



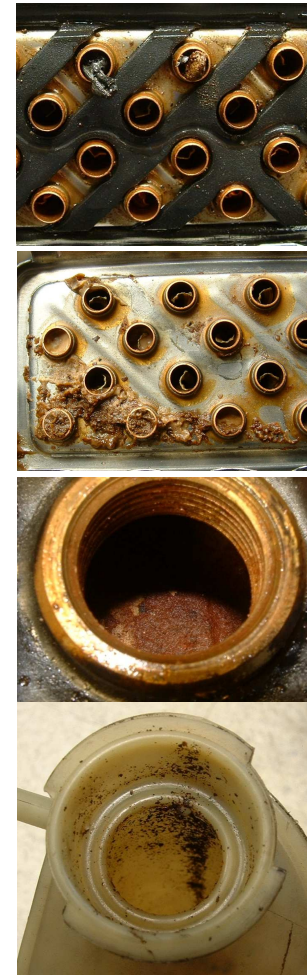
Flushing the cooling system

If the cooling system is soiled, the coolant has to be drained off and the cooling system flushed.

Soiling can be:

- Oil (faulty cylinder head gasket)
- Rust (interior corrosion engine)
- Aluminium (interior corrosion radiator)
- Foreign matter (additives/sealants)
- Foreign particles (faulty coolant pump)

Examinations of failed radiators have shown that rust sludge is the most frequent cause of soiling. This originates due to lack of or insufficient cleaning during repairs to the cooling system, or filling the system with the wrong types of anti-freeze or using the drained coolant again. Rust sludge can become deposited and block narrow channels, speeds up corrosion if bright metal surfaces are covered with it (anodic effect with pitting corrosion) and acts as an abrasive in the coolant circuit, particularly in spots where the direction of flow is diverted.



Cleaning

Depending on the degree of soiling, the cooling system must be cleaned using warm water or a special flushing liquid. There are several different flushing procedures available depending on the vehicle manufacturer and symptom. Audi prescribes the use of a special flushing liquid if the coolant is discoloured rust-brown and there are complaints about heating performance in the A6, for example. The flushing procedure has to be carried out in several cycles during which the thermostat has to be removed, and the heating power must be measured before and after flushing.



gemessen werden.

Volkswagen prescribes a cleaning agent with a **de-oiling** effect and the following procedure:

- Get the engine to operating temperature
- Drain off the coolant
- With 4-cylinder engines: fill with 3 litres of cleaning agent and supplement with water
- With 8-cylinder engines: fill with 4 litres of cleaning agent and supplement with water
- Allow the engine to run for 20 minutes with the thermostat open
- Drain the cleaning agent
- Repeat the procedure until the cleaning liquid drained is clear
- Repeat the procedure another 2 x with clear water
- Fill with anti-freeze



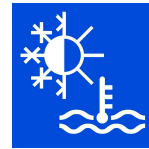
With the models Corsa B, Vectra B and Omega B up to model year 1997, Opel points out that a clogged radiator can cause the engine temperature to be too high. In this case, warm water (> 50 °C) should be used to flush the radiator and all the parts that coolant passes through in addition to the radiator (heat exchanger, cylinder head etc.) should be replaced.

Most cleaning agents are based on compounds containing formic acid, oxalic acid or hydrochloric acid which must never remain in the cooling system. **Always flush out thoroughly!** Sometimes leaks that were not visible before can occur after cleaning. This is often reputed to be caused by aggressive cleaning agents. In actual fact the leak was already there before, but the dirt deposits blocked the hole.

Behr Hella Service recommends cleaning the cooling system before any new parts are installed.

The degree of soiling and the vehicle manufacturer's specifications prescribe the procedure and the flushing medium to be used.

It must be noted that the design of modern cooling systems (e.g. flat-pipe) means that not all components can be flushed, which means they have to be replaced.



This particularly applies to the following components:

- Thermostat
- Radiator
- Electric valves
- Radiator cap
- Heat exchanger

If the coolant level can no longer be seen in the surge tank on account of soiling (oil, rust), the tank must also be replaced.

The thermostat and the radiator cap should always be replaced.

When cooling system cleaning agents are used, care must be taken that they do not corrode any sealing materials and do not get into the groundwater and are not drained via the oil trap.

Cleaning agents have to be collected together with the coolant and disposed of separately. After flushing, the system must be refilled with coolant according to the vehicle manufacturer's specifications (specification, heed mixing ratio), bled and checked for function and leaks.

Anti-freeze = Corrosion protection!