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

WARNING

Hot surfaces.

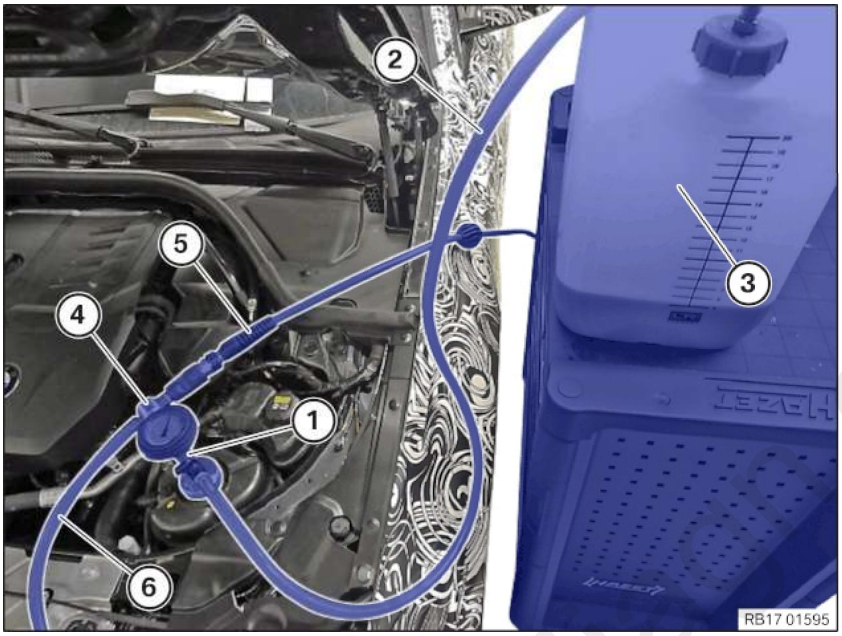
Risk of burning!

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

PRELIMINARY WORK

1 – 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 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.

TECHNICAL INFORMATION

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

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

Mixing different coolants is not permitted.

TECHNICAL INFORMATION

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

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

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

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

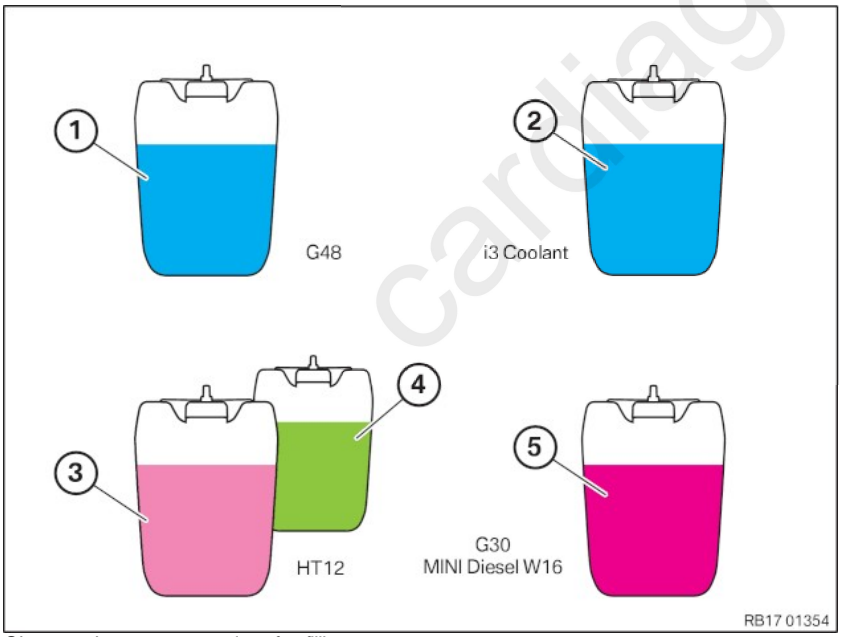
A bleeding procedure is required after a part has been exchanged in the cooling system and/or after refilling the cooling system.

TECHNICAL INFORMATION

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 vacuum filler device container



Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

1. **G48 (Blue)** G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.
2. **i3 coolant (blue)** is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.
3. **HT12 (Pink)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
4. **HT12 (Green)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
5. **G30 (Pink)** must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

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RISK OF DAMAGE

Damage to the engine.

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

- 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):

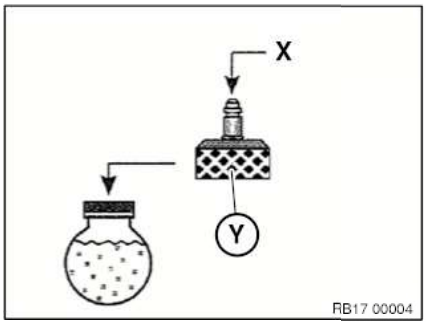
Type	Engine	Adapter (Y) from 17 0 100
G20/G29	B46 / B48 /B58	17 0 113

- 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.

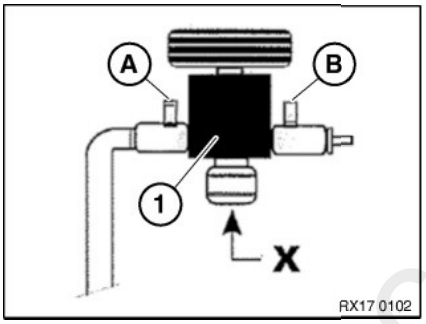
Capacity of high-temperature coolant circuit G20

B48B20O1/B46B20O1	9.8 l

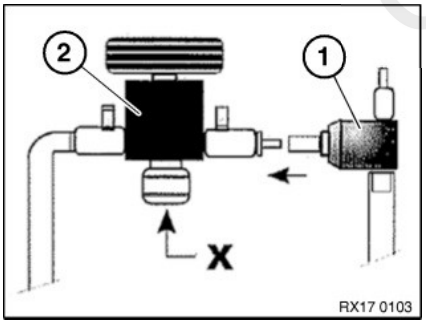
Expendable materials: Technically suitable antifreeze and corrosion inhibitor



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

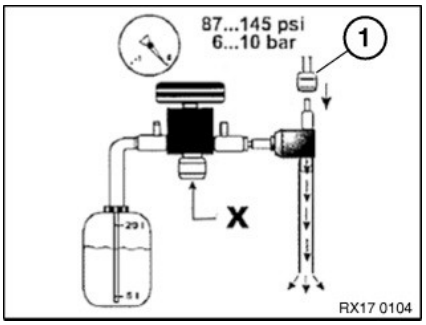


- Check whether shut-off valves (A) and (B) of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



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

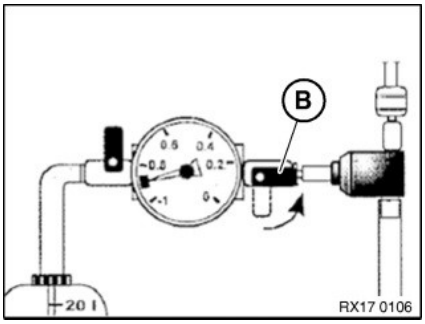
  (X)is the connection on the coolant expansion tank.



- Connect compressed air (1).

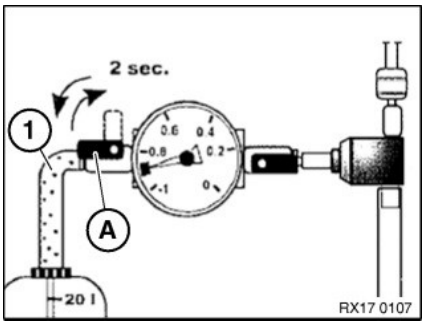
  (X)is the connection on the coolant expansion tank.

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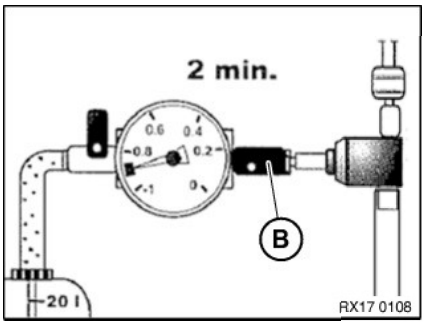
- Open shut-off valve (B).

  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.

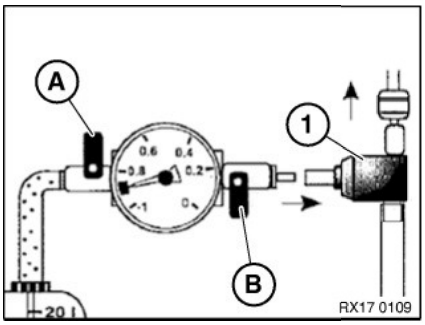


- Check the coolant hoses for porosity and renew porous coolant hoses as required.

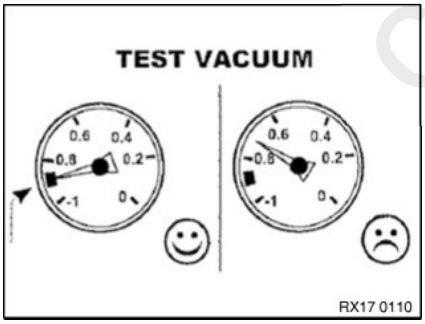
TECHNICAL INFORMATION

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

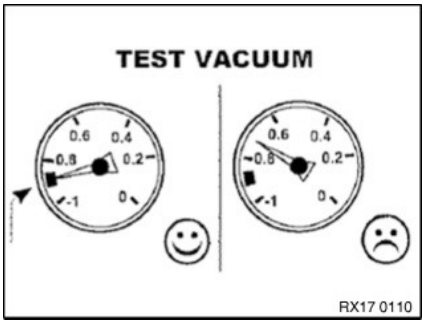
» Vacuum drops.

Measure

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

Check

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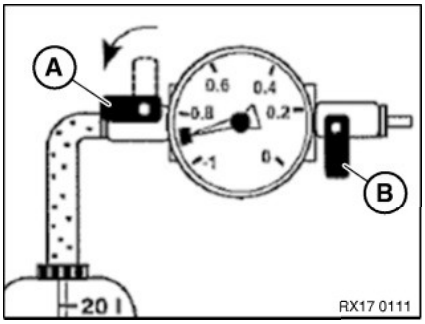
- Make sure the vacuum in the coolant circuit is maintained for at least 30 seconds.

Result

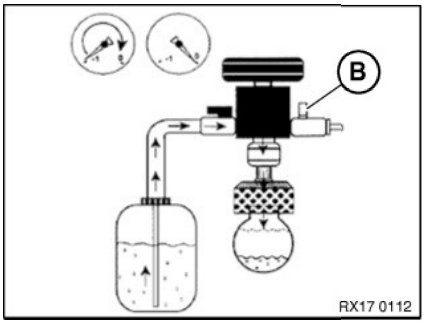
» Vacuum remains constant.

Measure

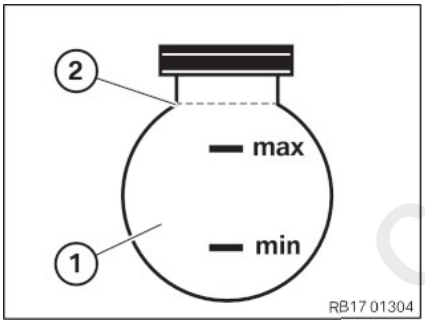
- Continue with filling.



- 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.

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MAIN WORK

2 – Bleed the high-temperature coolant circuit

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

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

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

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

The 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.

TECHNICAL INFORMATION

Before starting the automatic cooling system bleeding routine, make sure that **all coolant circuits** are **filled**. 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.

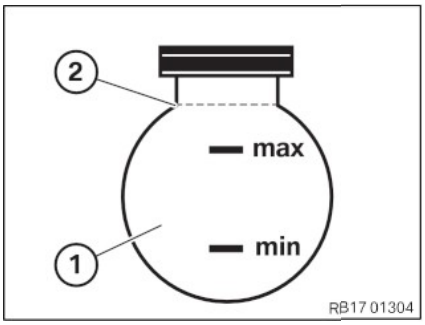
Make sure that terminal 15 is not disconnected for the bleeding procedure. Switch on low-beam headlights and hazard warning lights. If the low-beam headlights and hazard warning lights are not switched on, the ignition (terminal 15) will switch off automatically after a certain period of time and interrupt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

TECHNICAL INFORMATION

The electrical fan is activated during the entire cooling system bleeding routine.

TECHNICAL INFORMATION

The driving experience switch must not be set to the ECO PRO switch position.



- 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 coolant level in the high temperature coolant expansion tank (1) to the lower edge (2) of the coolant filler neck of the the high temperature coolant expansion tank (1) .
- Close the sealing cap on the coolant expansion tank of the high--temperature cooling circuit.
- Make sure the bonnet is **closed**.
- Make sure that the wheels touch the ground.
- Engage the parking brake.
- Do not engage any gear in manual-shift gearbox, and engage the gear to "P" or "N" automatic transmission.
- Connect battery charger.
- Switch on the ignition and make sure that it remains **switched on** (for example, activate the low-beam headlight and the **hazard warning light at the same time**).

  If the low-beam headlight and the hazard warning light are **not** switched on, the ignition (**terminal 15**) will switch off automatically after some time and interrupts the bleeding procedure.
- Check that the driving experience control is **not** in the **"ECO-PRO"** switch position.
- Adjust the heating to **maximum** temperature and adjust the blower to the **lowest** stage.
- Hold the accelerator pedal down to the limit position for at least **10 s** and do **no** kick the brake pedal.
- Start engine.
- Start the cooling system bleeding routine, pay attention to the display on the instrument cluster (KOMBI). ("Service function started")

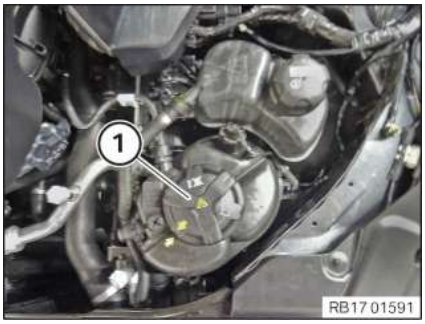
  The engine speed (up to 3500 rpm) and the actuators in the cooling system are activated **automatically** for 11 minutes according to a cooling system bleeding routine.

  The cooling system bleeding routine ends approx. 11 min **after** the engine starts.

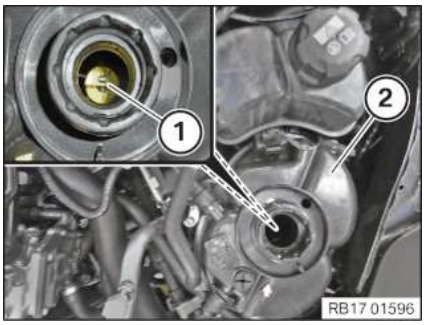
  The engine speed **drops** to the idle speed.
- Observe the display in the instrument cluster (KOMBI).

  If the service function is interrupted, the cooling system bleeding routine **must** be repeated.
- Switch off engine.
- Allow the coolant temperature to cool down to **< 50°C**.

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- Loosen sealing cap (1).



TECHNICAL INFORMATION

After the cooling system bleeding routine, the cooling system is topped up above the maximum mark.

Overfilling the cooling system serves to balance the remaining air in the cooling system.

The normal filling level of the coolant is reached while driving.

- Adjust the filling level in the coolant expansion tank (2) of the high-temperature coolant circuit to **200 ml** over the **maximum mark**(1) .



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

POSTPROCESSES

3 – Check the high-temperature cooling system for watertightness

WARNING

Hot surfaces.

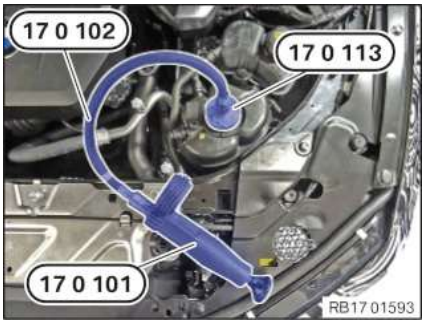
Risk of burning!

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



- Loosen sealing cap (1).

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- Attach the special tool 0 494 418 (17 0 101) with special tools 0 494 419 (17 0 102) and 0 494 642 (17 0 113) from the set of special tools 0 494 417 (17 0 100).
- Build up excess pressure and wait for approximately 2 minutes.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar



TECHNICAL INFORMATION

If the described test step is not completed successfully: repeat test step twice. Only replace the sealing cap after three tests with an incorrect opening pressure.

When driving at high ambient temperatures, the design may cause the pressure relief valve in the sealing cap to open slightly and air to escape together with dissolved coolant. This coolant vapour condenses on the surface of the coolant expansion tank and leaves traces of coolant when the vehicle has cooled down. These traces of coolant do not indicate whether the sealing cap is defective or not.

Escaping coolant vapours when the vehicle is at standstill may cause the pressure relief valve to stick to the sealing cap. This may cause an incorrect opening pressure.

- Screw on sealing cap (1) on special tool 0 494 643 (17 0 114) from the set of special tools 0 494 417 (17 0 100).
- Build up the pressure with special tools 0 494 418 (17 0 101) and 0 494 419 (17 0 102) from the set of special tools 0 494 417 (17 0 100).
- Observe on the pressure measuring device when the opening pressure has been reached.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar



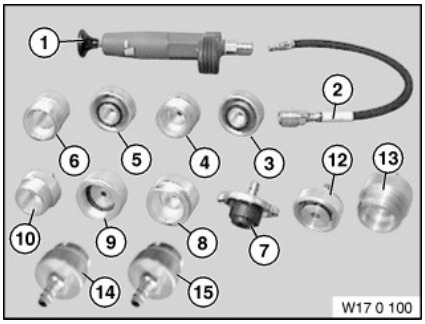
- Close sealing cap (1).
- Close the sealing cap (1) until the **arrows** are flush.

Additional Information

Overview of Special Tools

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0 494 417 (17 0 100) Tester



Common Used in step 13

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**	
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	

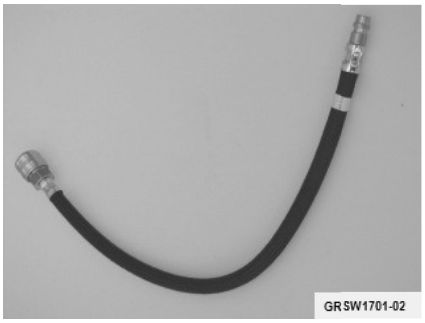
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0 494 418 (17 0 101) Pump



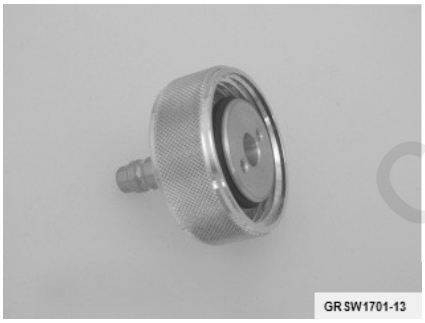
Common	Used in step 3
Usage	
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

0 494 419 (17 0 102) Hose



Common	Used in step 3
Usage	(hose with quick-release coupling)
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

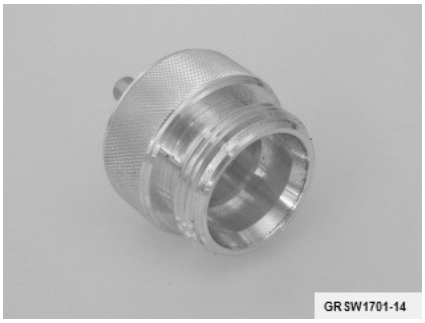
0 494 642 (17 0 113) Adapter



Common	Used in step 3
Usage	For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 494 643 (17 0 114) Adapter



Common	Used in step 3
Usage	For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

Overview Technical Data

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system	Used in step 3
Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar

Capacity of high-temperature coolant circuit G20	Used in step 1
B48B20O1/B46B20O1	9.8 l

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

Links

Repair instructions	Used in step
17 00 ... Notes for working on cooling system.	1

Operating materials	Used in step
Main group 17	1

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17 00 040 Bleed the cooling system and check it for watertightness with the special tool

WARNING

Hot surfaces.

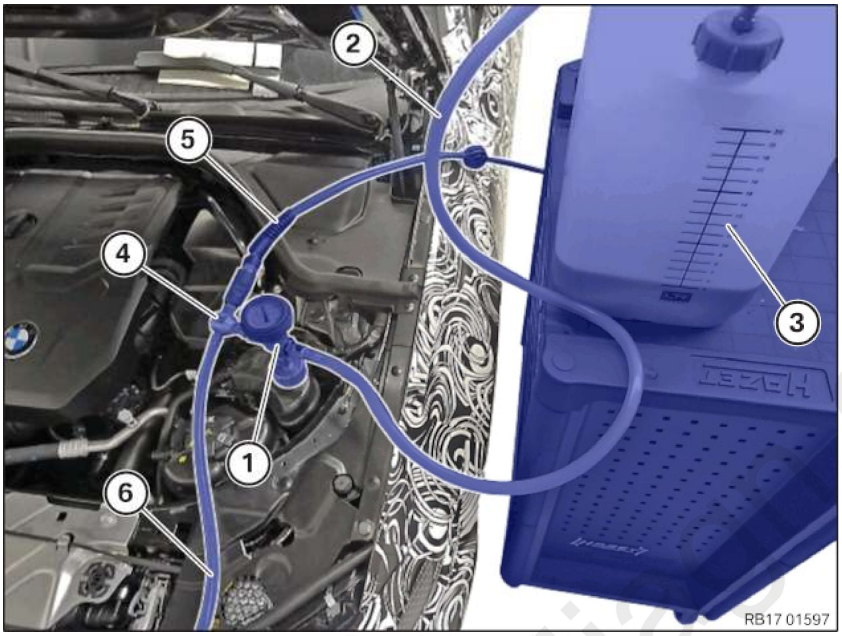
Risk of burning!

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

PRELIMINARY WORK

1 – 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.

TECHNICAL INFORMATION

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

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

Mixing different coolants is not permitted.

TECHNICAL INFORMATION

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

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

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

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

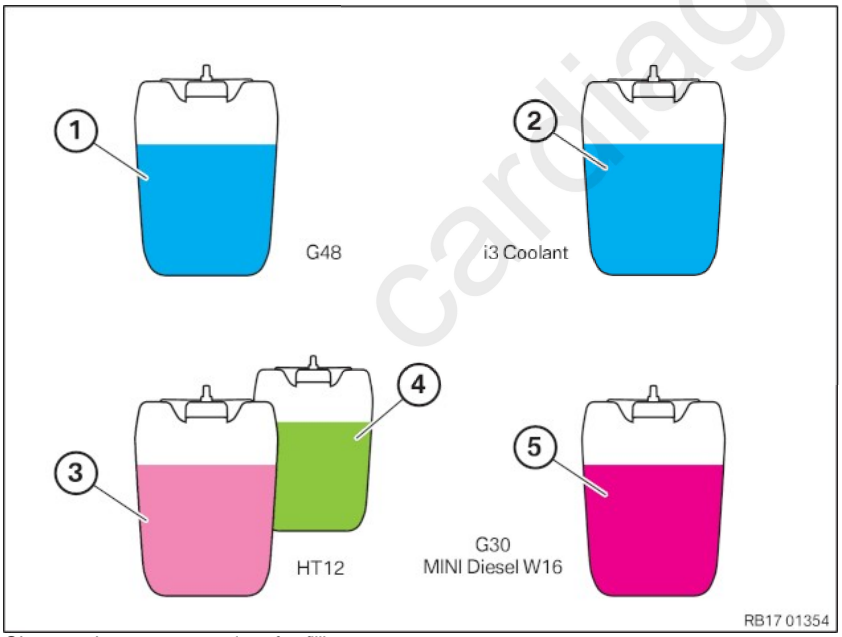
A bleeding procedure is required after a part has been exchanged in the cooling system and/or after refilling the cooling system.

TECHNICAL INFORMATION

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 vacuum filler device container



Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

1. **G48 (Blue)** G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.
2. **i3 coolant (blue)** is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.
3. **HT12 (Pink)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
4. **HT12 (Green)** HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.
5. **G30 (Pink)** must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

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RISK OF DAMAGE

Damage to the engine.

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

- 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):

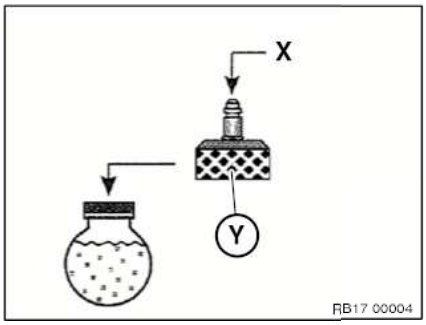
Type	Engine	Adapter (Y) from 17 0 100
G20/G29	B46 / B48 /B58	17 0 109

- 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.

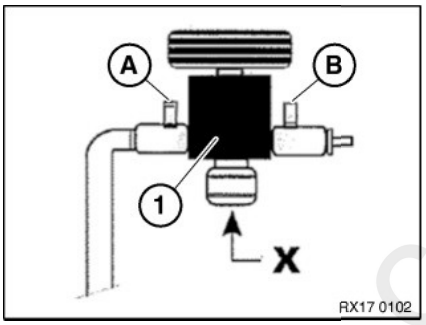
Capacity of low-temperature coolant circuit G20

B48B20O1/B46B20O1 (Low-temperature coolant circuit)	4.2 l

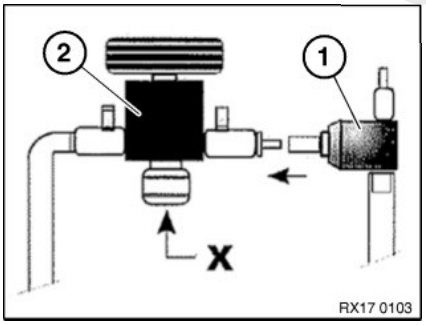
Expendable materials: Technically suitable antifreeze and corrosion inhibitor



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

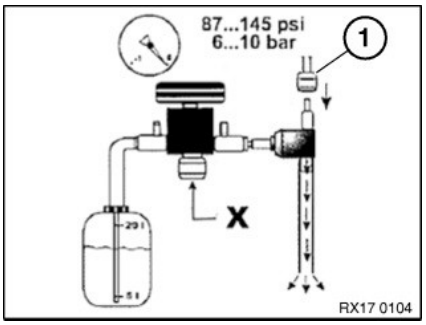


- Check that shutoff valves (A) and (B) of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



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

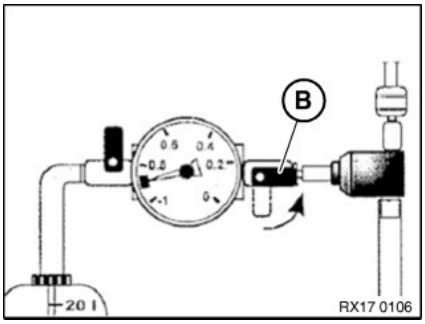
  (X)is the connection on the coolant expansion tank.



- Connect compressed air (1).

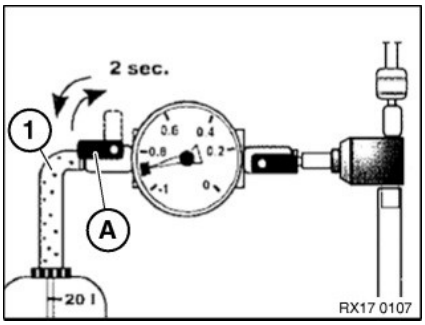
  (X)is the connection on the coolant expansion tank.

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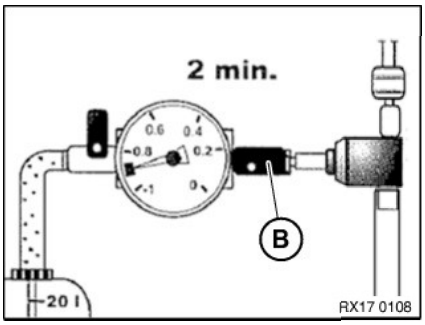
- Open shut-off valve (B).

  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.

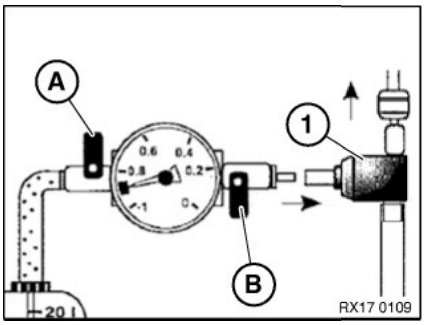


- Check the coolant hoses for porosity and renew porous coolant hoses as required.

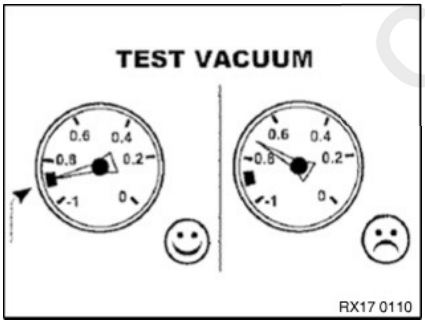
TECHNICAL INFORMATION

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

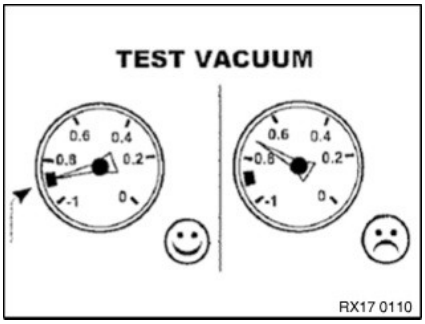
» Vacuum drops.

Measure

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

Check

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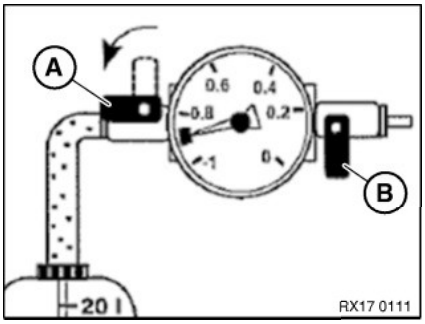
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

Result

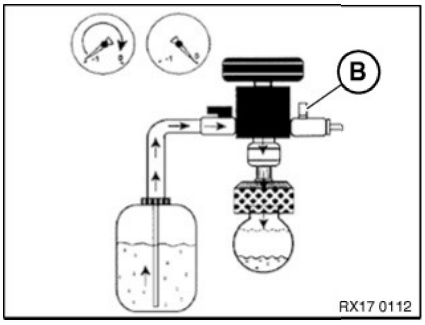
» Vacuum remains constant.

Measure

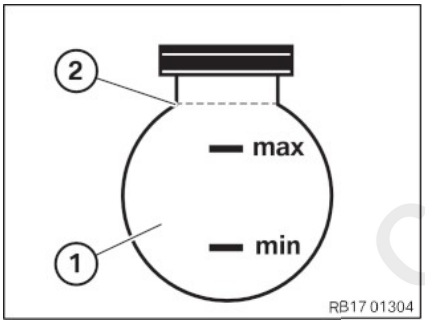
- Continue with filling.



- 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.

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MAIN WORK

2 – Bleeding the low-temperature cooling system

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

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

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

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

The 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.

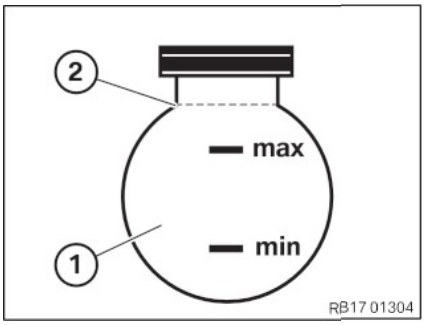
TECHNICAL INFORMATION

Before starting the automatic cooling system bleeding routine, make sure that **all coolant circuits** are **filled**. 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.

TECHNICAL INFORMATION

The driving experience switch must not be set to the ECO PRO switch position.



- Adjust the coolant level in the low-temperature coolant expansion tank (1) up to lower edge (2) of the coolant filler neck of low-temperature coolant expansion tank (1).
- Close the sealing cap on the coolant expansion tank of the low-temperature coolant circuit.
- Ensure that the bonnet is **open**.
- Connect battery charger.
- Switch on the ignition and ensure that it remains **switched on** (for example, activate the low-beam headlight and the hazard warning lights **at the same time**).
- If the low-beam headlight and the hazard warning light are **not** switched on, the ignition (**terminal 15**) will switch off automatically after some time and interrupts the bleeding procedure.
- Ensure that the Driving Experience Control is **not** in the **"ECO-PRO"** switch position.
- Adjust the heating to **maximum** temperature and adjust the blower to the **lowest** stage.
- Hold the accelerator pedal down to the limit position for at least **10 s** and do **not** press on the brake pedal.
- Do **not** start engine.

  The cooling system bleeding routine will start.

  The electric coolant pump in the low-temperature coolant circuit is activated for 11 minutes according to a cooling system bleeding routine.

  The cooling system bleeding routine ends after 11 minutes.

  The electric coolant pump is **no** longer activated.
- Note the display in the instrument cluster (KOMBI).

  If the service function is interrupted, the cooling system bleeding routine **must** be repeated.
- Allow the coolant temperature to cool down to **< 50°C**.



- Loosen sealing cap (1).

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TECHNICAL INFORMATION

After the cooling system bleeding routine, the cooling system is topped up above the maximum mark.

Overfilling the cooling system serves to balance the remaining air in the cooling system.

The normal filling level of the coolant is reached while driving.

- Adjust the filling level in coolant expansion tank (2) of the low-temperature coolant circuit to **100 ml** above the **maximum mark** (1) .
- Close sealing cap (1).

POSTPROCESSES

3 – Checking low-temperature cooling system for watertightness

WARNING

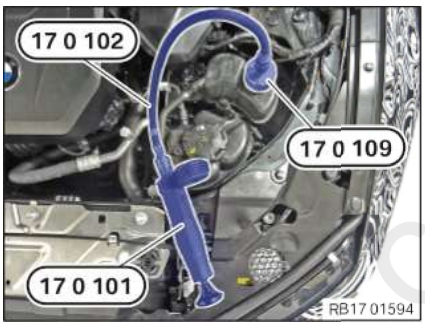
Hot surfaces.

Risk of burning!

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



- Loosen sealing cap (1).

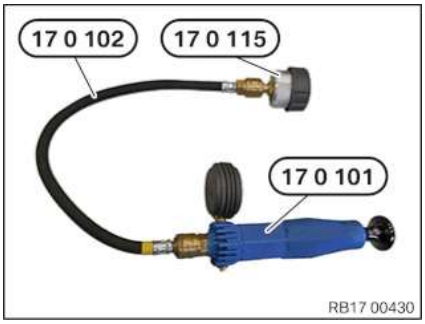


- Attach the special tool 0 494 418 (17 0 101) with special tools 0 494 419 (17 0 102) and 0 494 426 (17 0 109) from the set of special tools 0 494 417 (17 0 100).
- Build up excess pressure and wait for approximately 2 minutes.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar

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TECHNICAL INFORMATION

If the described test step is not completed successfully: repeat test step twice. Only replace the sealing cap after three tests with an incorrect opening pressure.

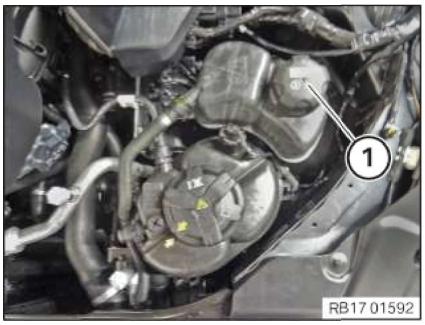
When driving at high ambient temperatures, the design may cause the pressure relief valve in the sealing cap to open slightly and air to escape together with dissolved coolant. This coolant vapour condenses on the surface of the coolant expansion tank and leaves traces of coolant when the vehicle has cooled down. These traces of coolant do not indicate whether the sealing cap is defective or not.

Escaping coolant vapours when the vehicle is at standstill may cause the pressure relief valve to stick to the sealing cap. This may cause an incorrect opening pressure.

- Screw on sealing cap (1) on special tool 0 495 889 (17 0 115) from the set of special tools 0 494 417 (17 0 100).
- Build up the pressure with special tools 0 494 418 (17 0 101) and 0 494 419 (17 0 102) from the set of special tools 0 494 417 (17 0 100).
- Observe on the pressure measuring device when the opening pressure has been reached.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar



- Close sealing cap (1).

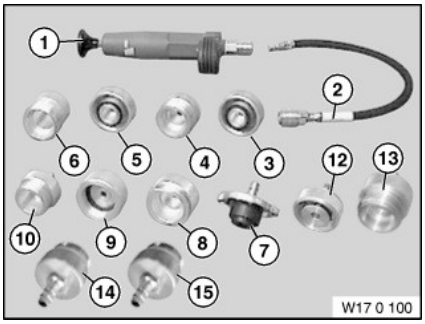
Additional Information

Overview of Special Tools

0 494 417 (17 0 100) Tester

Used in step 13

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Common

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**	
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	

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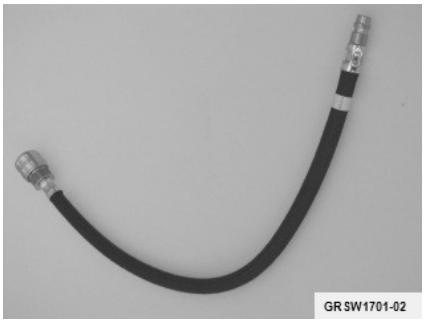
0 494 418 (17 0 101) Pump



Common Used in step 3

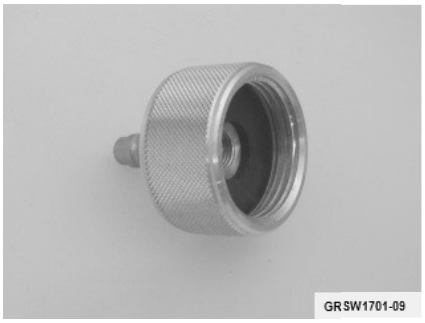
Usage	
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

0 494 419 (17 0 102) Hose



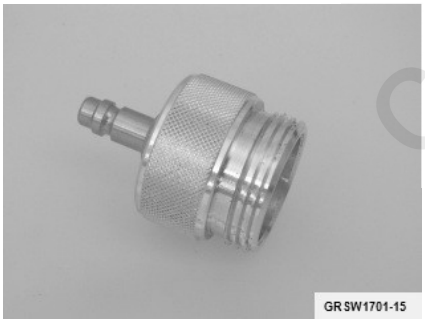
Common	Used in step 3
Usage	(hose with quick-release coupling)
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

0 494 426 (17 0 109) Adapter



Common	Used in step 3
Usage	For radiator connection R53/W11, R50/W17 adapter corresponds to 17 0 051
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 889 (17 0 115) Adapter



Common	Used in step 3
Usage	For radiator cap Model series: N12, N14
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	01 26 06 (321)

Overview Technical Data

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system	Used in step 3
Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar

Capacity of low-temperature coolant circuit G20	Used in step 1
B48B20O1/B46B20O1 (Low-temperature coolant circuit)	4.2 l
Expendable materials: Technically suitable antifreeze and corrosion inhibitor	

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Links

Repair instructions	Used in step
17 00 ... Notes for working on cooling system.	1

Operating materials	Used in step
Main group 17	1

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17 00 009 Check the cooling system for watertightness with the special tool

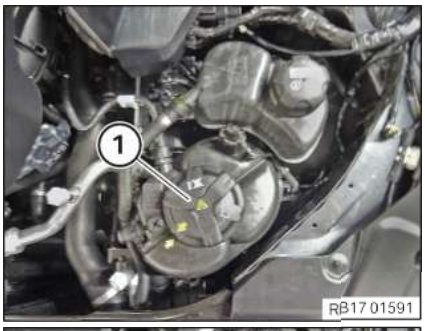
1 – Check the high-temperature cooling system for watertightness

WARNING

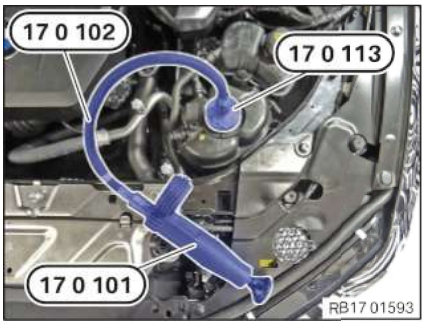
Hot surfaces.

Risk of burning!

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



- Loosen sealing cap (1).



- Attach the special tool 0 494 418 (17 0 101) with special tools 0 494 419 (17 0 102) and 0 494 642 (17 0 113) from the set of special tools 0 494 417 (17 0 100).
- Build up excess pressure and wait for approximately 2 minutes.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar



TECHNICAL INFORMATION

If the described test step is not completed successfully: repeat test step twice. Only replace the sealing cap after three tests with an incorrect opening pressure.

When driving at high ambient temperatures, the design may cause the pressure relief valve in the sealing cap to open slightly and air to escape together with dissolved coolant. This coolant vapour condenses on the surface of the coolant expansion tank and leaves traces of coolant when the vehicle has cooled down. These traces of coolant do not indicate whether the sealing cap is defective or not.

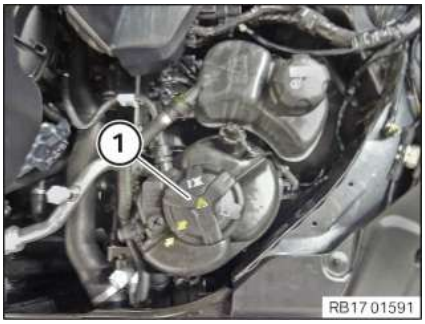
Escaping coolant vapours when the vehicle is at standstill may cause the pressure relief valve to stick to the sealing cap. This may cause an incorrect opening pressure.

- Screw on sealing cap (1) on special tool 0 494 643 (17 0 114) from the set of special tools 0 494 417 (17 0 100).
- Build up the pressure with special tools 0 494 418 (17 0 101) and 0 494 419 (17 0 102) from the set of special tools 0 494 417 (17 0 100).
- Observe on the pressure measuring device when the opening pressure has been reached.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar

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

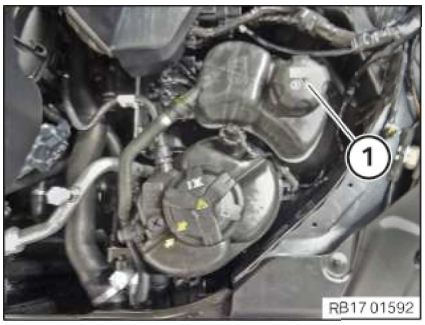
2 – Checking low-temperature cooling system for watertightness

WARNING

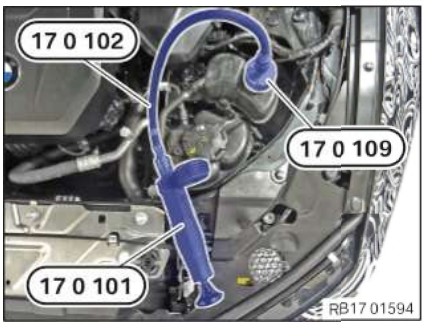
Hot surfaces.

Risk of burning!

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



- Loosen sealing cap (1).

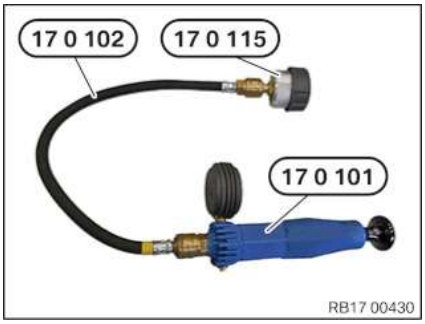


- Attach the special tool 0 494 418 (17 0 101) with special tools 0 494 419 (17 0 102) and 0 494 426 (17 0 109) from the set of special tools 0 494 417 (17 0 100).
- Build up excess pressure and wait for approximately 2 minutes.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar

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TECHNICAL INFORMATION

If the described test step is not completed successfully: repeat test step twice. Only replace the sealing cap after three tests with an incorrect opening pressure.

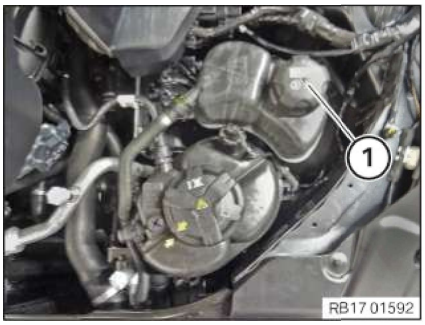
When driving at high ambient temperatures, the design may cause the pressure relief valve in the sealing cap to open slightly and air to escape together with dissolved coolant. This coolant vapour condenses on the surface of the coolant expansion tank and leaves traces of coolant when the vehicle has cooled down. These traces of coolant do not indicate whether the sealing cap is defective or not.

Escaping coolant vapours when the vehicle is at standstill may cause the pressure relief valve to stick to the sealing cap. This may cause an incorrect opening pressure.

- Screw on sealing cap (1) on special tool 0 495 889 (17 0 115) from the set of special tools 0 494 417 (17 0 100).
- Build up the pressure with special tools 0 494 418 (17 0 101) and 0 494 419 (17 0 102) from the set of special tools 0 494 417 (17 0 100).
- Observe on the pressure measuring device when the opening pressure has been reached.

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar



- Close sealing cap (1).

