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.
Contents

Introduction ................................................................. 4

Data Bus Systems
   Control Units for Powertrain CAN Data Bus ..................... 8
   Control Units for Convenience CAN Data Bus .................. 10
   Control Units for Infotainment CAN Data Bus
       Combi and Diagnosis ............................................. 12
   Sub-bus Systems ..................................................... 14

Onboard Power Supply
   Electronics Box ....................................................... 18
   Relay Carriers and Fuse Boxes .................................. 20
   Onboard Power Supply Control Unit ............................. 22
   Exterior lights ....................................................... 24
   Data Bus Diagnostic Interface .................................. 32
   Control Unit with Display in Dash Panel Insert .............. 34
   Convenience System Central Control Unit ..................... 38
   Immobilizer IV ...................................................... 40
   Start-Stop System ................................................. 44
   Electronic Steering Column Lock Control Unit ............... 46

Convenience and Safety Electronics
   Corning Light System (Advanced Frontlighting System) .... 48
   Customisation ...................................................... 50
   Parking Aid ......................................................... 52
   Transformer ......................................................... 54

Service ................................................................. 56

Test Yourself .......................................................... 58
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.
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
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.
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

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

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.

---

**Legend**

J533  Data bus diagnostic interface  
J583  NOx sensor control unit  
J623  Engine control unit

---

**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.

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.
Onboard Power Supply

Relay Carriers and Fuse Boxes

Locations

The relay carrier and the onboard power supply control unit are under the left-hand side of the dash panel.

Relay carrier

The relays connected to the relay carrier depend on the vehicle version and the equipment. On vehicles with heated seats, the circuit breakers for the heating elements (thermal fuses) are also mounted on the relay carrier.

Relay carrier on onboard power supply control unit

There is an additional relay carrier on the onboard power supply control unit.
Left-hand fuse box

The fuse box is on the left-hand side of the dash panel behind the cover.

Right-hand fuse box

The fuse box is on the right-hand side of the dash panel behind the cover.

Please refer to the ELSA electronic service information system for the current assignment of the fuses.
Onboard Power Supply

Onboard Power Supply Control Unit J519

Location

The onboard power supply control unit is on the left underneath the dash panel and forms a unit with the relay carrier.

Versions

The Passat is equipped with two different versions of the onboard power supply control unit.

- High version
  for vehicles with fog lights and/or Bi-Xenon lights and customisation options.

- Medium version
  for all other vehicle variants.

Fog lights can be retrofitted only if the medium version of the onboard power supply control unit is also exchanged for the high versions.
Tasks

The onboard power supply control unit switches and controls the following functions:

- **Outside light control with bulb monitoring**
  The blown bulb is indicated by the corresponding warning light or as a text in the dash panel insert.

- **Convenience lights with**
  **Coming Home**
  After the vehicle doors are closed, the area surrounding the vehicle is illuminated by a lighting system on the vehicle.

  **Leaving Home**
  The area surrounding the vehicle will be illuminated by a lighting system when the car is unlocked with the remote control.

- **Dimmable instrument lighting**
  **Gear selector lighting**

- **Interior light control**
  Terminal 30G, via which the interior lights are supplied with power, is switched by the onboard power supply control unit.

- **Fuel pump supply**
  When you open the driver’s door, the electrical fuel pump is supplied by the onboard power supply control unit with voltage.
  After you start the engine, the voltage is supplied by the engine control unit.

- **Front windscreen wiper**
  The CAN data bus signals are forwarded from the onboard power supply control unit to the wiper motor control unit.

- **Rear windscreen wipers**
  When you select reverse gear, the rear windscreen wiper is switched on (estate only).

- **Windscreen and rear window washer pump**

- **Turn signal control**

- **Electrical load management**
  Switch-off under 11.8 V, as in Touran.

- **Outside light control**

- **Heated rear windscreen**

- **Heated front windshield**

- **Terminal control**
  The onboard power supply control unit controls terminal 75x via the X-contact relief relay. Terminal 15 is controlled via the relay for voltage supply terminal 15 in the electronics box. Terminal 50 is controlled via the relay for voltage supply terminal 50 in the electronics box.
Onboard Power Supply

Exterior Lights

Front headlights

Design

The shape of the headlights is no longer the classic double round design. "Large eyes" are formed by tubes around the dipped beam lights. The large square full-beam reflector improves the full-beam performance considerably compared with the Passat 1997.

H7 headlights

The basic headlights use halogen technology. H7 lights are used for both the dipped and full-beam lights. A voltage stabilising system used by the onboard power supply control unit increases the life of the bulbs.

