23

M6X25		Tightening torque	8 Nm

Alternator to component carrier — Used in step 24

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

Battery positive lead on the starter motor generator — Used in step 2428

M8		Tightening torque	19 Nm

Air conditioning compressor in component carrier — Used in step 24

M10		Tightening torque	38 Nm

Throttle body to intake plenum — Used in step 27

6x50		Tightening torque	8 Nm

Wiring harness section to manifold — Used in step 28

TS5x20		Tightening torque	3,6 Nm

Wiring harness section to cylinder head cover — Used in step 28

TS5x20		Tightening torque	3,6 Nm

cardiagn.com

Standard screw connection M6			Used in step 28
M6		Tightening torque	8 Nm

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

Control unit holder			Used in step 29
M6		Tightening torque	8 Nm

Clean air pipe to exhaust turbocharger			Used in step 34
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 34
Clamp		Tightening torque	3 Nm

Negative battery cable to 48-V battery			Used in step 37
Nut M8		Tightening torque	19 Nm

Underbody protection, steering, to front axle support			Used in step 39
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 39
Hexagon bolt M6		Tightening torque	8 Nm

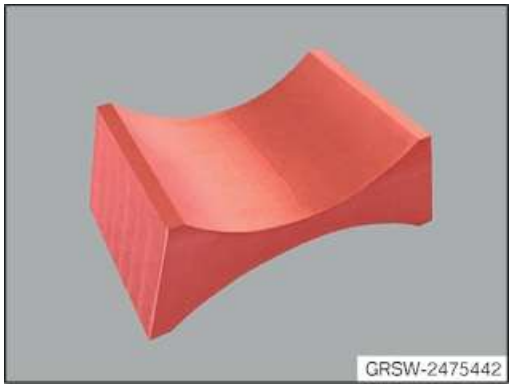
Underbody protection of the steering gear			Used in step 40
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front			Used in step 40
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Underbody protection front			Used in step 41
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Overview of Special Tools

2 475 442 Removal and installation tool



Common	Used in step 16172425
Usage	For removing and installing the drive belt of the ancillary components.
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475445
SI-Number	01 19 19 (668)

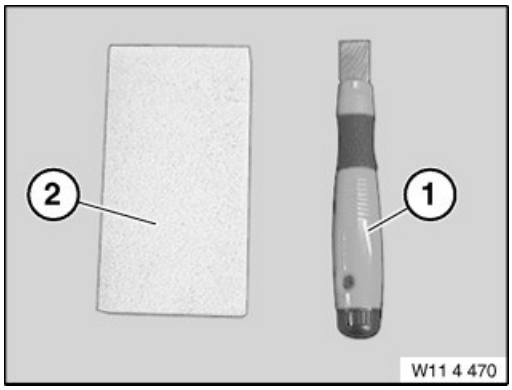
cardiagn.com

2 475 445 Pin



Common	Used in step 16172425
Usage	Tool for drive belt of 48 V ancillary components
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475442 83302475444
SI-Number	01 19 19 (668)

0 495 102 (11 4 470) Tool



Common	Used in step 22
Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Overview Technical Data

Height of the sealing bead — Used in step 22

2,0 mm ... 2,5 mm

Processing time of liquid sealing compound — Used in step 22

< 12 min

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	137

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	1031

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236

cardiagn.com

61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	236
61 20 900 Disconnecting and connecting battery earth lead	236
61 20 900 Disconnecting and connecting battery earth lead	236

cardiagn.com

61 20 900 Disconnecting and connecting battery earth lead	236
61 35 ... Notes on ESD protection (Electro Static Discharge)	1011131417
61 35 ... Notes on ESD protection (Electro Static Discharge)	101113141724
61 00 730 Encode/program control unit(s) (after vehicle test)	31
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	38
17 00 039 Bleeding cooling system (B37, B47)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	38

cardiagn.com

17 00 008 Draining and topping up the high-temperature coolant circuit	38
17 00 008 Draining and topping up the high-temperature coolant circuit	38
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	38
17 00 008 Draining and topping up the high-temperature coolant circuit	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	38
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 008 Draining and topping up coolant for high-temperature circuit	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	38

carsiagn.com

11 53 002 Removing and installing/replacing the secondary coolant thermostat

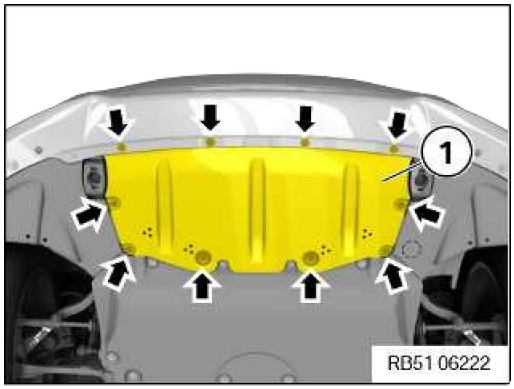
PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

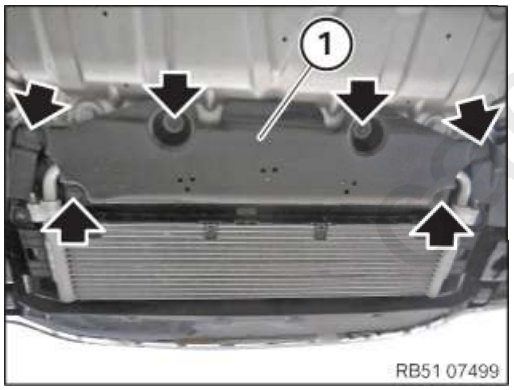
2 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

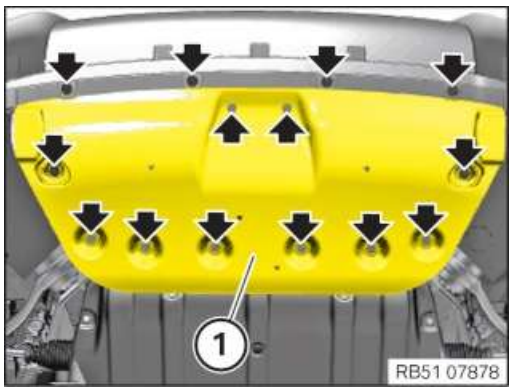
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

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

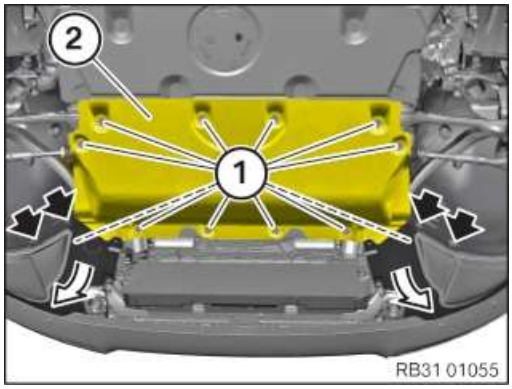


- **Version C:**

  Remove screws (arrows).