Additional Information

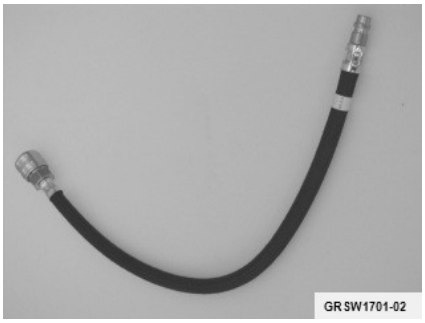
Overview of Special Tools

0 494 418 (17 0 101) Pump



Common	Used in step 12
Usage	
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

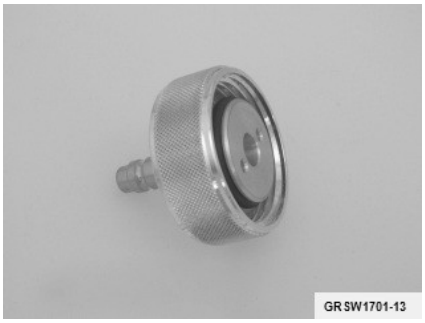
0 494 419 (17 0 102) Hose



Common	Used in step 12
Usage	(hose with quick-release coupling)
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

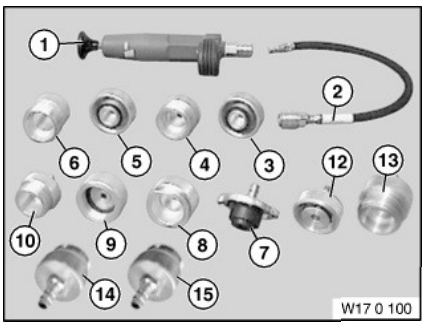
cardiagn.com

0 494 642 (17 0 113) Adapter



Common	Used in step 1
Usage	For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

0 494 417 (17 0 100) Tester



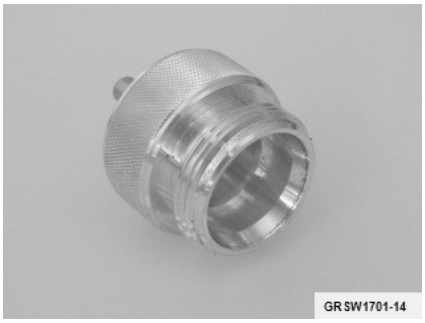
Common	Used in step 12
Usage	For checking engine cooling system on watertightness. For checking radiator cap.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 02 (884)

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**	
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	

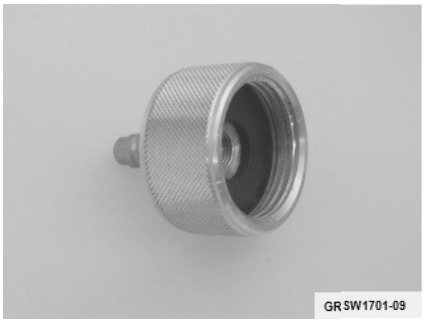
cardiagn.com

0 494 643 (17 0 114) Adapter



Common	Used in step 1
Usage	For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

0 494 426 (17 0 109) Adapter



Common	Used in step 2
Usage	For radiator connection R53/W11, R50/W17 adapter corresponds to 17 0 051
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 889 (17 0 115) Adapter



Common	Used in step 2
Usage	For radiator cap Model series: N12, N14
Included in the tool or work	0 494 417
Storage location	
Replaced by	
In connection with	
SI-Number	01 26 06 (321)

Overview Technical Data

Opening pressure of sealing cap / test pressure of high-temperature coolant circuit cooling system Used in step 12

Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure.	max. 0,1 bar
Test pressure for cooling system (gauge pressure)	1,5 bar

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17 00 008 Draining and topping up coolant for high-temperature circuit

PRELIMINARY WORK

1 – Removing the acoustic cover

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



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

2 – Removing the clean air pipe with the resonator

WARNING

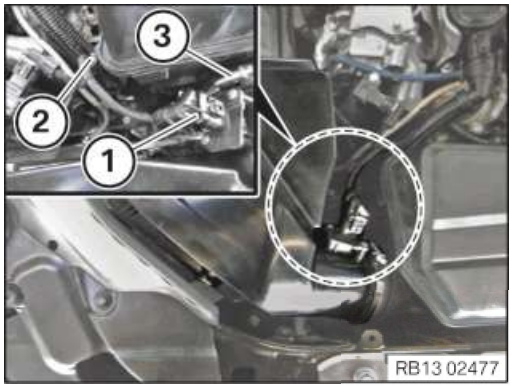
Hot surfaces.

Risk of burning!

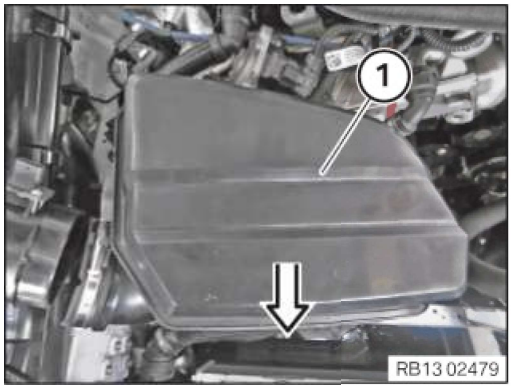
- Perform all work only on components that have cooled down.



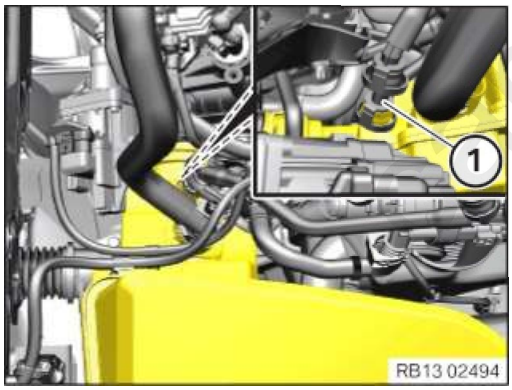
- Unlock the locks (1).
- Feed the engine ventilation line (2) out and set it aside.



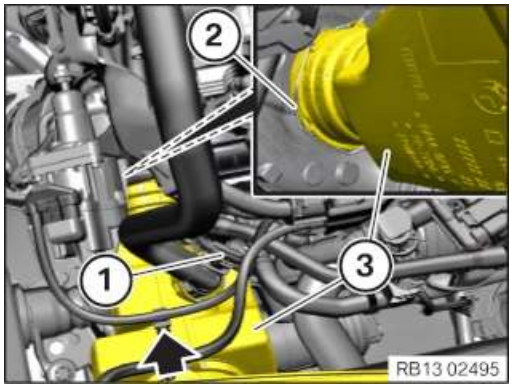
- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



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



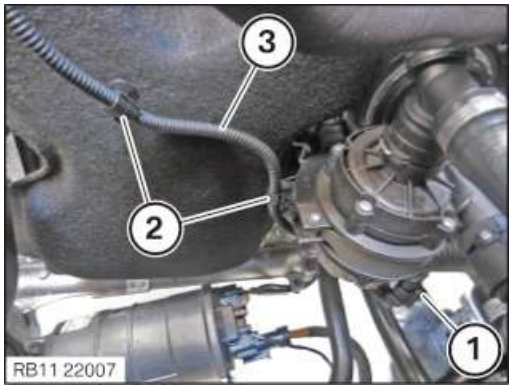
- Unlock and disconnect the tank ventilation line (1).



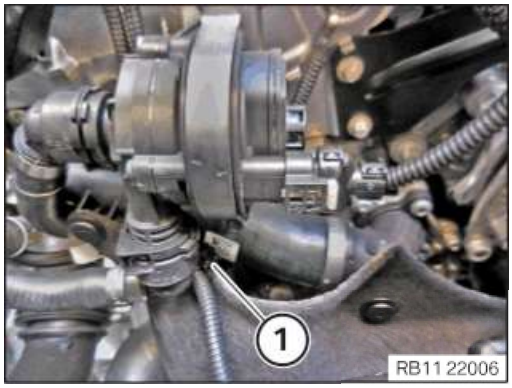
- Loosen the clamp (arrow).
- Unlock plug connection (1) and disconnect.
- Unlock the clamp (2).
- Feed out clean air pipe with resonator (3) and remove.

3 – Removing the acoustic cover for the engine at the front

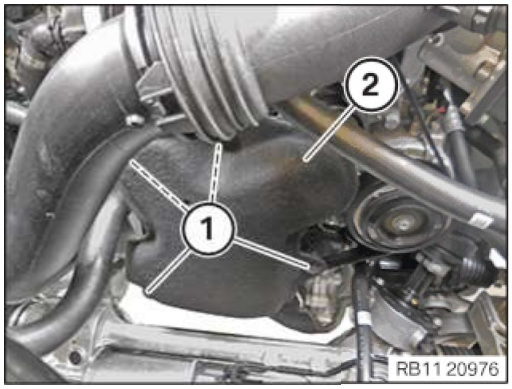
rdiagn.com



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

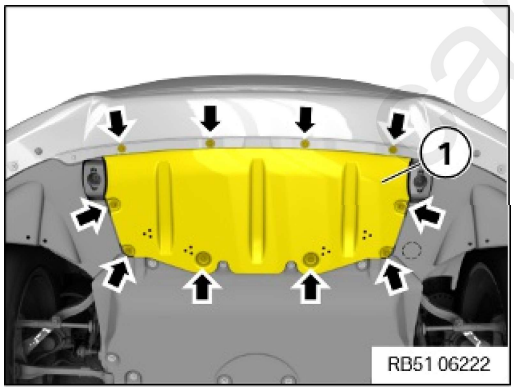


- Loosen clamp (1).



- Detach all expanding rivets (1).
- Guide the acoustic cover (2) out and remove.

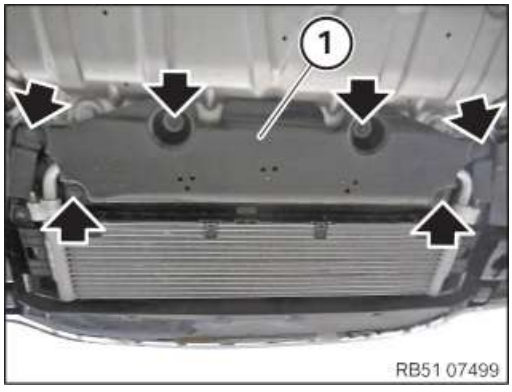
4 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

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

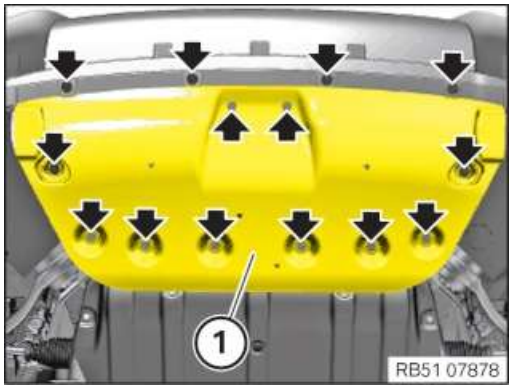


- **Version 2:**

  Remove screws (arrows).

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

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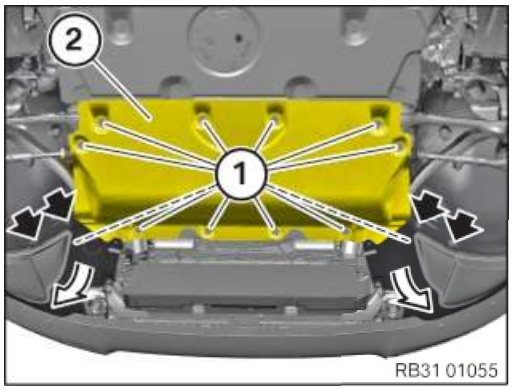


- **Version 3:**

  Remove screws (arrows).

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

5 – Remove the underbody protection of the steering gear



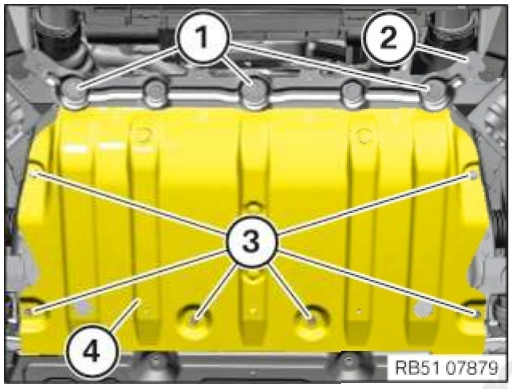
- **Version 1:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

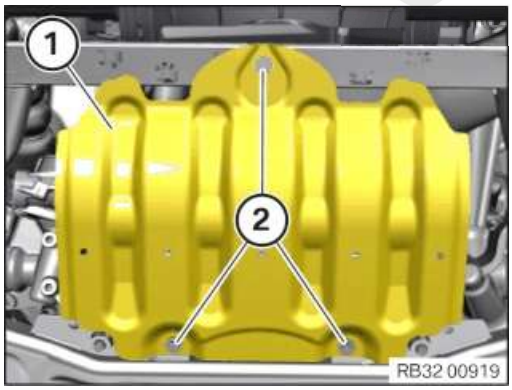
  Loosen screws (3).

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

6 – If installed: Removing the steering start protection

Prerequisite

The front underbody protection is removed.



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

MAIN WORK

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

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WARNING

Hot surfaces.

Risk of burning!

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

TECHNICAL INFORMATION

Life-long fill of coolant!

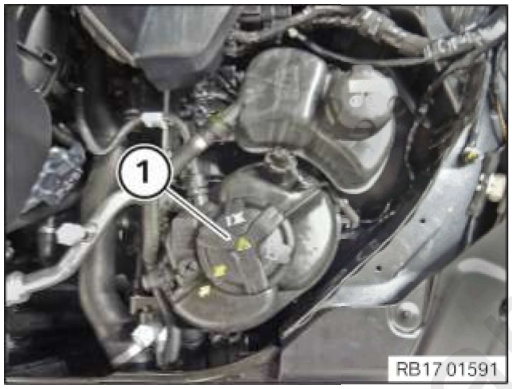
Do not reuse used coolant.

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.

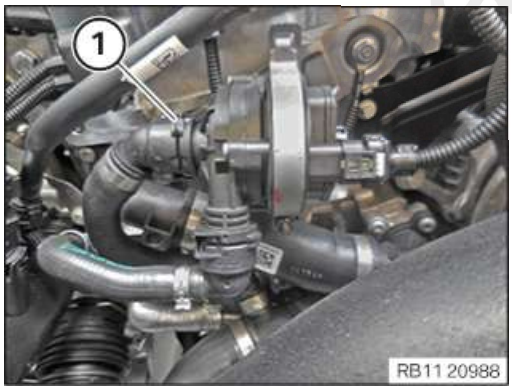
In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

TECHNICAL INFORMATION

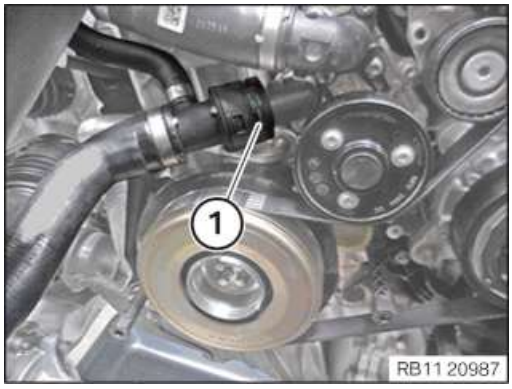
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Loosen sealing cap (1).



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



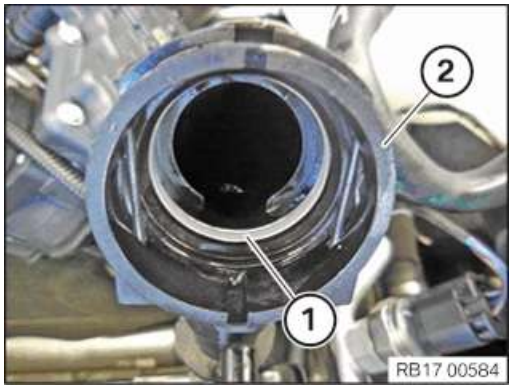
- Unlock and loosen coolant line (1).
- Catch and dispose of escaping coolant.

partdiagn.com

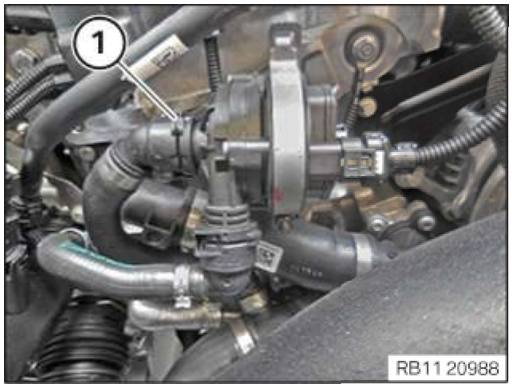
8 – Connecting the coolant lines for the high-temperature coolant circuit

TECHNICAL INFORMATION

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

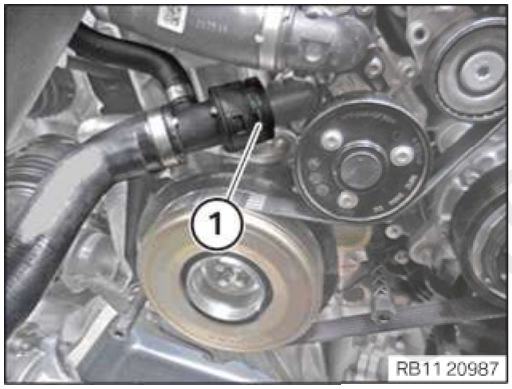


- Check the sealing rings (1) of the coolant lines (2) for damage and renew if necessary.



- Connect and lock coolant line (1).

  Coolant line (1) must audibly engage.

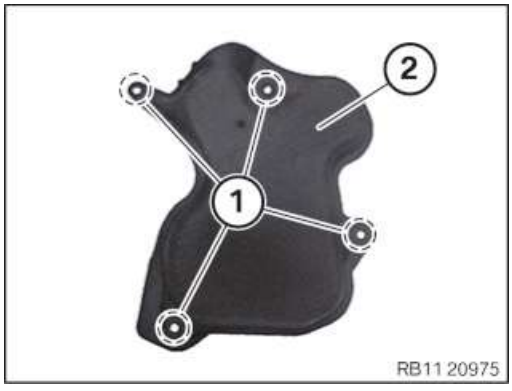


- Connect and lock coolant line (1).

  Coolant line (1) must audibly engage.

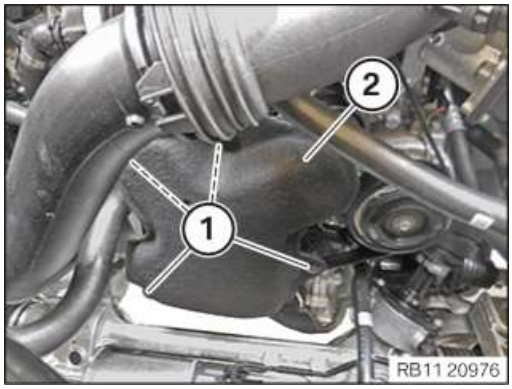
POSTPROCESSES

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

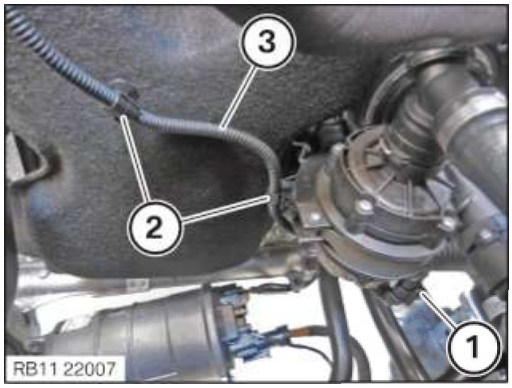


- Check if acoustic cover (2) in marked area (1) is damaged and replace acoustic cover (2) if necessary.

  Parts: Acoustic cover

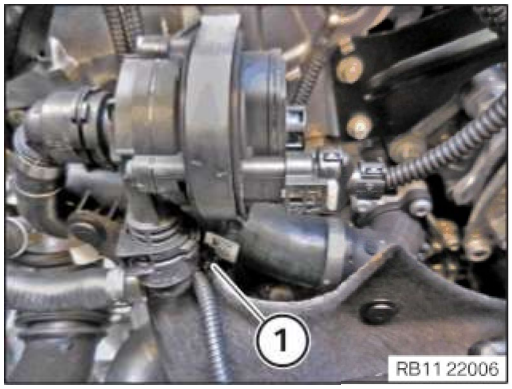


- Thread in and position the acoustic cover (2).
- Mount all expanding rivets (1).



- Feed in and position wiring harness section (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Secure clamps (1).

10 – Installing the clean air pipe with resonator



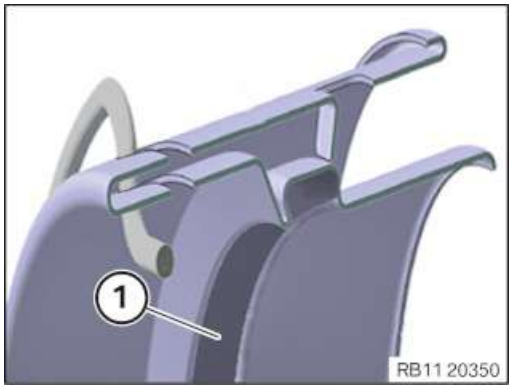
- Check the seal (1) for damages, replace if necessary.

▶ **Replace damaged gasket**

TECHNICAL INFORMATION

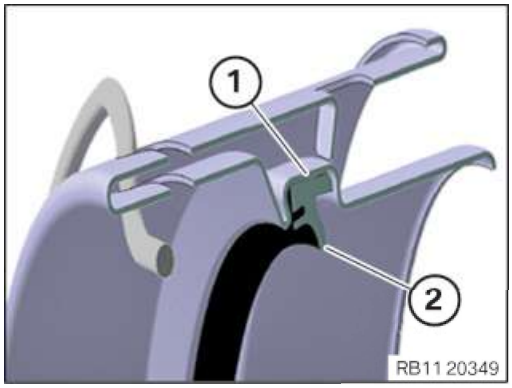
Do not use pointed or sharp-edged tools for the installation and/or removal.

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

  The gasket groove (1) must be clean.



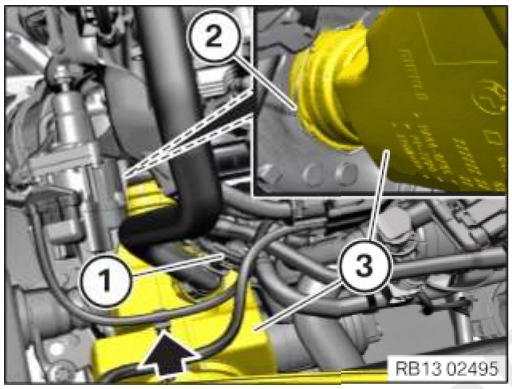
- Renew gasket.

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

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

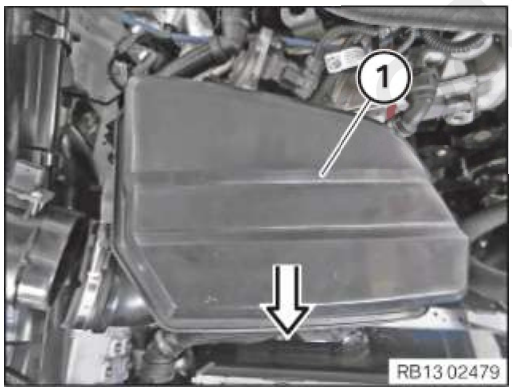
- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is pointing downwards (see figure).



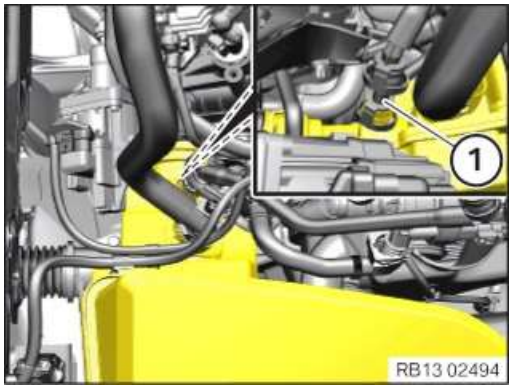
- Guide in and install the clean air pipe with resonator (3).
- Lock clamp (2).

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

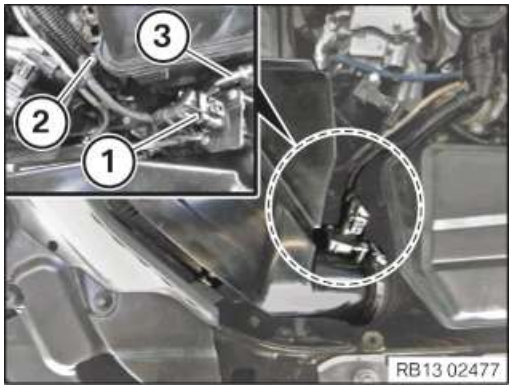
  The connector (1) must engage audibly.
- Secure clamp (arrow).



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



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



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

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

  The connector (1) must engage audibly.



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

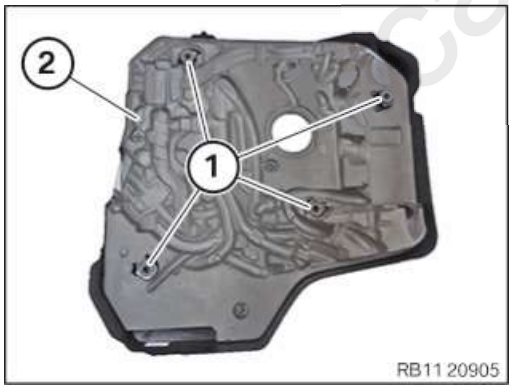
11 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



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

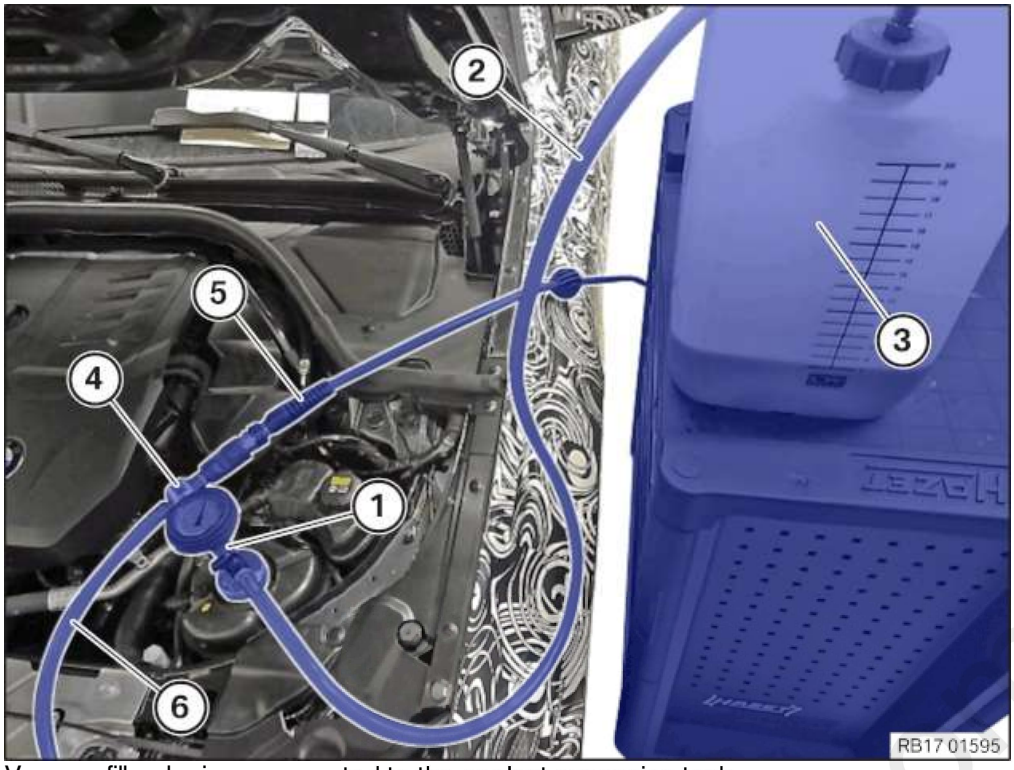


- Clip in the acoustic cover (1) into the holders in the **marked** areas.

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

12 – 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 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.

TECHNICAL INFORMATION

Follow notes for repair work on the cooling system.

For additional information see:

Main group 17

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

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.

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TECHNICAL INFORMATION

Mixing different coolants is not permitted.

TECHNICAL INFORMATION

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

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

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

The 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.

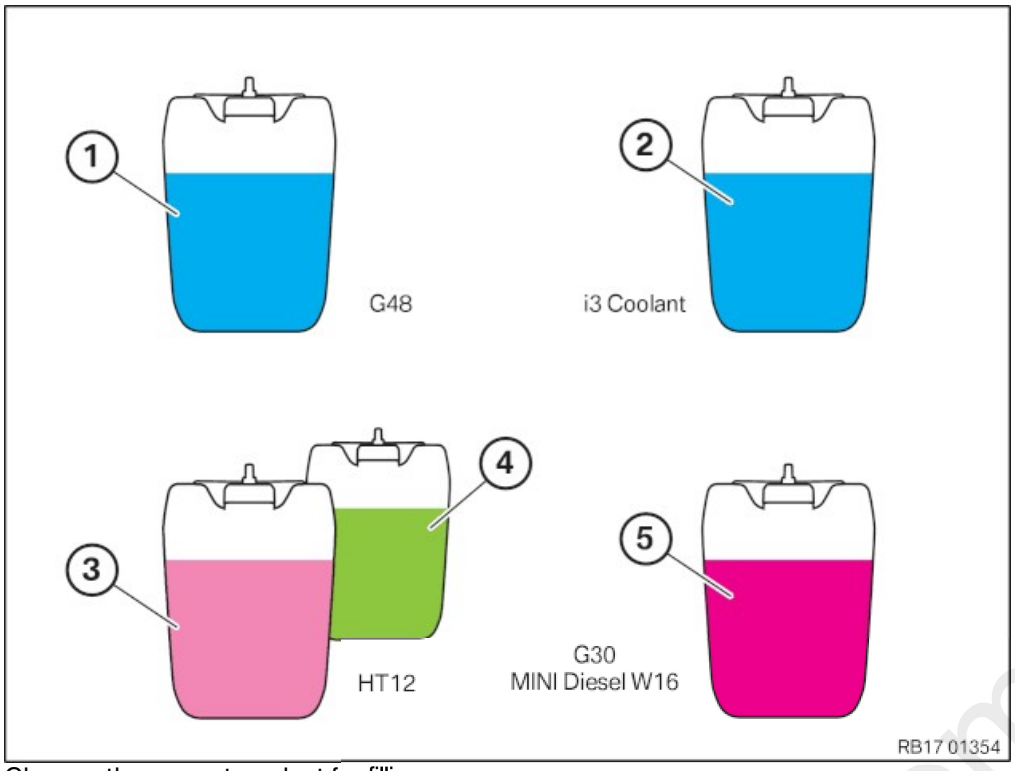
TECHNICAL INFORMATION

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

▸ **Observe the coolant type**

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Coolant in the vacuum filler device container



Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

1. G48 (Blue) G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.

2. i3 coolant (blue) is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.

3. HT12 (Pink) HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.

4. HT12 (Green) HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.

5. G30 (Pink) must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

RISK OF DAMAGE

Damage to the engine.

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

- 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.

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

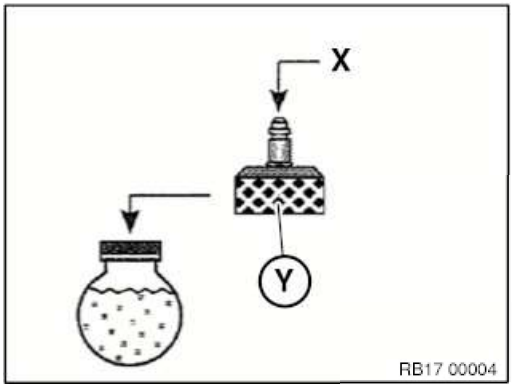
Type	Engine	Adapter (Y) from 17 0 100
G20/G29	B46 / B48 /B58	17 0 113

- 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.

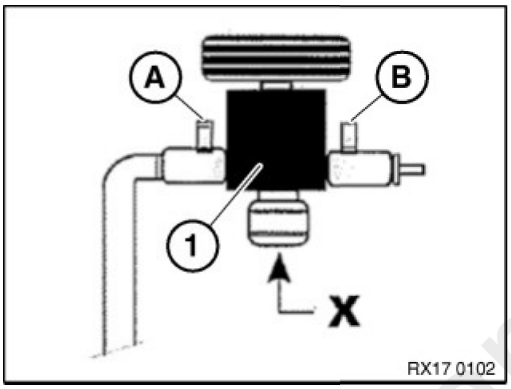
Capacity of high-temperature coolant circuit G20

B48B20O1/B46B20O1	9.8 l

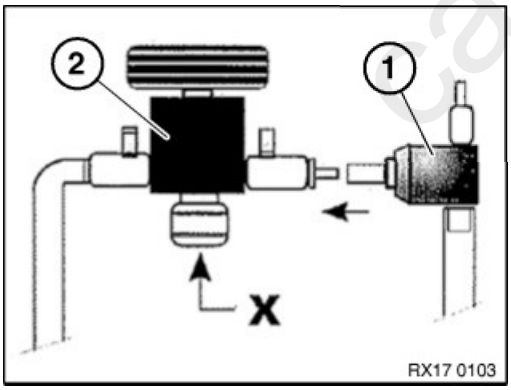
Expendable materials: Technically suitable antifreeze and corrosion inhibitor



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

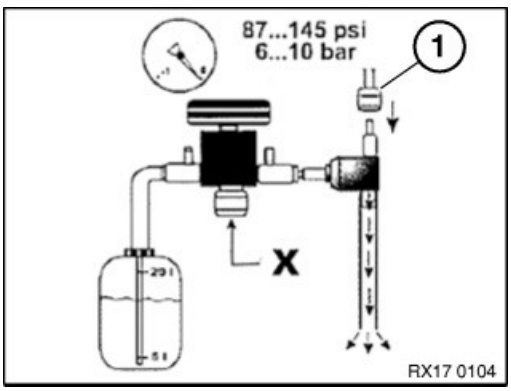


- Check whether shut-off valves (A) and (B) of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



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

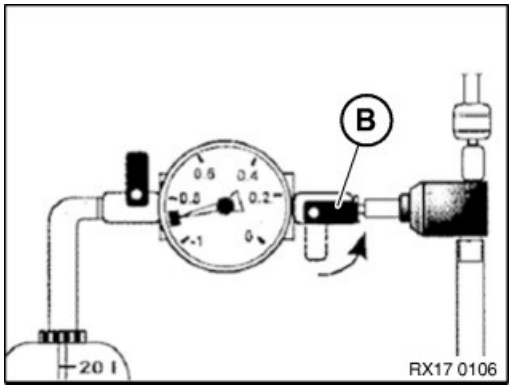
  (X)is the connection on the coolant expansion tank.



- Connect compressed air (1).

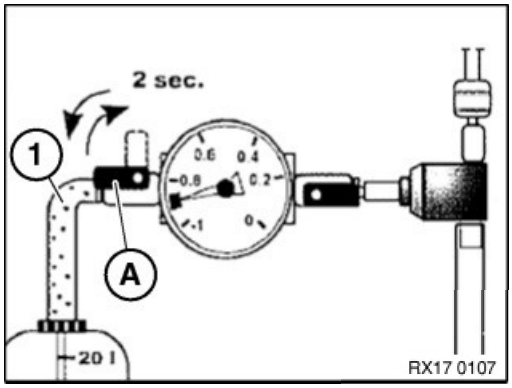
  (X)is the connection on the coolant expansion tank.

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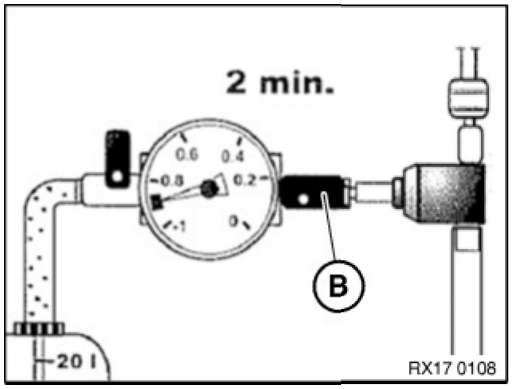
- Open shut-off valve (B).

  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.

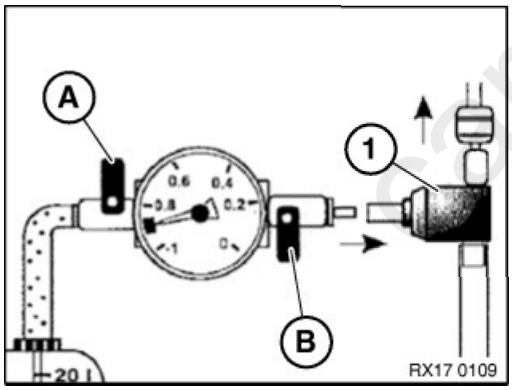


- Check the coolant hoses for porosity and renew porous coolant hoses as required.

TECHNICAL INFORMATION

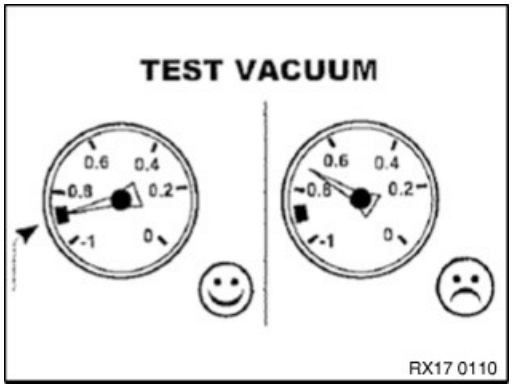
The coolant hoses contract during vacuum build-up.

- 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

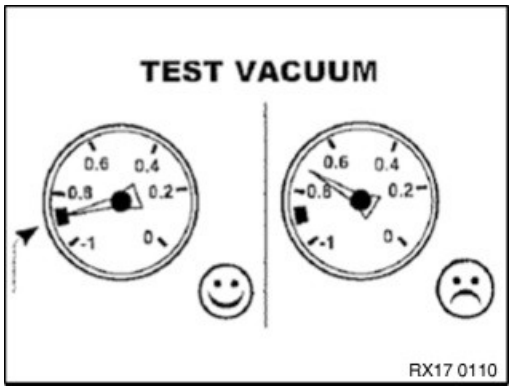
» Vacuum drops.

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Measure

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

Check



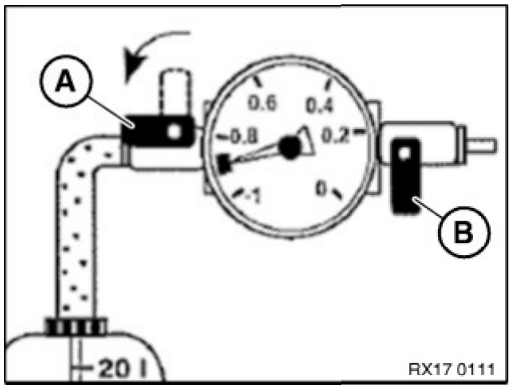
- Make sure the vacuum in the coolant circuit is maintained for at least 30 seconds.

Result

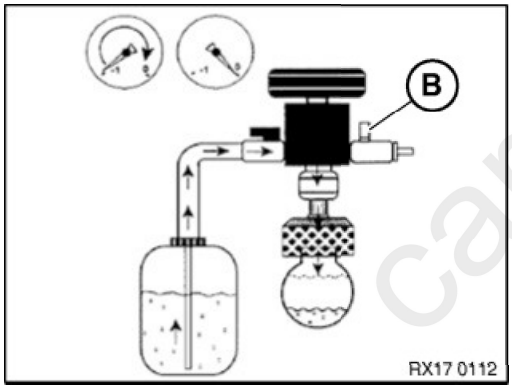
» Vacuum remains constant.

Measure

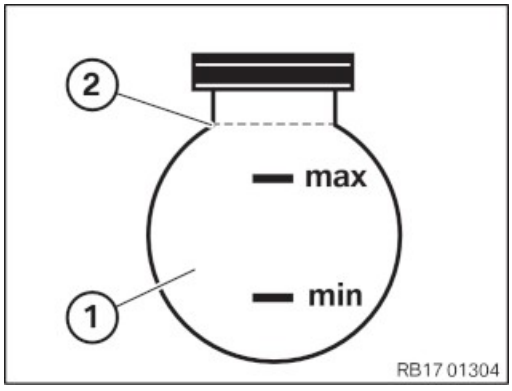
- Continue with filling.



- 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.

13 – Bleed the high-temperature coolant circuit

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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

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

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

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

The 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.

TECHNICAL INFORMATION

Before starting the automatic cooling system bleeding routine, make sure that **all coolant circuits** are **filled**. 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.

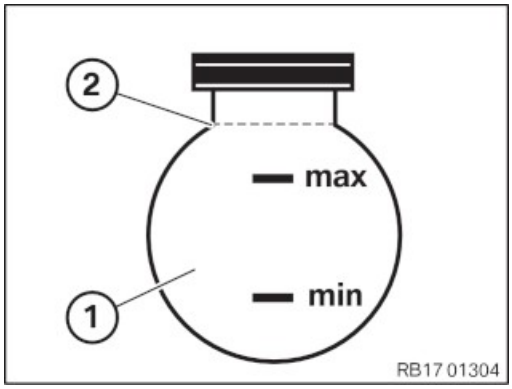
TECHNICAL INFORMATION

The electrical fan is activated during the entire cooling system bleeding routine.

TECHNICAL INFORMATION

The driving experience switch must not be set to the ECO PRO switch position.

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- 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 coolant level in the high temperature coolant expansion tank (1) to the lower edge (2) of the coolant filler neck of the the high temperature coolant expansion tank (1) .
- Close the sealing cap on the coolant expansion tank of the high--temperature cooling circuit.
- Make sure the bonnet is **closed**.
- Make sure that the wheels touch the ground.
- Engage the parking brake.
- Do not engage any gear in manual-shift gearbox, and engage the gear to "P" or "N" automatic transmission.
- Connect battery charger.
- Switch on the ignition and make sure that it remains **switched on** (for example, activate the low-beam headlight and the **hazard warning light at the same time**).

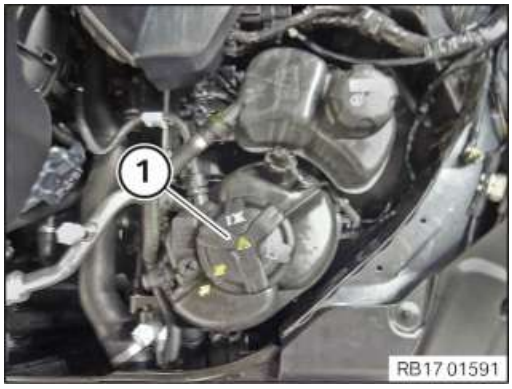
  If the low-beam headlight and the hazard warning light are **not** switched on, the ignition (**terminal 15**) will switch off automatically after some time and interrupts the bleeding procedure.
- Check that the driving experience control is **not** in the **"ECO-PRO"** switch position.
- Adjust the heating to **maximum** temperature and adjust the blower to the **lowest** stage.
- Hold the accelerator pedal down to the limit position for at least **10 s** and do **no** kick the brake pedal.
- Start engine.
- Start the cooling system bleeding routine, pay attention to the display on the instrument cluster (KOMBI). ("Service function started")

  The engine speed (up to 3500 rpm) and the actuators in the cooling system are activated **automatically** for 11 minutes according to a cooling system bleeding routine.

  The cooling system bleeding routine ends approx. 11 min **after** the engine starts.

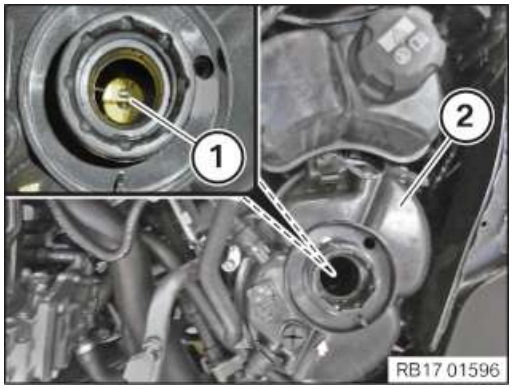
  The engine speed **drops** to the idle speed.
- Observe the display *in the instrument cluster* (KOMBI).

  If the service function is interrupted, the cooling system bleeding routine **must** be repeated.
- Switch off engine.
- Allow the coolant temperature to cool down to **< 50°C**.



- Loosen sealing cap (1).

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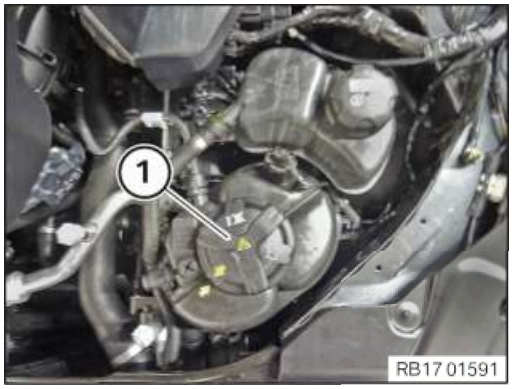
TECHNICAL INFORMATION

After the cooling system bleeding routine, the cooling system is topped up above the maximum mark.

Overfilling the cooling system serves to balance the remaining air in the cooling system.

The normal filling level of the coolant is reached while driving.

