

Self-study Programme 340

The Passat 2006 Electrical System

Design and Function

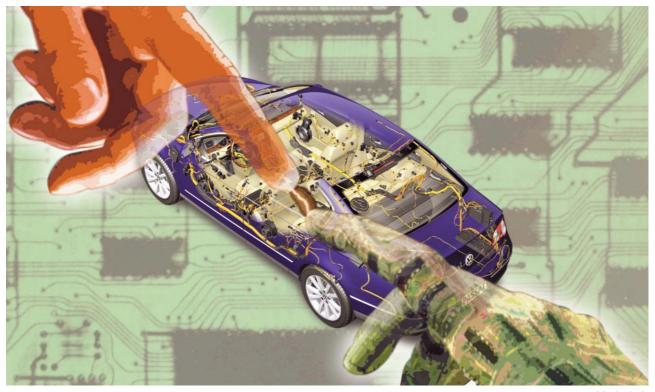


The Passat 2006 features further innovations in the area of vehicle electrics and electronics.

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.



S340_072

NEW

Important Note

Contents



| Introduction 4 |
|---|
| Data Bus Systems |
| Control Units for Powertrain CAN Data Bus |
| Control Units for Convenience CAN Data Bus |
| Control Units for Infotainment CAN Data Bus Combi and Diagnosis |
| Sub-bus Systems |
| Onboard Power Supply |
| Electronics Box |
| Relay Carriers and Fuse Boxes |
| Onboard Power Supply Control Unit |
| Exterior lights |
| Data Bus Diagnostic Interface |
| Control Unit with Display in Dash Panel Insert |
| Convenience System Central Control Unit |
| Immobilizer IV |
| Start-Stop System |
| Electronic Steering Column Lock Control Unit |
| Convenience and Safety Electronics |
| Corning Light System (Advanced Frontlighting System) |
| Customisation |
| Parking Aid |
| Transformer |
| Service |
| |
| Test Yourself |











