Filling coolant and bleeding the cooling system

Working on the vehicle cooling system

![WARNING!]

Use protective equipment when working on the vehicle cooling system.

- Coolant can cause skin irritation.
- Hot coolant can cause burns.
- Ethylene glycol can be fatal if ingested.

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![IMPORTANT!]

When making modifications to the cooling system, the cooling system must be emptied, refilled and pressure tested. The cooling system is advanced and minor faults can cause serious consequences for the functioning of the cooling system and the vehicle.

More information on pressure testing can be found under the heading *Pressure testing the cooling system*.
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**IMPORTANT!**

- Use only Scania Coolant, or another tested product that meets Scania requirements for antifreeze and corrosion protection. Damage arising from the use of incorrect coolant can invalidate Scania’s warranty.
- Damage to the coolant pump shaft seal will cause coolant leakage.
  - Fill coolant in the correct way; more information can be found under the heading *Filling*. Air pockets can cause overheating and thereby damage to the coolant pump shaft seal.
  - Do not start the engine if there is too little coolant in the cooling system because this could cause overheating and thereby extensive damage.
- Too high a proportion of antifreeze or corrosion protection will increase the amount of sludge and blockages in the radiator.
- Too low a proportion of antifreeze or corrosion protection may lead to corrosion in the cooling system or build-up of ice at low temperatures.

Contact a Scania dealer for more information about coolant.

**Environment**

Drained coolant should be treated as environmentally hazardous waste.
Coolant content and properties

Coolant recommended by Scania is a mixture of water, antifreeze and corrosion protection (ethylene glycol). Coolant has the following properties that are important for the functioning of the cooling system:

- Corrosion protection
- Antifreeze protection
- Raised boiling point

Hot countries

IMPORTANT!

In order to maintain corrosion protection and the higher boiling point, it is very important that the coolant contains antifreeze and corrosion protection. This also applies to countries where the temperature never drops below 0°C.

The proportion of antifreeze and corrosion protection should always be 35-55 per cent by volume. Otherwise, the coolant is not effective.
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Topping up
Coolant must only be topped up with pre-mixed coolant that meets Scania’s requirements for antifreeze and corrosion protection.

⚠️ IMPORTANT!
Containers that are used for mixing coolant must be intended for that purpose and free from any dirt or contaminants. Keep empty containers closed so that they do not accumulate dirt or dust.

Coolant should only be re-used within the coolant change interval. When re-using coolant it must be cleaned of dirt, sludge and particles prior to refilling. The coolant must not be re-used if it is contaminated with oil or fuel.
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Parts for the work

The following spare parts are available from Scania dealers. The use of other, equivalent parts is permitted:

<table>
<thead>
<tr>
<th>Designation</th>
<th>Part number</th>
<th>Illustration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant trolley</td>
<td>588 540</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adapter for draining coolant.</td>
<td>2 437 252</td>
<td></td>
<td>The adapter is required for coolant trolley (part number 588 540).</td>
</tr>
<tr>
<td>Adapter for bleeding the retarder.</td>
<td>99 301</td>
<td></td>
<td>The adapter is also required for emptying coolant with the earlier version of the trolley (part number 588 450).</td>
</tr>
</tbody>
</table>
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Filling

IMPORTANT!

If the vehicle is fitted with a bodywork circuit that has a thermostat, the coolant needs to reach operating temperature before the thermostat opens. When this occurs, the level of coolant can drop quickly. You therefore need to be prepared to fill coolant or switch off the engine.

Note:

- Scania recommends filling coolant using the coolant trolley (*part number 588 540*) via the drain and filler nipple. This is to minimise the occurrence of trapped air in the cooling system.
- If the coolant trolley is not available, it is also possible to fill coolant via the expansion tank, see exceptions below. Use appropriate containers to collect the coolant when filling via the expansion tank.
- Vehicles with L cabs and vehicles with high-level bodywork circuits for coolant outlets must always be filled via the drain and filler nipple. Only small quantities of coolant must be added via the expansion tank, e.g. when topping up after bleeding.
Filling coolant and bleeding the cooling system

Filling
1 Drain and filler nipple
2 Coolant trolley
3 Bleed pipe
4 Maximum level of coolant
5 Expansion tank cap
WARNING!

On vehicles fitted with an auxiliary water heater for the cab or engine heating, the cooling system must be bled before starting the water heater. Otherwise the water heater could overheat, which would lead to impaired function and shortened service life.

IMPORTANT!

Coolant must be filled to the maximum level before starting the engine. If the engine is started with the engine coolant level low, the coolant pump shaft seal may be damaged, which can result in leakage.

At the end of the filling process, small amounts of coolant can be filled via the expansion tank. Filling large amounts of coolant via the expansion tank will cause air pockets in the cooling system, which can result in damage to the coolant pump shaft seal.

Proceed as follows, see also the illustration *Filling*:

1. Connect the coolant trolley (2) with the adapter to the drain and filler nipple (1).
2. Open the expansion tank cap (5).
3. Ensure that the cooling system bleed pipes are not blocked or damaged. There are bleed pipes from the radiator and engine to the expansion tank.

4. Only for 9 litre engines:
   Ensure that the check valve on the static pressure pipe is correctly fitted. There is an arrow on the valve that indicates the flow direction and it should always point towards the centre of the cab.