Xenon headlights

The Passat 2006 can be ordered with optional Bi-Xenon headlights with cornering light function.

Xenon headlights are run with high-voltages of several 10,000 volts. Contact with this voltage can be fatal. Therefore make sure you follow the safety guidelines given in the ELSA electronic service information system.
Tail lights

Design

The tail lights feature the double round light design. They are two-piece.

Tail lights in side section

The tail light, brake lights and indicators use LEDs and are integrated in the side section.

The advantages of LEDs over bulbs are faster response times, better signal formation and greater homogeneity of the illuminated areas.

Tail lights in the boot lid

The rear fog light is on the left of the boot lid and the reverse light is on the right. Normal bulbs are used here.

Third brake light

A third brake light as well as the indicators mounted in the door mirrors compliment the headlights and tail lights and provide other road users with additional visual signals.

The third brake light at the top of the rear windscreen as well as the indicators in the door mirrors use LED technology.

The whole unit will need to be replaced if individual LEDs are faulty.
Onboard Power Supply

Rotary light switch

In the midline and highline version of the onboard power supply control unit, the light switch is a semiconductor element. It is therefore only used for activation. The lights are controlled by the onboard power supply control unit output stage.

Rotary light switch without automatic headlight control

The light in the light switch is illuminated when terminal 75 is switched active.

Rotary light switch with automatic headlight control

The symbol for automatic headlights is illuminated red when the light switch is set to "automatic headlight control".

When the switch is in the "automatic headlight control" position and the rain and light detector sensor has detected night-time or darkness, the symbol will be illuminated green.

When the switch is in the "automatic headlight control" position and the rain and light detector sensor has detected day-time or light, the symbol will be illuminated light green.

You will find further information on use of the rotary light switch and the warning lights in the Passat 2006 operating manual.
Indicator functions

The following indicator modes are available in the Passat 2006:

- Hazard warning lights
- Crash warning lights
- Emergency stop warning lights
- Turn signals
- Lane change flash
- Central locking flashing
- Anti-theft alarm flashing

The individual operating modes have different priorities. This allows a flash function to be activated even though another one is in use.

Priority 1  Hazard warning lights  Priority 4  Turn signals, lane change flash
Priority 2  Crash warning lights  Priority 5  Anti-theft alarm flash, central locking flash
Priority 3  Emergency stop warning lights

Hazard warning lights

The “hazard warning lights on” function is sent directly from the hazard warning light switch to the onboard power supply control unit. This information is not related to the status of terminal 15.

Crash warning lights

The hazard warning lights are switched on automatically when the airbag control unit recognises a crash.

Emergency stop warning lights

The hazard warning lights are switched on in an emergency braking situation (deceleration > 7 m/s² longer than 700 ms) or when the ABS is active for more than two seconds. This function needs to be activated in the onboard power supply control unit using a VAS tester.

Turn signals

This function is realised in the onboard power supply control unit and by the steering column electronics control unit. It is activated with the turn signal switch.

Lane change flash

If the turn signal switch is pressed for less than 1 second, the indicators will flash three times. Pressing the turn signal switch in the same direction for less than one second will add three more flashes. The function can be activated with the customisation options or the VAS tester.

Anti-theft alarm and central lock flash

These flash functions are requested by the convenience system central control unit from the onboard power supply control unit via the CAN data bus when the corresponding function is active.
Onboard Power Supply

Exterior lights functional diagram

Legend

D1 Immobilizer reading unit
E1 Light switch
E2 Turn signal switch
E3 Hazard warning light switch
E4 Headlight dipper/flasher switch
E7 Fog light switch
E18 Rear fog light switch
E20 Switches and instruments illumination regulator
E22 Intermittent wiper switch
E34 Rear wiper switch
E38 Intermittent wiper regulator
E44 Washer pump switch
(automatic wash/wipe and headlight washer system)
E102 Headlight range control regulator
E415 Entry and start authorisation switch
F Brake light switch
F4 Reversing light switch
F266 Bonnet contact switch
J285 Control unit with display in dash panel insert
J362 Immobilizer control unit
J386 Driver door control unit
J387 Front passenger door control unit
J393 Convenience system central control unit
J519 Onboard supply control unit
J527 Steering column electronics control unit
J533 Data bus diagnostic interface
J764 Electronic steering column lock control unit

