

**Special tools required:**

- [00 2 030](#)
- [17 0 100](#)

Type	Engine	Adapter Y from 17 0 100
E60/E61/E63/E64	All	17 0 113
E65/E66	M54/N52/N62/N62T/N73	17 0 105
E65/E66	M57S/M57T/M67/M67T	17 0 113
E70/E71/E72	All	17 0 113
E81/E82/E84/E87/E88/E89	All	17 0 113
E83	M54/N46/N52K	17 0 105
E83	M47S/M57S/M57T/M57Y/N47	17 0 113
E85/E86	All	17 0 105
E90/E91/E92/E93	All	17 0 113
R50/R52	W10	17 0 107 and 17 0 102
R50	W17	17 0 109
R52/R53	W11	17 0 109
R55/R56/R57/R58/R60/R61	All	17 0 109
F25/F26	All	17 0 113
F20/F21/F22/F23/F30/F31/F32/F33/F34/F35/F36/F87	All	17 0 113
F80/F82/F83	S55	17 0 113
F15/F16	All	17 0 113
F54/F55/F56/F57/F60	All	17 0 109
F45/F46/F48/F52	All	17 0 109
F85/F86	All	17 0 113

**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.

**Attention!**

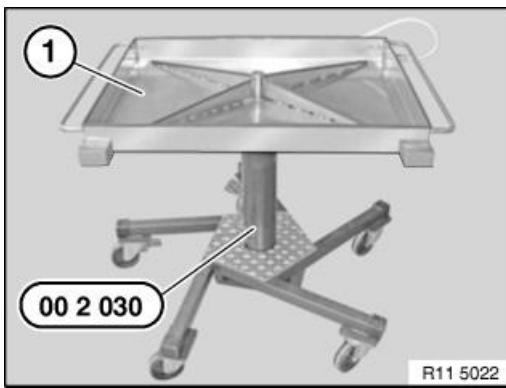
You must protect the alternator against contamination by coolant when carrying out repair work on the cooling circuit.

Cover alternator with suitable materials.

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

**Ordering information:**

- Workshop equipment
- Workshop equipment catalogue
- Vacuum filler device, order number 81 39 2 152 473
- Drip pan, order number 81 49 2 152 347
- Adapter: [17 0 100](#)

**Attention!**

Risk of slipping due to coolant on the floor.

Danger of injury!

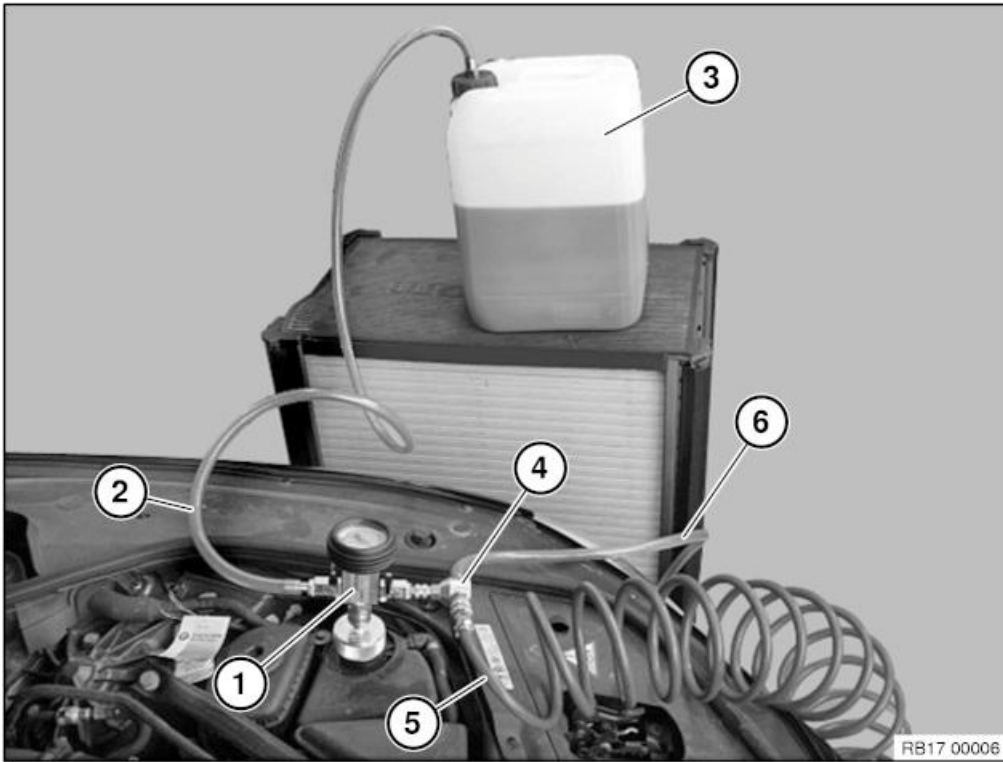
Catch and dispose of emerging coolant in drip tray (1) and if necessary special tool [00 2 030](#) (universal jack). **Recycling:**

Observe country-specific waste disposal regulations.

**Attention!**

All coolant hoses must be checked before filling cooling system with vacuum filling unit.

If necessary, replace damaged and porous coolant hoses.

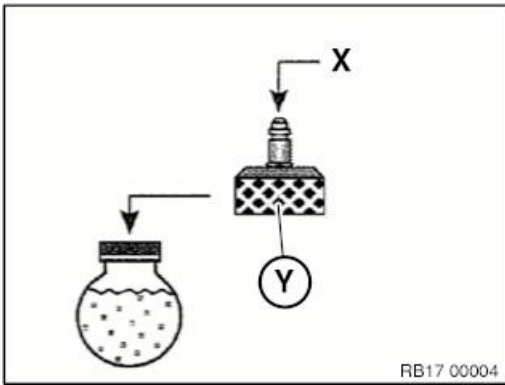


- 1) Vacuum filler device with pressure gauge and shutoff valves
- 2) Filler hose
- 3) Coolant container
- 4) Venturi nozzle
- 5) Compressed air connection (max. 6 bar)
- 6) Outgoing-air hose (lead outgoing-air hose into a collecting container)



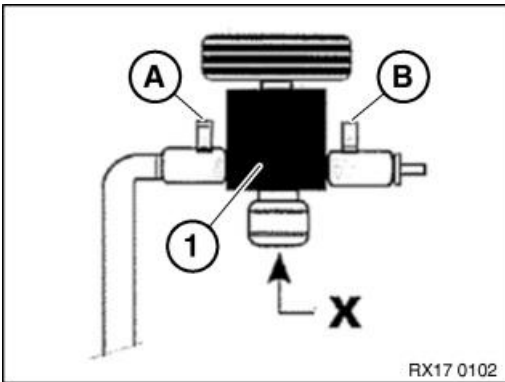
Preconditions

- Cooling system expansion tank must be empty.
- There must be sufficient premixed coolant in the vacuum filler device collecting vessel, 1–2 litres more than the filling capacity prescribed for the vehicle.
 - Use [only recommended coolant](#).
 - Observe [mixture ratio](#).
 - Observe capacities.
- Position the vacuum filler device container at the same height as the coolant expansion tank.
- Compressed-air connection with 6 bar pressure present.
- Set heating to maximum temperature.



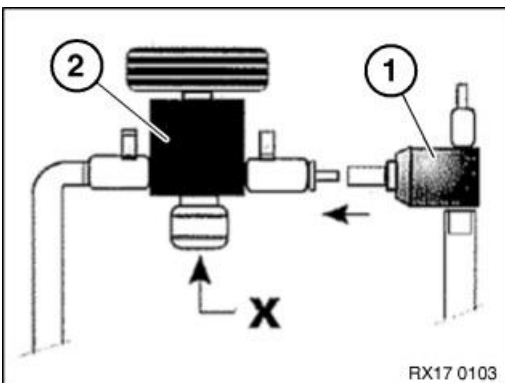
Select adapter (Y) according to table and connect to coolant expansion tank.

Connect vacuum filling unit to adapter connection (X).



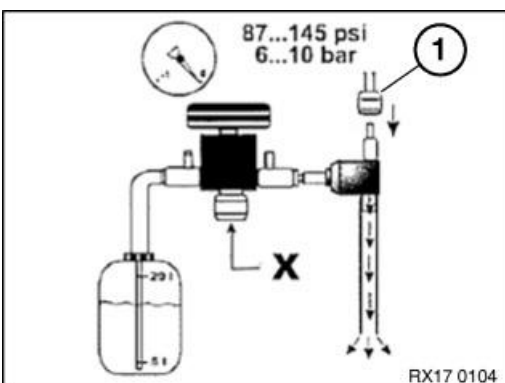
Shutoff valves (A) and (B) of the vacuum filler device (1) must be closed.

(X) Expansion tank connection



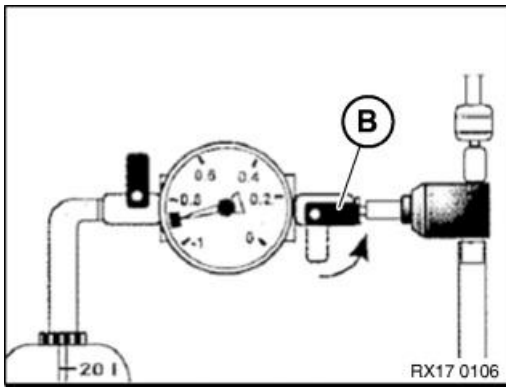
Connect Venturi nozzle (1) to vacuum filling unit (2).

(X) Expansion tank connection



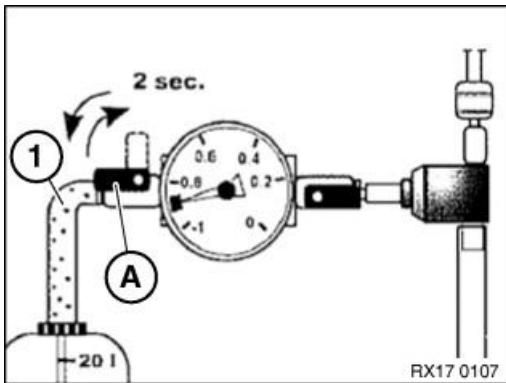
Connect compressed air (1).

(X) Expansion tank connection



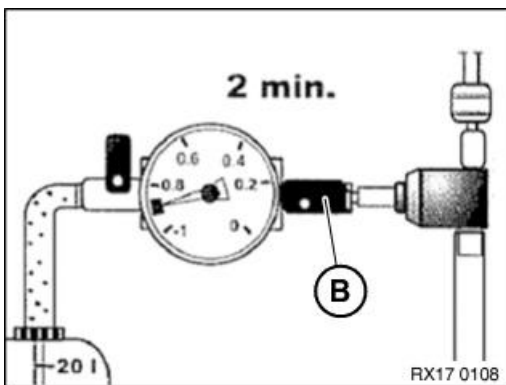
Open shutoff valve (B).

The venturi nozzle produces a flow noise.



Then open shutoff valve (A) until the filling hose (1) is free of bubbles.

Close shutoff valve (A) again. The filling hose (1) is vented in this way.

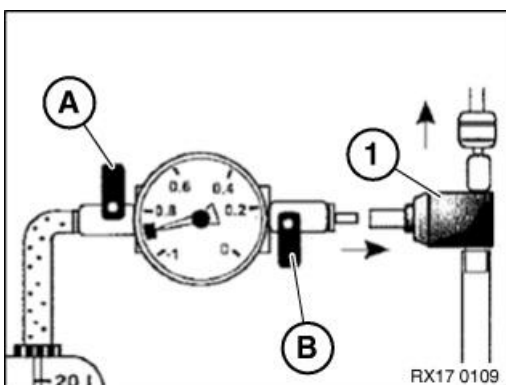


Shutoff valve (B) will remain open. Generate vacuum in coolant system for approx. 2 minutes. The final vacuum is reached at a vacuum of -0.7 to -0.95 bar. Green scale in the pressure gauge.

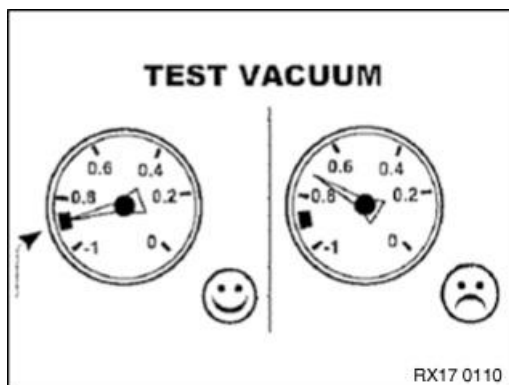
Note:

The coolant hoses contract during vacuum build-up.

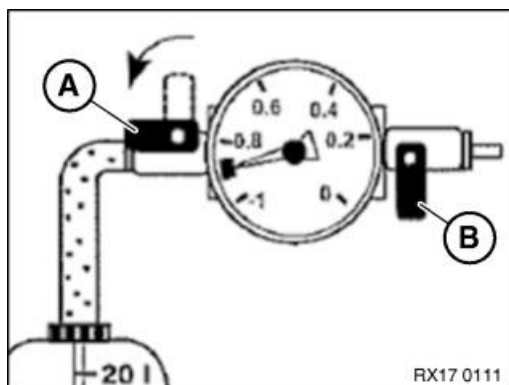
Then close shutoff valve (B) again.



Both shutoff valves (A) and (B) must be closed. Then seal Venturi nozzle (1).



The cooling system must hold the vacuum for 30 s. If the needle in the pressure gauge drops, this indicates a leak in the cooling system.
If the vacuum remains constant, proceed with filling.
In event of leaks, check for leaks.



