Self-Study Program 990123C

Audi Q5 hybrid quattro

Audi Academy

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Always check Technical Bulletins and the latest electronic service repair literature for information that may supersede any information included in this booklet.

Table of Contents

Table of Contents

Note

Alternating current (AC) voltage as low as 25 volts, and direct current (DC) voltage as low as 60 volts are hazardous to humans. It is therefore important to pay strict attention to the safety instructions in current technical literature, Guided Fault Finding, and warnings displayed on the vehicle.

All work on the high voltage system must be performed by a qualified high voltage technician. Only qualified high voltage technicians are allowed to disconnect the maintenance connector to de-energize the vehicle.

To ensure the proper and safe use of high voltage special tools, guidelines in current technical literature must also be strictly followed.

The Self-Study Program provides introductory information regarding the design and function of new models, automotive components, or technologies.

The Self-Study Program is not a Repair Manual!
All values given are intended as a guideline only.

For maintenance and repair work, always refer to current technical literature.

Reference

Note

Hybrid Vehicles at Audi

AUDI AG can look back at over 20 years of experience with hybrid technology. The first generation of the Audi duo, a hybrid concept car based on the Audi 100 Avant, made its European debut in 1989. A five-cylinder gasoline engine drove the front wheels and a part-time electric motor developing 12 hp (9 kW) drove the rear wheels. Rechargeable nickel-cadmium batteries provided the energy source.

Another duo variant based on the Audi 100 Avant quattro followed two years later.

In 1997, AUDI AG became the first European manufacturer to build a limited edition hybrid production vehicle. It was based on the Audi A4 Avant.

Drive for this A4 was provided by a 1.9 liter TDI engine developing 90 hp (66 kW), and a water-cooled electric motor developing 29 hp (21 kW). This front-wheel drive vehicle used an electric motor powered by a lead-gel battery that could be recharged by plugging into an electrical outlet.

The A4 Avant duo electric motor could also recover energy during deceleration. In electric mode, the duo attained a top speed of 50 mph (80 km/h) and a maximum speed of 105 mph (170 km/h) with TDI power.

Further development in hybrid technology was showcased in the Audi R18 e-tron quattro prototype race cars at the 2012 24 Hours of Le Mans. Audi dominated the competition, taking first and second place, becoming the first manufacturer to win the legendary race with hybrid technology. The winning cars featured a TDI turbo diesel engine powering the rear wheels, and an electric motor powering the front axle for greater acceleration coming out of corners.

In addition to hybrids, Audi is also developing a new family of electrically powered vehicles (e-tron) capable of driving long distances.

The Audi A1 e-tron, designed for congested city driving conditions, always operates electrically. No additional gasoline or TDI engine is used to extend driving range.

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The Q5 hybrid quattro is the first Audi hybrid model with twin drive systems. Its 2.0L TFSI engine develops 211 hp (155 kW), operating in tandem with a water-cooled electric motor developing 54 hp (40 kW). The electric motor is powered by a compact lithium-ion battery.

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Hybrid Technology

The word “hybrid” comes from the Latin word “hibrida”, which means the offspring of a mixed union. In vehicles, a hybrid is a system which combines two different technologies.

Automotive hybrid powertrain technology can be either:

- Bivalent drive
- Hybrid drive

Bivalent Drive

Vehicles with bivalent drive technology have an internal combustion engine which can burn different types of fuel to provide drive power.

These vehicles can run on fossil and renewable fuels (diesel and biodiesel) or liquid and gaseous fuels (gasoline, natural gas, and liquid propane gas), and are gaining market share.

Hybrid Drive

A combination of two different drive units, hybrid drive technology is an internal combustion engine working with an electric motor (e-machine).

Hybrid drive can generate electrical energy from kinetic energy (for instance, brake energy recuperation), serve as a motor for driving the vehicle, and act as a starter for the internal combustion engine.

There are three types of hybrid drives:

- Full hybrid drive
- Mild hybrid drive
- Micro hybrid drive