Audi A8 hybrid

The Audi A8 hybrid is designed as a parallel hybrid. Its combustion engine and the electric motor are located one directly behind the other and are linked by a clutch to work together, when necessary. Their interplay – referred to as “boosting” – briefly results in a peak system output of 180 kW (245 hp) and a maximum system torque of 480 Nm (354.03 lb ft).

The combustion engine is a 2.0 TFSI. The four-cylinder, turbocharged engine generates 155 kW (211 hp) and maximum torque of 350 Nm (258.15 lb-ft). The Audi valvelift system (AVS) varies the lift of the exhaust valves in two stages depending on load and engine speed. The Active Noise Control (ANC) eliminates intrusive engine noise by broadcasting a precise antiphase sound to the cabin through the sound system’s speakers.

The electric motor in the A8 hybrid is a permanent magnet synchronous machine producing up to 40 kW (54 hp) and 210 Nm (154.89 lb-ft) of torque. The disc-shaped electric motor is integrated into the hybrid transmission – a highly modified eight-speed tiptronic – where it takes the place of the torque converter. A multi-plate clutch in an oil bath connects and disconnects the electric motor and the TFSI smoothly and very precisely.

The comfortable and fast-shifting hybrid transmission, which directs the power to the front wheels, significantly contributes to the efficiency of the Audi A8 hybrid – its eight gears are widely spread. When the 2.0 TFSI is deactivated, an electric pump maintains the oil pressure in the hydraulic system to safeguard the convenient start-stop function.

The driver of the Audi A8 hybrid can switch between three driving programs. The EV characteristic map prioritizes the electric drive; the D mode controls the combustion engine and the electric motor efficiently; and the S mode as well as the touch control gate of the 8-speed tiptronic are designed for a sporty driving style. The Audi A8 can be driven in five different modes: Driving with the TFSI engine alone, with the electric motor alone or in hybrid mode is possible, as are recuperation and boosting.

When the driver releases the accelerator, the electric motor works as a generator and recovers energy, which it stores in the lithium-ion battery. In most situations the TFSI is then decoupled from the drive system and does not cause any drag losses. “Gliding” like this is possible up to 160 km/h (99.42 mph).

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If the driver brakes lightly, the electric motor performs the deceleration itself; during heavier braking, the hydraulic braking system is simultaneously activated. A complex control strategy adapts all braking actions to the conditions of electric driving and recuperation.

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