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

3 – Remove the underbody protection of the steering gear



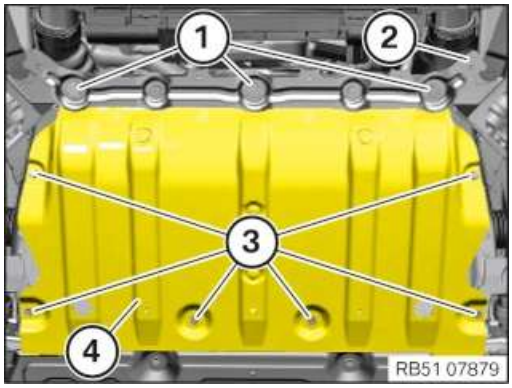
- **Version A:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

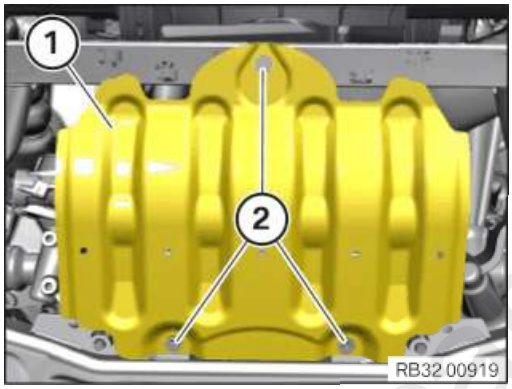
  Loosen screws (3).

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

4 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

5 – 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.

cardiagn.com



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

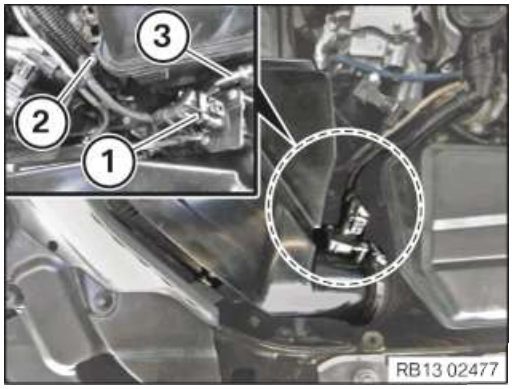
6 – Removing the clean air pipe with the resonator

WARNING

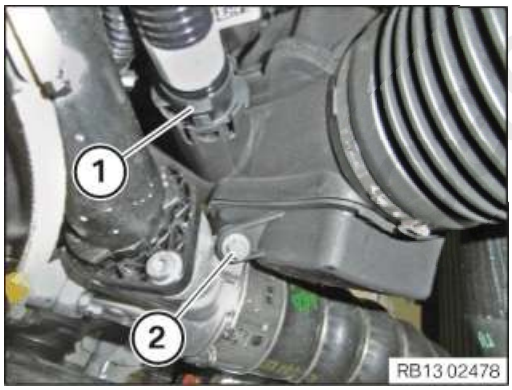
Hot surfaces.

Risk of burning!

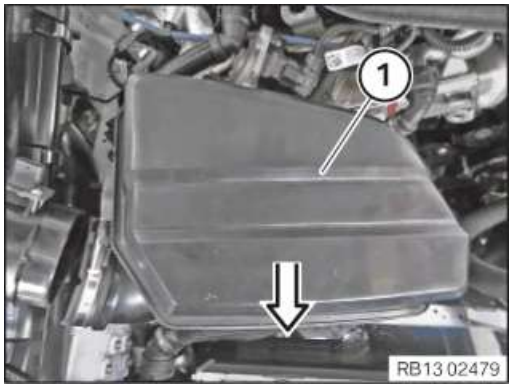
- Perform all work only on components that have cooled down.



- 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.

rdiagn.com



- Unlock and loosen clamp (1).



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

7 – Draining coolant

WARNING

Hot fluids.

Risk of scalding!

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

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

Life-long fill of coolant!

Do not reuse used coolant.

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

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

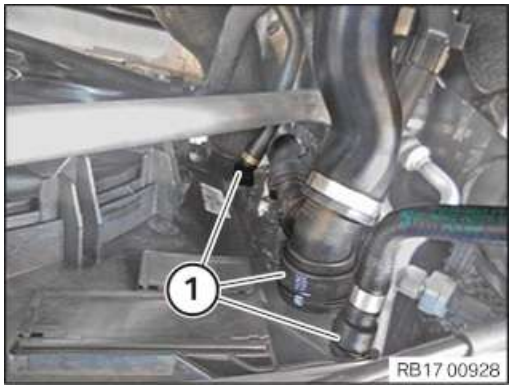
cardiagn.com

TECHNICAL INFORMATION

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



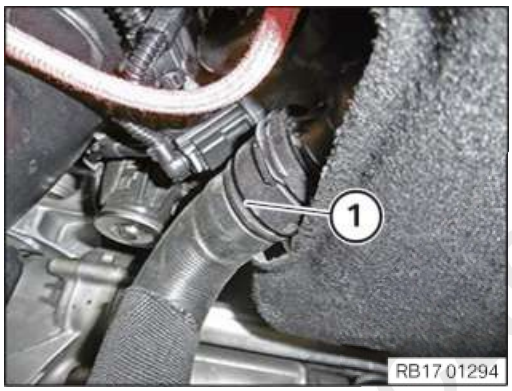
- Loosen sealing cap (1) from the coolant expansion tank.



NOTICE

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

- Unlock all coolant lines (1) and detach.
- Catch and dispose of escaping coolant.



- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

8 – Removing the throttle body

WARNING

Hot surfaces.

Risk of burning!

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

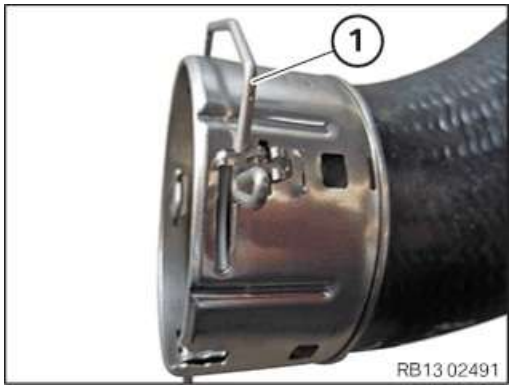
obdiag.com

RISK OF DAMAGE

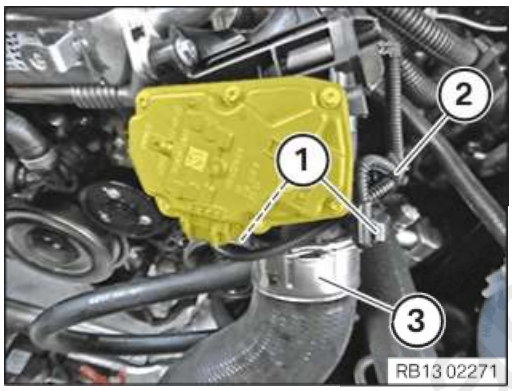
Electrostatic discharge.

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 clamp (1) and engage in this position.

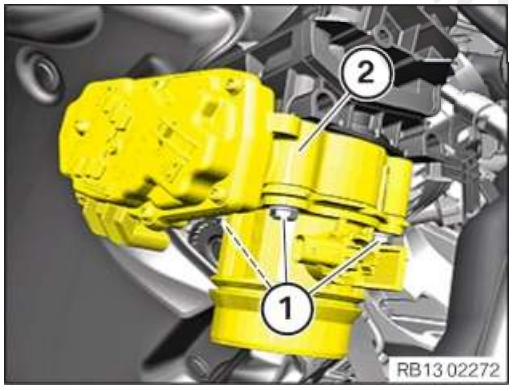


- Unlock and disconnect plug connections (1).

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).

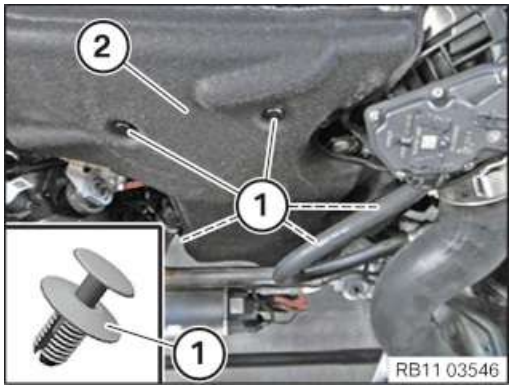
9 – Remove acoustic cover of the front engine

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.