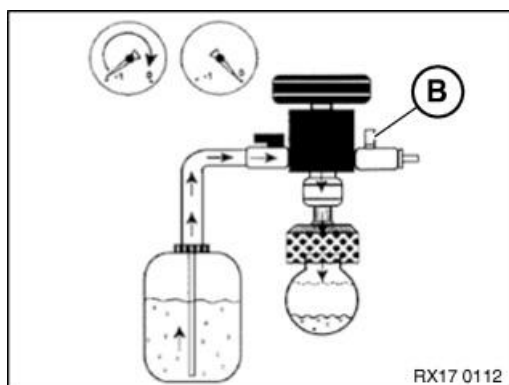
Attention!

There must be sufficient premixed coolant in the vacuum filler device collecting vessel, 1-2 litres more than the vehicle capacity.

Position the vacuum filler device container at the same height as the coolant expansion tank.

Shut-off valve (B) remains closed during the filling process.

To fill the cooling system, open shutoff valve (A) to vacuum filler device container.



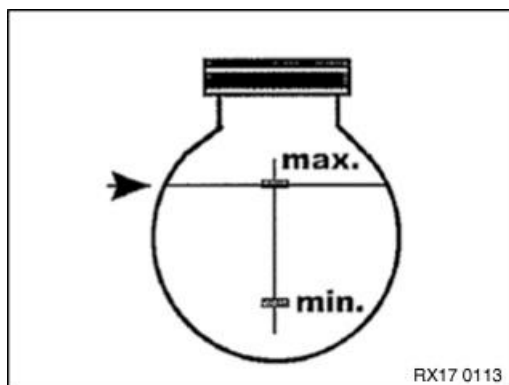
Coolant is now added.

The filling procedure is finished when the needle in the pressure gauge is at 0 bar or no longer falls.

If necessary, reduce remaining vacuum. Open shutoff valve (B) to do so.



Remove vacuum filling unit with adapter from expansion tank.



Adjust coolant level to maximum.

Close coolant expansion tank.



After the cooling system has been filled with the vacuum filling unit, another bleeding procedure must be performed for the following vehicles:

- [E84 N20](#)
- [F25, F26 N52T, N55,](#)
- [F25, F26 N20](#)
- [E70, E71 N63, S63](#)
- [E70, E71 N57 D30 S 1](#)
- [E72 N63](#)
- [F20, F21, F30, F31 F35, N13](#)
- [F20, F21, F22, F23, F30, F31, F32, F33, F34, F35 F36 N20, N26](#)
- [F20, F21, F22, F23, F30, F31, F32, F33, F34, F35 F36 F87 N55](#)
- [F30 N55 Hybrid car](#)
- [F15 N55](#)
- [F15 N63 B44 O1](#)
- [F15 N57 D30 S 1](#)
- [F54, F55, F56, F57, F60, B36, B38, B48, B46](#)
- [F80, F82, F83, S55](#)
- [F45, F46, F48, B38, B46, B48](#)
- [F25, F26, B47](#)
- [F45, F46, F48, B47, B37](#)
- [F54, F55, F56, F60, B37, B47](#)
- [F16 N63 B44 O1](#)
- [F16 N55](#)
- [F16 N57 D30 S 1](#)
- [F20, F21, F22, F23, F30, F31, F32, F33, F34, F36, B47](#)
- [F21, F20, B37](#)
- [F85, F86 S63 T 2](#)



After the cooling system has been filled with the vacuum filling unit, another bleeding procedure must be performed for vehicles with an electric coolant pump: Note:

Do not open the coolant expansion tank sealing cap during the bleeding procedure.

Switch on the low-beam headlights to perform the bleeding procedure. If the low-beam headlights are not switched on, the ignition (Terminal 15) will switch off automatically after a certain period of time and interrupt the bleeding procedure.

1. Connect battery charger.
2. Switch the ignition on.
3. Switch on low-beam headlight.
4. Set heating to maximum temperature. Take back blower to smallest stage.
5. Driving experience switch must not be set to ECO PRO!
6. Press accelerator pedal for 10 seconds to floor. **Engine** must **not** be started.
7. The bleeding procedure was started by pressing the accelerator pedal and takes approx. 12 min. (the electrical coolant pump was activated and switches off automatically after approx. 12 min).
8. Then adjust filling level in coolant expansion tank to maximum.
9. Check cooling system for leaks.
10. If the cooling system bleeding has to be performed again, deactivate DME completely (remove ignition key for approx. 3 minutes). Then repeat from point 3.



Check function of cooling system.

Check cooling system for leaks.



Special tools required:

- [00 2 030](#)
- [17 0 101](#)
- [17 0 113](#)
- [17 0 114](#)



Warning!

Danger of scalding!

Only perform this work after engine has cooled down.



Protective measures/rules of conduct:

- Wear safety goggles
- Wear protective gloves
- Observe national/country-specific regulations

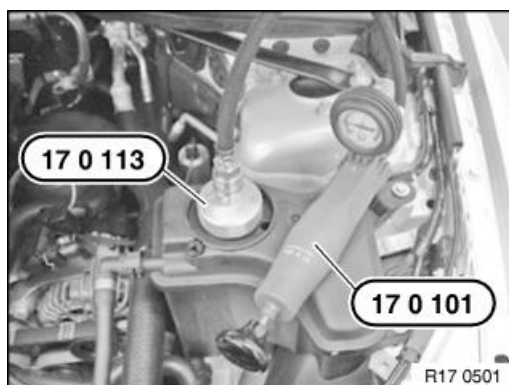


Important!

Risk of slipping due to coolant on the floor.

Risk of injury!

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool [00 2 030](#) (universal hydraulic lifting equipment). **Recycling:** Observe country-specific waste-disposal regulations.



Checking pressure drop in cooling system:

Open cap on coolant expansion tank. Fit special tool [17 0 101](#) / [17 0 113](#).

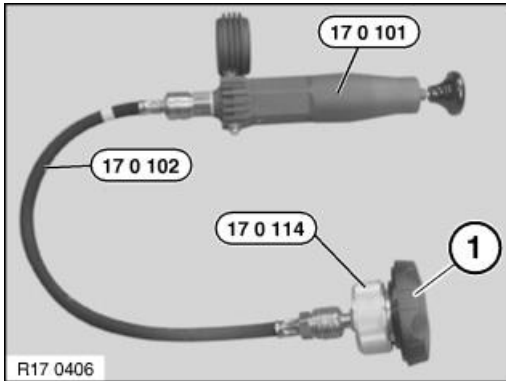
Build up gauge pressure of 1.5 bar, and wait approx. 2 minutes.

Cooling system is impervious to leaks if pressure drop is max. 0.1 bar.

**Checking pressure relief valve in cap: Note:**

While the vehicle is driven at high outside temperatures, the design may cause the pressure relief valve in the cap to open slightly and air together with dissolved coolant to escape. This coolant vapour condenses on the surface of the expansion tank and leaves traces when the vehicle has cooled down. These traces do not indicate whether the cap is defective or not. When the vehicle has been parked up for an extended period of time, the residual escaping coolant can cause the pressure relief valve in the cap to stick; therefore check the cap again 2 to 3 times.

Replace the cap only after you have checked three times and there is an incorrect opening pressure.

**Checking pressure relief valve in cap:**

Screw cap (1) onto special tool [17 0 114](#).

Build up pressure with special tool (hand pump) [17 0 101](#); observe pressure gauge to ascertain when opening pressure is achieved.

Compare [opening pressure of pressure relief valve](#).

**Special tools required:**

- [00 2 030](#)
- [17 0 101](#)
- [17 0 113](#)
- [17 0 114](#)

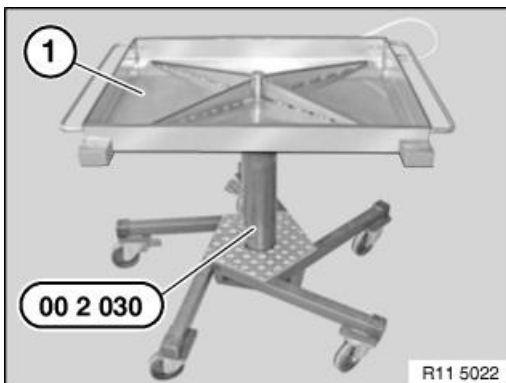
**Warning!**

Risk of scalding!

Only perform this repair work after engine has cooled down.

**Protective measures/rules of conduct:**

- Wear safety goggles
- Wear protective gloves
- Observe national/country-specific regulations

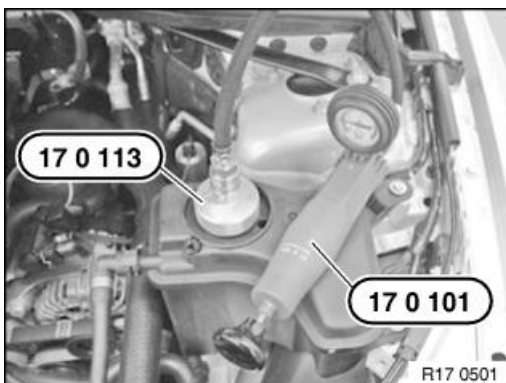
**Important!**

Risk of skidding due to coolant on the floor.

Danger of injury!

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool [00 2 030](#) (universal hydraulic lifting equipment). **Recycling:**

Observe country-specific waste disposal regulations.

**Checking pressure drop in cooling system:**

Open the sealing cap on the coolant expansion tank. Fit special tool [17 0 101](#) / [17 0 113](#).

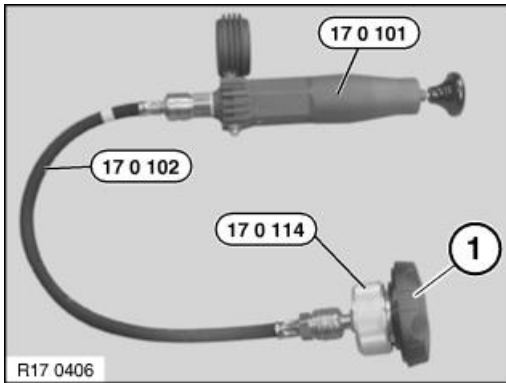
Build up gauge pressure of 1.5 bar, wait approx. 2 minutes.

Cooling system is impervious to watertightness if pressure drop is max. 0.1 bar.

**Checking pressure relief valve in sealing cap: *Note:***

While the driving at high ambient temperatures, the design may cause the pressure relief valve in the sealing cap to open slightly and air together with dissolved coolant to escape. This coolant vapour condenses on the surface of the expansion tank and leaves toes when the vehicle has cooled down. These toes do not indicate whether the sealing cap is defective or not. When the vehicle has been parked up for an extended period of time, the residual escaping coolant can cause the pressure relief valve in the sealing cap to stick; therefore check the sealing cap again 2 to 3 times.

Replace the sealing cap only after you have checked three times and there is an incorrect opening pressure.

**Checking pressure relief valve in sealing cap:**

Screw sealing cap (1) onto special tool [17 0 114](#) .

Build up pressure with special tool (hand pump) [17 0 101](#) ; observe pressure gauge to ascertain when opening pressure is achieved.

Compare [opening pressure of pressure relief valve](#).

**Special tools required:**

- [00 2 030](#)

**Warning!****Risk of scalding!**

Only carry out repair work on cooling system after engine has cooled down.

**Important!****Lifetime 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 partial quantities of coolant, replace these quantities which have been drained with new coolant.

Installation note:

Use [only recommended coolant](#).

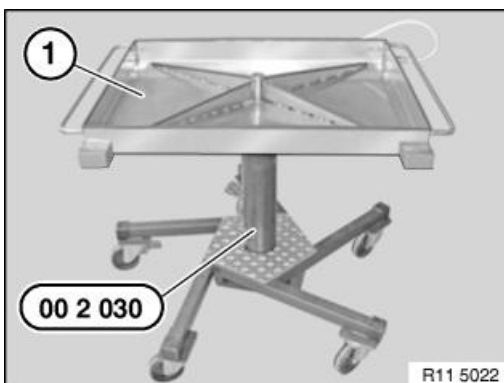
Observe [mixture ratio](#).

**Protective measures/rules of conduct:**

- Wear safety goggles
- Wear protective gloves
- Observe national/country-specific regulations

**Important!**

For dirt contamination of the cooling system (e.g. by engine oil), the cooling system must be rinsed with water until all dirt contamination is removed!

**Important!**

Risk of skidding due to coolant on the floor.

Danger of injury!

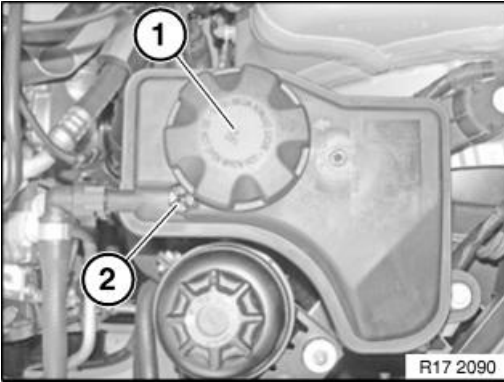
Catch and dispose of drained coolant in drip tray (1) and if necessary special tool [00 2 030](#) (universal hydraulic lifting equipment). **Recycling:**

Observe country-specific waste disposal regulations.

