Self-study Programme 340

The Passat 2006
Electrical System

Design and Function
The Passat 2006 features further innovations in the area of vehicle electrics and electronics.

The developers have paid particular attention to comfort in this car.

One example is the entry and start authorisation switch. For the first time, you do not have to turn the ignition key to start the engine.

This self-study programme should help you get to know the electrical system in the Passat 2006 and become familiar with the new features.
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Introduction

Fuse Boxes and Relay Locations in the Onboard Power Supply

Locations

The Passat 2006 onboard power supply is decentralised and is therefore similar to the Golf 2004 system. The Passat also has a fuse box on the right-hand side of the dash panel due to the large number of electrical consumers.

The distribution of the fuse boxes and relays among different locations allows fast and precise fault diagnosis.
Relay carrier, on left under dash panel, above onboard power supply control unit.

Relay carrier on onboard power supply control unit, on left under dash panel.

Fuse box, on left in dash panel.
Networking Concept

Overview of networked control units

The data bus diagnostic interface J533 forms the interface for communication among the following data bus systems:

- Powertrain CAN data bus
- Convenience CAN data bus
- Infotainment CAN data bus
- Combi CAN data bus
- Diagnostics CAN data bus

The following data bus systems are connected downstream of a CAN data bus system as a sub-bus system:

- LIN data bus
- CAN data bus, electromechanical parking brake
- Sensor CAN data bus
- Cornering lights CAN data bus
- Serial data bus
E221 Operating unit in steering wheel
E415 Entry and start authorisation switch
G85 Steering angle sender
G273 Interior monitoring sensor
G384 Vehicle inclination sender
G397 Rain and light detector sensor
G419 ESP sensor unit
H12 Alarm horn
J104 ABS control unit
J136 Seat and steering column adjustment control unit with memory
J217 Automatic gearbox control unit
J234 Airbag control unit
J255 Climatronic control unit
J285 Control unit with display in dash panel insert
J345 Trailer detector control unit
J364 Auxiliary heater control unit
J386 Driver door control unit
J387 Front passenger door control unit
J388 Rear left door control unit
J389 Rear right door control unit
J393 Convenience system central control unit
J400 Wiper motor control unit
J412 Mobile telephone operating electronics control unit
J428 Adaptive cruise control unit
J446 Parking aid control unit
J492 Four-wheel drive control unit
J500 Power steering control unit
J503 Control unit with display for radio and navigation
J519 Onboard power supply control unit
J521 Front passenger seat position with memory control unit
J525 Digital sound package control unit
J527 Steering column electronics control unit
J533 Data bus diagnostic interface
J540 Electromechanical parking brake control unit
J583 NOx sensor control unit
J587 Selector lever sensors control unit
J604 Auxiliary air heater control unit
J605 Boot lid control unit
J623 Engine control unit
J667 Power output module for left headlight
J668 Power output module for right headlight
J738 Telephone controls control unit
J743 Mechatronics for direct shift gearbox
J745 Cornering light and headlight range control unit
J764 Electronic steering column lock control unit
J788 Powertrain CAN bus isolation relay
R Radio
T16 Diagnosis connection 16-pin connector
Data Bus Systems

Control Units for Powertrain CAN Data Bus

Control units and locations

The adjacent diagram shows the control units that are involved in the powertrain CAN data bus communication as well as their locations.

The data transfer speed is 500kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

The powertrain CAN data bus is not suitable for use with a single cable – data transfer would not be possible if one CAN cable fails.

Due to new terminology for the names of components, some terms may be different to those used in other self-study programmes.

* To be used at a later point in time.
Data bus diagnostic interface J533, on left under dash panel

Steering column electronics control unit J527, under the steering column switch

Four-wheel drive control unit J492 *, on the Haldex coupling, in front of the rear axle

Airbag control unit, under centre console at front

Selector lever sensors control unit J587, under centre console at front

Power steering control unit J500, on the steering rack near the bulkhead

Automatic gearbox control unit J217, in front left wheel housing

Data bus diagnostic interface J533, on left under dash panel

Automatic gearbox control unit J217, in front left wheel housing

Selector lever sensors control unit J587, under centre console at front

Power steering control unit J500, on the steering rack near the bulkhead

Automatic gearbox control unit J217, in front left wheel housing

Data bus diagnostic interface J533, on left under dash panel
Control Units for Convenience CAN Data Bus

