

Service Training



Self-study Programme 340

The Passat 2006 Electrical System

Design and Function

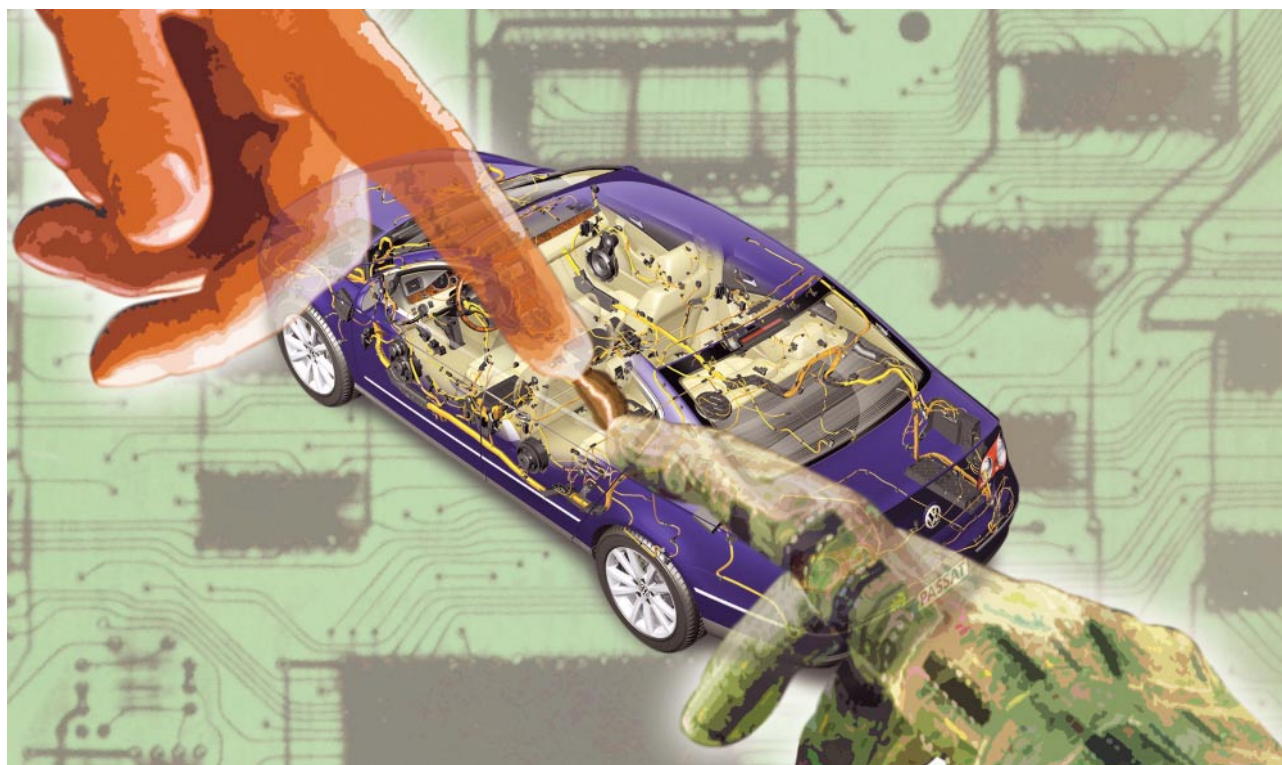


The Passat 2006 features further innovations in the area of vehicle electrics and electronics.

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.

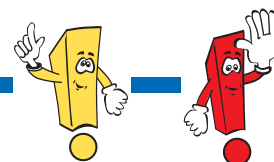


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NEW

**The self-study programme shows the design and function of new developments.
The contents will not be updated.**

For current testing, adjustment and repair instructions, refer to the relevant service literature.



Important Note



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Introduction

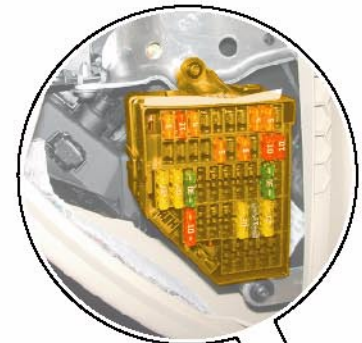


Fuse Boxes and Relay Locations in the Onboard Power Supply

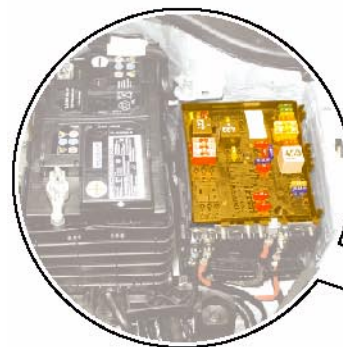
Locations

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.

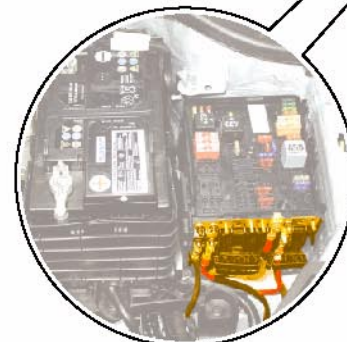
The distribution of the fuse boxes and relays among different locations allows fast and precise fault diagnosis.