- Adjust the filling level in the coolant expansion tank (2) of the high-temperature coolant circuit to **200 ml** over the **maximum mark**(1) .

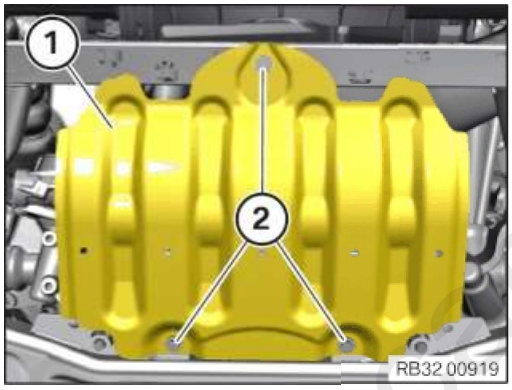


- Close sealing cap (1).
- Close the sealing cap (1) until the **arrows** are flush.

14 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.



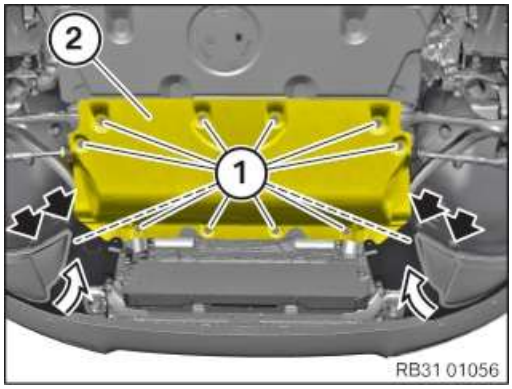
- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

15 – Install the underbody protection of the steering gear

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

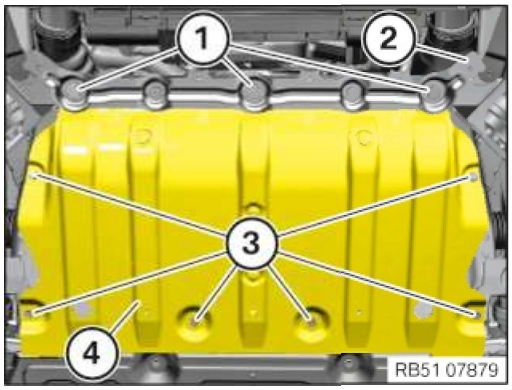
Underbody protection of the steering gear

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

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

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



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

Underbody protection of the steering gear

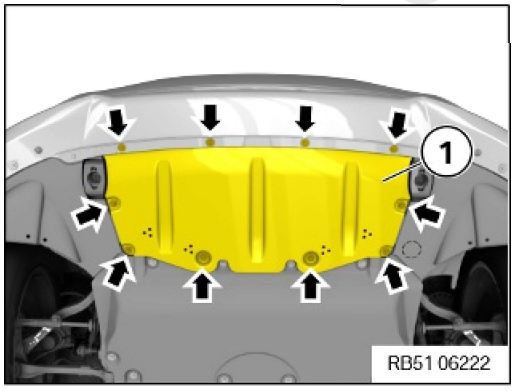
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

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

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

16 – Installing the front underbody protection



- **Version 1:**

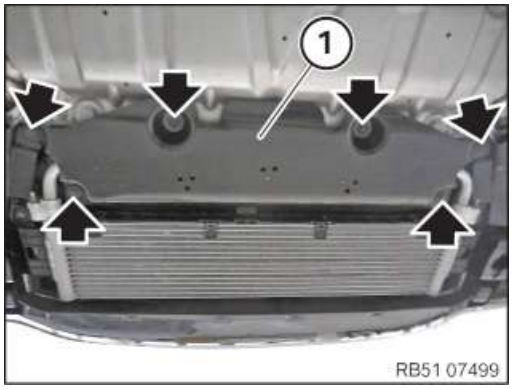
  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

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

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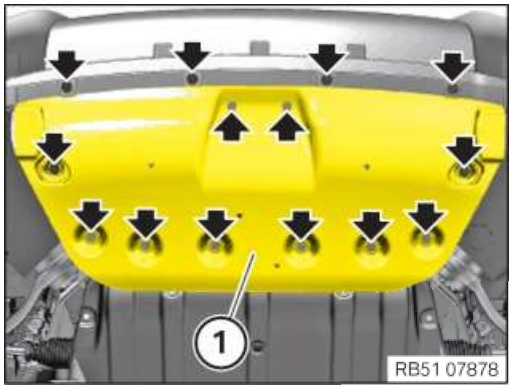
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Clean air pipe to upper section of intake filter housing — Used in step 10

Clamp		Tightening torque	3 Nm

Bumper buffer device steering on front axle support — Used in step 14

M10		Tightening torque	56 Nm

Underbody protection of the steering gear — Used in step 15

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

Wheel arch cover (screws) — Used in step 15

Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support — Used in step 15

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 16

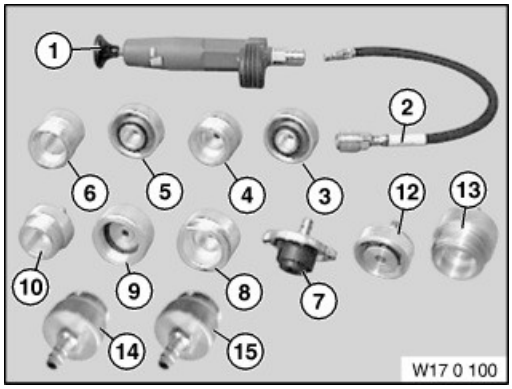
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Overview of Special Tools

0 494 417 (17 0 100) Tester

Common — Used in step 12

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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**	
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)	

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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

Capacity of high-temperature coolant circuit G20	Used in step 12
B48B20O1/B46B20O1	9.8 l

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

Links

Repair instructions	**Used in step**
17 00 ... Notes for working on cooling system.	12

Operating materials	**Used in step**
Main group 17	12

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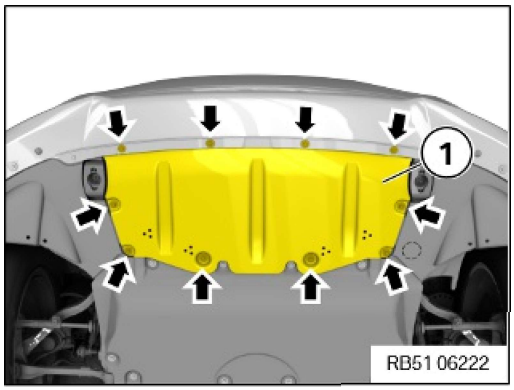
17 00 011 Draining and topping up the coolant for the low-temperature circuit

Prerequisite

- Switch off ignition.

PRELIMINARY WORK

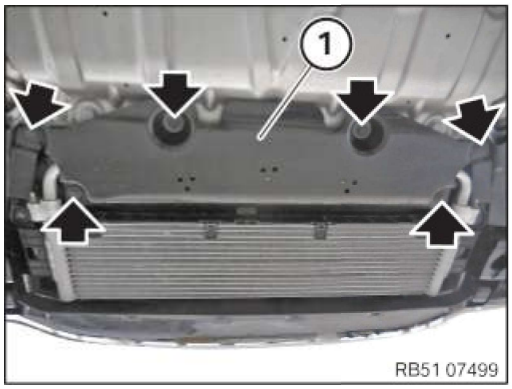
1 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

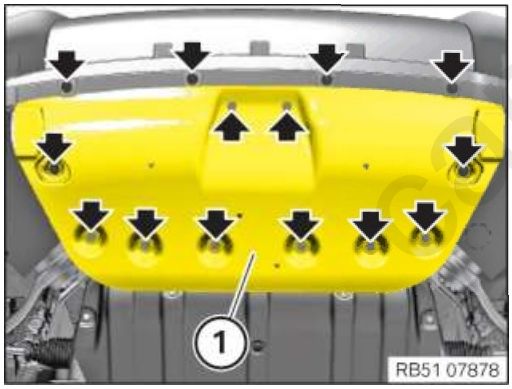
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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

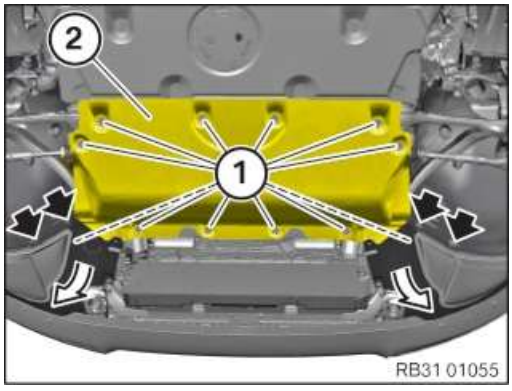


- **Version 3:**

  Remove screws (arrows).

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

2 – Remove the underbody protection of the steering gear



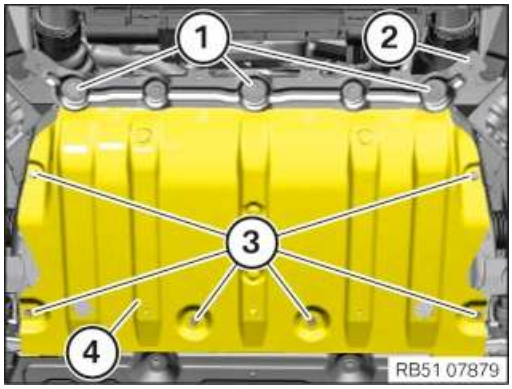
- **Version 1:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

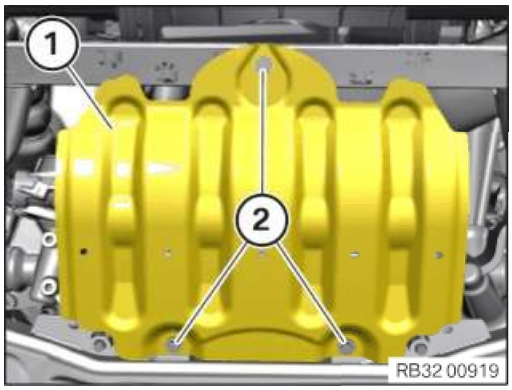
  Loosen screws (3).

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

3 – If installed: Removing the steering start protection

Prerequisite

The front underbody protection is removed.



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

MAIN WORK

4 – Draining the coolant from the low-temperature cooling system

WARNING

Hot surfaces.

Risk of burning!

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

TECHNICAL INFORMATION

Life-long fill of coolant!

Do not reuse used coolant.

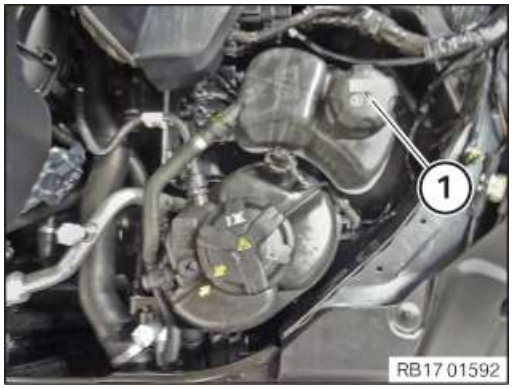
When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

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.

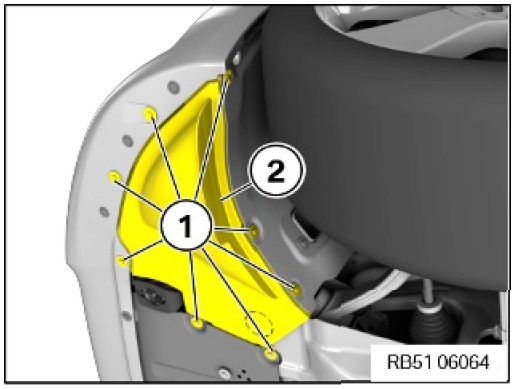
TECHNICAL INFORMATION

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

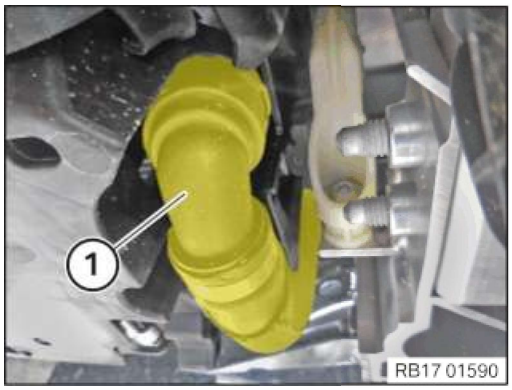
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- Loosen sealing cap (1).



- Loosen screws (1).
- Guide out and remove bottom left cover (2) to the front.



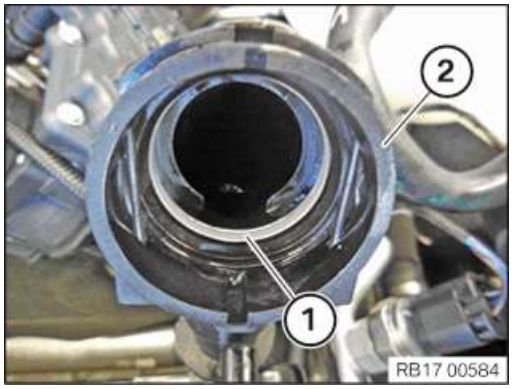
- Unlock and disconnect the coolant line (1).
- Catch and dispose of escaping coolant.

POSTPROCESSES

5 – Connecting the coolant lines for the low-temperature coolant circuit

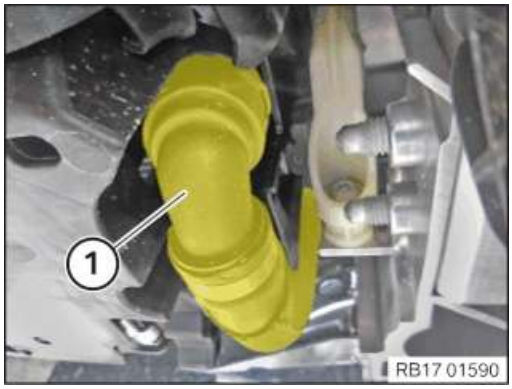
TECHNICAL INFORMATION

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



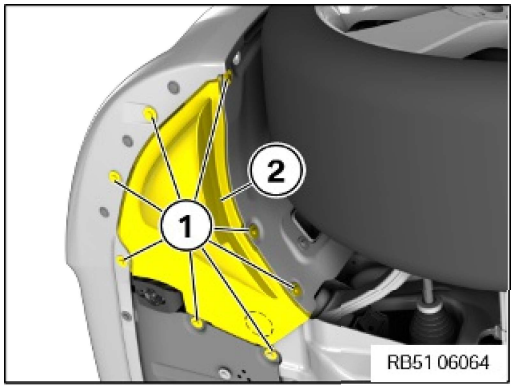
- Check the sealing rings (1) of the coolant lines (2) for damage and renew if necessary.

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- Connect and lock the coolant line (1).

  The coolant line (1) must audibly engage.



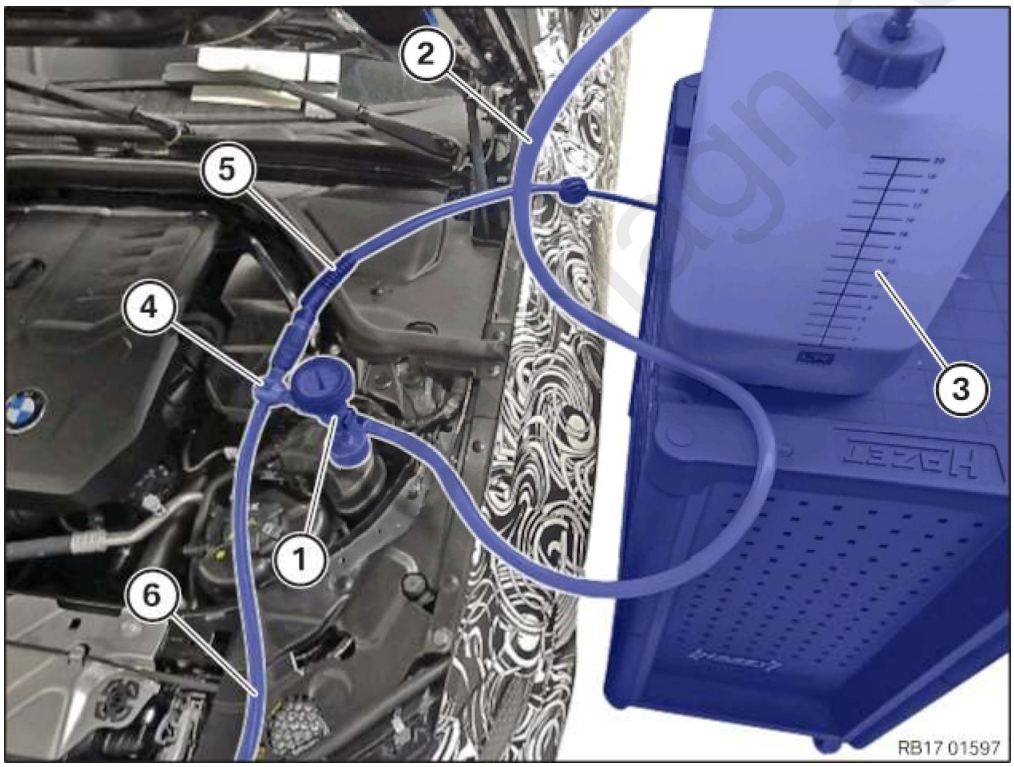
- Feed in and install cover (2) at the bottom front left.
- Tighten the screws (1).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

6 – 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.

TECHNICAL INFORMATION

Follow notes for repair work on the cooling system.

For additional information see:

Main group 17

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

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

Mixing different coolants is not permitted.

TECHNICAL INFORMATION

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

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

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

The 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.

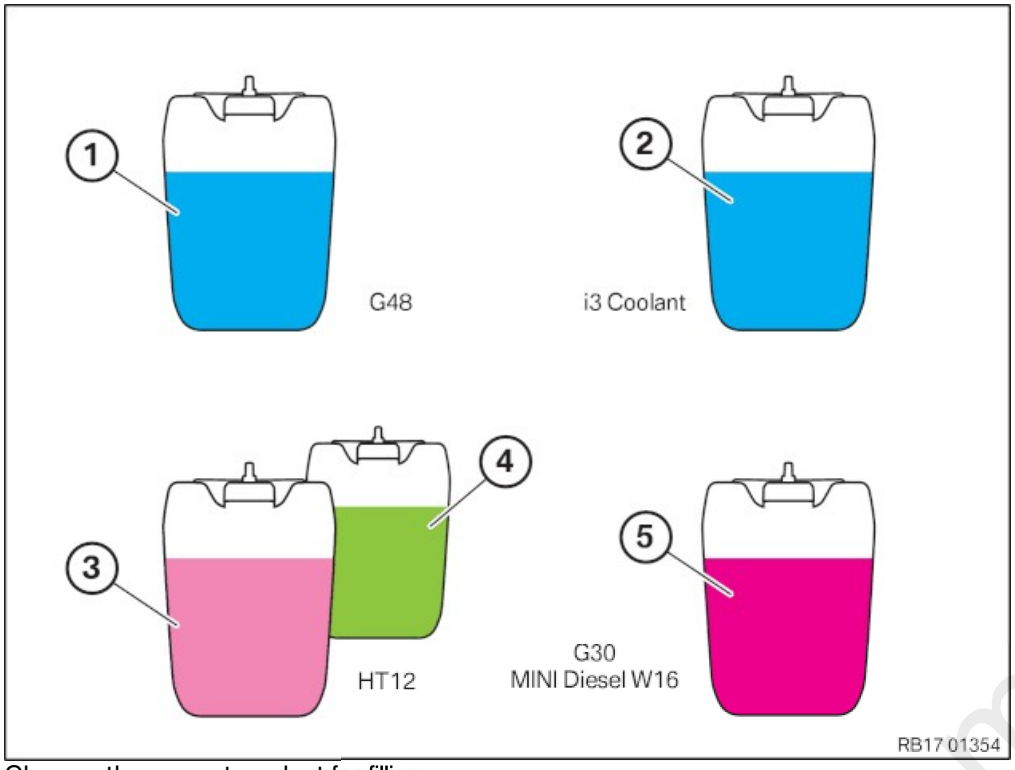
TECHNICAL INFORMATION

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

▸ **Observe the coolant type**

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Coolant in the vacuum filler device container



Choose the correct coolant for filling

A vehicle must be filled with the coolant with which it is delivered ex works

1. G48 (Blue) G48 must not be mixed with the i3Coolant or the G30 MINI diesel fuelW16.

2. i3 coolant (blue) is used only for the i3 heater circuit. i3 coolant must not be filled in the other coolant circuits or mixed with the other coolants.

3. HT12 (Pink) HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.

4. HT12 (Green) HT12 must not be mixed with the i3 coolant or the G30 MINI diesel fuel W16.

5. G30 (Pink) must be used only for the **MINI diesel fuel W16**. G30 must not be filled in the other coolant circuits or mixed with the other coolants.

RISK OF DAMAGE

Damage to the engine.

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

- 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.

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

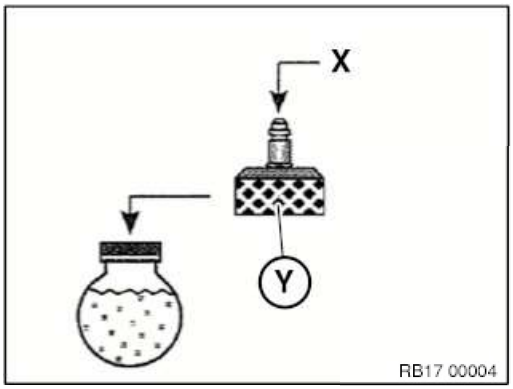
Type	Engine	Adapter (Y) from 17 0 100
G20/G29	B46 / B48 /B58	17 0 109

- 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.

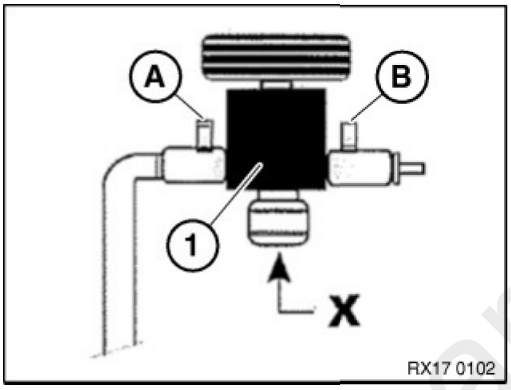
Capacity of low-temperature coolant circuit G20

B48B20O1/B46B20O1 (Low-temperature coolant circuit)	4.2 l

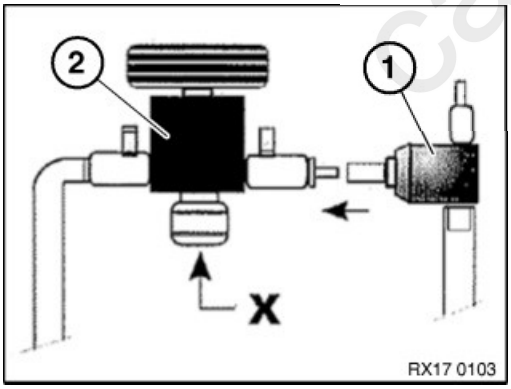
Expendable materials: Technically suitable antifreeze and corrosion inhibitor



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

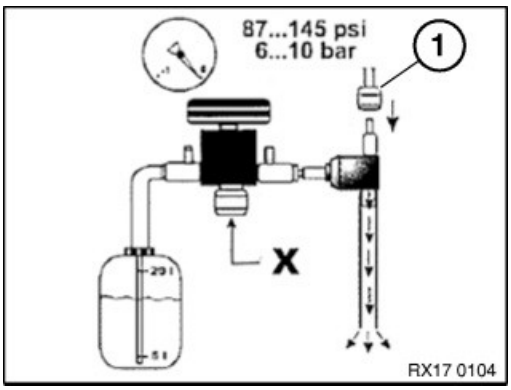


- Check that shutoff valves (A) and (B) of the vacuum filler device (1) are closed.
- Connect and lock connection (X) to the coolant expansion tank.



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

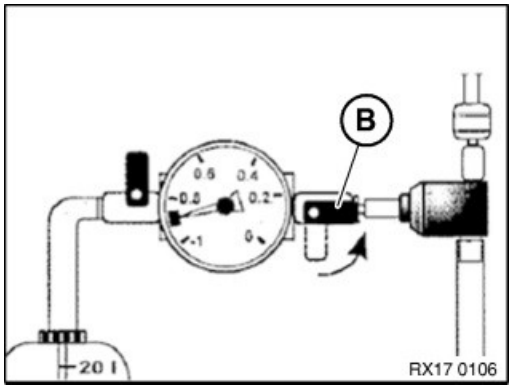
  (X)is the connection on the coolant expansion tank.



- Connect compressed air (1).

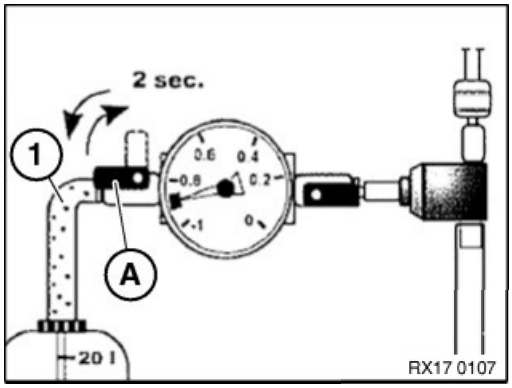
  (X)is the connection on the coolant expansion tank.

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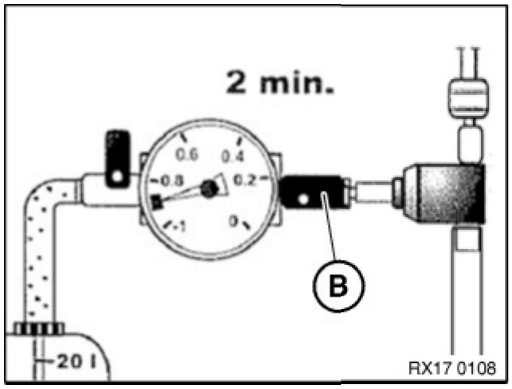
- Open shut-off valve (B).

  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.

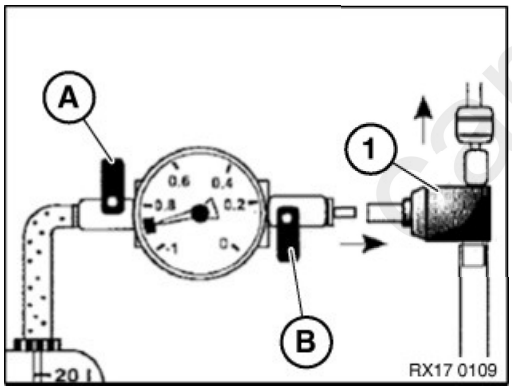


- Check the coolant hoses for porosity and renew porous coolant hoses as required.

TECHNICAL INFORMATION

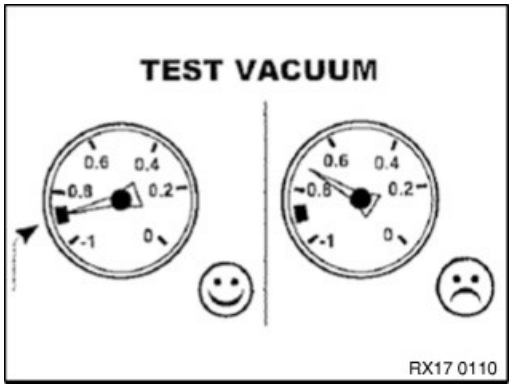
The coolant hoses contract during vacuum build-up.

- 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

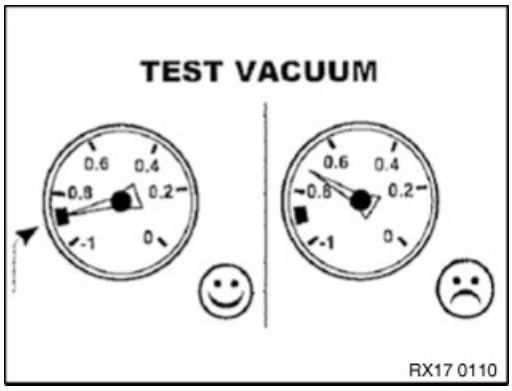
» Vacuum drops.

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Measure

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

Check



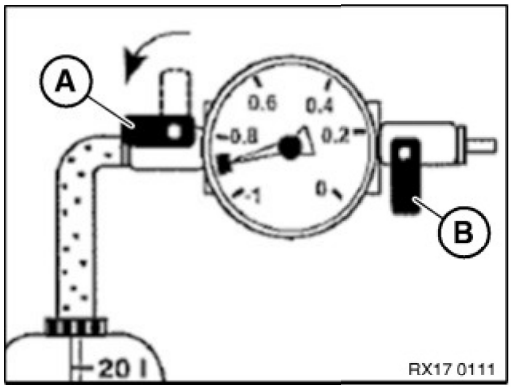
- The vacuum in the coolant circuit must be maintained for at least 30 seconds.

Result

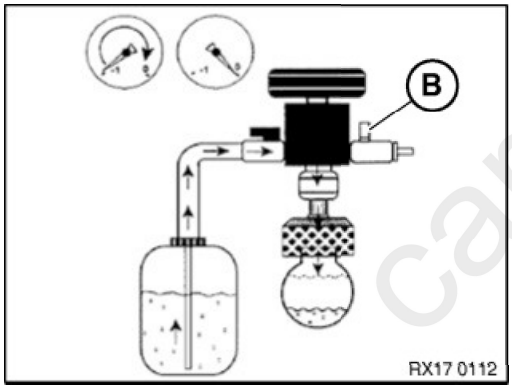
» Vacuum remains constant.

Measure

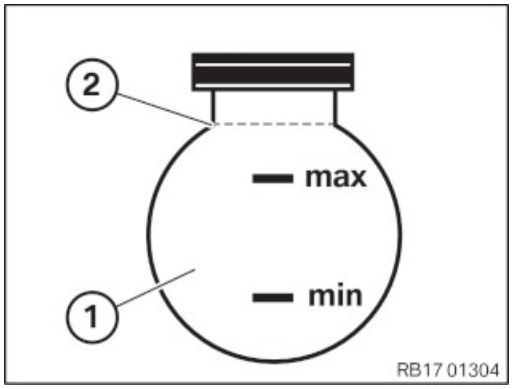
- Continue with filling.



- 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.

7 – Bleeding the low-temperature cooling system

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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

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

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

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

The 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.

TECHNICAL INFORMATION

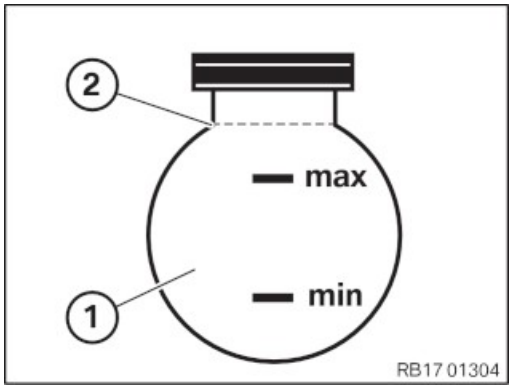
Before starting the automatic cooling system bleeding routine, make sure that **all coolant circuits** are **filled**. If the cooling system bleeding routine is started while one of the coolant circuits is empty, there is a risk of damage to the electric coolant pump when running it dry.

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.

TECHNICAL INFORMATION

The driving experience switch must not be set to the ECO PRO switch position.

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- Adjust the coolant level in the low-temperature coolant expansion tank (1) up to lower edge (2) of the coolant filler neck of low-temperature coolant expansion tank (1).
- Close the sealing cap on the coolant expansion tank of the low-temperature coolant circuit.
- Ensure that the bonnet is **open**.
- Connect battery charger.
- Switch on the ignition and ensure that it remains **switched on** (for example, activate the low-beam headlight and the hazard warning lights **at the same time**).
- If the low-beam headlight and the hazard warning light are **not** switched on, the ignition (**terminal 15**) will switch off automatically after some time and interrupts the bleeding procedure.
- Ensure that the Driving Experience Control is **not** in the **"ECO-PRO"** switch position.
- Adjust the heating to **maximum** temperature and adjust the blower to the **lowest** stage.
- Hold the accelerator pedal down to the limit position for at least **10 s** and do **not** press on the brake pedal.
- Do **not** start engine.

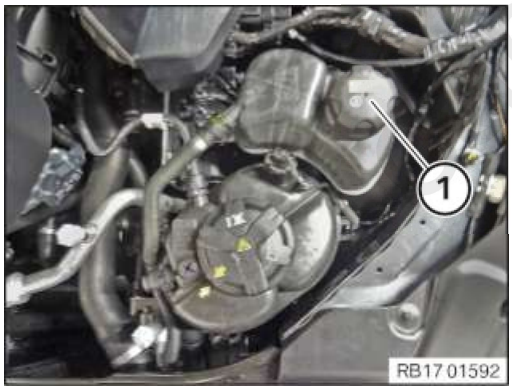
  The cooling system bleeding routine will start.

  The electric coolant pump in the low-temperature coolant circuit is activated for 11 minutes according to a cooling system bleeding routine.

  The cooling system bleeding routine ends after 11 minutes.

  The electric coolant pump is **no** longer activated.
- Note the display in the instrument cluster (KOMBI).

  If the service function is interrupted, the cooling system bleeding routine **must** be repeated.
- Allow the coolant temperature to cool down to **< 50°C**.



- Loosen sealing cap (1).



TECHNICAL INFORMATION

After the cooling system bleeding routine, the cooling system is topped up above the maximum mark.

Overfilling the cooling system serves to balance the remaining air in the cooling system.

The normal filling level of the coolant is reached while driving.

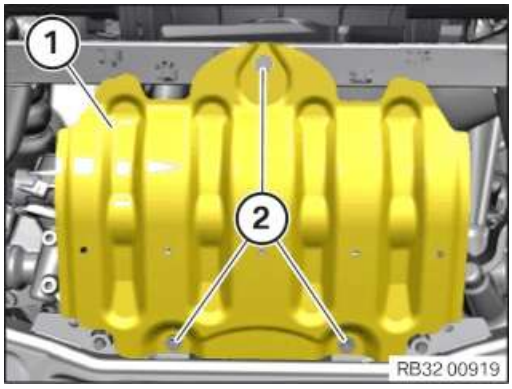
- Adjust the filling level in coolant expansion tank (2) of the low-temperature coolant circuit to **100 ml** above the **maximum mark** (1) .
- Close sealing cap (1).

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8 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.

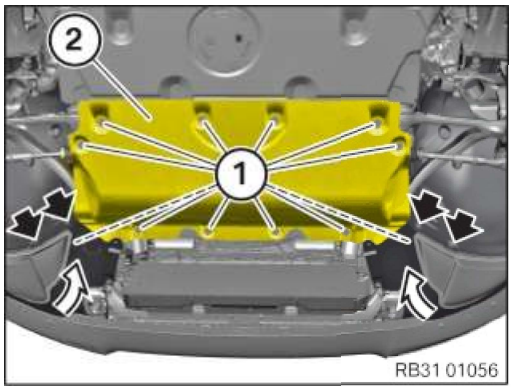


- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

9 – Install the underbody protection of the steering gear



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

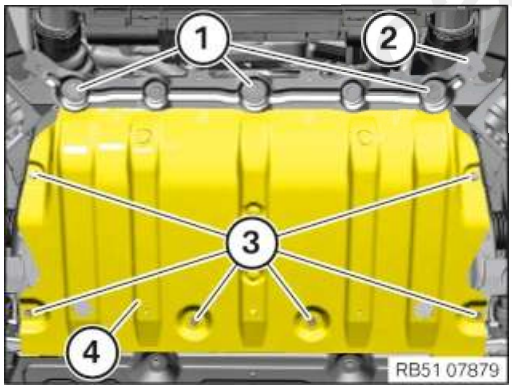
Underbody protection of the steering gear

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

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

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



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

Underbody protection of the steering gear

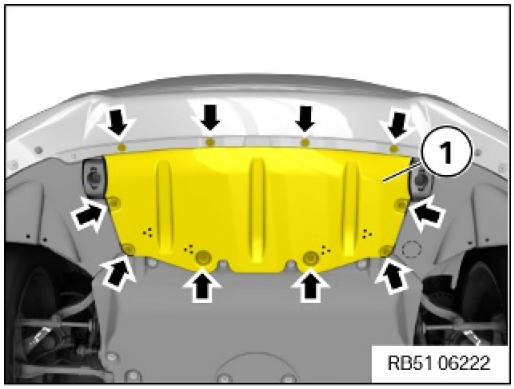
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

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

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

10 – Installing the front underbody protection



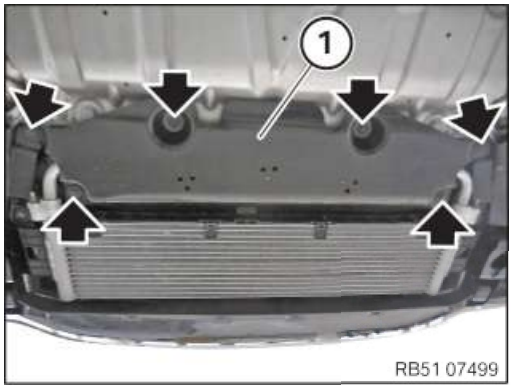
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



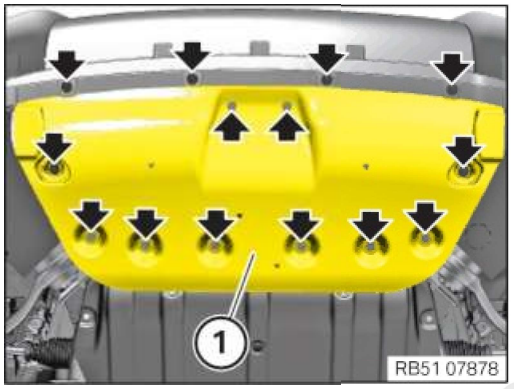
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Cover, front bottom on side — Used in step 5

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Bumper buffer device steering on front axle support — Used in step 8

M10		Tightening torque	56 Nm

Underbody protection of the steering gear — Used in step 9

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

Wheel arch cover (screws) — Used in step 9

Thermoplastic hexagon screw		Tightening torque	3 Nm

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Holder underride guard to front axle support Used in step 9

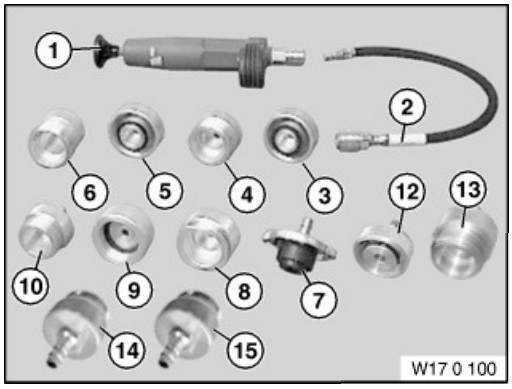
M10		Tightening torque	56 Nm

Underbody protection front Used in step 10

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

Overview of Special Tools

0 494 417 (17 0 100) Tester



Common Used in step 6

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**	
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	

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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

Capacity of low-temperature coolant circuit G20	Used in step 6
B48B20O1/B46B20O1 (Low-temperature coolant circuit)	4.2 l

Expendable materials: Technically suitable antifreeze and corrosion inhibitor

Links

Repair instructions	**Used in step**
17 00 ... Notes for working on cooling system.	6

Operating materials	**Used in step**
Main group 17	6

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17 00 ... Instructions for working on cooling system



Warning!

Risk of scalding, carry out repairs on the cooling system only when the engine has cooled down.



Attention!

Wear protective gloves and safety goggles.



Attention!

Life-time coolant filling:

Never 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 drained and refilled.

In the case of other removal work involving the draining of part quantities of coolant, replace these quantities which have been drained with new coolant.

Installation note:
Use only recommended coolant.

Observe mixture ratio.



Attention!

Open cooling system only when it has cooled down.

Opening the cooling system while hot can result in air entering the system.

This can cause overheating with permanent damage to the engine.



Attention!

Protect the alternator from contamination when carrying out any repairs on the coolant circuit.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Attention!

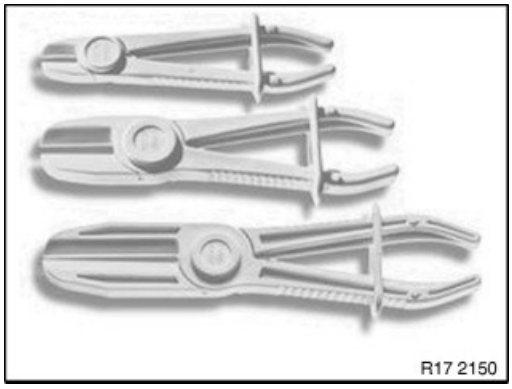
Do not fill coolant expansion tank over maximum level, as overfilling will cause the coolant to overflow. This may cause traces of coolant on the expansion tank or in the engine compartment and allow an incorrect conclusion about possible leaks.

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Recycling

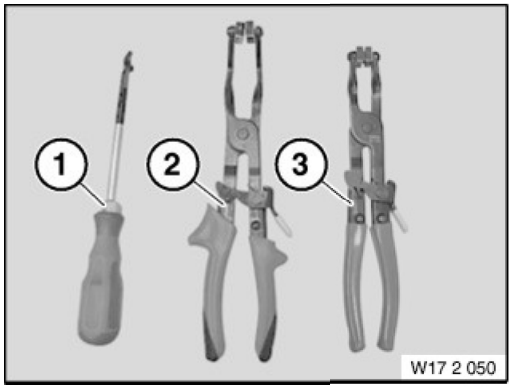
Catch and dispose of drained coolant.

Observe country-specific waste disposal regulations.



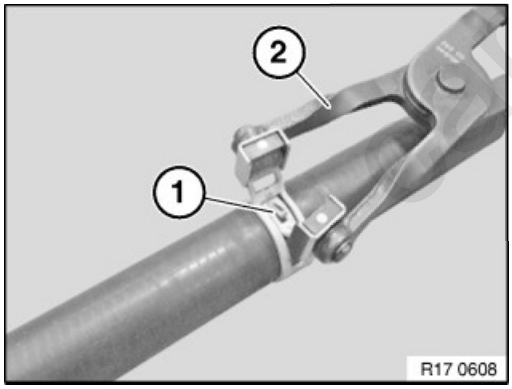
Note:
To disconnect the coolant hoses, use a commercially available disconnection tool such as HAZET (see table).

HAZET number:	Description
4590-1	Length of disconnect pliers (mm): 150
4590-2	Length of disconnect pliers (mm): 180
4590-3	Length of disconnect pliers (mm): 253
4590 / 2	Set of clamping pliers
4590 / 3	Set of clamping pliers

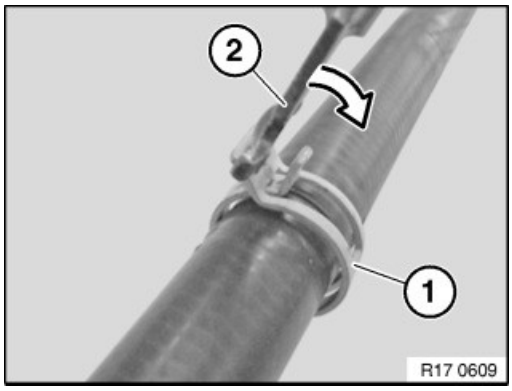


Set of special tools 17 2 050 for removing and installing the spring bracket clamps for coolant hoses.

- (1) Release tool.
- (2) Pliers (bent version).
- (3) Pliers (straight version).

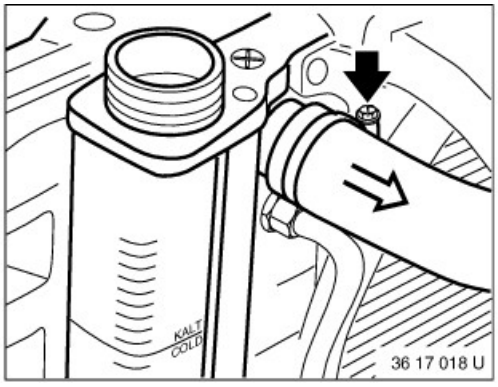


Loosen spring strap (1) with the pliers (2).



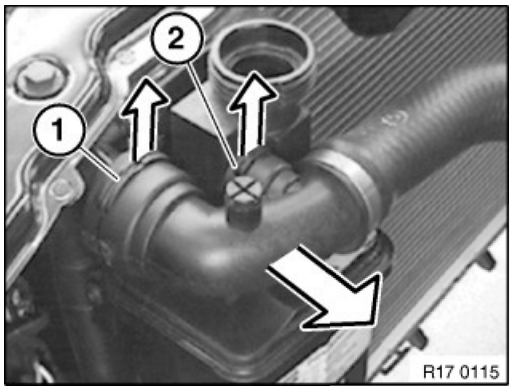
Unlock spring strap (1) with the release tool (2).