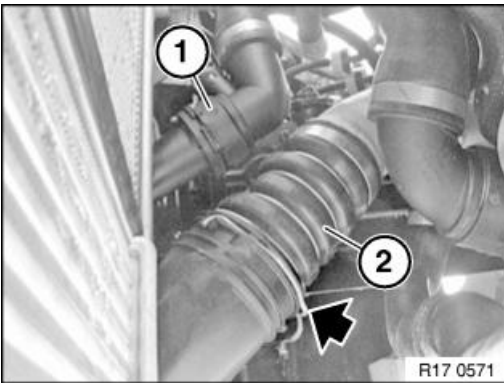


Necessary preliminary work:

- Remove [pedestrian protection](#)



Open sealing cap (1) on coolant expansion tank.



Unlock and detach coolant hose (1).

Drain coolant.

Do **not** pull off charge-air duct (2)!



Use only recommended [coolant](#).

Observe [mixture ratio](#).

Observe [filling capacity](#).

[Fill and bleed cooling system.](#)

[Check cooling system for watertightness.](#)

**Special tools required:**

- [00 2 030](#)

**Warning!**

Risk of scalding!

This repair work on the cooling system should only be carried out on an engine that has cooled down!

**Important!****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](#).

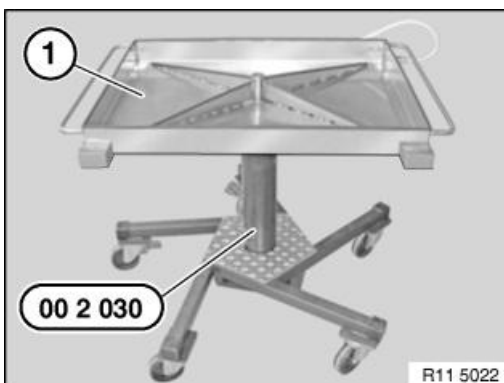
Observe [mixture ratio](#).

**Protective measures/rules of conduct:**

- Wear safety goggles
- Wear protective gloves
- Observe national/country-specific regulations

**Important!**

For dirt contamination of the cooling system (e.g. by engine oil), the cooling system must be rinsed with water until all dirt contamination is removed!

**Important!**

Risk of skidding due to coolant on the floor.

Danger of injury!

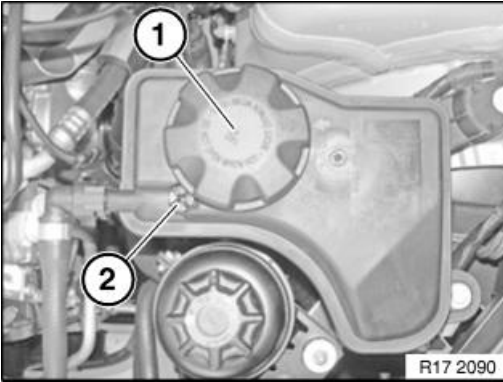
Catch and dispose of drained coolant in drip tray (1) and if necessary special tool [00 2 030](#) (universal hydraulic lifting equipment). **Recycling:**

Observe country-specific waste disposal regulations.

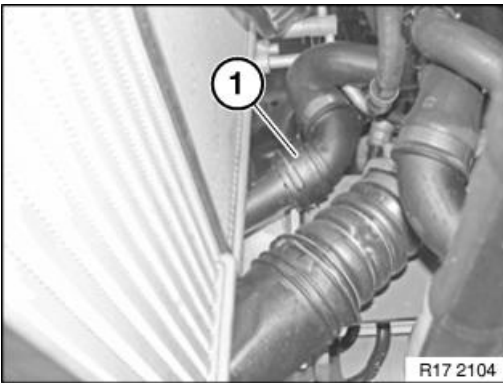


Necessary preliminary work:

- Remove front [underbody protection](#).



Release sealing cap (1) on coolant expansion tank.



Unlock and pull off coolant hose (1) from radiator.

Drain, catch and dispose of coolant.

Note:

For purposes of clarity, the fan cowl is shown removed.



Adding coolant:

Use only recommended [coolant](#).

Observe [capacities](#).

Observe [mixture ratio](#).

[Fill and bleed cooling system.](#)

[Check cooling system for watertightness.](#)

**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!**

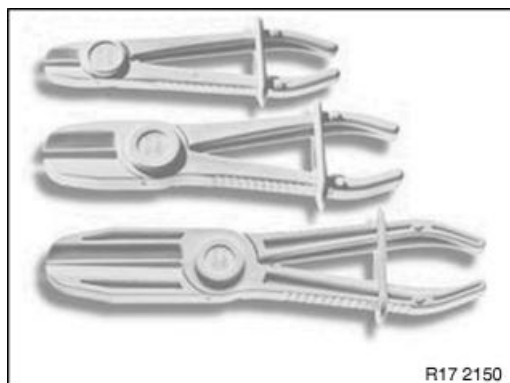
Do not fill coolant expansion tank over maximum level, as overfilling will cause the coolant to overflow. This may cause traces of coolant on the expansion tank or in the engine compartment and allow an incorrect conclusion about possible leaks.



Recycling

Catch and dispose of drained coolant.

Observe country-specific waste disposal regulations.

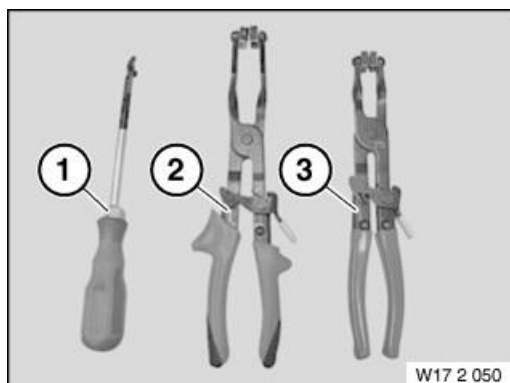


R17 2150

Note:

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

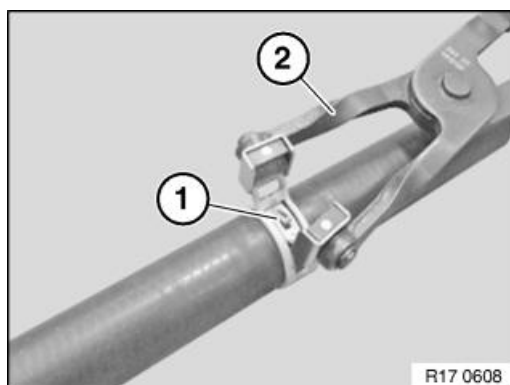
HAZET number:	Description
4590-1	Length of disconnect pliers (mm): 150
4590-2	Length of disconnect pliers (mm): 180
4590-3	Length of disconnect pliers (mm): 253
4590 / 2	Set of clamping pliers
4590 / 3	Set of clamping pliers



W17 2 050

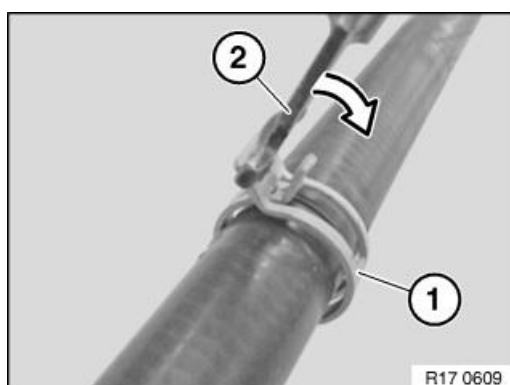
Set of special tools 17 2 050 for removing and installing the spring bracket clamps for coolant hoses.

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



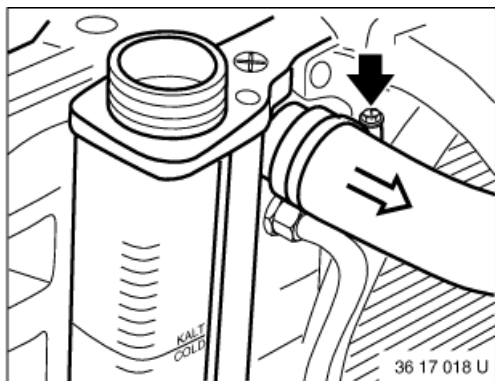
R17 0608

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



R17 0609

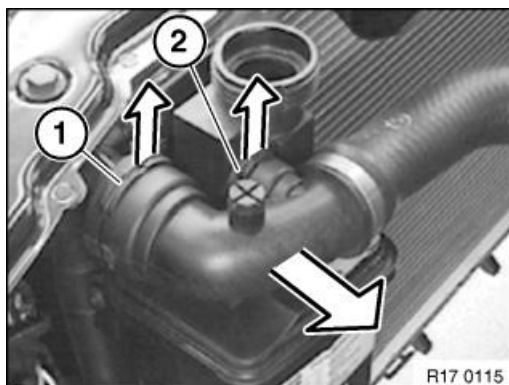
Unlock spring strap (1) with the release tool (2).



Note:

Tightening torque for hose clamps

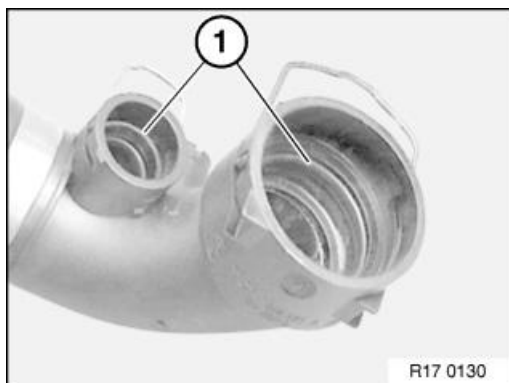
WAF 5	1.0 - 1.5 Nm
WAF 6	2.5 - 3.5 Nm



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

Dismantling of quick-release coupling

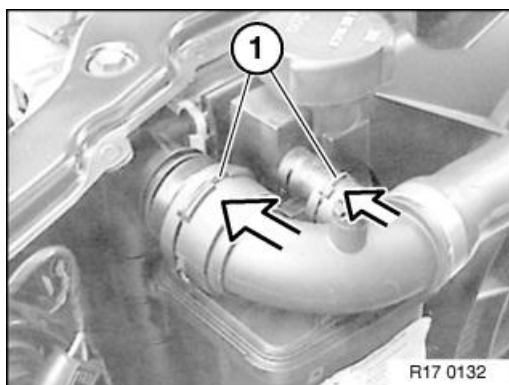
Pull out lock (1) and (2). Pull off hose.



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.

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



Warning!

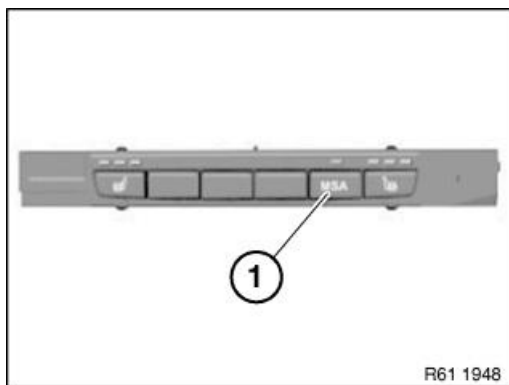
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

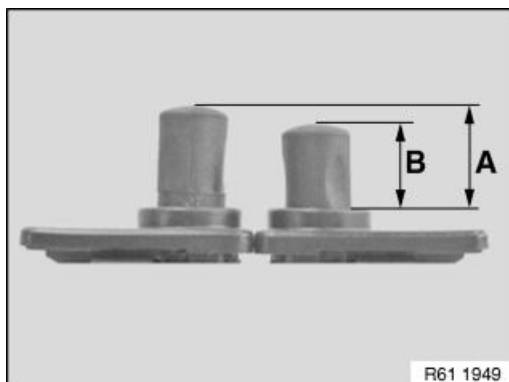
Observe safety precautions when working on MSA vehicles.

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
 $A = 10 \text{ mm}$
 - Basic setting (engine hood/bonnet open)
 $B = 7 \text{ mm}$

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



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](#)



Warning!

Risk of scalding!

Only perform this repair work after engine has cooled down.



Important!

When carrying out repair work on the oil, coolant or fuel circuit, the alternator must be protected against dirt contamination.

Cover alternator with suitable materials.

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



Necessary preliminary tasks:

- Fill [cooling system](#).
- [Check cooling system for water leaks](#).



Note:

When adding coolant, it is absolutely essential to adhere to the following sequence:

1. Engine off
2. Take off sealing cap on coolant expansion tank.
3. Open bleeder screw on expansion tank
4. Set heating to MAX (this setting is retained up to Point 12)
5. Slowly fill expansion tank with coolant up to MAX
6. Close bleeder screw on expansion tank
7. Start engine and run at idle for 5 minutes.
8. Close sealing cap, press on accelerator pedal several times to approx. 3000 rpm
9. Run engine for a further 5 minutes at idle speed
10. Open sealing cap
11. Top up coolant up to maximum cold fill level (= 4400 ml)
12. Overfill expansion tank with remaining coolant (= 300 ml)
13. Close sealing cap.



Additional instructions for vehicles with auxiliary heating optional equipment:

- Turn off engine.
- Run auxiliary heater for 2 minutes
- Start engine and run at idle for approx. 1 minute
- Press accelerator pedal twice up to approx. 2500 rpm
- Open sealing cap on expansion tank
- Top up coolant up to max. cold fill level.
- Top up expansion tank with an additional 100 ml
- Close sealing cap on expansion tank



Special tools required:

- [00 2 030](#)
- [17 0 101](#)
- [17 0 113](#)
- [17 0 114](#)



Warning!

Danger of scalding!

Only perform this work after engine has cooled down.