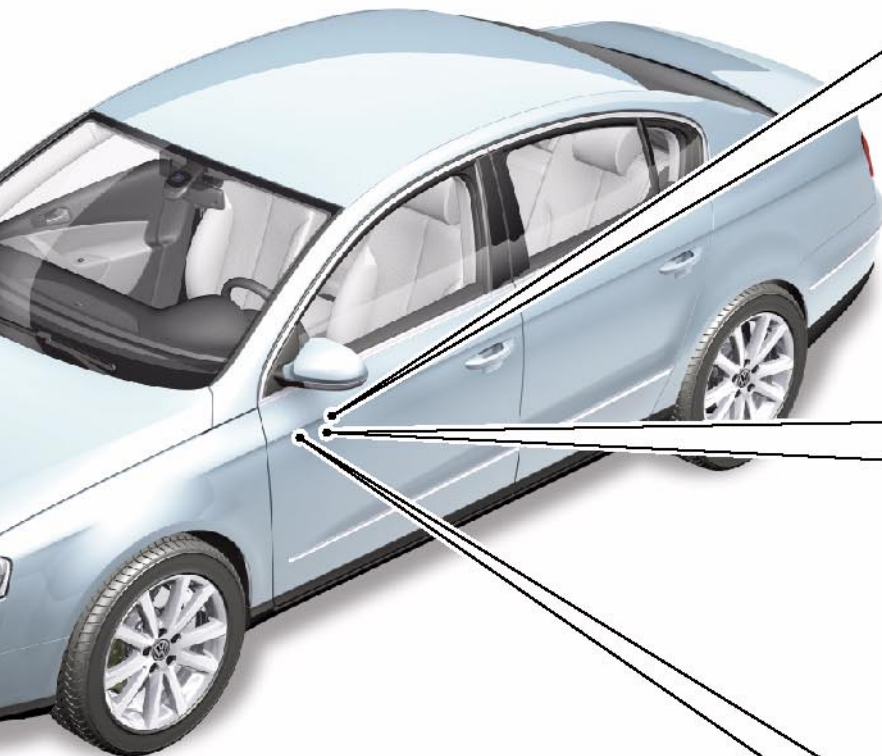
Fuse box,
in right-hand side of
dash panel



Electronics box,
on left of engine compartment



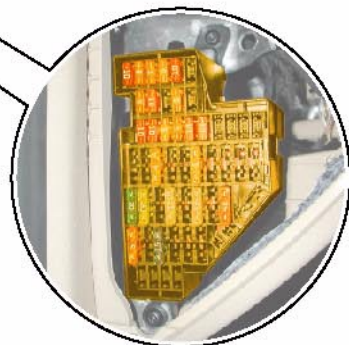
Back-up fuse box,
on left of engine compartment



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

S340_001

Introduction



Networking Concept

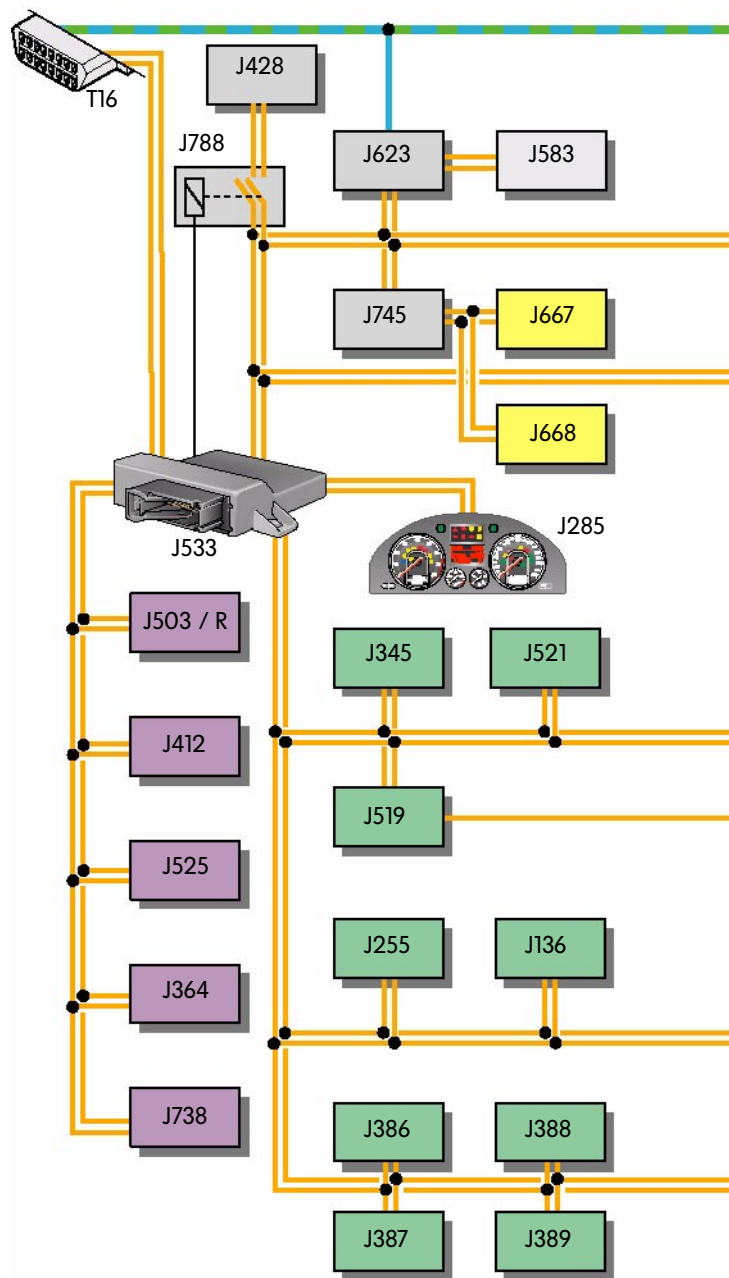
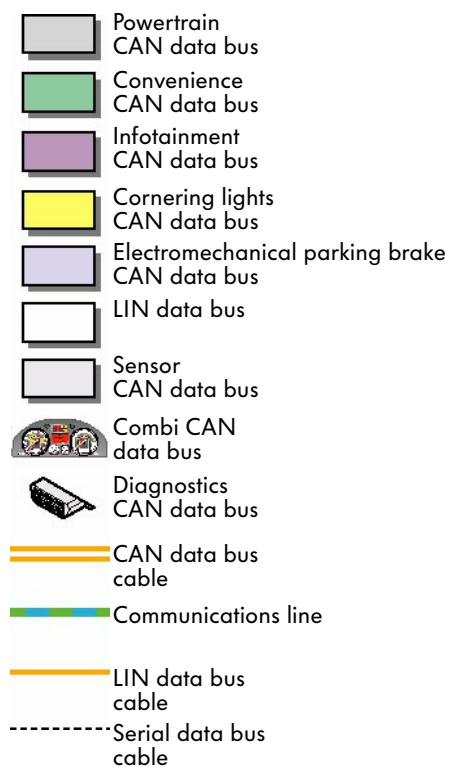
Overview of networked control units