Introduction

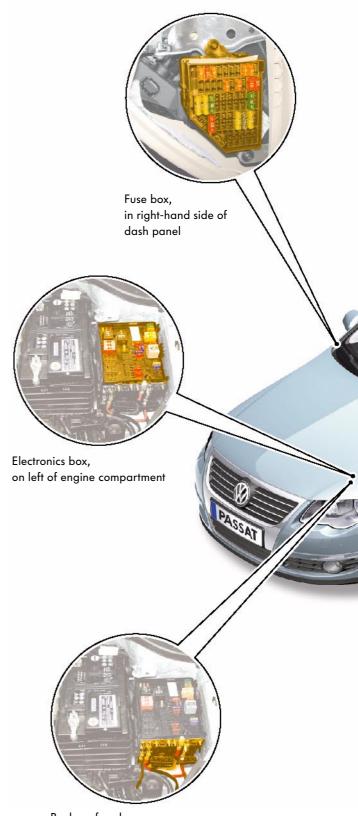


Fuse Boxes and Relay Locations in the Onboard Power Supply

Locations

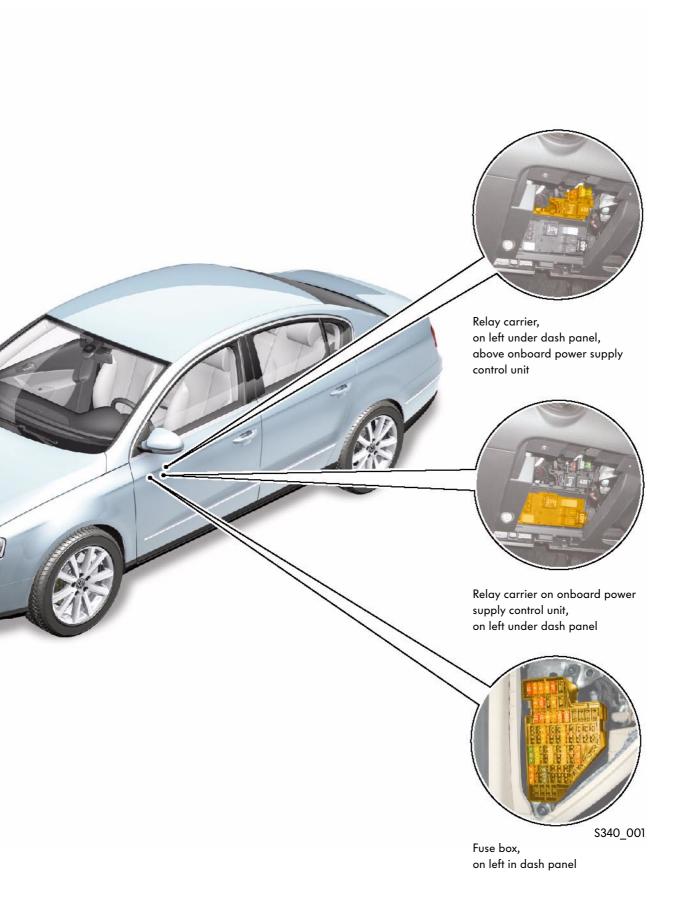
The Passat 2006 onboard power supply is decentralised and is therefore similar to the Golf 2004 system. The Passat also has a fuse box on the right-hand side of the dash panel due to the large number of electrical consumers.

The distribution of the fuse boxes and relays among different locations allows fast and precise fault diagnosis.



Back-up fuse box, on left of engine compartment





Introduction



Networking Concept

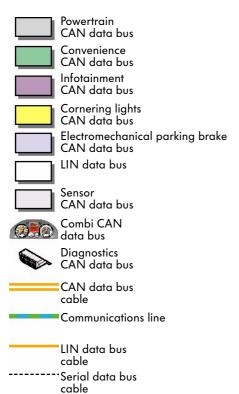
Overview of networked control units

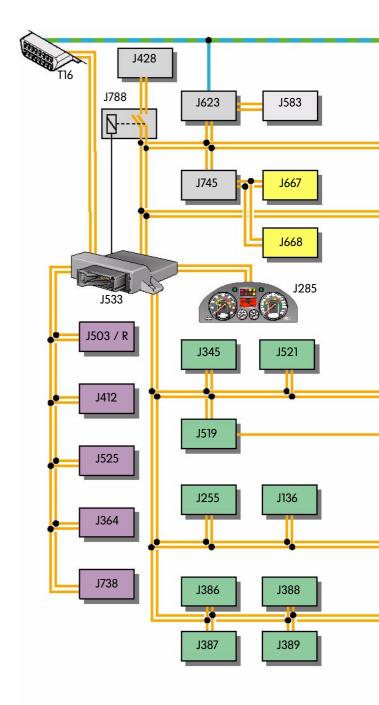
The data bus diagnostic interface J533 forms the interface for communication among the following data bus systems:

- 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:

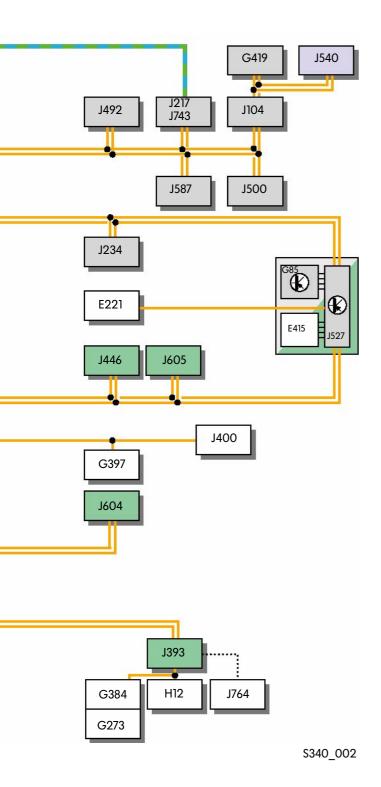
- LIN data bus
- CAN data bus, electromechanical parking brake
- Sensor CAN data bus
- Cornering lights CAN data bus
- Serial data bus