K1 Main beam warning lamp
K4 Side light warning lamp
K6 Hazard warning light system warning lamp
K13 Rear fog light warning lamp
K18 Trailer operation warning lamp
K65 Left turn signal warning lamp
K94 Right turn signal warning lamp
K170 Bulb failure warning lamp
L9 Light switch illumination bulb
L22 Left fog light bulb
L23 Right fog light bulb
L46 Rear fog light bulb
L76 Button illumination bulb
L131 Exterior mirror turn signal bulb, driver's side
L132 Exterior mirror turn signal bulb, front passenger side
M1 Left side light bulb
M2 Right tail light bulb
M3 Right side light bulb
M4 Left tail light bulb
M5 Front left turn signal bulb
M6 Rear left turn signal bulb
M7 Front right turn signal bulb
M8 Rear right turn signal bulb
M9 Left brake light bulb
M10 Right brake light bulb
M17  Right reversing light bulb
M25  High level brake light bulb
M29  Left dipped beam bulb
M30  Left main beam bulb
M31  Right dipped beam bulb
M32  Right main beam bulb
N360 Steering column lock control element
N376 Ignition key withdrawal lock solenoid
S    Fuse
V48  Left headlight range control motor
V49  Right headlight range control motor
W31  Front left entry light
W32  Front right entry light
X    Number plate light

**Legend:**
- Green: Input signal
- Blue: Output signal
- Red: Positive
- Brown: Earth
- Orange: Data bus
Onboard Power Supply

Automatic headlight control

Dusk function

If light switch E1 is set to “automatic headlight control”, the rain and light detector sensor G397 automatically measures the light, e.g. when entering a tunnel, and sends a signal to the onboard power supply control unit to automatically switch on the driving lights.

Legend
E1 Light switch
E415 Entry and start authorisation switch
G397 Rain and light sensor
J519 Onboard supply control unit
L123 Left dipped beam bulb
L124 Right dipped beam bulb
L125 Left main beam bulb
L126 Right main beam bulb

Motorway function

The motorway function switches the driving lights on when the car travels faster than 140 km/h for over 10 seconds. They are switched off again when the car travels slower than 65 km/h for longer than 150 seconds. The function is activated when the light switch is set to “automatic headlight control”.

Rain function

The rain function switches the driving lights on when the front wipers are active for longer than 5 seconds and the light switch is set to “automatic headlight control”. The driving lights are switched off again when there is no wipe procedure for longer than 255 seconds.
Vehicle lights

Emergency light mode

If the onboard power supply control unit is not capable of controlling the car lights due to a processor malfunction, an additional piece of hardware will take over the following lights:
- Brake light
- Side light
- Dipped beam

Light functions

The following lights have additional functions:

<table>
<thead>
<tr>
<th>Lights</th>
<th>Additional functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear left and right brake lights</td>
<td>Dimmed switch on as tail light dimmed to 10%</td>
</tr>
<tr>
<td>Rear left and right indicator</td>
<td>Dimmed switch on as tail light dimmed to 15%</td>
</tr>
</tbody>
</table>

Light switch delay

The delay prevents the headlights being switched on briefly in the “automatic headlight control” position when you quickly turn the switch from the “off” position to the “side lights” or “headlights” position.

<table>
<thead>
<tr>
<th>From/to</th>
<th>Off</th>
<th>Automatic headlight control</th>
<th>Side light</th>
<th>Driving lights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Lights on&quot; (ms)</td>
<td>&quot;Lights off&quot; (ms)</td>
<td>&quot;Lights on&quot; (ms)</td>
<td>&quot;Lights off&quot; (ms)</td>
</tr>
<tr>
<td>Off</td>
<td>500</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Automatic headlight control</td>
<td>0</td>
<td>0</td>
<td>600</td>
<td>0</td>
</tr>
<tr>
<td>Side light</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Driving lights</td>
<td>0</td>
<td>0</td>
<td>600</td>
<td>600</td>
</tr>
</tbody>
</table>
Data Bus Diagnostic Interface J533

Function

Due to the high proportion of networked functions, large quantities of data have to be transferred. To ensure trouble-free data exchange, several data bus systems are required to exchange data between each other.

The data bus diagnostic interface links these data buses as a gateway interface and allows data transfer.

Location

The data bus diagnostic interface is on the left under the dash panel, above the accelerator pedals.

Master functions

The data bus diagnostic interface J533 takes over the master functions for terminal 15 run-on on the powertrain CAN data bus as well as the control logic for sleep and wake-up mode of the data bus systems.

For more information on the data bus diagnostic interface, see SSP 307 “The Touran – Electrical System”.

32
Transport mode

The car battery can be discharged during long transportation and standing times due to no-load currents. Transport mode is activated to keep power consumption as low as possible. Control unit with display in dash panel insert J285 indicates that transport mode is active.