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

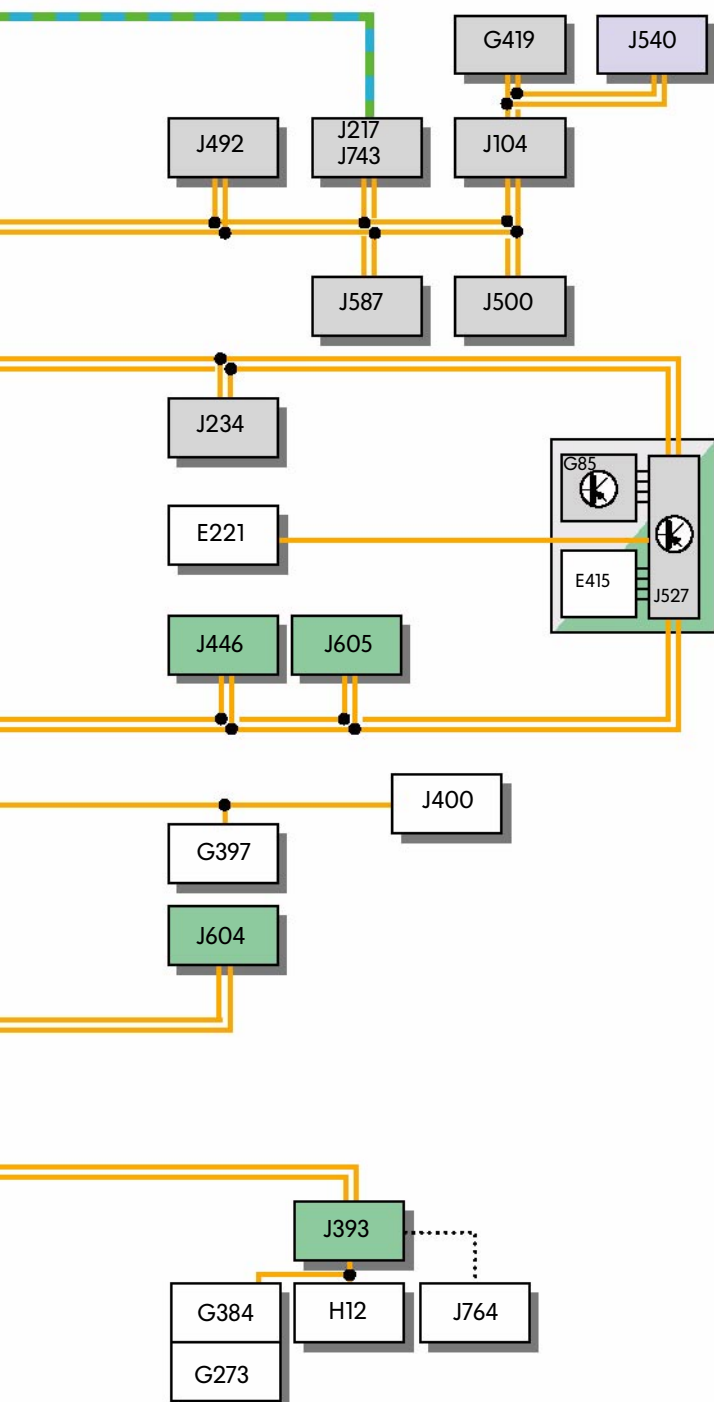
- Powertrain CAN data bus
- Convenience CAN data bus
- Infotainment CAN data bus
- Combi CAN data bus
- Diagnostics CAN data bus

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

S340_002



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.