Control units and locations

The adjacent diagram shows the control units that are involved in the convenience CAN data bus communication as well as their locations. The data transfer speed is 100 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

The convenience CAN data bus is suitable for use with a single cable – data transfer would still be possible if one CAN cable fails.
Parking aid control unit J446, in the side section at rear right

Trailer detector control unit J345, in the side section at rear left

Multifunction steering wheel control unit J453, in the steering wheel

Steering column electronics control unit J527, in the steering column

Seat and steering column adjustment control unit with memory J136, under driver’s seat

Onboard power supply control unit J519, on relay carrier under the dash panel
Data Bus Systems

Control Units for Infotainment CAN Data Bus
Combi and Diagnosis

Control units and locations

The adjacent diagram shows the control units that are involved in the infotainment and combi CAN data bus communication as well as their locations.

Infotainment CAN data bus

The data transfer speed is 100 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

The infotainment CAN data bus is suitable for use with a single cable – data transfer would still be possible if one CAN cable fails.

Combi and diagnosis CAN data bus

The data transfer speed is 500 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

The combi and diagnosis CAN data bus systems are not suitable for use with a single cable – data transfer would not be possible if one CAN cable fails.

Auxiliary heater control unit J364, in right wheel housing

CD changer R41, in glove compartment
Mobile telephone operating electronics control unit J412, under passenger seat.

Data bus diagnostic interface J533, in footwell on driver's side, near pedals.

Diagnosis connector T16 on left under dash panel, driver's side.

Control unit with display in dash panel insert J285.

Digital sound package control unit J525, under driver's seat.

Control unit with display for radio and navigation J503, in the dash panel.
Data Bus Systems

Sub-bus Systems

LIN data bus

The Local Interconnect Network is a local system that transfers data via a single-wire connection at a data transfer rate of 1 - 20 kbit/s. The transfer rate is stored in the master control unit software. The data exchange occurs between a master control unit and up to 16 slave control units. The communication between the individual subscribers is initiated exclusively by the master control unit that can also communicate on the CAN data bus.

Legend
G273 Interior monitoring sensor
G384 Vehicle inclination sender
G397 Rain and light sensor
H12 Alarm horn
J393 Convenience system central control unit
J400 Wiper motor control unit
J519 Onboard power supply control unit
J533 Data bus diagnostic interface

Control Units for LIN Data Bus
Electromechanical CAN data bus

The data transfer speed of the electromechanical parking brake CAN data bus is 500 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

The powertrain CAN data bus is not suitable for use with a single cable — data transfer would not be possible if one CAN cable fails.

Control units for electromechanical parking brake CAN data bus

Legend
J104  ABS control unit
JS33  Data bus diagnostic interface
JS40  Control unit for electromechanical parking brake

Additional CAN data bus systems are necessary due to the high requirements (data rate and quantity).
Cornering Lights (Advanced Frontlighting System) CAN Data Bus

The data transfer speed of the cornering light CAN data bus is 500 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

The cornering light CAN data bus is not suitable for use with a single cable – data transfer would not be possible if one CAN cable fails.

Legend

J533 Data bus diagnostic interface
J667 Power output module for left headlight
J668 Power output module for right headlight
J745 Cornering light and headlight range control unit
**Sensor CAN data bus**

The data transfer for the sensor CAN data bus is the same as the cornering light CAN data bus and transfers the data between the engine control unit and the NOx sensor control unit.

**Serial data bus**

The serial data bus transfers the data via a single-wire connection at 9800 kbit/s between the electronic steering column lock control unit and the convenience system central control unit. Using the serial data bus system increases theft protection compared with use of the LIN data bus system.
Onboard Power Supply

Electronics Box

Location

The electronics box is mounted at the front right in the engine compartment.

Description

All fuses and relays for protection and control of the electrical components in the engine compartment are accommodated in the electronics box.

There is therefore no cable running into the interior and back.

Troubleshooting is made easier, the protection is configured better to the consumer and multiple assignment of fuses is avoided to a great extent.

Please refer to the ELSA electronic service information system for the current assignment with fuses and relays in the electronics box.
Electronics Box

The electronics box also contains the following relay in addition to the fuses for the components in the engine compartment:

- Voltage supply relay
terminal 30 J317

Back-up fuse box

The back-up fuse box contains the fuses for

- the alternator,
- the electromechanical power steering,
- the radiator fan,
- the ABS control unit.