Protective measures/rules of conduct:

- Wear safety goggles
- Wear protective gloves
- Observe national/country-specific regulations

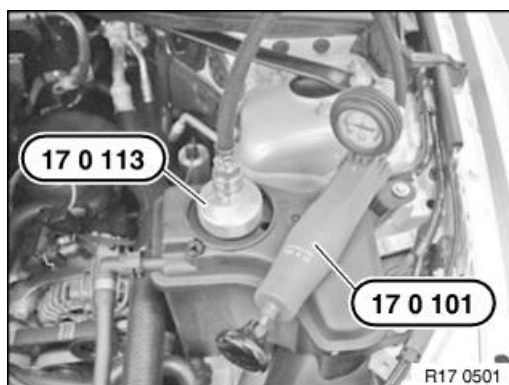


Important!

Risk of slipping due to coolant on the floor.

Risk of injury!

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool [00 2 030](#) (universal hydraulic lifting equipment). **Recycling:** Observe country-specific waste-disposal regulations.



Checking pressure drop in cooling system:

Open cap on coolant expansion tank. Fit special tool [17 0 101](#) / [17 0 113](#).

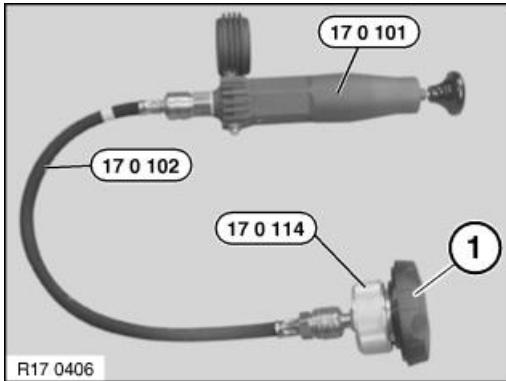
Build up gauge pressure of 1.5 bar, and wait approx. 2 minutes.

Cooling system is impervious to leaks if pressure drop is max. 0.1 bar.

**Checking pressure relief valve in cap: *Note:***

While the vehicle is driven at high outside temperatures, the design may cause the pressure relief valve in the cap to open slightly and air together with dissolved coolant to escape. This coolant vapour condenses on the surface of the expansion tank and leaves traces when the vehicle has cooled down. These traces do not indicate whether the cap is defective or not. When the vehicle has been parked up for an extended period of time, the residual escaping coolant can cause the pressure relief valve in the cap to stick; therefore check the cap again 2 to 3 times.

Replace the cap only after you have checked three times and there is an incorrect opening pressure.

**Checking pressure relief valve in cap:**

Screw cap (1) onto special tool [17 0 114](#) .

Build up pressure with special tool (hand pump) [17 0 101](#) ; observe pressure gauge to ascertain when opening pressure is achieved.

Compare [opening pressure of pressure relief valve](#).

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.

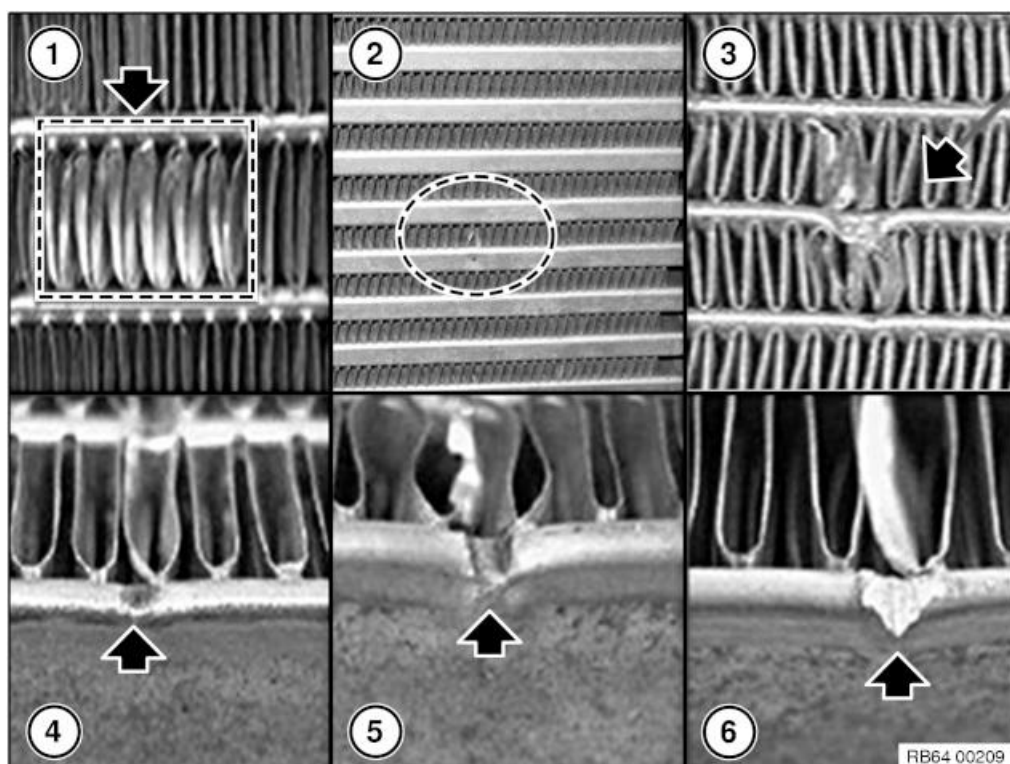
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

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

Note:

The deformations shown in Fig.Â (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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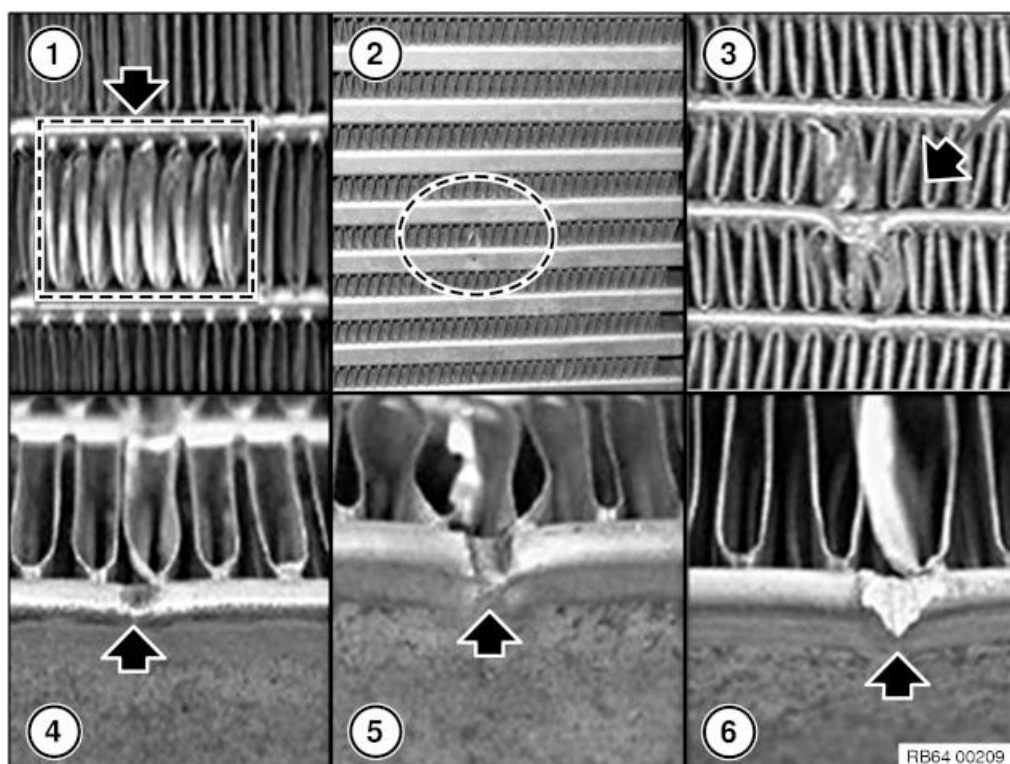
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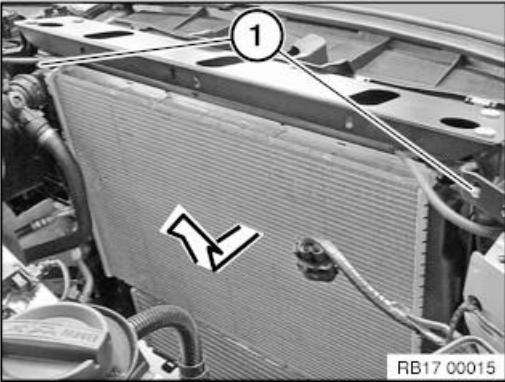
The air conditioning condenser is not to be replaced in this case.

17 11 000 Removing and installing coolant radiator

PRELIMINARY WORK

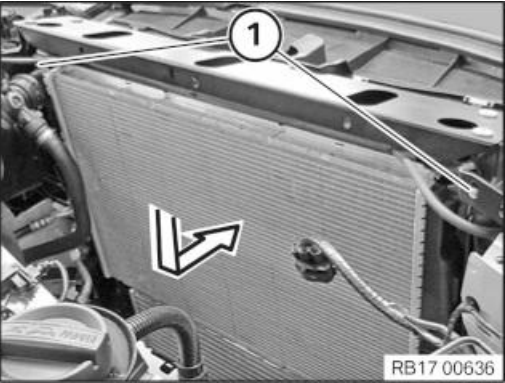
MAIN WORK

1 – Removing the radiator



- Loosen screws (1).
- If necessary, unlock and pull off the coolant hoses.
- Feed out radiator towards rear and remove by pulling upwards.

2 – Install radiator



- Insert the radiator from the top and towards the front.
- If necessary, insert and lock the coolant hose.
- Tighten the screws (1).

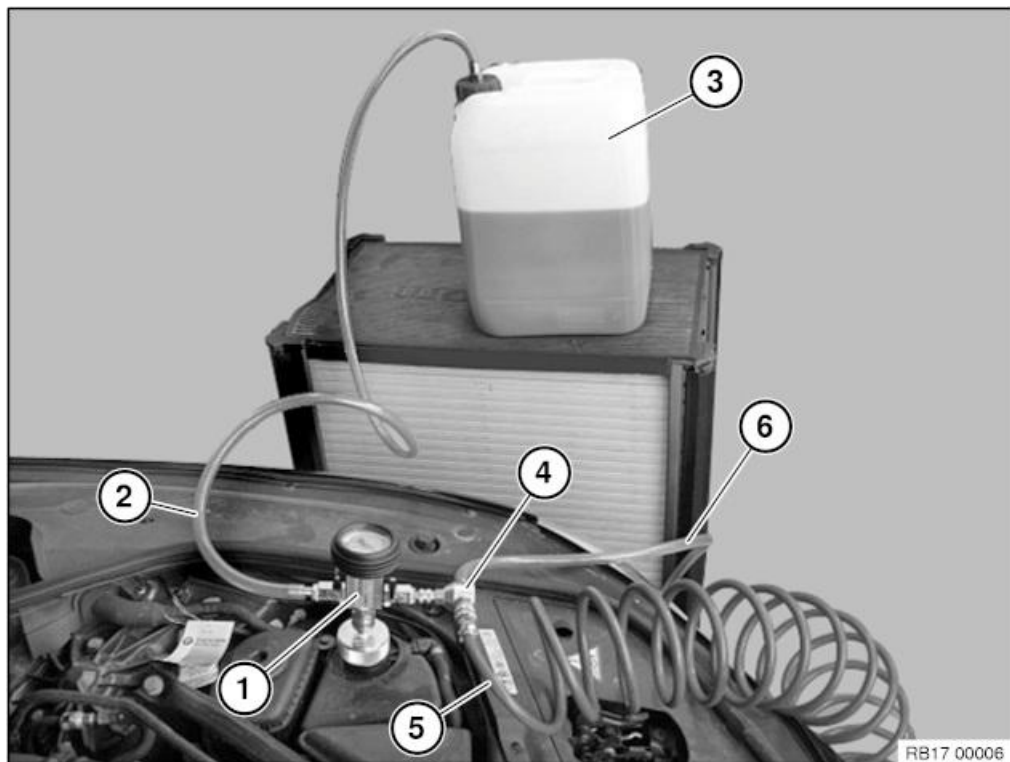
Radiator on module carrier

	4 Nm
--	------

POSTPROCESSES

3 – Bleed and fill the cooling system with the vacuum filler device

Vacuum filler device



Vacuum filler device - exemplary schematic diagram

- 1 Vacuum filler device with pressure gauge and shutoff valves
- 2 Filling hose
- 3 Fluid tank with coolant
- 4 Venturi nozzle
- 5 Compressed air connection (maximum 6 bar)
- 6 Out-going hose (lead out-going hose into a collecting vessel)

Prerequisite

The coolant expansion tank is empty. Compressed air connection with pressure of 6 bar is available.



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.

Check

- Check all coolant hoses for damage.

Result

» Coolant hose are damaged or porous.

Measure

- Renew coolant hoses.

- Position the fluid tank of the vacuum filler device at the same height as the coolant expansion tank.



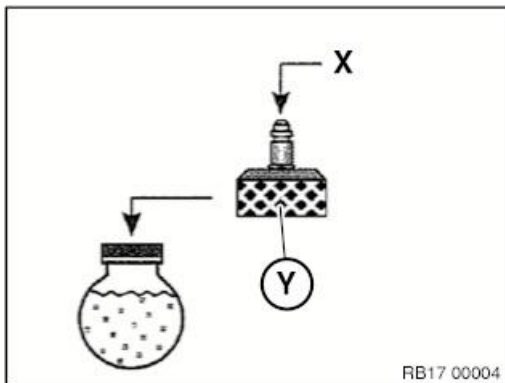
RISK OF DAMAGE

Contaminant or foreign body.

