Audi Q2 – 2.0 TDI quattro S tronic

The quattro permanent all-wheel drive system ensures optimal traction and handling under any road conditions. It comes standard with the 2.0 TFSI and the 2.0 TDI with an output of 140 kW (190 hp). It is optionally available for the 2.0 TDI with an output of 110 kW (150 hp).

quattro drive uses an electrohydraulically actuated multi-plate clutch. The clutch is mounted at the end of the prop shaft, in front of the rear axle differential, which improves the axle load distribution. It contains a package of plates running in an oil bath. The metal friction rings are arranged behind one another in pairs – one ring of each pair is rigidly meshed with the clutch drum, which rotates with the prop shaft; the other ring is meshed with the output shaft to the rear axle differential.

Torque is distributed continuously between the axles. The multi-plate clutch can direct the torque to the rear axle fully variably in a 50:50 ratio within just a few milliseconds. To do this, a piston presses the plate packages together via controlled action. An electrically actuated axial-piston pump develops the required oil pressure, which can reach nearly 40 bar.

The electronic control of the multi-plate clutch combines driving pleasure and driving safety on a whole new level. It can already begin sending a portion of the torque to the rear axle when the driver turns sportily into a corner. As soon as the driver accelerates, the power presses the SUV into the curve. At the cornering limit, the systems works in close conjunction with the wheel-selective torque control, an intelligent software function of the ESC. This enables precise turn-in into the corner during load reversal, and provides maximum control and reliability when drifting on a low-friction road surface.

New technologies: the seven-speed S tronic
Two versions of the seven-speed S tronic are used. Engines with up to 85 kW (116 hp) are paired with a proven unit that weighs just 70 kilograms *(154.3 lb)*. Its two clutches run dry. The top engines with torque ratings of 320 Nm *(236.0 lb-ft)* and above are paired with a newly developed S tronic in which the clutches run in an oil bath.

The seven gears of the new dual-clutch transmission allow a wide spread of 8.7. The changes in engine speed between gears remain relatively small, allowing the engine to always run close its ideal operating point.

Innovative solutions enhance the efficiency of the new seven-speed S tronic. Oil is

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supplied via a small, mechanically driven gear pump. In some situations, such as when starting off on a hill, this is augmented by a second, electrically driven pump to meet the increased demand. Extensive optimization was able to reduce friction in many components, contributing to the outstanding efficiency of the new dual-clutch transmission.

In either version, the seven-speed S tronic is a versatile transmission. Drivers can let it shift automatically or change gears themselves using the selector lever or the optional shift paddles on the steering wheel. There is also a choice of three driving programs in automatic mode. In D mode, the engine runs as often as possible at low revs; in S mode, the driving style is sportier and the revs are higher.

If the optional Audi drive select handling system is set to “efficiency” mode, the clutch disengages when coasting, allowing the compact SUV to freewheel. With the start-stop function, the engine already shuts off when speed drops to 7 km/h *(4.3 mph)*.

The seven-speed dual-clutch transmission transfers the engine’s power via three shafts – one drive shaft and two output shafts. This layout enables a short design, which is necessary for pairing it with the transverse four-cylinder engines in the Audi Q2*.

The seven-speed S tronic comprises two subunits. The large K1 clutch located on the outside conducts the engine torque via a solid shaft to the gear wheels for the odd gears 1, 3, 5 and 7. A hollow shaft rotates around the solid shaft. It is connected to the second, smaller K2 clutch, which is located inside the larger clutch, and which controls the gear wheels for the gears 2, 4 and 6, as well as the reverse gear.

Both transmission subunits are continually active, but only one is connected to the engine at any one time. For example, when the driver accelerates in third gear, the fourth gear is already engaged in the second transmission structure. Shifts are performed by switching the clutches. Shifting gears takes only a few hundredths of a second and is completed dynamically, fluidly and comfortably with practically no interruption of traction. The multi-plate clutches are managed with extreme precision.

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