The 2006 Passat Electrical System Design and Function

Self-Study Program
Course Number 871503

Volkswagen of America, Inc.
Volkswagen Academy
Printed in U.S.A.
Printed 05/2005
Course Number 871503

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

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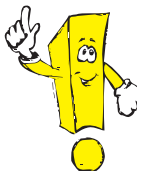
New!



Important/Note!

This Self-Study Program covers the electrical system of the 2006 Passat.

This Self-Study Program is not a Repair Manual. This information will not be updated.

For testing, adjustment and repair procedures, always refer to the latest electronic service information.

Course Introduction

This Self-Study Program covers the 2006 Passat electrical system. This program also describes the new control modules, the networking of various body electrical systems, and the various CAN-bus systems.

The 2006 Passat makes extensive use of control modules and networking using multiple Controller Area Network (CAN) buses. Signals are transmitted digitally from one control module to another on each CAN-bus, eliminating the need for a separate wire for each signal. The use of CAN-bus communication for controls and accessories reduces the wires needed in the vehicle.

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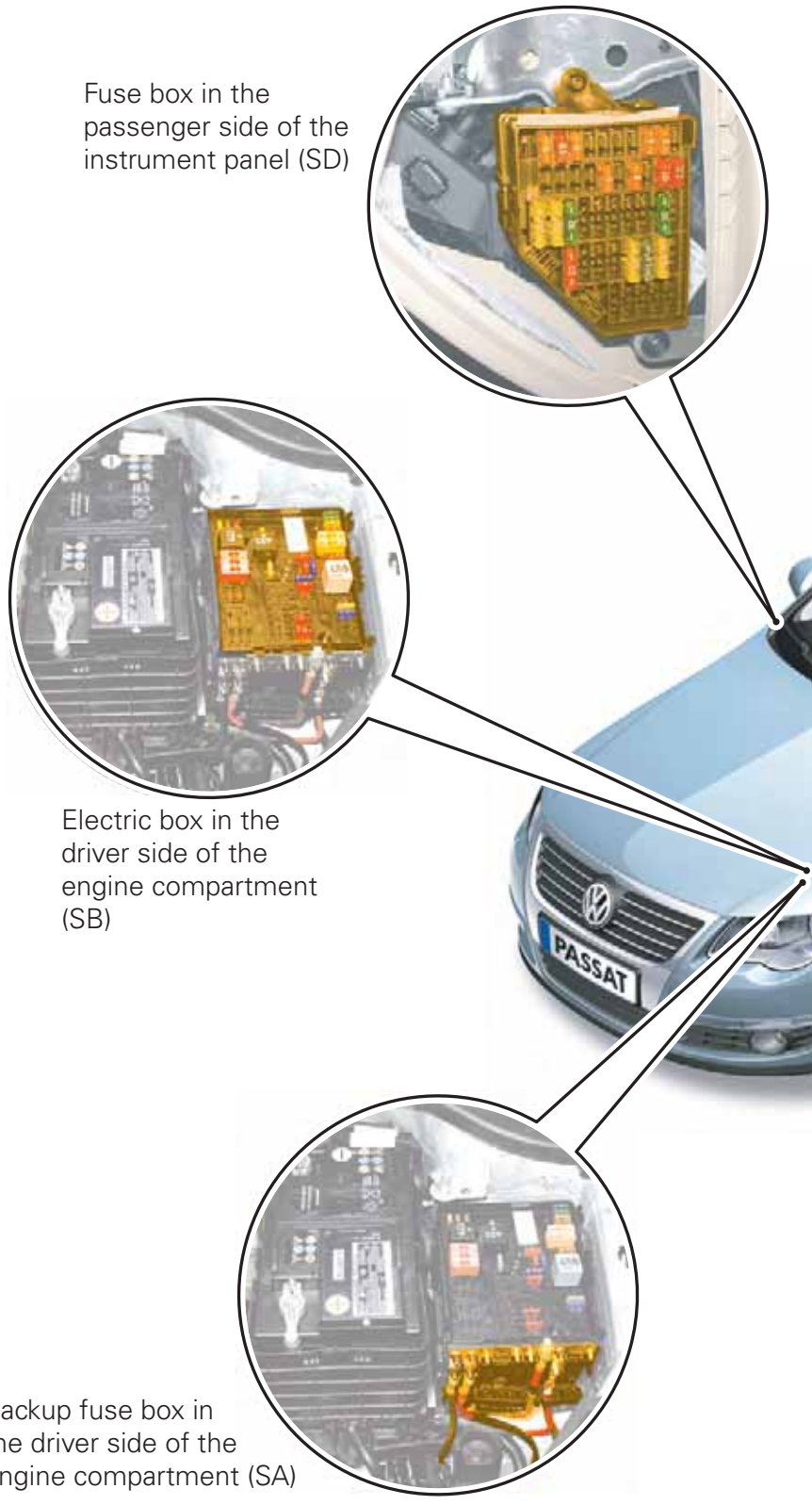
Introduction