10 – Removing the drive belt for alternator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

Component with preload.

Danger of injury!

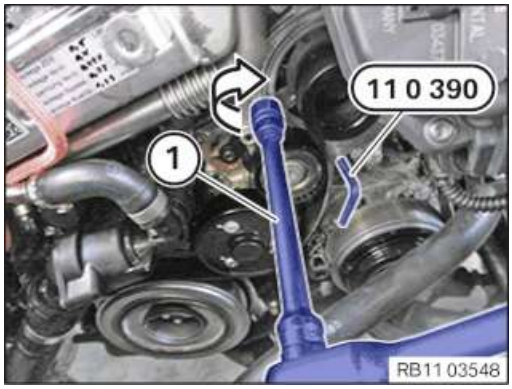
- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

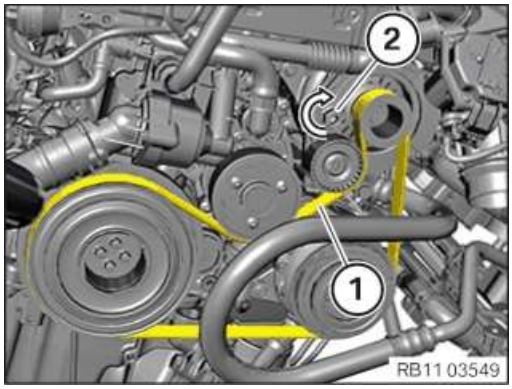
TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.



- If reusing the drive belt for alternator: Mark the direction of rotation.
- Relax the belt tensioner in the direction of the arrow using a standard tool (1).
- Fix the belt tensioner with the special tool 0 496 268 (11 0 390).

cardiagn.com



- Relieve belt tensioner at hexagon head (2) in direction of arrow up to limit position.
- Guide out and remove drive belt for alternator (1).

11 – Removing the alternator

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 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.

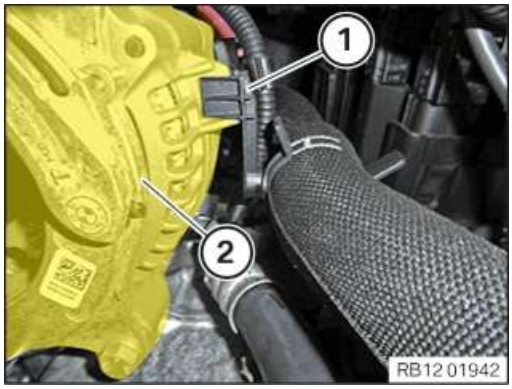
RISK OF DAMAGE

Electrostatic discharge.

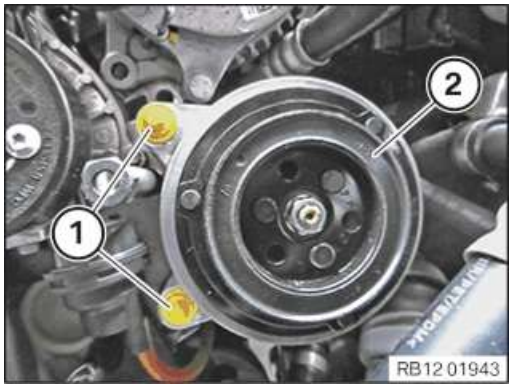
Damage to or destruction of electrical components.

- 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)

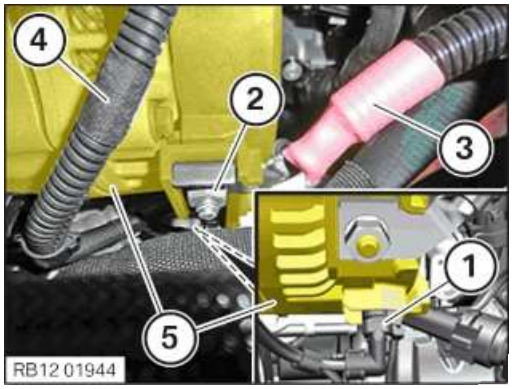
cardiagn.com



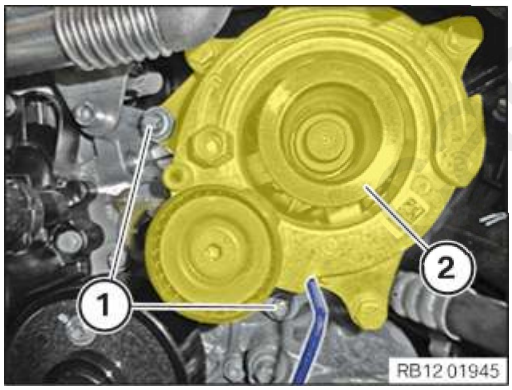
- Release the bracket (1) from the alternator (2).



- Loosen screws (1).
- Slide the air conditioning compressor (2) out and set it aside.

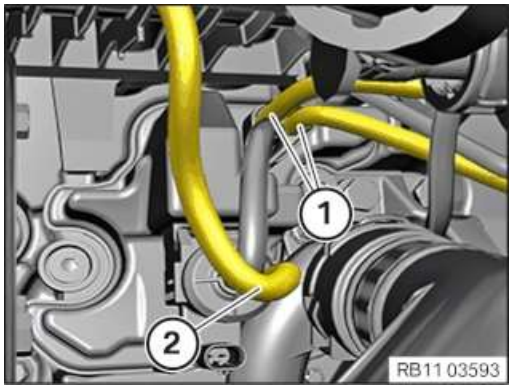


- Unlock the plug connection (1) and disconnect it from the alternator (5).
- Release the nut (2) on the alternator (5).
- Feed out positive battery cable (3) and put to one side.
- Remove the wiring harness section (4) and put to one side.



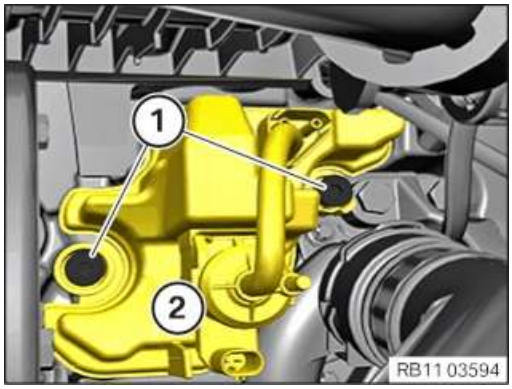
- Loosen screws (1).
- Guide out alternator (2) and remove.

12 – Remove vacuum reservoir



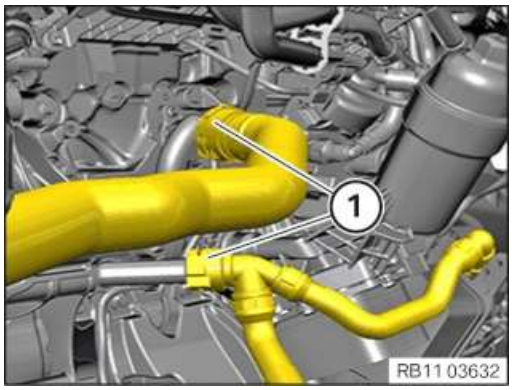
- Pull off vacuum hose (1) from the vacuum reservoir.
- Pull off the vacuum hose (2) from the electric changeover valve.

rdiagn.com

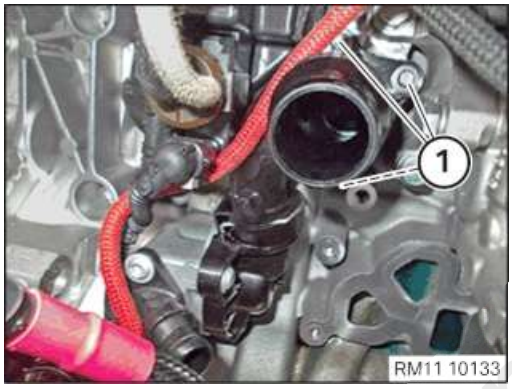


- Loosen screws (1).
- Feed out and remove the vacuum reservoir (2).