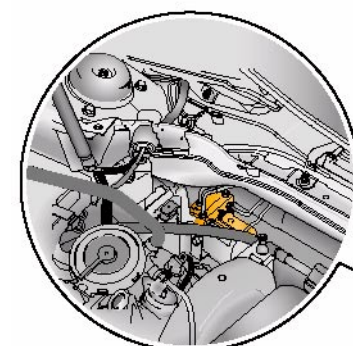
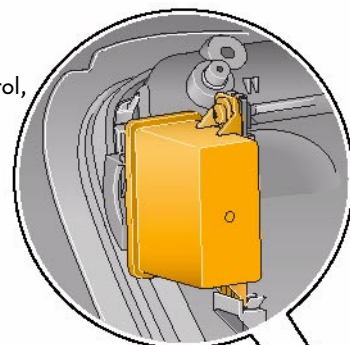
The data transfer speed is 500kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

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.

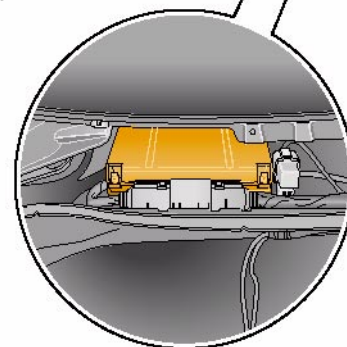
Headlight range control, control unit J431, on right-hand side of glove compartment



ABS control unit J104, on the bulkhead, on right inside engine compartment



Adaptive cruise control unit J428 *, behind the brand badge



Engine control unit J623, under the plenum chamber cover

* To be used at a later point in time.

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

Airbag control unit,
under centre console at front



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

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

Data bus diagnostic interface J533,
on left under dash panel

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

Automatic gearbox control unit J217,
in front left wheel housing

S340_004

Data Bus Systems

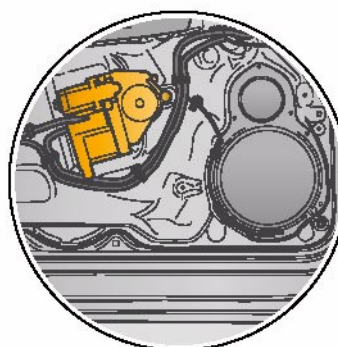
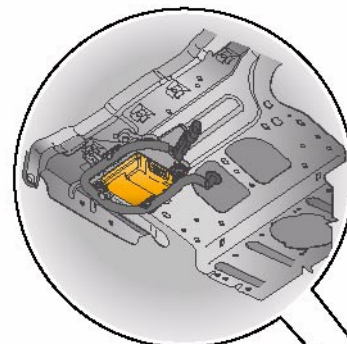
Control Units for Convenience CAN Data Bus

Control units and locations

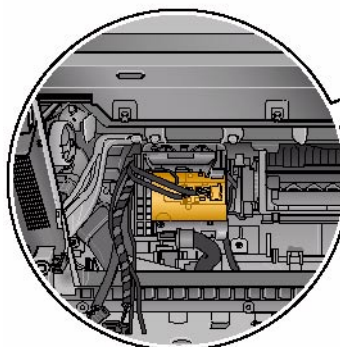
The adjacent diagram shows the control units that are involved in the convenience CAN data bus communication as well as their locations. The data transfer speed is 100 kbit/s. The transfer occurs via the CAN high cable and the CAN low cable. The CAN cables are twisted together for secure data transfer.

