Audi Q8 sport concept

Groundbreaking drive system technology and an accentuated sporty look: at the 2017 Geneva International Motor Show, Audi will be presenting another concept car which demonstrates the potential of the future Q8 model range. The Audi Q8 sport concept study demonstrates the vision Audi's developers and designers have for the dynamic yet efficient SUV of tomorrow.

Characteristic aerodynamic features in the front and rear are a prominent part of the Audi Q8 sport concept design. The highly efficient drive system concept of the study is particularly groundbreaking. The 3.0 TFSI six-cylinder engine featuring a mild hybrid system and an electric powered compressor is a world first. The result: the Q8 sport concept presents itself as a multi-disciplined athlete with a number of talents. Thanks to its 350 kW (476 hp) output and its 700 Newton meters (516.3 lb-ft) of torque, it sprints from 0 - 100 km/h (0 62.1 mph) in just 4.7 seconds and keeps going until it reaches its top speed of 275 km/h (170.9 mph). Meanwhile, its range of more than 1,200 kilometers (745.6 mi) ensures it is also suitable for long journeys.

Thanks to the superb recuperation performance of 20 kW, this prominent SUV holds back when it comes to fuel consumption. Compared with a model equipped with a regular TFSI six-cylinder engine without mHEV system, the Q8 sport concept with its 20 kW greater performance consumes around one liter less fuel per 100 km – that corresponds to a reduction in CO_2 emissions of 25 g/km (40.2 g/mi).

"The drive system of the Audi Q8 sport concept is a major step towards optimizing efficiency and sustainability in large-volume series production. The combination of mild hybrid technology and a TFSI engine sets a new benchmark for the synthesis of electromobility and combustion engines. In the future, this combination will be used in many Audi models," says Rupert Stadler, Chairman of the Board of Management at AUDI AG.

Highly efficient power package: the drive system
The architecture of the drive system in the new Audi Q8 sport concept is revolutionary: for the first time ever, Audi is combining a 331 kW (450 hp) 3.0 TFSI six-cylinder engine with an electric powered compressor and an effective mild hybrid system for recuperation. The starter generator positioned between the crankshaft and the transmission handles recuperation and, if required, can work in the opposite direction as an additional electric motor. The 48-volt electrical system assures the supply of electrical power.

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For the customer, this approach has a number of advantages: the energy recovered as part of recuperation can, if required, be used to increase performance. During boost operation – where the combustion engine and electric motor are used simultaneously – the electric motor's additional 20 kW of output and its torque of 170 Nm (125.4 lb-ft) open up a total of 350 kW of power to the engine and bring its total torque up to 700 Nm (516.3 lb-ft). The result is sporty acceleration from any speed and rev range.

Positioned at the rear under the luggage compartment, the lithium ion battery with an energy storage capacity of 0.9 kWh makes it possible to keep moving slowly in stop-start traffic with the combustion engine switched off, as well as allowing for maneuvering and parking under electric power alone. During braking, efficient recuperation using the 20-kW-strong starter generator quickly recharges the battery to ensure that the vehicle can regularly be driven under electric power.

In addition to the two exhaust gas turbochargers, the electric powered compressor provides the Q8 sport concept with an additional kick by supplying the three-liter six-cylinder engine with fresh air. The electric powered compressor supports the turbochargers at times when the exhaust gas is insufficient for rapid development of power. It therefore opens up delay-free acceleration to the V6 gasoline engine – something previously only known to diesel engines and electric motors. It's a recipe for success which already works impressively in the series production Audi SQ7.

The electric powered compressor is positioned in a bypass downstream of the intercooler, i.e. close to the engine. Instead of the turbine wheel, it integrates a compact electric motor. It accelerates the engine's compressor wheel up to 70,000 rpm in less than 250 milliseconds. With the support of the electric powered compressor, the power of the 3.0 TFSI is always spontaneously available as soon as the accelerator is depressed, even at low engine speeds. When driving off, the SUV immediately takes a lead of several meters ahead of the competition. During comfort-oriented driving, the electric powered compressor technology prevents unnecessary downshifts and thus keeps the engine speed at a low level. Meanwhile, sporty drivers will appreciate the supreme and spontaneous delivery of power when exiting curves.

The Q8 sport concept drive system with its V6 TFSI and additional electric motor supplies the performance of a true eight-cylinder engine, yet with the fuel consumption of a frugal four-cylinder. That's because, compared with a similar engine without mild hybrid system, the consumption reduces by more than a liter per 100 kilometers, despite serving up 20 kW of additional power. The total range of the Q8 sport concept equipped with an 85-liter (22.5 US gal) fuel tank is more than 1,200 kilometers (745.6 mi).

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When driving, the drive system management controls the operating states of the Audi both intelligently and flexibly: the luxury SUV can boost, coast and recuperate as appropriate for the situation. The predictive efficiency assistant is a standard feature which supports the driver by supplying greatly detailed information on the vehicle surroundings to the control unit. Route data from the navigation system and Car-to-X services from Audi connect are also taken into account.

High-tech from production models: drivetrain and suspension

In the Audi Q8 sport concept, the quattro permanent all-wheel drive system transfers the power of the drive system to the road with supreme control. Even for its wide-track chassis, the technology study makes use of the latest high-end solutions from the luxury-class product portfolio. The adaptive air suspension sport – an air suspension system with controlled damping – allows for a broad spectrum of ride characteristics, ranging from cushioned cruising to firm and tight handling. Furthermore, it sets the ground clearance in five levels with 90 millimeter (3.5 in) height differences, selecting the ideal level in each case. The front and rear axles are engineered as lightweight five-link constructions.

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