Innovative thermal management

The novel thermal management system, an innovation from Audi in many engines, lowers fuel consumption by up to 3 percent. Rather than being circulated, the coolant remains still during the warm-up phase so that the engine oil quickly reaches its operating temperature of between 80 and 120 degrees Celsius (between 176 and 248 degrees Fahrenheit). This significantly shortens the phase of greater frictional resistance due to viscous oil in the crankshaft drive and valve gear.

Depending on the engine, the innovative thermal management system takes on various embodiments – featuring an on-demand water pump or ball valves, for instance. The 3.0 TDI employs a particularly sophisticated technology. Its crankcase and cylinder heads each have their own cooling water loops connected to one another via a valve. During the warm-up phase, the coolant in the block is not circulated. The oil cooler is also bypassed during this phase. The water in the crankcase is often not circulated, even at low load when the engine is warm. The coolant, which circulates through the heads, heats the cabin and also feeds the cooler of the exhaust gas recirculation system.

In many cases, the transmission fluid is also heated as part of the innovative thermal management technology. In the Audi A8 and certain other models, a software module controls a number of actuators. These divide up the flows of heat between the engine, the transmission and the interior, always with the goal of maximum efficiency – in the city and on the highway, in summer and in winter.

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