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

Front passenger seat position with memory J521, under passenger seat



Door control units J386, J387, J388, J389, in the doors



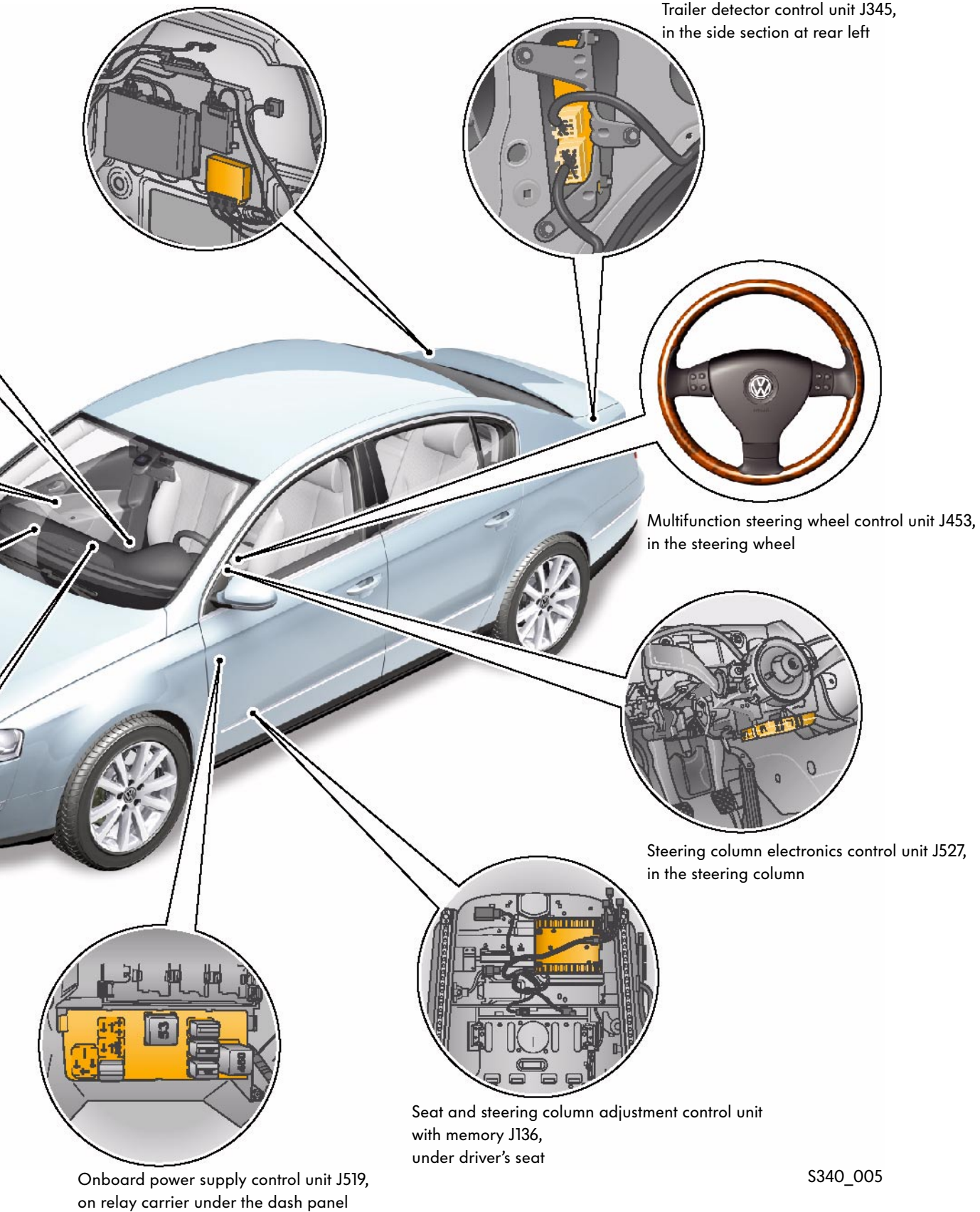
Convenience system central control unit J393, on right under dash panel



Climatronic control unit J255, in middle of dash panel

Parking aid control unit J446,
in the side section at rear right

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



S340_005

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.

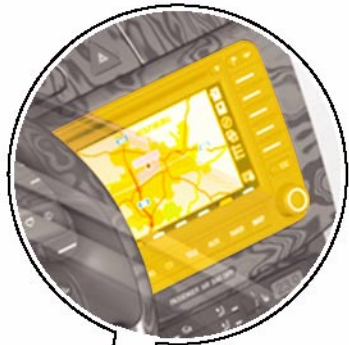


CD changer R41,
in glove compartment

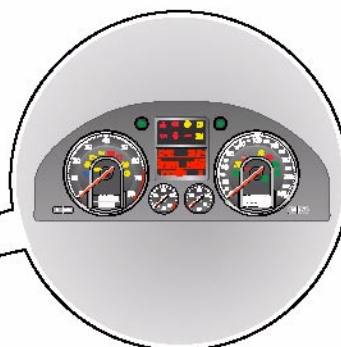
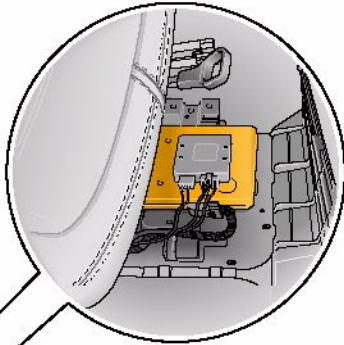


Auxiliary heater control unit J364,
in right wheel housing

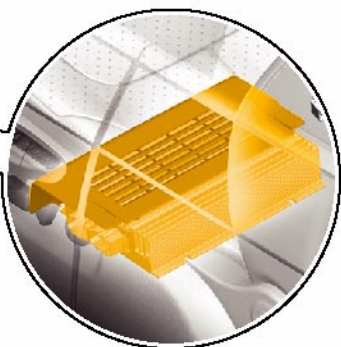
Control unit with display for radio and navigation J503, in the dash panel