Electrical System Fuses and Relays

Locations

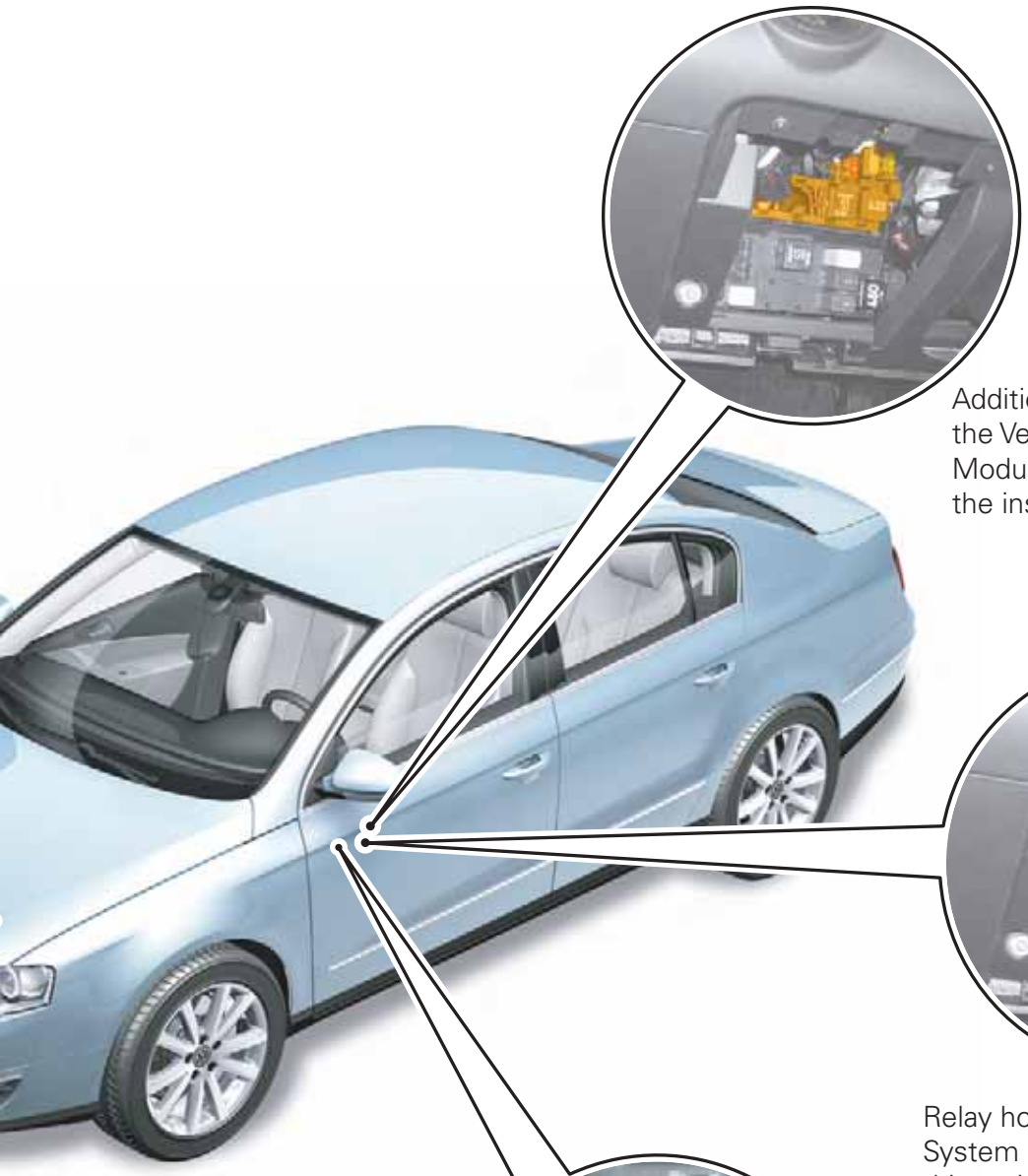
The electrical system on the 2006 Passat is entirely redesigned. Because of this, the mounting location of fuse and relay centers have changed.