S340 003





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

Control Units for Powertrain CAN Data Bus

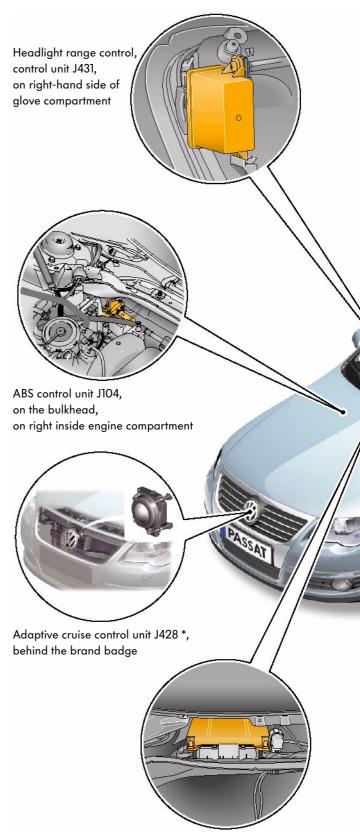
Control units and locations



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.

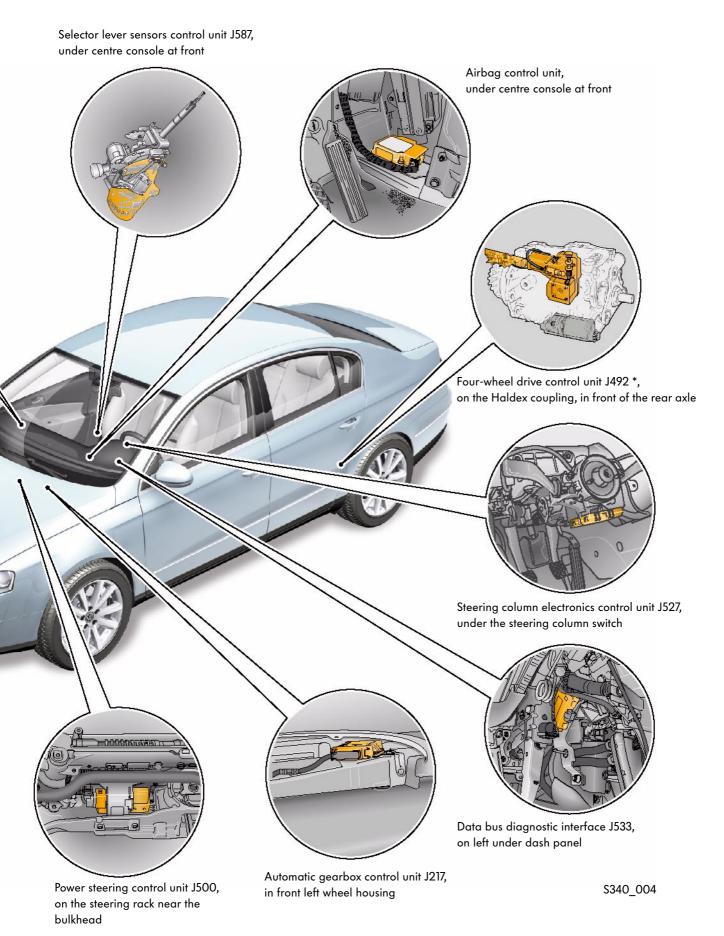


Q

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.





