Audi A8 – Mild Hybrid Electric Vehicle (MHEV) with active suspension

Even more efficient: engines with MHEV technology
At its market introduction in Europe, the new A8 will start out with two extensively reengineered V6 turbo engines, a 3.0 TDI with 210 kW (286 hp) (Combined fuel consumption in l/100 km: 5.8 - 5.6 (40.6 - 42.0 US mpg)*; Combined CO_2 emissions in g/km: 152 - 145 (244.6 - 233.4 g/mi)*) and a 3.0 TFSI with 250 kW (340 hp) (Combined fuel consumption in l/100 km: 7.8 - 7.5 (30.2 - 31.4 US mpg)*; Combined CO_2 emissions in g/km: 178 - 171 (286.5 - 275.2 g/mi)*). Other engine versions and a plug-in-hybrid with inductive in-car charging will follow in 2018. All engines offer supreme refinement, ample performance and high efficiency. The new mild hybrid technology (MHEV, mild hybrid electric vehicle) drives down fuel consumption even further – by as much as 0.7 liters (0.3 US gal) of fuel per 100 kilometers (62.1 mi) in real driving conditions. Particulate filters for the gasoline engines will also follow in the next year.

Audi’s MHEV technology is based on a newly developed 48-volt primary electrical system – it supplies the 12-volt system that now becomes an electrical subsystem. The 48-volt system is fed by a belt alternator starter (BAS) connected to the engine’s crankshaft by the belt drive. A lithium-ion battery positioned safely beneath the luggage compartment floor serves as the storage unit.

The new drive combines efficiency with comfort in a very special way: Thanks to the higher voltage, the new A8 can coast along silently in a speed range from 55 through 160 km/h (34.2 through 99.4 mph). The automobile then proceeds with zero emissions for up to 40 seconds with the engine off altogether. As soon as the driver steps on the gas again, the belt alternator starter prompts a swift but soft restart. In addition, start/stop operation is actually active from 22 km/h (13.7 mph). When the brakes are applied, the BAS can recover up to 12 kW of power, again helping to reduce fuel consumption.

From silky-smooth to firm: the suspension
Active suspension, dynamic all-wheel steering, electronic suspension platform (ESP) – Audi has rethought every aspect of the chassis of its new flagship. Revolutionary technologies and control systems make it even more comfortable, sporty and safe. It spans a whole new breadth of characteristics – from the silky-smooth progress that befits a luxury sedan to the dynamically firm handling of a sports car.

The very fundamentals of its design are state of the art. The front and rear axle, both of them mounted on subframes, take the form of high-precision five-link constructions made

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extensively from lightweight aluminum. Both the progressive steering, which becomes more direct the further it is turned, and the adaptive air suspension with controlled damping are standard features. The driver can define the air suspension settings using the three Audi drive select driving profiles comfort, auto and dynamic, and also in a separate lift mode. From a speed of 120 km/h (74.6 mph), the body is automatically lowered by 20 millimeters (0.8 in) for improved aerodynamics. For this to take place, the car must have been running in the auto or dynamic mode continuously for at least 30 seconds.

A new dimension of flexibility: the Audi AI active suspension
Adaptive air suspension already gives the A8 a wide spread of operating characteristics ranging from smooth ride comfort to sporty handling. This impression is heightened engagingly with Audi AI active suspension, which will be available from market launch. Audi AI active suspension is a fully active, electromechanically operated suspension system. For each wheel there is one electric motor supplied by the 48-volt primary electrical system. In each case there is also a transmission, a rotary tube housing a titanium roll bar and a lever that exerts up to 1,100 newton-meters (811.3 lb-ft) on the suspension via a coupling rod.

A new feature in active suspension is that the load can be increased or reduced individually on all four wheels, for active control of the body in every driving situation. This introduces a new dimension of flexibility: If the driver selects the dynamic mode in the Audi drive select system, the new A8 becomes an agile sports car – it turns in firmly, and its roll angles are roughly halved compared with the normal status. By contrast, in comfort mode, the body floats smoothly even over rough bumps in the road.

As well as improving comfort and handling, active suspension in combination with crossing assist improves passive safety in the event of a lateral collision. In an impending lateral collision at more than 25 km/h (15.5 mph), the suspension actuators raise the body on the side exposed to the danger by up to 80 millimeters (3.1 in) within half a second. The aim is to present an even more resistant section of the body to the other party by way of an impact zone. The side sills and floor structure accommodate a large portion of the impact forces. Deformation of the cabin and the loads acting on the occupants, above all to the chest and abdomen areas, can be reduced by up to 50 percent compared with a lateral collision with no raising of the suspension. The pre sense 360° system is a requirement for the new function.

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