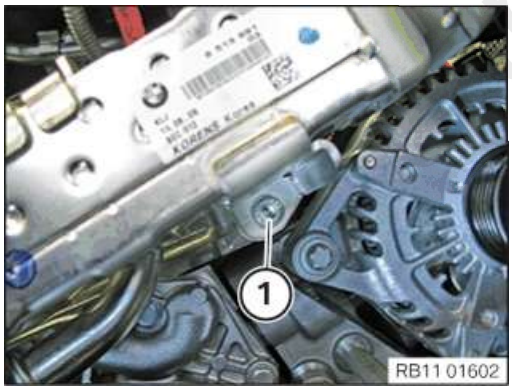
13 – Removing the component carrier



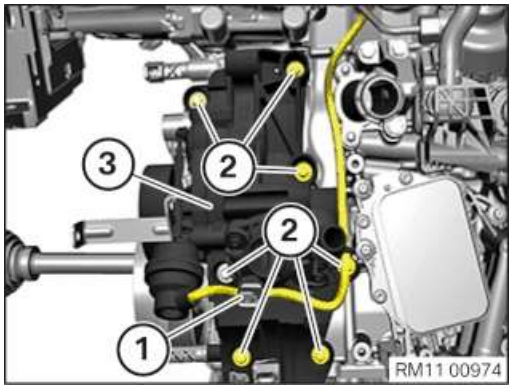
- Unlock and pull off the coolant hoses (1).



- Loosen screws (1).



- Loosen the screw (1) below the exhaust-gas recirculation cooler.



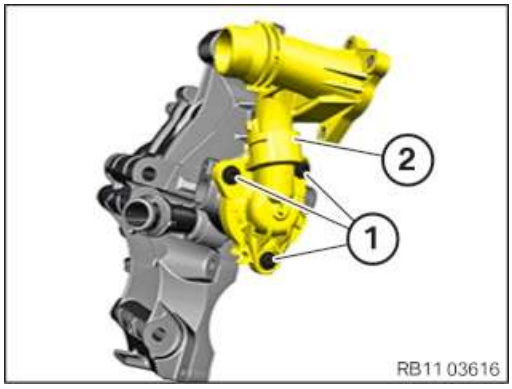
- Disconnect the vacuum line (1) from the vacuum unit and detach it from the clamp on the component carrier.
- Loosen screws (2).
- Lift off and remove the component carrier (3) from the crankcase.

cardiagn.com

14 – Removing the secondary coolant thermostat

TECHNICAL INFORMATION

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



- Loosen screws (1).
- Guide out and remove the connecting branch (2).

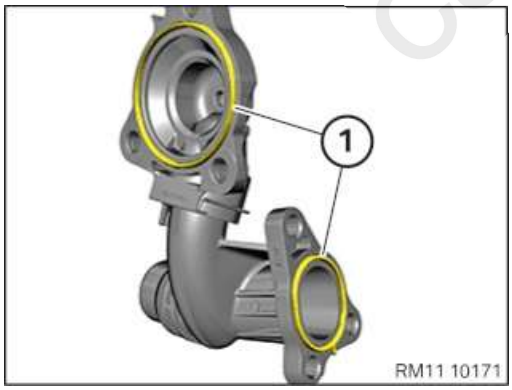


- Removing the secondary coolant thermostat.
- Ensure that the guide (1) is present on the secondary coolant thermostat.

15 – Installing the secondary coolant thermostat

TECHNICAL INFORMATION

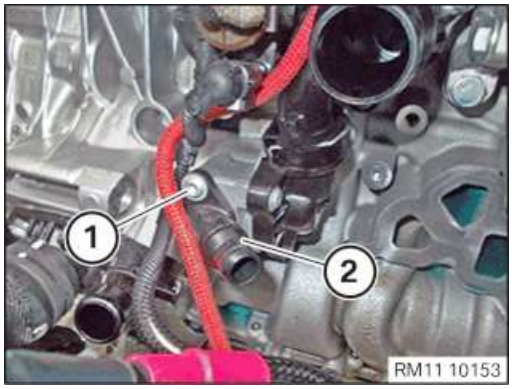
The sealing surfaces must be free from oils, grease and cleaning agents.



- Replace the seals (1).

  Parts: Seals

cardiagn.com



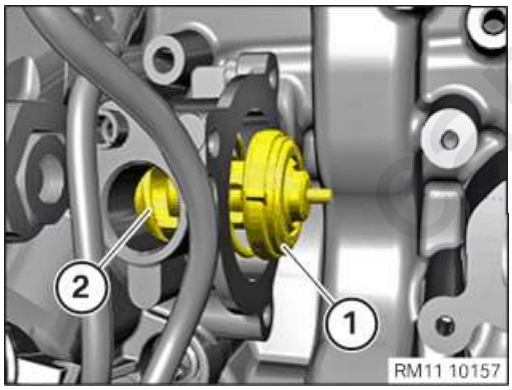
- Loosen screw (1).
- Guide out and remove the connecting branch (2).



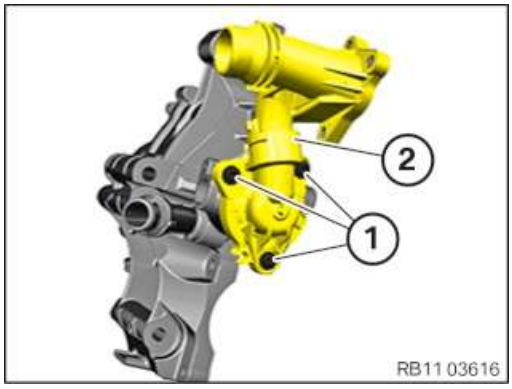
- Ensure that the guide (1) is present on the secondary coolant thermostat.
- Replace the coolant thermostat if the guide (1) is damaged or missing.



- Position the coolant thermostat (1) in the connecting branch.
- When positioning the thermostat, one must make sure that the guide of the coolant thermostat (1)sits correctly in the housing (2).



- Position the coolant thermostat (1) in the component carrier.
- Fasten the coolant thermostat through the opening (2).



- Feed the coolant thermostat with the connecting branches (2) into the component carrier and install it.
- Tighten the screws (1).

Connecting branch to component carrier

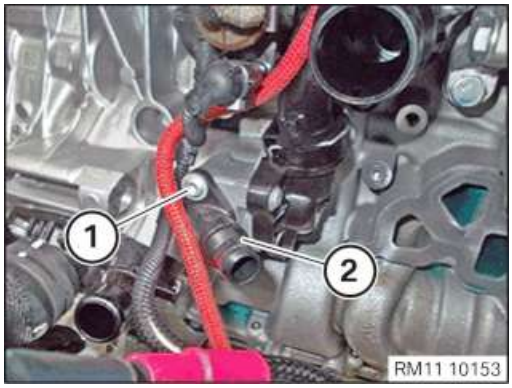
M6x20		Tightening torque	8 Nm

erdiagn.com



- Renew the O-ring (1) on the connecting branch.

  Parts: O-ring



- Insert connecting branch (2) and install.
- Tighten down screw (1).