While transport mode is active, the car can be started and can be driven normally. The following convenience and infotainment consumers are deactivated:

- Central locking
- Window regulators
- Radio
- Multifunction steering wheel
- Remote control
- Interior monitoring
- Receiver for auxiliary heater remote start
- Inclination sensor
- Save LED in the door
- Interior lights after 30 seconds active
- Seat memory
- Air conditioning

Deactivate transport mode

Transport mode can only be switched off with the VAS diagnostic testers via the vehicle self-diagnosis (collection services). It is automatically disabled after a distance > 50 km.

Activate transport mode

Transport mode can only be switched on with the VAS diagnostic testers via the vehicle self-diagnosis (collection services). It can only be activated within the first 150 km.
Control Unit with Display in Dash Panel Insert J285

Function

The control unit with display in dash panel insert receives its information for the display unit and warning lights from the various control units via the data bus diagnostic interface J533 and via the combi CAN data bus.

External sensor signals still reach the control unit in the dash panel insert from the following sensors via discrete wiring:

- F1  Oil pressure switch
- F9  Handbrake warning switch
- F34 Brake fluid level warning contact
- G17 Ambient temperature sensor
- G32 Coolant shortage indicator sender
- G33 Windscreen washer fluid level sender
- G34 Brake pad wear sender
- G266 Oil level and oil temperature sender
- J538 Fuel pump control unit
**Variants**

The gauges in the display in the dash panel insert Y24 are divided into three versions.

**Lowline version**

The lowline version has eight LED warning lights (E) and a semi-dot liquid crystal display (LCD) (F).

**Midline version**

The midline version has eight LED warning lamps (E), a mini-dot display (F), a semi-dot LCD in the speedometer (O) and in the rev counter (N).

**Highline version**

The midline version has a dot-matrix display (K), a semi-dot LCD in the speedometer (O) and in the rev counter (N).

**Common equipment**

All versions have:

- Rev counter (A) G5
- Speedometer (B) G21
- Coolant temperature gauge (C) G3
- Fuel gauge (D) G1
## Onboard Power Supply

