Audi Q8 e-tron – Brake-by-wire

Electrohydraulically integrated brake system

The technical prerequisite for the efficient recuperation properties in the Audi Q8 e-tron* is the brake-by-wire braking system – it completely decouples the brake pedal and brake hydraulics. When the driver presses the brake pedal, the system calculates whether the generators' recuperation power is sufficient for the desired deceleration or whether it's necessary to use the disc brakes on the front and rear axles. Audi was the first manufacturer in the world to use this electrohydraulically integrated brake control system in a mass-produced electric-drive vehicle, when it introduced the e-tron series.

If the situation demands a deceleration that exceeds 0.3 g, the controller computes the required amount of braking power within milliseconds. A displacement piston in the brake hydraulics generates additional pressure; put into motion by an electric spindle drive, it pushes brake fluid into the brake lines and generates additional brake force using the conventional friction brakes.

The transition between electric and hydraulic braking is smooth and homogeneous, the driver does not notice it – the brake forces remain constant. Using a pressure-resistant element, a second piston generates the familiar pedal feeling for the driver's foot. In the case of ABS braking, the driver will not feel the pressure build-up and reduction in the pedal, otherwise felt as irritating, hard pulsations. Even at a very slow speed, such as during maneuvering, the Audi Q8 e-tron* decelerates efficiently via the wheel brakes.

The new electrohydraulic actuation allows the brake control system to build up pressure for the wheel brakes with great precision, and roughly twice as fast as a conventional system. This enables a larger air gap, i.e., a greater distance between the brake pad and brake disk to be set, minimizing possible friction and heat generation and increasing the range. During automated emergency braking, there are only 150 milliseconds between when the brakes are applied and the presence of maximum brake pressure between the pads and disks.

Thanks to this rapid pressure build-up, the electrohydraulically integrated brake control system shortens the braking distance by up to 20 percent compared with a conventional brake system. Thanks to the recuperation output of the Audi Q8 e-tron*, the wheel brakes are used less frequently in everyday driving, reducing wear and lowering service and operating costs for the vehicle.

To prevent the steel disks from rusting, a brake cleaning function automatically opts to use the friction brakes at certain intervals, even though recuperation would be possible, keeping the system in ideal operating condition.

A six-piston fixed caliper brake is mounted on the front axle, and a single-piston floating caliper on the rear axle. The internally ventilated discs measure 375 mm in diameter at the front and 350 mm at the rear.

*__Audi Q8 50 e-tron__ Combined electric power consumption in kWh/100 km (*62.1 mi*): - (NEDC); 24.0–20.1 (WLTP); combined CO2 emissions in g/km (*g/mi*): 0 (0)

__Audi Q8 55 e-tron__ Combined electric power consumption in kWh/100 km (*62.1 mi*): - (NEDC); 24.4–20.6 (WLTP); combined CO2 emissions in g/km (*g/mi*): 0 (0)

__Audi SQ8 e-tron__ Combined electric power consumption in kWh/100 km (*62.1 mi*): - (NEDC); 28.0–24.6 (WLTP); combined CO2 emissions in g/km (*g/mi*): 0 (0)

__Audi Q8 50 Sportback e-tron__ Combined electric power consumption in kWh/100 km (*62.1 mi*): - (NEDC); 23.7–19.5 (WLTP); combined CO2 emissions in g/km (*g/mi*): 0 (0)

__Audi Q8 55 Sportback e-tron__ Combined electric power consumption in kWh/100 km (*62.1 mi*): - (NEDC); 24.1–19.9 (WLTP); combined CO2 emissions in g/km (*g/mi*): 0 (0)

__Audi SQ8 Sportback e-tron__ Combined electric power consumption in kWh/100 km (*62.1 mi*): - (NEDC); 27.0–23.5 (WLTP); combined CO2 emissions in g/km (*g/mi*): 0 (0)

Only consumption and emissions values are only available according to WLTP and not according to NEFZ for this vehicle. Information on fuel consumption and CO2 emissions in ranges are dependent on the chosen vehicle specification.

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