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Note:
Tightening torque for hose clamps

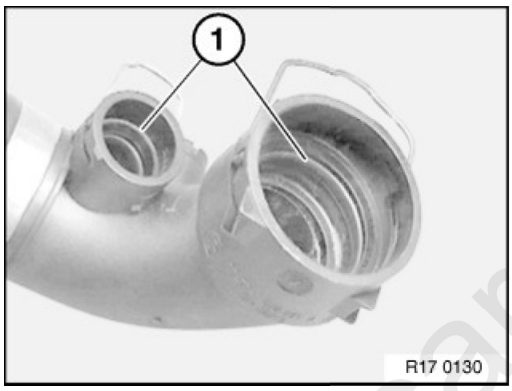
WAF 5	1.0 - 1.5 Nm
WAF 6	2.5 - 3.5 Nm



Notes on disassembly/installation of the quick-release couplings of the coolant hoses

Dismantling of quick-release coupling

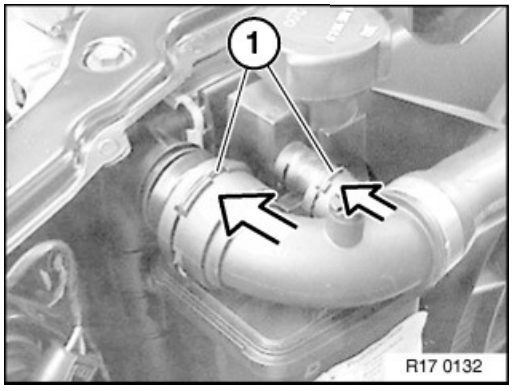
Pull out lock (1) and (2). Pull off hose.



Installation note:

Check O-rings (1).

Do not coat O-rings (1) with lubricant.



Assembly of quick-release coupling

Press in lock (1) before installing quick-release coupling.

Push on hose.

Quick-release couplings must clearly snap audibly into place.

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



Warning!

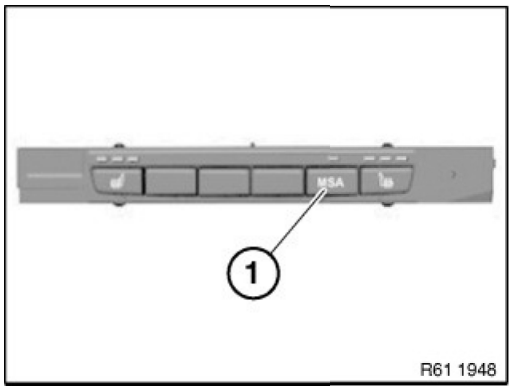
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

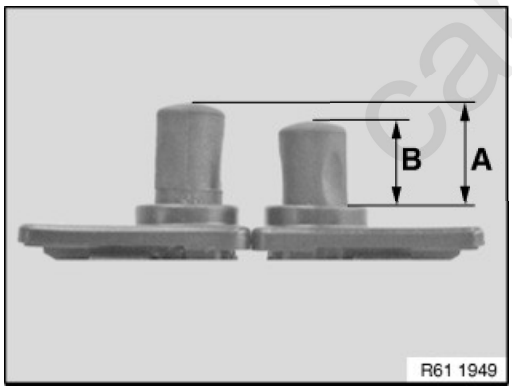
Observe safety precautions when working on MSA vehicles.

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

MSA function is deactivated by:



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



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

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

    B = 7 mm

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



When working with diagnosis tools:

- Observe instructions in diagnosis tool

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

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

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64 53 ... Instructions for replacement of air conditioning capacitors and radiator/coolers

Attention!

Even when they are correctly installed or due to normal driving, radiators (oil cooler, radiator, charge air cooler) or air conditioning condensers may show slight impressions or deformations on their discs (1).

A slight sag with a large radius for the air conditioning condenser is also permissible.

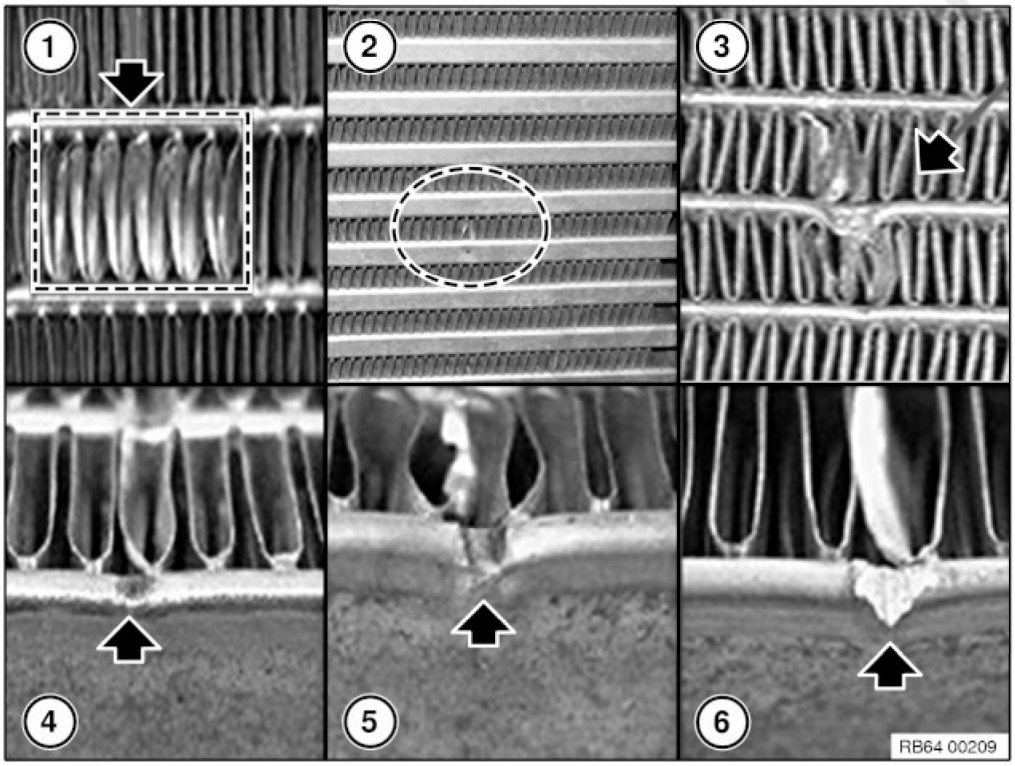
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig. (1) can be bent back with a standard fin comb..

Damage to lines carrying media or on the flat pipe require exchange of the radiator or air conditioning condenser (2-6).



Dryer flask (integrated in the air conditioning condenser):

Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

64 53 ... Instructions for replacement of air conditioning capacitors and radiator/coolers

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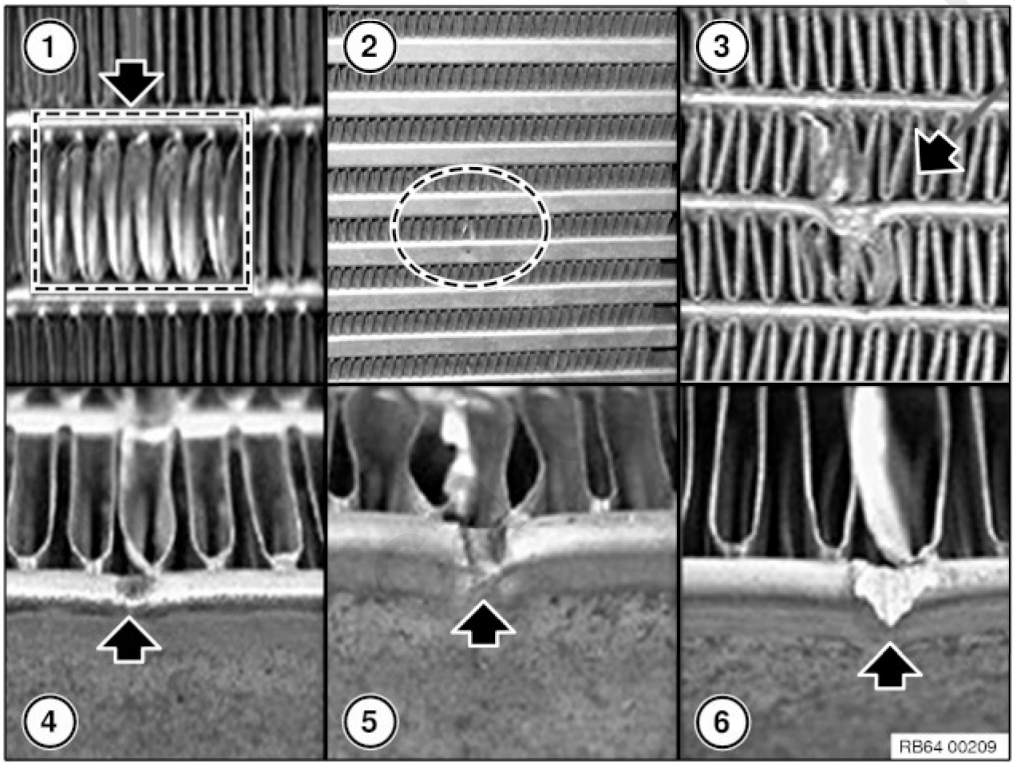
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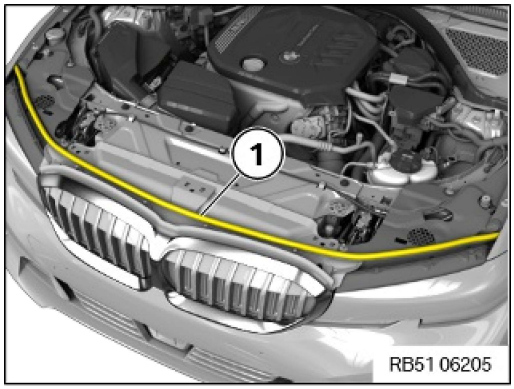
Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

17 11 006 Remove and install/ replace low temperature cooler

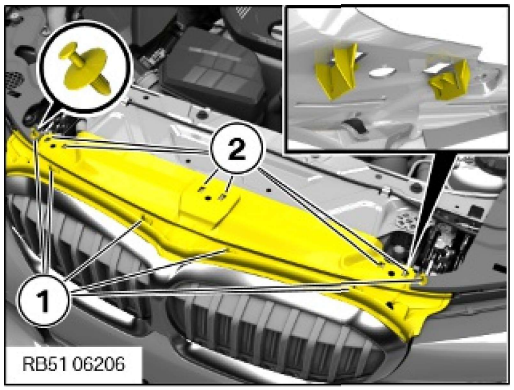
PRELIMINARY WORK

1 – Remove the seal for the bonnet in front



- Pull off front bonnet seal (1) upwards.

2 – Removing the centre engine compartment cover



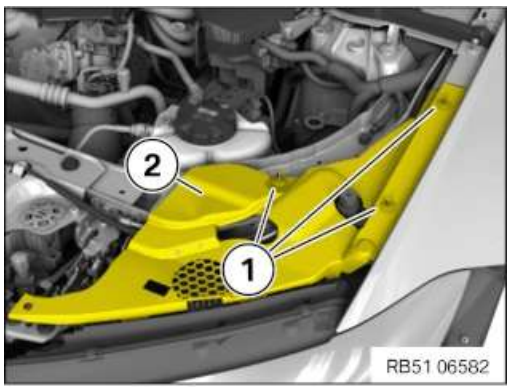
- Detach all expanding rivets (1).
- Release the cover of the centre engine compartment with the latch mechanisms (2) .
- Feed the cover for the centre engine compartment out to the rear.

3 – Partially remove the top left and right cover in the engine compartment

NOTICE

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

▶ **Removing the cover in the engine compartment on top partially**



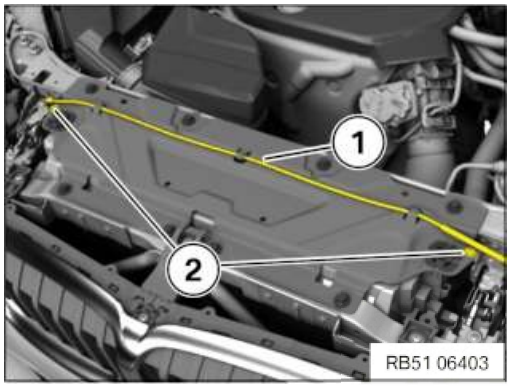
- Loosen the expanding rivet (1).
- Remove the cover in the engine compartment on top (2) partially.

4 – Removing the top cross connection

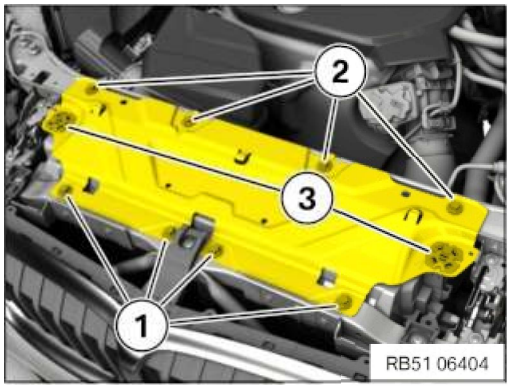
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- Release the housing for the coupling of the Bowden cables (1) from the body.

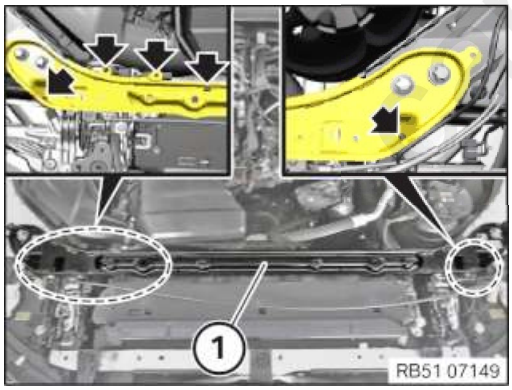


- Detach Bowden cable (1) at the top cross connection.
- Loosen screws (2).

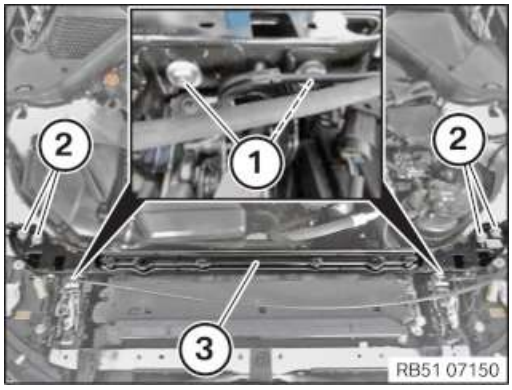


- Loosen screws (1) and (2).
- Remove the top cross connection with the holders(3) towards the top.

5 – Remove the rear top cross connection



- Release the clips (arrows) in the marked areas from the top rear cross connection (1).



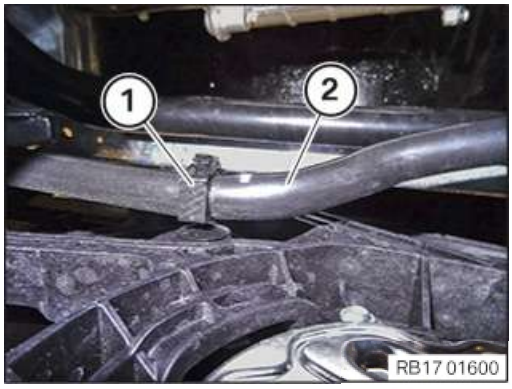
- Loosen screws (1).
- Loosen screws (2).
- Guide out and remove top rear cross connection (3).

6 – Remove fan cowl.

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TECHNICAL INFORMATION

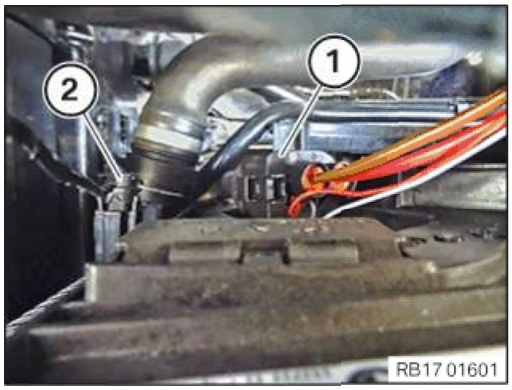
- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!



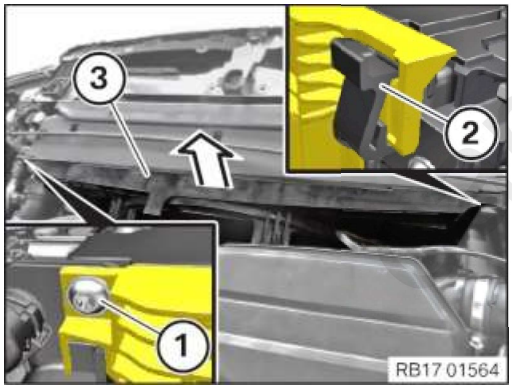
- **If installed:** Release transmission oil line (2).

  Unlock the holder (1).

  Thread out transmission oil line (2) and set aside.

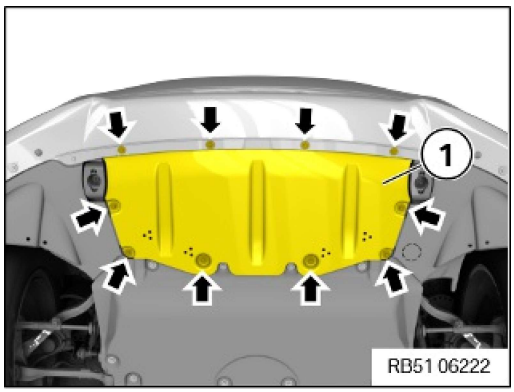


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.



- Loosen screw (1).
- Unlock lock (2).
- Guide out and remove fan cowl (3) **carefully** in the direction of the arrow.

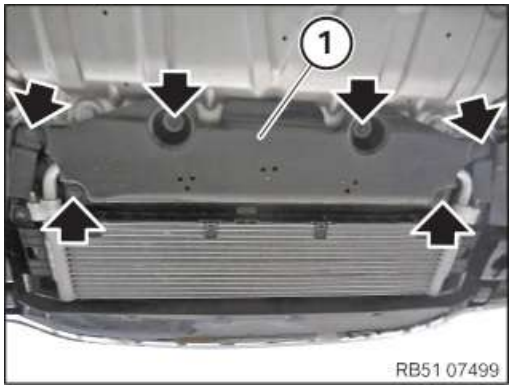
7 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

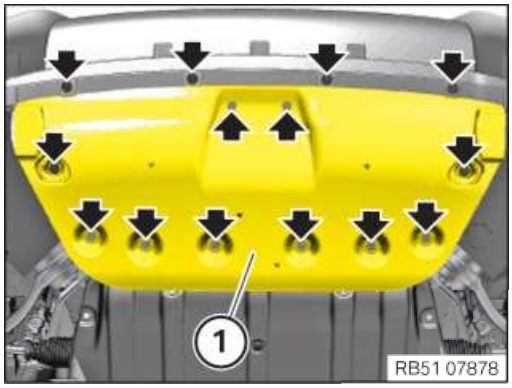
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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

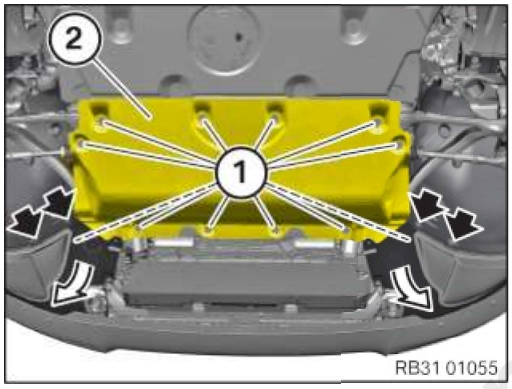


- **Version 3:**

  Remove screws (arrows).

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

8 – Remove the underbody protection of the steering gear



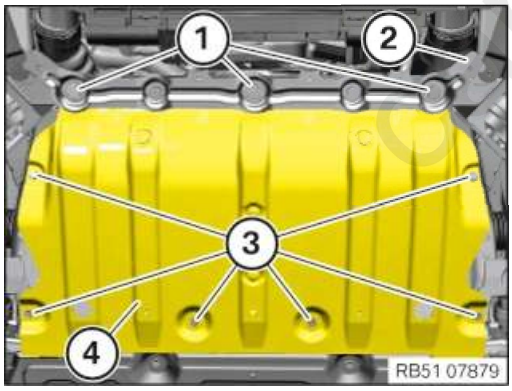
- **Version 1:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

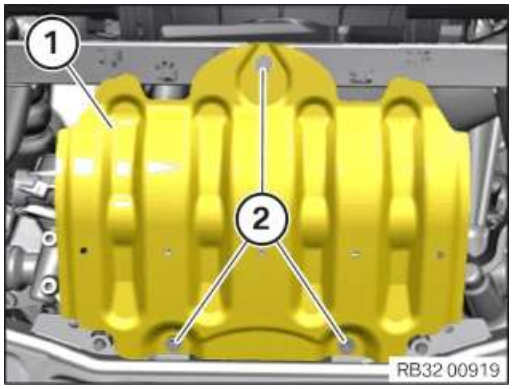
  Loosen screws (3).

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

9 – If installed: Removing the steering start protection

Prerequisite

The front underbody protection is removed.



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

10 – Draining the coolant from the low-temperature cooling system

WARNING

Hot surfaces.

Risk of burning!

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

TECHNICAL INFORMATION

Life-long fill of coolant!

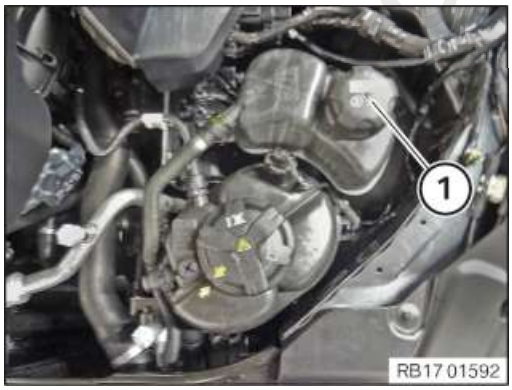
Do not reuse used coolant.

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.

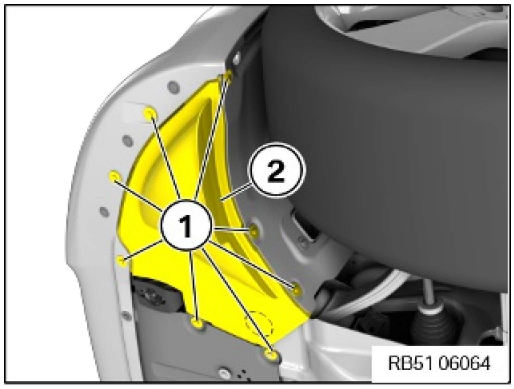
TECHNICAL INFORMATION

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

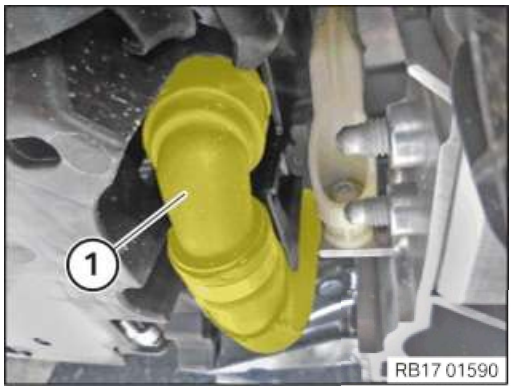


- Loosen sealing cap (1).

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- Loosen screws (1).
- Guide out and remove bottom left cover (2) to the front.



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

MAIN WORK

11 – Remove the radiator of the low-temperature coolant circuit

WARNING

Hot surfaces.

Risk of burning!

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

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.

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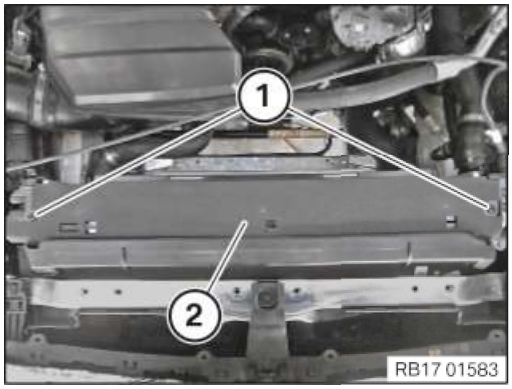
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TECHNICAL INFORMATION

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

TECHNICAL INFORMATION

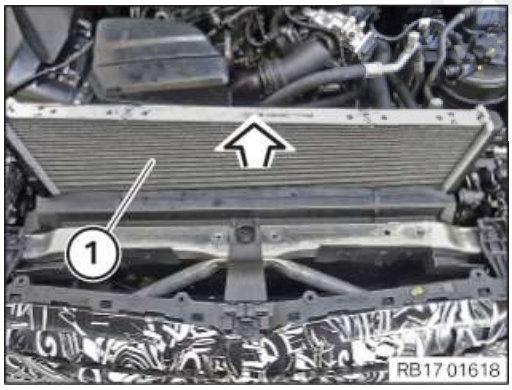
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



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



- Unlock and disconnect the coolant line (1).



- Guide out and remove the radiator of low-temperature coolant circuit (1) **carefully** in the direction of the arrow.

12 – Install the radiator of the low-temperature coolant circuit

WARNING

Hot surfaces.

Risk of burning!

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

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CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

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- Conduct all work in appropriate personal protective equipment only.

TECHNICAL INFORMATION

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TECHNICAL INFORMATION

Follow notes for repair work on the cooling system.

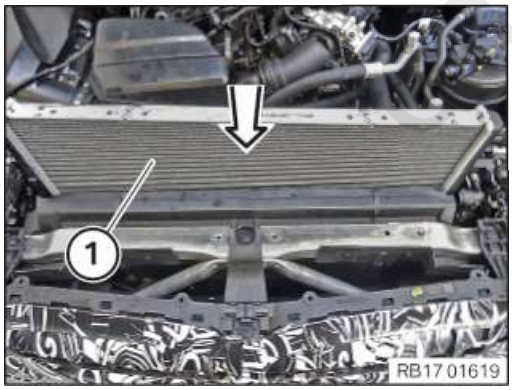
For additional information see:

Main group 17

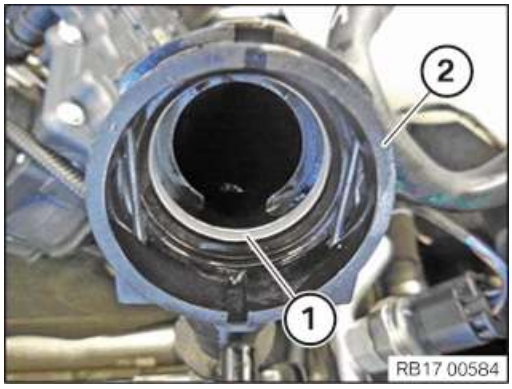
17 00 ... Notes for working on the cooling system

TECHNICAL INFORMATION

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



- Guide in and install the radiator of low-temperature coolant circuit (1) **carefully** in the direction of the arrow.



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

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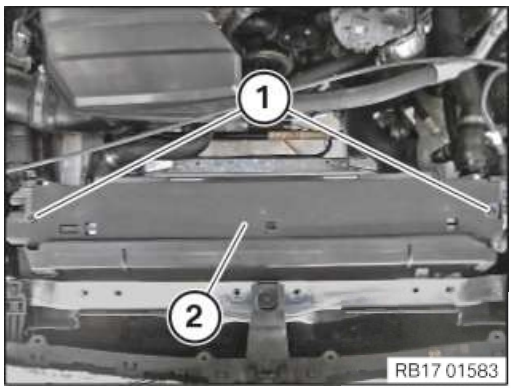


TECHNICAL INFORMATION

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

- Connect and lock the coolant line (1).

  The coolant line (1) must audibly engage.



- Guide in and install the top cover (2).
- Tighten the screws (1).

Cooling module cover on holder

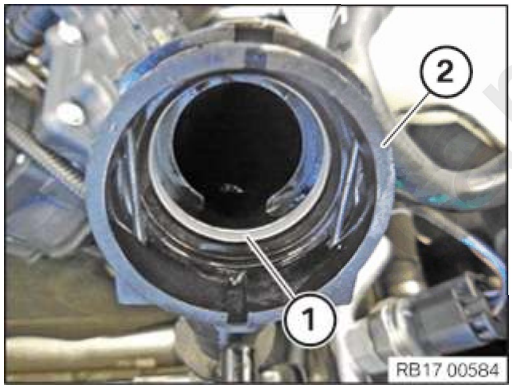
D6X20		Tightening torque	6 Nm

POSTPROCESSES

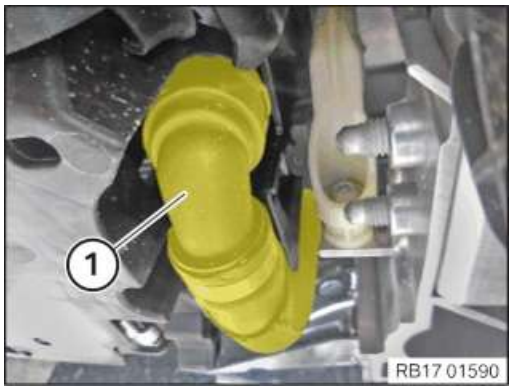
13 – Connecting the coolant lines for the low-temperature coolant circuit

TECHNICAL INFORMATION

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



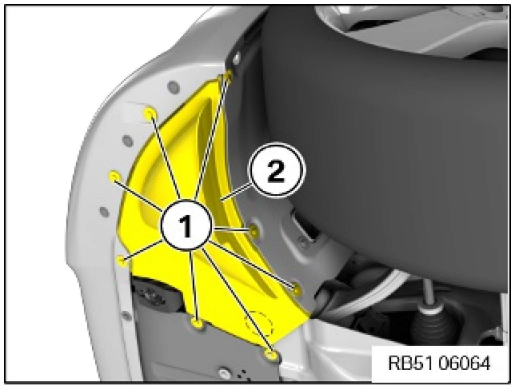
- Check the sealing rings (1) of the coolant lines (2) for damage and renew if necessary.



- Connect and lock the coolant line (1).

  The coolant line (1) must audibly engage.

erdiagn.com

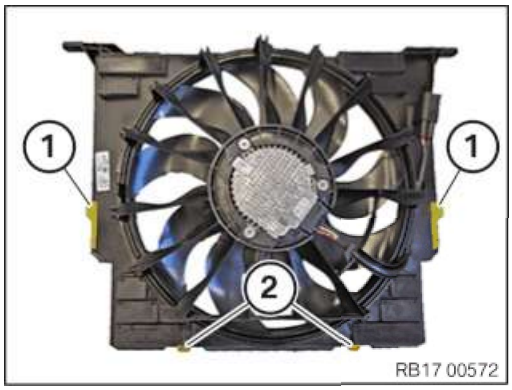


- Feed in and install cover (2) at the bottom front left.
- Tighten the screws (1).

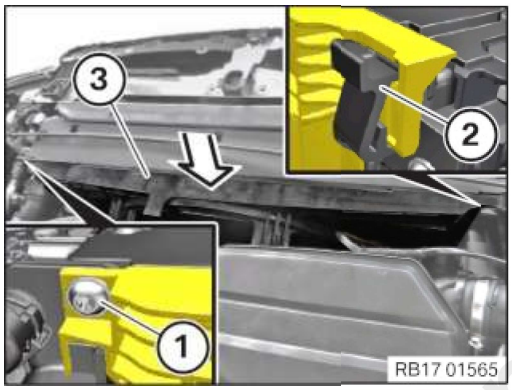
Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

14 – Install fan cowl



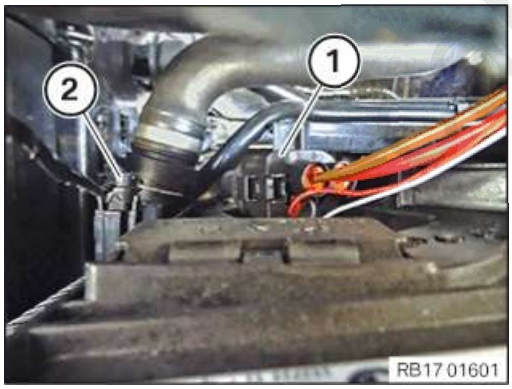
- Feed guides (1) into the radiator.
- Feed guides (2) into the charge air cooler.



- Guide in and install fan cowl (3) **carefully** in the direction of the arrow.
- Ensure that the lock (2)engages audibly.
- Tighten down screw (1).

Fan cowl with electric fan on radiator

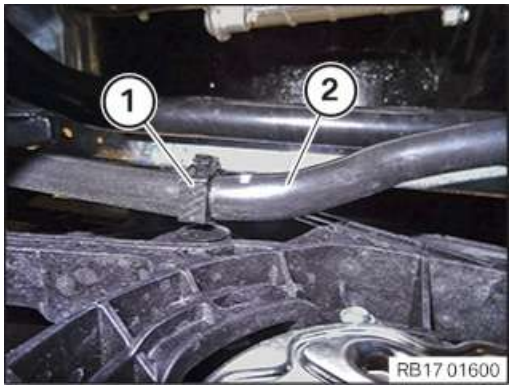
TS6x20		Tightening torque	6,5 Nm



- Connect connectors (2) and lock.

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

  The connector (1) must engage audibly.



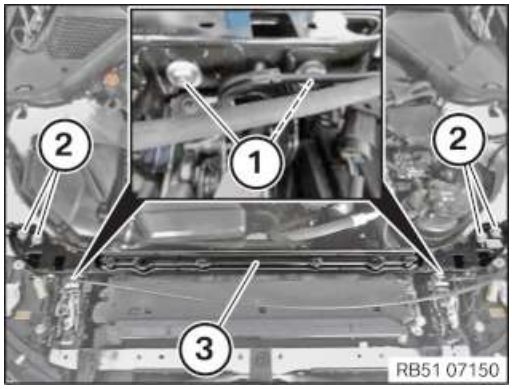
- **If installed:** Secure the transmission oil line (2).

  Insert and install the transmission oil line (2).

  Lock holder (1).

15 – Install the rear top cross connection

.com



- Guide in and position the top rear cross connection (3).
- Tighten the screws (1).

Top rear cross connection to bonnet catch support

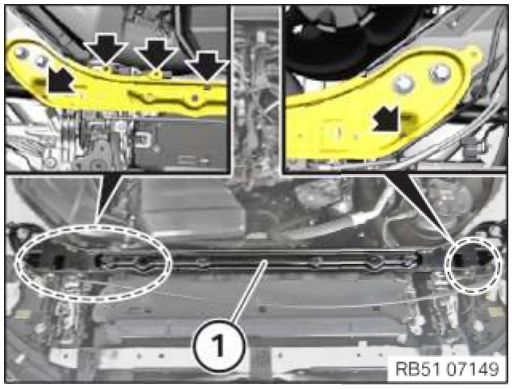
Flat-head screw M6x20		Tightening torque	11,8 Nm

- Renew screws (2).

  Parts: Bolts
- Tighten the screws (2).

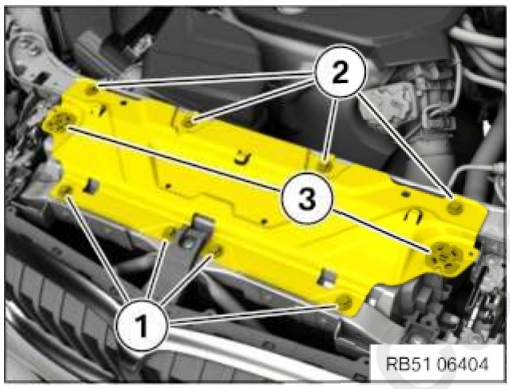
Rear top cross connection to wheel arch carrier support

M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °



- Secure the clips (arrows) in the marked areas to the top rear cross connection (1).

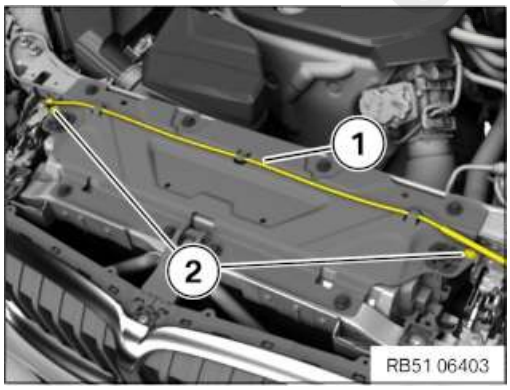
16 – Installing the top cross connection



- Set and position upper cross connection with holders (3) from above.
- Tighten down screws (1) and (2).

Cross connection, top

M8x20		Tightening torque	28 Nm



- Tighten down screws (2).

Cross connection, top

M6x20		Tightening torque	11,8 Nm

- Attach Bowden cable (1) on the upper cross connection.



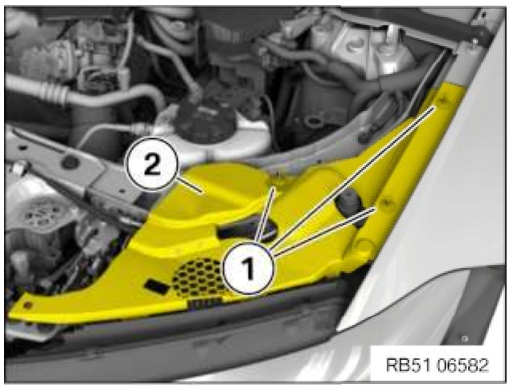
- Clip in the housing for the coupling of the Bowden cables (1).

17 – Install the cover in the engine compartment at top left and right partially

NOTICE

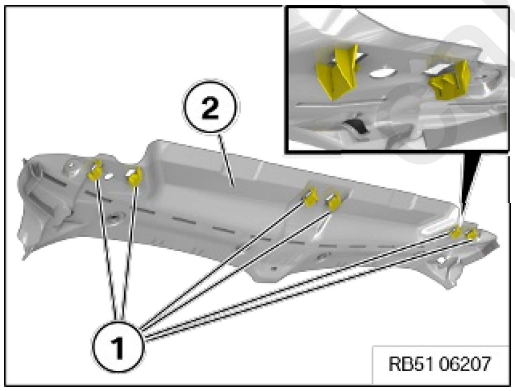
Description is for left component only. Procedure on the right side is identical.

▸ **Installing the cover in the engine compartment on top partially**



- Install the cover in the engine compartment on top (2).
- Secure expanding rivet (1).

18 – Installing cover for engine compartment centre



Check

- Check latch mechanisms (1) of cover for engine compartment centre (2) for damage.

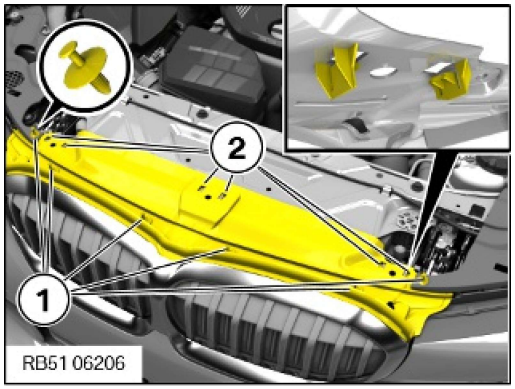
Result

» The latch mechanism (1) is damaged.

Measure

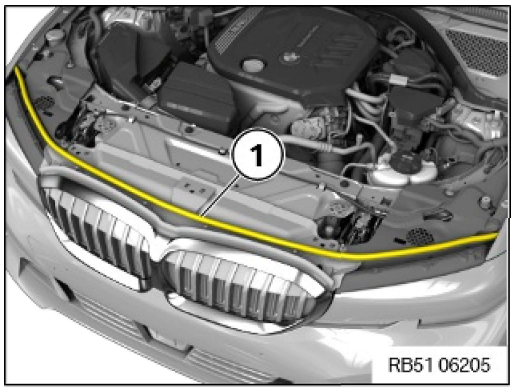
- Renew cover for engine compartment centre (2).

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- Guide in the cover for the engine compartment centre from the rear and position it.
- Clip in the cover for the engine compartment centre with latch mechanisms (2).
- Mount all expanding rivets (1).

19 – Install the seal for the front bonnet



- Position the bonnet seal(1) and connect it on the mounting on the bumper and on the headlights.

20 – Filling and bleed the low-temperature coolant circuit

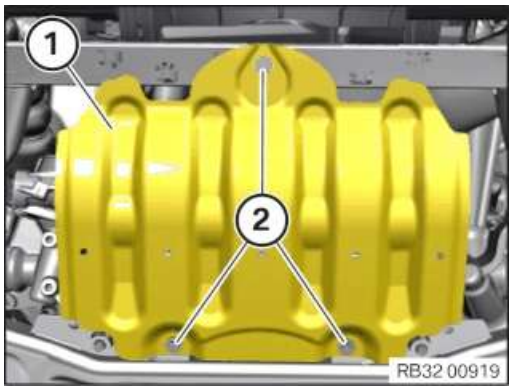


- See additional information.

21 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.



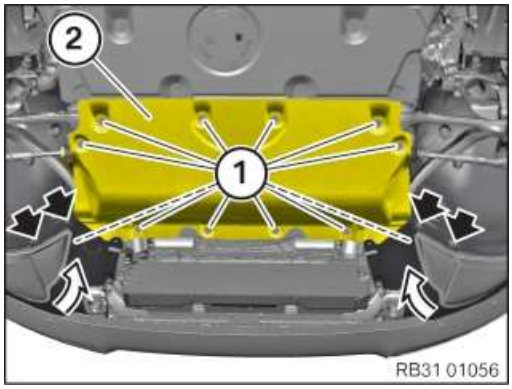
- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

22 – Install the underbody protection of the steering gear

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

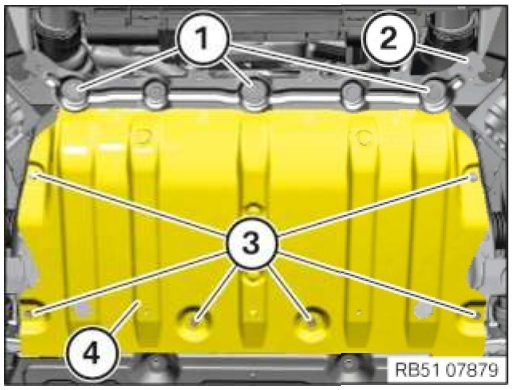
Underbody protection of the steering gear

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

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

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



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

Underbody protection of the steering gear

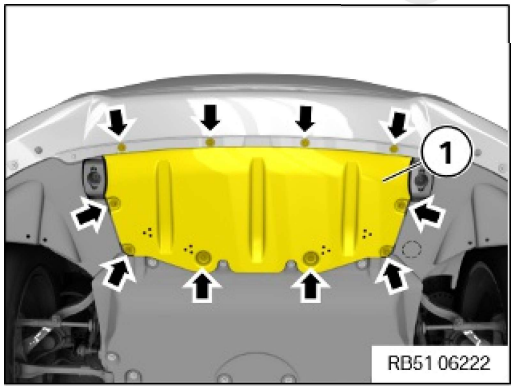
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

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

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

23 – Installing the front underbody protection



- **Version 1:**

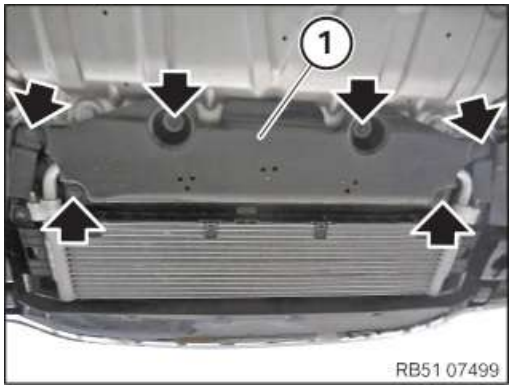
  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

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

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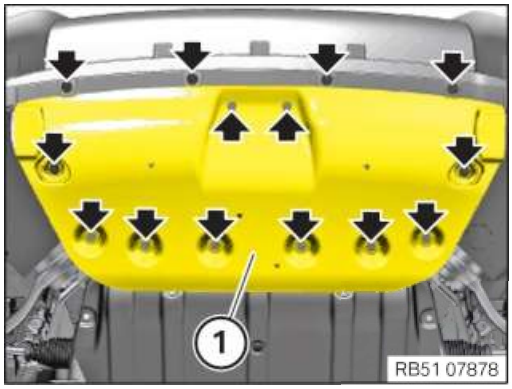
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Cooling module cover on holder — Used in step 12

D6X20		Tightening torque	6 Nm

Cover, front bottom on side — Used in step 13

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Fan cowl with electric fan on radiator — Used in step 14

TS6x20		Tightening torque	6,5 Nm

Top rear cross connection to bonnet catch support — Used in step 15

Flat-head screw M6x20		Tightening torque	11,8 Nm

Rear top cross connection to wheel arch carrier support — Used in step 15

M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

Cross connection, top — Used in step 16

M8x20		Tightening torque	28 Nm

Cross connection, top — Used in step 16

M6x20		Tightening torque	11,8 Nm

Bumper buffer device steering on front axle support — Used in step 21

M10		Tightening torque	56 Nm

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Underbody protection of the steering gear Used in step 22

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

Wheel arch cover (screws) Used in step 22

Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support Used in step 22

M10		Tightening torque	56 Nm

Underbody protection front Used in step 23

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

Links

Repair instructions	Used in step
17 00 ... Instructions for repair work on cooling system	1112
17 11 103 Removing and installing/replacing coolant expansion tank for the low-temperature coolant circuit	20
17 11 103 Removing and installing/replacing coolant expansion tank for the low-temperature coolant circuit	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Venting cooling system and checking on watertightness	20
17 00 040 Venting high temperature - cooling system and checking for water leaks (N20 hybrid drive)	20
17 00 040 Venting high temperature - cooling system and checking for water leaks (N20 hybrid drive)	20
17 00 040 Bleeding lower-temperature cooling system (B48)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 011 Draining and topping up coolant circuit for low temperature	20
17 00 040 Bleed the low-temperature cooling system and check for watertightness (coolant circuit for low temperature)	20
17 00 040 Bleeding and filling low temperature cooling system using vacuum filler device (B48)	20
17 00 011 Draining and topping up low-temperature coolant circuit	20

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17 00 011 Draining and topping up low-temperature coolant circuit	20
17 00 040 Bleeding the low-temperature coolant circuit and checking it for watertightness	20
17 00 040 Bleeding the low-temperature coolant circuit and checking it for watertightness	20
17 00 015 Draining and topping up the coolant circuit for the drive \PREMIUM	20
17 00 011 Draining and topping up low-temperature coolant circuit	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (low-temperature coolant circuit)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	20

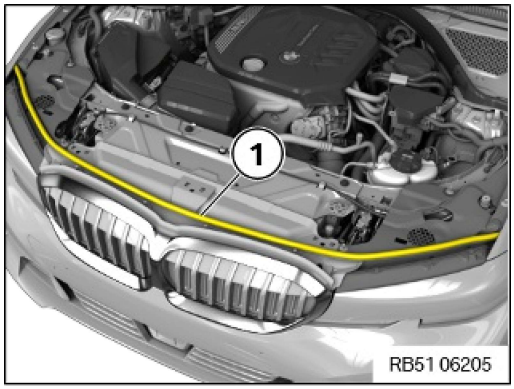
Operating materials	**Used in step**
Main group 17	1112

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17 11 000 Removing and installing coolant radiator

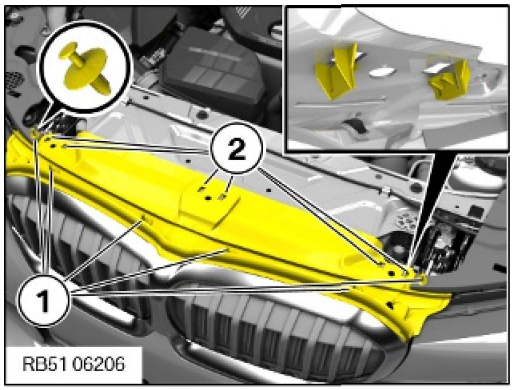
PRELIMINARY WORK

1 – Remove the seal for the bonnet in front



- Pull off front bonnet seal (1) upwards.