### Equipped with warning lamps

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Warning lamp</th>
<th>Lowline</th>
<th>Midline</th>
<th>Highline</th>
<th>Warning text or warning</th>
</tr>
</thead>
</table>
| ![Airbag](image) | Airbag | X | X | X | Airbag fault  
Airbag Belt tensioner deactivated |
| ![ABS](image) | ABS (anti-lock brake system) | X | X | X | ABS |
| ![Brake pad wear](image) | Brake pad wear | X | X | | Pictogram | Check brake pad |
| ![Preheat](image) | Preheat (diesel engines)  
or  
Electronic Power Control | X | X | X | Engine fault Workshop!  
Emissions Workshop! |
| ![Dynamic oil pressure warning](image) | Dynamic oil pressure warning | Flashing | Flashing | Flashing | Pictogram | Stop Oil pressure Engine off  
Owner’s manual  
3 x warning buzzer |
| ![Diesel particle filter](image) | Diesel particle filter | X | X | | Pictogram |
| ![Power steering](image) | Power steering  
Electronic Power Steering | X | X | X | Steering lock fault!  
Lock steering!  
Move steering!  
Steering lock! Workshop! |
| ![Electronic brake pressure distribution](image) | Electronic brake pressure distribution | X | X | X | 3 x warning buzzer |
| ![Parking brake / electromechanical parking brake](image) | Parking brake / electromechanical parking brake | X | X | X | Handbrake on  
Release parking brake by hand!  
Depress brake pedal! |
| ![Electromechanical parking brake Warning lamp](image) | Electromechanical parking brake Warning lamp | X | X | X | Parking brake fault!  
Owner’s manual! |
| ![ESP](image) | ESP  
TCS | X | X | X | |
<p>| <img src="image" alt="Left-hand indicator" /> | Left-hand indicator | X | X | X | Acoustic signal |
| <img src="image" alt="Right-hand indicator" /> | Right-hand indicator | X | X | X | Acoustic signal |
| <img src="image" alt="Trailer turn signals" /> | Trailer turn signals | X | X | X | |
| <img src="image" alt="Main beam" /> | Main beam | X | X | X | |
| <img src="image" alt="Cruise control" /> | Cruise control | X | X | X | |</p>
<table>
<thead>
<tr>
<th>Icon</th>
<th>Warning lamp</th>
<th>Lowline</th>
<th>Midline</th>
<th>Highline</th>
<th>Warning text or warning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Icon Bulb failure" /></td>
<td>Bulb failure</td>
<td>X</td>
<td></td>
<td>X</td>
<td>e.g. Front left dipped beam defective!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Constantly illuminated; Faulty bulb</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flashing: HRC or AFS faulty</td>
</tr>
<tr>
<td><img src="image" alt="Icon Boot lid" /></td>
<td>Boot lid</td>
<td>X</td>
<td>X</td>
<td>Pictogram</td>
<td>e.g. Boot lid open!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 x warning buzzer at speed of &gt; 6 km/h</td>
</tr>
<tr>
<td><img src="image" alt="Icon Door open" /></td>
<td>Door open</td>
<td>X</td>
<td>X</td>
<td>Pictogram</td>
<td>Driver’s door open!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Passenger door open!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rear left door open!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rear right door open!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 x warning buzzer at speed of &gt; 6 km/h</td>
</tr>
<tr>
<td><img src="image" alt="Icon Fuel reserve" /></td>
<td>Fuel reserve</td>
<td>X</td>
<td>X</td>
<td>Pictogram</td>
<td>Please refuel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 x warning buzzer</td>
</tr>
<tr>
<td><img src="image" alt="Icon Coolant low or overheating" /></td>
<td>Coolant low or overheating</td>
<td>X</td>
<td>X</td>
<td>Pictogram</td>
<td>Stop! Check coolant Owner’s manual</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 x warning buzzer</td>
</tr>
<tr>
<td><img src="image" alt="Icon Alternator" /></td>
<td>Alternator</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Icon Engine check EOBD" /></td>
<td>Engine check EOBD</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Engine fault Workshop!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emissions Workshop!</td>
</tr>
<tr>
<td><img src="image" alt="Icon Bonnet open" /></td>
<td>Bonnet open</td>
<td>X</td>
<td>X</td>
<td>Pictogram</td>
<td>Door warning! Hood!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 x warning buzzer when v &gt; 6 km/h</td>
</tr>
<tr>
<td><img src="image" alt="Icon Rear fog lights" /></td>
<td>Rear fog lights</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Icon Oil level" /></td>
<td>Oil level</td>
<td>X</td>
<td>X</td>
<td>Pictogram</td>
<td>Check oil level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil sensor Workshop!</td>
</tr>
<tr>
<td><img src="image" alt="Icon Tyre pressure monitoring" /></td>
<td>Tyre pressure monitoring</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1 x warning buzzer</td>
</tr>
<tr>
<td><img src="image" alt="Icon Shift lock" /></td>
<td>Shift lock</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Icon Seat belt" /></td>
<td>Seat belt</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Please fasten seatbelt</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gong</td>
</tr>
<tr>
<td><img src="image" alt="Icon Day driving lights" /></td>
<td>Day driving lights</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Icon Fuel cap open" /></td>
<td>Fuel cap open</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Icon Wash fluid low" /></td>
<td>Wash fluid low</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Top up wash fluid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 x warning buzzer</td>
</tr>
</tbody>
</table>
Onboard Power Supply

Convenience System Central Control Unit J393

Location

The convenience system central control unit is located under the dash panel, on the right behind the glove compartment.

Tasks

The convenience system central control unit activates and controls the following functions:

- Central locking control unit
- Activation of rear door control units
- Activation of the fuel tank flap release
- Activation of the boot lid release
- Activation of the anti-theft alarm via LIN bus
- Activation of the tyre pressure monitor
- Activation of the immobilizer
- Activation of the entry and start authorisation system.

In the Passat 2006, the tyre pressure monitoring (via tyre pressure sensors and tyre pressure monitor aerials), immobilizer control unit J362 and entry and start authorisation control unit J518 functions are combined in the convenience system central control unit for the first time.

Furthermore the convenience system central control unit is the master control unit in the LIN anti-theft alarm data bus. The anti-theft alarm system includes the interior monitoring sensor G273, the intelligent anti-theft alarm system horn H12 and the vehicle inclination sensor G384.
Central locking

The convenience system central control unit controls all central locking functions. The central locking system includes the doors, the boot lid and the tank filler flap.

There are three locking states.

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlocked</td>
<td>The doors can be opened from the inside and outside.</td>
</tr>
<tr>
<td>Locked</td>
<td>The doors can only be opened from the inside by pulling the door handle once.</td>
</tr>
<tr>
<td>Safe</td>
<td>The doors cannot be opened either from the inside or the outside.</td>
</tr>
</tbody>
</table>

Locking points

It is operated by the emergency lock cylinder in the driver’s door, the interior locking button and the remote control on the car key. The motors for the central locking in the driver’s and passenger door are controlled by the respective door control units. The control of the rear doors, the boot lid and the tank filler flap is handled by the convenience system central control unit.

Operating central locking

If the vehicle is locked via the interior locking button, the LED integrated in the button will illuminate. The doors can be opened from the inside by pulling the door handle once.