Connecting branch to component carrier

M6x20		Tightening torque	8 Nm

POSTPROCESSES

16 – Installing the component carrier



RISK OF DAMAGE

Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

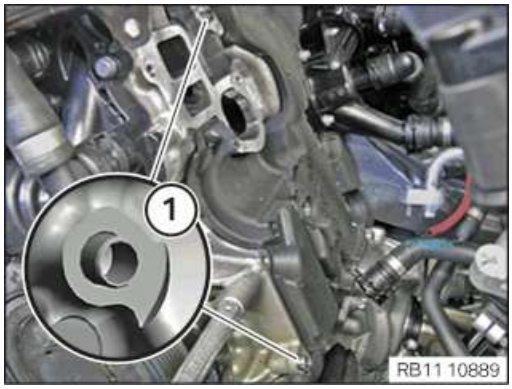
- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

- Clean the sealing surface using special tool 0 495 102 (11 4 470).



- Clean the sealing surface (1) using special tool 0 495 102 (11 4 470).

Check



- Check the fitting sleeves (1) for damage.

desired state

- The fitting sleeves (1) must not be scratched or deformed.

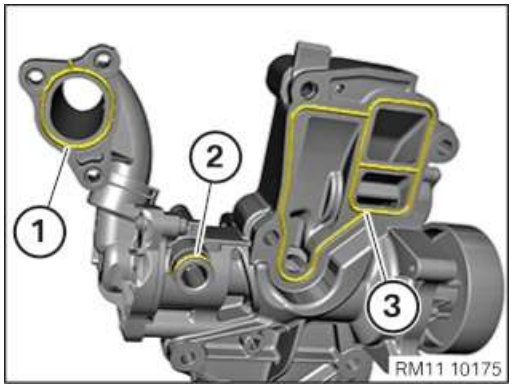
Result

» The fitting sleeves (1) are damaged.

Measure

- Renew fitting sleeves.

  Parts: Fitting sleeves



- Renew the seal (1).

  Parts: Gasket

- Renew O-ring (2).

  Parts: O-ring

- Check the sealing bead (3) for damage.
- Check the height of the sealing bead in reference to the surface.

Height of the sealing bead

	2,0 mm ... 2,5 mm

- If necessary, reapply the sealing bead.

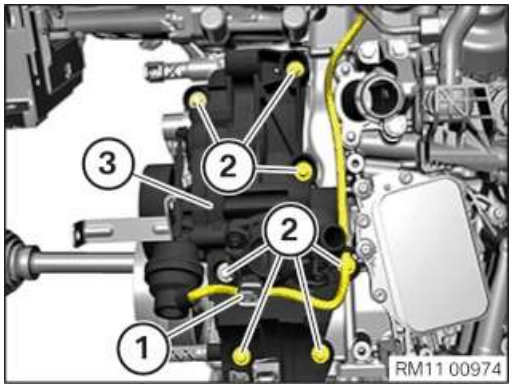
Sealing compound

Loctite 5970 liquid sealing compound **Processing time <10 minutes at room temperature**	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

Processing time of liquid sealing compound

	< 12 min



- Renew screws (2).

  Parts: Screws

- Position the component carrier (3) on the crankcase.
- Tighten the screws (2).

Component carrier to crankcase

M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

- Connect the vacuum line (1) on the vacuum unit and attach it in the clamp on the component carrier.

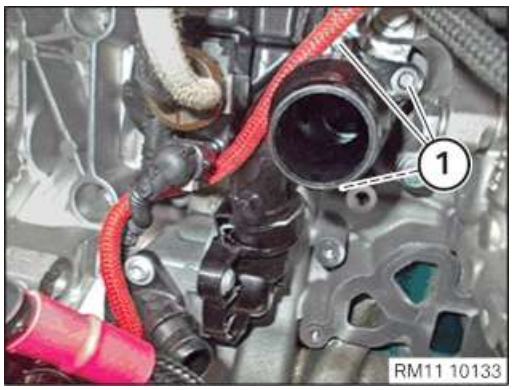
cardiagn.com



- Tighten the screw (1) below the exhaust-gas recirculation cooler.

Exhaust-gas recirculation cooler to cylinder head

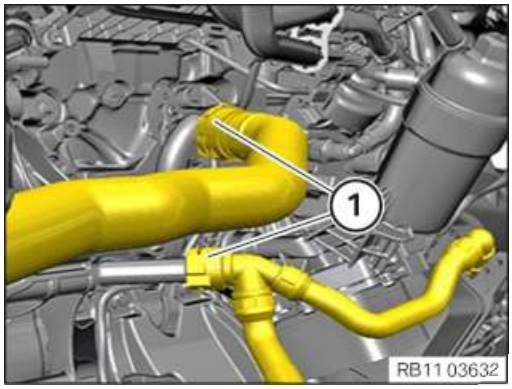
M8x20 / M8x28		Tightening torque	19 Nm



- Tighten the screws (1).

Connecting branch to engine block

M6x25		Tightening torque	8 Nm

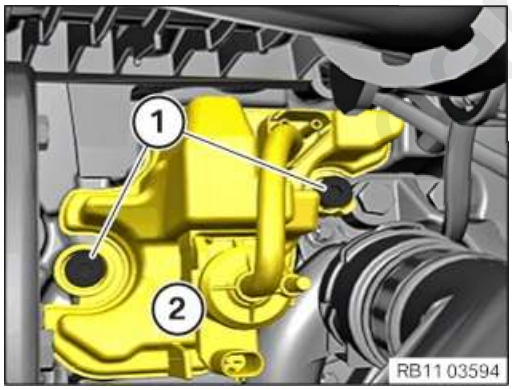


TECHNICAL INFORMATION

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

- Connect coolant hoses (1) and lock audibly.

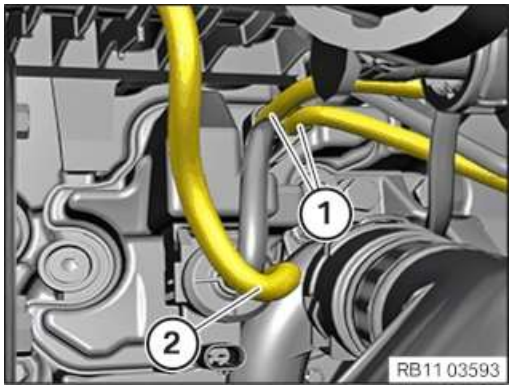
17 – Install vacuum reservoir



- Insert and install the vacuum reservoir (2).
- Tighten the screws (1).

Vacuum reservoir to crankcase

M6X25		Tightening torque	8 Nm



- Connect vacuum hoses (1) to the vacuum reservoir.
- Connect vacuum hose (2) to the electric changeover valve.

18 – Installing the alternator

CAUTION

Improper routing of the positive battery cable.

Risk of short circuits!

