11 53 015 Removing and installing/replacing heat management module

Hot fluids.

Risk of scalding!

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

Hot surfaces.

Risk of burning!

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

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

PRELIMINARY WORK

1 – Removing the acoustic cover

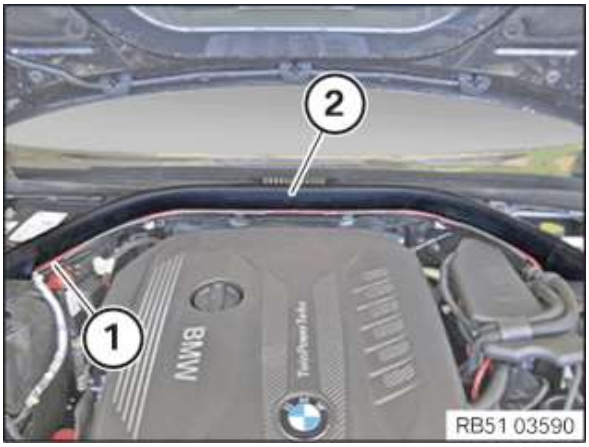
Damage to the acoustic cover/design cover.

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 seal for the rear bonnet



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

3 – Removing acoustic cover at rear

- Unclip the acoustic cover (1) in the marked areas and remove it to the top.

4 – Remove the cover for the centre engine compartment

- Release all expanding rivets (arrows).
- Remove the cover (1).

5 – Remove both front-end struts

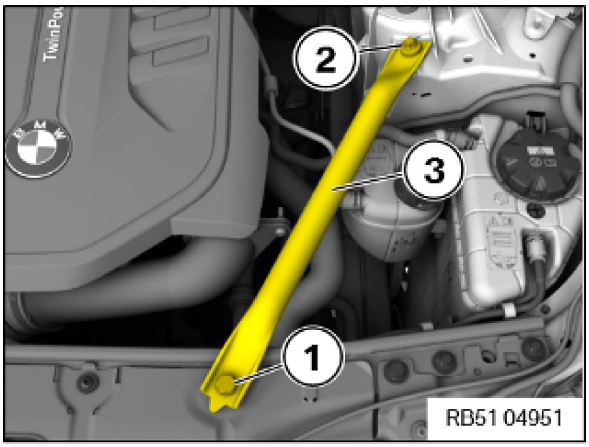
Description is for left component only. Procedure on the right side is identical.

▶ Removing the front-end strut

Use of an incorrect tool (impact screwdriver) to release and tighten the screws.

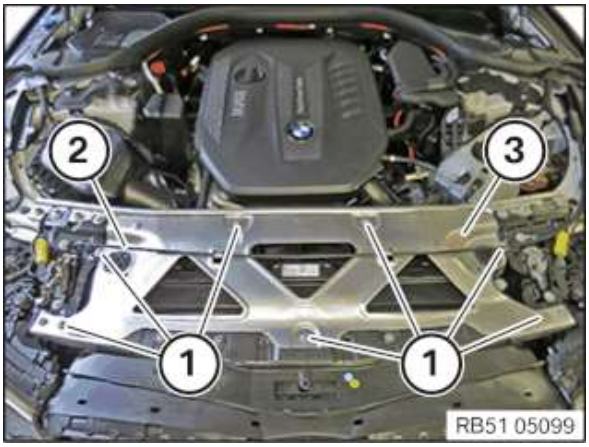
Damaged thread.

- Only use a standard tool (e.g. reversible ratchet) to release/tighten the screw.



- Loosen screws (1) and (2).
- Remove the front-end strut (3).

6 – Remove front cross connection (front-end strut removed)

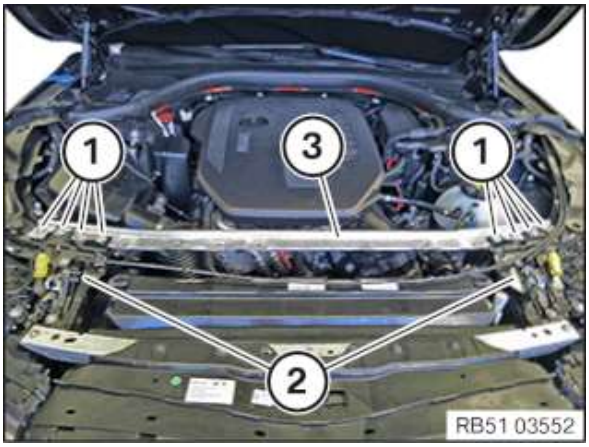


- Loosen screws (1).
- Detach the cable (2).
- Feed out the front cross connection (3) toward the top.

7 – Remove the rear top cross connection

Careless handling of tools and sharp-edged components.
Scratch, surface damage.

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



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

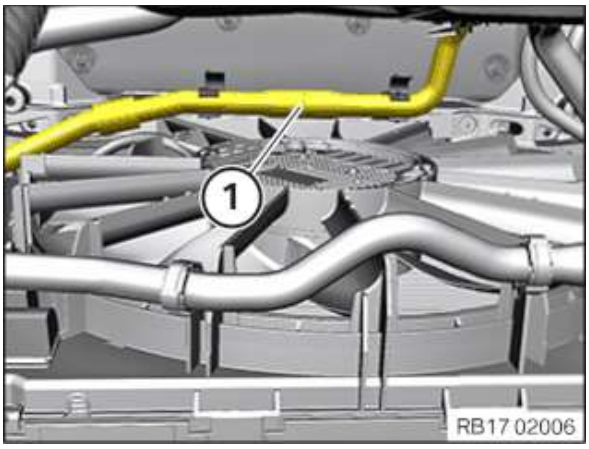
8 – Removing the fan cowl

Hot surfaces.

Risk of burning!

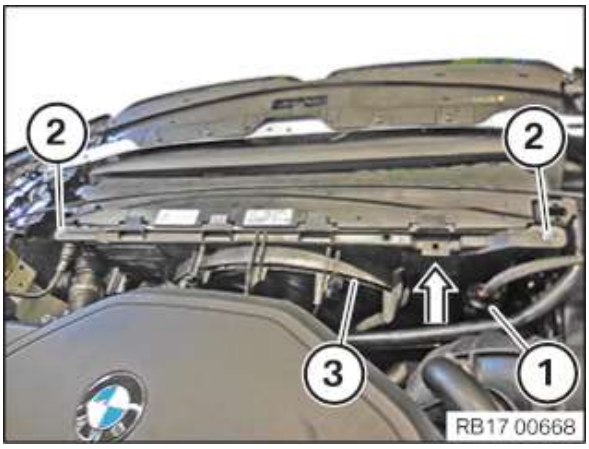
- Perform all work only on components that have cooled down.

- Unlock and loosen the clamps (1).
- Feed out coolant line (2) and place to one side.



- **If fitted:**

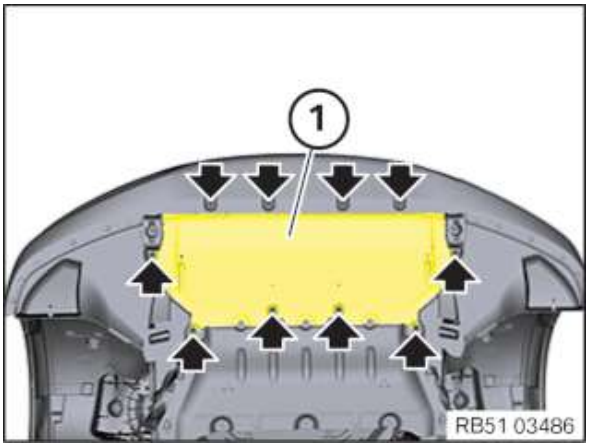
  Release the coolant line (1) below at the fan cowl from the clamps and place it to the side.



- Unlock and loosen connector (1).
- Loosen screws (2).
- Guide out fan cowl (3) in direction of arrow and remove.

9 – Remove front underbody protection and/or front stiffening plate

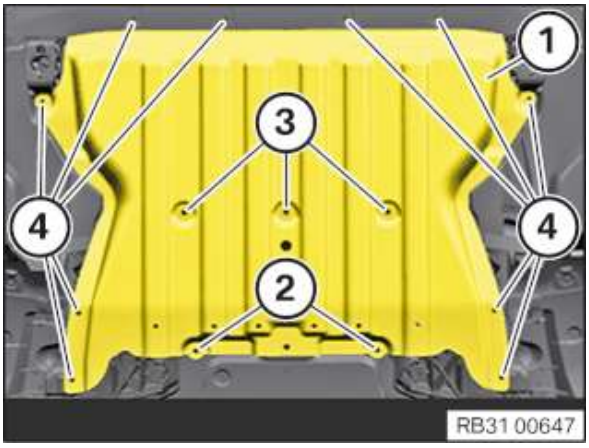
Different variants may be installed depending on the vehicle equipment.



- **Version A:**

  Remove screws (arrows).

  Feed out the front underbody protection (1).



Driving without stiffening plate is not permissible.

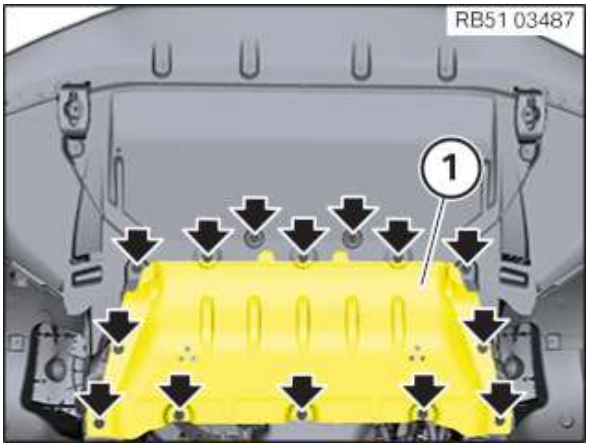
- **Version B:**

  Loosen screws (2) to (4).

  Remove the front stiffening plate (1).

10 – Removing the underbody protection of the steering gear and front stiffening plate respectively

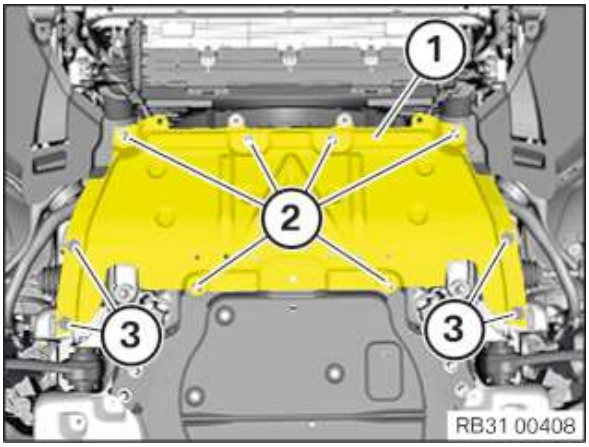
Different variants may be installed depending on the vehicle equipment.



- **Version A:**

  Release all bolts (arrows).

  Guide out underbody protection (1) of the steering gear.



Driving without stiffening plate is not permissible.

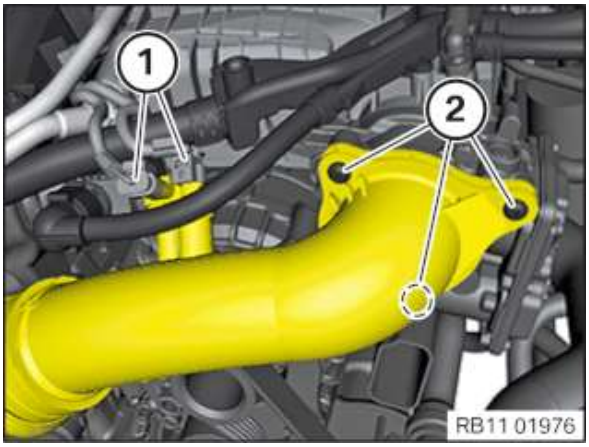
- **Version B:**

  Loosen screws (3).

  Loosen screws (2).

  Remove front stiffening plate (1).

11 – Detaching the charge air line from the throttle body



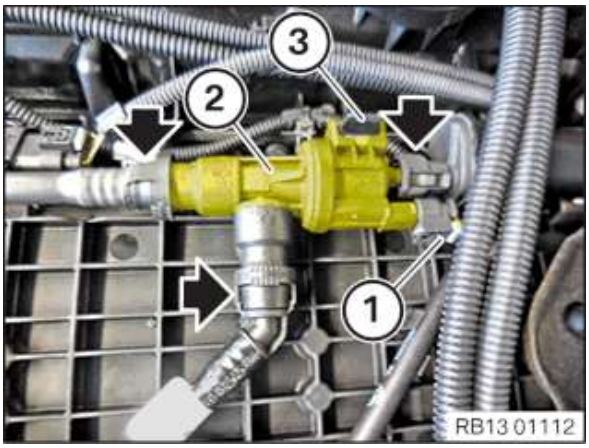
- Unlock and disconnect connector (1).
- Loosen screws (2).
- Remove charge air line from throttle body and place to one side.

12 – Remove tank vent valve

Electrostatic discharge.

Damage to or destruction of electrical components.

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



- Unlock and loosen connector (1).
- Unlock and disconnect the tank ventilation lines (arrows).
- Detach and remove the tank vent valve (2) from the holder (3).

13 – Removing the DME control unit

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)

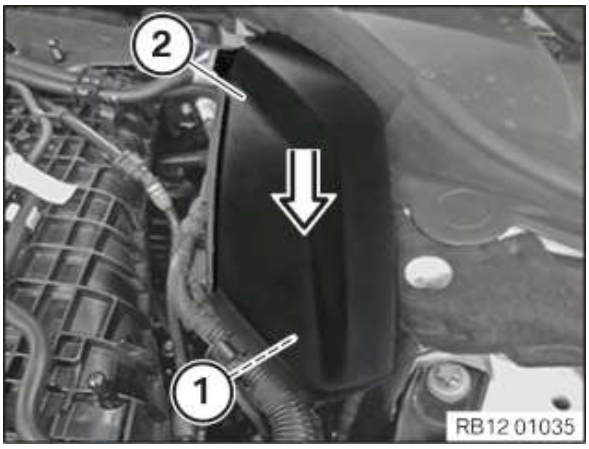
Follow instructions for removing and installing control units.

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

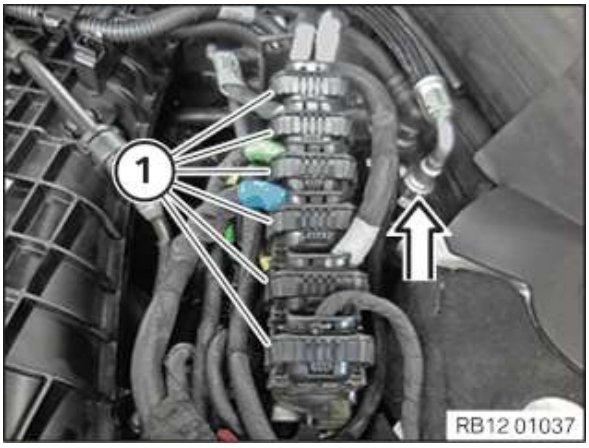
In a warranty case, you must always provide a fault memory printout with the defective part, even if the fault memory does not contain an entry.

Control unit must be programmed after it is replaced.
For additional information see: 61 00 ... Programming/encoding control unit(s)

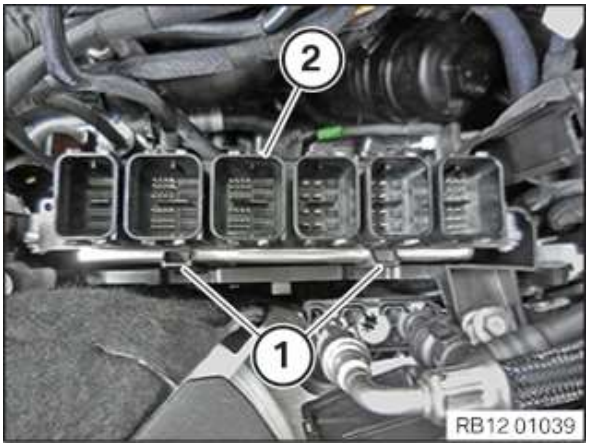
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.