When individual door opening is activated, opening the car mechanically with the car key only unlocks the driver’s door. Turning the key twice also only operates the door control unit on the driver’s side.

Pressing the OPEN or CLOSE button more than 200 times outside the reception range of the convenience system central control unit blocks the remote control unit. The remote control needs to be re-activated by pressing the OPEN button and then unlocking the car with the car key (within one minute).
Immobilizer IV

What does the immobilizer IV comprise?

The immobilizer IV is not a separate control unit, but a function.
It includes:

● Storage of all theft-related features of the control units in the FAZIT central database in Wolfsburg.
● Communication of the convenience system central control unit, in which the immobilizer is integrated, with the other components involved.
● Encryption of the data communication between the individual control units.

Central FAZIT database

The central FAZIT database at Volkswagen in Wolfsburg is a essential component of the immobilizer IV.
FAZIT stands for “Fahrzeugauskunft- und zentrales Identifikations-Tool” (Vehicle Information and Central Identification Tool). All theft-related data from the control units that are integrated in the “Immobilizer” function are stored in this database.

It is not possible to adapt the control units used without an online connection to FAZIT.
Data Transfer

- Only an online query by the diagnostic tester transfers the data safely, quickly and reliably in the car.
- A PIN query of the immobilizer components by fax or prior enabling of the components is not possible.
- All components involved in the immobilizer have to be taught online.
- All car keys (including replacements) are already pre-coded at the factory for a specific car and can only be taught for this vehicle.

Legend

J393 Convenience system central control unit
J533 Data bus diagnostic interface
Onboard Power Supply

**Immovilizer components**

**Convenience system central control unit J393**

The immobilizer function is integrated in the convenience system central control unit. The control unit needs to be adjusted online after a replacement.

**Electronic steering column lock control unit J764**

The approval for locking and unlocking the steering column is provided via the “Immobilizer” function in the convenience system central control unit. The control unit can only be replaced and adjusted together with the convenience system central control unit.

**Entry and start authorisation switch (E415)**

The entry and start authorisation switch contains the reader coil for reading the transponder in the car key. The switch for entry and start authorisation does not need to be adjusted after changing.

**Engine control unit J623**

The engine control unit is part of the “Immobilizer” function. Authorisation via the CAN data bus from the convenience system central control unit is required for continuous running of the engine. This control unit needs to be adjusted online after a replacement.
Replacement of control units

Control units that are involved in the “Immobilizer” function can only be replaced with an online connection to the FAZIT database.

**Convenience system central control unit J393**
- Request data via online connection
- Data transfer via VAS tester
- Download data into control unit
- Teach control unit
- Teach car key

**Engine control unit J623**
- Request data via online connection
- Data transfer via VAS tester
- Download data into control unit
- Data exchange between control unit and FAZIT
- Teach car key

**Electronic steering column lock control unit J764 and convenience system central control unit J393**
- Request data via online connection
- Data transfer via VAS tester
- Download data into control unit
- Data exchange between control units and FAZIT
- Teach car key
Onboard Power Supply

Start-Stop System

Entry and start authorisation switch

The entry and start authorisation switch is part of the driving authorisation system. It is used as a mechanical holder for the ignition key, converts the push movement of the ignition key into electrical signals and picks up the reader coil for electronic identification of the ignition key.

Key ignition

The ignition key does not have a key bit as the car is started with a pushing movement for the first time, not by turning.

Emergency key

The emergency key is used to open the driver’s door mechanically if you cannot open it with the remote control. It is inserted in the ignition key. Also the key ring holder is attached to it. It can be used when the emergency key is in the second notch.
**Key positions**

The various terminal voltages (terminal S, terminal 15) are activated and the start procedure is initiated by pushing the ignition key into the entry and start authorisation switch.

**Switch positions**

The following switch positions can be set by pushing the ignition key:

- P₀ Off
- P₁ S contact on
- P₂ Terminal 15 on
- P₃ Terminal 15 drive
  (the ignition key automatically moves to this position after starting)
- P₄ Terminal 50 on

---

**Legend**

- D₁ Immobilizer reading unit
- D₂ Immobilizer reader coil
- E₄₁₅ Entry and start authorisation switch
- J₃₆₂ Immobilizer control unit
- J₅₁₉ Onboard supply control unit
- J₅₂₇ Steering column electronics control unit
- J₅₃₃ Data bus diagnostic interface
- J₇₆₄ Electronic steering column lock control unit
- N₃₇₆ Ignition lock withdrawal solenoid lock
Electronic Steering Column Lock Control Unit

Control unit

The electronic steering column lock is supplied with power by the convenience central control unit J393. Locking and unlocking as well as diagnosis is controlled with the convenience system central control unit via a serial data bus connection.

