



Creeping coolant loss

Leaky EGR coolers often go unnoticed

Situation

Since the introduction of exhaust emission standard Euro 4, the use of EGR systems with EGR coolers is becoming increasingly widespread (also see PIERBURG Service Information SI 0108).

EGR coolers are not typical wearing parts. Nevertheless, this part may fail during the life of an engine.



Fig. 1: EGR valve with EGR cooler

Background

In EGR coolers, the engine coolant acts as the cooling agent. The coolers are made of stainless steel or aluminium. In unfavourable or unintended operating states (e.g. if running the engine with highly sulphurous fuel or biofuel), the formation of aggressive combustion products can increase. Over longer periods, this may lead to internal leakage, which is also associated with a gradual loss of coolant. In the search for the cause of this loss, cylinder head gaskets, cylinder heads or the seals of wet cylinder liners are frequently replaced in error and without success.

Causes of the problem

Leakage from the exhaust-gas side is more often the cause of the problem. A less common cause is pitting on the coolant side. Unsuitable cooling fluids can lead to corrosion or cavitation.

As the exhaust-gas back pressure is greater than the pressure in the cooling system during operation, the loss of coolant is not always immediately noticeable. When the engine is switched off, the coolant seeps into the engine's exhaust tract or intake air system.

If the EGR cooler is positioned higher than the intake and exhaust valves, this can cause coolant to accumulate in the combustion chamber of one or more cylinders. When the engine is started, "water hammer" occurs, with severe damage to pistons, cylinders or conrods.

Summary

To prevent expensive and time-consuming engine repairs when searching for coolant leaks, check for leakage from the EGR cooler before you start to dismantle the engine.

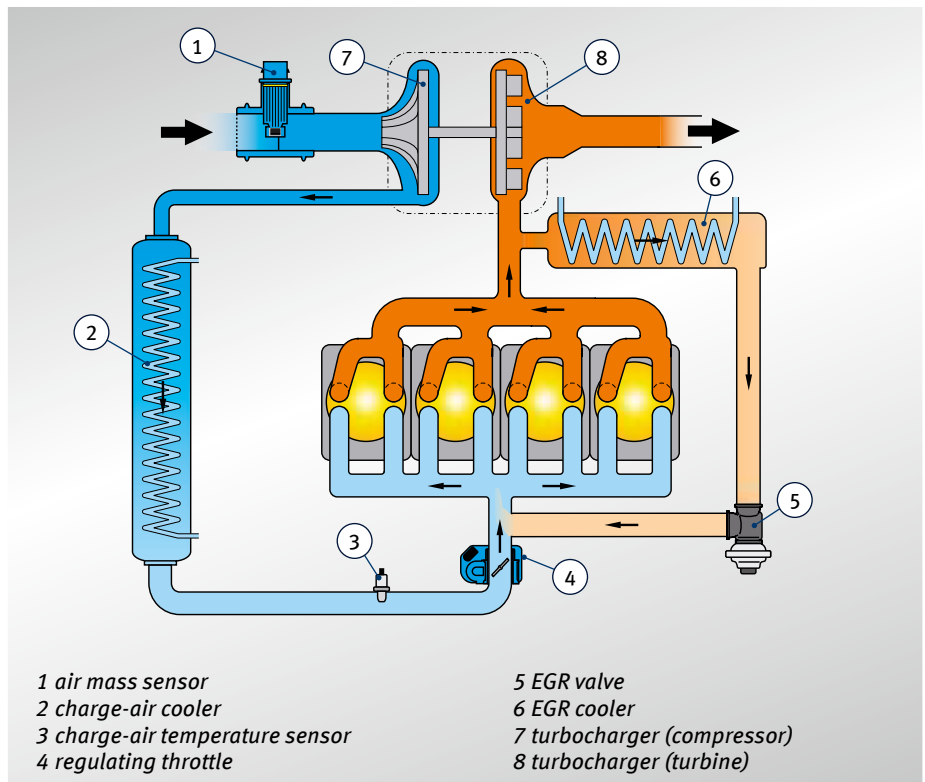


Fig. 2: schematic diagram of cooled recirculating exhaust gas

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