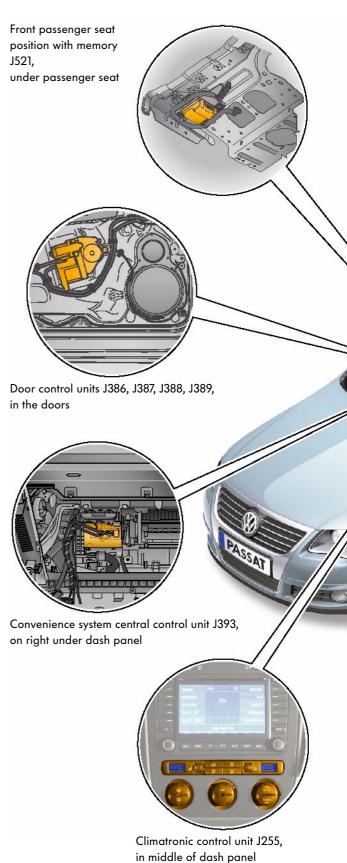
Control Units for Convenience CAN Data Bus

Control units and locations

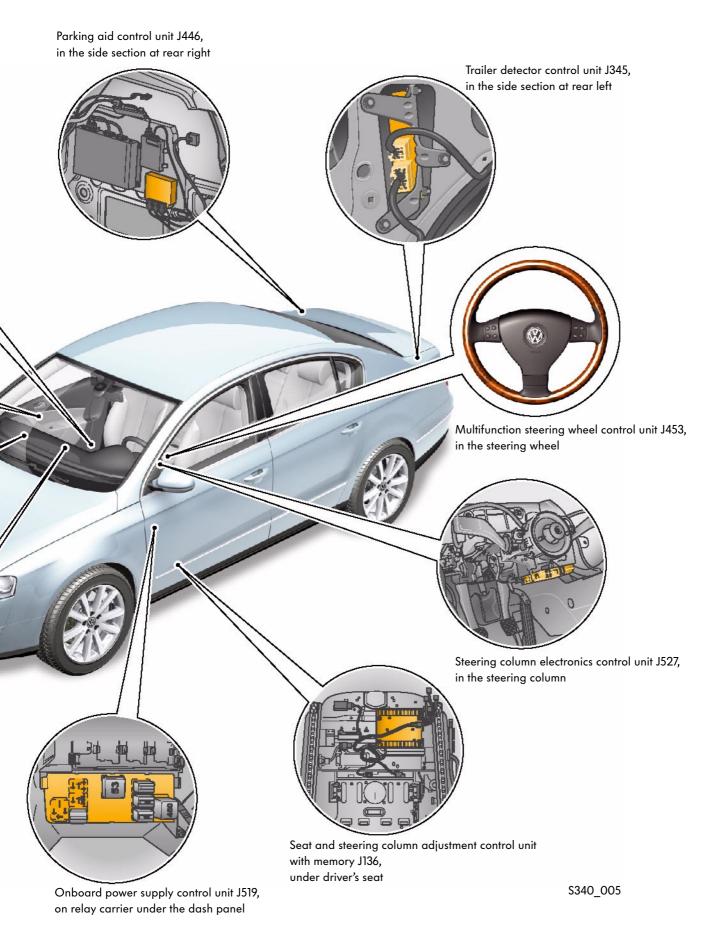


The adjacent diagram shows the control units that are involved in the convenience CAN data bus communication as well as their locations. The data transfer speed is 100 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

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







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

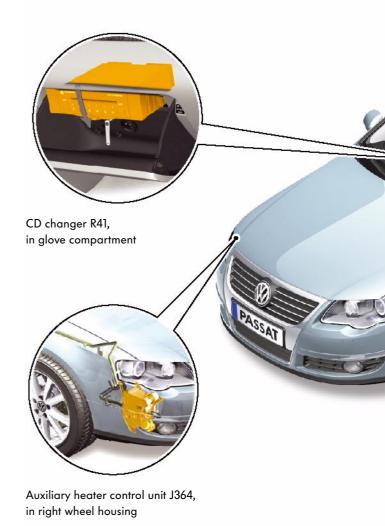
The data transfer speed is 100 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