Fuse box in the passenger side of the instrument panel (SD)

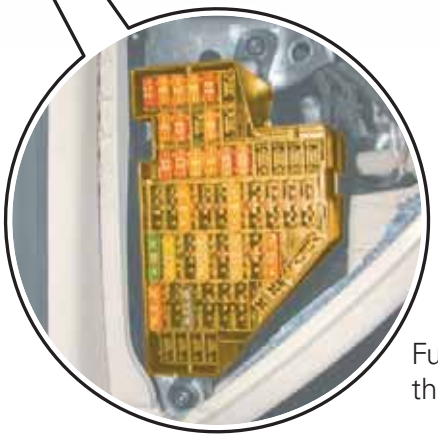
Electric box in the driver side of the engine compartment (SB)

Backup fuse box in the driver side of the engine compartment (SA)



Additional relay holder located on the Vehicle Electrical System Control Module J519, under the driver side of the instrument panel

Relay holder and Vehicle Electrical System Control Module J519, under the driver side of the instrument panel



Fuse box in the driver side of the instrument panel (SC)

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Electric Box

Location

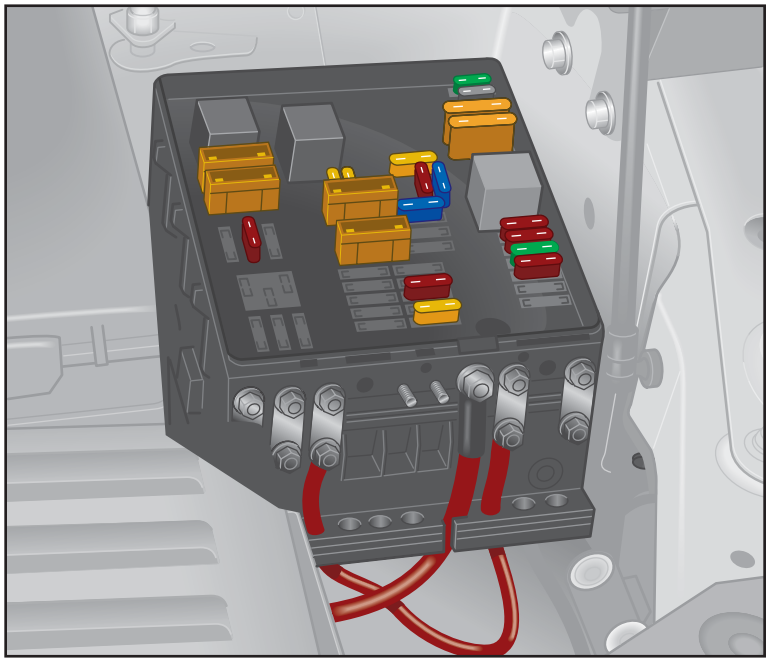
The electric box is located in the engine compartment on the driver side.

Description

All fuses and relays that protect or control the electrical components in the engine compartment are in the electric box.

This eliminates cable and wire routing into the interior and back.

Fuses are located close to the electrical devices that they protect. This makes troubleshooting easier because fuses that protect multiple devices are minimized.



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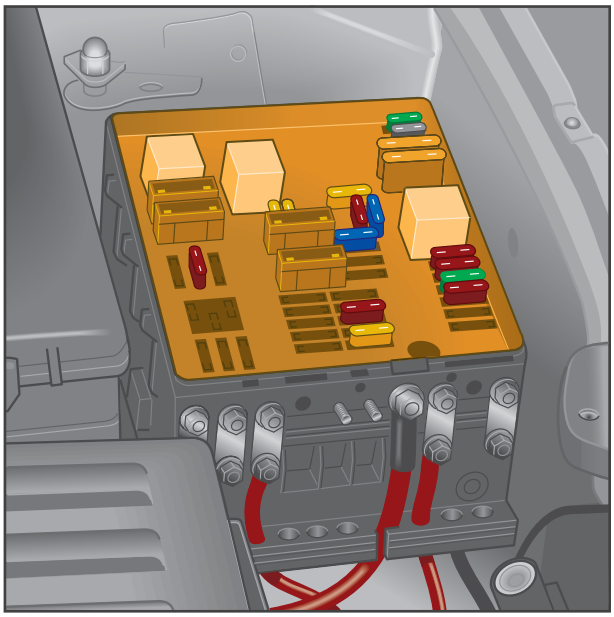
Please reference the current service repair information for fuse and relay locations.

