
1.8 TFSI

A central innovation in the 1.8 TFSI is the addition of indirect fuel injection. Indirect injection supplements FSI direct fuel injection in the part-load range. This lowers fuel consumption and reduces particulate emissions to within the limits of the future Euro 6 standard. FSI fuel injection is active when starting and at higher loads. The valve control system has been given greater operating freedom. The Audi valvelift system, which adjusts the lift of the valves as needed, is active on the exhaust side; the camshafts can also be adjusted.

The innovative thermal management system features a further innovation: a fully electronic coolant regulation system. Two rotating cores control the flow of coolant. They ensure that the engine oil is brought up to operating temperature as soon as possible after the engine is started and set the water temperature between 85 and 107 degrees Celsius (185 and 225 degrees Fahrenheit) as a function of the driving situation to achieve the best compromise between minimal friction and high thermodynamic efficiency for any load and engine speed.

The exhaust manifold is integrated into the cylinder head, where it is bathed in water. This solution reduces the temperature of the exhaust, eliminating the need to use a richer mixture at full load and thus reducing fuel consumption during sporty driving. The turbocharger is also a new development. Its most important innovation is an electric wastegate actuator that adjusts the boost pressure particularly quickly and precisely.

The weight of the 1.8 TFSI has been reduced from 135 to 131.5 kilograms (297.62 to 289.91 lb). Internal friction has also been significantly reduced by the use of an innovative coating on the piston skirts and by mounting the two balance shafts in roller bearings. The regulated oil pump requires little energy itself, and a high-precision electric system controls the oil-jet cooling for the piston heads.

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