2 – Removing the centre engine compartment cover



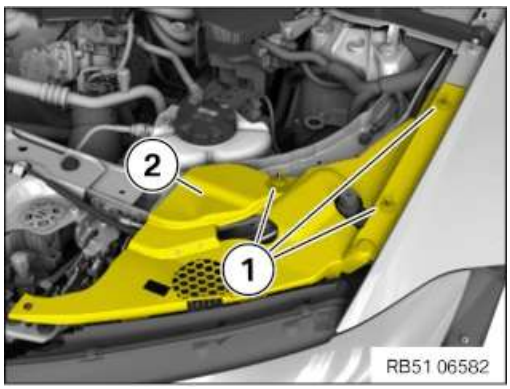
- Detach all expanding rivets (1).
- Release the cover of the centre engine compartment with the latch mechanisms (2) .
- Feed the cover for the centre engine compartment out to the rear.

3 – Partially remove the top left and right cover in the engine compartment

NOTICE

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

▶ **Removing the cover in the engine compartment on top partially**



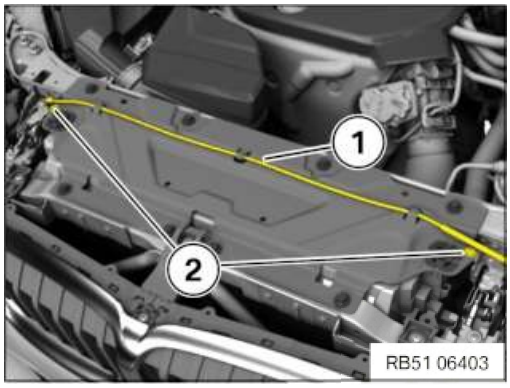
- Loosen the expanding rivet (1).
- Remove the cover in the engine compartment on top (2) partially.

4 – Removing the top cross connection

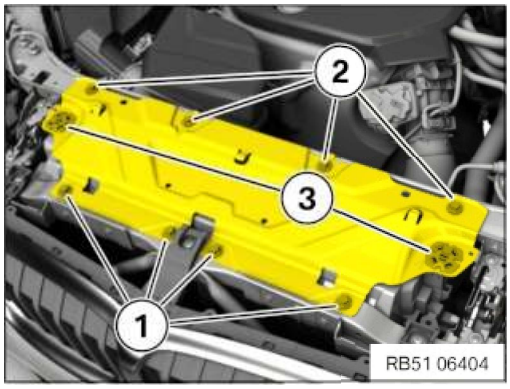
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- Release the housing for the coupling of the Bowden cables (1) from the body.

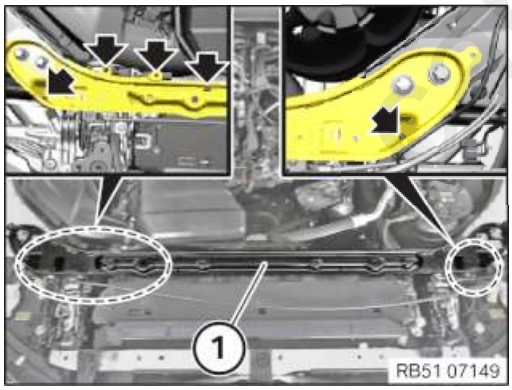


- Detach Bowden cable (1) at the top cross connection.
- Loosen screws (2).

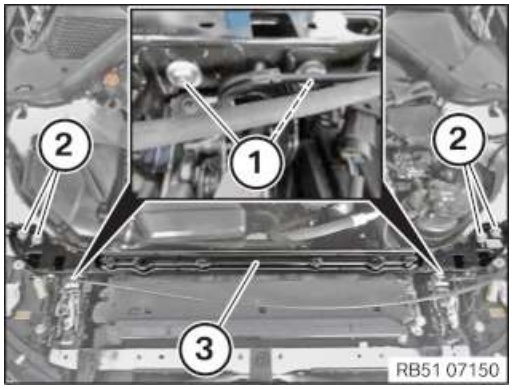


- Loosen screws (1) and (2).
- Remove the top cross connection with the holders(3) towards the top.

5 – Remove the rear top cross connection



- Release the clips (arrows) in the marked areas from the top rear cross connection (1).



- Loosen screws (1).
- Loosen screws (2).
- Guide out and remove top rear cross connection (3).

6 – Removing the acoustic cover

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WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



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

7 – Removing the clean air pipe with the resonator

WARNING

Hot surfaces.

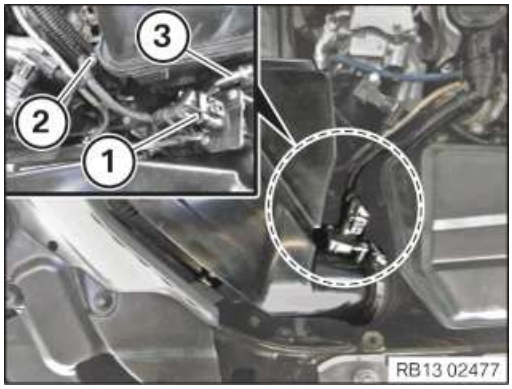
Risk of burning!

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

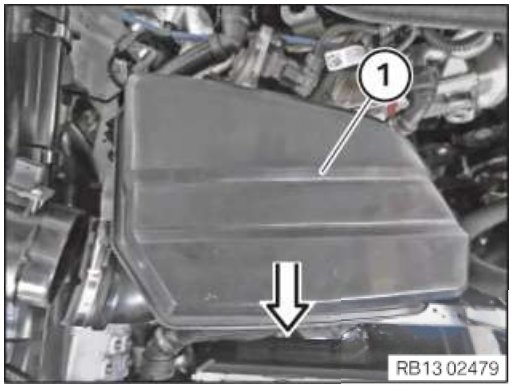


- Unlock the locks (1).
- Feed the engine ventilation line (2) out and set it aside.

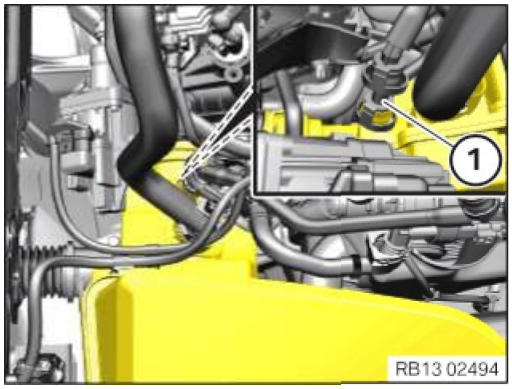
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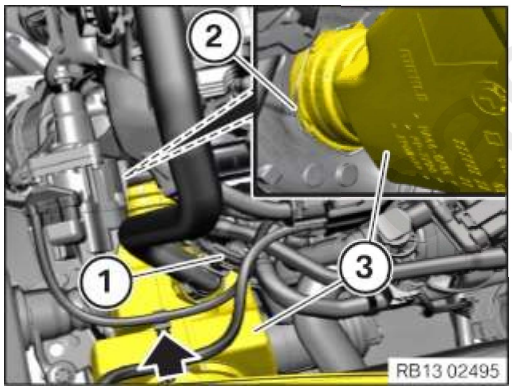
- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



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

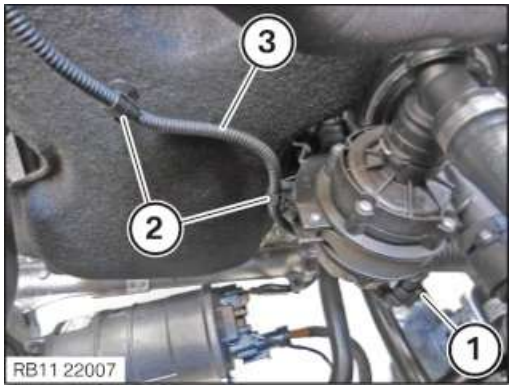


- Unlock and disconnect the tank ventilation line (1).



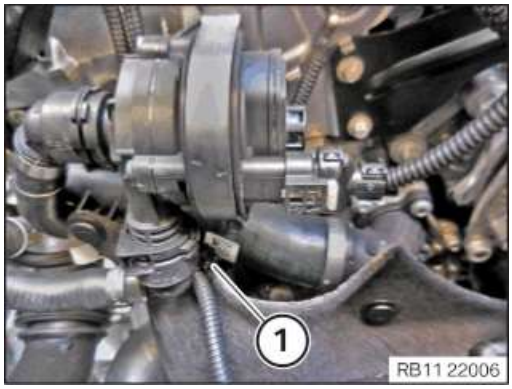
- Loosen the clamp (arrow).
- Unlock plug connection (1) and disconnect.
- Unlock the clamp (2).
- Feed out clean air pipe with resonator (3) and remove.

8 – Removing the acoustic cover for the engine at the front

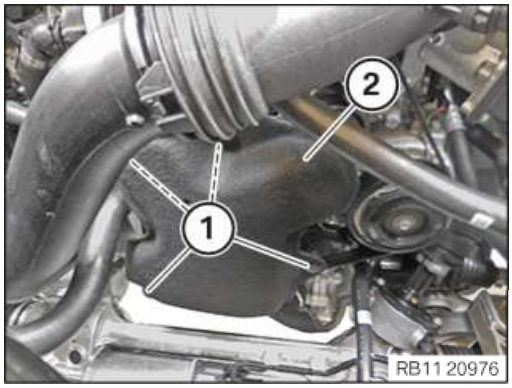


- Unlock plug connection (1) and disconnect.
- Loosen clamps (2).
- Remove the wiring harness section (3) and put to one side.

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- Loosen clamp (1).

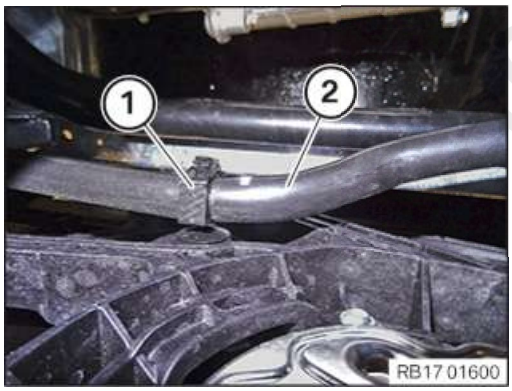


- Detach all expanding rivets (1).
- Guide the acoustic cover (2) out and remove.

9 – Remove fan cowl.

TECHNICAL INFORMATION

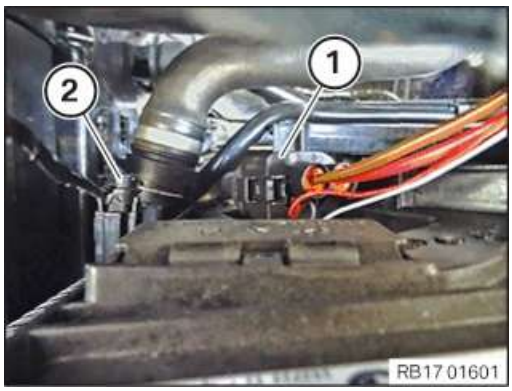
- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!



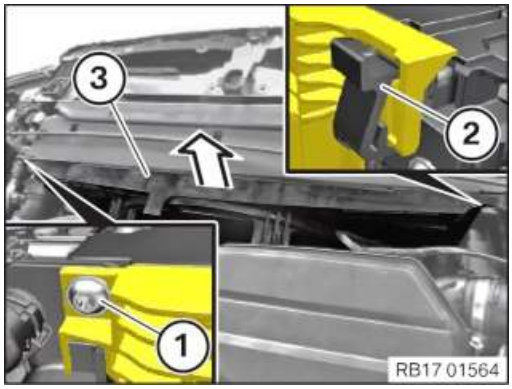
- **If installed:** Release transmission oil line (2).

  Unlock the holder (1).

  Thread out transmission oil line (2) and set aside.

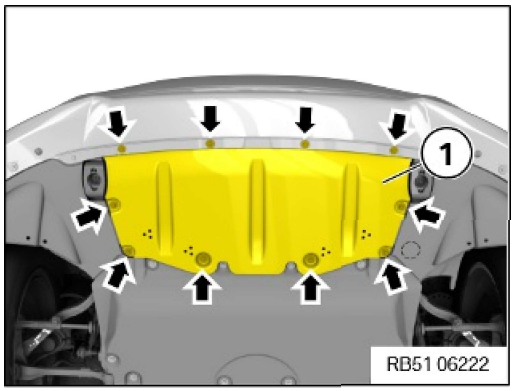


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.



- Loosen screw (1).
- Unlock lock (2).
- Guide out and remove fan cowl (3) **carefully** in the direction of the arrow.

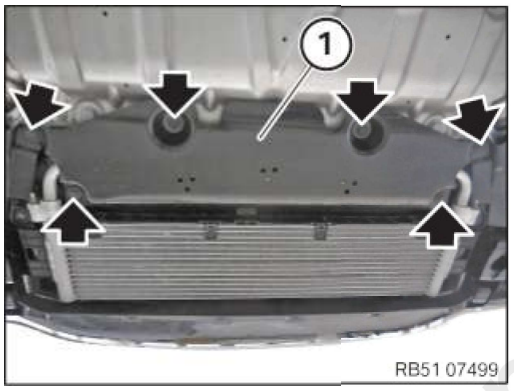
10 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

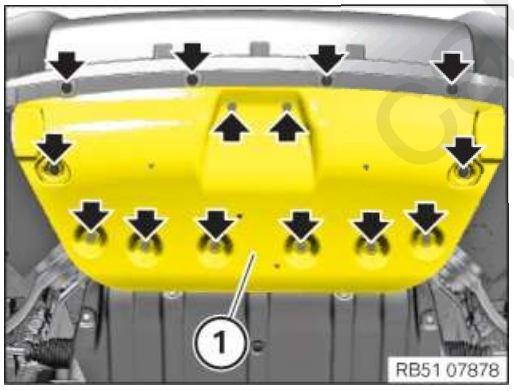
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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

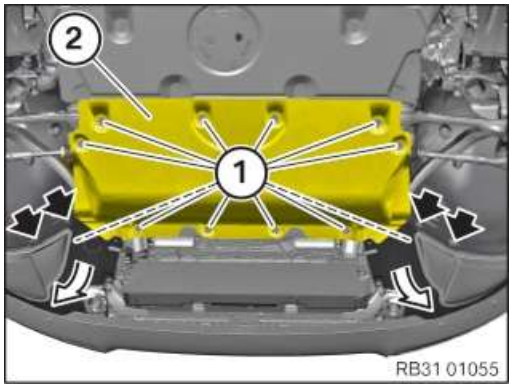


- **Version 3:**

  Remove screws (arrows).

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

11 – Remove the underbody protection of the steering gear



- **Version 1:**

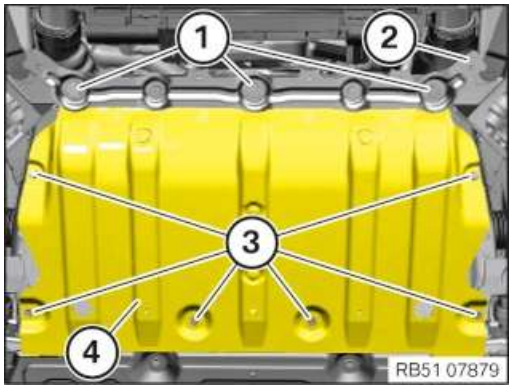
  Unscrew the screws (arrows) of the wheel arch cover on wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).

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- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

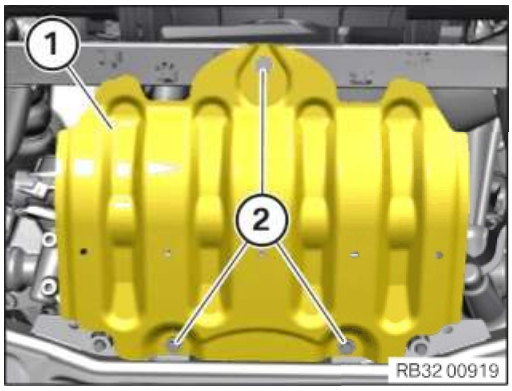
  Loosen screws (3).

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

12 – If installed: Removing the steering start protection

Prerequisite

The front underbody protection is removed.



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

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

WARNING

Hot surfaces.

Risk of burning!

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

TECHNICAL INFORMATION

Life-long fill of coolant!

Do not reuse used coolant.

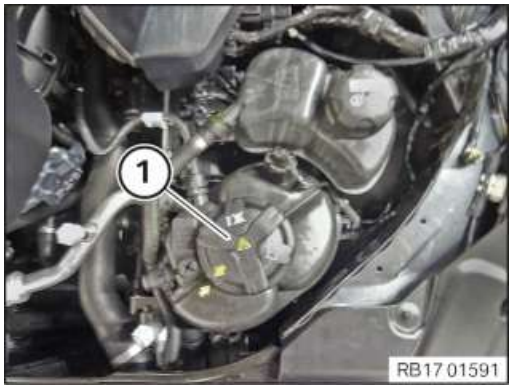
When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

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.

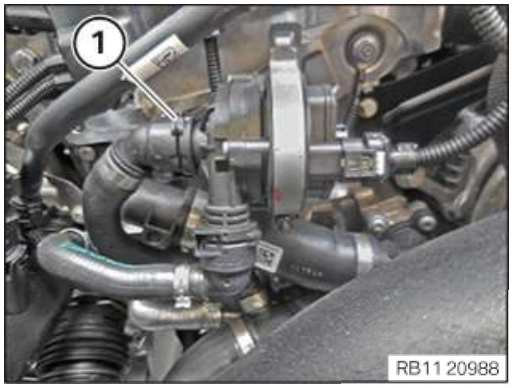
TECHNICAL INFORMATION

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

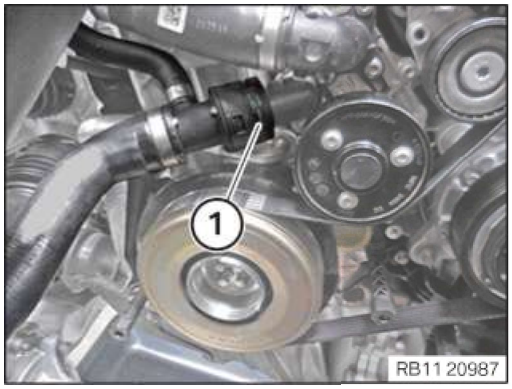
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- Loosen sealing cap (1).



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



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

MAIN WORK

14 – Remove the radiator of the high-temperature coolant circuit

WARNING

Hot surfaces.

Risk of burning!

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

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.

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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

Follow notes for repair work on the cooling system.

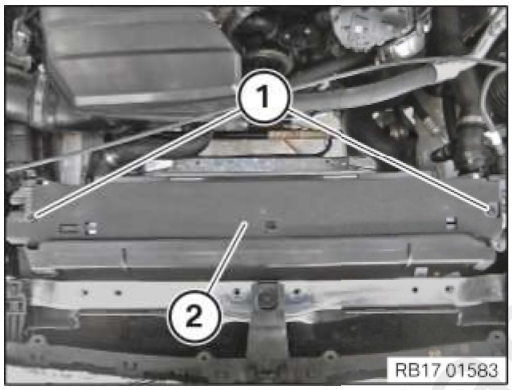
For additional information see:

Main group 17

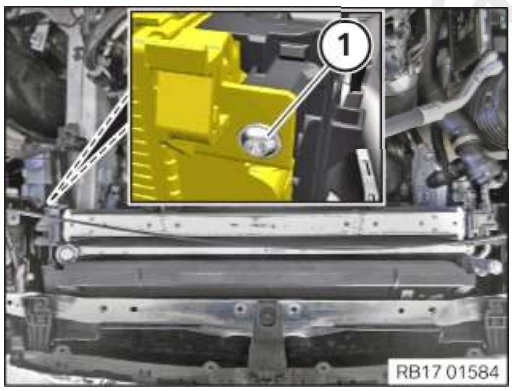
17 00 ... Notes for working on the cooling system

TECHNICAL INFORMATION

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



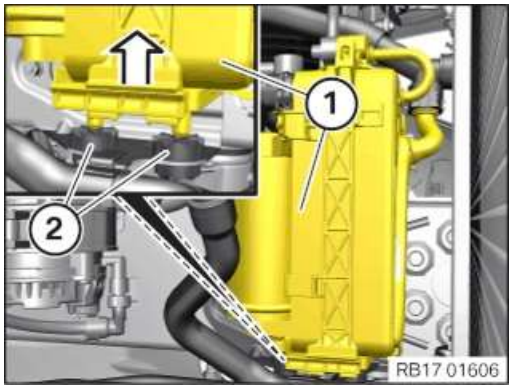
- Loosen screws (1).
- Feed the cover (2) out towards the top and remove.



- Loosen screw (1).



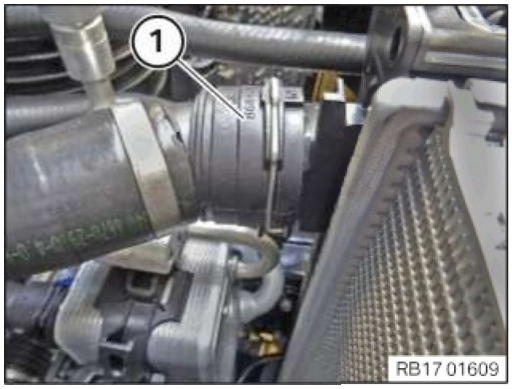
- Release screw (1) of air conditioning condenser.



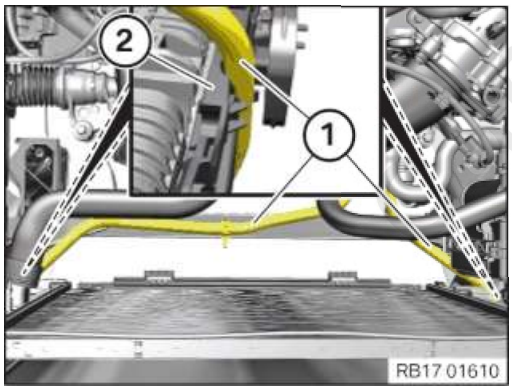
- Release the air conditioning condenser (1) in the direction of arrow form the rubber mounts (2) and set it aside.



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

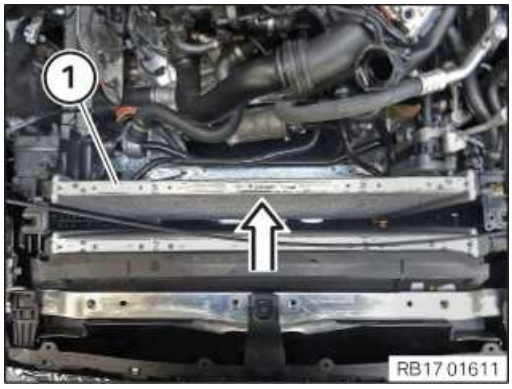


- Unlock and disconnect the coolant line (1).
- Catch and dispose of escaping coolant.



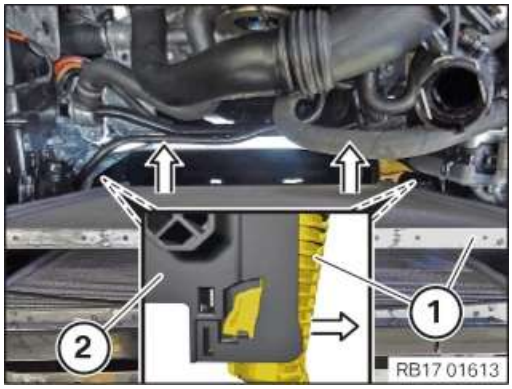
- **With automatic transmission:**

  Release the transmission oil lines (1) on left and right from the holders (2).

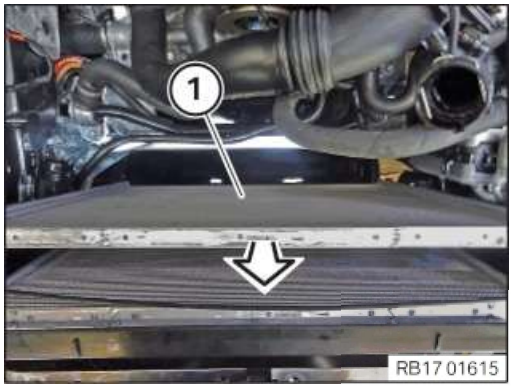


- Tilt the radiator of the high-temperature coolant circuit (1) in the direction of arrow.

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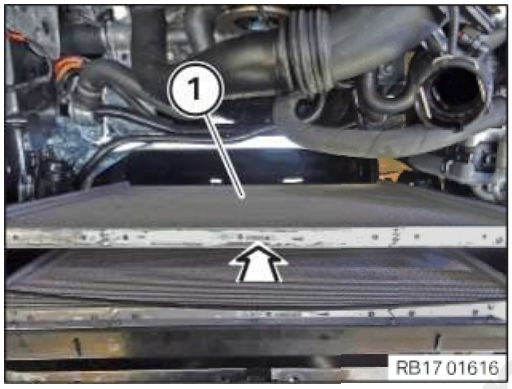


- Press the radiator of the high-temperature coolant circuit (1) in the below area in the direction of arrow feed out from the holders (2).

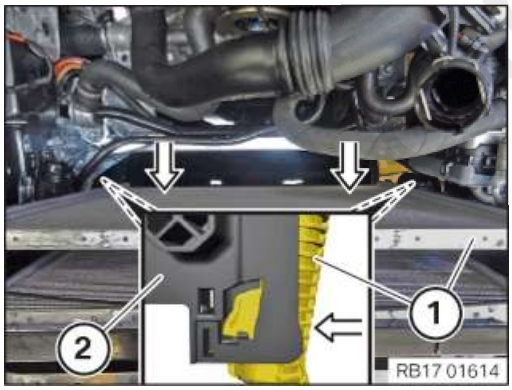


- Guide out radiator of high-temperature coolant circuit (1) **carefully** in direction of arrow and remove.

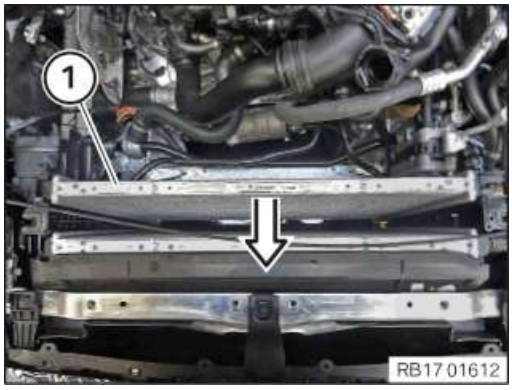
15 – Install the radiator of the high-temperature coolant circuit



- Feed in the radiator of the high-temperature coolant circuit (1) **carefully** in the direction of arrow.

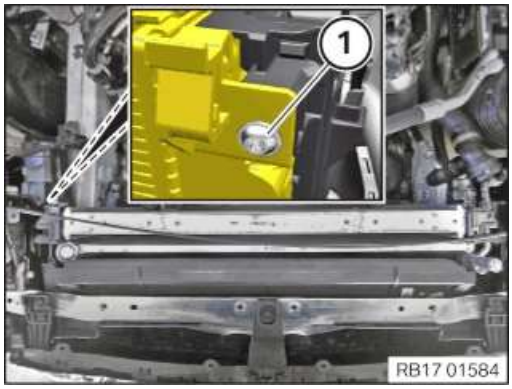


- Feed in the radiator of the high-temperature coolant circuit (1) in the below area to the holder (2)in the direction of arrow and install.



- Position the radiator of the high-temperature coolant circuit (1) in the direction of arrow.

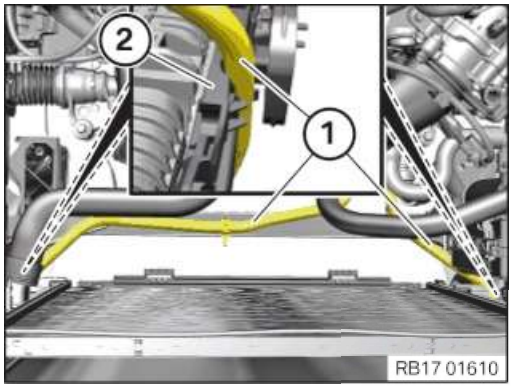
rdiagn.com



- Tighten down screw (1).

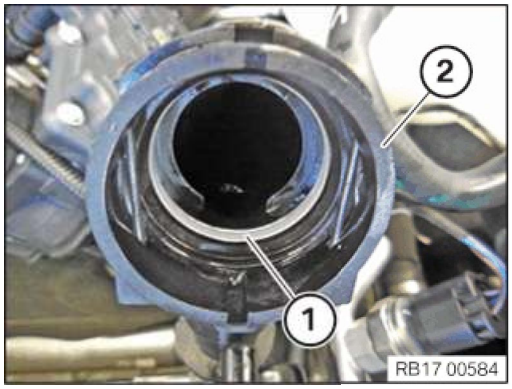
Radiator on holder

D6x20 screw		Tightening torque	6 Nm

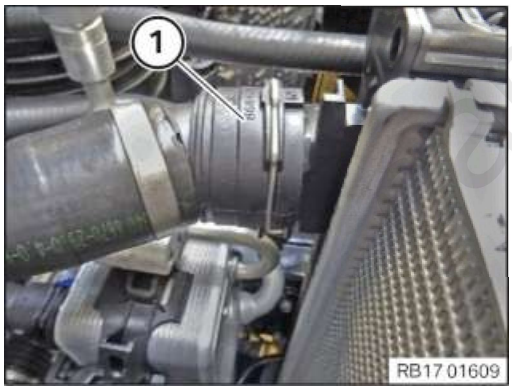


- **With automatic transmission:**

  Feed in the transmission oil lines (1) on left and right to the holders (2) and install.



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



TECHNICAL INFORMATION

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

- Connect and lock the coolant line (1).

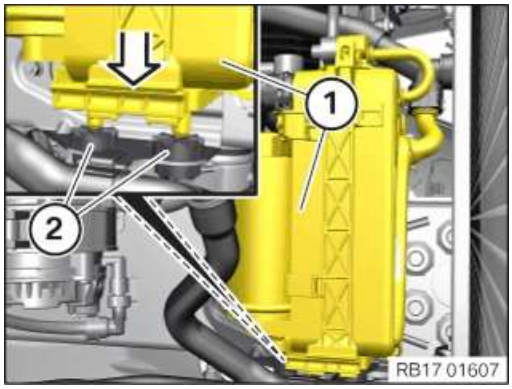


TECHNICAL INFORMATION

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

- Connect and lock the coolant line (1).

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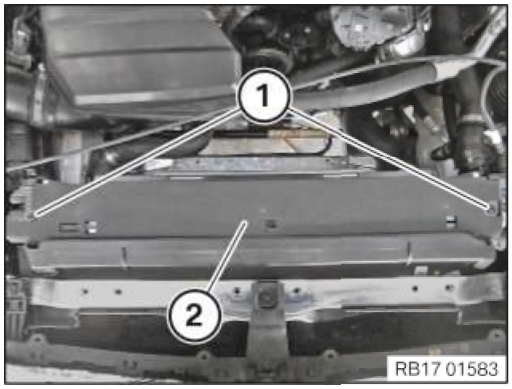
- Feed in and install air conditioning condenser (1) to rubber mount (2)in the direction of arrow.



- Tighten down screw (1).

Air conditioning condenser bracket on body

	Tightening torque	8 Nm



- Guide in and install cover (2) towards the top.
- Tighten the screws (1).

Cooling module cover on holder

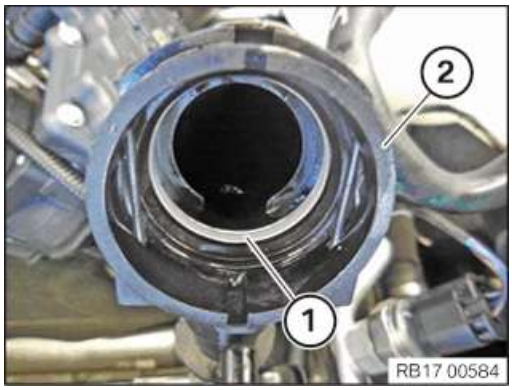
D6X20		Tightening torque	6 Nm

POSTPROCESSES

16 – Connecting the coolant lines for the high-temperature coolant circuit

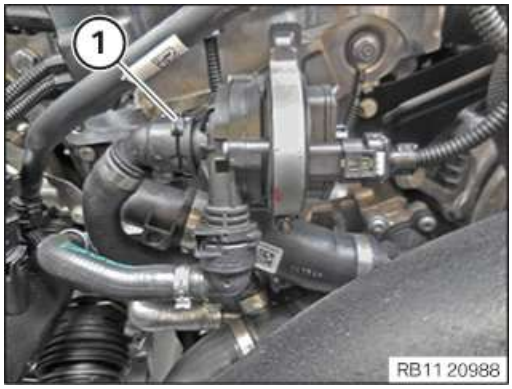
TECHNICAL INFORMATION

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.

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- Connect and lock coolant line (1).

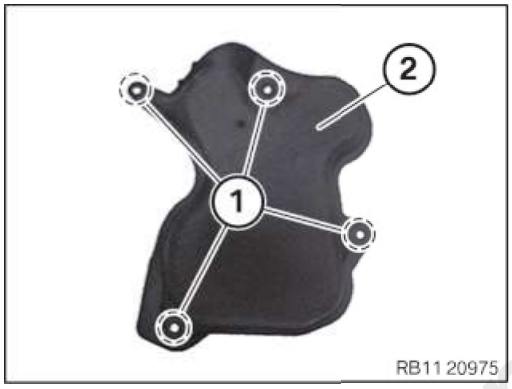
  Coolant line (1) must audibly engage.



- Connect and lock coolant line (1).

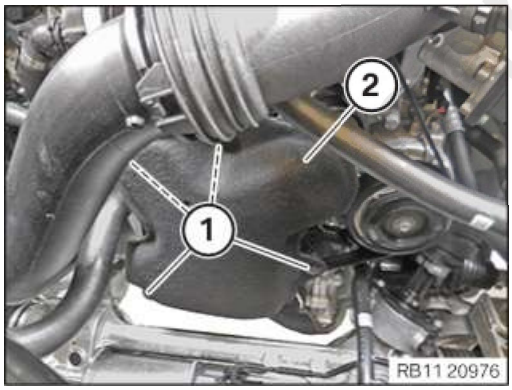
  Coolant line (1) must audibly engage.

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

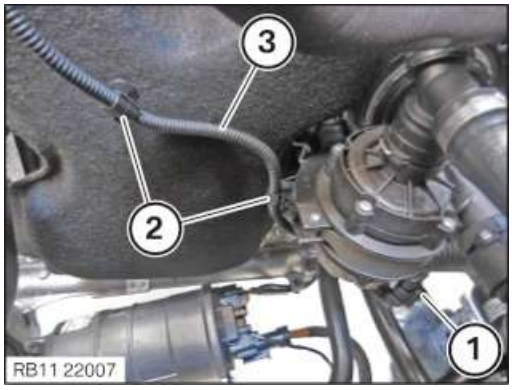


- Check if acoustic cover (2) in marked area (1) is damaged and replace acoustic cover (2) if necessary.

  Parts: Acoustic cover



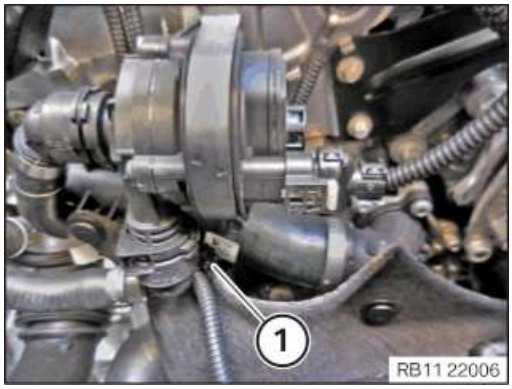
- Thread in and position the acoustic cover (2).
- Mount all expanding rivets (1).



- Feed in and position wiring harness section (3).
- Secure clamps (2).
- Connect connectors (1) and lock.

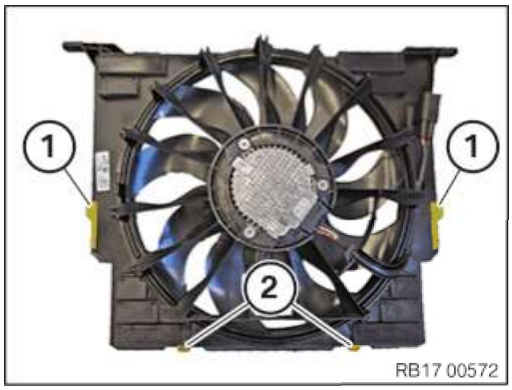
  The connector (1) must engage audibly.

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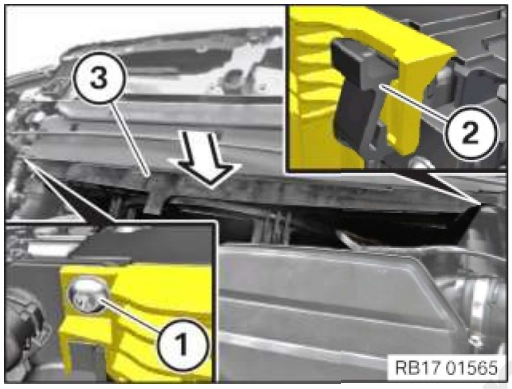


- Secure clamps (1).

18 – Install fan cowl



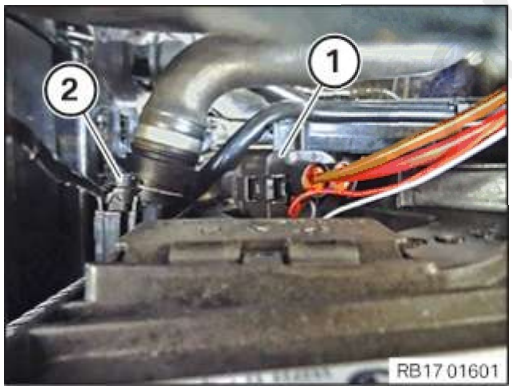
- Feed guides (1) into the radiator.
- Feed guides (2) into the charge air cooler.



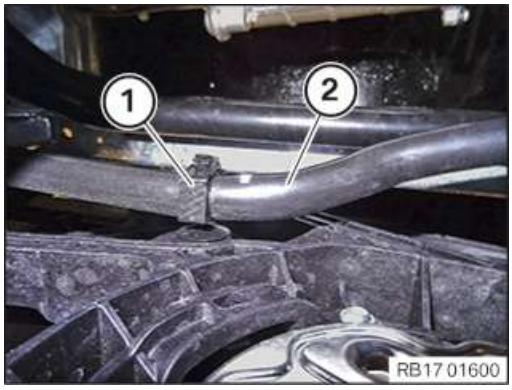
- Guide in and install fan cowl (3) **carefully** in the direction of the arrow.
- Ensure that the lock (2)engages audibly.
- Tighten down screw (1).

Fan cowl with electric fan on radiator

TS6x20	Tightening torque	6,5 Nm



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



- **If installed:** Secure the transmission oil line (2).
  Insert and install the transmission oil line (2).
  Lock holder (1).

19 – Installing the clean air pipe with resonator

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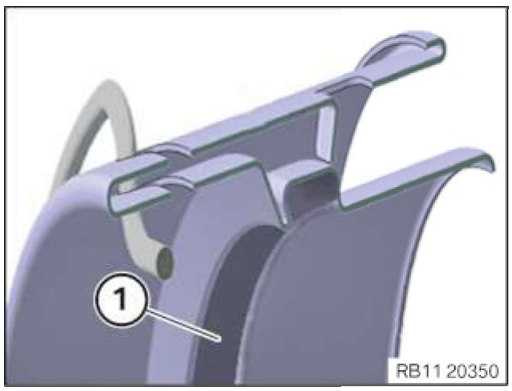


- Check the seal (1) for damages, replace if necessary.

▸ **Replace damaged gasket**

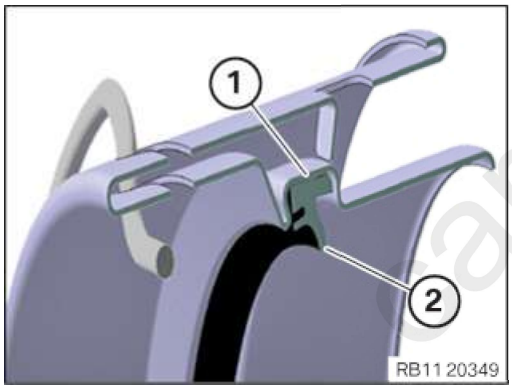
TECHNICAL INFORMATION

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



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

  The gasket groove (1) must be clean.



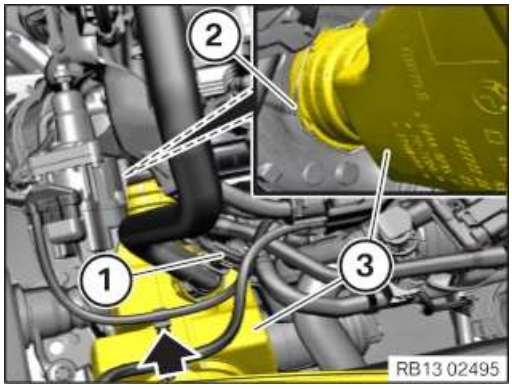
- Renew gasket.

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

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

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

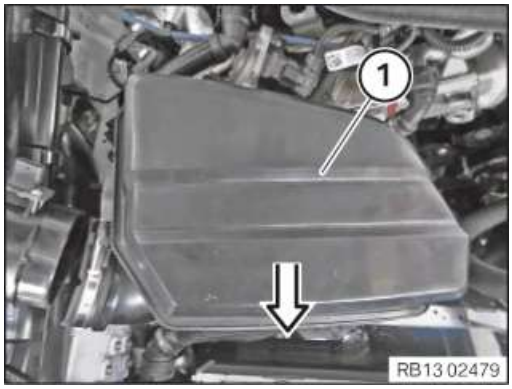


- Guide in and install the clean air pipe with resonator (3).
- Lock clamp (2).

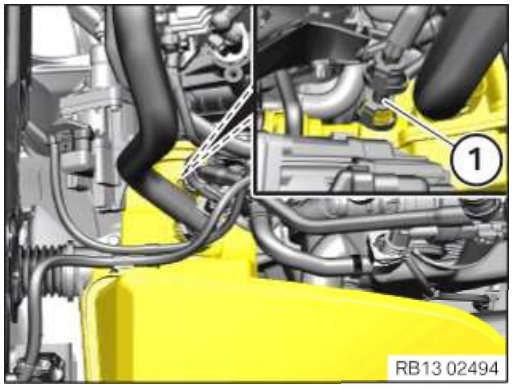
  The clamp (2) must engage audibly.
- Connect connectors (1) and lock.

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

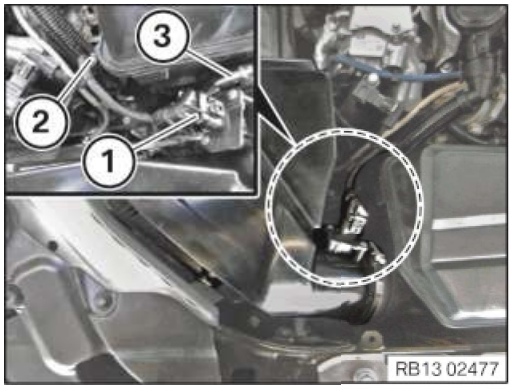
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- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



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



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

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

  The connector (1) must engage audibly.