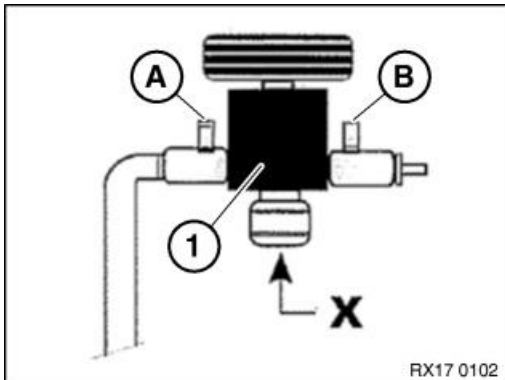
Contamination can result in malfunctions, operating failure or leaks.

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

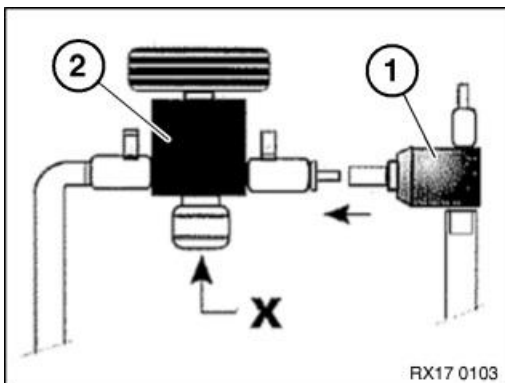
- Cover alternator watertight.
- The fluid tank of the vacuum filler device must be filled with 1 l to 2 l more than the required capacity of coolant for the vehicle.
- Set heating to maximum temperature.



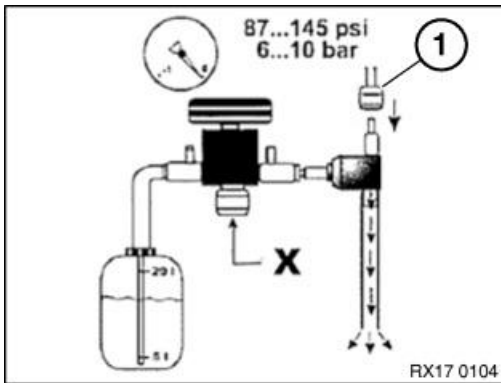
- Connect special tool **0 494 417 (17 0 100)** (Y) to the coolant expansion tank.
- Connect vacuum filler device to connection (X) of the adapter.



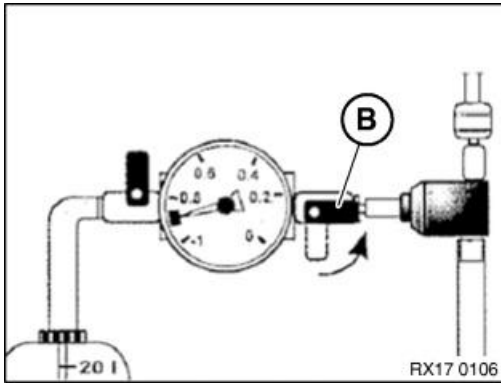
- Close shutoff valves (A) and (B) of the vacuum filler device (1).
(X) is the connection on the coolant expansion tank.



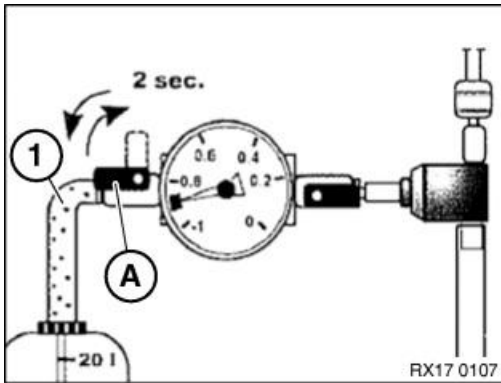
- Connect Venturi nozzle (1) to the vacuum filler device (2).
(X) is the connection on the coolant expansion tank.



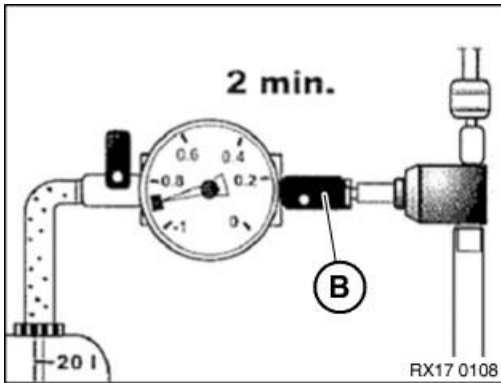
- Connect compressed air hose (1).
- (X) is the connection on the coolant expansion tank.



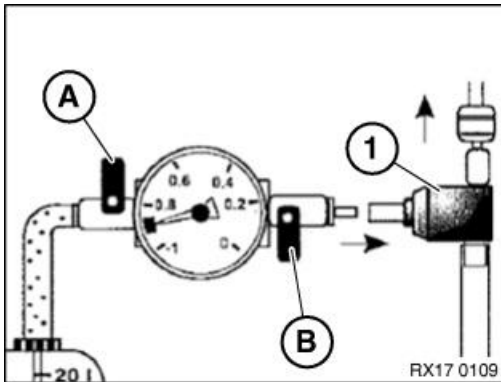
- Open shutoff valve (B).
- The Venturi nozzle generates a flow noise.



- Open shutoff valve (A) until the filling hose (1) is full without bubbles.
- Close shutoff valve (A) again.
- » The filling hose (1) has now been bled.



- After a vacuum of -0.7 bar to -0.95 bar has been reached in the coolant circuit (duration approximately 2 minutes), close the shutoff valve (B).



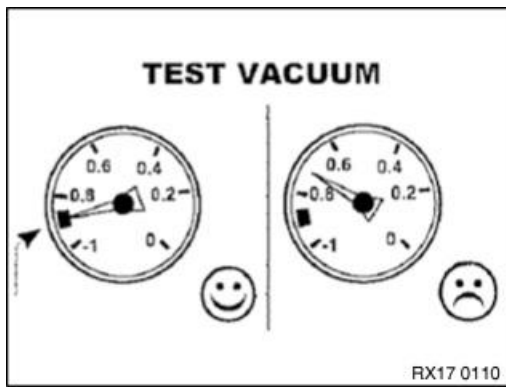
- Check whether the shutoff valves (A) and (B) are closed.
- Disconnect the Venturi nozzle (1).

Check



TECHNICAL INFORMATION

The coolant hoses contract during vacuum build-up.



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

Result

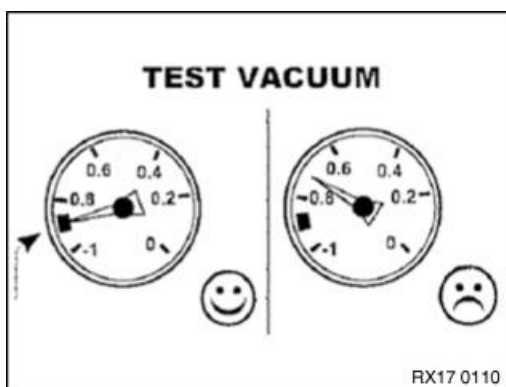
» Vacuum drops.

Measure

- Look for leak, repair cooling system, start filling procedure from the beginning.

Check

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

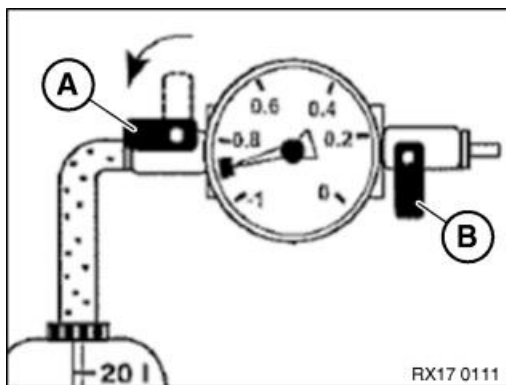


Result

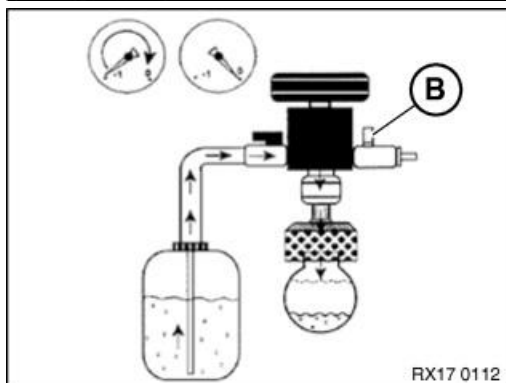
» Vacuum remains constant.

Measure

- Continue with the filling procedure.

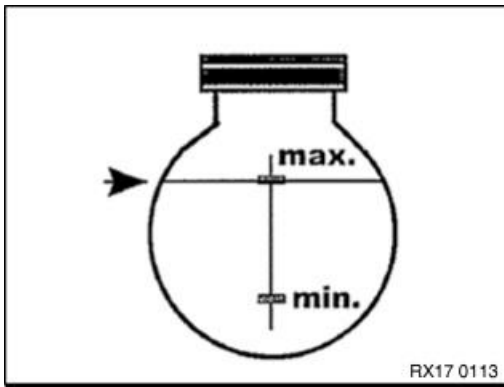


- Keep shutoff valve (B) closed during the filling process.
- To fill the cooling system, open the shutoff valve (A) to the fluid tank of the vacuum filler device.



- 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. Open the shutoff valve (B).

- Remove vacuum filler device and special tool **0 494 642 (17 0 113)** from the coolant expansion tank.



- Adjust the coolant level in the coolant expansion tank to the maximum mark.

4 – Check cooling system for leaks



WARNING

Hot fluids.

Risk of scalding!

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



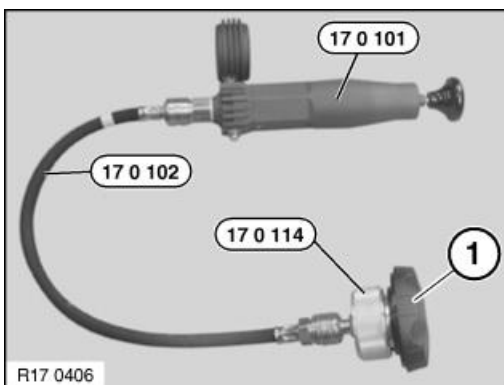
TECHNICAL INFORMATION

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



TECHNICAL INFORMATION

Notes on work at the cooling system form the basis of these repair instructions and must be complied with at all times. For additional information see: 17 00 ... Instructions for repair work on cooling system



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 the matching adapter from the set of special tools **0 494 417 (17 0 100)** (e.g. adapter **0 494 643 (17 0 114)**).
- Build up pressure using the hand pump from the special tools **0 494 418 (17 0 101)**. Observe on the pressure gauge when the opening pressure has been reached.

Check

- Generate pressure.
- Compare measured values with setpoint values.

Opening pressure of coolant sealing cover

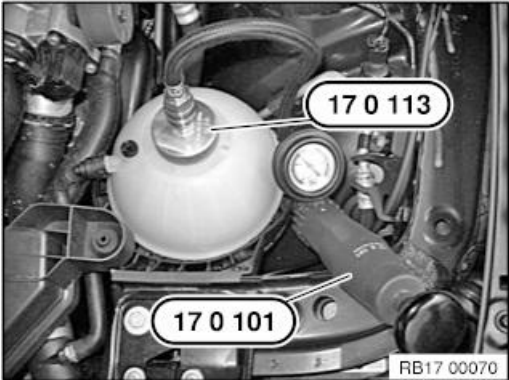
Pressure relief valve opens when the pressure exceeds the ambient pressure.	min. 1,4 bar
Electric changeover valve must open at latest when the pressure is lower than the ambient pressure	max. 0,1 bar

Result

» Measured values do not correspond with setpoint values.

Measure

- Exchange sealing cap.
- Release sealing cap on the coolant expansion tank.
- Place special tool **0 494 418 (17 0 101)** and the matching adapter from the set of special tools **0 494 417 (17 0 100)** on the coolant expansion tank (e.g. adapter **0 494 642 (17 0 113)**).



Check

- Build up excess pressure and wait approx. 2 minutes.

Cooling system test pressure

Test pressure for cooling system (gauge pressure)	1,5 bar
Pressure drop	max. 0,1 bar

Result

» Measured values do not correspond with setpoint values.

Measure

- Search cooling system for leakage.

Additional Information

Overview of Tightening Torques

Radiator on module carrier

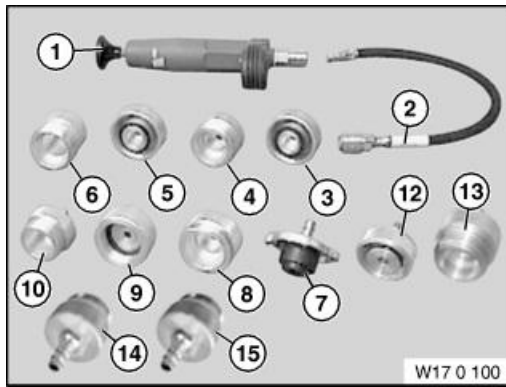
Used in step 2

	4 Nm
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Overview of Special Tools

0 494 417 (17 0 100) Tester

Common	Used in step 3 4
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	

0 494 642 (17 0 113) Adapter



Common

Used in step [3](#) [4](#)

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	

0 494 643 (17 0 114) Adapter



Common

Used in step [4](#)

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	

0 494 418 (17 0 101) Pump



Common

Used in step [4](#)

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

Overview Technical Data

Opening pressure of coolant sealing cover

Used in step [4](#)

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

Cooling system test pressure

Used in step [4](#)

Test pressure for cooling system (gauge pressure)

1,5 bar

Pressure drop

max. 0,1 bar

Links

Repair instructions

Used in step

Operating materials

Used in step

[Main group 17](#)

3

**Warning!**

Risk of scalding!