5. Only for vehicles with high-level bodywork circuits:
   Open the ventilating valves in the bodywork circuit’s highest point/points.

6. Only for vehicles with valves to the bodywork circuit:
   Open the valve to the bodywork circuit, to allow the flow to pass through the circuit.

7. Only for vehicles with Scania retarders:
   a) Remove the rubber plug and connect the adapter (part number: 99 301) with hose to the bleed nipple on the retarder coolant pipe, see illustrations A and B. The hose should be long enough to conduct the air-mixed coolant to the coolant trolley or any other collecting tank.
   b) Fill coolant using the coolant trolley (2) until a steady flow of coolant with no air comes out of the coolant pipe on the retarder.
   c) Finish filling, remove the adapter and hose, and then replace the rubber plug.

A. Bleed nipple on the retarder coolant pipe, manual gearbox.
B. Bleed nipple on the retarder coolant pipe, automatic gearbox.
8. Continue to fill coolant using the coolant trolley (2) until the coolant reaches the maximum level of the expansion tank (4).

9. Tighten the expansion tank cap (5).

10. Only for vehicles with high-level bodywork circuits:
   a) Fill coolant until coolant starts to leak from the ventilating valve(s) in the bodywork circuit’s highest point.
   b) Tighten the ventilating valves in the bodywork circuit.

11. Disconnect the coolant trolley (2).

12. Pressure test the cooling system.
   More information can be found under the heading *Pressure testing the cooling system*.

13. Fill coolant to the maximum level through the filler spout in the expansion tank and close the cap (5).

14. Start the engine and let it run at a maximum idling speed of 600 rpm for approx. five minutes. Stop the engine, fill with coolant to the maximum permissible level if the coolant level has fallen noticeably or has reached its minimum level. After filling, ensure that the expansion tank cap is tightly closed.
15. Start the engine and increase engine speed to 800 rpm for three to five minutes.
16. Stop the engine, top up with coolant to the maximum level through the filler spout in the expansion tank and close the cap.
17. Warm up the cooling system until the thermostat opens (approx. 90°C), then increase the engine speed to 1,200 rpm for five to 10 minutes.
18. Stop the engine, wait until the coolant has cooled down. Then fill with coolant to the maximum level through the filler spout in the expansion tank and close the cap.

**IMPORTANT!**

When the thermostat opens, the level of coolant drops quickly. You therefore need to be prepared to fill coolant via the expansion tank or switch off the engine.

19. Check that there are no leaks in the engine, vehicle circuit or bodywork circuit.
20. For 7 litre engines only:

Perform the following procedure with the expansion tank cap closed. If the coolant level drops below the minimum level, lower the engine speed to idling speed and fill with coolant.

a) Without valve and thermostat in the bodywork circuit:

   Let the engine run at 2,000 rpm for 20 minutes until the coolant level in the expansion tank does not change. Check that the return hose from the bodywork circuit becomes hot when the flow is circulating.

b) Valve for bodywork circuit:

   Make sure that the valve to the bodywork circuit is open. Let the engine run at 2,000 rpm for 20 minutes until the coolant level in the expansion tank does not change. Check that the return hose from the bodywork circuit becomes hot when the valve is open and the flow is circulating.

c) Thermostat for bodywork circuit:

   Let the engine run at 2,000 rpm until the thermostat opens. Run the engine for a further 10 minutes until the coolant level in the expansion tank is stable and does not change. Check that the return hose from the bodywork circuit becomes hot when the thermostat is open and the flow is circulating.
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21. Fill coolant to the maximum level of the expansion tank (4) once the cooling system has been bled. After filling, ensure that the expansion tank cap is tightly closed.

Drive the vehicle with a heavy load after bleeding so that the thermostat in the motor opens and the radiator is bled. If necessary, then fill the expansion tank (4) with coolant to its maximum level.

**IMPORTANT!**

After filling coolant, a small amount of air may remain in the cooling system. Some longer drives are required for all the air to escape. The engine must be warm and the thermostat completely open. After filling the coolant level should therefore be checked before each start for the next five to 10 times the vehicle is driven.
Pressure testing the cooling system

Pressure test the cooling system to check that the system is sealed.

- The delivery valve must not be triggered until the pressure has reached 0.9-1.1 bar overpressure.
- Once the delivery valve has been triggered, the remaining pressure in the system must not be lower than 0.8 bar overpressure.
Parts for the work

The following spare parts are available from Scania dealers. The use of other, equivalent parts is permitted.

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<tr>
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<tr>
<td>Cooling system tester</td>
<td>587 048</td>
<td><img src="image1.png" alt="Cooling system tester" /></td>
</tr>
<tr>
<td>Adapter for pressure testing the cooling system</td>
<td>99 312</td>
<td><img src="image2.png" alt="Adapter for pressure testing the cooling system" /></td>
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</table>
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Work description for pressure testing

1. Remove the expansion tank cap.
2. Check the sealing surface on the filler pipe and the cap gasket for damage.
3. Check the coolant level. Fill if necessary.
4. Fit the cooling system tester (part number: 587 048) with adapter (part number: 99 312) on the cap hole, see illustration.
5. Pump up the pressure until the pressure limiting valve opens. The correct opening pressure is 0.9-1.1 bar.
6. Stop pumping and allow the pressure limiting valve to close.

If the pressure continues to drop below 0.8 bar, there may be a leakage. Rectify the leakage and carry out a new pressure test.