- Unlock and loosen clamp (1).
- Guide and remove cover (2) in direction of arrow.

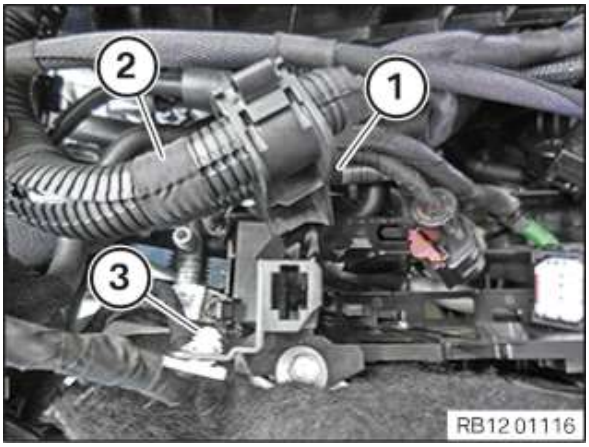


- Unlock and disconnect the plug connections (1) in the direction of arrow.



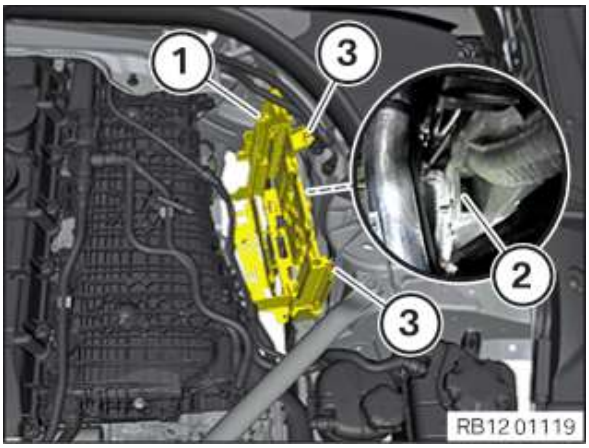
- Unlock the locks (1).
- Guide out and remove DME control unit (2).

14 – Remove control unit holder

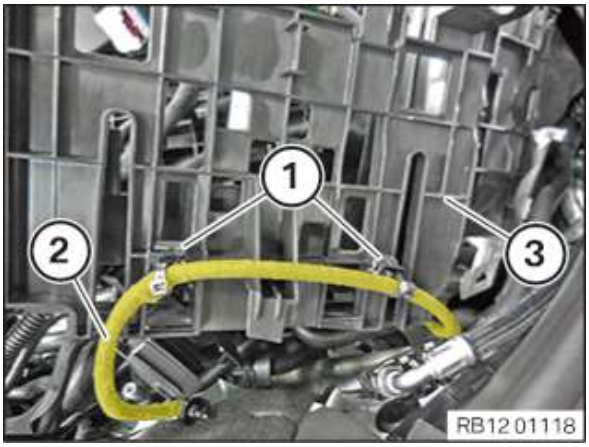


- Unlock and loosen lock (1).
- Remove the wiring harness (2) and put to one side.
- Unlock and loosen clamp (3).

- Unlock and loosen wiring harness (1).



- Loosen screws (3).
- Remove the control unit holder (1) from the guide (2).
- Raise the control unit holder (1).



- Unlock and loosen the clamps (1).
- Remove the wiring harness (2) and put to one side.
- Guide out and remove the control unit holder (3).

15 – Drain the coolant from the low-temperature cooling system

Hot surfaces.

Risk of burning!

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

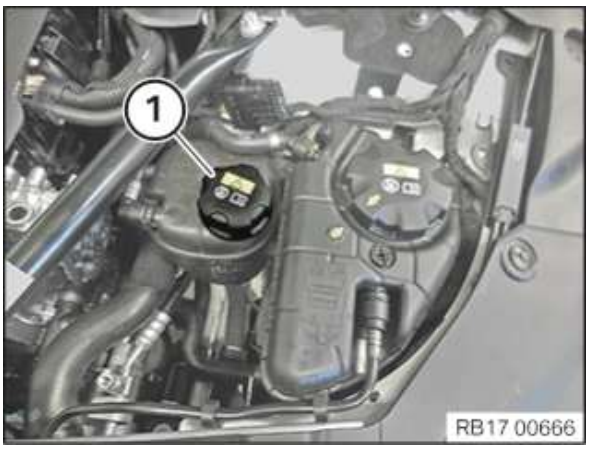
Life-long fill of coolant!

Do not reuse used coolant.

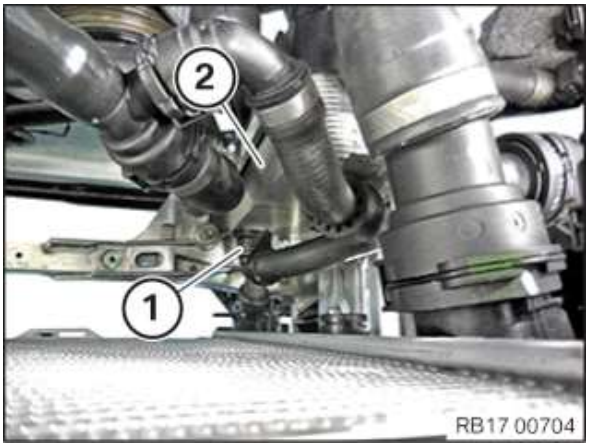
When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

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.

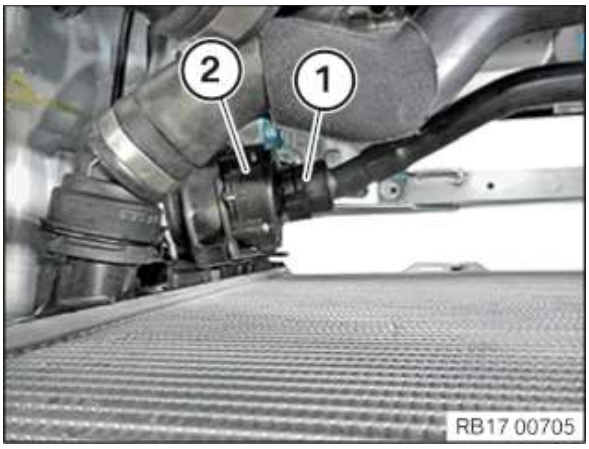
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Loosen sealing cap (1).



- Unlock and disconnect the coolant line (1) at the air conditioning condenser (2).
- Catch and dispose of escaping coolant.



- Unlock and release coolant line (1) at the electric coolant pump (2).
- Catch and dispose of escaping coolant.

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

Hot surfaces.

Risk of burning!

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

Life-long fill of coolant!

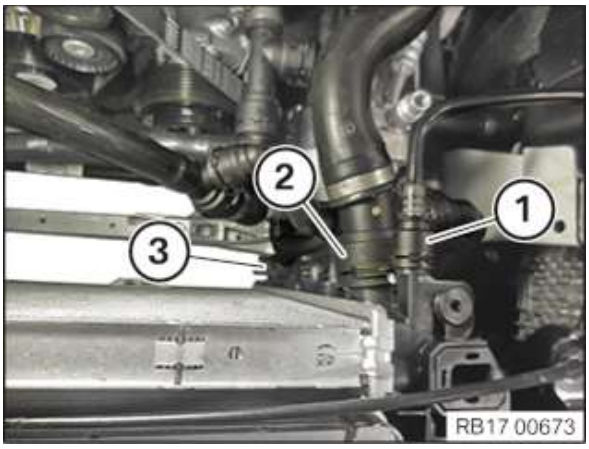
Do not reuse used coolant.

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.

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

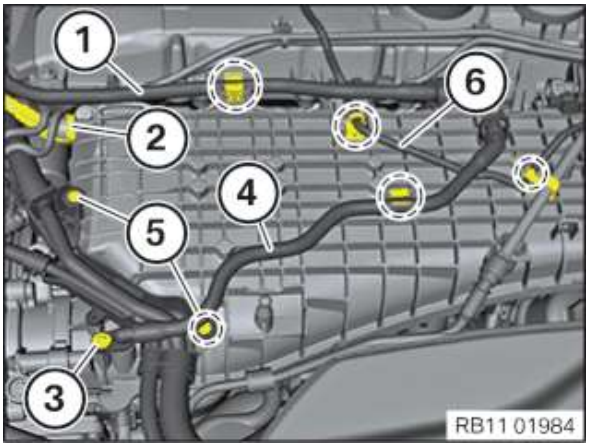
- Loosen sealing cap (1).



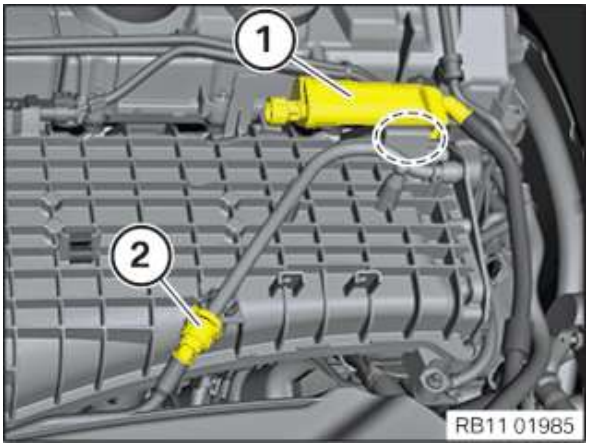
- Unlock and loosen coolant line (1).
- Unlock and loosen coolant line (2).
- Unlock and loosen coolant line (3).
- Catch and dispose of escaping coolant.

17 – Removing the intake plenum

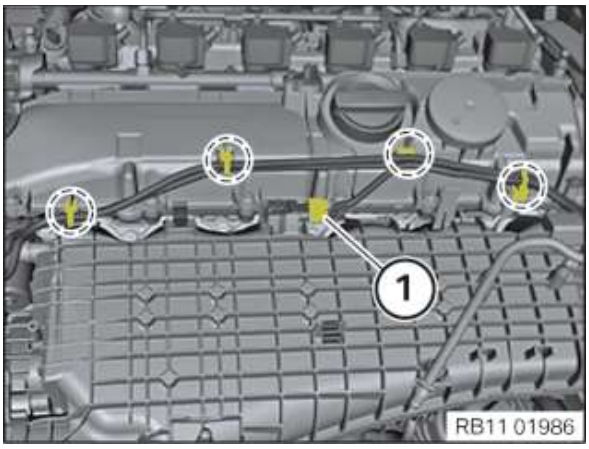
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



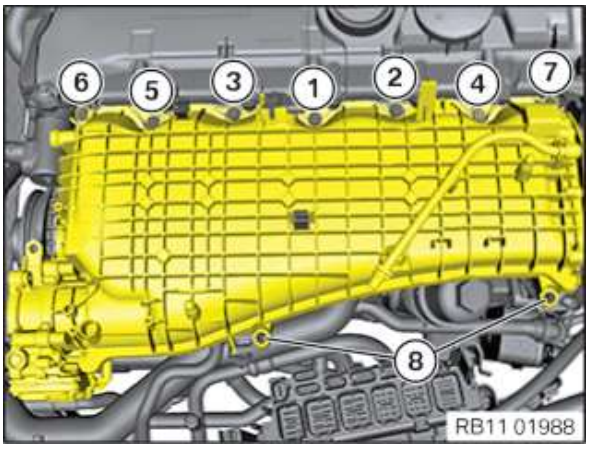
- Unclip tank ventilation line (1) in the marked area.
- Unlock and pull off engine ventilation line (2).
- Unscrew the bolt (3) and unclip the tank ventilation line (4) in the marked area.
- Remove tank ventilation line (4).
- Unscrew the bolts (5) and set the engine wiring harness aside.
- Unclip cable (6) in marked areas.



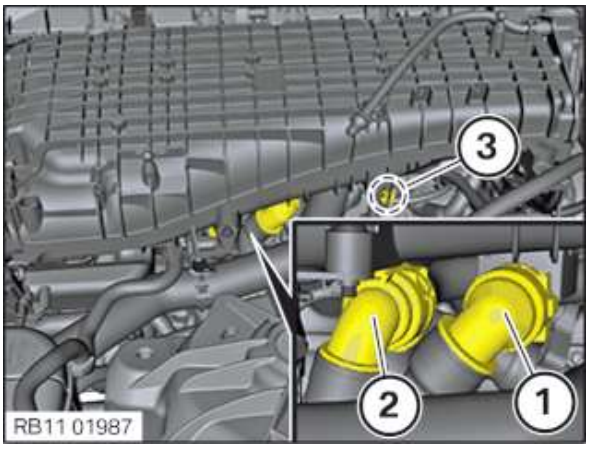
- Loosen tank ventilation line (1) in marked area from intake plenum.
- Unlock closure (2) and pull off the coolant line.



- Unlock and disconnect connector (1).
- Unclip the wiring harness in the marked areas.



- Loosen screws (8).
- Loosen screws in the order (7) to (1).
- Slightly raise air intake header.



- Unlock the closure (1) and pull off the coolant feed line.
- Unlock the closure (2) and pull off the coolant return line.
- Unclip the wiring harness from the clamp (3).

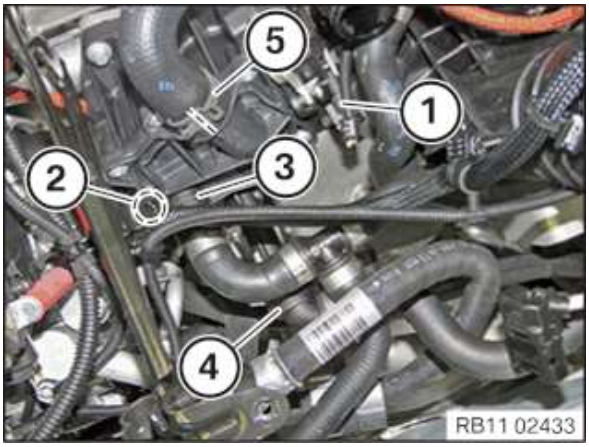
Additional coolant can escape. Make sure that no coolant enters the intake port of the cylinder head.

- Remove intake plenum.

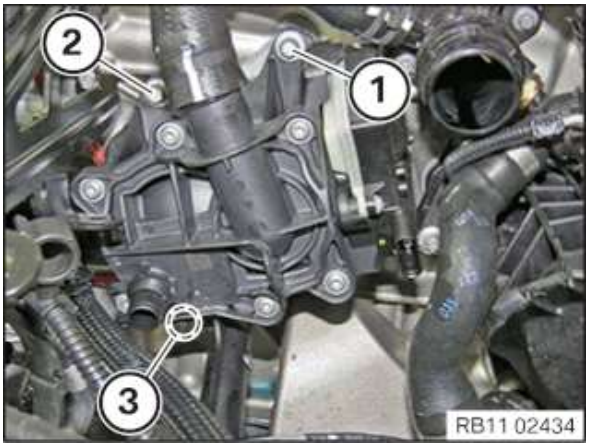
MAIN WORK

18 – Remove heat management module

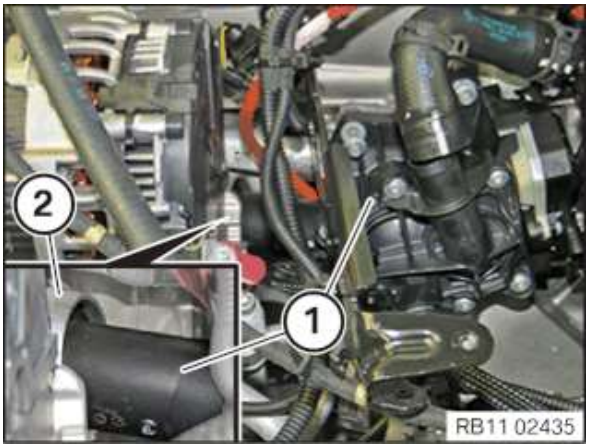
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Unlock and disconnect connector (1).
- Unclip positive battery cable in area (2).
- Unlock and pull off the coolant hoses (3) and (4).
- Loosen clamp (5) and pull off the coolant hose.