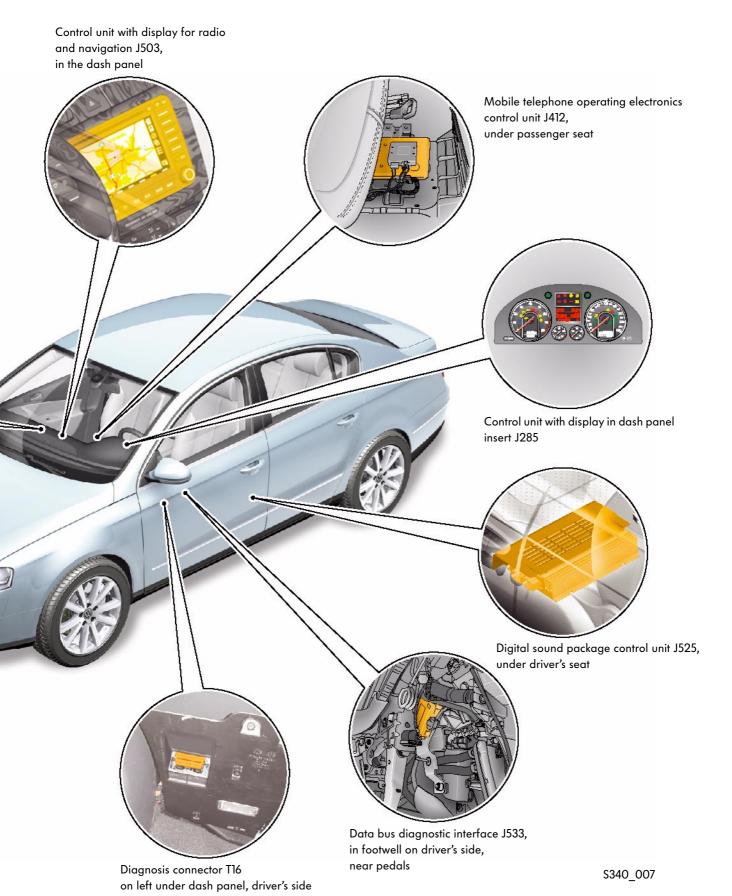
The infotainment CAN data bus is suitable for use with a single cable – data transfer would still be possible if one CAN cable fails.

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.







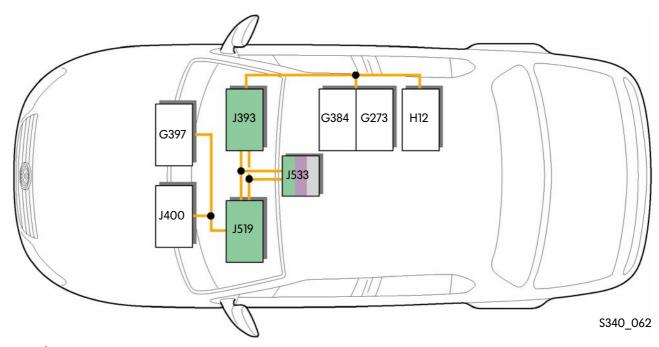
Sub-bus Systems

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.

Control Units for LIN 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

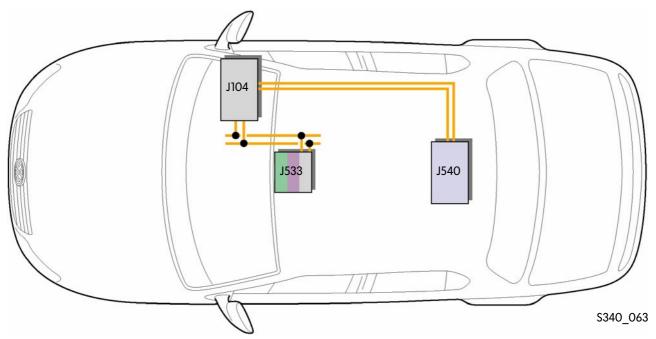
J533 Data bus diagnostic interface

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
- J533 Data bus diagnostic interface
- J540 Control unit for electromechanical parking brake



Additional CAN data bus systems are necessary due to the high requirements (data rate and quantity).

