Audi e-tron S Sportback – Twin motor and electric Torque Vectoring

Innovation from the quattro pioneer: twin motor with electrical torque vectoring

The drive has been programmed for efficiency in everyday life; in normal driving mode, only the rear electric motors work. The front drive is unpowered but switches itself on – with the driver barely noticing – if the driver needs more power.

It also switches on predictively if the grip declines. It does so when friction values are low and during rapid cornering. The electric all-wheel drive is complemented by a further technical innovation in the form of electrical torque vectoring, which brings the advantages of the conventional sport differential into the electric era. Each one of the rear electric motors sends the drive forces directly to the wheel via a transmission; there is no longer a mechanical differential. 40 years following the launch of quattro technology, Audi is thus raising the principle of the four powered wheels to a completely new level of technology. The result: more agile driving and self-steering characteristics, and thus a higher cornering speed.

One further advantage is the traction. If, during acceleration, a rear wheel comes into contact with a road surface with a low friction value, i.e. if the road surface is covered in black ice or has a loose subsurface, the moment can be distributed precisely and quickly between the two motors. The full moment is gradually distributed to the wheel with powerful traction, while the wheel with low traction continues moving with almost no moment.

The two prototypes of the e-tron S models drive on 20-inch alloy wheels in the 5-V-spoke S design as standard. Different wheels up to 22 inches in size are available on request. To achieve an S-typical transverse dynamism, the tire widths in the sizes 20 inches, 21 inches and 22 inches have all been enlarged to 285 mm (11.2 in). Black brake calipers with a red S rhombus, with six pistons at the front in each case, grip the large brake discs (front diameter: 400 mm (15.7 in)). A further standard feature is the sporty progressive steering – its ratio becomes more and more direct, the further the driver turns the steering wheel. The front and rear axles have been created as a five-link design. Harmonization of the elastokinematics and of the dampers has also been optimized for the S models. In order to even further reduce the rolling movements during cornering, the stabilizers on both axles have been enlarged.

Dynamism 2.0: the driving experience

The driving experience of the two prototypes for the Audi e-tron S-models cannot fail to impress with its level of dynamism, agility and traction increased once more. In the S gear, both cars go from a standstill to 100 km/h (62.1 mph) in 4.5 seconds – almost seamlessly and nearly no noise – propulsion does not end until 210 km/h (130.5 mph), limited electronically. Thanks to a powerful cooling system, the drive gives the full boost power of 370 kW and 973 Nm (717.6 lb-ft) of torque in reproducible form for eight seconds in each case. The nominal values in the D gear without boost are 320 kW and 808 Nm (596.0 lb-ft).

In terms of handling, the electric S models cannot fail to impress with their outstanding agility and traction: They can accelerate from a curve as dynamically as a sports car, their drive character is much more focused on the rear wheels and much more sporty in nature. If the ESC stabilization control is set to “Sport” and the Audi drive select dynamic handling system is set to maximum performance with “Dynamic” mode, the drive layout facilitates a high level of transverse dynamics and, on request, controlled drifts as well. The driving behavior is predictable at all times, and is characterized by an ultra-high level of safety and reliability.

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