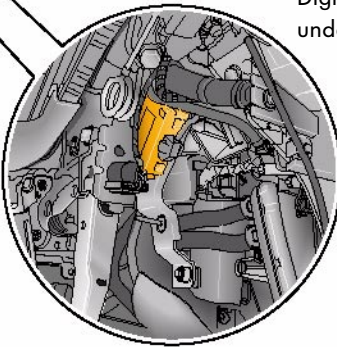
Mobile telephone operating electronics control unit J412, under passenger seat



Control unit with display in dash panel insert J285



Digital sound package control unit J525, under driver's 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

S340_007

Data Bus Systems

Sub-bus Systems

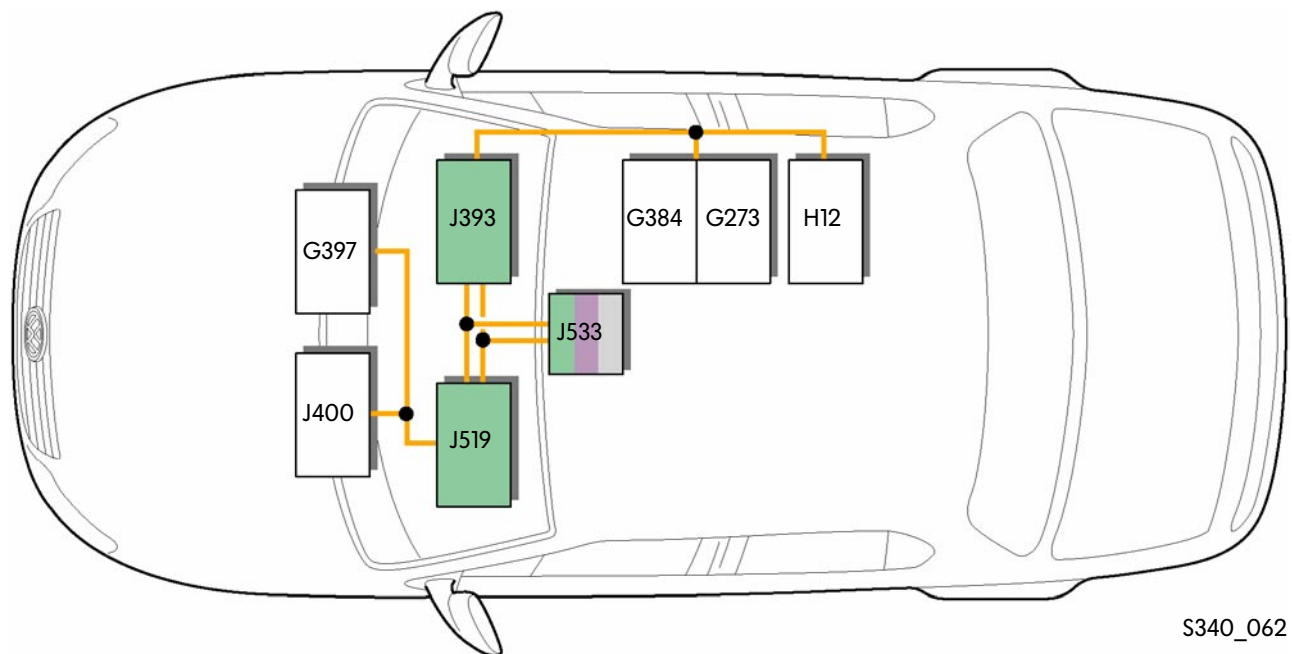
LIN data bus



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.