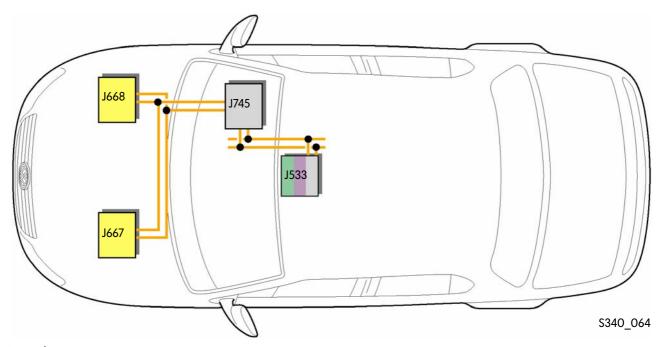
Cornering Lights (Advanced Frontlighting System) CAN Data Bus



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.

Control units for cornering light CAN data bus

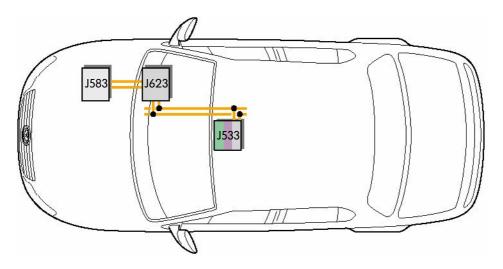


Legend

- 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.



Legend

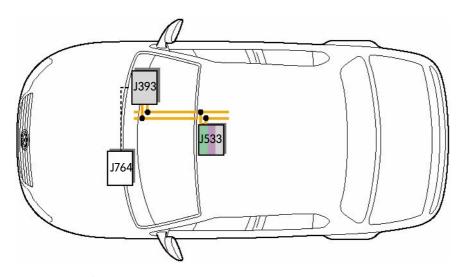
J533 Data bus diagnostic interface

J583 NOx sensor control unit

J623 Engine 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.



S340_066

S340_065

Legend

J533 Data bus diagnostic interface

J393 Convenience system central control unit

J764 Electronic steering column lock control unit

Onboard Power Supply

Electronics Box

Location

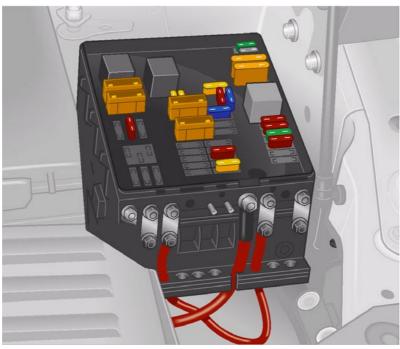
The electronics box is mounted at the front right in the engine compartment.

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.



S340_010

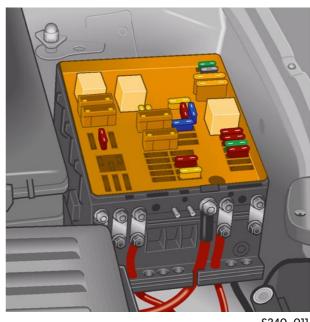


Please refer to the ELSA electronic service information system for the current assignment with fuses and relays in the electronics box.

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



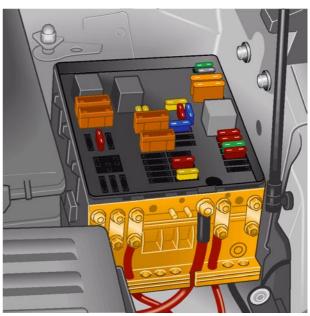


S340_011

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.



S340_012