Only perform this repair work after engine has cooled down.

**Important!**

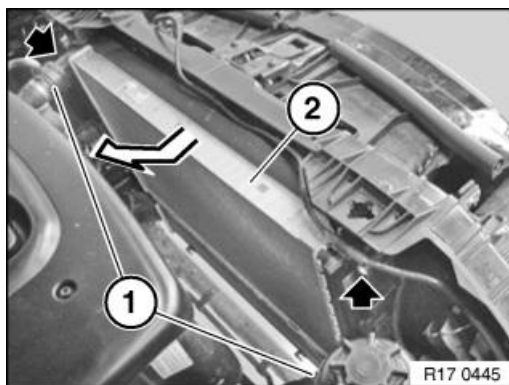
Wear safety goggles and protective gloves.

*Necessary preliminary tasks:*

- Follow [instructions for repair work](#) on the cooling system
- Remove [fan cowl](#)
- Drain [coolant](#)

If fitted on radiator core:

- Remove transmission oil cooler for automatic transmission fluid



Release screws.

Unlock and disconnect coolant hoses (1).

Remove radiator (2) towards top.



Reassemble the vehicle.

Check [cooling system](#) for leak tightness.

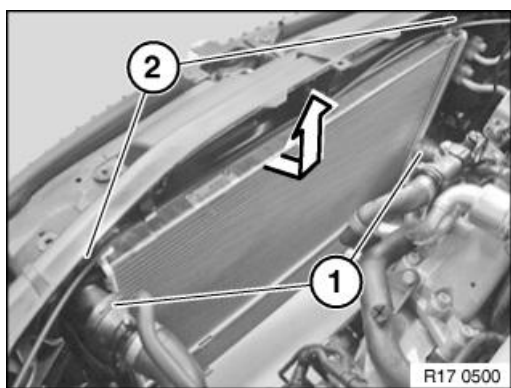
**Warning!**

Risk of scalding!

Only perform this repair work after engine has cooled down.

**Necessary preliminary work:**

- Follow instructions for [repair work on the cooling system](#).
- Remove [fan cowl](#).
- Drain [coolant](#).



Release and disconnect coolant hoses (1).

Unfasten screws (2).

Remove radiator towards top.



Reassemble the vehicle.

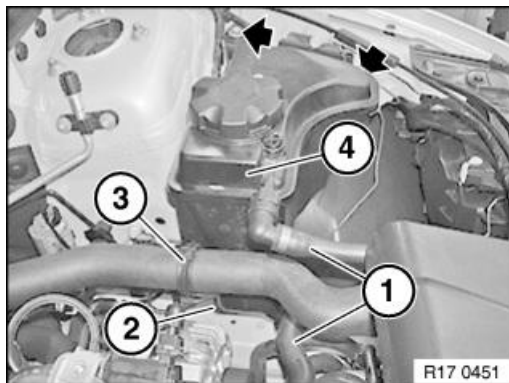
[Check cooling system for leaks.](#)

17 11 100 Removing and installing/renewing coolant expansion tank (M47T2, M57T2, N47, N47S, N57)



Necessary preliminary tasks:

- Drain [coolant](#).



Release and disconnect coolant hoses (1).

Unlock and disconnect plug (2) on coolant level switch.

If fitted, unlock holder (3).

Release screws.

Remove coolant expansion tank (4).

Installation note:

Insert retaining pin in rubber grommet.



[Check cooling system for leaks.](#)



Warning!

Risk of scalding!

Only perform this repair work after engine has cooled down.



Important!

When performing repair work on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

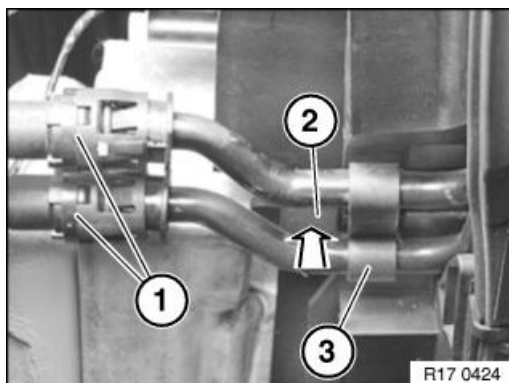
Cover alternator with suitable materials.

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



Necessary preliminary tasks:

- After completing this repair work, check [oil level in oil reservoir of hydraulic steering](#).
- Remove [radiator](#).

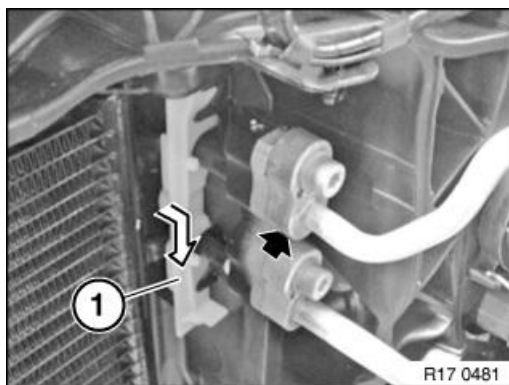


Press lines (1) in direction of cooling loop, pull black locking ring rearwards. Keep locking ring pressed and detach lines (1) from cooling loop.

Important!

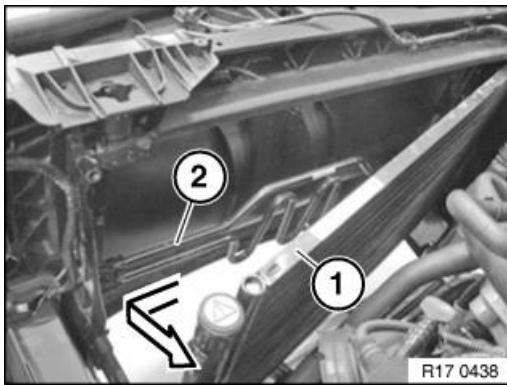
Catch and dispose of emerging oil.

Press lock (2). Pull cooling loop (3) of hydraulic steering rearwards out of holder.



Unlock seal (1) in direction of arrow and remove.

Release screw.



Remove A/C capacitor rearwards top from fixtures.

Carefully tilt capacitor (1) in direction of engine, taking care not to damage the capacitor or lines in the process.

Note:

Lines of A/C system remain connected to capacitor.

Pull cooling loop (2) of hydraulic steering out of module carrier and remove.

17 11 035 Removing and installing/replacing fan cowl with electric fan (M47T2, N47, N47S)

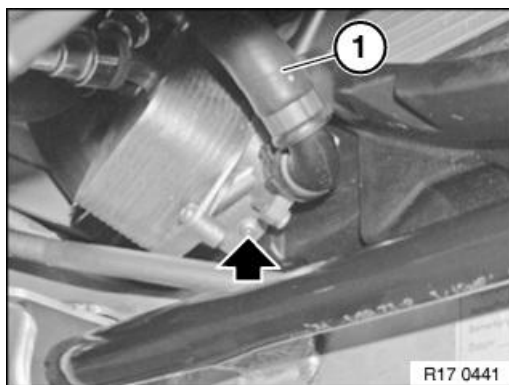


When the engine is switched off after the end of the journey, it may be necessary to operate the electric fan. In rare cases, the electric fan may operate for up to 11 minutes. This serves the component protection. In this context, renewing the electric fan will not remedy the problem!



Necessary preliminary tasks:

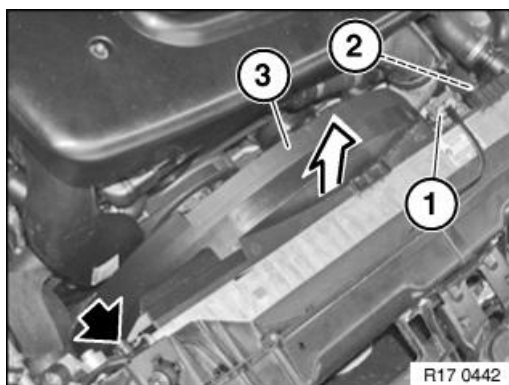
- Remove [intake port](#).
- **Automatic only:**
Remove front [underbody protection](#).
- **E84 and automatic only:**
Remove [pedestrian protection](#).



Automatic only:

Loosen screw.

Unclip hose (1) from fan cowl.



Unlock connector (1) and pull off.

Loosen screw.

Unlock catch (2) and remove fan cowl (3) towards top.



Note:

Reassemble the vehicle.

17 11 035 Removing and installing/replacing fan cowl with electric fan (N47T D20 U/O/K/T 1)

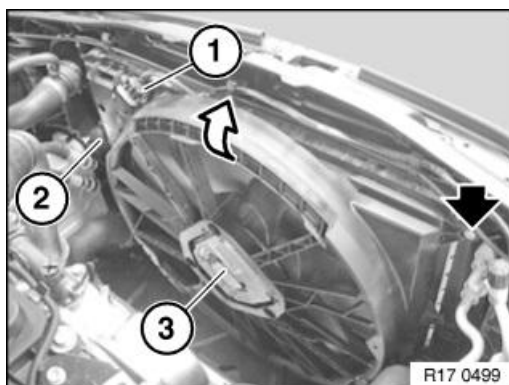


When the engine is stopped after the end of the journey, operation of the electric fan may be necessary. In rare cases, operation of the electric fan can last up to 11 min. This is for component protection. In this context, renewing the electric fan will not remedy the problem!



Necessary preliminary tasks:

- Remove [intake port](#).



Unlock connector (1) and pull off.

Loosen screw.

Unlock catch (2) and remove fan cowl (3) towards top.



Note:

Reassemble the vehicle.

Check stored error/fault messages.

Delete the fault memory.



Important!

Risk of scalding!

Only perform this repair work after engine has cooled down.



Recycling

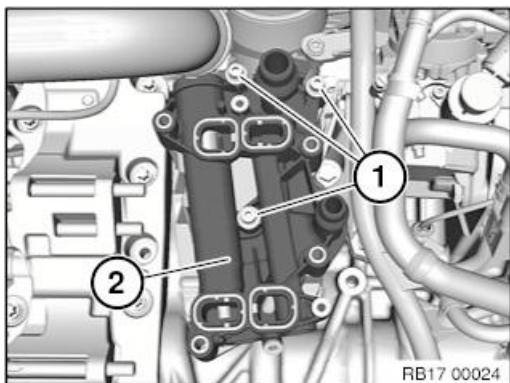
Catch and dispose of drained coolant in a suitable container.

Observe country-specific waste disposal regulations.



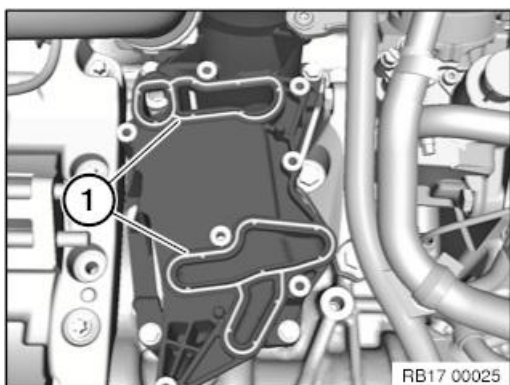
Necessary preliminary tasks:

- Remove [gearbox oil cooler](#).



Release screws (1).

Remove thermostat housing with thermostat (2).



Installation note:

Replace the seals (1) on the oil filter housing.



Assemble engine.

17 21 500 Flush gearbox oil cooler and lines (automatic transmission) (GA8HP45Z)



Special tools required:

- [17 2 018](#)
- [17 2 019](#)



Note:

Follow operations for:

- Installing a new or replacement transmission.



Procedure:

Automatic transmission removed.

Connect appropriate adapters (see description below) to oil lines exiting from automatic transmission.

Use quick-release coupling to connecting line [17 2 019](#) from oil dispenser unit.

Use quick-release coupling to drain line [17 2 018](#).

Hold and direct open end of drain line into a suitable collecting vessel.

Using oil dispenser unit, flush approx. 1 litre of transmission fluid (refer to BMW Service [Operating Fluids](#)) through oil lines and transmission oil cooler.

Reposition quick-release couplings.

Flush oil lines/transmission oil cooler in opposite direction with approx. 1 litre of transmission fluid (refer to BMW Service [Operating Fluids](#)).

Disconnect quick-release couplings.

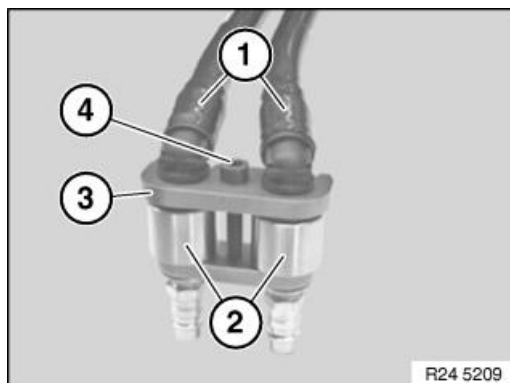
Remove adapter.



Recycling:

Never use flushing oil.