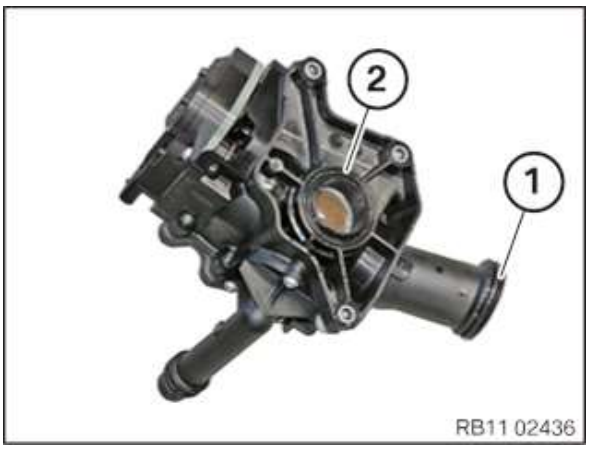


- Loosen screws (1) to (3).



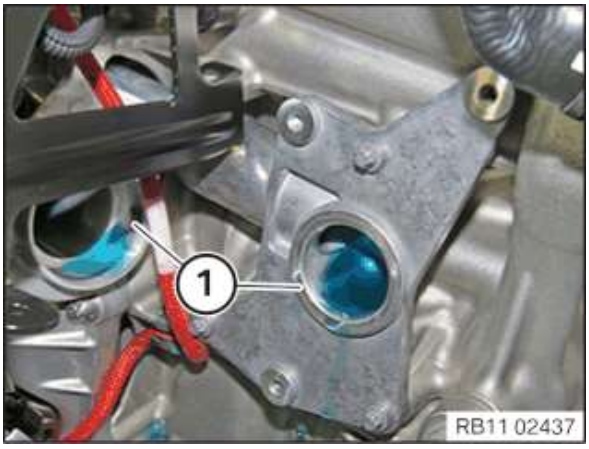
- Feed out the heat management module (1) to the outside rear out of the component carrier.

19 – Install heat management module

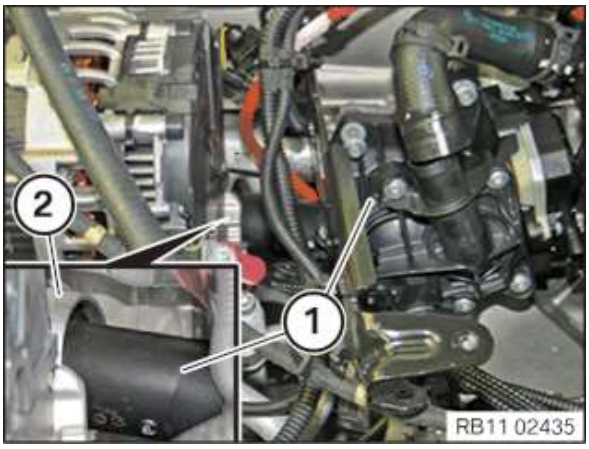


- Renew the O-Ring (1) and gasket (2).

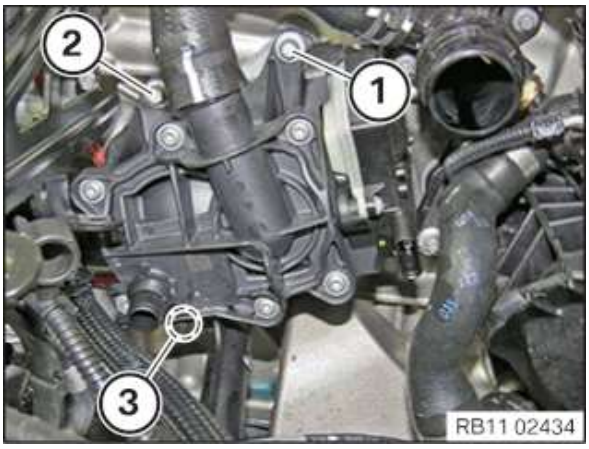
  Parts: O-ring and gasket



- Clean sealing surface (1).



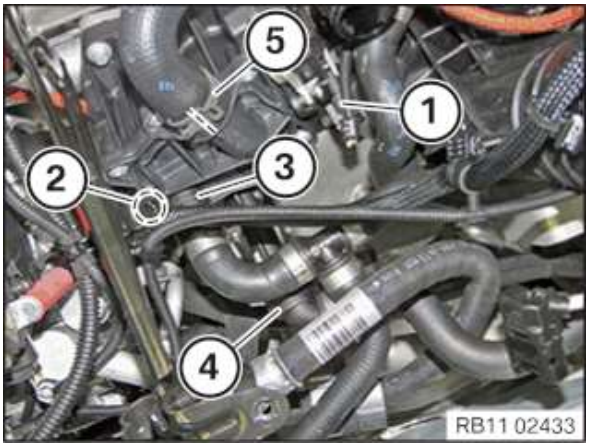
- Feed out the heat management module (1) to the outside rear out of the component carrier (2).



- Tighten the screws (1) to (3).

Heat management module to engine block

Captive screws	8 Nm



- Insert coolant hose onto the heat management module and fasten with the clamp (5).

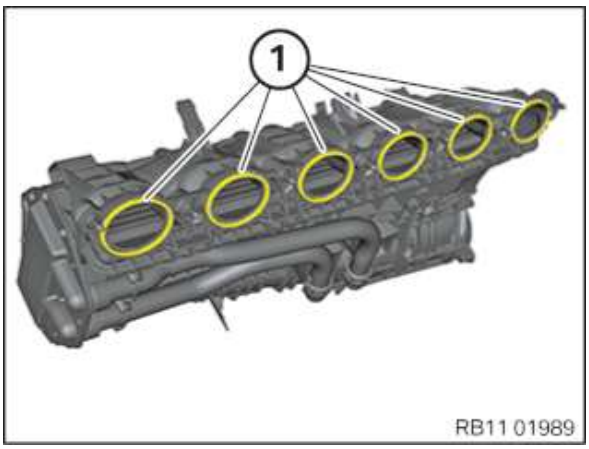
  See that the marking lines up.

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

- Connect and lock the coolant hoses (3) and (4).
- Clip in positive battery cable in area (2).
- Connect connector (1).

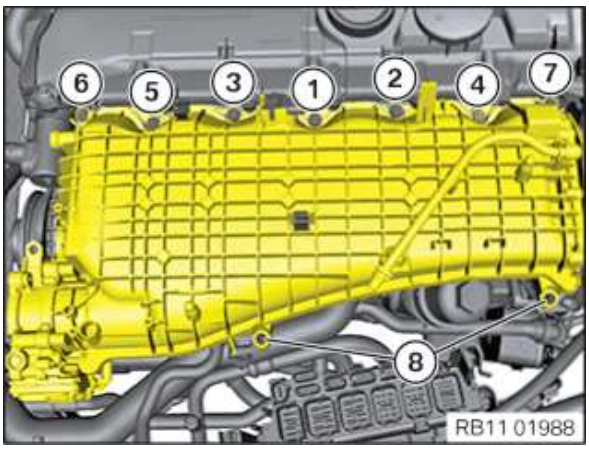
POSTPROCESSES

20 – Installing the intake plenum



- Renew gaskets (1).

  Parts: Seals



Additional coolant can escape. Make sure that no coolant enters the intake port of the cylinder head.

- Position the intake plenum.
- Tighten screws in the order (1) to (7).

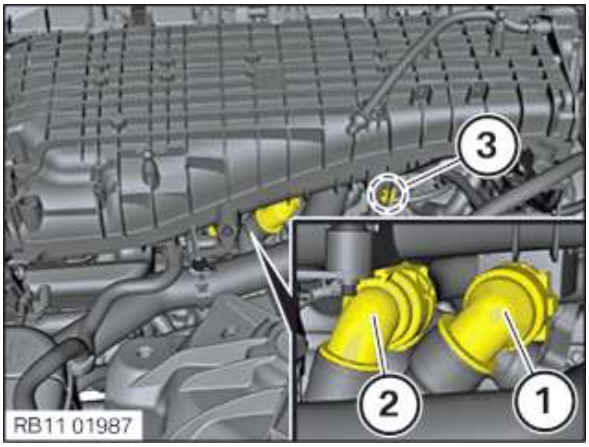
Intake plenum to cylinder head

Observe tightening sequence.	Jointing torque	5 Nm
	Tightening torque	10 Nm

- Tighten down screws (8).

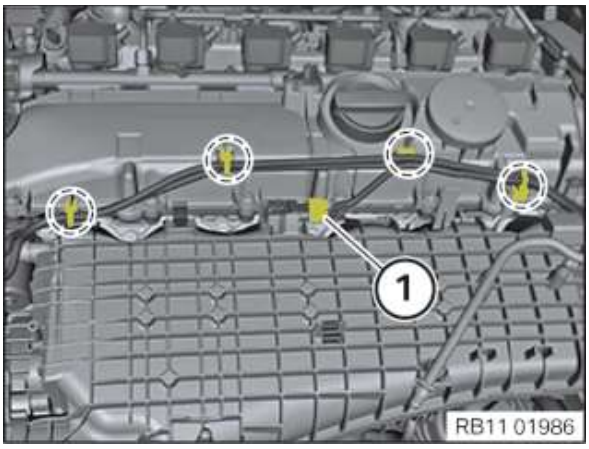
Intake plenum to rear/front support

BM6 x 25	10 Nm

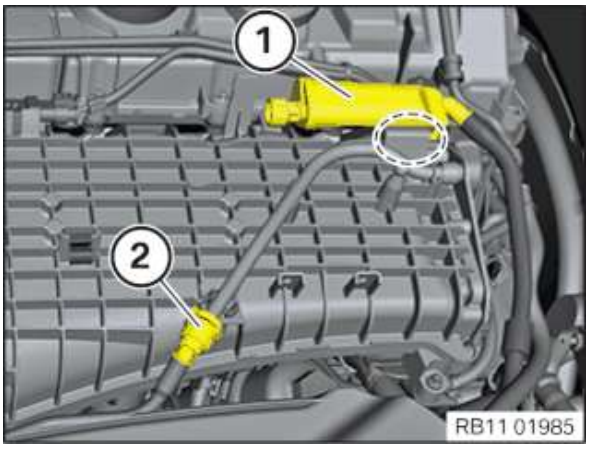


Make sure that the connections are locked correctly. The locks must engage audibly.

- Lock the closure (2) and connect the coolant return line.
- Lock the closure (1) and connect the coolant feed line.
- Clip the wiring harness into the clamp (3).

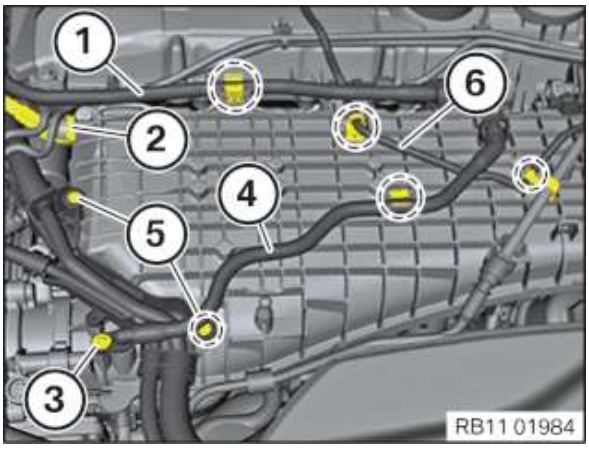


- Clip in wiring harness in marked areas.
- Connect the connector (1) to the charging pressure sensor.



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

- Lock closure (2) and connect to the coolant pipe.
- Attach the tank ventilation line (1) in the indicated area.



- Clip in cable (6) in marked areas.
- Position engine wiring harness and tighten with the screws (5).

Wiring harness to intake plenum

	5 Nm

- Position tank ventilation line (4).
- Tighten the screw (3) and clip in the tank ventilation line (4) in the marked area.

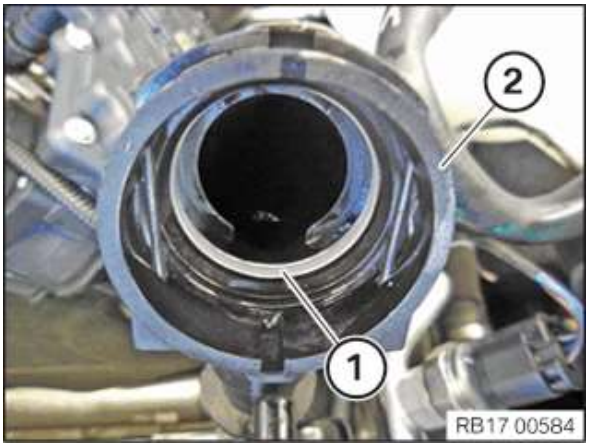
Tank ventilation line to intake plenum

TS5 x 16	5 Nm

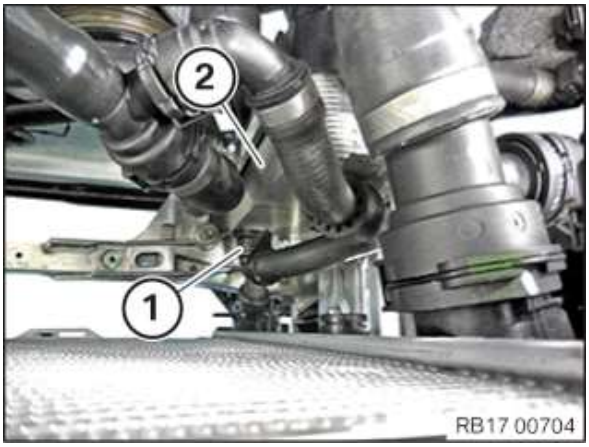
- Connect the engine ventilation line (2) to the intake plenum.
- Clip in the tank ventilation line (1) in the marked area.

21 – Connect the coolant lines for the low-temperature coolant circuit

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

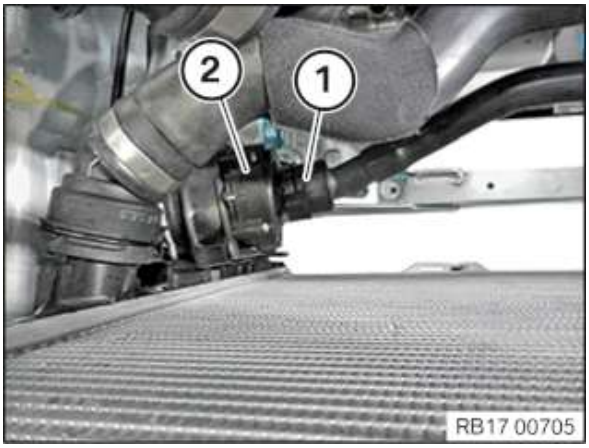


- Check the sealing rings (1) of the coolant lines (2) for damage and renew if necessary.



- Connect and lock coolant line (1) on air conditioning condenser (2).

  The coolant line (1) must audibly engage.

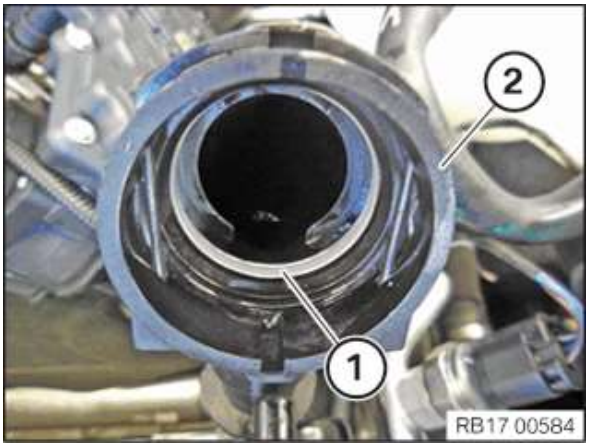


- Connect and lock the coolant line (1) to the electric coolant pump (2).

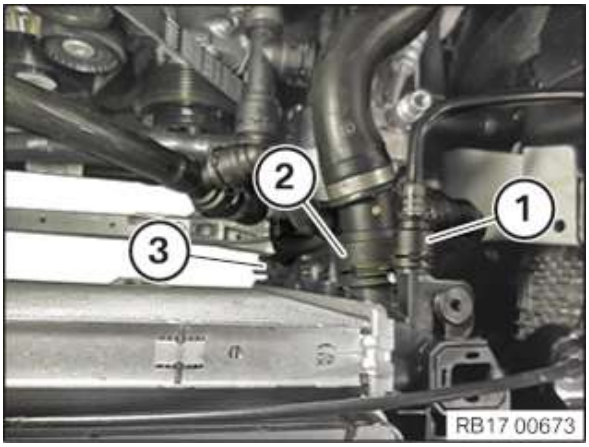
  The coolant line (1) must audibly engage.

