Audi S5 Coupé – 3.0 TFSI

**Strong heart: 3.0 V6 TFSI**
The completely redesigned, turbocharged 3.0 TFSI engine for the Audi S5 Coupé offers powerful performance: high power, ample torque, spontaneous response and a sonorous sound. All of that paired with a new level of efficiency.

From its 2,995 cc of displacement, the V6 TFSI produces 260 kW (354 hp), which is 15 kW (21 hp) more than the previous engine. A constant 500 Nm *(368.8 lb-ft)* (plus 60 Nm/*44.3 lb-ft*) of torque is available from a low 1,370 all the way to 4,500 rpm. In the NEDC, the new 3.0 TFSI in the S5 Coupé consumes just 7.3 liters per 100 kilometers*(32.2 US mpg)* – a $CO_2$ equivalent of 166 grams per kilometer *(267.2 g/mi)*. Fuel consumption has dropped by five percent compared with the predecessor engine.

**New combustion process: higher efficiency**
The decisive success factor for the efficiency of the V6 3.0 TFSI is the new combustion process from Audi. It is based on what is known as the B-cycle, which is similar to the process used in the Audi A4 2.0 TFSI with 140 kW (190 hp)* and utilizes the high-pressure injection valves that are arranged centrally in the combustion chambers.

The shortened compression stroke of the updated combustion process enables the use of an engine process with a significantly higher geometric compression ratio in the V6 TFSI. Combined with a power stroke that, while normal, is longer relative to the compression stroke, this allows for more efficient combustion and increased engine efficiency.

This measure normally significantly reduces the fill of the cylinders, however, and the high compression ratio increases the engine’s tendency to knock, which significantly limits the maximum achievable output. The Audi valvelift system resolves this conflict between efficiency and output orientation. Under part load, it enables a very short intake aperture duration of 130 degrees of camshaft angle coupled with the early closure of the intake valve. At higher loads, the engine can switch to a camshaft contour with a longer aperture duration and greater intake valve lift, with which the engine achieves its maximum output.

**Turbocharger: separate exhaust gas flows**
The turbocharger, which replaces the mechanical compressor of the previous engine, operates according to the twin-scroll principle. The exhaust branches of the two cylinder banks run separately in the exhaust manifold and in the turbocharger housing, and only merge before the turbine wheel. This technology avoids undesirable interactions between


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the two gas columns, and it makes a major contribution toward early and powerful torque build-up.

The turbocharger is located within the 90-degree V of the cylinder banks. It normally sits on the outside next to the crankcase. Accordingly, the exhaust side is on the inner side of the cylinder heads and the intake side on the outer side. This layout enables compact construction and short gas flow paths with minimal flow losses – the 3.0 TFSI responds extremely spontaneously and directly.

**Weight reduction: minus 14 kilograms *(30.9 lb)***
Thanks to a thorough redesign, the V6 TFSI has shed 14 kilograms *(30.9 lb)* and now weighs 172 kilograms *(379.2 lb)*. Made with an aluminum alloy using the complex sand casting process, the cylinder crankcase features integrated, thin-walled cylinder liners of gray cast iron. In combination with the newly developed rings for the aluminum pistons, this reduces friction.

Another efficiency module is the thermal management system. The crankcase and the cylinder head have separate coolant circuits. After a cold start, the switchable water pump controls the flow of coolant through the engine so that the oil comes up to its operating temperature as quickly as possible. The exhaust manifold is integrated into the cylinder head and coolant circulates around it, which helps to heat up the engine quickly. When the engine is warm the system reduces the exhaust gas temperature, which reduces fuel consumption, particularly during sporty driving.

Status: 6/2016

Source: www.audi-technology-portal.com
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