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

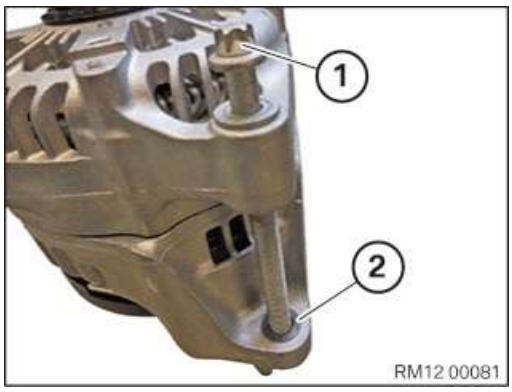
RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

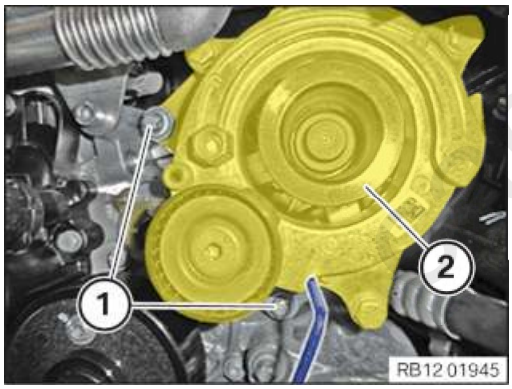
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

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

▸ **Prepare for the installation of the alternator**



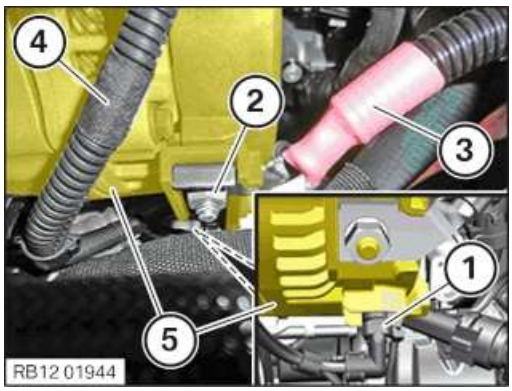
- Screw the screw (1) into the threaded support sleeve (2).
- Slightly press back the threaded support sleeve (2) using the bolt (1).
- Once again unscrew the screw (1) from the threaded support sleeve (2).



- Insert and install the alternator (2).
- Tighten the screws (1).

Alternator to component carrier

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm



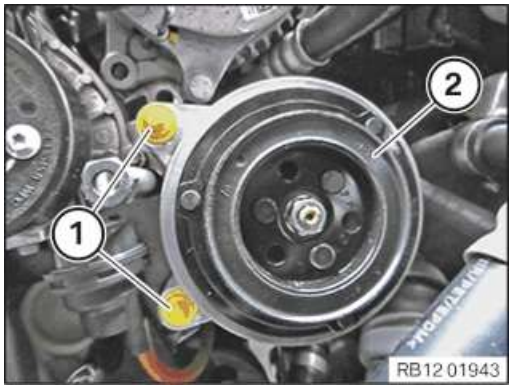
- Guide in the wiring harness section (4) and install.
- Insert and install the positive battery cable (3).
- Tighten the nut (2) on the alternator (5).

Positive battery cable to the alternator

M8		Tightening torque	19 Nm

- Connect the plug (1) with the alternator (5) and lock.

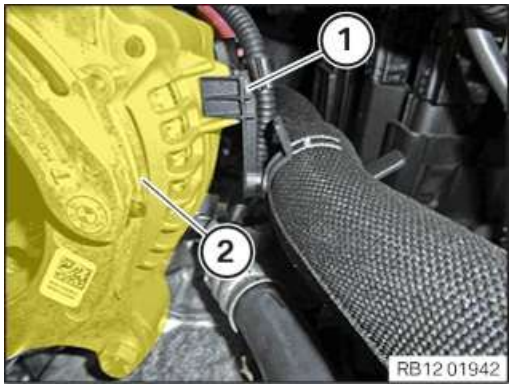
  The connector (1) must engage audibly.



- Insert and install the air conditioning compressor (2).
- Tighten the screws (1).

Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm



- Secure holder (1) to alternator (2).

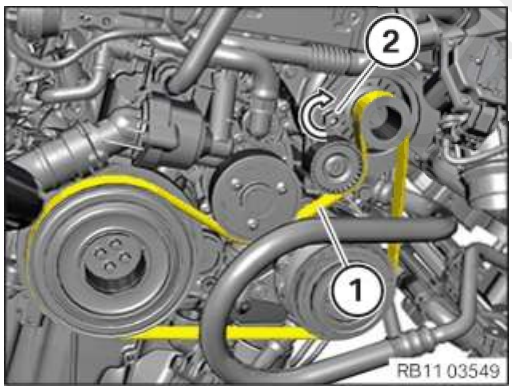
19 – Installing the drive belt for alternator

TECHNICAL INFORMATION

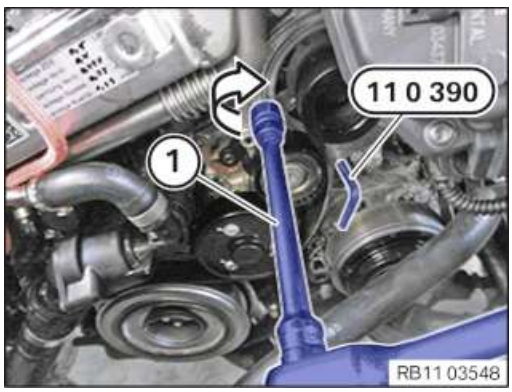
If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.

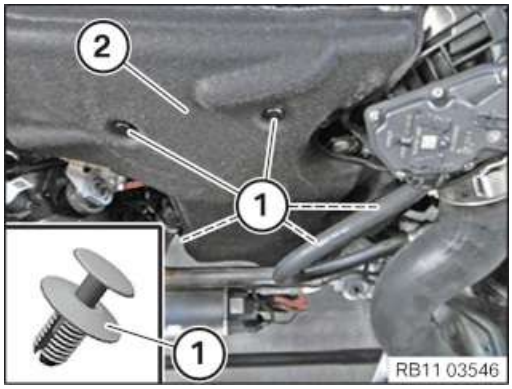


- Check drive belt for alternator (1) for coolant and oil residues and, if necessary, renew it.
- Relieve belt tensioner at hexagon head (2) up to limit position in direction of arrow.
- Install drive belt for alternator (1).



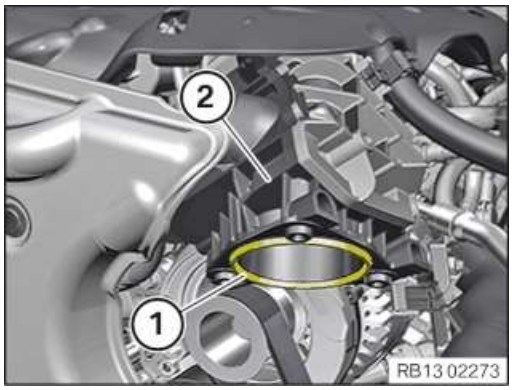
- Increase the preload of the belt tensioner using conventional tool (1) in the direction of arrow until the special tool 0 496 268 (11 0 390) can be removed.
- Remove special tool 0 496 268 (11 0 390).
- Stretch the drive belt for the alternator.

20 – Install acoustic cover for the engine, front



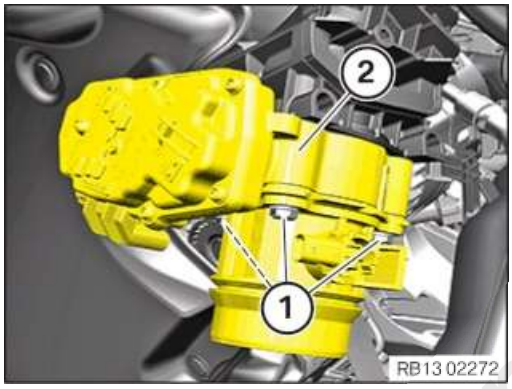
- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

21 – 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

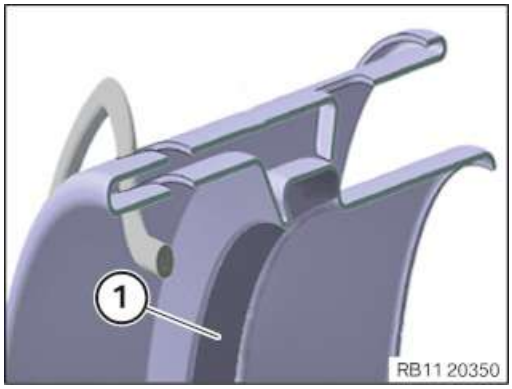


- Check the seal (1) for damage, renew if necessary.