22 – Connect the coolant lines for the high-temperature coolant circuit

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



- Check the sealing rings (1) of the coolant lines (2) for damage and renew if necessary.

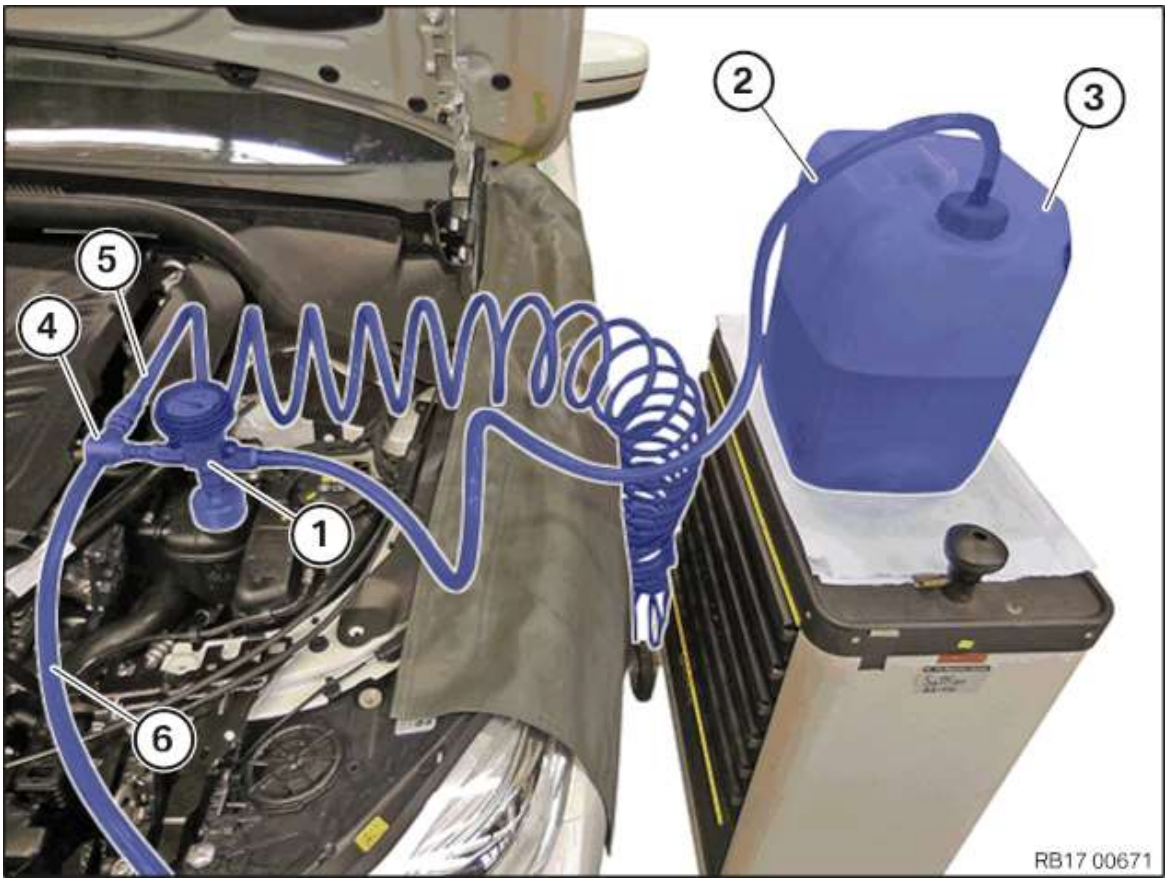


- Connect and lock coolant line (1).
- Connect and lock coolant line (2).
- Connect and lock coolant line (3).

  All coolant lines must audibly engage.

23 – Filling the low-temperature cooling system with the vacuum filler device

Vacuum filler device



Vacuum filler device - connected to the coolant expansion tank

1 Vacuum filler device with pressure gauge and shutoff valves

2 Filling hose

3 Fluid tank with coolant

4 Venturi nozzle

5 Compressed air connection (maximum of 6 bar)

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

Prerequisite

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

Follow notes for repair work on the cooling system.
For additional information see:
Main group 17
17 00 ... Notes for working on the cooling system

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.

Mixing different coolants is not permitted.

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

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

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

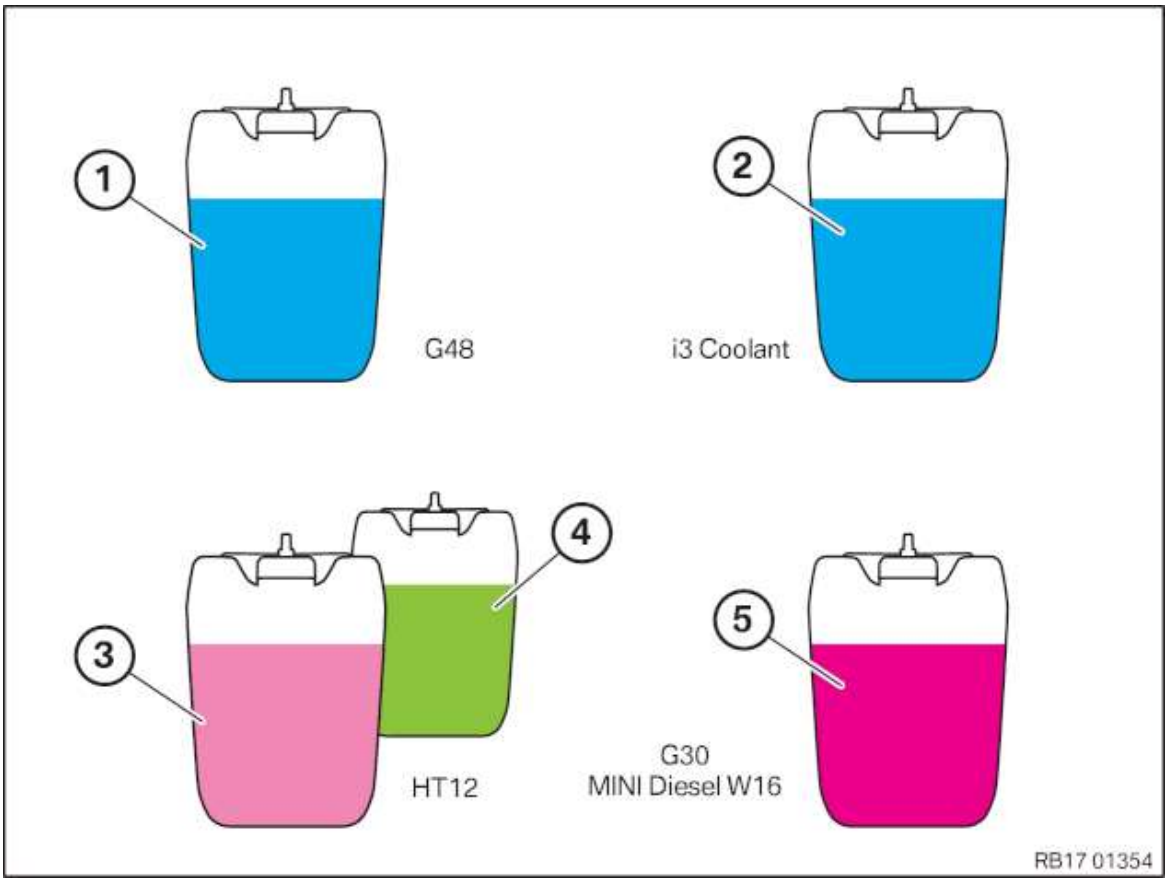
Operation of the vehicle is not permitted unless the filling procedure has been completed. Otherwise, functional limitations (degradation) and/or overheating may occur.

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

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

▶ Observe the coolant type

Coolant in the collecting vessel of vacuum filler device



Choose the correct coolant for filling.

In general, a vehicle has to be filled with the coolant with which it is delivered from the factory.

1 G48 (Blue) (BMW LC-87) Must **not** be mixed with i3 Coolant or G30 MINI Diesel W16.

2 i3 Coolant (Blue) (BMW LC-13) Is used only for heater circuit i3. i3 Coolant must **not** be added to other coolant circuits or mixed with other coolants.

3 HT12 (Rose) (BMW LC-18) Must **not** be mixed with i3 Coolant or G30 MINI Diesel W16.

4 HT12 (Green) (BMW LC-18) Must **not** be mixed with i3 Coolant or G30 MINI Diesel W16.

5 G30 (Rose) (BMW LC-07) May be W16 used exclusively for the **MINI Diesel**. G30 must **not** be filled in the other coolant circuits or mixed with the other coolants.

Damage to the engine or components in high-voltage vehicles

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

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

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

Type	Engine	Adapter (Y) from 17 0 100
G11/G12/G14/G15/G16/G30/G31/G32/G38	B48/B58	17 0 109

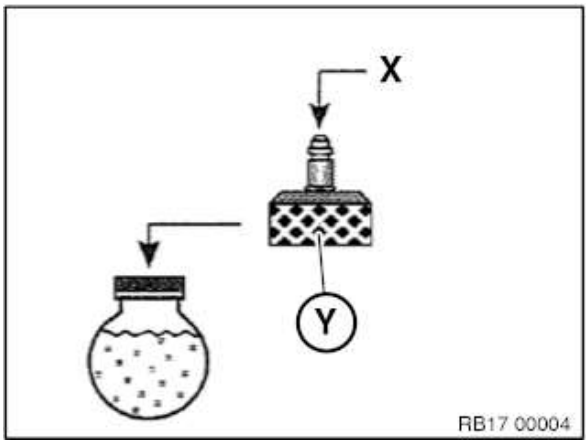
- The fluid tank of the vacuum filler device must be filled with 1 l to 2 l more than the specified capacity of coolant for the vehicle.

Cooling system capacity

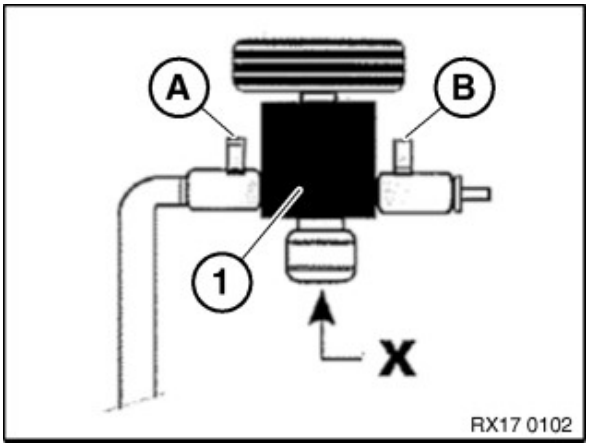
B58 (high temperature cooling circuit)	11,3 l
B58 (low temperature cooling circuit)	4,1 l
Expendable materials: Technically suitable antifreeze and corrosion inhibitor	

Cooling system capacity

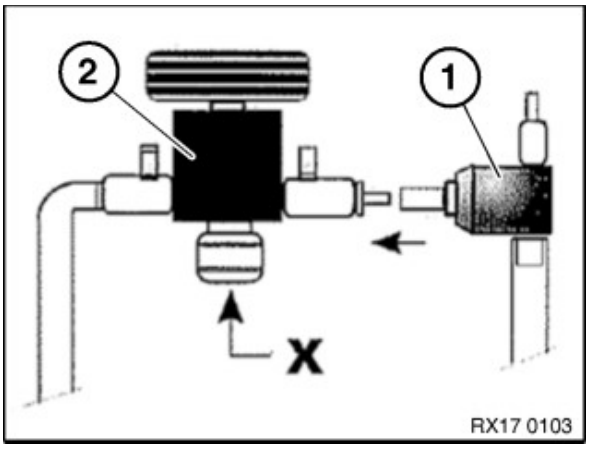
B58B30M1 High-temperature coolant circuit	6,9 l
B58B30M1 High-temperature coolant circuit (SA823)	8 l
B58B30M1 Low-temperature coolant circuit	2.95 l
Expendable materials: Technically suitable antifreeze and corrosion inhibitor	



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

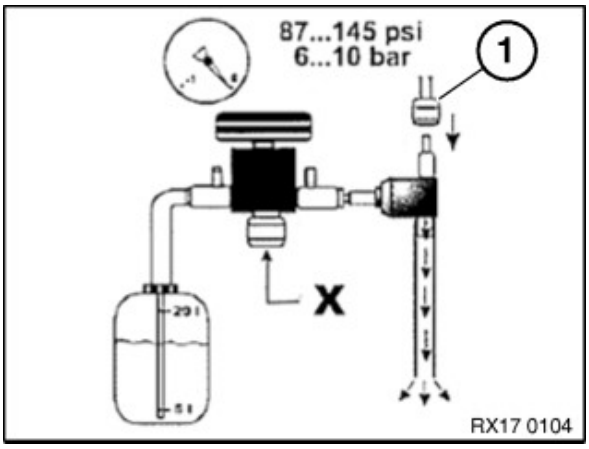


- Check that shutoff valves (A) and (B) of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



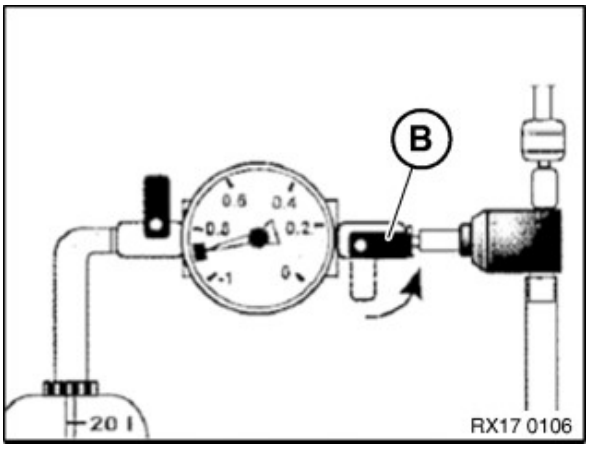
- Connect Venturi nozzle (1) to the vacuum filler device (2).

  (X)is the connection on the coolant expansion tank.



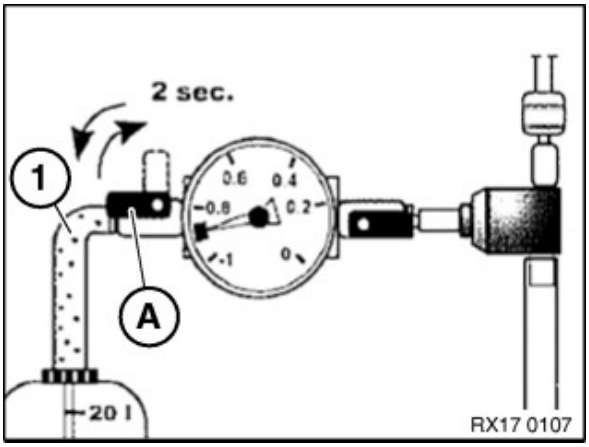
- Connect compressed air (1).

  (X)is the connection on the coolant expansion tank.



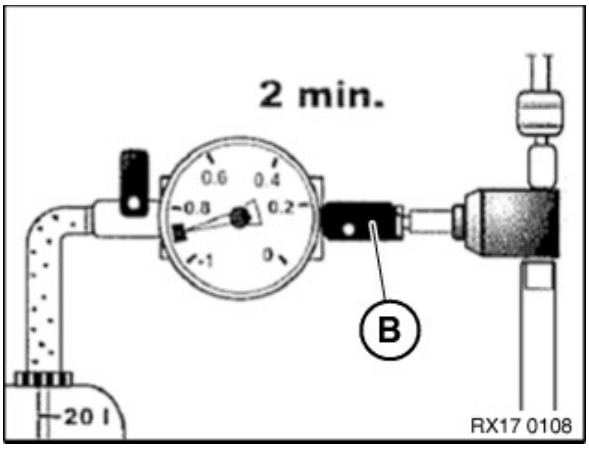
- Open shut-off valve (B).

  The Venturi nozzle produces a flow noise.



