Audi A4 – 2.0 TFSI ultra

The 2.0 TFSI with a displacement of 1,984 cc is available in the new the Audi A4 ultra and A4 Avant ultra. Its technical refinements are the exhaust manifold integrated into the cylinder head, the rotary-valve model for thermal management, the Audi valve-lift system (AVS) for the intake valves, the electric wastegate of the turbocharger and the dual fuel injection. In partial load, indirect injection in the inlet manifold supplements the FSI direct injection.

The gasoline ultra model, delivers 140 kW (190 hp) and torque of 320 Nm (236 lb-ft) between 1,450 and 4,200 rpm. Very agile performance: 7.5 seconds from 0 to 100 km/h (62.1 mph) and a top speed of 238 km/h (130.5 mph) for the Avant; 7.3 seconds and 240 km/h (130.5 mph) for the Sedan (both with S tronic). NEDC fuel consumption is excellent: The Avant consumes 5.0 liters per 100 kilometers (*47 US mpg*) and the Sedan 4.8 liters (*49 US mpg*), equivalent to 114 and 109 grams of CO_2 per kilometer (183.5 and 175.4 grams per mile) respectively.

Revolutionary combustion method

These results are based on a new strategy – Audi continues to develop its successful engine downsizing into rightsizing. The pioneering efficiency of the 2.0 TFSI is the result of an innovative combustion method whereby the comparatively large engine displacement is not a handicap, but a prerequisite. With a moderate driving style, customers of new Audi A4 and A4 Avant experience the economical advantages of a small engine, but do not feel its disadvantages when driving in a more sporty manner.

The new combustion method with shorter compression and longer expansion phases as well as increased compression is designed especially for partial load, by far the most common mode of operation. The intake valves close much earlier than usual; in connection with increased pressure in the intake manifold, this reduces throttling losses during aspiration.

Due to the shortened compression phase, the compression ratio was successfully increased from 9.6:1 to 11.7:1. This means that in the compression phase, the engine only has to compress as much gas as a 1.4 TFSI. Also in the expansion phase, in which it fully utilizes its two liters of displacement, it profits from the high compression ratio; the resulting higher level of pressure during combustion further increases the engine’s efficiency.

Source: www.audi-technology-portal.com
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In order for the fuel-air mixture to swirl sufficiently despite the short intake time, the combustion chambers, piston recesses, intake ducts and turbocharging of the new 2.0 TFSI are specially adapted to the new combustion method. Under higher loads, the Audi valvelift system opens the intake valves later, resulting in a higher charge, which ensures good power and torque delivery. Injection pressure has been increased to 250 bar.

Status: 9/2015

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