▸ **Replacing damaged seal**

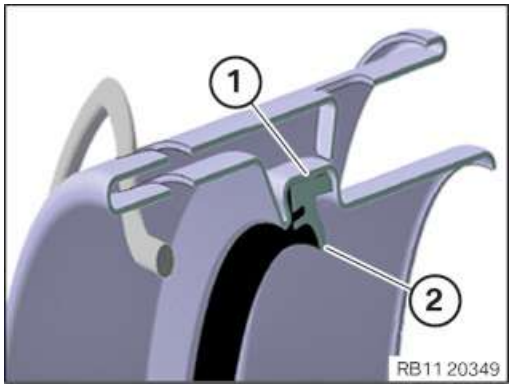
TECHNICAL INFORMATION

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.



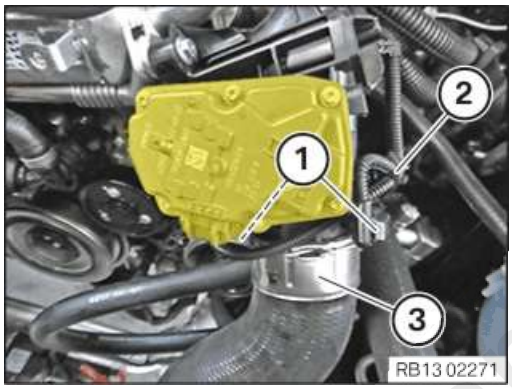
- Renew gasket.

  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.



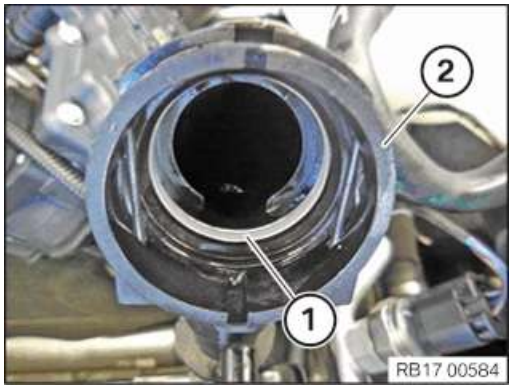
- Lock clamp (1).

22 – Connecting the coolant lines

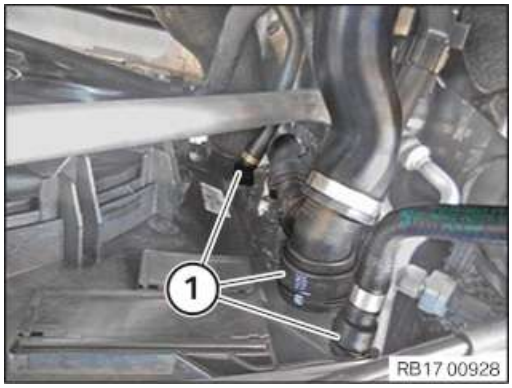
TECHNICAL INFORMATION

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

carmanuals.com



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



NOTICE

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

- Connect and lock the coolant lines (1).

  The coolant lines (1) must engage audibly.



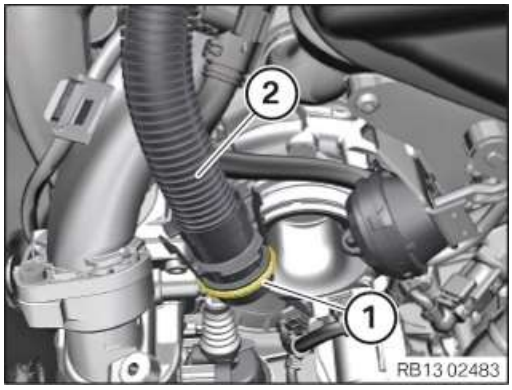
- Connect and lock coolant line (1).

  The coolant line (1) must audibly engage.

23 – Installing the clean air pipe with resonator



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

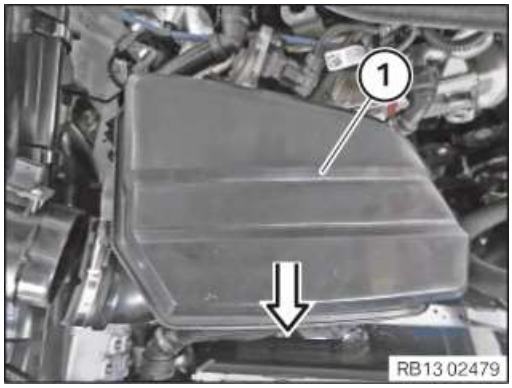


- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.

rdiagn.com



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

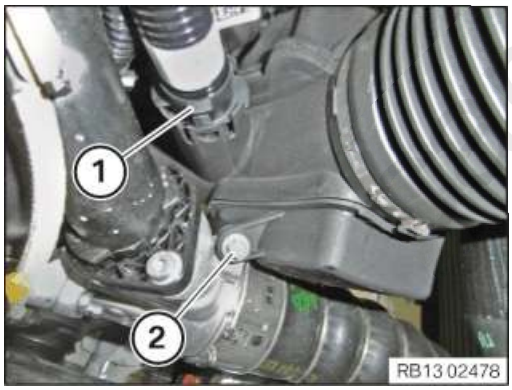


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

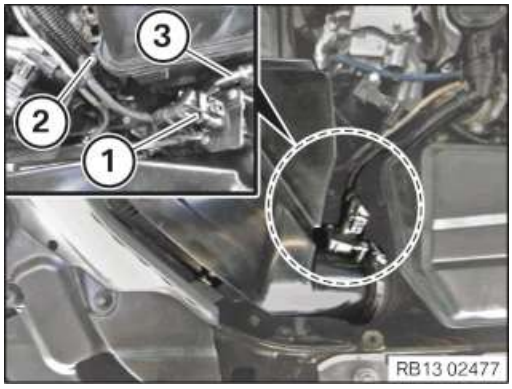
  The clamp (1) must engage audibly.



- 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.

24 – Install acoustic cover

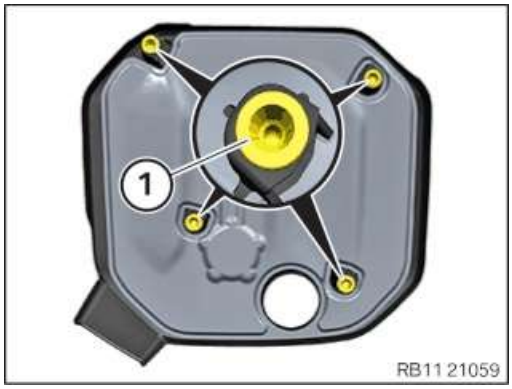
fdiagn.com

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.

25 – Connecting all battery earth leads



- See additional information.

26 – Filling and bleed the high-temperature coolant circuit

cardiagn.com



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.