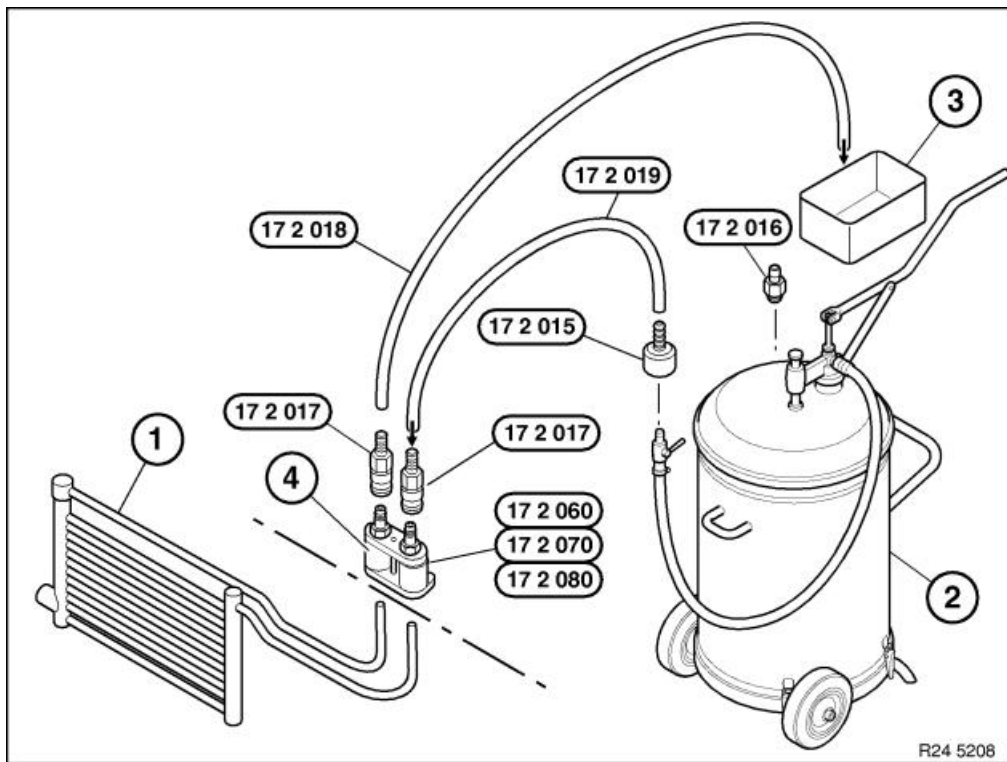
Dispose of flushing oil according to country-specific waste disposal regulations.



Press hydraulic lines (1) into adapters (2).

Slide clamping bracket (3) into guides and secure with screw (4).

Arrangement of flushing device for gearbox GA8HP45Z



1) Transmission oil cooler with lines

2) Oil dispenser unit

17 2 015 Connection for oil dispenser unit (2), manufacturer: Deutsche Tecaletmit or

17 2 016 Connection for oil dispenser unit (2), manufacturer: Horn

17 2 017 quick-release coupling (2 pieces)

17 2 019 Hose to oil dispenser unit (2)

3) Oil drip tray

17 2 018 Hose to oil drip tray (3)

4) Adapter with clamping bracket

17 2 080 Adapter with clamping bracketGA8HP45Z

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.

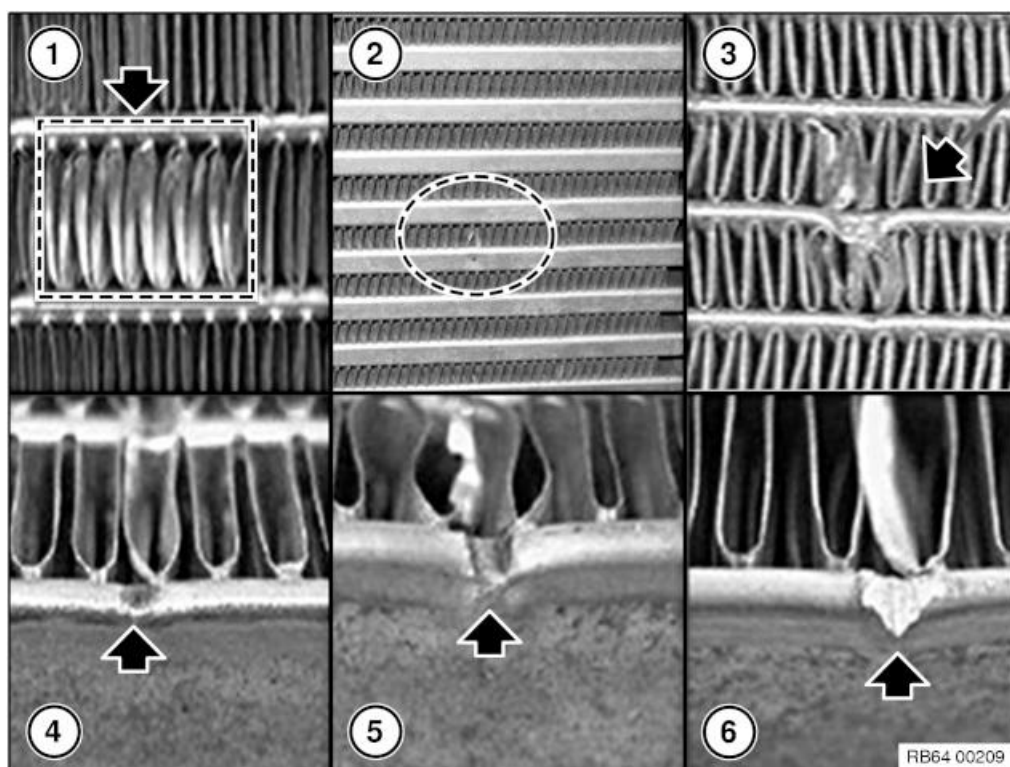
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

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

Note:

The deformations shown in Fig.Â (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 21 500 Flush gearbox oil cooler and lines (automatic transmission) (GA8HP45Z)



Special tools required:

- [17 2 018](#)
- [17 2 019](#)



Note:

Follow operations for:

- Installing a new or replacement transmission.



Procedure:

Automatic transmission removed.

Connect appropriate adapters (see description below) to oil lines exiting from automatic transmission.

Use quick-release coupling to connecting line [17 2 019](#) from oil dispenser unit.

Use quick-release coupling to drain line [17 2 018](#).

Hold and direct open end of drain line into a suitable collecting vessel.

Using oil dispenser unit, flush approx. 1 litre of transmission fluid (refer to BMW Service [Operating Fluids](#)) through oil lines and transmission oil cooler.

Reposition quick-release couplings.

Flush oil lines/transmission oil cooler in opposite direction with approx. 1 litre of transmission fluid (refer to BMW Service [Operating Fluids](#)).

Disconnect quick-release couplings.

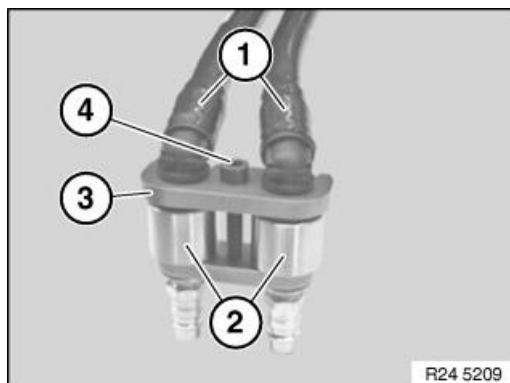
Remove adapter.



Recycling:

Never use flushing oil.

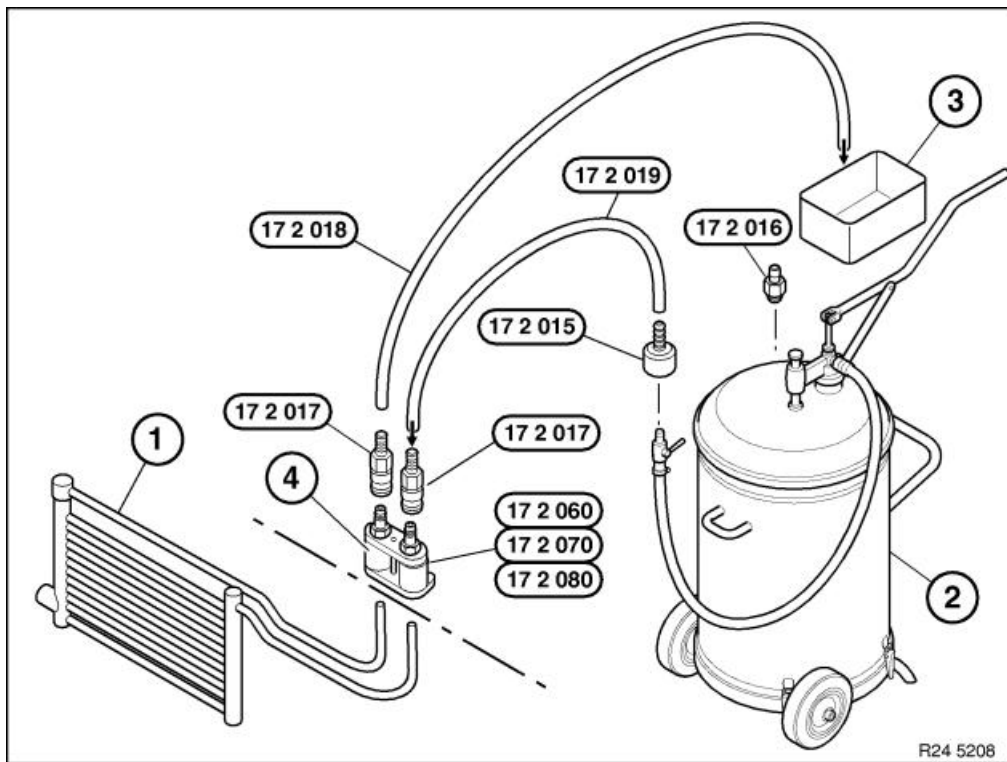
Dispose of flushing oil according to country-specific waste disposal regulations.



Press hydraulic lines (1) into adapters (2).

Slide clamping bracket (3) into guides and secure with screw (4).

Arrangement of flushing device for gearbox GA8HP45Z



1) Transmission oil cooler with lines

2) Oil dispenser unit

17 2 015 Connection for oil dispenser unit (2), manufacturer: Deutsche Tecaletmit or

17 2 016 Connection for oil dispenser unit (2), manufacturer: Horn

17 2 017 quick-release coupling (2 pieces)

17 2 019 Hose to oil dispenser unit (2)

3) Oil drip tray

17 2 018 Hose to oil drip tray (3)

4) Adapter with clamping bracket

17 2 080 Adapter with clamping bracketGA8HP45Z

17 22 010 Removing and installing/replacing gearbox oil cooler for automatic transmission (N47, N47S)



Important!

Risk of scalding!

Only perform this repair work after engine has cooled down.



Necessary preliminary tasks:

- Drain [coolant](#)
- Remove [underbody protection](#)
- **E84 only:**
Remove [pedestrian protection](#)



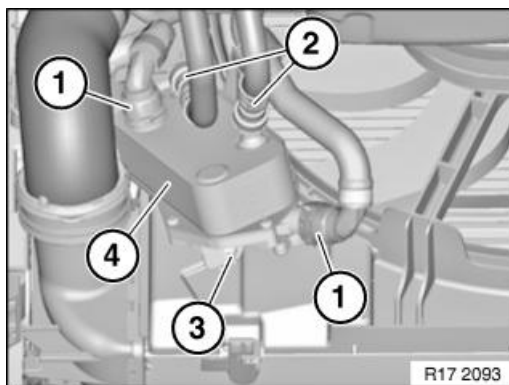
Recycling

Catch and dispose of drained coolant in a suitable container.

Transmission oil emerges when transmission oil lines are detached from transmission oil cooler.

Catch and dispose of escaping transmission oil in a suitable container.

Observe country-specific waste disposal regulations.



Release and disconnect coolant hoses (1).

Unlock transmission oil lines (2) and detach.

Release screw (3).

Tightening torque [17 11 7AZ](#).

Remove transmission oil cooler (4).



Note:

Assemble engine.

Check [oil level](#) in automatic transmission. If necessary, top up automatic transmission oil.

17 22 010 Removing and installing/replacing transmission oil cooler for automatic transmission (N47 D20 U/O/K/T 1)



Important!

Risk of scalding!

Only perform this repair work after engine has cooled down.



Necessary preliminary tasks:

- Remove [acoustic cover](#)
- Drain [coolant](#).



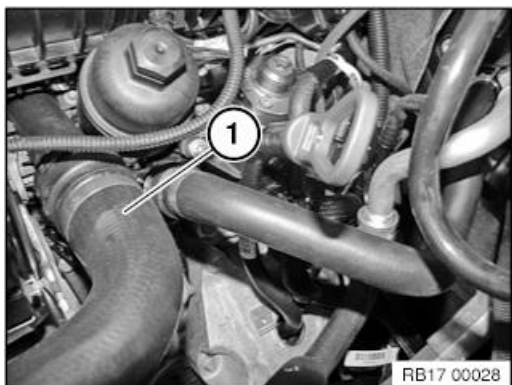
Recycling

Catch and dispose of drained coolant in a suitable container.

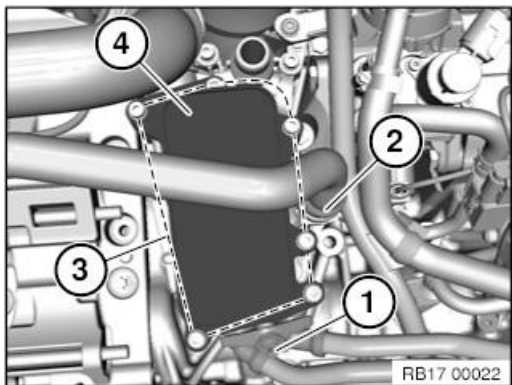
Transmission oil emerges when fluid lines are detached from transmission oil cooler.