To take the increased safety requirements into account, the electronic steering column lock release needs to be authorised by three separate control units.

Lock/unlock

The following conditions need to be met:

- An authorised key needs to be recognised by the immobilizer.
- Data bus diagnostic interface J533 (speed = 0 km/h; revs = 0 rpm)
- Steering column electronics control unit J527 (terminal 15 off; speed = 0 km/h)
- Convenience system central control unit J393 (terminal 15 off; CAN signals from J533 and J527 OK)
- Entry and start authorisation switch E415 (S contact off, terminal 15 off)
- Electronic steering column lock control unit J764 (checks whether both speed signals from J533 and J527 are OK)

The electronic steering column only unlocks when an authorised key is recognised by the immobilizer. Terminals 15 and 50 are only activated once the electronic steering column lock has been released.
Legend

E415  Entry and start authorisation switch
J104  ABS control unit
J285  Control unit with display in dash panel insert
J386  Driver door control unit
J393  Convenience system central control unit
J519  Onboard supply control unit
J527  Steering column electronics control unit
J533  Data bus diagnostic interface
J623  Engine control unit
J764  Electronic steering column lock control unit

- CAN data bus
- Output signal
- Input signal
- Plus
- Serial data bus
Convenience and safety electronics

Cornering Light System (Advanced Frontlighting System)

A cornering light system is optionally available for the Passat 2006.

Dynamic cornering lights

The dynamic cornering lights are adjusted to the steering angle during cornering and therefore guarantee optimum road illumination in all driving situations.

Static cornering lights

The static cornering light is particularly useful when you turn off at crossroads and into side roads. An additional bulb in the headlights is switched on for this.

You will find further information on the cornering lights in SSP 335 “Cornering Light System”
Dynamic cornering light operation

The dipped beam bulb module is swivelled horizontally by an integrated electric motor.

Swivelling angle

The swivelling angle is approx. 15 degrees for the outside headlight and approx. 7.5 degrees for the inside headlight in the curve.

Illumination

Curves are illuminated better due to the varying swivelling angles. The maximum possible illumination is reached by the headlight on the inside of the curve swivelling in twice as far as the headlight on the outside of the curve.

At driving speeds under 10km/h, the bulb modules are not swivelled. Over 10km/h, the swivelling angle is basically dependent on the curve radius. The legal requirements stipulating that the headlights may be not swivelled while the vehicle is stationary are therefore fulfilled. Also, the headlights are swivelled slightly when the vehicle accelerates from a standstill and the steering angle remains constant.
Convenience and safety electronics

Customisation

Customisation options allow customers to make their own settings for convenience and infotainment functions.

The specific settings for the different equipment functions are made using a control element and a display.

The system is operated using the lever on the steering wheel and the menus are selected using the display in the dash panel insert Y24. The settings you select are stored in the control unit that is responsible for control of the respective function.

The necessary information is transferred between the control unit in the dash panel insert and the respective control units via the CAN data bus.

Control units involved in customisation

Legend

G397 Rain and light sensor
R Radio
J285 Control unit with display in dash panel insert
J364 Auxiliary heater control unit
J386..J389 Door control units
J393 Convenience system central control unit
J400 Wiper motor control unit
J412 Mobile telephone operating electronics control unit
J453 Multifunction steering wheel control unit
J503 Control unit with display for radio and navigation
J519 Onboard supply control unit
J527 Steering column electronics control unit
J533 Data bus diagnostic interface
Y24 Display in dash panel insert

S340_053
For example: Menu guide

- Lights & Vision
- Coming Home
- Leaving Home
- Footwell light

**Lane change flash**
- Wipers
- Factory setting
- Back

**Lane change flash Off**
- On
- Off
- Back

- Short press of button

**Lane change flash on**
- On
- Off
- Back

- Long press of button

**Lane change flash off**
- On
- Off
- Back
Convenience and Safety Electronics

Parking Aid

The parking aid supports the driver when manoeuvring and parking. It is based on the familiar 8-channel ultrasound technology.

Parking aid control unit J446

The parking aid control unit J446 is located in the boot at the rear right.

Parking aid button E266

The parking aid button is on the right next to the selector lever or gearstick. The parking aid is activated when you press the button or select reverse gear.

It is switched off when you press the button again or automatically at a speed > 15 km/h.

The LED in the button turns yellow when the parking aid is active. If the LED is flashing, a fault has been detected.
**Parking aid sender**

The senders are mounted in the rear and front bumpers as well as the radiator grille.

