



3.0 TDI Biturbo

The top version of the 3.0 TDI is a high-performance diesel engine, with which Audi is setting new standards for performance and efficiency. The twin-turbo design features two turbochargers connected in series that both provide thrust.

A vacuum-actuated valve – the turbine switchover valve – connects the two turbochargers. They are water-cooled, and pulse dampers are used to reduce their vibrations. An optimized intercooler lowers the temperature of the compressed air, thus increasing the mass of the air in the combustion chamber.

The turbine switchover valve is closed at low revs. The small charger with its variable turbine geometry does the lion's share of the work here, with the large charger responsible for pre-compression. From about 2,500 rpm, the valve starts to open and the small charger increasingly transfers the major share of work to its counterpart. In the range between 3,500 and 4,000 rpm, the valve opens completely, and only the large charger still operates.

The high-performance concept also led to modifications to the engine itself. Modifications were made to the cylinder head cooling, the timing and lift of the intake cam shafts, the pistons and their oil jet cooling. A special coating reduces the friction of the piston pins. High-end methods, including plate honing and laser exposure, are used during the fabrication of the engine block at the engine plant in Győr, Hungary. These methods are used with numerous Audi engines.

The common rail system develops up to 2,000 bar of pressure and injects as many as eight partial amounts of fuel into the cylinder. The regulated oil pump and the water pump have been optimized for maximum efficiency.

The sophisticated technology results in immensely powerful performance. The top-of-the-line TDI provides its peak torque of 650 Nm (479.42 lb-ft) of torque from 1,450 to 2,800 rpm. It revs up to 5,200 rpm with no difficulty at all, with a sporty and classy sound through the entire rev range. This is due in large part to the sound actuator integrated into the exhaust system. This is essentially a loudspeaker in a "side channel" of the exhaust system.

It uses a modulation process to superimpose a defined oscillating pattern over the typical exhaust sound, underscoring the awesome power delivery of the 3.0 TDI biturbo with a



rich and sonorous tapestry of sound.

Status: 2011