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

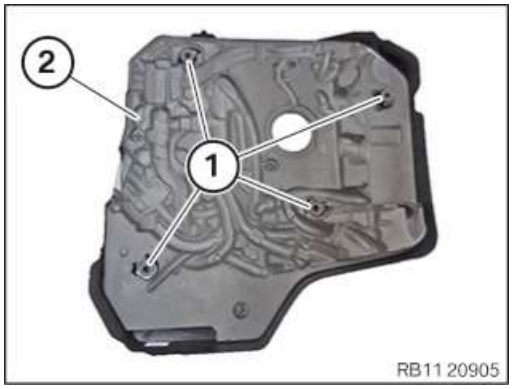
20 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



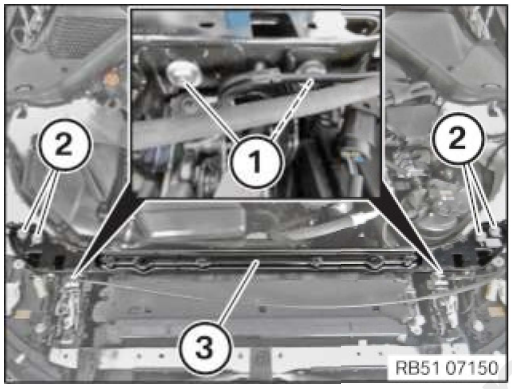
- Check all rubber mounts (1) of acoustic cover (2) for correct seating.



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

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

21 – Install the rear top cross connection



- Guide in and position the top rear cross connection (3).
- Tighten the screws (1).

Top rear cross connection to bonnet catch support

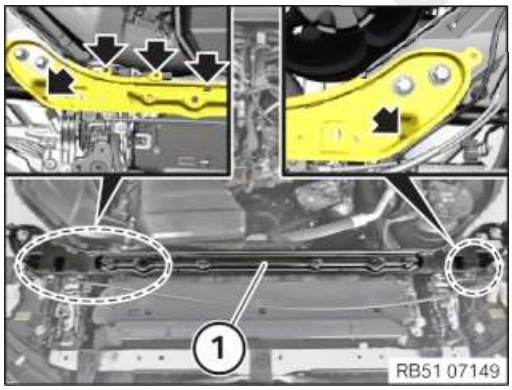
Flat-head screw M6x20		Tightening torque	11,8 Nm

- Renew screws (2).

  Parts: Bolts
- Tighten the screws (2).

Rear top cross connection to wheel arch carrier support

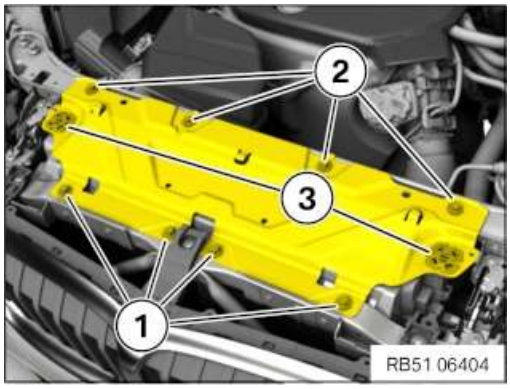
M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °



- Secure the clips (arrows) in the marked areas to the top rear cross connection (1).

22 – Installing the top cross connection

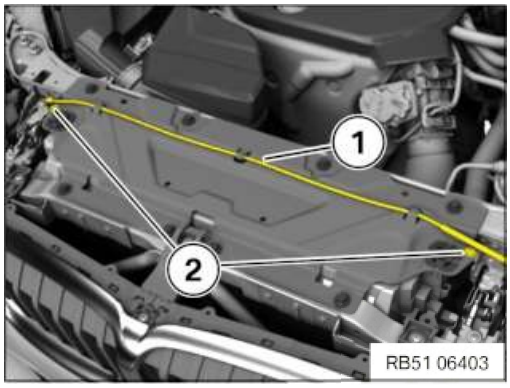
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- Set and position upper cross connection with holders (3) from above.
- Tighten down screws (1) and (2).

Cross connection, top

M8x20		Tightening torque	28 Nm

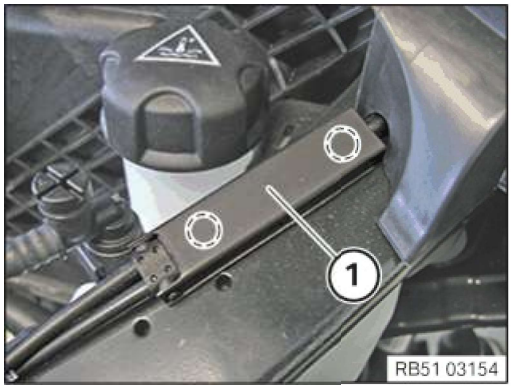


- Tighten down screws (2).

Cross connection, top

M6x20		Tightening torque	11,8 Nm

- Attach Bowden cable (1) on the upper cross connection.



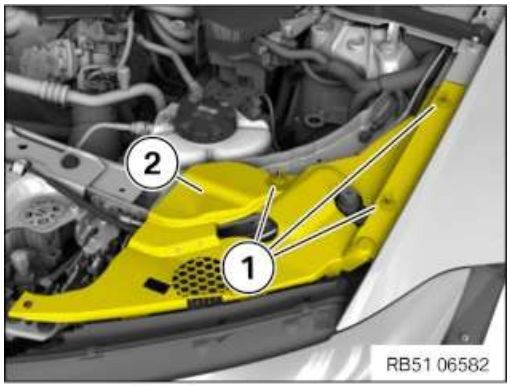
- Clip in the housing for the coupling of the Bowden cables (1).

23 – Install the cover in the engine compartment at top left and right partially

NOTICE

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

▸ **Installing the cover in the engine compartment on top partially**

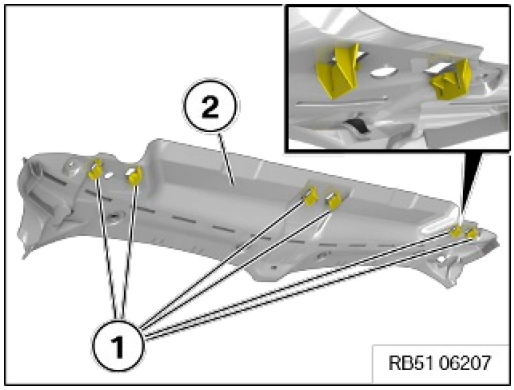


- Install the cover in the engine compartment on top (2).
- Secure expanding rivet (1).

24 – Installing cover for engine compartment centre

Check

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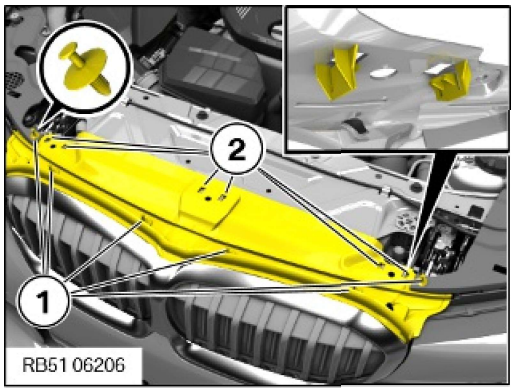
- Check latch mechanisms (1) of cover for engine compartment centre (2) for damage.

Result

» The latch mechanism (1) is damaged.

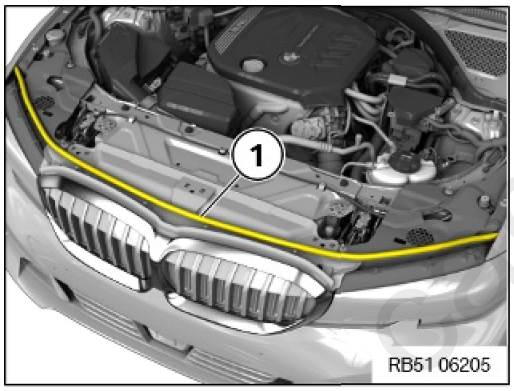
Measure

- Renew cover for engine compartment centre (2).



- Guide in the cover for the engine compartment centre from the rear and position it.
- Clip in the cover for the engine compartment centre with latch mechanisms (2).
- Mount all expanding rivets (1).

25 – Install the seal for the front bonnet



- Position the bonnet seal(1) and connect it on the mounting on the bumper and on the headlights.

26 – Filling and bleed the high-temperature coolant circuit



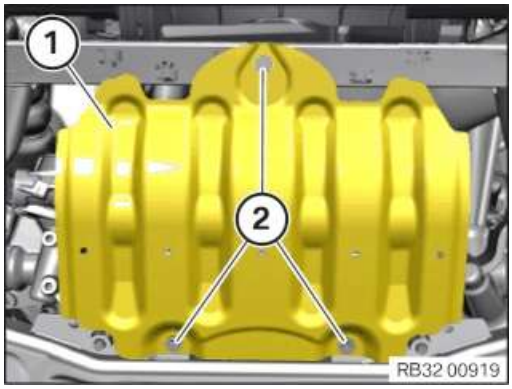
- See additional information.

27 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.

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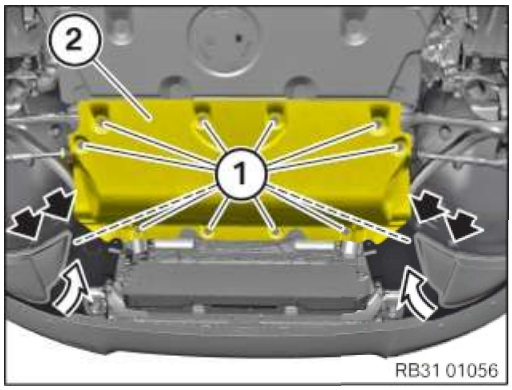


- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

28 – Install the underbody protection of the steering gear



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

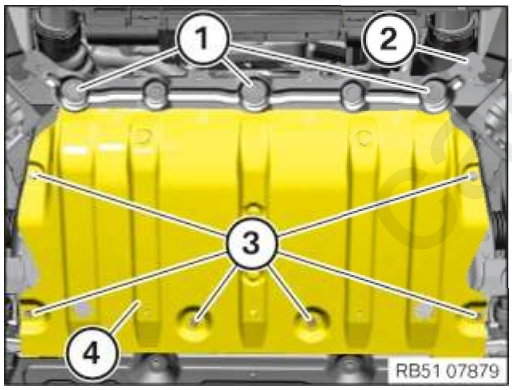
Underbody protection of the steering gear

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

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

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



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

Underbody protection of the steering gear

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

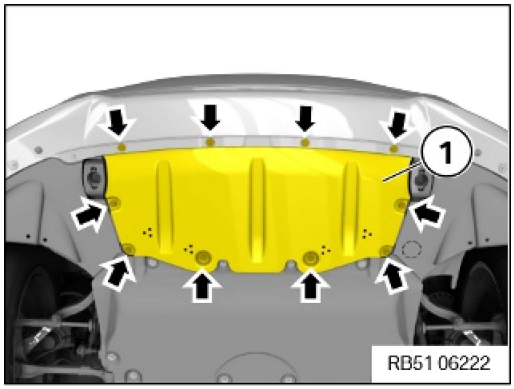
- Position holder of underride protection (2).
- Tighten the screws (1).

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

29 – Installing the front underbody protection

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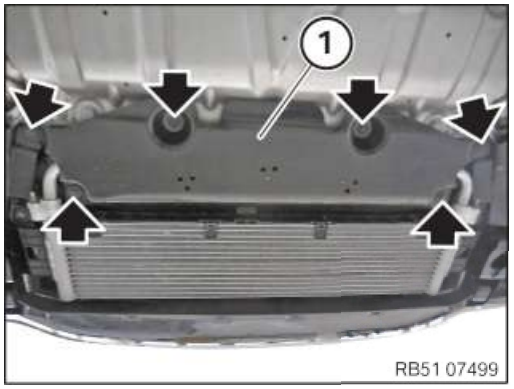
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



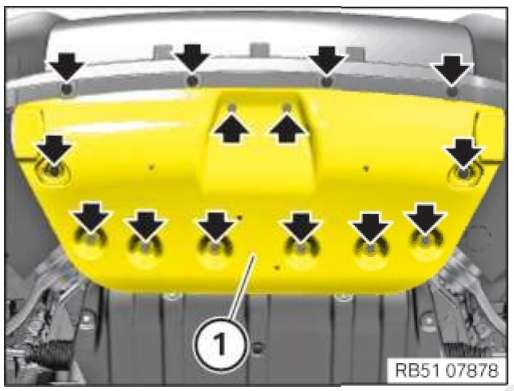
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Radiator on holder — Used in step 15

D6x20 screw		Tightening torque	6 Nm

Air conditioning condenser bracket on body — Used in step 15

		Tightening torque	8 Nm

Cooling module cover on holder — Used in step 15

D6X20		Tightening torque	6 Nm

Fan cowl with electric fan on radiator — Used in step 18

TS6x20		Tightening torque	6,5 Nm

Clean air pipe to upper section of intake filter housing — Used in step 19

Clamp		Tightening torque	3 Nm

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Top rear cross connection to bonnet catch support			Used in step 21
Flat-head screw M6x20		Tightening torque	11,8 Nm

Rear top cross connection to wheel arch carrier support			Used in step 21
M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

Cross connection, top			Used in step 22
M8x20		Tightening torque	28 Nm

Cross connection, top			Used in step 22
M6x20		Tightening torque	11,8 Nm

Bumper buffer device steering on front axle support			Used in step 27
M10		Tightening torque	56 Nm

Underbody protection of the steering gear			Used in step 28
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Wheel arch cover (screws)			Used in step 28
Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support			Used in step 28
M10		Tightening torque	56 Nm

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

Links

Repair instructions	Used in step
17 00 ... Notes for working on cooling system.	14
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
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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

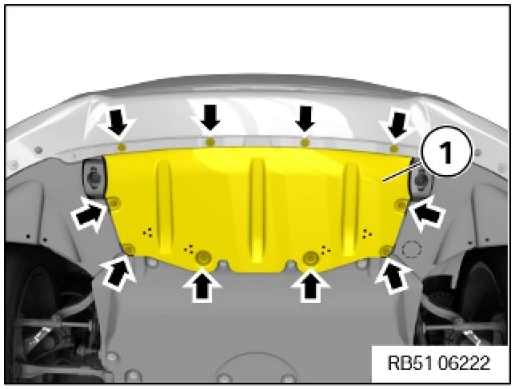
Operating materials	**Used in step**
Main group 17	14

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17 11 100 Removing and installing/replacing coolant expansion tank

PRELIMINARY WORK

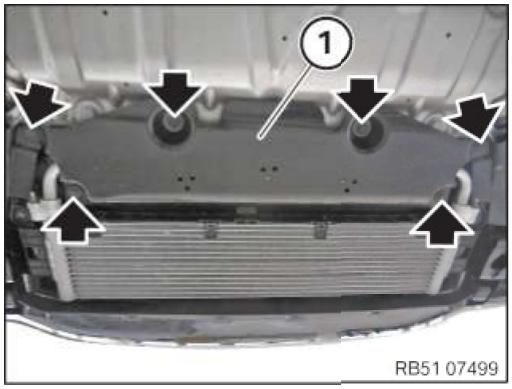
1 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

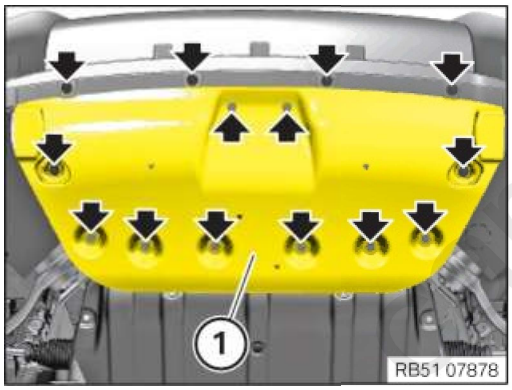
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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

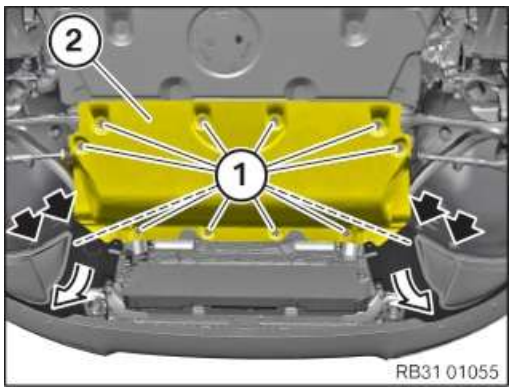


- **Version 3:**

  Remove screws (arrows).

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

2 – Remove the underbody protection of the steering gear



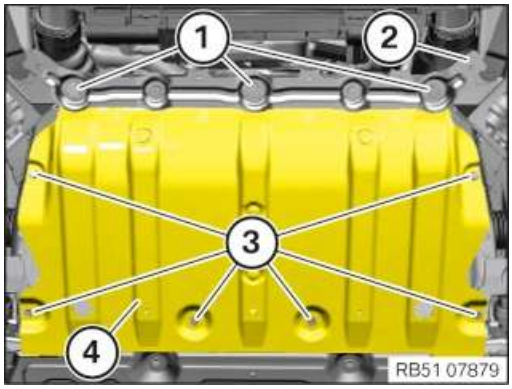
- **Version 1:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

  Loosen screws (3).

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

MAIN WORK

3 – Removing coolant expansion tank of high-temperature coolant circuit

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!

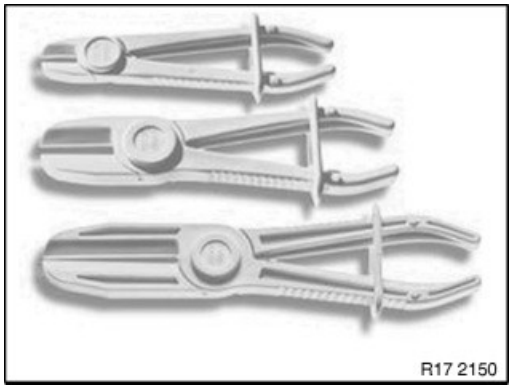
Do not reuse used coolant.

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.

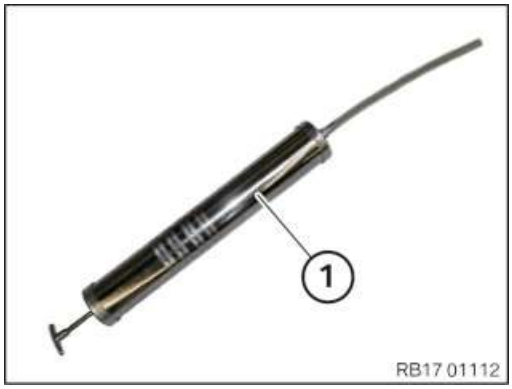
TECHNICAL INFORMATION

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



- Use commercially available disconnection tools to pinch off the coolant lines.

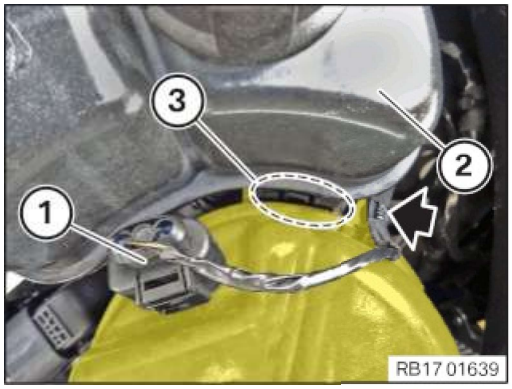
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- Use commercially available syringe (1) or suitable tool to draw off coolant expansion tank.



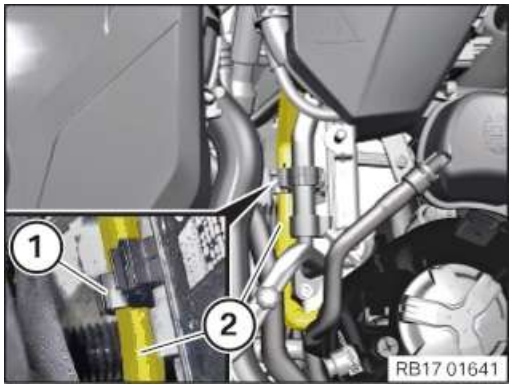
- Open the lid (1) on the coolant expansion tank for the high-temperature coolant circuit.
- Draw off coolant using **standard pump** from the coolant expansion tank for high-temperature coolant circuit and dispose of it.



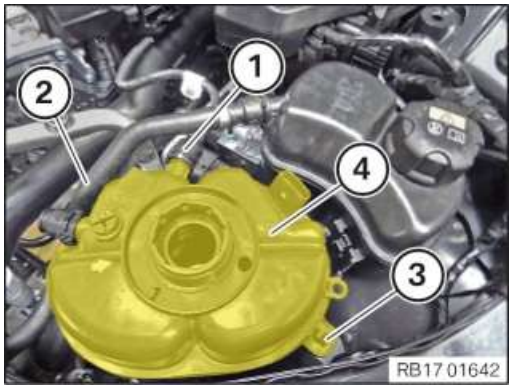
- Unlock plug connection (1) and disconnect.
- Loosen the clamp (arrow).
- Unlock coolant expansion tank (2) for the low-temperature coolant circuit in marked area.



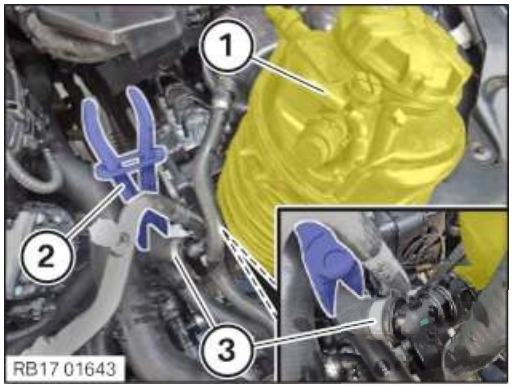
- Feed out and position the coolant expansion tank (1)for the low-temperature coolant circuit from the holders.



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



- Unlock and disconnect the coolant line (1).
- Release coolant line (2) from coolant expansion tank (4) for the high-temperature coolant circuit.
- Unlock lock (3).



TECHNICAL INFORMATION

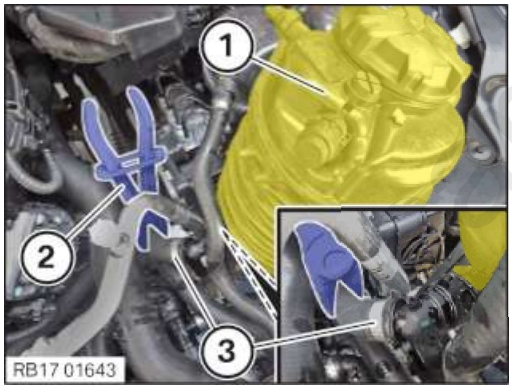
Only flexible hose pipes may be disconnected.

- Feed out and position the coolant expansion tank (1)for the high-temperature coolant circuit from the holders, upwards.
- Disconnect the coolant line (3) using standard disconnection tool (2).
- Unlock and disconnect the coolant line (3).
- Removing coolant expansion tank (1) for the high-temperature coolant circuit.

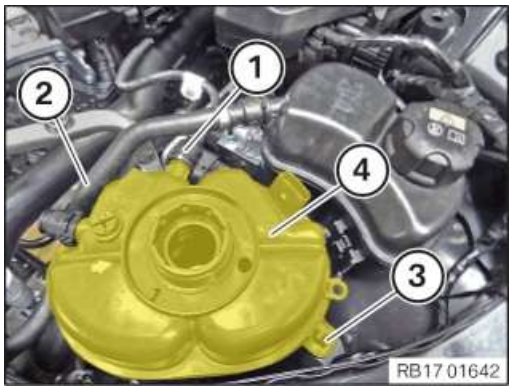
4 – Removing coolant expansion tank of high-temperature coolant circuit

TECHNICAL INFORMATION

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



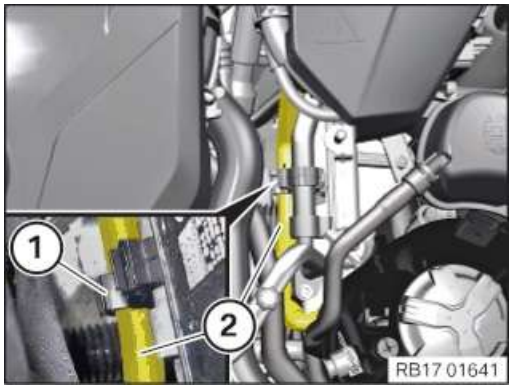
- Feed in and position the coolant expansion tank (1) for the high-temperature coolant circuit.
- Connect and lock the coolant line (3).
- Remove conventional disconnection tool(2).
- Feed in and install the coolant expansion tank (1) for the high-temperature coolant circuit in the holders.



- Ensure that the lock (3)engages audibly.
- Secure coolant line (2) to coolant expansion tank (4) for the high-temperature coolant circuit.
- Connect and lock the coolant line (1).

  The coolant line (1) must audibly engage.

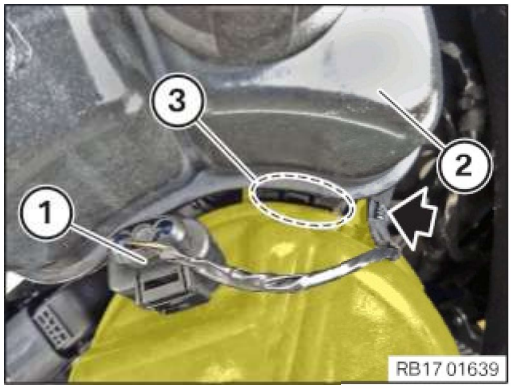
ctdiagn.com



- Feed in the coolant line to the holder (1) and position.
- Lock holder (1).



- Feed in and position the coolant expansion tank (1) for the low-temperature coolant circuit.



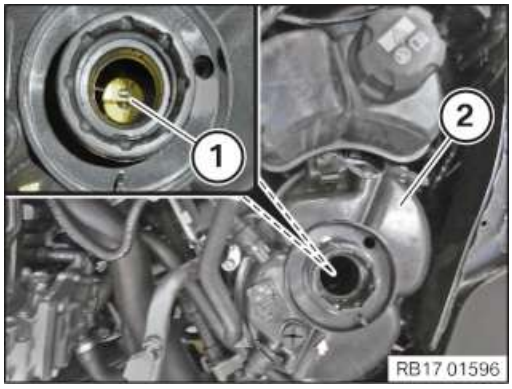
- Feed in and install the coolant expansion tank (2) for the low-temperature coolant circuit to the holders.

  The lock (3) must audibly engage.
- Secure clamp (arrow).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Loosen sealing cap (1).



TECHNICAL INFORMATION

Follow notes for repair work on the cooling system.

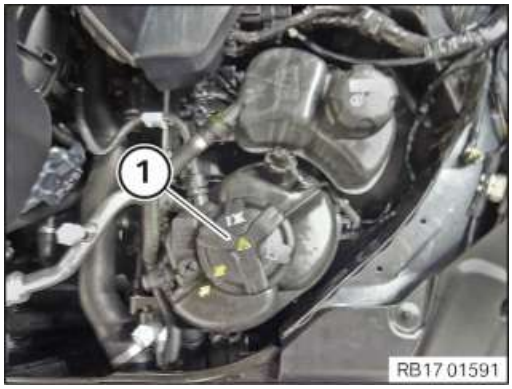
For additional information see:

Main group 17

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

- Adjust the filling level in coolant expansion tank (2) for the high-temperature coolant circuit to **max. mark** (1) .

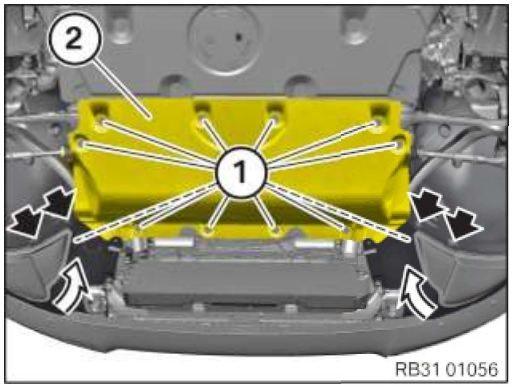
carmanualsdiagram.com



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

POSTPROCESSES

5 – Install the underbody protection of the steering gear



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

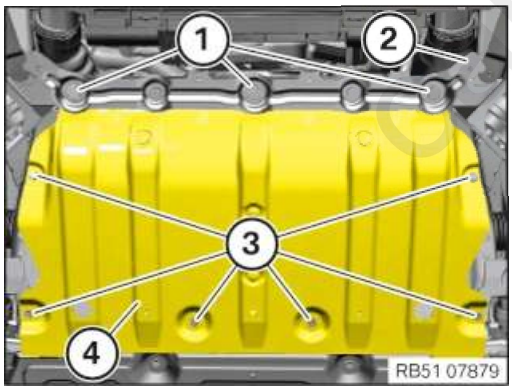
Underbody protection of the steering gear

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

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

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



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

Underbody protection of the steering gear

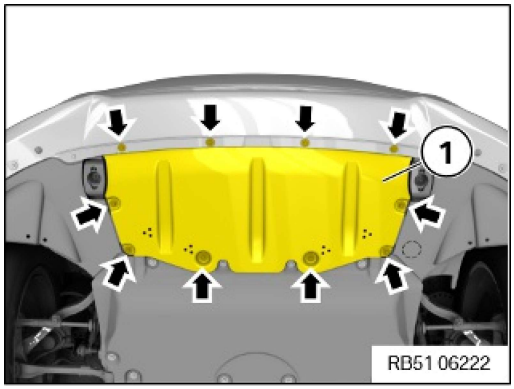
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

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

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

6 – Installing the front underbody protection



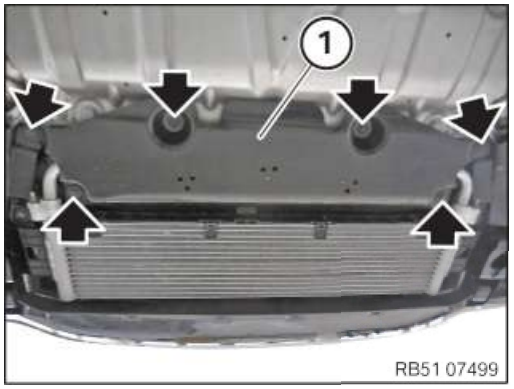
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



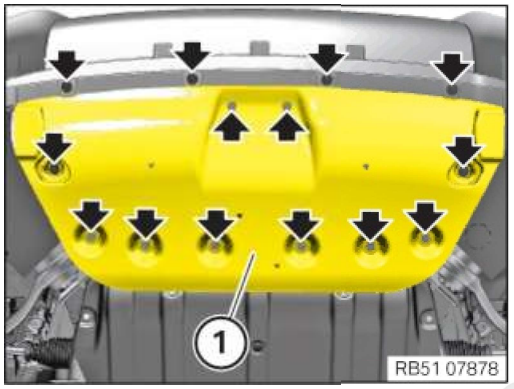
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Underbody protection of the steering gear — Used in step 5

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

Wheel arch cover (screws) — Used in step 5

Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support — Used in step 5

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 6

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

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Links

Operating materials	Used in step
Main group 17	4

cardiagn.com

17 11 103 Removing and installing/replacing coolant expansion tank for the low-temperature coolant circuit

PRELIMINARY WORK

1 – Removing the wheel



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

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



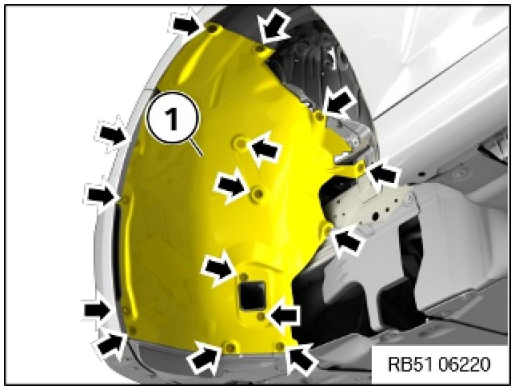
- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter from the tool set .

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

NOTICE

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

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

MAIN WORK

3 – Removing the coolant expansion tank for the low-temperature coolant circuit

WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

TECHNICAL INFORMATION

Use commercially available pinch-off tools to pinch off the coolant hoses.

TECHNICAL INFORMATION

Life-long fill of coolant!

Do not reuse used coolant.

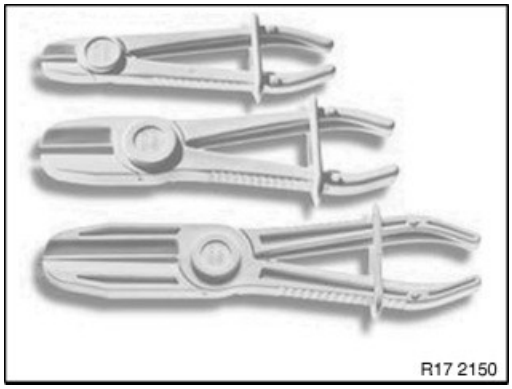
When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

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.

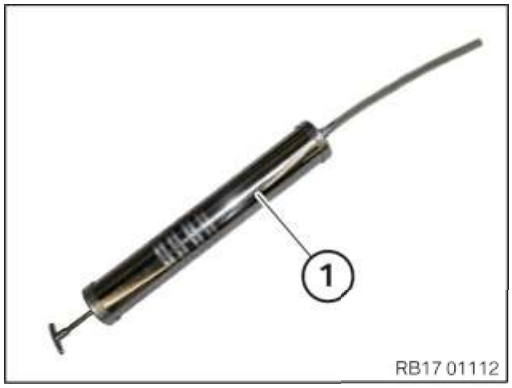
TECHNICAL INFORMATION

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

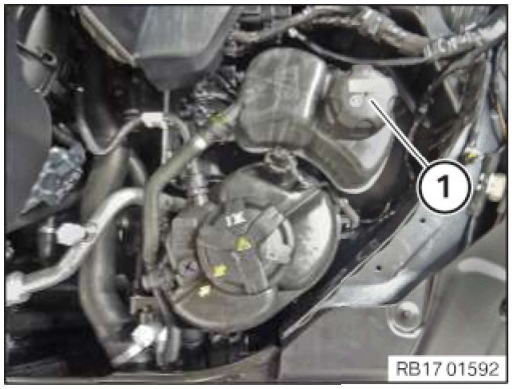
cardiagn.com



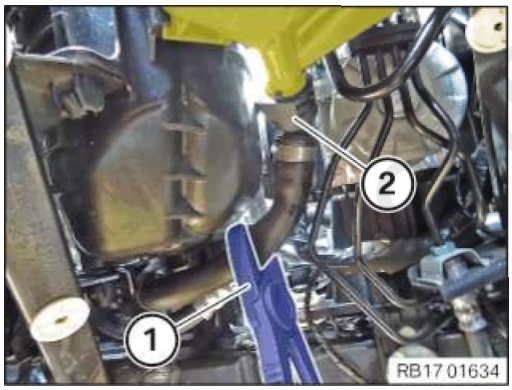
- Use commercially available disconnection tools to pinch off the coolant lines.



- Use commercially available syringe (1) or suitable tool to draw off coolant expansion tank.



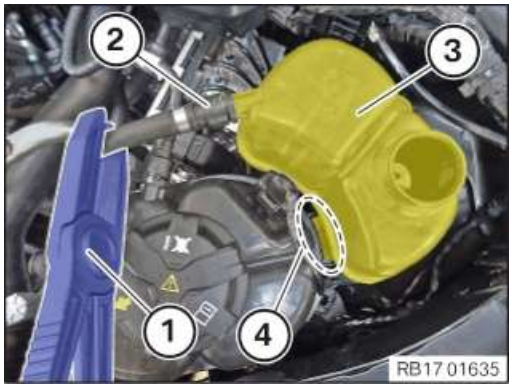
- Open the lid (1) on the coolant expansion tank.
- Draw off coolant using **standard pump** from the coolant expansion tank for low-temperature coolant circuit and dispose it.



TECHNICAL INFORMATION

Only flexible hose pipes may be disconnected.

- Disconnect the coolant line (2) using standard disconnection tool (1).
- Unlock and disconnect the coolant line (2).



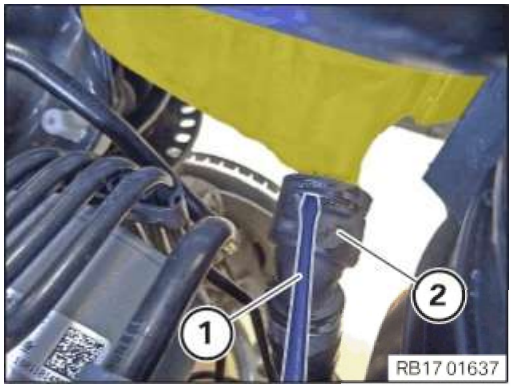
TECHNICAL INFORMATION

Only flexible hose pipes may be disconnected.

- Disconnect the coolant line (2) using standard disconnection tool (1).
- Unlock and disconnect the coolant line (2).
- Unlock coolant expansion tank (3) for low-temperature coolant circuit in marked area (4).



- Pull coolant expansion tank (1) for low-temperature coolant circuit upwards from the holders and position.



- Unlock the coolant lines (2) with a conventional screwdriver (1) and disconnect.



- Guide out and remove the coolant expansion tank (1) for low-temperature coolant circuit toward the top.

4 – Installing the coolant expansion tank for the low-temperature coolant circuit

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.

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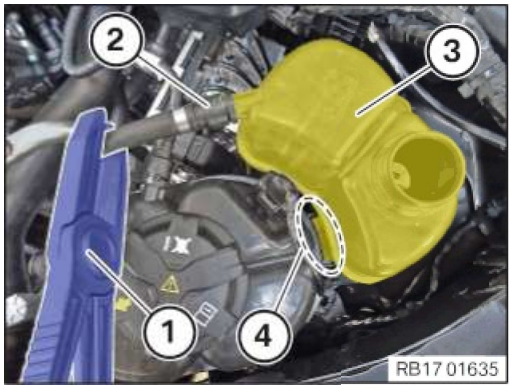


- Feed in and position the coolant expansion tank (1) for the low-temperature coolant circuit.



- Connect and lock the coolant line (1).

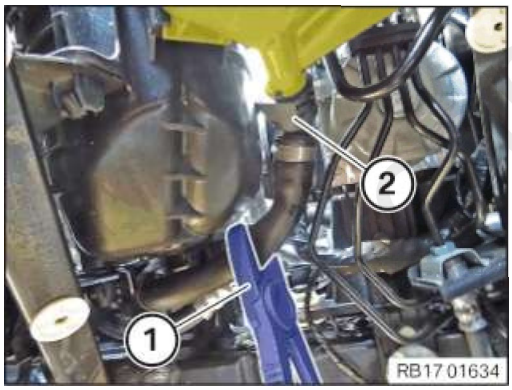
  The coolant line (1) must audibly engage.



- Guide in and install coolant expansion tank (3) for the low-temperature coolant circuit in the holders.

  The lock must engage audibly in the marked area (4).
- Connect and lock the coolant line (2).

  The coolant line (2) must audibly engage.
- Remove conventional disconnection tool(1).



- Connect and lock the coolant line (2).

  The coolant line (2) must audibly engage.
- Remove conventional disconnection tool(1).



TECHNICAL INFORMATION

Follow notes for repair work on the cooling system.

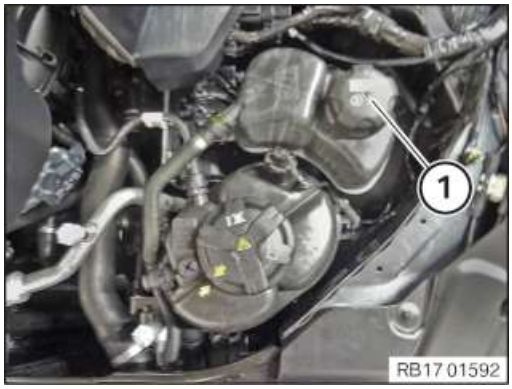
For additional information see:

Main group 17

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

- Fill up coolant expansion tank (2) for the low-temperature coolant circuit with coolant up to the **maximum mark** (1).

rdiagn.com



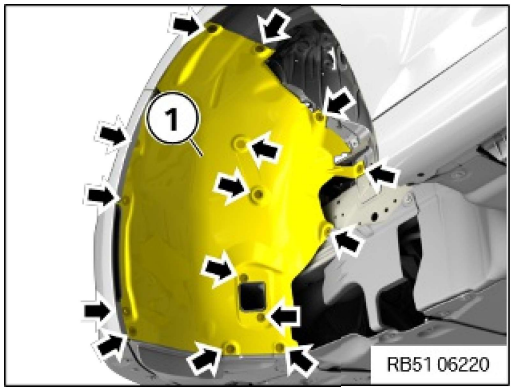
- Close sealing cap (1).

POSTPROCESSES

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

NOTICE

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



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

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

6 – Mounting the wheel



TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

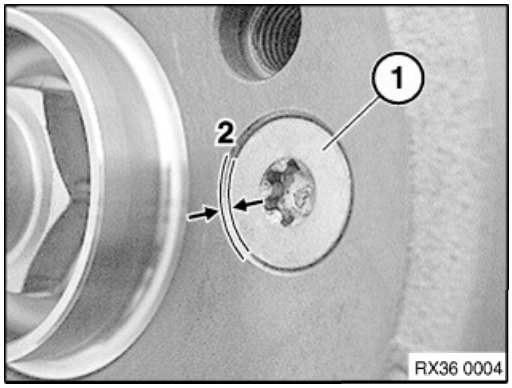
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

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- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

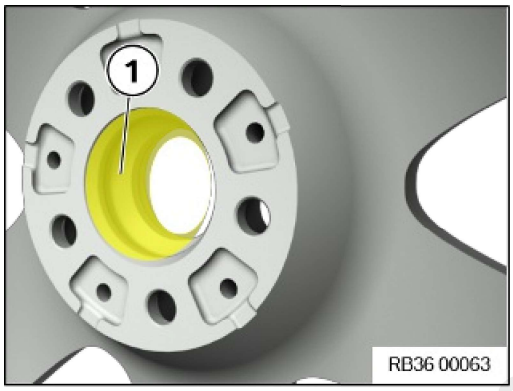
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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



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

Expendable materials

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

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

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



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

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

Additional Information

Overview of Tightening Torques

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Overview of Tightening Torques

Wheel arch trim panel, front — Used in step 5

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Brake disc to front wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 6

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

Overview of Special Tools

2 344 011 Tool

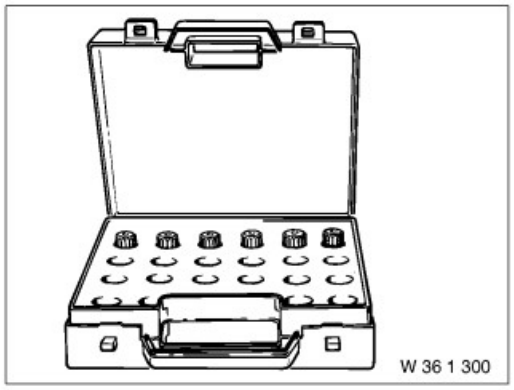


Common — Used in step 6

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common — Used in step 1

Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

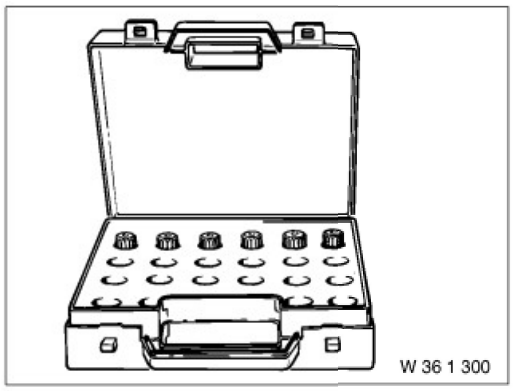
carsiagn.com

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

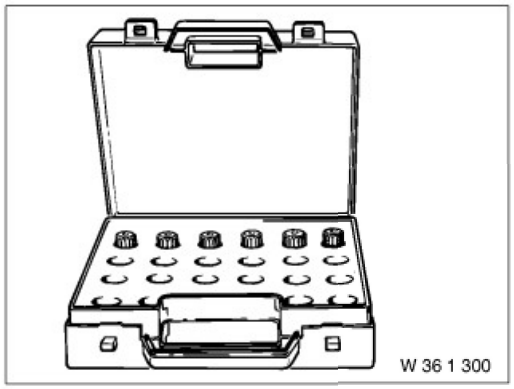
cardiagn.com

0 495 228 (36 1 331) Wheel stud



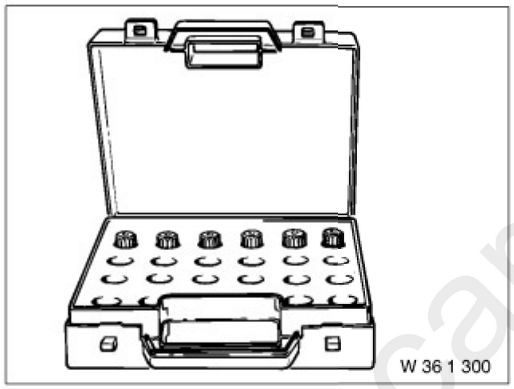
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



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

Links

Operating materials	Used in step
Main group 17	4

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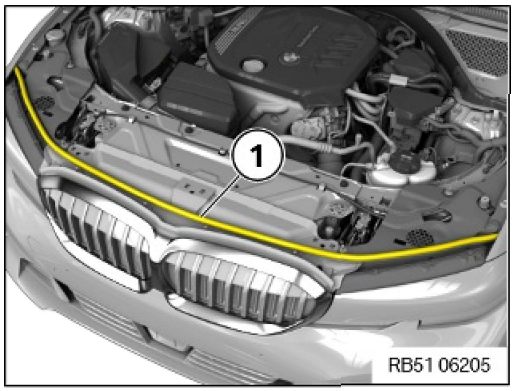
17 11 035 Removing and installing/replacing fan cowl with electric fan

TECHNICAL INFORMATION

- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!