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

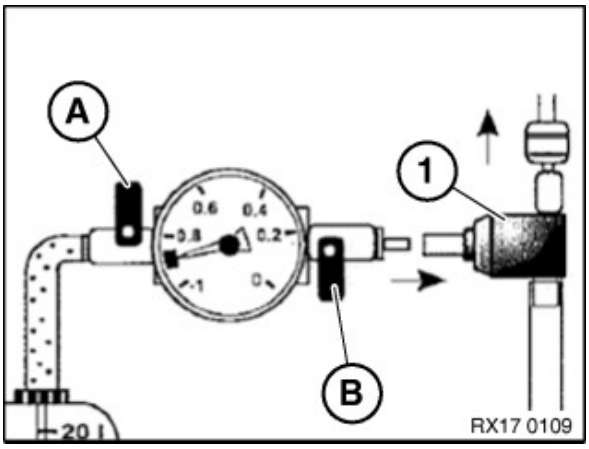
» The filling hose (1) has now been bled.



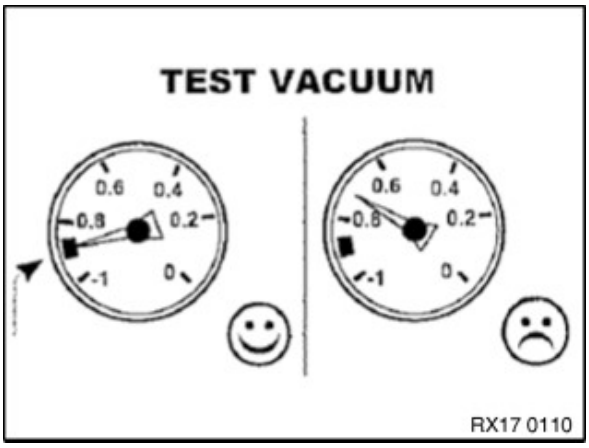
- Check the coolant hoses for porosity and renew porous coolant hoses as required.

The coolant hoses contract during vacuum build-up.

- After a vacuum of -0.7 to -0.95 bar has been created in the coolant circuit (duration approx. 2 min), shut the shutoff valve (B).



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



Check

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

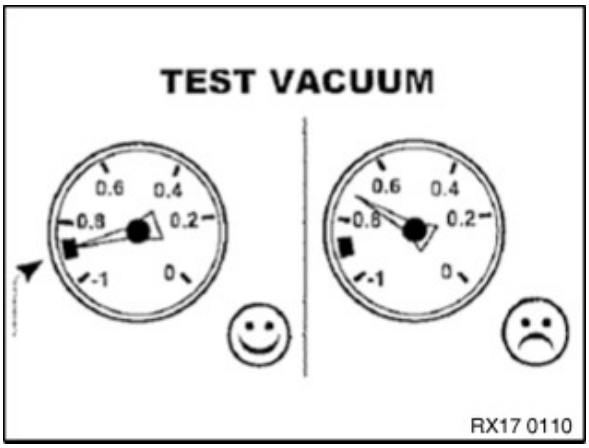
Result

» Vacuum drops.

Measure

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

Check



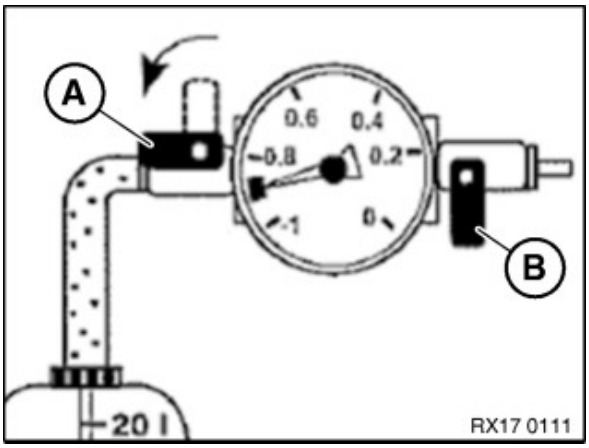
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

Result

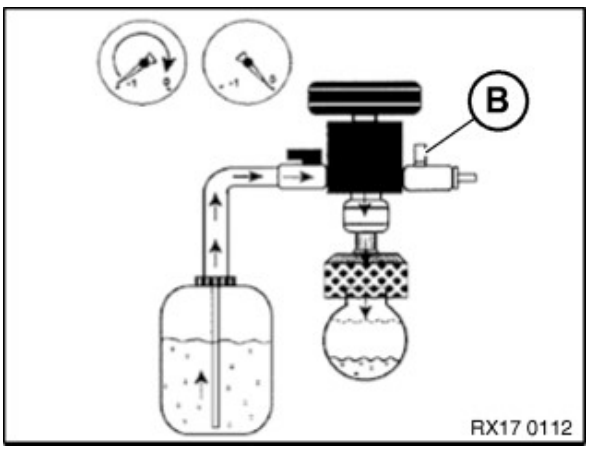
» Vacuum remains constant.

Measure

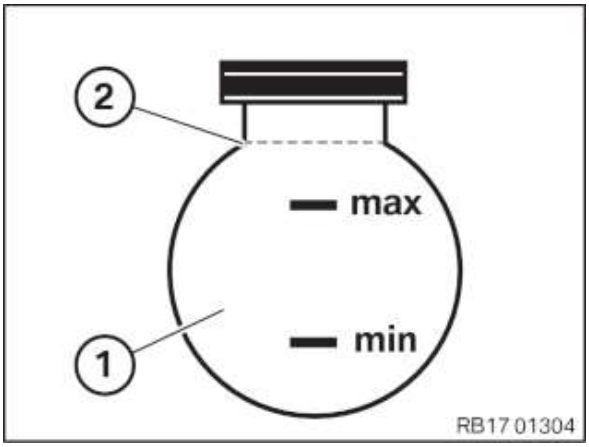
- Continue with filling.



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



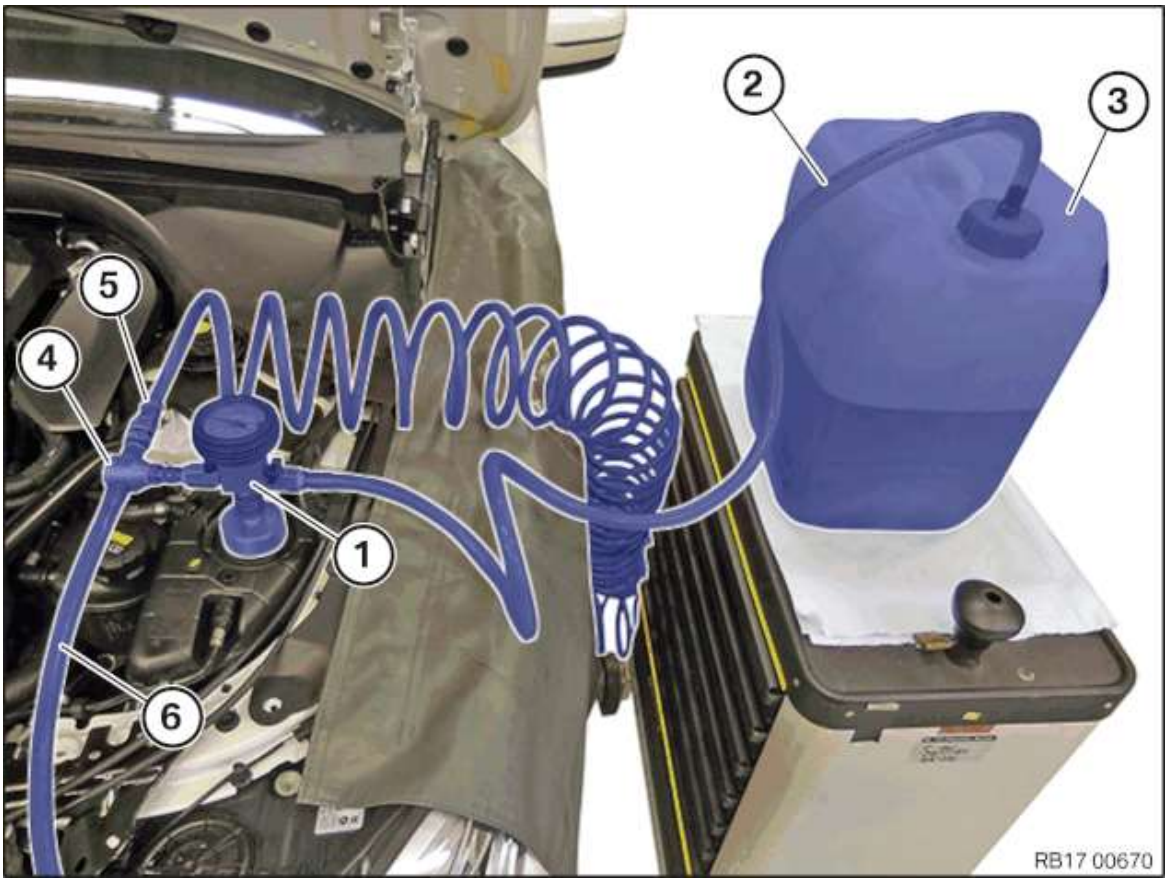
- Stop the filling procedure when the needle in the pressure measuring device is on 0 bar or it no longer drops.
- If necessary, reduce remaining vacuum. In order to do so, open shutoff valve (B).



- Remove the vacuum filler device with the adapter from the low-temperature coolant expansion tank (1).
- Adjust the coolant level in the low-temperature coolant expansion tank (1) up to the lower edge of the coolant filler neck (2) of the low-temperature coolant expansion tank (1).
- After filling the cooling system with the vacuum filler device, **also** run the cooling system bleeding routine.

24 – Fill the high-temperature cooling system with the vacuum filler device

Vacuum filler device



Vacuum filler device - connected to the coolant expansion tank

1 Vacuum filler device with pressure gauge and shutoff valves

2 Filling hose

3 Fluid tank with coolant

4 Venturi nozzle

5 Compressed air connection (maximum 6 bar)

6 Exhaust hose (Routing the exhaust hose to a collecting vessel)

Prerequisite

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

Follow notes for repair work on the cooling system.

For additional information see:

Main group 17

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

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.

Mixing different coolants is not permitted.

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

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

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

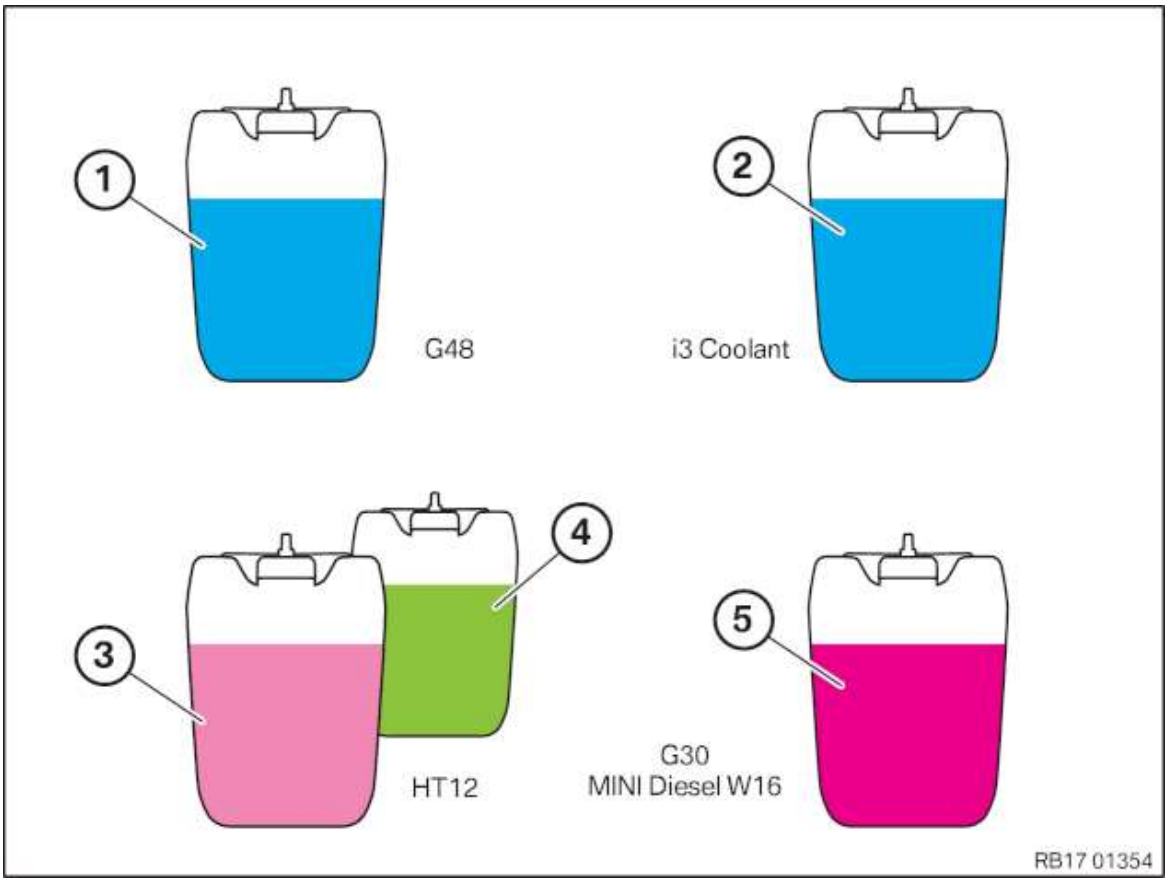
Operation of the vehicle is not permitted unless the filling procedure has been completed. Otherwise, functional limitations (degradation) and/or overheating may occur.

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

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

▶ Observe the coolant type

Coolant in the collecting vessel of vacuum filler device



Choose the correct coolant for filling.

In general, a vehicle has to be filled with the coolant with which it is delivered from the factory.

1 G48 (Blue) (BMW LC-87) Must **not** be mixed with i3 Coolant or G30 MINI Diesel W16.

2 i3 Coolant (Blue) (BMW LC-13) Is used only for heater circuit i3. i3 Coolant must **not** be added to other coolant circuits or mixed with other coolants.

3 HT12 (Rose) (BMW LC-18) Must **not** be mixed with i3 Coolant or G30 MINI Diesel W16.

4 HT12 (Green) (BMW LC-18) Must **not** be mixed with i3 Coolant or G30 MINI Diesel W16.

5 G30 (Rose) (BMW LC-07) May be W16 used exclusively for the **MINI Diesel**. G30 must **not** be filled in the other coolant circuits or mixed with the other coolants.

Damage to the engine or components in high-voltage vehicles

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

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

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

Type	Engine	Adapter (Y) from 17 0 100
G11/G12/G14/G15/G16/G30/G31/G32/G38	B48/B58	17 0 103

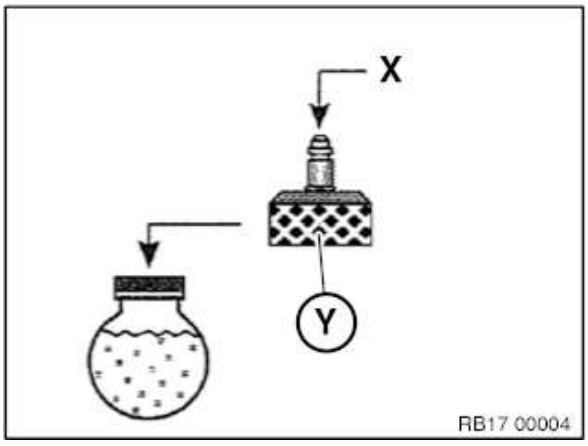
- The fluid tank of the vacuum filler device must be filled with 1 l to 2 l more than the specified capacity of coolant for the vehicle.