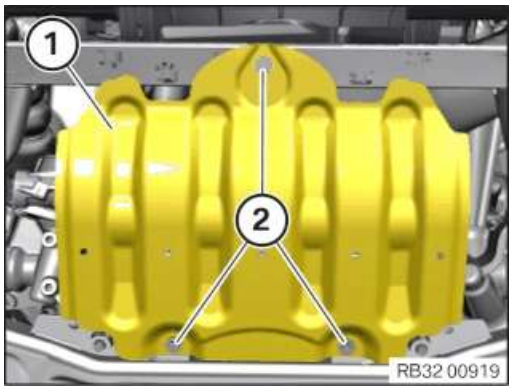
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

27 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

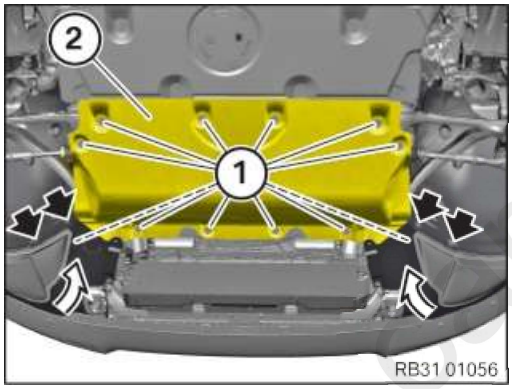
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

28 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

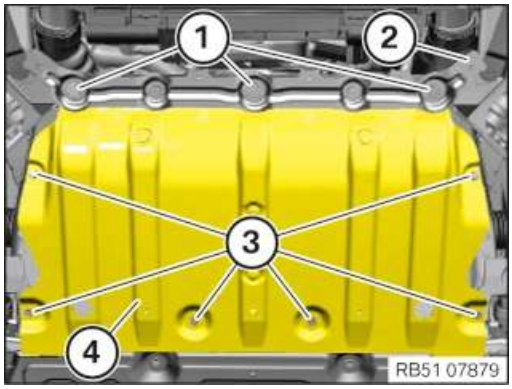
- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

carlagn.com



- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

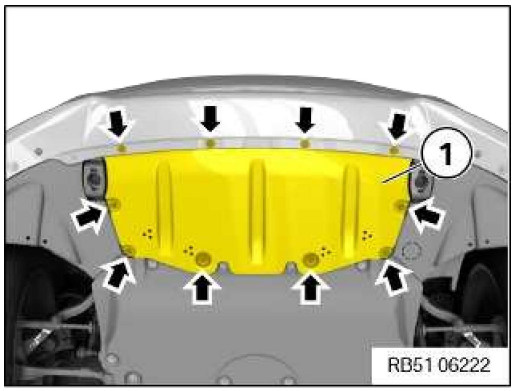
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

29 – Installing the front underbody protection



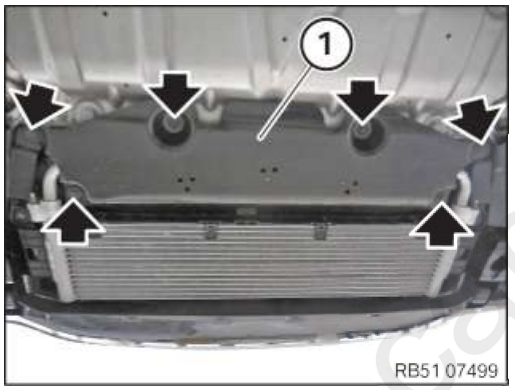
- **Version A:**

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

  Tighten screws (arrows).

Underbody protection front

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



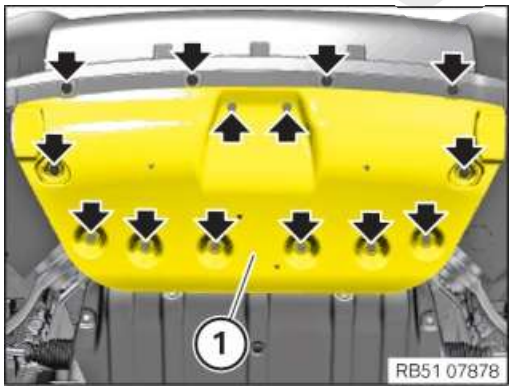
- **Version B:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Connecting branch to component carrier Used in step 15

M6x20		Tightening torque	8 Nm

carmagn.com

Component carrier to crankcase			Used in step 16
M8x35		Tightening torque	19 Nm
		Angle of rotation	45 °

Exhaust-gas recirculation cooler to cylinder head			Used in step 16
M8x20 / M8x28		Tightening torque	19 Nm

Connecting branch to engine block			Used in step 16
M6x25		Tightening torque	8 Nm

Vacuum reservoir to crankcase			Used in step 17
M6X25		Tightening torque	8 Nm

Alternator to component carrier			Used in step 18
M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm
M10x90		Tightening torque	38 Nm

Positive battery cable to the alternator			Used in step 18
M8		Tightening torque	19 Nm

Air conditioning compressor in component carrier			Used in step 18
M10		Tightening torque	38 Nm

Throttle body to intake plenum			Used in step 21
6x50		Tightening torque	8 Nm

Clean air pipe to exhaust turbocharger			Used in step 23
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 23
Clamp		Tightening torque	3 Nm

Underbody protection, steering, to front axle support			Used in step 27
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 27
Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 28
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

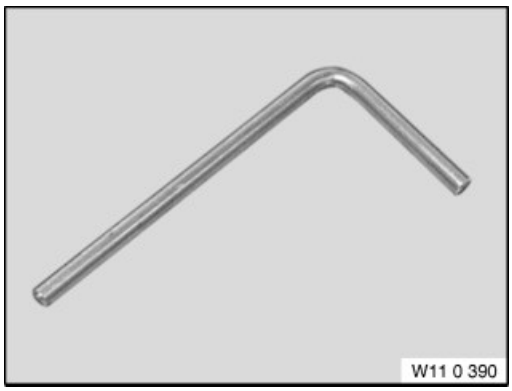
Wheel arch trim panel, front			Used in step 28
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Underbody protection front			Used in step 29
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

cardiagn.com

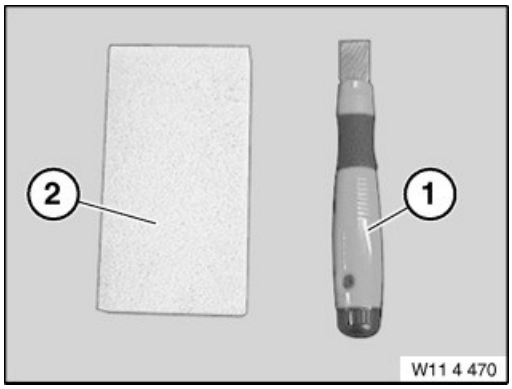
Overview of Special Tools

0 496 268 (11 0 390) Pin



Common	Used in step 1019
Usage	(roll pin) For securing new tensioning pulley (poly-V belt)
Included in the tool or work	
Storage location	B24
Replaced by	
In connection with	
SI-Number	01 15 07 (390)

0 495 102 (11 4 470) Tool



Common	Used in step 16
Usage	(cleaning kit) For cleaning sealing surfaces on magnesium crankcase/cylinder head.
Included in the tool or work	
Storage location	C52
Replaced by	
In connection with	
SI-Number	01 17 04 (130)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 103 (11 4 471)		**Scraper**	
2	0 495 104 (11 4 472)		**Extractor** (grindstone)	

Overview Technical Data

Height of the sealing bead	Used in step 16
	2,0 mm ... 2,5 mm

Processing time of liquid sealing compound	Used in step 16
	< 12 min

Links

General repair instructions	Used in step

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125

cardiagn.com

61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 20 900 Disconnecting and connecting battery earth lead	125
61 35 ... Notes on ESD protection (Electro Static Discharge)	811
61 35 ... Notes on ESD protection (Electro Static Discharge)	81118

17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	26
17 00 039 Bleeding cooling system (B37, B47)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	26
17 00 008 Draining and topping up the high-temperature coolant circuit	26
17 00 008 Draining and topping up the high-temperature coolant circuit	26
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	26
17 00 008 Draining and topping up the high-temperature coolant circuit	26

17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	26
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 008 Draining and topping up coolant for high-temperature circuit	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	26

carmagn.com