



Oil coolers

General points

The cooling of oils under a high thermal load (engine, gear, steering aid) by oil coolers or the guarantee of an almost constant temperature results in significant advantages. The intervals between oil changes can be extended and the service life of various components increases. Depending on the requirements, oil coolers are located in/on the radiator or directly on the engine block. A basic distinction is made between air-cooled and coolant-cooled types of oil cooler.



Various oil coolers

Design/Function

These days, conventional cooling is no longer sufficient for vehicle units which are under a high load. Thus, for example, the engine oil is cooled extremely irregularly, since it is dependent on outdoor temperature and the wind blast. Air-cooled oil coolers which are located in the air stream at the front end of the vehicle, contribute to sufficient cooling of the oil temperature. Liquid-cooled oil coolers are connected to the engine coolant circuit and provide optimum temperature regulation. In this case, coolant flows through the oil cooler. When the engine is hot, the coolant withdraws the heat from the oil, thus cooling it down. When the engine is cold, the coolant warms up more quickly than the oil and thus dissipates heat to the oil. This helps the oil to reach its operating temperature more quickly. Quick achievement of the operating temperature or the maintenance of a constant operating temperature is particularly important in the case of automatic transmission and steering aids. Otherwise, steering could become too stiff or too easy-running, for example. Today, pipe coolers are being replaced more and more by compact all-aluminium stack-disc coolers. These offer greater large-area cooling despite reduced design space and can be attached at a wide variety of points in the engine compartment.



Stack-disc oil coolers



Effects of failure

A faulty oil cooler can become noticeable as follows:

- Poor cooling performance
- Oil loss
- Increased oil temperature
- Soiled coolant

The following can be considered as possible causes:

- Poor heat exchange caused by external or internal impurities (insects, dirt, oil sludge, corrosion)
- Oil loss through damage (accident)
- Oil penetrating the cooling system (inner leak)
- Loss of oil through leaky connections

Troubleshooting

Test steps towards recognising faults:

- Check oil and coolant levels
- Check oil cooler with regard to outer soiling, damage (hairline cracks)
- Check coolant for soiling/dischouring and anti-freeze content
- Watch out for external leaks (connections)
- Check the flow rate (blockage due to foreign materials, corrosion, oil sludge etc.)