**Signal flow diagram**

![Image of signal flow diagram]

**Legend**
- E266 Parking aid button
- G203 Rear left parking aid sender
- G204 Rear centre left parking aid sender
- G205 Rear centre right parking aid sender
- G206 Rear right parking aid sender
- G252 Front right parking aid sender
- G253 Front centre right parking aid sender
- G254 Front centre left parking aid sender
- G255 Front left parking aid sender
- H15 Rear parking aid warning buzzer
- H22 Front parking aid warning buzzer
- J104 ABS/ESP control unit
- J217 Automatic gearbox control unit
- J285 Control unit with display in dash panel insert
- J345 Trailer detector control unit
- J446 Parking aid control unit
- J519 Onboard supply control unit
- J533 Data bus diagnostic interface

**Signal flow**
1. Wheel speed from J104 to J446 via J533.
2. Selector lever position J217 to J446 via J533.
4. Trailer detection from J345 to J446
   - If a trailer is detected, only the front senders will be active.
5. Terminal 15 on and reversing light on from J519 to J446
6. Fault detected from J446 to J533
7. E266 pressed
8. Signals from the rear parking aid senders
9. Signals from the front parking aid senders
10. Trigger H15
11. Trigger H22
Convenience and Safety Electronics

Transformer

The Passat 2006 can be ordered with an optional 230 V/50 Hz electrical socket. A transformer has been installed in the car to produce the alternating voltage. It is permanently connected to the socket. This unit is located in the centre console in place of the cupholder.

Electrical socket

The 230 V socket does not have an earth connector and can only be operated with a maximum continuous output of 150 W. Approx. 300 W can be supplied as a short peak output (2 min). The socket has a built-in child protection device, which also functions as a switch. A green LED above the socket shows that it is working properly. If this LED flashes red, there is a fault. This can occur when the output exceeds 150 W for a long period (overtemperature cut-off) or the load draw is too high (greater than 300 W).

No repairs may be carried out on 230 Volt systems. Therefore the whole module needs to be replaced when the socket or transformer is faulty.
The socket is only powered when the engine is running (terminal 61). Except for the signal cable from the onboard power supply control unit, the transformer is connected to the onboard power supply control unit with a voltage supply (terminal 30) and an earth point. The alternating voltage stage is electrically isolated.

The following appliances can be run with the transformer, for example:

- Notebook power supply 75-110 W
- Games console 40-100 W
- Bulb 25-100 W
- Television ~85 W
- Baby bottle warmer ~80 W
- Battery charger ~50 W
- Mobile phone charger ~30 W
- DVD player ~30 W
- Shaver ~10 W

The following appliances cannot be run with the transformer, for example:

- Hairdryer > 1000 W
- Vacuum cleaner > 800 W
- Coffee machine > 500 W
- Appliances with an earth connection
- Work lights with neon tubes
Wiper Adapter Systems

Two new adapter systems are used for the wipers on the Passat 2006 called the side-lock and top-lock systems. Both systems allow you to replace the wiper blades in the parked position and ensure a more stable connection to the wiper arm.

Side-lock adapter system

Top-lock adapter system
Washer Fluid Hose

The Passat 2006 features an improved connector system for the washer fluid hose.

Washer fluid hose connector

Please refer to the ELSA electronic service information system for specific instructions on replacing wiper blades and separating the connectors.
Test Yourself

1. What is the maximum appliance output that can be connected constantly to the 230 V socket?
   - a) 100 W
   - b) 150 W
   - c) 300 W
   - d) 150 W, but only for 2 minutes

2. Which functions are not integrated in the new convenience system central control unit?
   - a) Immobilizer
   - b) Tyre pressure monitoring
   - c) Central locking
   - d) Transformer

3. Which light systems are used in the new Passat tail lights?
   - a) LEDs only
   - b) Bulbs only
   - c) Bulbs in the side section, LEDs in the boot lid
   - d) LEDs in the side section, bulbs in the boot lid
4. Which components have to be adjusted using the FAZIT database?

☐ a) Convenience system control unit
☐ b) Electronic steering column lock control unit
☐ c) Engine control unit
☐ d) Onboard supply control unit

5. Where is the entry and start authorisation switch?

☐ a) In the door handle
☐ b) In the dash panel
☐ c) In the boot
☐ d) In the driver’s door, next to the window switches

6. How many sensors does the Passat 2006 parking aid system have?

☐ a) 4 sensors, just at the rear
☐ b) 6 sensors at the front, 6 sensors at the rear
☐ c) 4 sensors at the front, 4 sensors at the rear
☐ d) 6 sensors, just at the rear

Answers: 1 b; 2 d; 3 a; b; c; 5 b; 6 c