Cooling system capacity

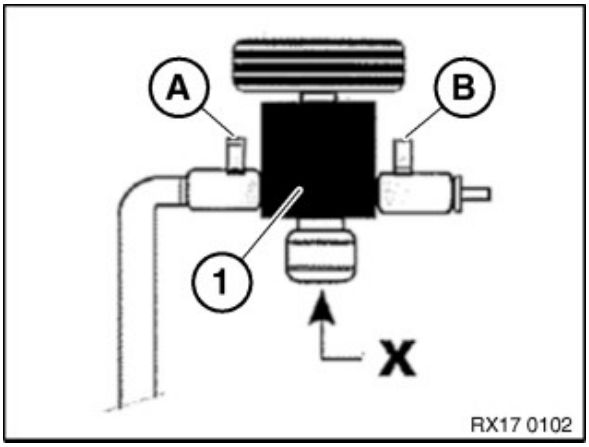
B58B30M1 High-temperature coolant circuit	6,9 l
B58B30M1 High-temperature coolant circuit (SA823)	8 l
B58B30M1 Low-temperature coolant circuit	2.95 l
Expendable materials: Technically suitable antifreeze and corrosion inhibitor	

Cooling system capacity

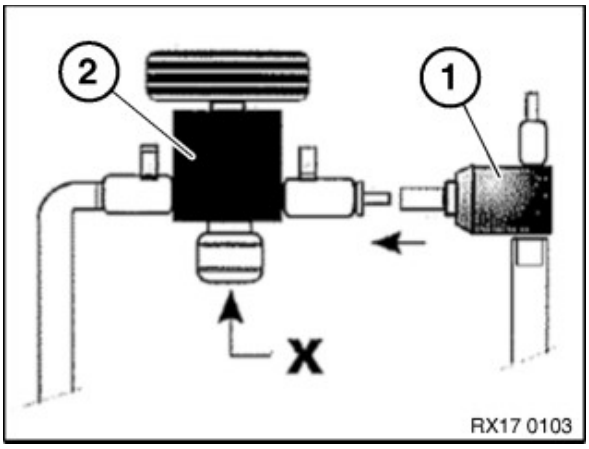
B58 (high temperature cooling circuit)	11,3 l
B58 (low temperature cooling circuit)	4,1 l
Expendable materials: Technically suitable antifreeze and corrosion inhibitor	



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

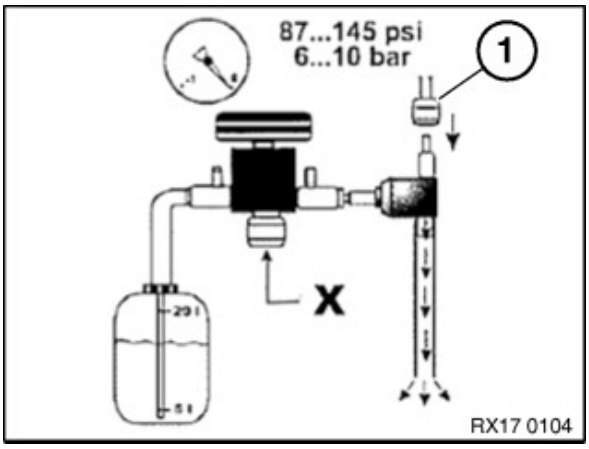


- Check whether shut-off valves (A) and (B) of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



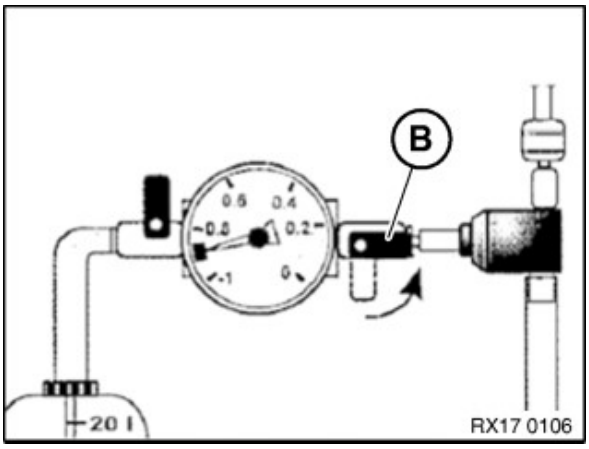
- Connect Venturi nozzle (1) to the vacuum filler device (2).

  (X)is the connection on the coolant expansion tank.



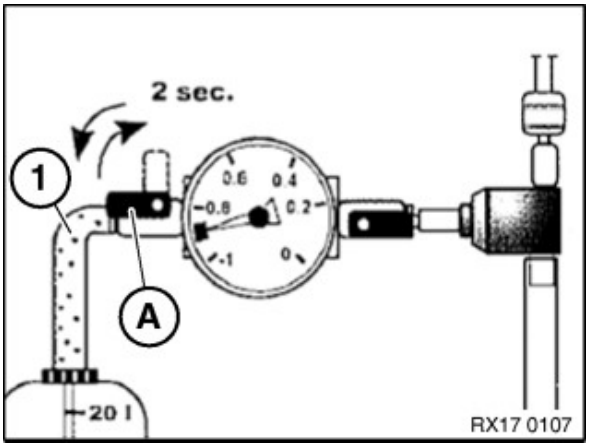
- Connect compressed air (1).

  (X)is the connection on the coolant expansion tank.



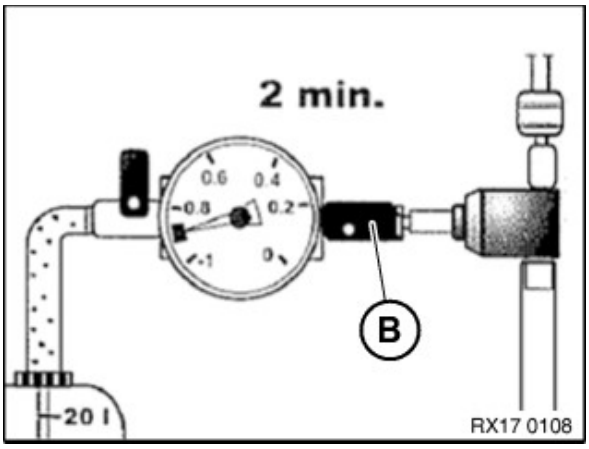
- Open shut-off valve (B).

  The Venturi nozzle produces a flow noise.



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

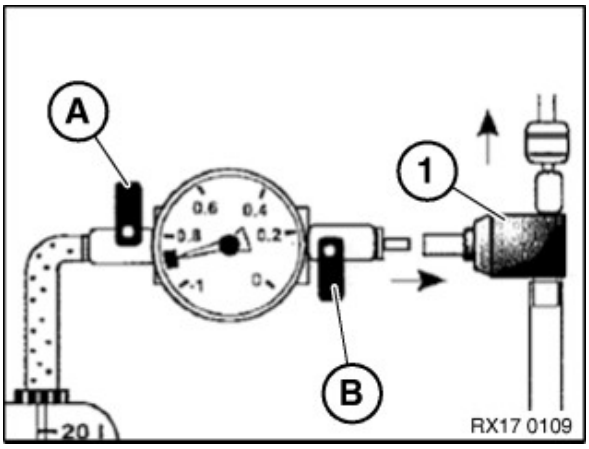
» The filling hose (1) has now been bled.



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

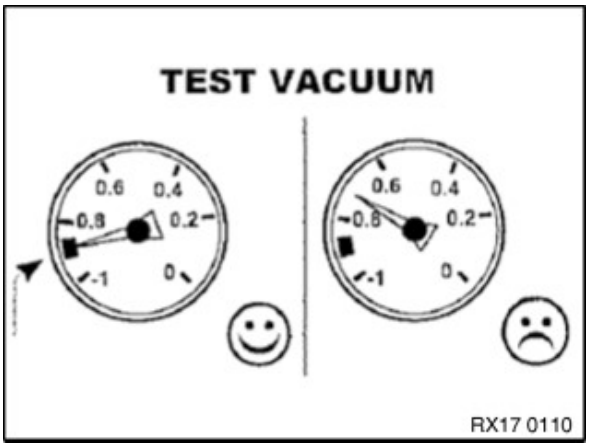
The coolant hoses contract during vacuum build-up.

- After having established a vacuum in the coolant circuit of between -0.7 to -0.95 bar (duration approximately 2 min), close the shut-off valve (B).



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

Check



- Make sure the vacuum in the coolant circuit is maintained for at least 30 seconds.

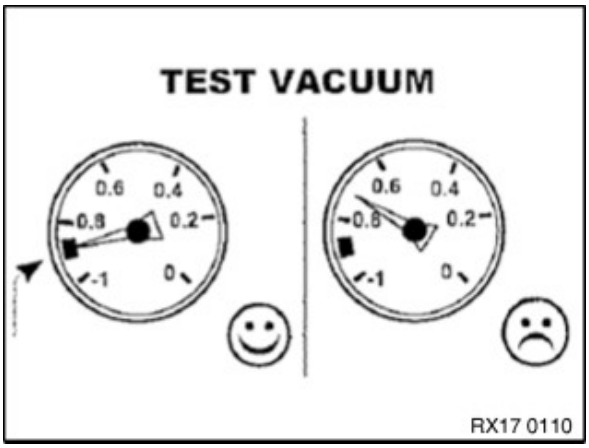
Result

» Vacuum drops.

Measure

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

Check



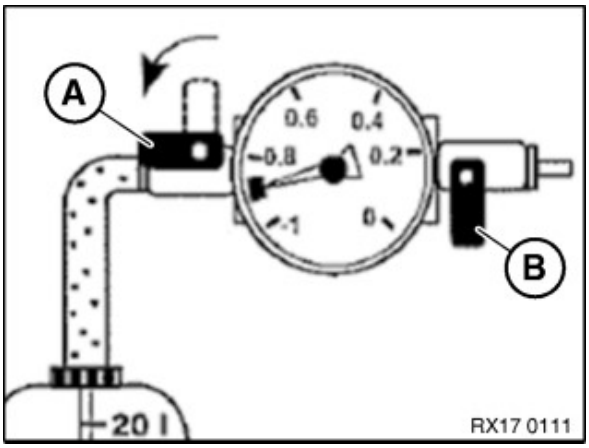
- Make sure the vacuum in the coolant circuit is maintained for at least 30 seconds.

Result

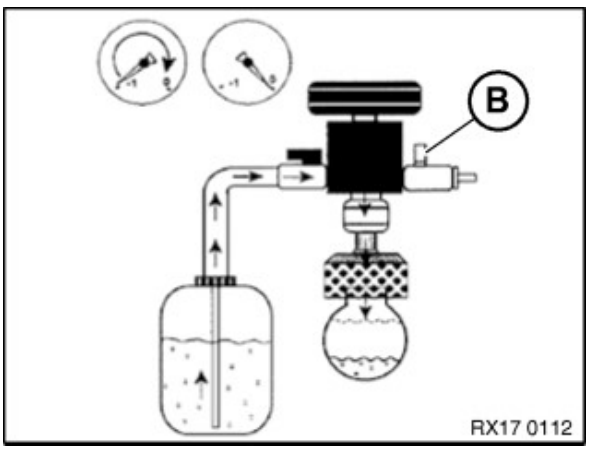
» Vacuum remains constant.

Measure

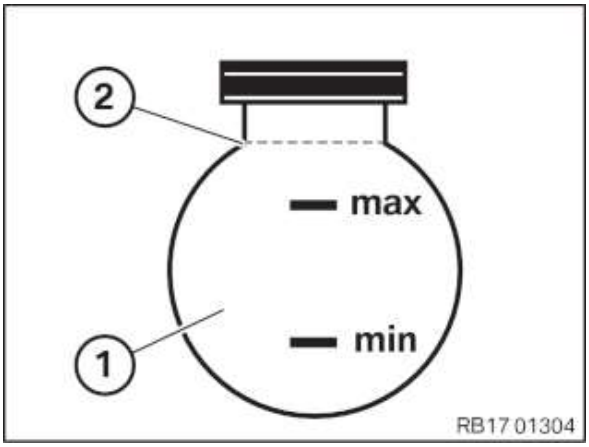
- Continue with filling.



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



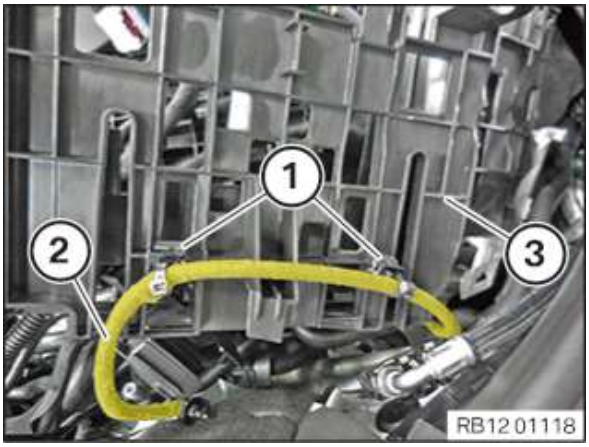
- Stop the filling procedure when the needle in the pressure measuring device is on 0 bar or it no longer drops.
- If necessary, reduce remaining vacuum. In order to do so, open shutoff valve (B).



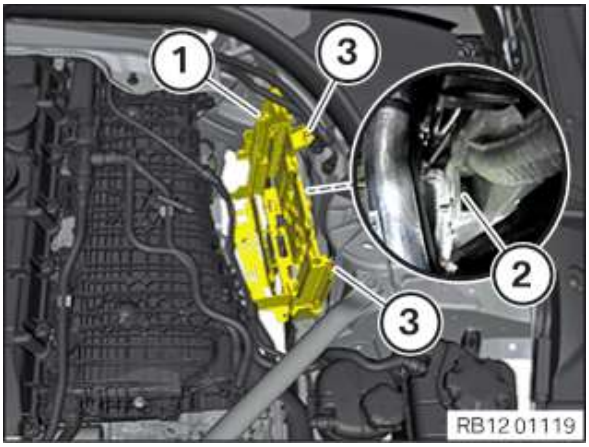
- Remove the vacuum filler device with the adapter from the high temperature coolant expansion tank (1).
- Top up the coolant level in the high temperature coolant expansion tank (1) to the lower edge of the coolant filler neck (2) in the high temperature coolant expansion tank (1).
- After filling the cooling system with the vacuum filler device, **also** run the cooling system bleeding routine.

25 – Install control unit holder

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.



- Insert the control unit holder (3).
- Thread in vehicle wiring harness (2) and fasten with clamps (1).

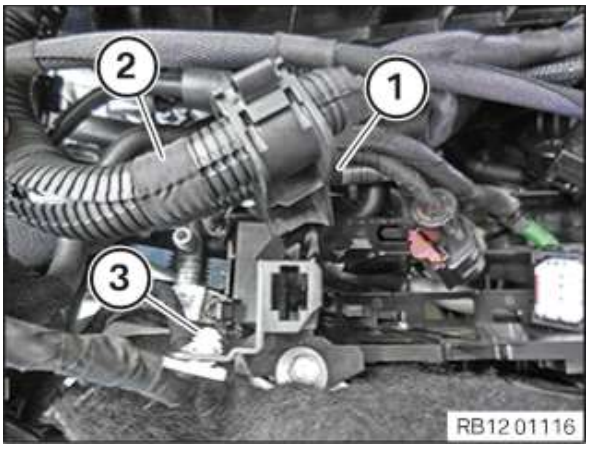


- Feed the control unit holder (1) into the guide (2) and install.
- Tighten down screws (3).

Control unit holder on spring strut dome

Hexagon screw	Tightening torque	8 Nm

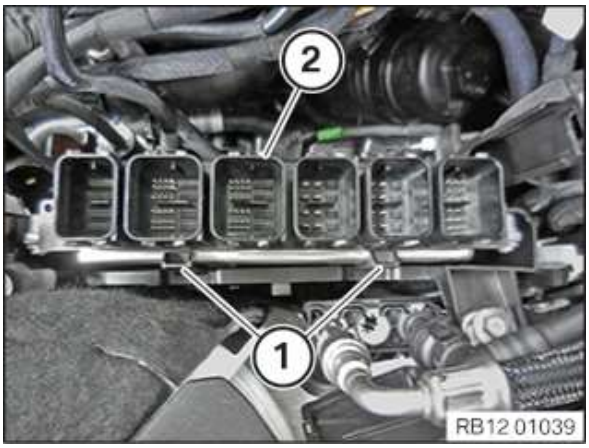
- (1)Secure wiring harness.



- Insert and install the wiring harness (2).
- Lock the lock (1).