Control Units for LIN Data Bus



S340_062

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

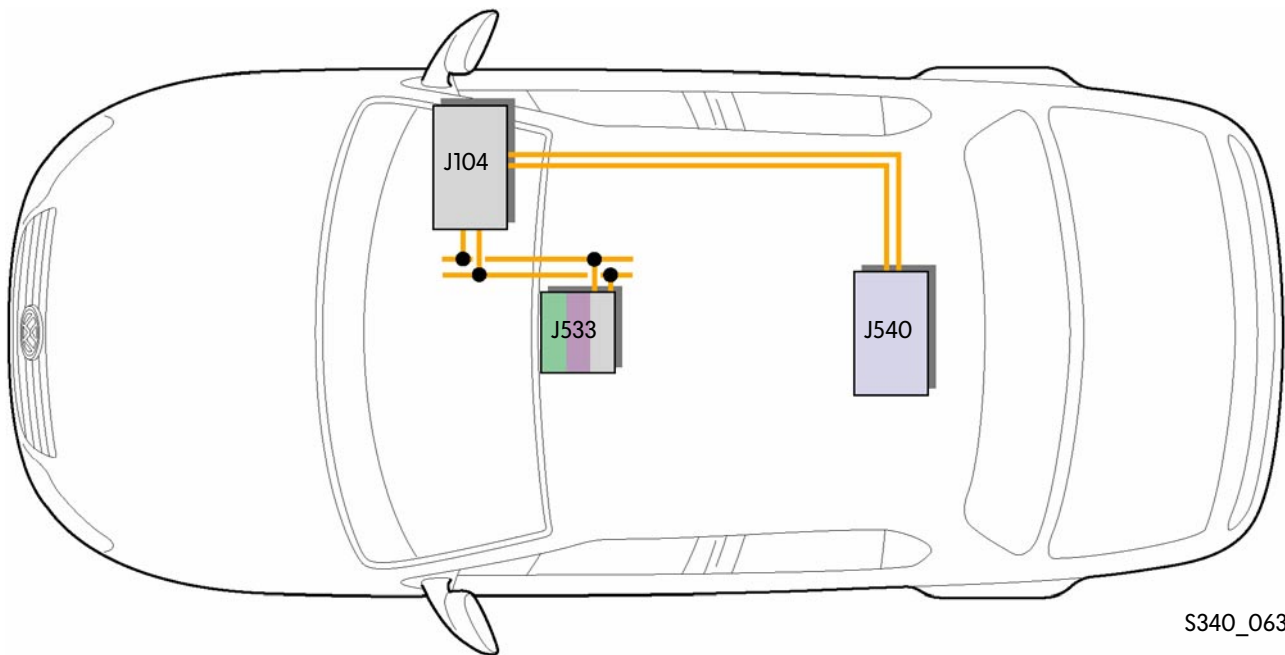
Electromechanical CAN data bus

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



S340_063

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).

Data Bus Systems

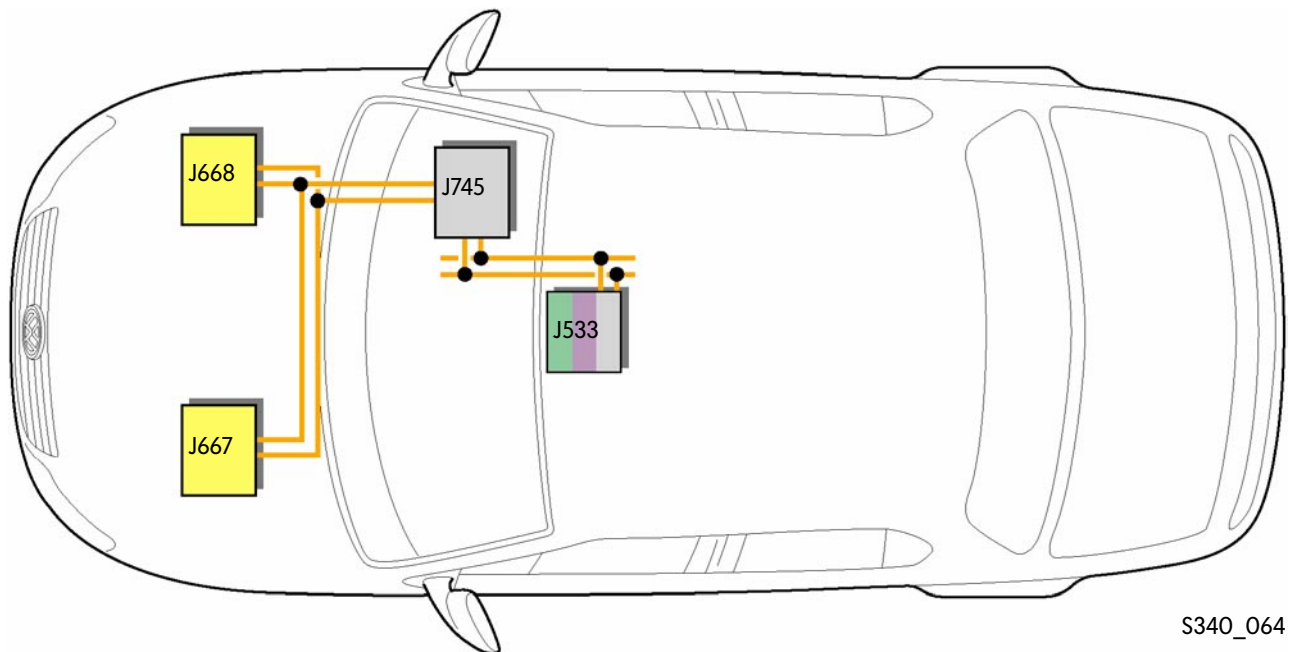
Cornering Lights (Advanced Frontlighting System) CAN Data Bus



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



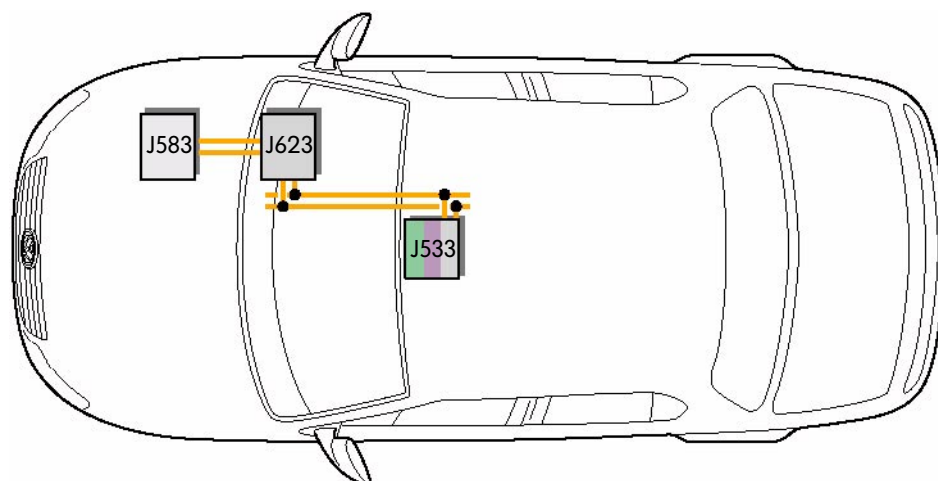
S340_064

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.