Catch and dispose of escaping transmission oil in a suitable container.

Observe country-specific waste disposal regulations.



Unlock and detach coolant hose (1).



Note:

The transmission oil cooler is located in the oil filter housing.

Release screw (1).

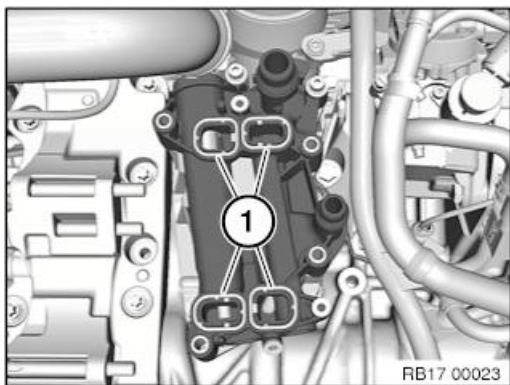
Pull transmission oil lines off of transmission oil cooler and close with suitable plugs.

Installation note:

Replace sealing rings.

Release bolts along line (3).

Remove transmission oil cooler (4).



Installation note:

Replace gaskets (1) on thermostat housing.



Note:

Assemble engine.

Check [oil level](#) in automatic transmission. If necessary, top up automatic transmission oil.

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.

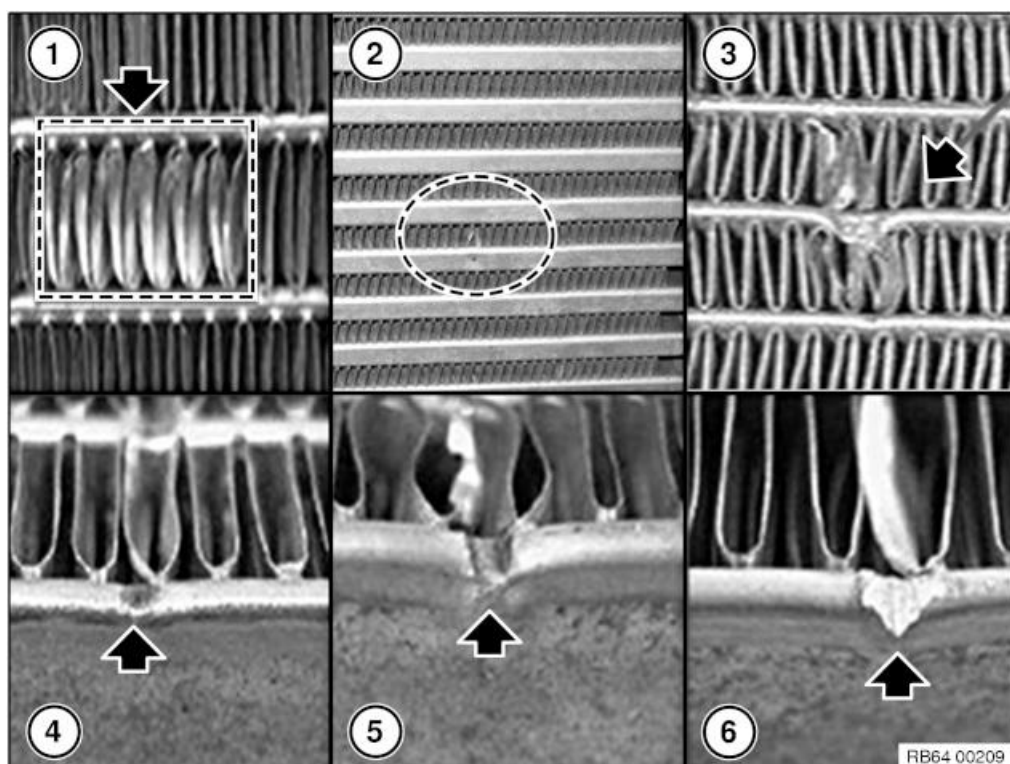
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

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

Note:

The deformations shown in Fig.Â (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 51 000 Remove and installing/renewing charge air cooler (M47T2, M57T2, N47, N47S, N57)



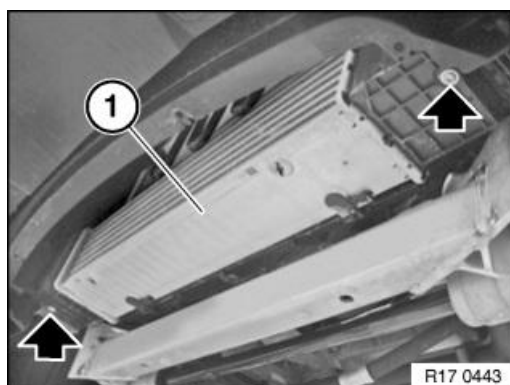
Necessary preliminary tasks:

- Remove [front underbody protection](#).
- Unlock charge-air hose on left and right of charge air cooler and disconnect.
- **E84 only:**
Remove [pedestrian protection](#).



Important!

Coat sealing rings of snap fasteners with lubricant.
Pressure pipes cannot be fitted without lubricant.



Release screws and remove charge air cooler (1). *Installation note:* Charge air hoses must audibly snap into place.



Reassemble the vehicle.



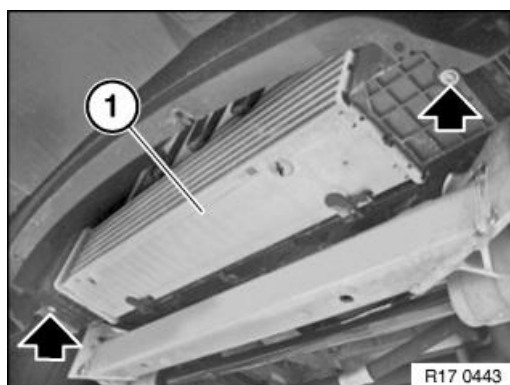
Necessary preliminary tasks:

- Remove [front underbody protection](#).
- Unlock charge-air hose on left and right of charge air cooler and disconnect.
- **E84 only:**
Remove [pedestrian protection](#).



Important!

Coat sealing rings of snap fasteners with lubricant.
Pressure pipes cannot be fitted without lubricant.



Release screws and remove charge air cooler (1). *Installation note:*
Charge air hoses must audibly snap into place.



Reassemble the vehicle.

**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!**

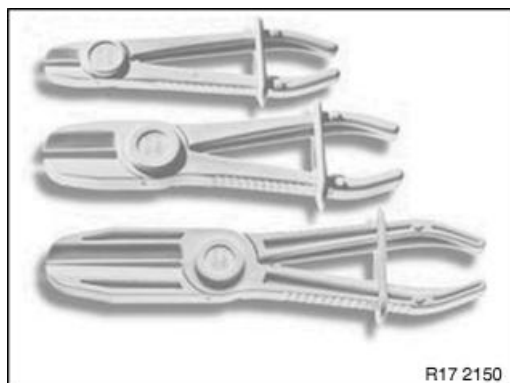
Do not fill coolant expansion tank over maximum level, as overfilling will cause the coolant to overflow. This may cause traces of coolant on the expansion tank or in the engine compartment and allow an incorrect conclusion about possible leaks.



Recycling

Catch and dispose of drained coolant.

Observe country-specific waste disposal regulations.

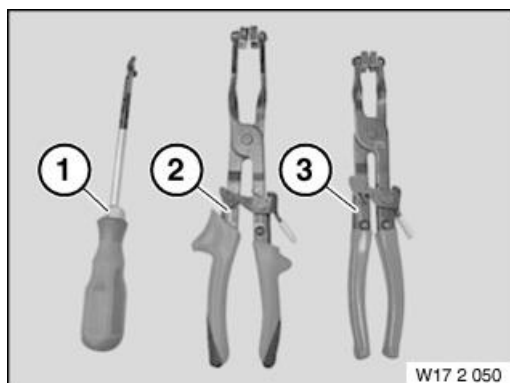


R17 2150

Note:

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

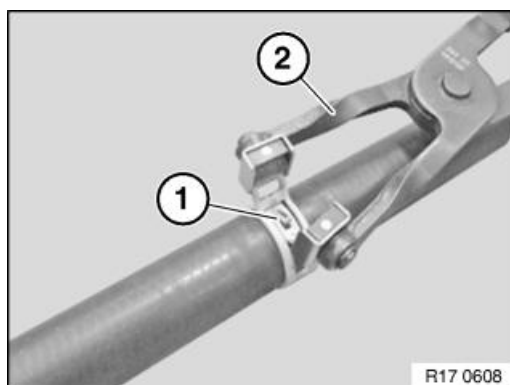
HAZET number:	Description
4590-1	Length of disconnect pliers (mm): 150
4590-2	Length of disconnect pliers (mm): 180
4590-3	Length of disconnect pliers (mm): 253
4590 / 2	Set of clamping pliers
4590 / 3	Set of clamping pliers



W17 2 050

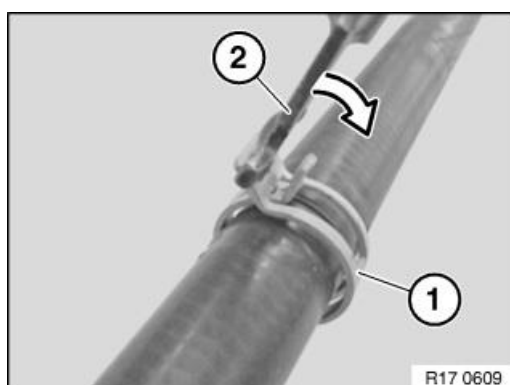
Set of special tools 17 2 050 for removing and installing the spring bracket clamps for coolant hoses.

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



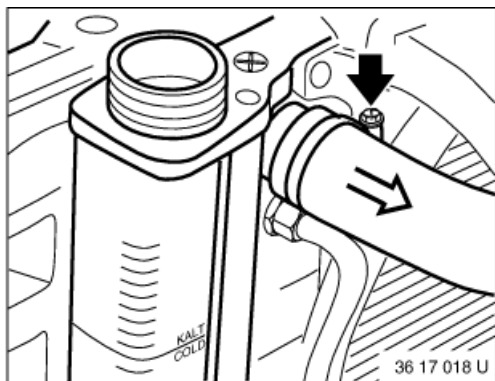
R17 0608

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



R17 0609

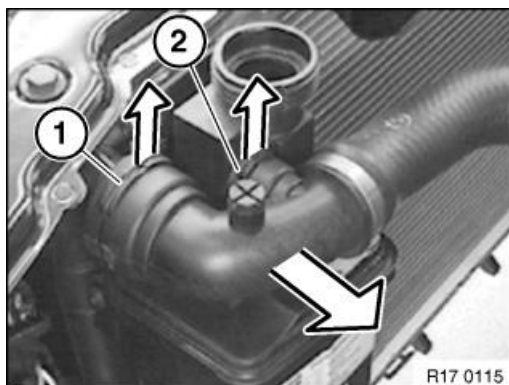
Unlock spring strap (1) with the release tool (2).



Note:

Tightening torque for hose clamps

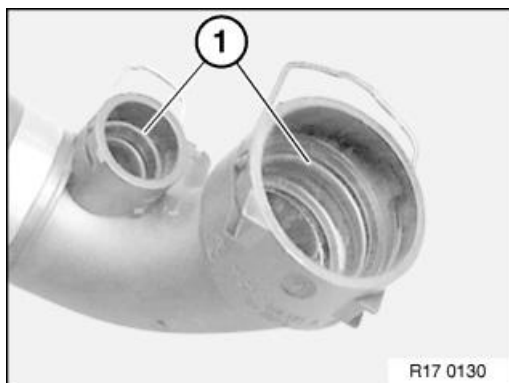
WAF 5	1.0 - 1.5 Nm
WAF 6	2.5 - 3.5 Nm



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

Dismantling of quick-release coupling

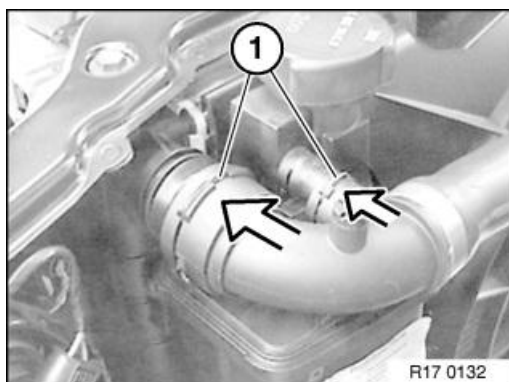
Pull out lock (1) and (2). Pull off hose.



Installation note:

Check O-rings (1).

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



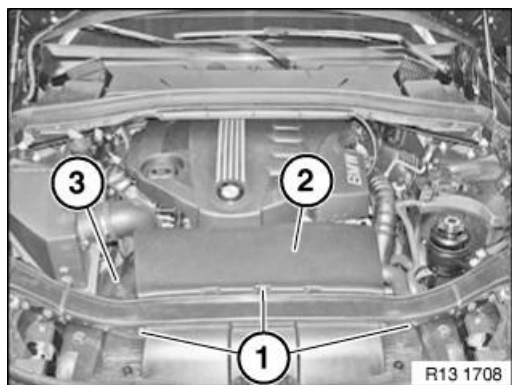
Assembly of quick-release coupling

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

Push on hose.

Quick-release couplings must clearly snap audibly into place.

13 Removing intake duct (N47, N47S)



Release screws (1).

Detach hose (3) on intake filter housing.

Lift off intake duct (2) and remove.