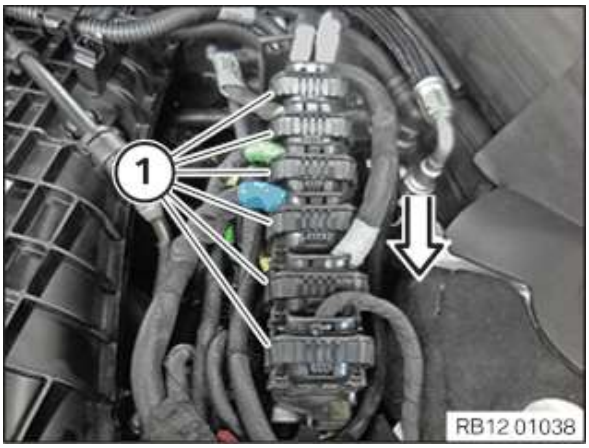
  The lock (1) must audibly engage.
- Secure clamp (3).

26 – Installing the DME control unit



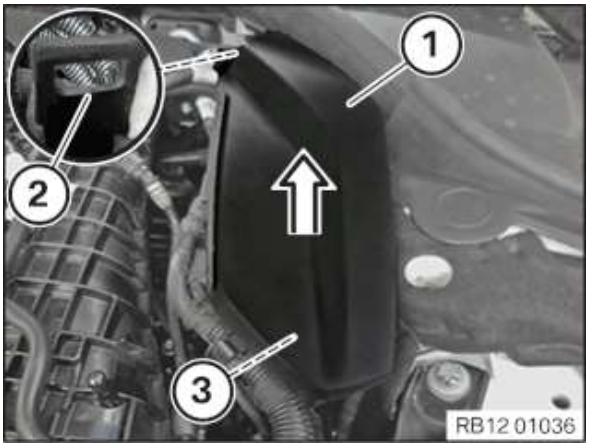
- Feed in and install DME control unit (2).

  The locks (1) must engage audibly.



- Connect the connector (1) in the direction of arrow and lock it.

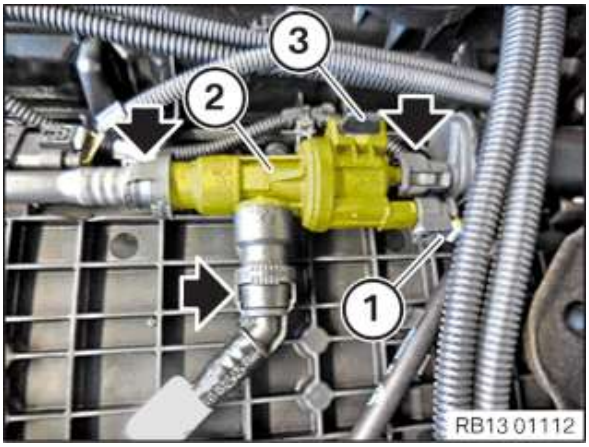
  The connectors (1) must engage audibly.



- Guide in and install the cover (1) into the guide (2) in the direction of arrow.
- Lock clamp (3).

  The clamp (3) must engage audibly.

27 – Installing the tank vent valve

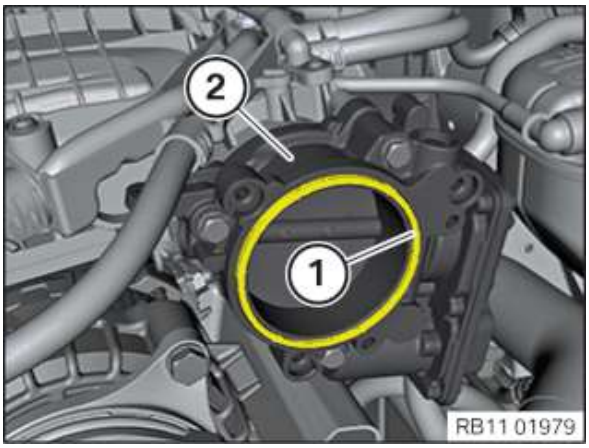


- Secure the tank vent valve (2) to the holder (3).
- Connect and lock the tank ventilation lines (arrows).

  Make sure you can hear the tank ventilation lines engage.
- Connect and lock the connector (1).

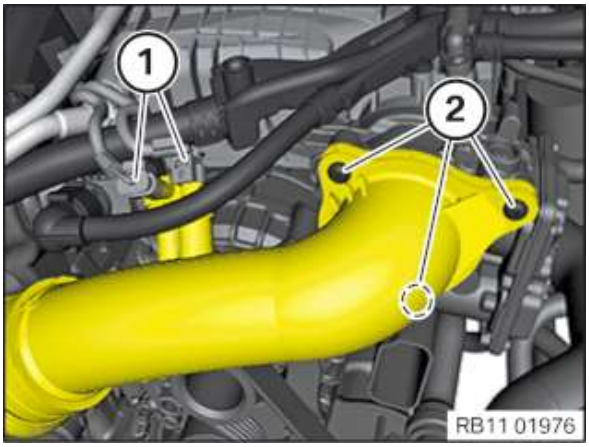
  The connector (1) must engage audibly.

28 – Fasten charge air line to the throttle body



- Renew the gasket (1) on the throttle body (2).

  Parts: Gasket



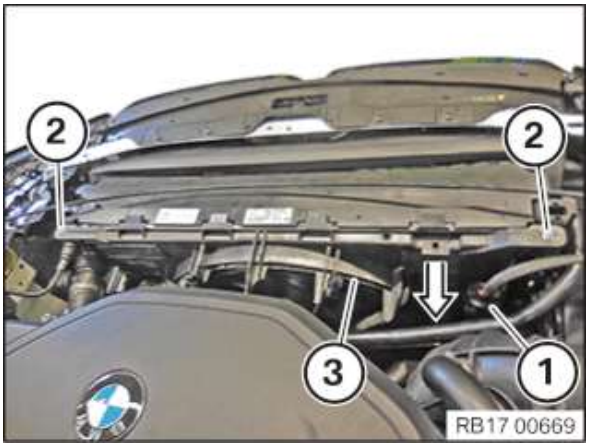
- Tighten down screws (2).

Charge air duct to throttle body

M6x30	Tightening torque	8 Nm

- Connect connector (1).

29 – Install fan cowl



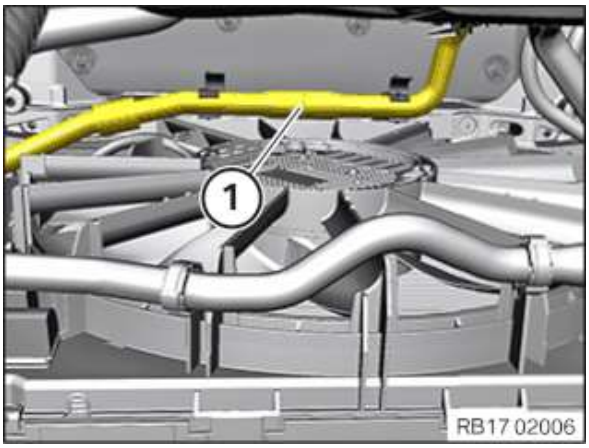
- Feed in and install the fan cowl (3) in the direction of the arrow.
- Tighten the screws (2).

Fan cowl on radiator

TS6x20	6 Nm

- Connect and lock the connector (1).

  The connector (1) must engage audibly.



- **If fitted:**

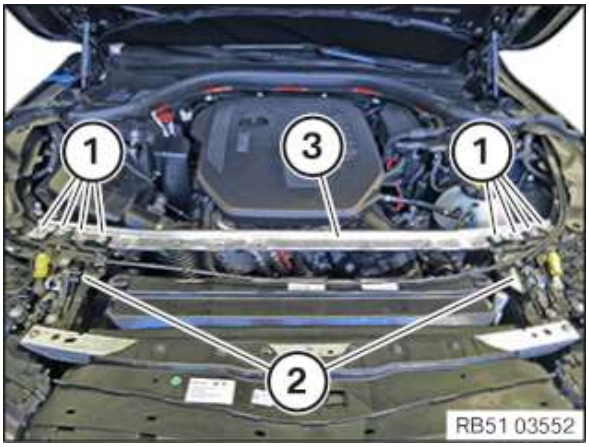
  Fasten the coolant line (1) below at the fan cowl with the clamps.

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

  The clamps (1) must engage audibly.

30 – Install the rear top cross connection

Careless handling of tools and sharp-edged components.
Scratch, surface damage.
- Protect working area.
- Handle tools and components carefully.

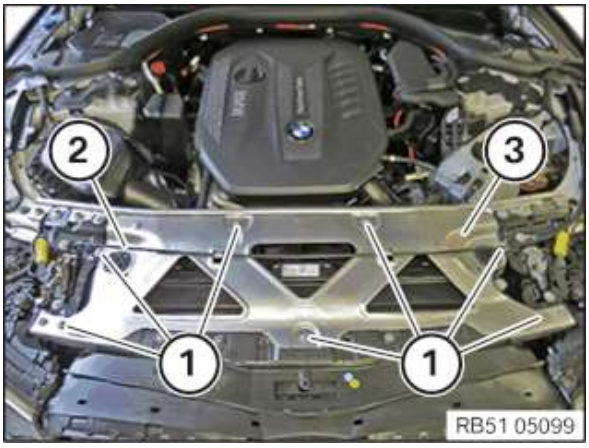


- Slightly lift the support (2) of the bonnet lock on the right and insert the cross connection at the rear top (3) to the front.
- Slightly lift the support (2) of the bonnet lock on the left and insert the cross connection at the rear top (3) to the front.
- Tighten the screws (1).

Rear top cross connection to wheel arch carrier support

Torx screw M8x30	Tightening torque	19 Nm
Torx screw M10x40	Tightening torque	19 Nm

31 – Install front cross connection (front-end strut removed)



- Guide in the front cross connection (3).
- Attach the cable (2).
- Tighten the screws (1).

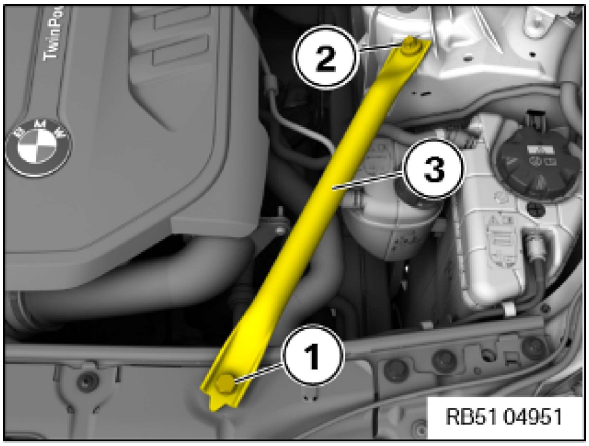
Front cross connection

Screw	Tightening torque	11,8 Nm

32 – Installing both front-end struts

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

▶ Installing the front-end strut



- Install the front-end strut (3).

Use of an incorrect tool (impact screwdriver) to release and tighten the screws.

Damaged thread.

- Only use a standard tool (e.g. reversible ratchet) to release/tighten the screw.

- Clean threads on spring strut dome.
- Renew the screw (1).

  Parts: Screw
- Tighten down screw (1).

Front-end strut to cross connection

Hexagon screw	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	90 °

- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

Front end strut

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

- Repair damaged threads on the spring strut dome with a Helicoil insert.

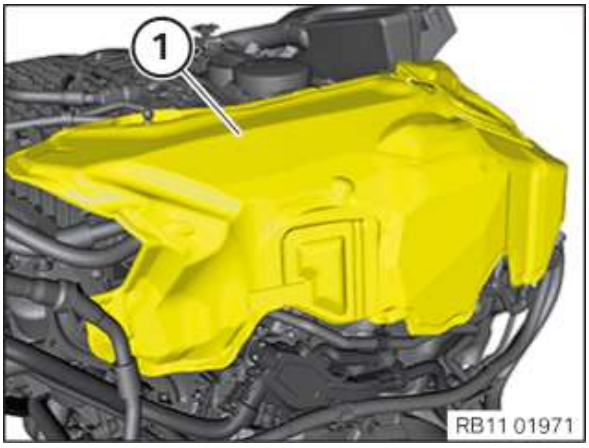
Expendable materials

Helicoil thread insert	M10x30 mm	07129909659

33 – Install the cover of the engine compartment centre

- Install the cover (1).
- Install all expanding rivets (arrows).

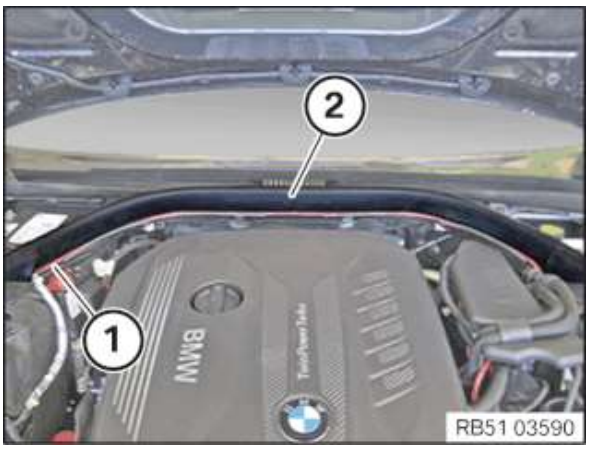
34 – Installing acoustic cover at rear



- Make sure the acoustic cover (1) is correctly positioned on the rear side of the engine.

- Install the acoustic cover (1) from the top and clip it in into the marked areas.

35 – Install the seal for the bonnet



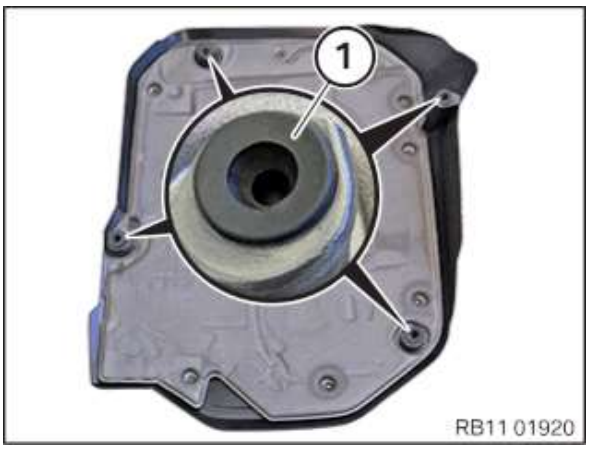
- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

36 – Install acoustic cover

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.

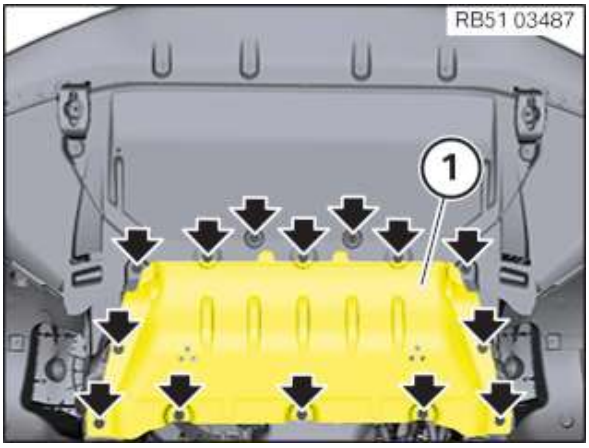


- Check the acoustic cover for correct installation of all the rubber mounts (1).

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

37 – Installing the underbody protection of the steering gear or the front stiffening plate

Different variants may be installed depending on the vehicle equipment.



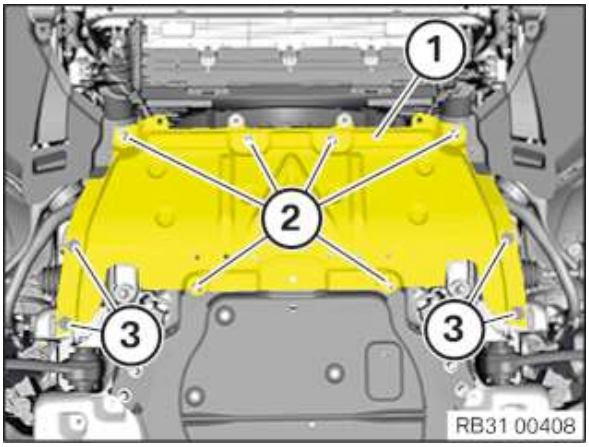
- **Version A:**

  Insert steering gear aggregate protective plate (1).

  Tighten screws (arrows).

Underbody protection

Screw		Tightening torque	3 Nm



- **Version B:**

  Renew screws (2).

