Audi RS 3 Sedan

Since 2010, the 2.5 TFSI has been voted “International Engine of the Year” in its class for seven consecutive years. Now, Audi presents a new version of the successful power unit. The turbo engine which drives the new RS 3 Sedan* and the facelifted RS 3 Sportback* is the most powerful series-production five-cylinder engine on the world market.

Increased performance: 33 hp more power
An output of 294 kW (400 hp) corresponds to an increase of 33 hp. With the displacement of 2,480 cm3 remaining unchanged, the specific output is now 161.3 hp per liter. Its maximum torque of 480 Nm (354.0 lb-ft) is available at engine speeds as low as 1,700 rpm and remains constant up to 5,850 rpm. The five-cylinder engine thus catapults both models to the top of their class: they accelerate from zero to 100 km/h (0 to 62.1 mph) in 4.1 seconds – two tenths of a second faster than before. On request, Audi can increase the electronically limited top speed from 250 km/h (155.3 mph) to 280 km/h (174.0 mph).

Weight reduction: 26 kilograms (57.3 lb) lighter
The new five-cylinder engine is 26 kilograms (57.3 lb) lighter than its predecessor which is of considerable advantage to the RS models with regard to the axle load distribution and gross weight. The curb weight (without driver) of the RS 3 Sportback is just 1,510 kilograms (3,329.0 lb). Each hp only has to move 3.78 kilograms (8.3 lb). The RS 3 Sedan weighs 1,515 kilograms (3,340.0 lb) with a power-to- weight ratio of 3.79 kilograms (8.4 lb) per hp.

Elaborate measures on the 2.5 TFSI reduce internal friction while at the same time increasing power output. Its crankcase was changed from compacted graphite iron to aluminum. The cylinder barrels are plasma-coated; the crankshaft main bearings are six millimeters (0.2 in) smaller in diameter. The crankshaft is hollow bored and is therefore 1 kg (2.2 lb) lighter, while the aluminum pistons have integrated channels for oil cooling.

In the short warm-up phase after a cold start, the switchable water pump does not circulate the coolant in the cylinder head – the 2.5 TFSI engine thus reaches its operating temperature more quickly. This lowers the coefficient of friction and reduces fuel consumption. The start-stop and recuperation systems also contribute towards improving efficiency. In the NEDC cycle, the RS 3 Sedan and the RS 3 Sportback consume 8.3 liters of fuel per 100 km (28.3 US mpg).

Optimum power delivery: dual injection system
The gas exchange of the five-cylinder engine is designed for high throughput. The large

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turbocharger presses the intake air into the combustion chambers with up to 1.35 bar. The intercooler with its 80 percent efficiency reduces the temperature in order to achieve the highest possible oxygen concentration. Intake and exhaust camshafts can be adjusted as required. On the exhaust side, the Audi valvelift system (AVS) changes the valve opening duration in two stages depending on the load and engine speed – for moderate consumption at low and partial load, as well as for a spontaneous throttle response and high tractive power at full load. For a better mixture formation, the new 2.5 TFSI engine works with a dual injection system. It provides the option of injecting fuel into the intake manifold as well as directly into the combustion chamber. The duration and type of injection can be variably optimized for each engine operating point.

Unique: the sound of the five-cylinder engine
The 2.5 TFSI has a firing interval of 144 degrees. Because of the 1-2-4-5-3 ignition sequence, ignition alternates between directly adjacent cylinders and those further apart from one another. This brings with it a very special rhythm. The basic tone is accompanied by characteristic harmonic frequencies. The engine control unit also contributes indirectly to the unmistakable sound. At high load, the flaps in the exhaust system open for an even fuller sound. Using Audi drive select, the driver can control the opening and closing of the flaps individually – both on the standard RS exhaust system as well as on the optional RS sport exhaust system with black tailpipe trims. The latter sharpens the characteristic five-cylinder sound further.

Drivetrain
The seven-speed S tronic is standard on the RS 3 Sedan* and the RS 3 Sportback*. The lower gears of the compact dual-clutch transmission are dynamically short whilst the seventh gear has a long ratio to reduce fuel consumption. A heat exchanger controls the temperature of the transmission oil whilst a new angle drive at the prop shaft saves two kilograms (4.4 lb).

The driver can let the seven-speed S tronic operate automatically or can change gear themselves using the selector lever or the steering wheel paddles. There is also a choice of two driving programs in automatic mode. In D mode, the engine is optimized for everyday traffic. In S mode, the engine is designed for more agility and the revs are higher. Gears are shifted almost imperceptibly within hundredths of a second. The Launch Control controls starts with optimum traction. With its help, the RS 3 taps into the full potential of its acceleration. Prerequisite: the ESC sport mode must be active and the selector lever in the S position.

Variable power distribution: the quattro drive
The quattro permanent all-wheel drive combines gripping dynamism with considerable

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stability. Its central component is the electronically controlled, hydraulically activated multi-plate clutch, which is mounted at the rear axle for reasons of axle load distribution. The multi-plate clutch uses software that is tailored specifically to the RS 3. It distributes the drive torque extremely quickly to the front and rear axle as required. Depending on the driving style and coefficient of friction, between 50 and 100 percent of the available drive force can be sent to the rear axle. An electrically driven pump presses the plates in the clutch together with a maximum oil pressure of 40 bar. As soon as the grip on the road is reduced or the driver adopts a more sporty driving style, the clutch can direct some of the drive force to the rear axle when turning into the corner.

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