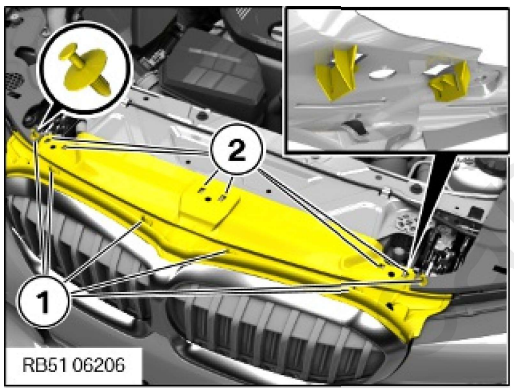
PRELIMINARY WORK

1 – Remove the seal for the bonnet in front



- Pull off front bonnet seal (1) upwards.

2 – Removing the centre engine compartment cover



- Detach all expanding rivets (1).
- Release the cover of the centre engine compartment with the latch mechanisms (2) .
- Feed the cover for the centre engine compartment out to the rear.

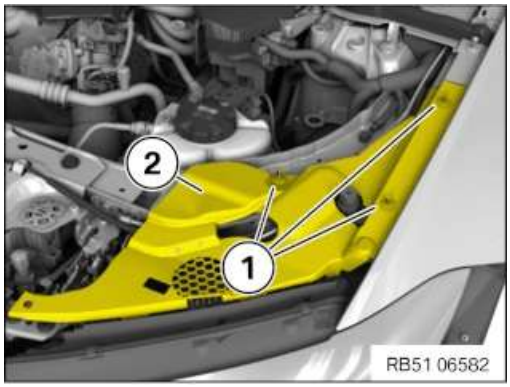
3 – Partially remove the top left and right cover in the engine compartment

NOTICE

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

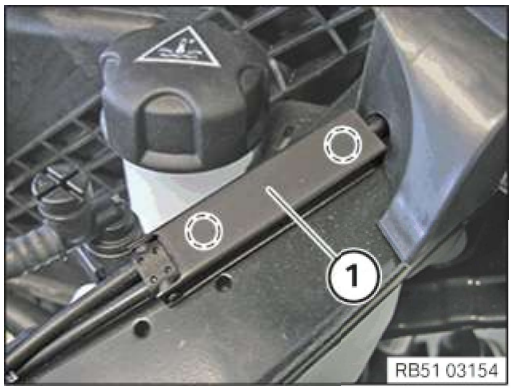
▸ **Removing the cover in the engine compartment on top partially**

mydiagn.com

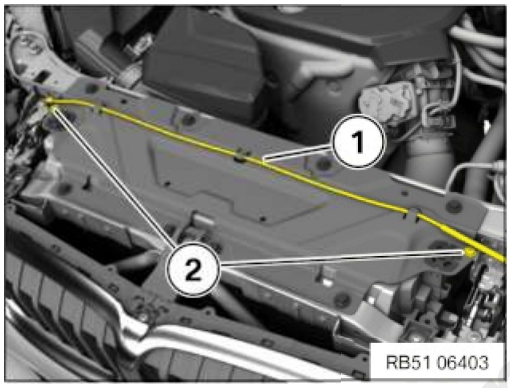


- Loosen the expanding rivet (1).
- Remove the cover in the engine compartment on top (2) partially.

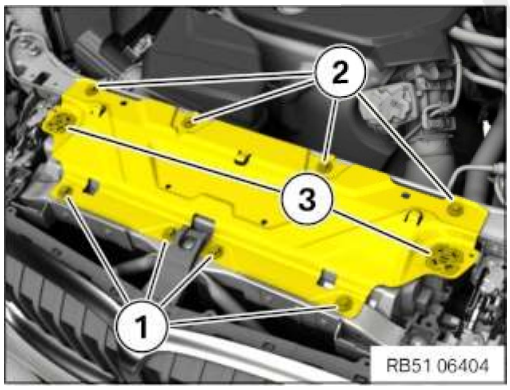
4 – Removing the top cross connection



- Release the housing for the coupling of the Bowden cables (1) from the body.

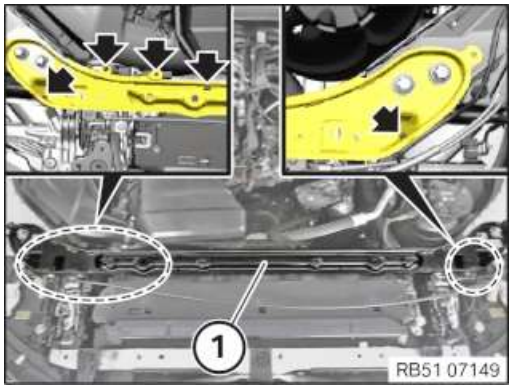


- Detach Bowden cable (1) at the top cross connection.
- Loosen screws (2).



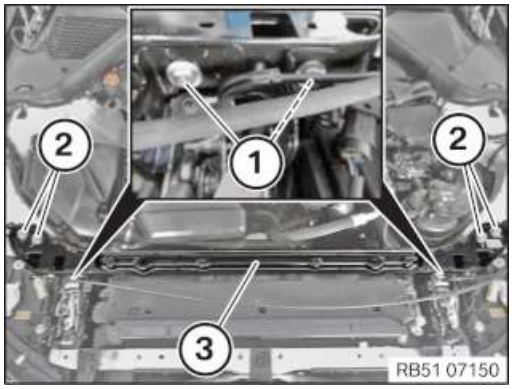
- Loosen screws (1) and (2).
- Remove the top cross connection with the holders(3) towards the top.

5 – Remove the rear top cross connection



- Release the clips (arrows) in the marked areas from the top rear cross connection (1).

rdiagn.com



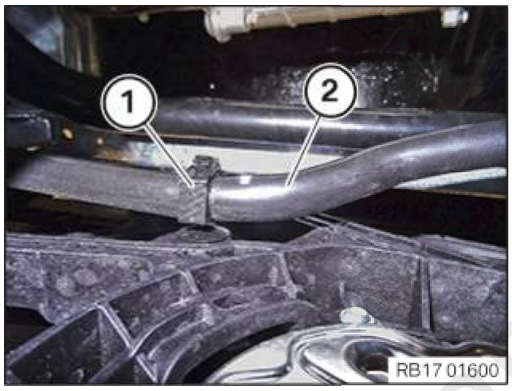
- Loosen screws (1).
- Loosen screws (2).
- Guide out and remove top rear cross connection (3).

MAIN WORK

6 – Remove fan cowl.

TECHNICAL INFORMATION

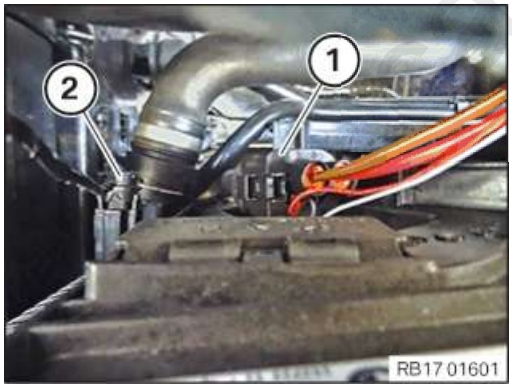
- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!



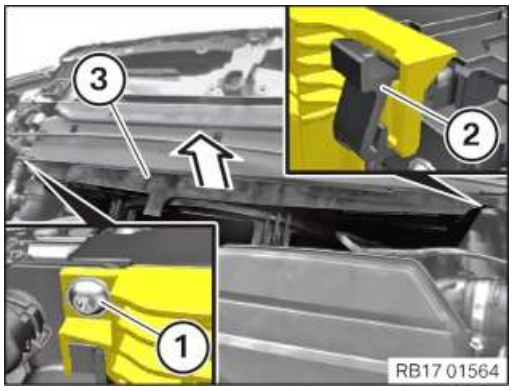
- **If installed:** Release transmission oil line (2).

  Unlock the holder (1).

  Thread out transmission oil line (2) and set aside.



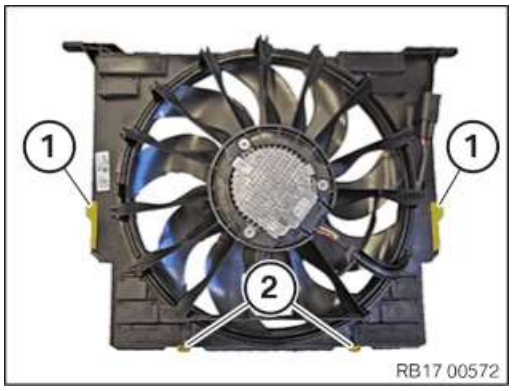
- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.



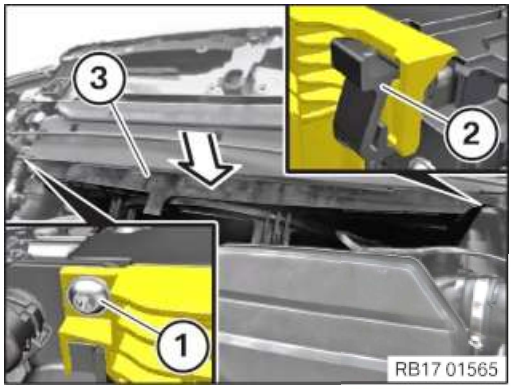
- Loosen screw (1).
- Unlock lock (2).
- Guide out and remove fan cowl (3) **carefully** in the direction of the arrow.

7 – Install fan cowl

7 – Install fan cowl



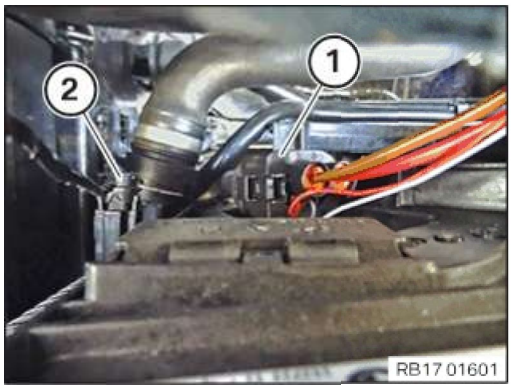
- Feed guides (1) into the radiator.
- Feed guides (2) into the charge air cooler.



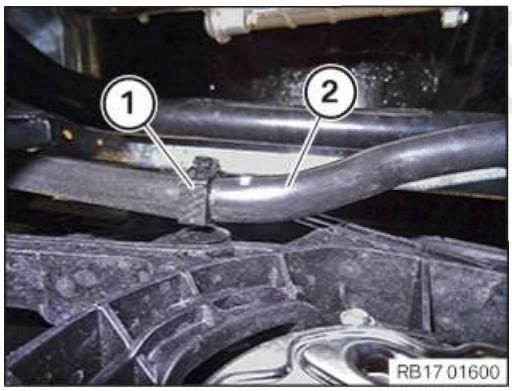
- Guide in and install fan cowl (3) **carefully** in the direction of the arrow.
- Ensure that the lock (2)engages audibly.
- Tighten down screw (1).

Fan cowl with electric fan on radiator

TS6x20		Tightening torque	6,5 Nm



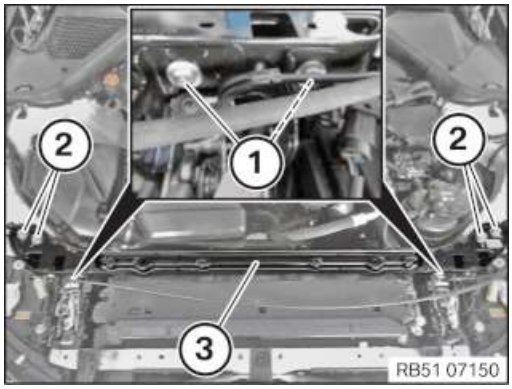
- Connect connectors (2) and lock.
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.
  The connector (1) must engage audibly.



- **If installed:** Secure the transmission oil line (2).
  Insert and install the transmission oil line (2).
  Lock holder (1).

POSTPROCESSES

8 – Install the rear top cross connection



- Guide in and position the top rear cross connection (3).
- Tighten the screws (1).

Top rear cross connection to bonnet catch support

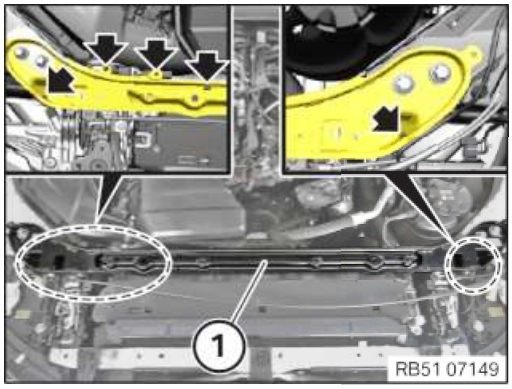
Flat-head screw M6x20		Tightening torque	11,8 Nm

- Renew screws (2).

  Parts: Bolts
- Tighten the screws (2).

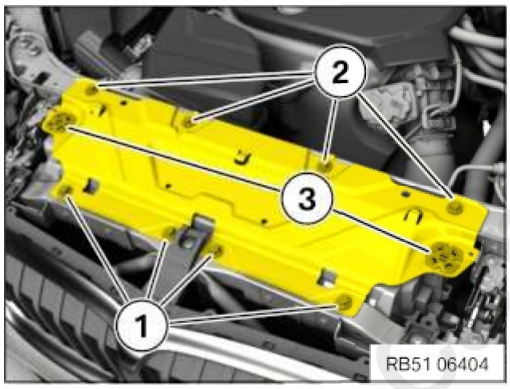
Rear top cross connection to wheel arch carrier support

M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °



- Secure the clips (arrows) in the marked areas to the top rear cross connection (1).

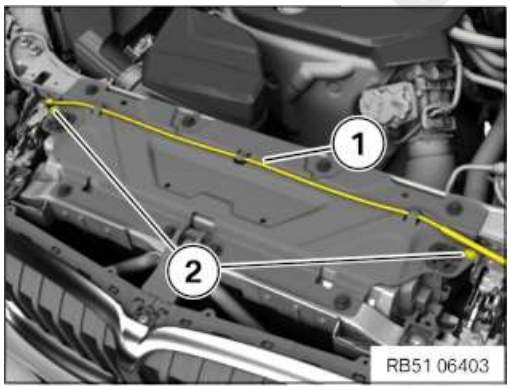
9 – Installing the top cross connection



- Set and position upper cross connection with holders (3) from above.
- Tighten down screws (1) and (2).

Cross connection, top

M8x20		Tightening torque	28 Nm



- Tighten down screws (2).

Cross connection, top

M6x20		Tightening torque	11,8 Nm

- Attach Bowden cable (1) on the upper cross connection.

Offroadgn.com



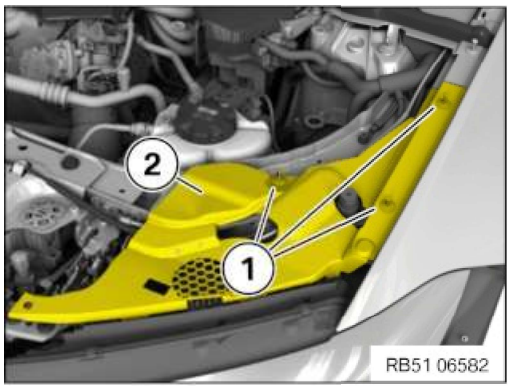
- Clip in the housing for the coupling of the Bowden cables (1).

10 – Install the cover in the engine compartment at top left and right partially

NOTICE

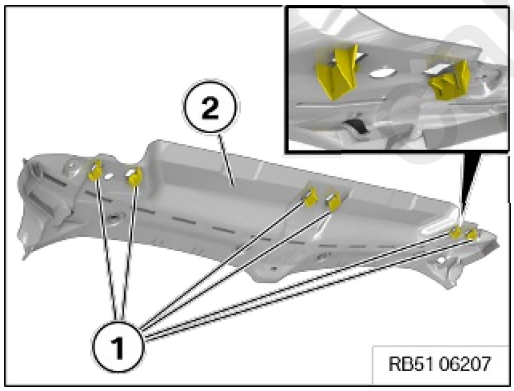
Description is for left component only. Procedure on the right side is identical.

▸ **Installing the cover in the engine compartment on top partially**



- Install the cover in the engine compartment on top (2).
- Secure expanding rivet (1).

11 – Installing cover for engine compartment centre



Check

- Check latch mechanisms (1) of cover for engine compartment centre (2) for damage.

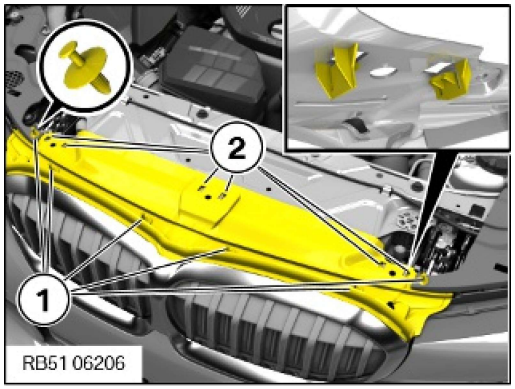
Result

» The latch mechanism (1) is damaged.

Measure

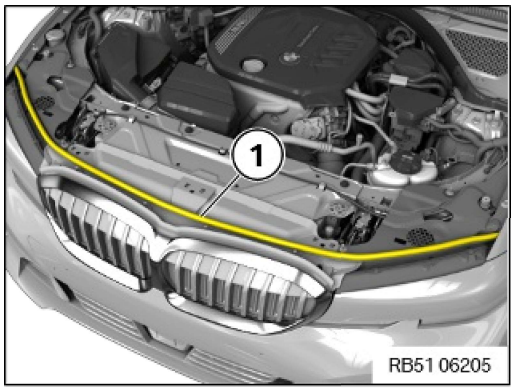
- Renew cover for engine compartment centre (2).

cardiagn.com



- Guide in the cover for the engine compartment centre from the rear and position it.
- Clip in the cover for the engine compartment centre with latch mechanisms (2).
- Mount all expanding rivets (1).

12 – Install the seal for the front bonnet



- Position the bonnet seal(1) and connect it on the mounting on the bumper and on the headlights.

Additional Information

Overview of Tightening Torques

Fan cowl with electric fan on radiator — Used in step 7

TS6x20		Tightening torque	6,5 Nm

Top rear cross connection to bonnet catch support — Used in step 8

Flat-head screw M6x20		Tightening torque	11,8 Nm

Rear top cross connection to wheel arch carrier support — Used in step 8

M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

Cross connection, top — Used in step 9

M8x20		Tightening torque	28 Nm

Cross connection, top — Used in step 9

M6x20		Tightening torque	11,8 Nm

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64 53 ... Instructions for replacement of air conditioning capacitors and radiator/coolers

Attention!

Even when they are correctly installed or due to normal driving, radiators (oil cooler, radiator, charge air cooler) or air conditioning condensers may show slight impressions or deformations on their discs (1).

A slight sag with a large radius for the air conditioning condenser is also permissible.

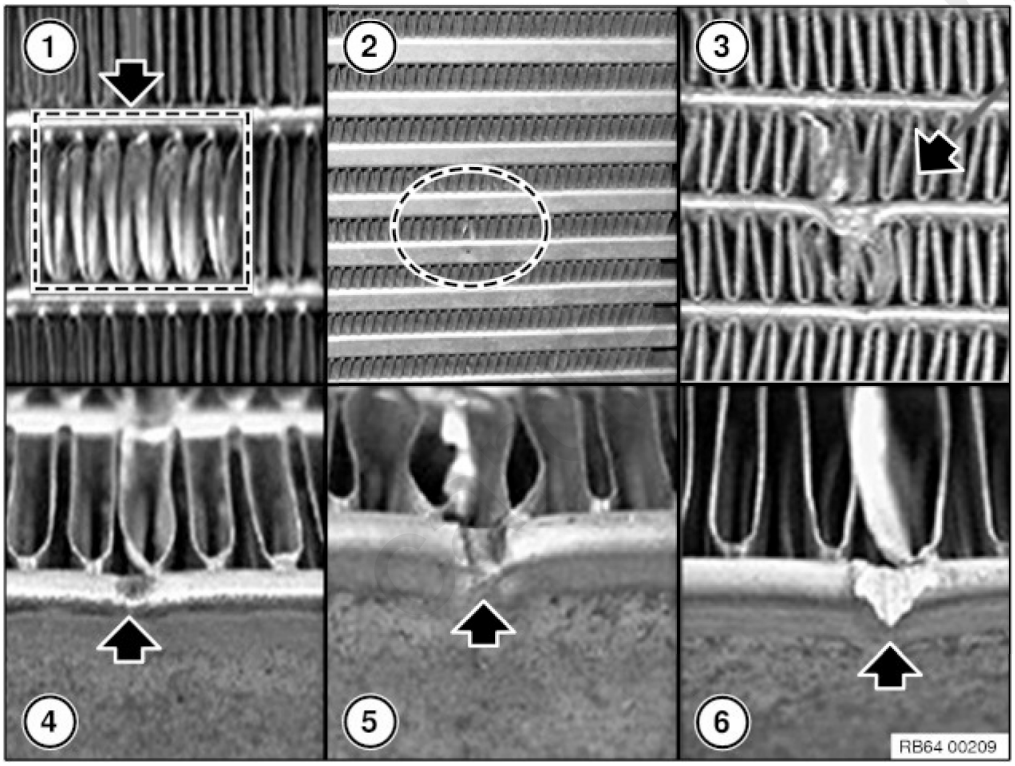
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig. (1) can be bent back with a standard fin comb..

Damage to lines carrying media or on the flat pipe require exchange of the radiator or air conditioning condenser (2-6).



Dryer flask (integrated in the air conditioning condenser):

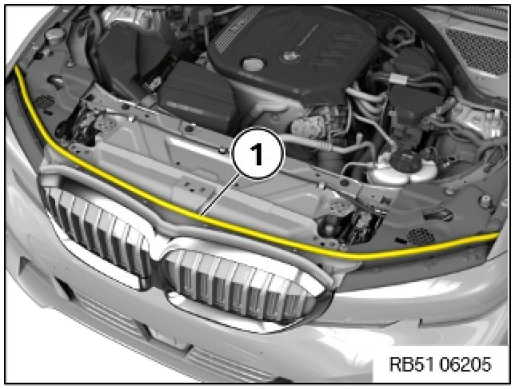
Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

17 21 010 Removing and installing/replacing the transmission oil cooler

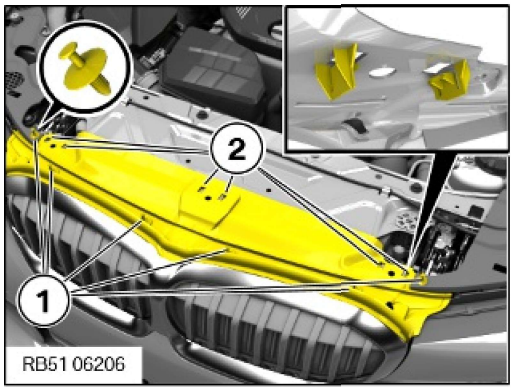
PRELIMINARY WORK

1 – Remove the seal for the bonnet in front



- Pull off front bonnet seal (1) upwards.

2 – Removing the centre engine compartment cover



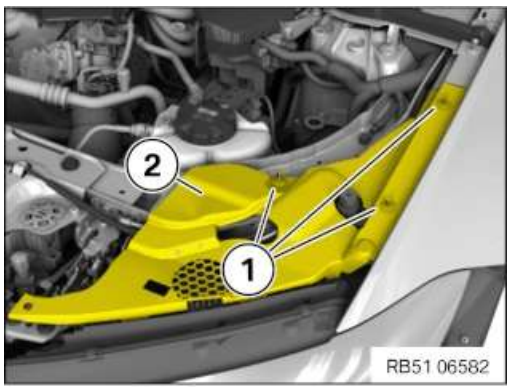
- Detach all expanding rivets (1).
- Release the cover of the centre engine compartment with the latch mechanisms (2) .
- Feed the cover for the centre engine compartment out to the rear.

3 – Partially remove the top left and right cover in the engine compartment

NOTICE

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

▸ **Removing the cover in the engine compartment on top partially**



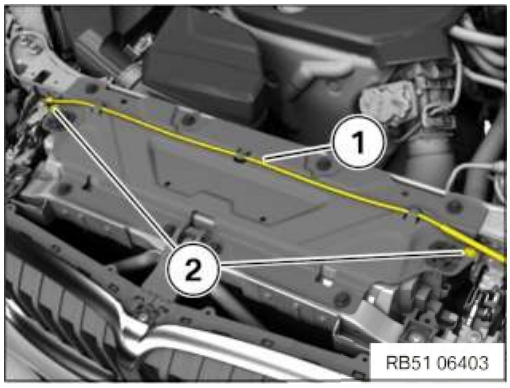
- Loosen the expanding rivet (1).
- Remove the cover in the engine compartment on top (2) partially.

4 – Removing the top cross connection

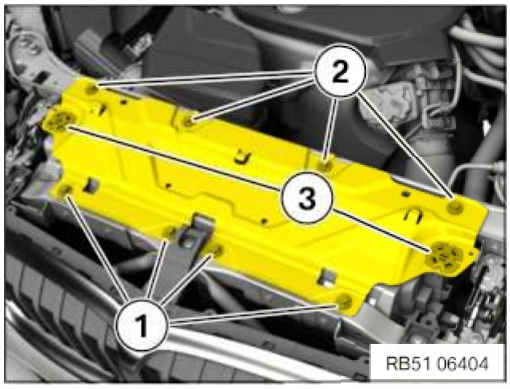
cardiagn.com



- Release the housing for the coupling of the Bowden cables (1) from the body.

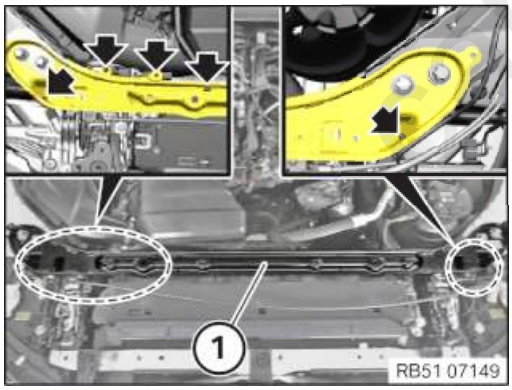


- Detach Bowden cable (1) at the top cross connection.
- Loosen screws (2).

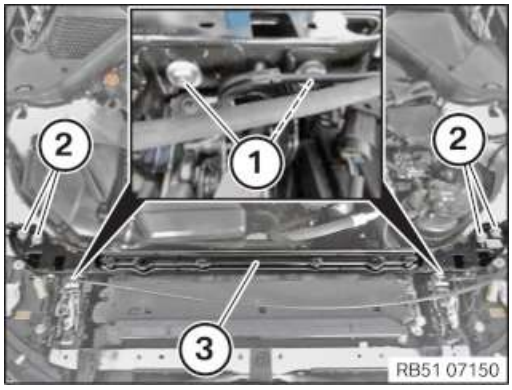


- Loosen screws (1) and (2).
- Remove the top cross connection with the holders(3) towards the top.

5 – Remove the rear top cross connection



- Release the clips (arrows) in the marked areas from the top rear cross connection (1).



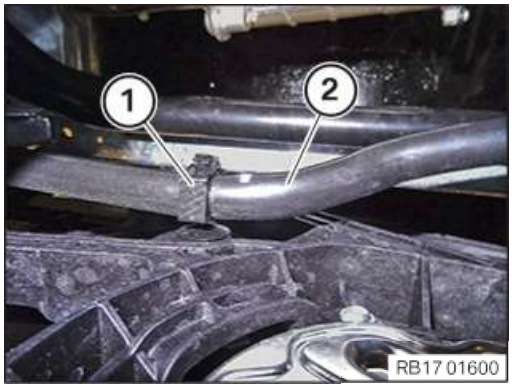
- Loosen screws (1).
- Loosen screws (2).
- Guide out and remove top rear cross connection (3).

6 – Remove fan cowl.

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TECHNICAL INFORMATION

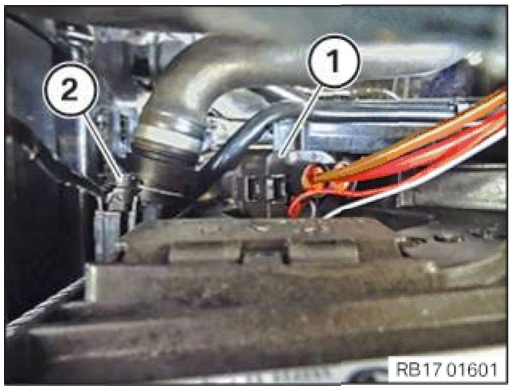
- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!



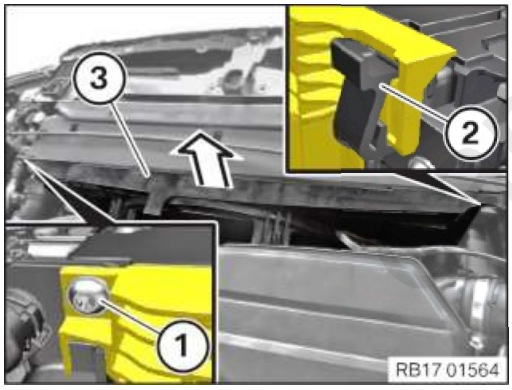
- **If installed:** Release transmission oil line (2).

  Unlock the holder (1).

  Thread out transmission oil line (2) and set aside.

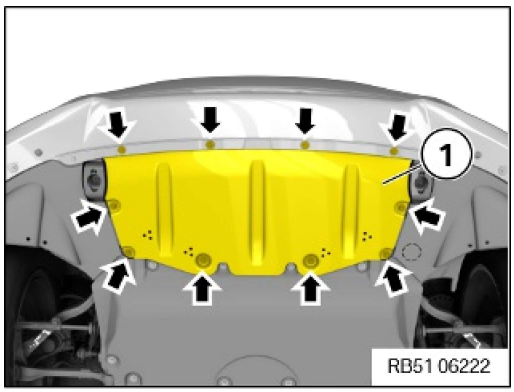


- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.



- Loosen screw (1).
- Unlock lock (2).
- Guide out and remove fan cowl (3) **carefully** in the direction of the arrow.

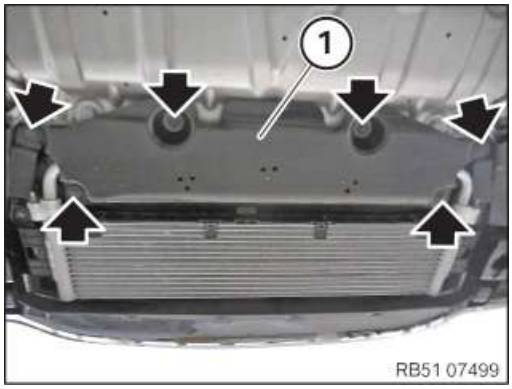
7 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

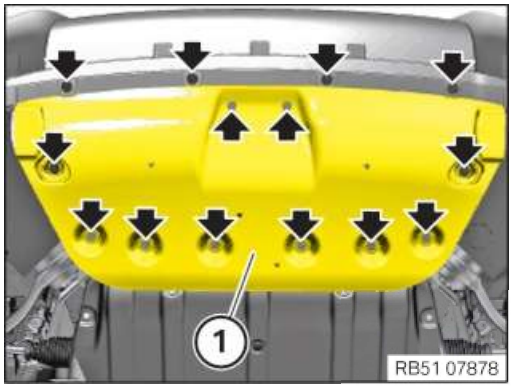
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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

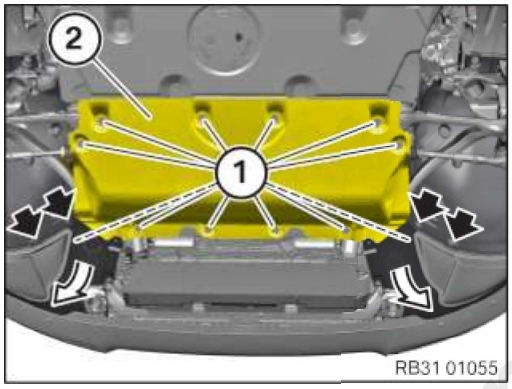


- **Version 3:**

  Remove screws (arrows).

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

8 – Remove the underbody protection of the steering gear



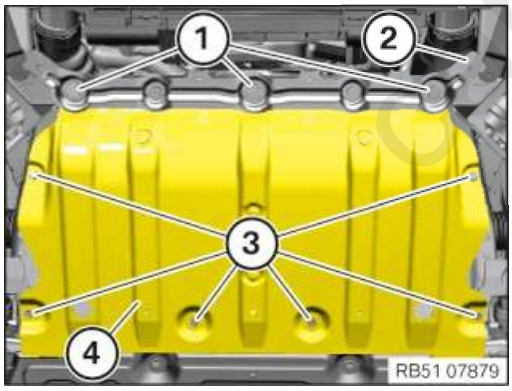
- **Version 1:**

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

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

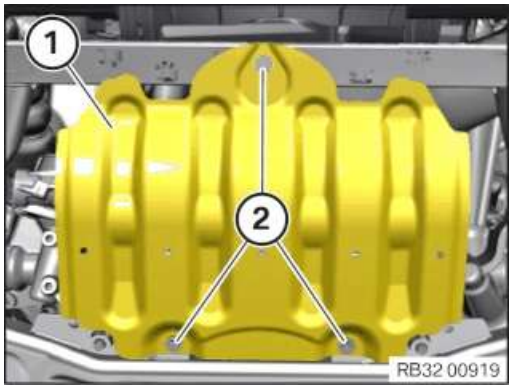
  Loosen screws (3).

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

9 – If installed: Removing the steering start protection

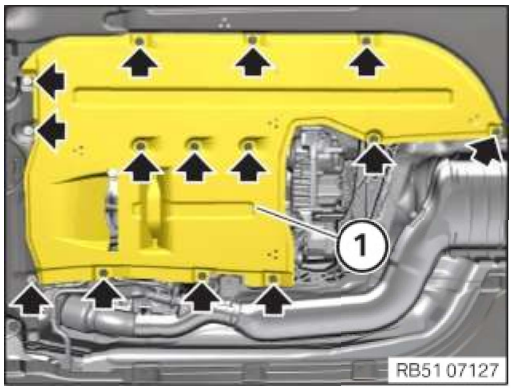
Prerequisite

The front underbody protection is removed.



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

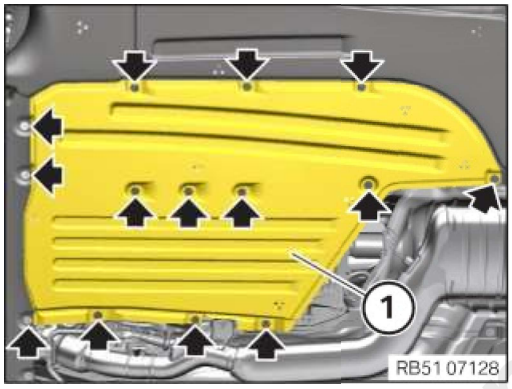
10 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



- **Version 2:**

  Remove screws (arrows).

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

11 – Draining the coolant from the low-temperature cooling system

WARNING

Hot surfaces.

Risk of burning!

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

TECHNICAL INFORMATION

Life-long fill of coolant!

Do not reuse used coolant.

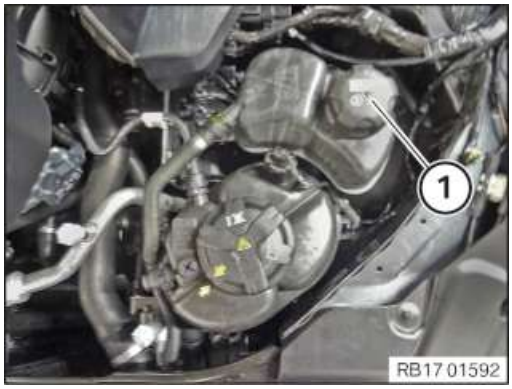
When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

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.

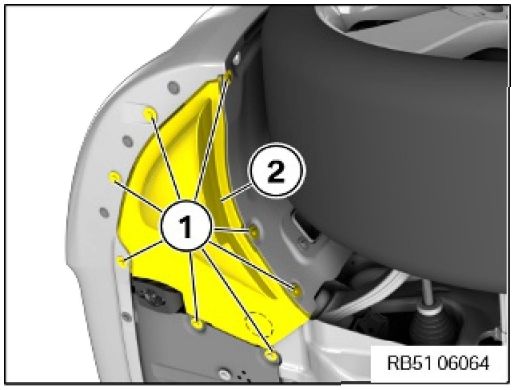
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TECHNICAL INFORMATION

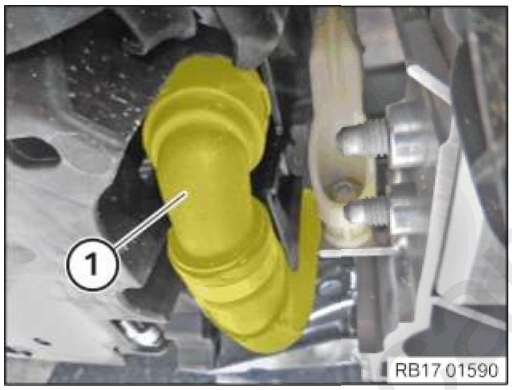
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Loosen sealing cap (1).



- Loosen screws (1).
- Guide out and remove bottom left cover (2) to the front.



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

12 – Remove the radiator of the low-temperature coolant circuit

WARNING

Hot surfaces.

Risk of burning!

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

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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

Follow notes for repair work on the cooling system.

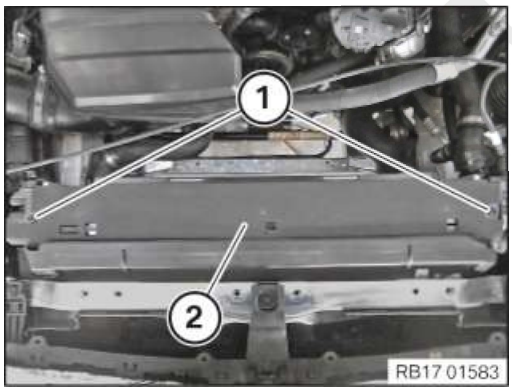
For additional information see:

Main group 17

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

TECHNICAL INFORMATION

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

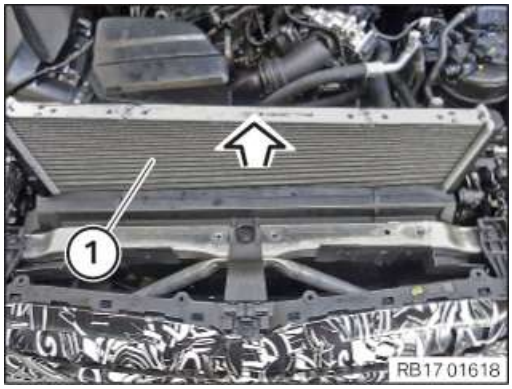


- Loosen screws (1).
- Guide out and remove top cover (2).



- Unlock and disconnect the coolant line (1).

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- Guide out and remove the radiator of low-temperature coolant circuit (1) **carefully** in the direction of the arrow.

MAIN WORK

13 – Remove transmission oil cooler

WARNING

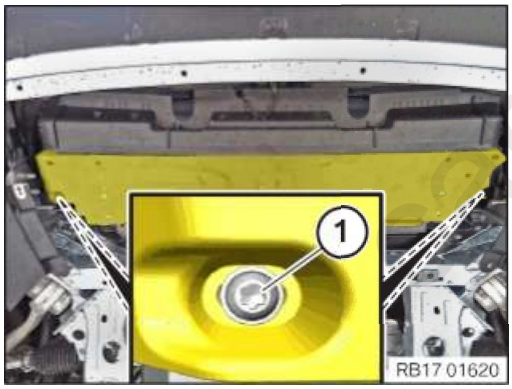
Hot surfaces.

Risk of burning!

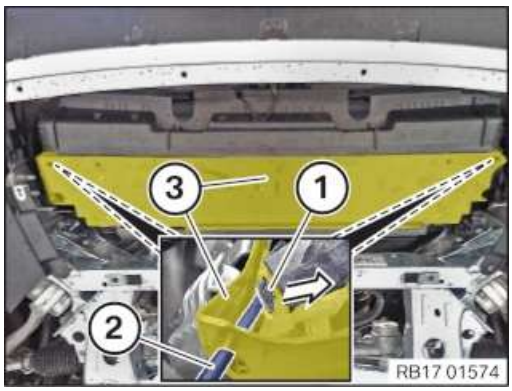
- Perform all work only on components that have cooled down.

TECHNICAL INFORMATION

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

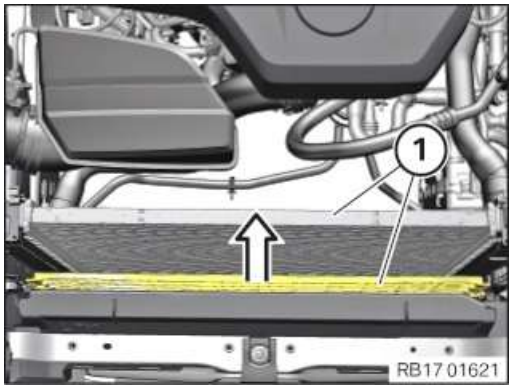


- Loosen screws (1).



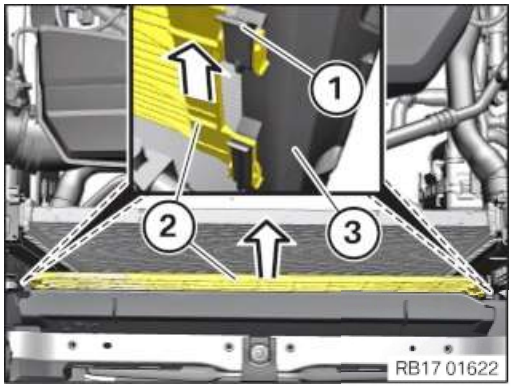
- Unlock lock (1) in the direction of the arrow using a standard screwdriver (2).
- Guide out and remove cover (3) downwards.

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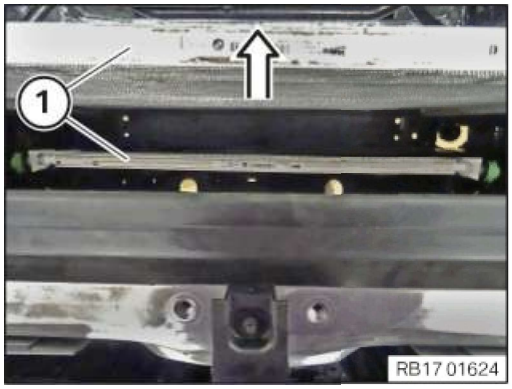


- For better accessibility:

  Tilt and hold cooling module (1) in the direction of the arrow.

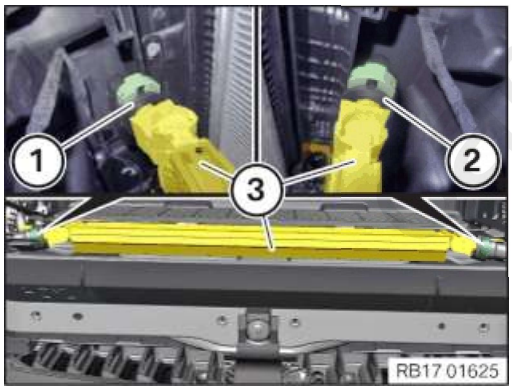


- Unlock lock (1).
- Guide out and remove stone chip guard (2) from holders (3) in the direction of the arrow.

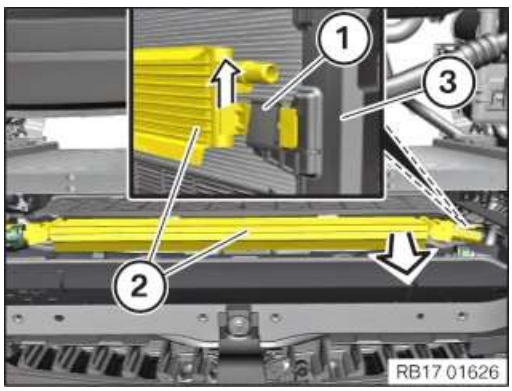


- For better accessibility:

  Tilt and hold cooling module (1) in the direction of the arrow.

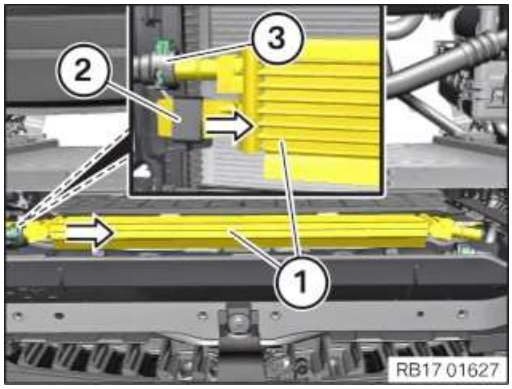


- Unlock the right transmission oil line (1) and disconnect it from transmission oil cooler (3).
- Catch and dispose of escaping transmission oil.
- Unlock the left transmission oil line (2) and disconnect it from transmission oil cooler (3).
- Catch and dispose of escaping transmission oil.