  Parts: Screws

  Position the front stiffening plate (1).

  Tighten the screws (2).

Stiffening plate to front axle support

M8	Renew screws.	Jointing torque	25 Nm
		Angle of rotation	70 °

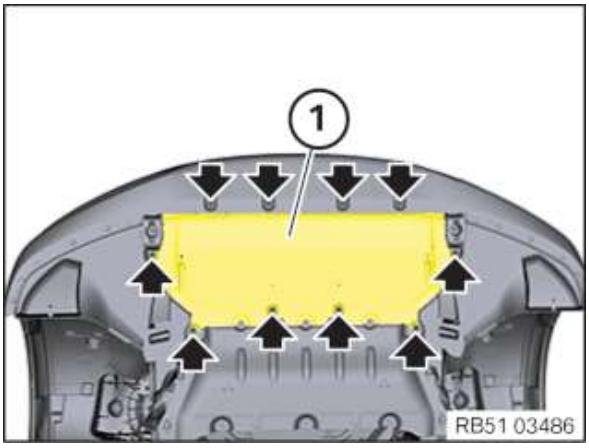
- Tighten the screws (3).

Cover, steering unit

Screw		Tightening torque	3 Nm

38 – Install front underbody protection and/or front stiffening plate

Different variants may be installed depending on the vehicle equipment.



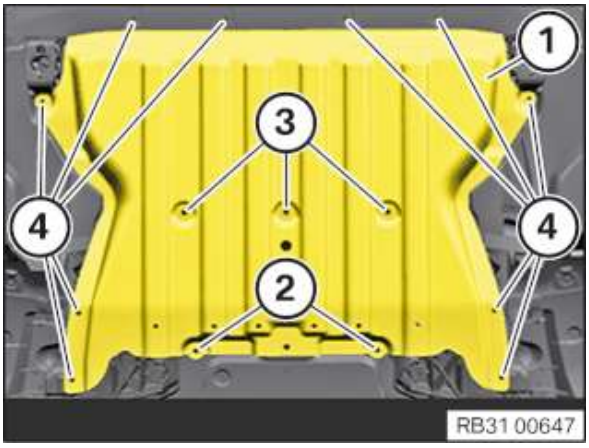
- **Version A:**

  Insert the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Screw		Tightening torque	3 Nm



- **Version B:**

  Position the front stiffening plate (1).

  Renew screws (2).

  Parts: Screws

  Tighten the screws (2).

Stiffening plate to front axle support

M8	Renew screws.	Jointing torque	25 Nm
		Angle of rotation	70 °

- Tighten the screws (3).
- Tighten the screws (4).

Underbody protection

Screw		Tightening torque	3 Nm

39 – Bleeding the low-temperature cooling system

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.

Before starting the automatic cooling system bleeding routine, make sure that **both coolant circuits** are **filled**. The cooling system bleeding routine is automatically started simultaneously for both coolant circuits. If the cooling system bleeding routine is started while one of the coolant circuits is empty, there is a risk of damage to the electric coolant pump when running it dry.

Make sure that terminal 15 is not disconnected for the bleeding procedure. Switch on low-beam headlights and hazard warning lights. If the low-beam headlights and hazard warning lights are not switched on, the ignition (terminal 15) will switch off automatically after a certain period of time and interrupt the bleeding procedure.

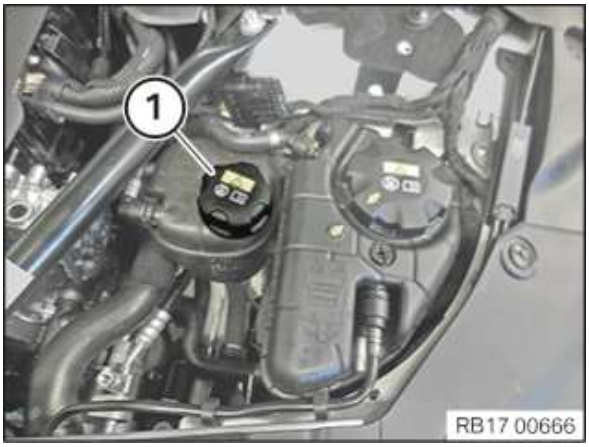
Filling **without** the vacuum filler device (watering can filling) is **not permitted**.

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

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

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

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



- Remove the vacuum filler device from the coolant expansion tank of the low-temperature coolant circuit.
- Adjust the coolant level in the coolant expansion tank of the low-temperature coolant circuit to the maximum mark.
- Close the sealing cap (1) on the coolant expansion tank of the low-temperature coolant circuit.
- Connect battery charger.
- **Activate** the testing-analysis-diagnosis (PAD) by quickly actuating the START-STOP button three times.
- Activate the low-beam headlight and the hazard warning lights **at the same time**.

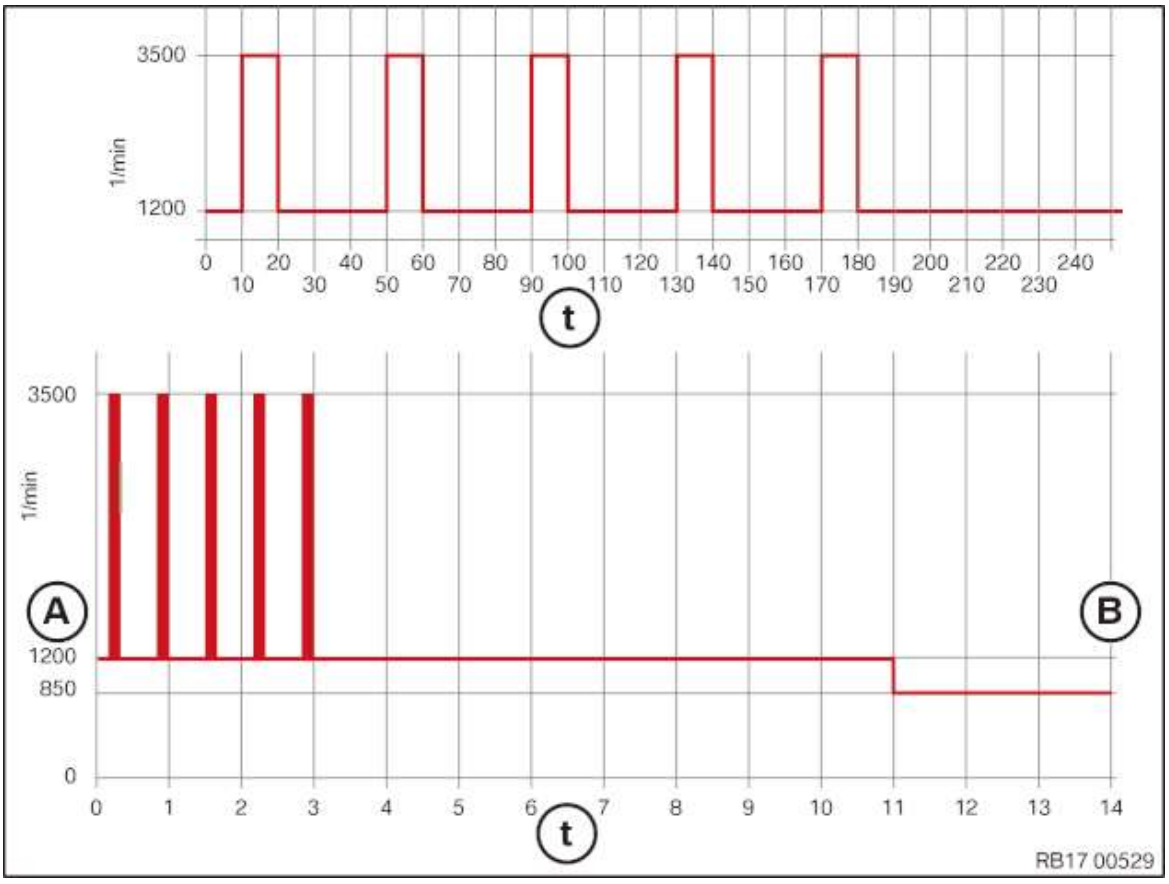
  If the low-beam headlight and the hazard-warning lights are **not** switched on, then the ignition (**terminal 15**) will automatically switch off after some time and interrupt the bleeding procedure.
- Close driver's door.
- Adjust the heating to **maximum** temperature and adjust the blower to the **lowest** stage.
- Floor the accelerator pedal and hold for 15 s.

  The automatic cooling system bleeding routine will be initiated.

  The cooling system bleeding routine ends automatically after approximately 11 minutes.
- Adjust the filling level in the coolant expansion tank of the low-temperature coolant circuit to**100 ml** above the **maximum mark** (1).

40 – Bleed the high-temperature coolant circuit

Bleed the high-temperature coolant system



A = increased idle speed

B= Cooling system bleeding routine finished

t = Time

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

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

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

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

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

Before starting the automatic cooling system bleeding routine, make sure that **both coolant circuits** are **filled**. The cooling system bleeding routine is automatically started simultaneously for both coolant circuits. If the cooling system bleeding routine is started while one of the coolant circuits is empty, there is a risk of damage to the electric coolant pump when running it dry.

Make sure that terminal 15 is not disconnected for the bleeding procedure. Switch on low-beam headlights and hazard warning lights. If the low-beam headlights and hazard warning lights are not switched on, the ignition (terminal 15) will switch off automatically after a certain period of time and interrupt the bleeding procedure.

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.

During the cooling system bleeding routine, the electric fan may be activated sporadically.

- Remove the vacuum filler device from the coolant expansion tank of the high-temperature coolant system.
- Open the bleeder screw on the coolant expansion tank for the high-temperature coolant circuit and close it again after approx. **10 s**.

  You can close the bleeder screw prior to expiry of the 10 s once coolant escapes.
- Adjust the filling level in the coolant expansion tank of the high-temperature cooling system to the maximum mark.
- Close the sealing cap on the coolant expansion tank of the high--temperature cooling circuit.
- Connect battery charger.
- Close driver's seat belt.
- **Activate** the testing-analysis-diagnosis (PAD) by quickly pressing the START-STOP button 3 times.
- Adjust the heating to **maximum** temperature and adjust the blower to the **lowest** stage.
- Floor the accelerator pedal and hold for **15 s**.

  The automatic cooling system bleeding routine will be initiated.
- Start engine.

  The Idle speed is automatically increased to **1200 rpm**.
- **Press accelerator pedal until engine speed reaches approx. 3500 rpm, maintain this engine speed for 10 s .**
- Hold idle speed for **30 s**.
- **Press accelerator pedal until engine speed reaches approx. 3500 rpm, maintain this engine speed for 10 s .**
- Hold idle speed for **30 s**.
- **Press accelerator pedal until engine speed reaches approx. 3500 rpm, maintain this engine speed for 10 s .**
- Hold idle speed for **30 s**.
- **Press accelerator pedal until engine speed reaches approx. 3500 rpm, maintain this engine speed for 10 s .**
- Hold idle speed for **30 s**.
- **Press accelerator pedal until engine speed reaches approx. 3500 rpm, maintain this engine speed for 10 s .**

  The cooling system bleeding routine has finished approximately **11 min** after the engine starts.

  The engine speed drops to the **idle speed** again.
- Switch off engine.
- Allow the engine to cool down.
- Adjust the filling level in the coolant expansion tank of the high-temperature coolant circuit to 200 ml above the maximum mark.

- Close the sealing cap (1) until the **arrows** are flush.

Additional Information

Overview of Tightening Torques

Heat management module to engine block		Used in step 19
Captive screws		8 Nm

Intake plenum to cylinder head		Used in step 20
Observe tightening sequence.	Jointing torque	5 Nm
	Tightening torque	10 Nm

Intake plenum to rear/front support		Used in step 20
BM6 x 25		10 Nm

Wiring harness to intake plenum		Used in step 20
		5 Nm

Tank ventilation line to intake plenum		Used in step 20
TS5 x 16		5 Nm

Control unit holder on spring strut dome		Used in step 25
Hexagon screw	Tightening torque	8 Nm

Charge air duct to throttle body		Used in step 28
M6x30	Tightening torque	8 Nm

Fan cowl on radiator		Used in step 29
TS6x20		6 Nm

Rear top cross connection to wheel arch carrier support		Used in step 30
Torx screw M8x30	Tightening torque	19 Nm
Torx screw M10x40	Tightening torque	19 Nm

Front cross connection			Used in step 31
Screw		Tightening torque	11,8 Nm

Front-end strut to cross connection			Used in step 32
Hexagon screw	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	90 °

Front end strut			Used in step 32
Screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

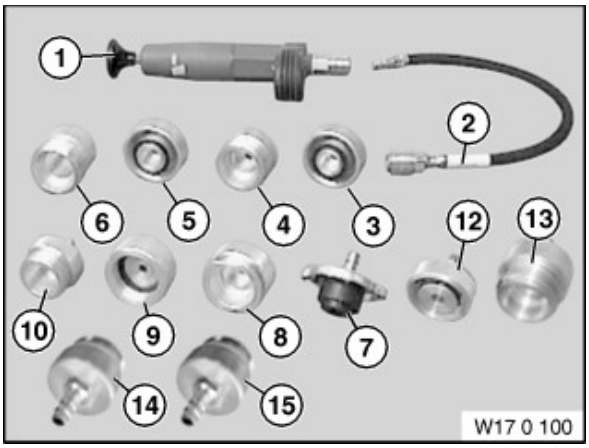
Underbody protection			Used in step 37 38
Screw		Tightening torque	3 Nm

Stiffening plate to front axle support			Used in step 37 38
M8	Renew screws.	Jointing torque	25 Nm
		Angle of rotation	70 °

Cover, steering unit			Used in step 37
Screw		Tightening torque	3 Nm

Overview of Special Tools

0 494 417 (17 0 100) Tester



Common		Used in step 23 24
Usage	For checking engine cooling system on watertightness. For checking radiator cap.	
Included in the tool or work		
Storage location	Individual	
Replaced by		
In connection with		
SI-Number	01 07 02 (884)	

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
5	0 494 422 (17 0 105)		**Adapter** For radiator cap (sawtooth thread)	

10	0 494 427 (17 0 111)	**Adapter** For radiator cap R53/W11, R50/W17 adapter replaced 17 0 052.
1	0 494 418 (17 0 101)	**Pump** Replacement part for set 8330 0494417 (170100)
2	0 494 419 (17 0 102)	**Hose** (hose with quick-release coupling)
3	0 494 420 (17 0 103)	**Adapter** For radiator cap (normal thread)
4	0 494 421 (17 0 104)	**Adapter** For radiator cap (normal thread)
6	0 494 423 (17 0 106)	**Adapter** For radiator cap (sawtooth thread)
7	0 494 424 (17 0 107)	**Adapter** For radiator cap R50 / W10
8	0 494 425 (17 0 108)	**Adapter** For radiator cap R50 / W10
9	0 494 426 (17 0 109)	**Adapter** For radiator connection R53/W11, R50/W17 adapter corresponds to 17 0 051
11	0 494 428 (17 0 112)	**Case**
12	0 494 642 (17 0 113)	**Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)
13	0 494 643 (17 0 114)	**Adapter** For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)
14	0 495 889 (17 0 115)	**Adapter** For radiator cap Model series: N12, N14

Overview Technical Data

Cooling system capacity	Used in step 23 24
B58 (high temperature cooling circuit)	11,3 l
B58 (low temperature cooling circuit)	4,1 l
Expendable materials: Technically suitable antifreeze and corrosion inhibitor	

Cooling system capacity	Used in step 23 24
B58B30M1 High-temperature coolant circuit	6,9 l
B58B30M1 High-temperature coolant circuit (SA823)	8 l
B58B30M1 Low-temperature coolant circuit	2.95 l
Expendable materials: Technically suitable antifreeze and corrosion inhibitor	

Links

Functional descriptions	Used in step
Terminal control, Parking-Residing-Driving	

Repair instructions (PRE)	Used in step
Notes on the identification of the high-voltage system	

General repair instructions	Used in step
12 00 ... Instructions for removal and replacement of control units	13 26

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	12 13
61 35 ... Notes on ESD protection (Electro Static Discharge)	12 13
17 00 ... Notes for working on cooling system	23 24
61 00 730 Encode/program control unit(s) (after vehicle test)	26

Operating materials	Used in step
Main group 17	23 24