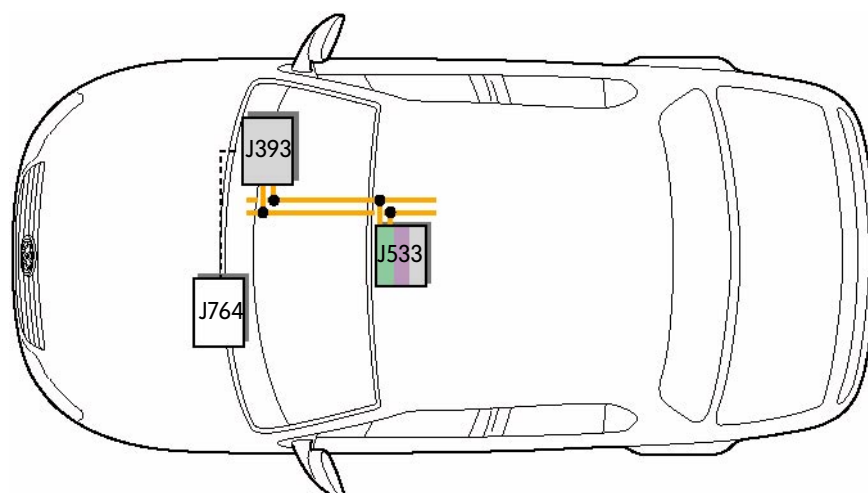
S340_065

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

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

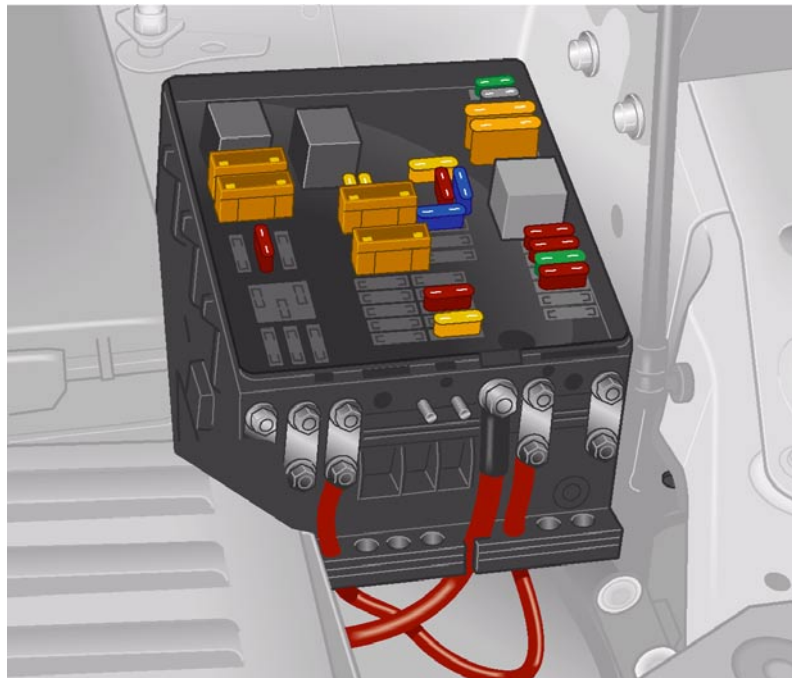
The electronics box is mounted at the front right in the engine compartment.

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

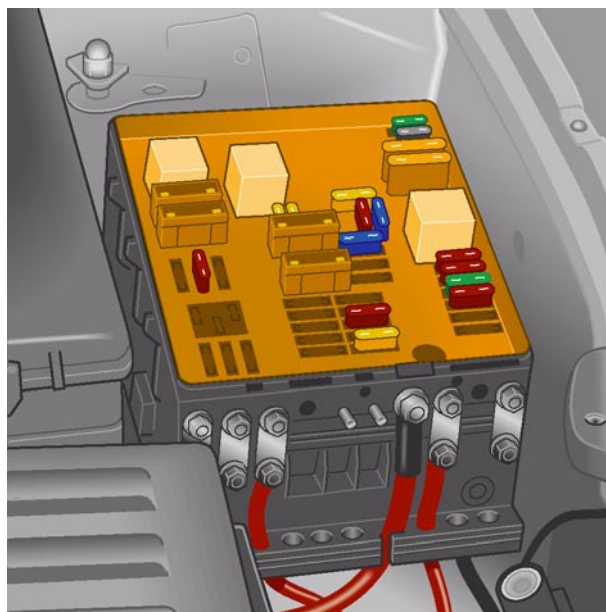


Please refer to the ELSA electronic service information system for the current assignment with fuses and relays in the electronics box.

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



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.