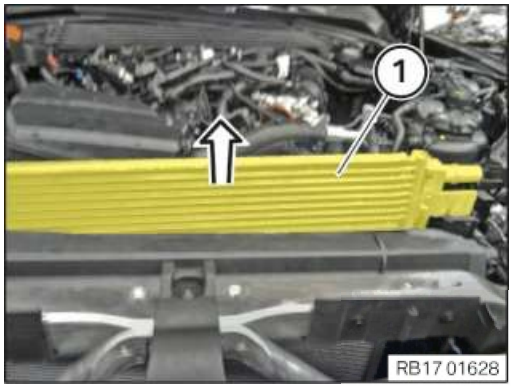


- Unlock lock (1).
- Guide out transmission oil cooler (2) from holder (3) in the direction of the arrow and set it aside.

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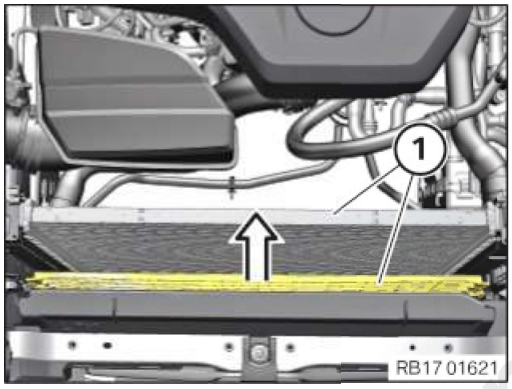


- Guide out transmission oil cooler (1) from holder (2) and transmission oil line (3) in the direction of the arrow.



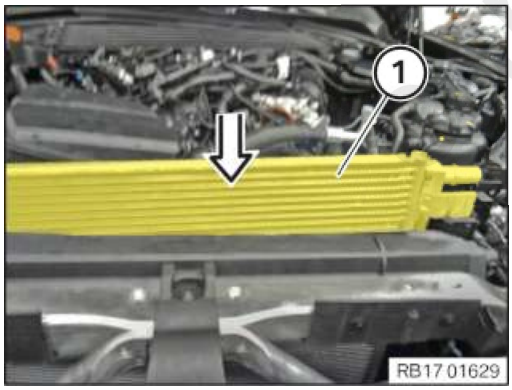
- Guide out and remove transmission oil cooler (1) in the direction of the arrow.

14 – Install transmission oil cooler

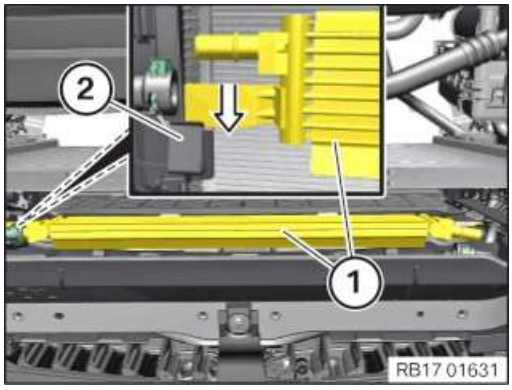


- For better accessibility:

  Tilt and hold cooling module (1) carefully in the direction of the arrow.

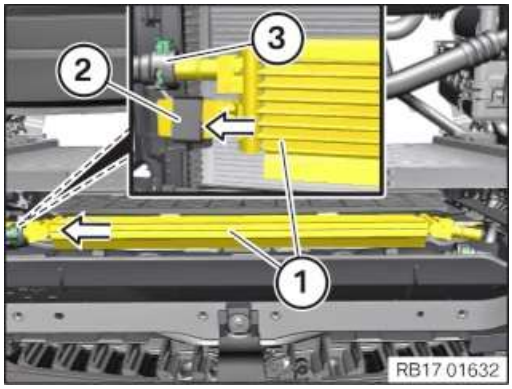


- Feed in the transmission oil cooler(1) in the direction of the arrow.

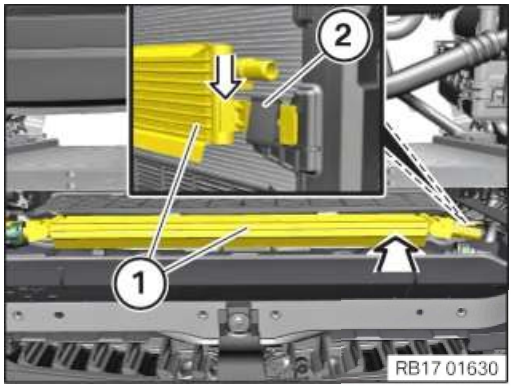


- Feed in the transmission oil cooler(1) on the holder (2) in the direction of the arrow.

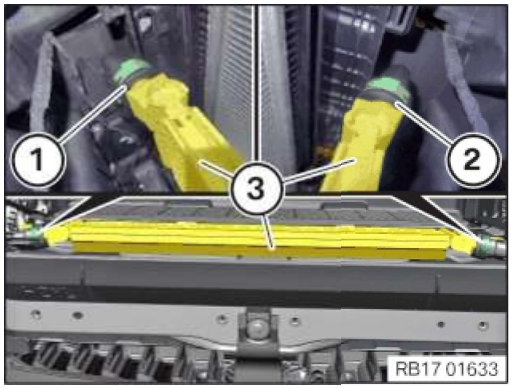
.diagn.com



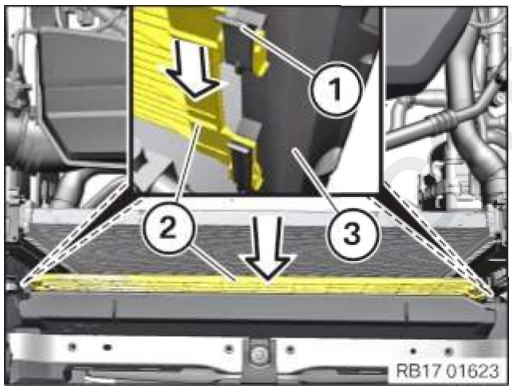
- Feed in the transmission oil cooler(1) on the holder (2) and the transmission oil line(3)in the direction of the arrow.



- Feed in and install the transmission oil cooler(1) on the holder (2) in the direction of the arrow.

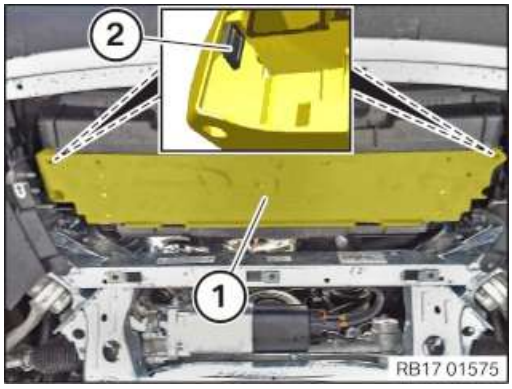


- Connect and lock the transmission oil line(2) with the transmission oil cooler (3).
- Connect and lock the transmission oil line(1) with the transmission oil cooler (3).



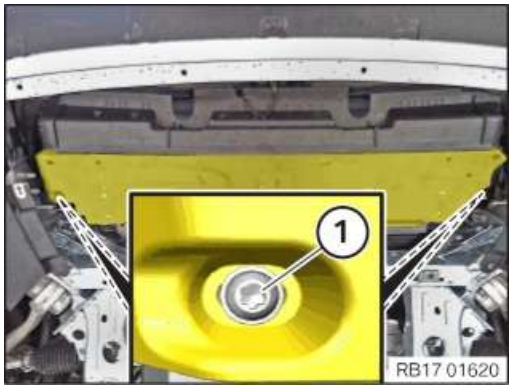
- Feed in the stone chip guard (2) into holders (3) in the direction of the arrow and install.

  The locks (1) must engage audibly.



- Guide in and install cover (1).
- Ensure that locks (2) engage correctly.

.com



- Tighten the screws (1).

Cooling module cover on holder

D6X20		Tightening torque	6 Nm

POSTPROCESSES

15 – Install the radiator of the low-temperature coolant circuit

WARNING

Hot surfaces.

Risk of burning!

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

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

Follow notes for repair work on the cooling system.

For additional information see:

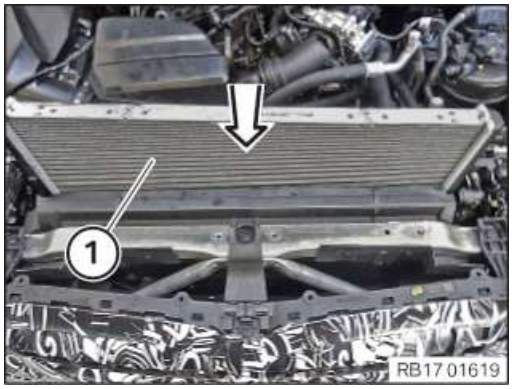
Main group 17

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

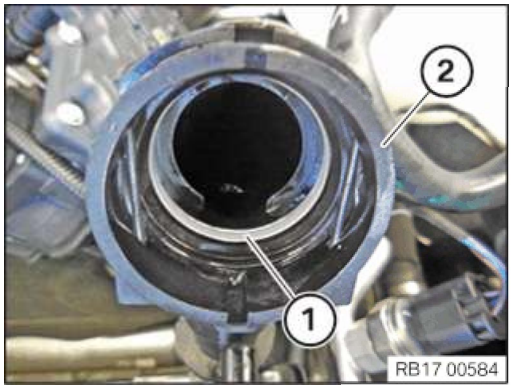
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TECHNICAL INFORMATION

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



- Guide in and install the radiator of low-temperature coolant circuit (1) **carefully** in the direction of the arrow.



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

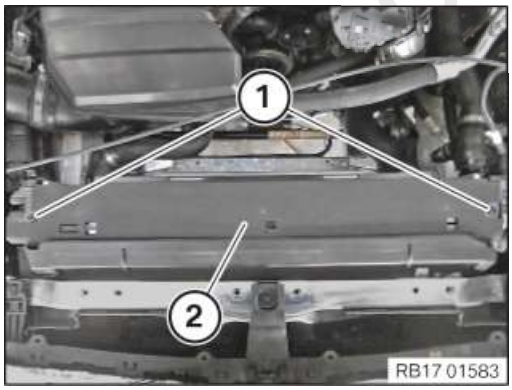


TECHNICAL INFORMATION

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

- Connect and lock the coolant line (1).

  The coolant line (1) must audibly engage.



- Guide in and install the top cover (2).
- Tighten the screws (1).

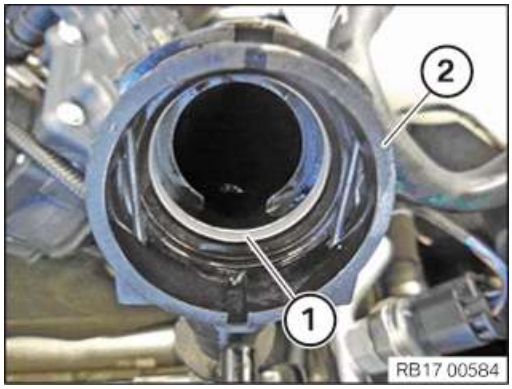
Cooling module cover on holder

D6X20		Tightening torque	6 Nm

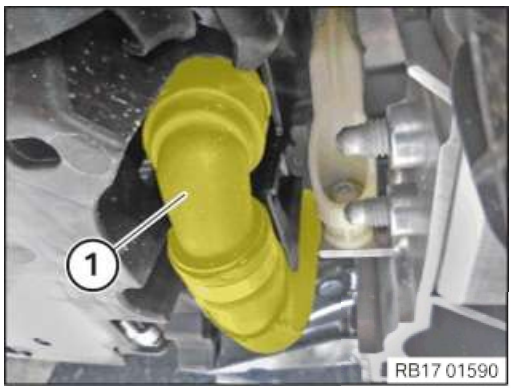
16 – Connecting the coolant lines for the low-temperature coolant circuit

TECHNICAL INFORMATION

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

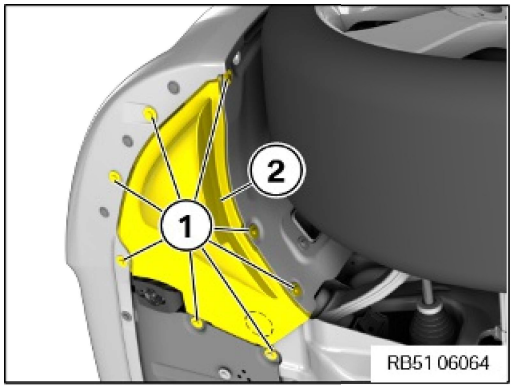


- Check the sealing rings (1) of the coolant lines (2) for damage and renew if necessary.



- Connect and lock the coolant line (1).

  The coolant line (1) must audibly engage.



- Feed in and install cover (2) at the bottom front left.
- Tighten the screws (1).

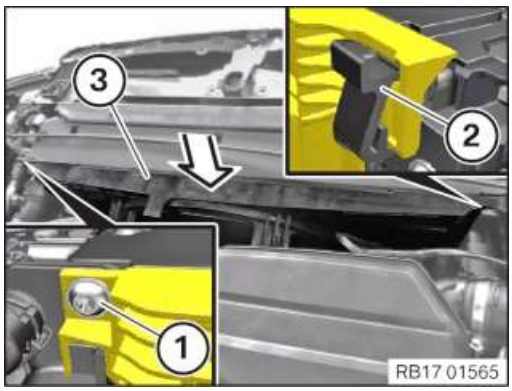
Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

17 – Install fan cowl



- Feed guides (1) into the radiator.
- Feed guides (2) into the charge air cooler.

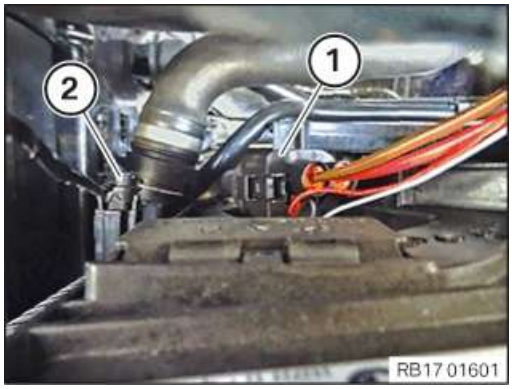


- Guide in and install fan cowl (3) **carefully** in the direction of the arrow.
- Ensure that the lock (2)engages audibly.
- Tighten down screw (1).

Fan cowl with electric fan on radiator

TS6x20		Tightening torque	6,5 Nm

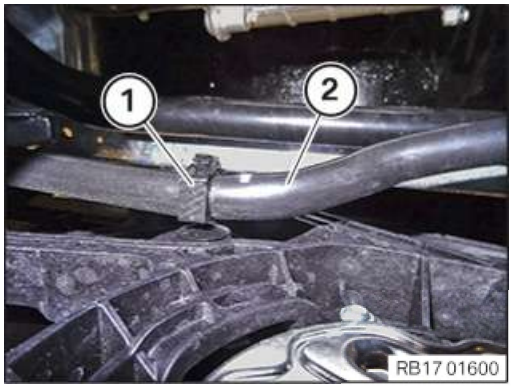
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- Connect connectors (2) and lock.

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

  The connector (1) must engage audibly.

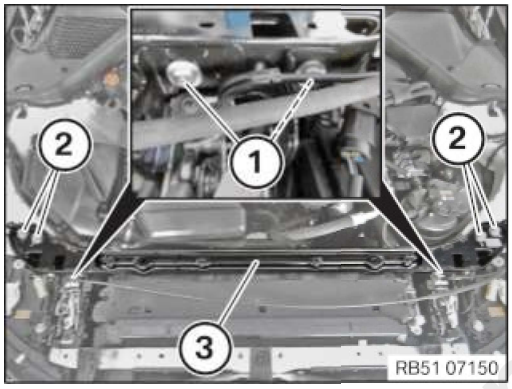


- **If installed:** Secure the transmission oil line (2).

  Insert and install the transmission oil line (2).

  Lock holder (1).

18 – Install the rear top cross connection



- Guide in and position the top rear cross connection (3).
- Tighten the screws (1).

Top rear cross connection to bonnet catch support

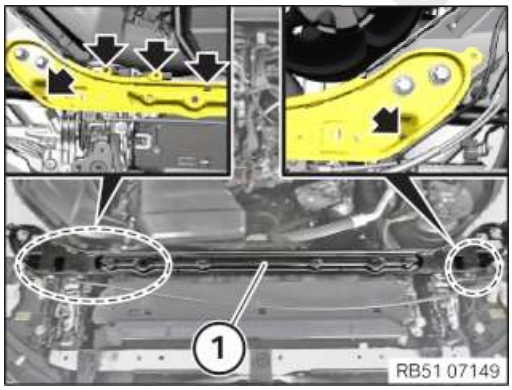
Flat-head screw M6x20		Tightening torque	11,8 Nm

- Renew screws (2).

  Parts: Bolts
- Tighten the screws (2).

Rear top cross connection to wheel arch carrier support

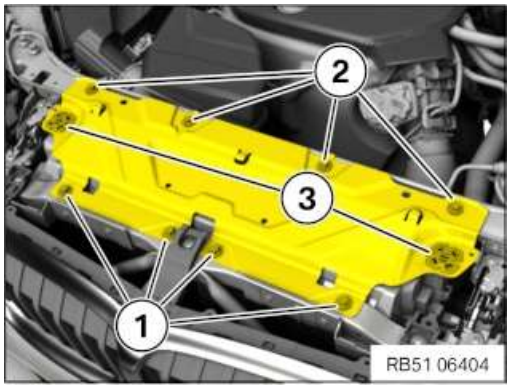
M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °



- Secure the clips (arrows) in the marked areas to the top rear cross connection (1).

19 – Installing the top cross connection

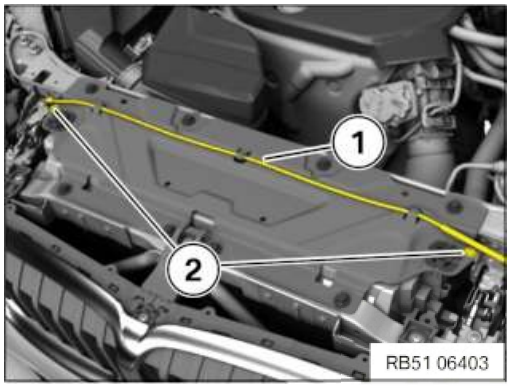
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- Set and position upper cross connection with holders (3) from above.
- Tighten down screws (1) and (2).

Cross connection, top

M8x20		Tightening torque	28 Nm

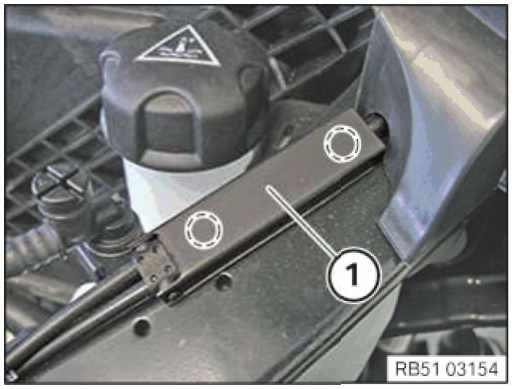


- Tighten down screws (2).

Cross connection, top

M6x20		Tightening torque	11,8 Nm

- Attach Bowden cable (1) on the upper cross connection.



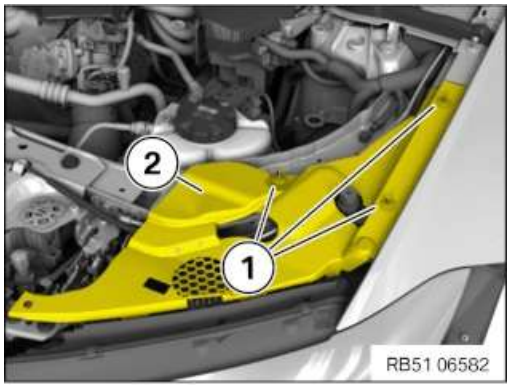
- Clip in the housing for the coupling of the Bowden cables (1).

20 – Install the cover in the engine compartment at top left and right partially

NOTICE

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

▸ **Installing the cover in the engine compartment on top partially**

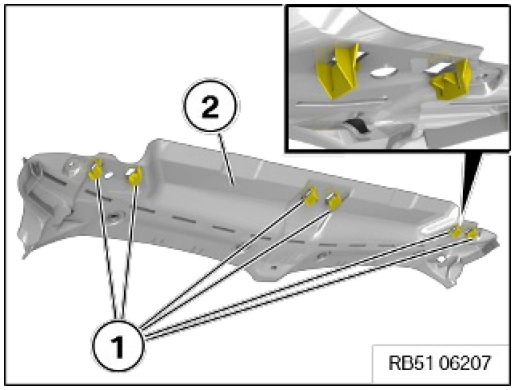


- Install the cover in the engine compartment on top (2).
- Secure expanding rivet (1).

21 – Installing cover for engine compartment centre

Check

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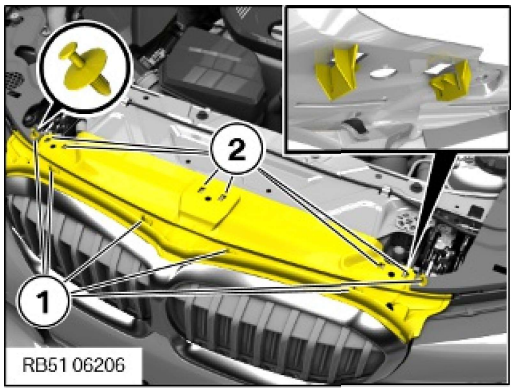
- Check latch mechanisms (1) of cover for engine compartment centre (2) for damage.

Result

» The latch mechanism (1) is damaged.

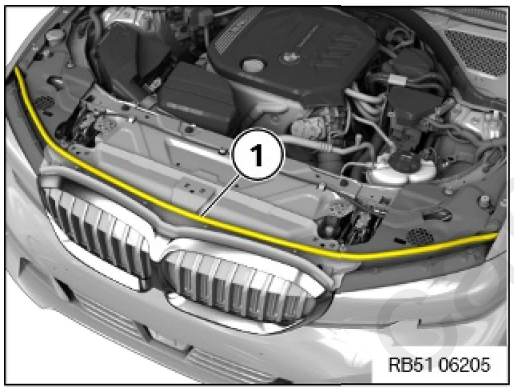
Measure

- Renew cover for engine compartment centre (2).



- Guide in the cover for the engine compartment centre from the rear and position it.
- Clip in the cover for the engine compartment centre with latch mechanisms (2).
- Mount all expanding rivets (1).

22 – Install the seal for the front bonnet



- Position the bonnet seal(1) and connect it on the mounting on the bumper and on the headlights.

23 – Filling and bleed the low-temperature coolant circuit



- See additional information.

24 – Checking/topping up oil level in automatic transmission

Prerequisite

Vehicle in horizontal position.

The vehicle is secured against rolling away.

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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

To set the correct oil level, it is mandatory that the service function "Transmission control unit: Oil-level adjustment" is carried out with the diagnosis system.

TECHNICAL INFORMATION

Performing oil-level adjustment:

Certain fault memory entries may require an oil-level adjustment in the automatic transmission and after repairs have been completed (e.g. exchange of mechatronics, exchange of the converter, exchange of the transmission, servicing of automatic transmission oil).

TECHNICAL INFORMATION

The automatic transmission fluid specified by BMW must be used for the automatic transmission.

For additional information see: SBS-ANL-SBS1996-240596143_A14 (automatic transmission fluid for ZF transmissions, etc.)

- Connect diagnosis system.
- Observe preconditions for the oil-level adjustment with the diagnosis system:
  - Precondition for beginning: Transmission oil temperature 30°C to 40°C.
  - Precondition for ending: Transmission oil temperature 40°C to 50°C.
- Call up service function (drive).
- Carry out oil-level adjustment in accordance with instructions.



- **Top up the automatic transmission fluid:**
- Loosen the oil filler plug (1) using the special tool 2 405 614.
- Top up automatic transmission fluid according to the instructions in the diagnosis system.

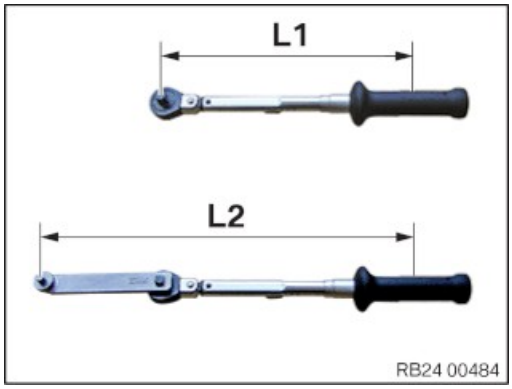
GA8HP51Z transmission capacity

	min. 9,28 l
Transmission oil: Automatic transmission fluid ATF 3+	

GA8HP76Z transmission capacity

	min. 9,35 l
Transmission oil: Automatic transmission fluid ATF 3+	

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TECHNICAL INFORMATION

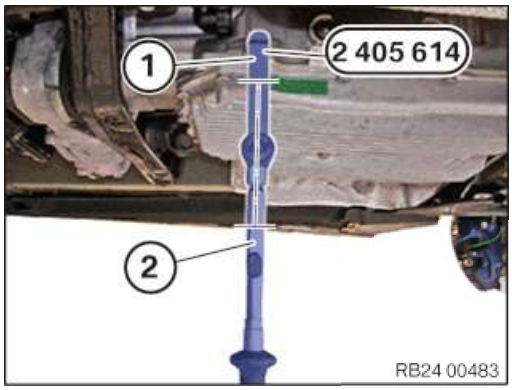
The setpoint torque deviates from the torque to be set when using special tool 2 405 614.

- **Converting the setpoint torque into the torque to be set:**

  (setpoint torque x L1) : L2 =torque to be set.

  L1 = Length from the centre of the handle to the reversible ratchet head

  L2 = Length from the centre of the handle to the engaging of the special tool in the bolt.



- Renew the oil filler plug (1) and the sealing ring.

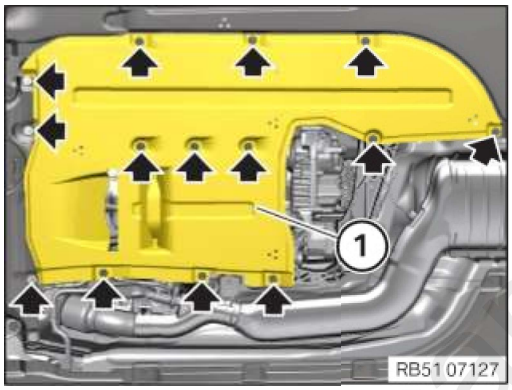
  Parts: Oil filler plug, sealing ring

- Make sure that the special tool 2 405 614 and the torque wrench (2) align while tightening the oil filler plug (1).
- Tighten the oil filler plug (1) with the special tool 2 405 614 and the torque wrench (2).

Oil filler plug

M18x1.5		Tightening torque	35 Nm

25 – Installing underbody protection at rear



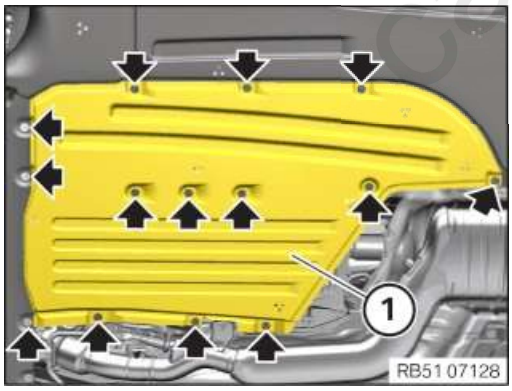
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

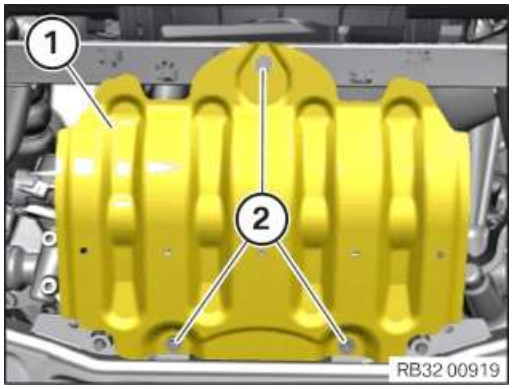
Hexagon screw		Tightening torque	3 Nm

26 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.

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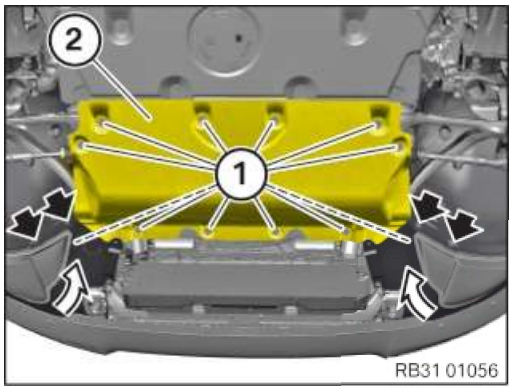


- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

27 – Install the underbody protection of the steering gear



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

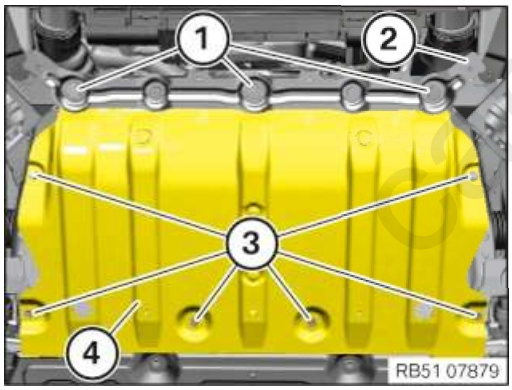
Underbody protection of the steering gear

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

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

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm



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

Underbody protection of the steering gear

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

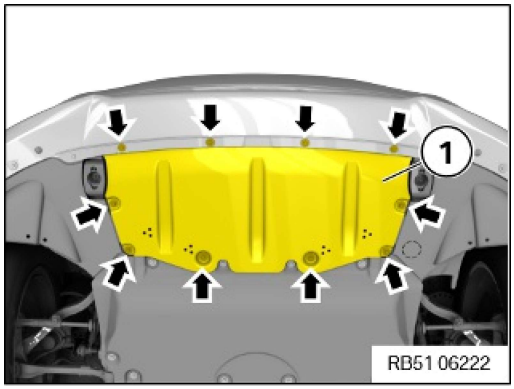
- Position holder of underride protection (2).
- Tighten the screws (1).

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

28 – Installing the front underbody protection

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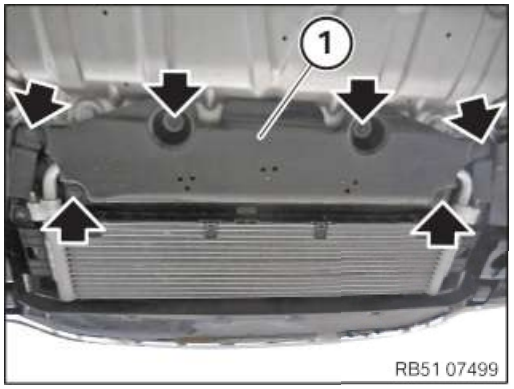
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



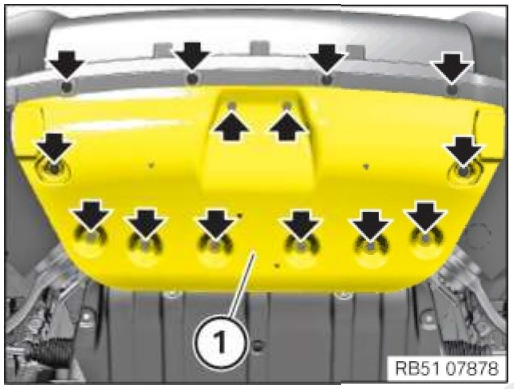
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

Additional Information

Overview of Tightening Torques

Cooling module cover on holder — Used in step 1415

D6X20		Tightening torque	6 Nm

Cover, front bottom on side — Used in step 16

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Fan cowl with electric fan on radiator — Used in step 17

TS6x20		Tightening torque	6,5 Nm

Top rear cross connection to bonnet catch support — Used in step 18

Flat-head screw M6x20		Tightening torque	11,8 Nm

Rear top cross connection to wheel arch carrier support — Used in step 18

M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

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Cross connection, top — Used in step 19

M8x20		Tightening torque	28 Nm

Cross connection, top — Used in step 19

M6x20		Tightening torque	11,8 Nm

Oil filler plug — Used in step 24

M18x1.5		Tightening torque	35 Nm

Underbody protection — Used in step 25

Hexagon screw		Tightening torque	3 Nm

Bumper buffer device steering on front axle support — Used in step 26

M10		Tightening torque	56 Nm

Underbody protection of the steering gear — Used in step 27

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

Wheel arch cover (screws) — Used in step 27

Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support — Used in step 27

M10		Tightening torque	56 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

2 405 614 Socket wrench



Common — Used in step 24

Usage	For opening and closing the oil filler plug. Contour-graphic silhouette foil is included in delivery specification. Further information on the contour-graphic silhouette foil can be found in service information 00 22 13 (969). Replaced by 2455997
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 33 15 (305)

Overview Technical Data

GA8HP51Z transmission capacity — Used in step 24

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	min. 9,28 l
Transmission oil: Automatic transmission fluid ATF 3+	

GA8HP76Z transmission capacity Used in step 24

	min. 9,35 l
Transmission oil: Automatic transmission fluid ATF 3+	

Links

Repair instructions	Used in step
17 00 ... Instructions for repair work on cooling system	1215
17 11 103 Removing and installing/replacing coolant expansion tank for the low-temperature coolant circuit	23
17 11 103 Removing and installing/replacing coolant expansion tank for the low-temperature coolant circuit	23
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23
17 00 040 Venting cooling system and checking on watertightness	23
17 00 040 Venting high temperature - cooling system and checking for water leaks (N20 hybrid drive)	23
17 00 040 Venting high temperature - cooling system and checking for water leaks (N20 hybrid drive)	23
17 00 040 Bleeding lower-temperature cooling system (B48)	23
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23
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17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23
17 00 011 Draining and topping up coolant circuit for low temperature	23
17 00 040 Bleed the low-temperature cooling system and check for watertightness (coolant circuit for low temperature)	23
17 00 040 Bleeding and filling low temperature cooling system using vacuum filler device (B48)	23
17 00 011 Draining and topping up low-temperature coolant circuit	23
17 00 011 Draining and topping up low-temperature coolant circuit	23
17 00 040 Bleeding the low-temperature coolant circuit and checking it for watertightness	23
17 00 040 Bleeding the low-temperature coolant circuit and checking it for watertightness	23
17 00 015 Draining and topping up the coolant circuit for the drive \PREMIUM	23
17 00 011 Draining and topping up low-temperature coolant circuit	23
17 00 040 Bleed the cooling system and check for watertightness with the special tool (low-temperature coolant circuit)	23

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17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	23

Operating materials	Used in step
14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z	24

Operating materials	Used in step
Main group 17	1215

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64 53 ... Instructions for replacement of air conditioning capacitors and radiator/coolers

Attention!

Even when they are correctly installed or due to normal driving, radiators (oil cooler, radiator, charge air cooler) or air conditioning condensers may show slight impressions or deformations on their discs (1).

A slight sag with a large radius for the air conditioning condenser is also permissible.

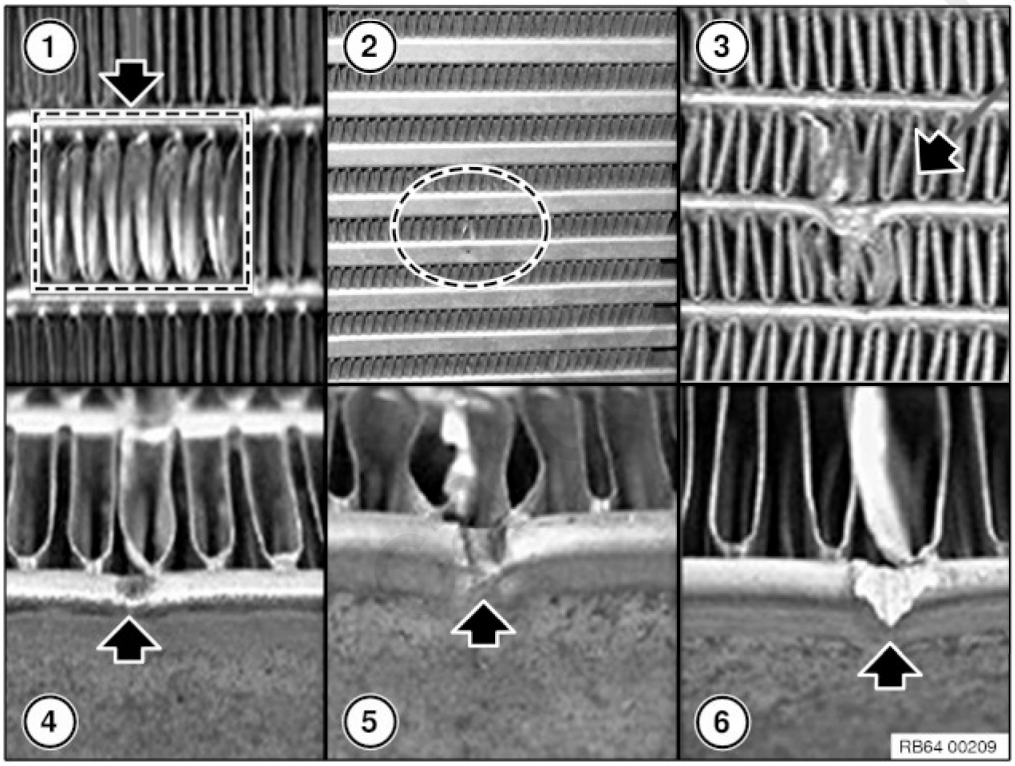
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig. (1) can be bent back with a standard fin comb..

Damage to lines carrying media or on the flat pipe require exchange of the radiator or air conditioning condenser (2-6).



Dryer flask (integrated in the air conditioning condenser):

Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

17 00 ... Instructions for working on cooling system



Warning!

Risk of scalding, carry out repairs on the cooling system only when the engine has cooled down.



Attention!

Wear protective gloves and safety goggles.



Attention!

Life-time coolant filling:

Never 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 drained and refilled.

In the case of other removal work involving the draining of part quantities of coolant, replace these quantities which have been drained with new coolant.

Installation note:
Use only recommended coolant.

Observe mixture ratio.



Attention!

Open cooling system only when it has cooled down.

Opening the cooling system while hot can result in air entering the system.

This can cause overheating with permanent damage to the engine.



Attention!

Protect the alternator from contamination when carrying out any repairs on the coolant circuit.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Attention!

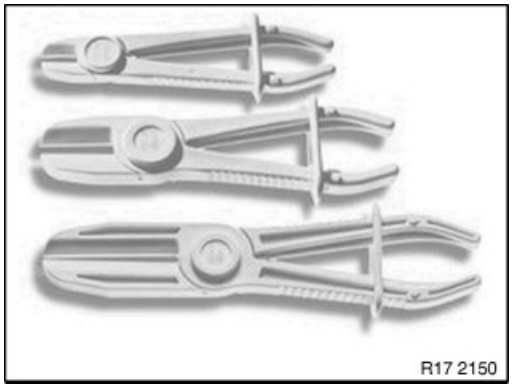
Do not fill coolant expansion tank over maximum level, as overfilling will cause the coolant to overflow. This may cause traces of coolant on the expansion tank or in the engine compartment and allow an incorrect conclusion about possible leaks.

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Recycling

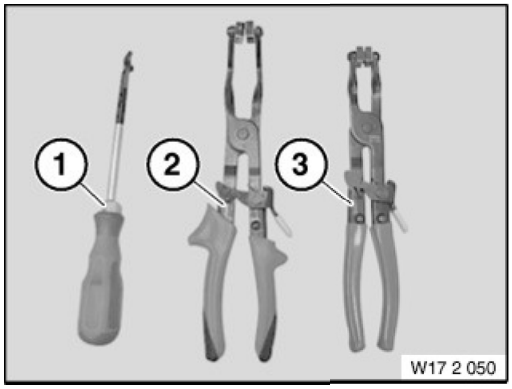
Catch and dispose of drained coolant.

Observe country-specific waste disposal regulations.



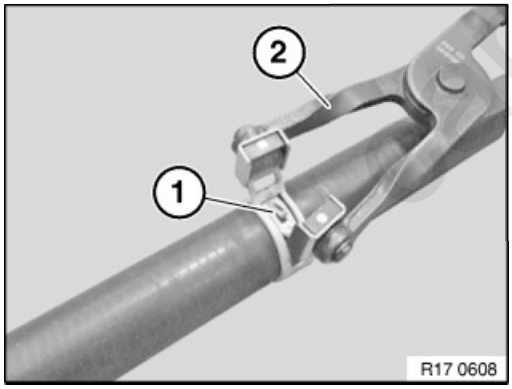
Note:
To disconnect the coolant hoses, use a commercially available disconnection tool such as HAZET (see table).

HAZET number:	Description
4590-1	Length of disconnect pliers (mm): 150
4590-2	Length of disconnect pliers (mm): 180
4590-3	Length of disconnect pliers (mm): 253
4590 / 2	Set of clamping pliers
4590 / 3	Set of clamping pliers

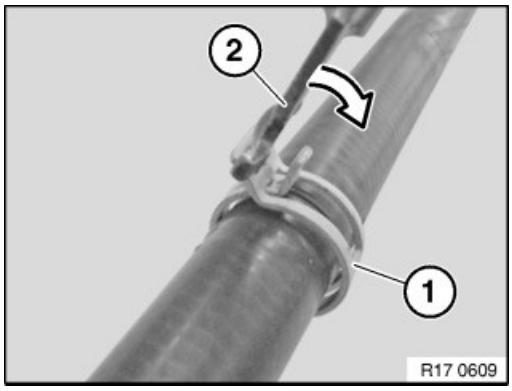


Set of special tools 17 2 050 for removing and installing the spring bracket clamps for coolant hoses.

- (1) Release tool.
- (2) Pliers (bent version).
- (3) Pliers (straight version).

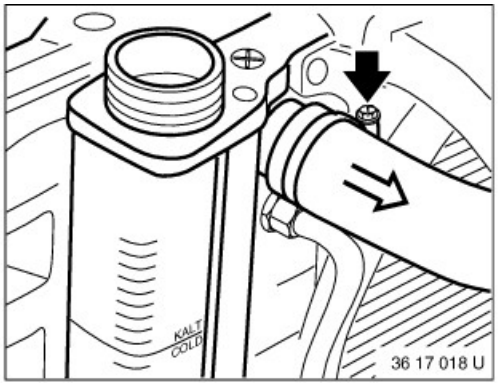


Loosen spring strap (1) with the pliers (2).



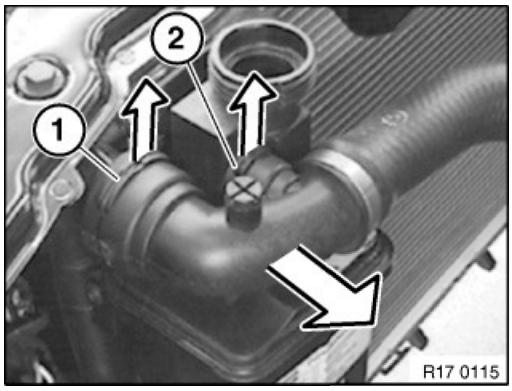
Unlock spring strap (1) with the release tool (2).

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Note:
Tightening torque for hose clamps

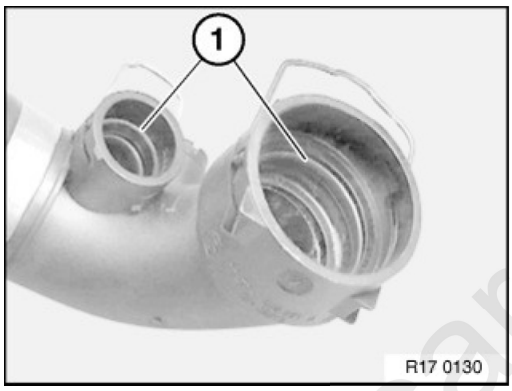
WAF 5	1.0 - 1.5 Nm
WAF 6	2.5 - 3.5 Nm



Notes on disassembly/installation of the quick-release couplings of the coolant hoses

Dismantling of quick-release coupling

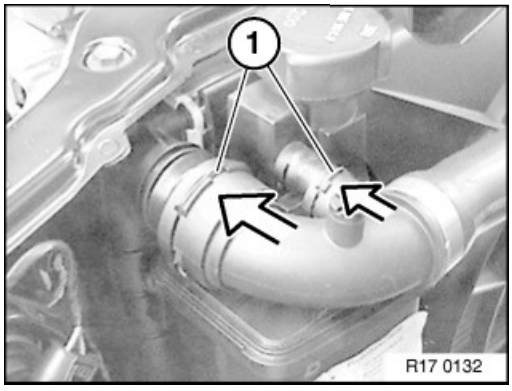
Pull out lock (1) and (2). Pull off hose.



Installation note:

Check O-rings (1).

Do not coat O-rings (1) with lubricant.



Assembly of quick-release coupling

Press in lock (1) before installing quick-release coupling.

Push on hose.

Quick-release couplings must clearly snap audibly into place.

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