Electric Box (SB)

In addition to the fuses for the components in the engine compartment, the electric box contains the following relay:

- Power Supply Relay (terminal 30, B+) J317



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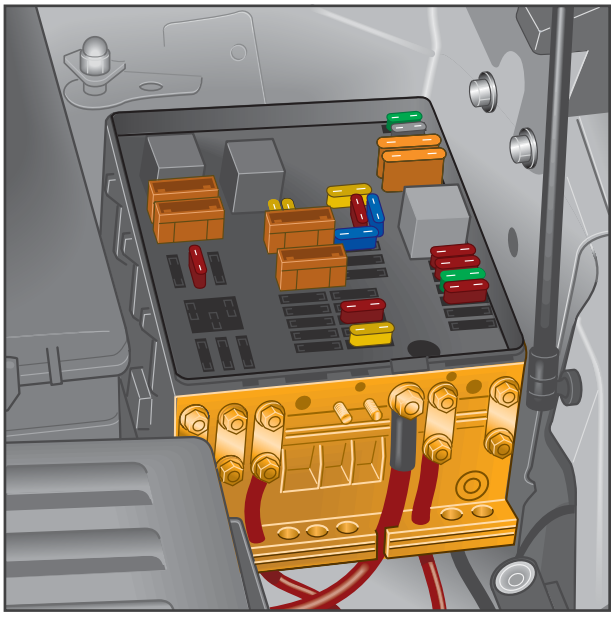
Backup Fuse Box (SA)

The backup fuse box contains the fuses for:

- Alternator
- Electro-Mechanical power assisted steering
- Radiator fan
- Control module for ABS



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Relay Holder and Fuse Boxes

Location

The relay holder and the Vehicle Electrical System Control Module J519 are located under the left side of the instrument panel.

Vehicle Electrical System Control Module J519

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Relay Holder

An additional relay holder is located on the Vehicle Electrical System Control Module J519.

The number of relays in the relay holder depends on the vehicle model and equipment options.

Vehicles with seat heating have the thermal fuses for the heating elements located in the relay holder.

Relay Holder

S340_008

Driver Side Fuse Box (SC)

A fuse box is located behind the cover on the driver side of the instrument panel.

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Passenger Side Fuse Box (SD)

A fuse box is also located behind the cover on the passenger side of the instrument panel.

S340_014

Please reference the current service repair information for fuse and relay locations.

Communication Network

Networked Control Modules

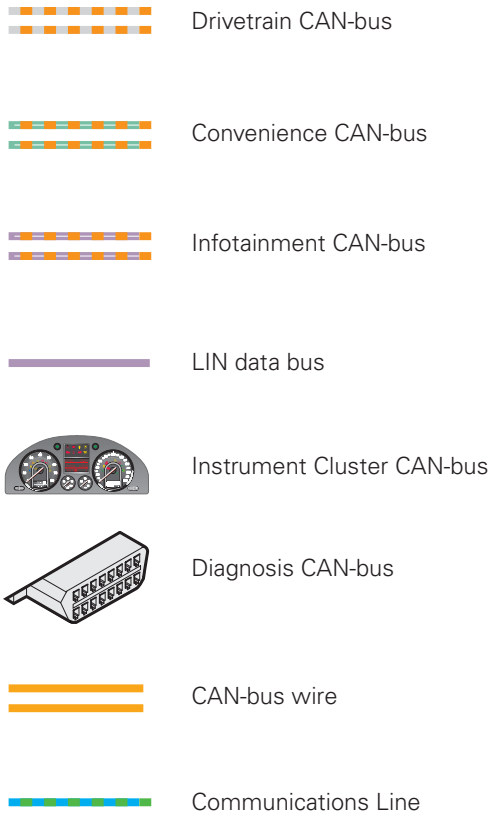
To allow communication between the control modules, they are connected by several data bus systems.

The Data Bus On Board Diagnostic Interface J533 (Gateway) allows communication between the following data buses:

- CAN-bus Drivetrain
- CAN-bus Comfort
- CAN-bus Infotainment
- CAN-bus Instrument Cluster
- CAN-bus Diagnosis

The following data bus systems are sub-sets of the main CAN-bus system:

- LIN data bus
- CAN-bus for electric parking brake
- CAN-bus for sensors
- CAN-bus for Adaptive Front Lighting System (AFS)
- Serial data bus



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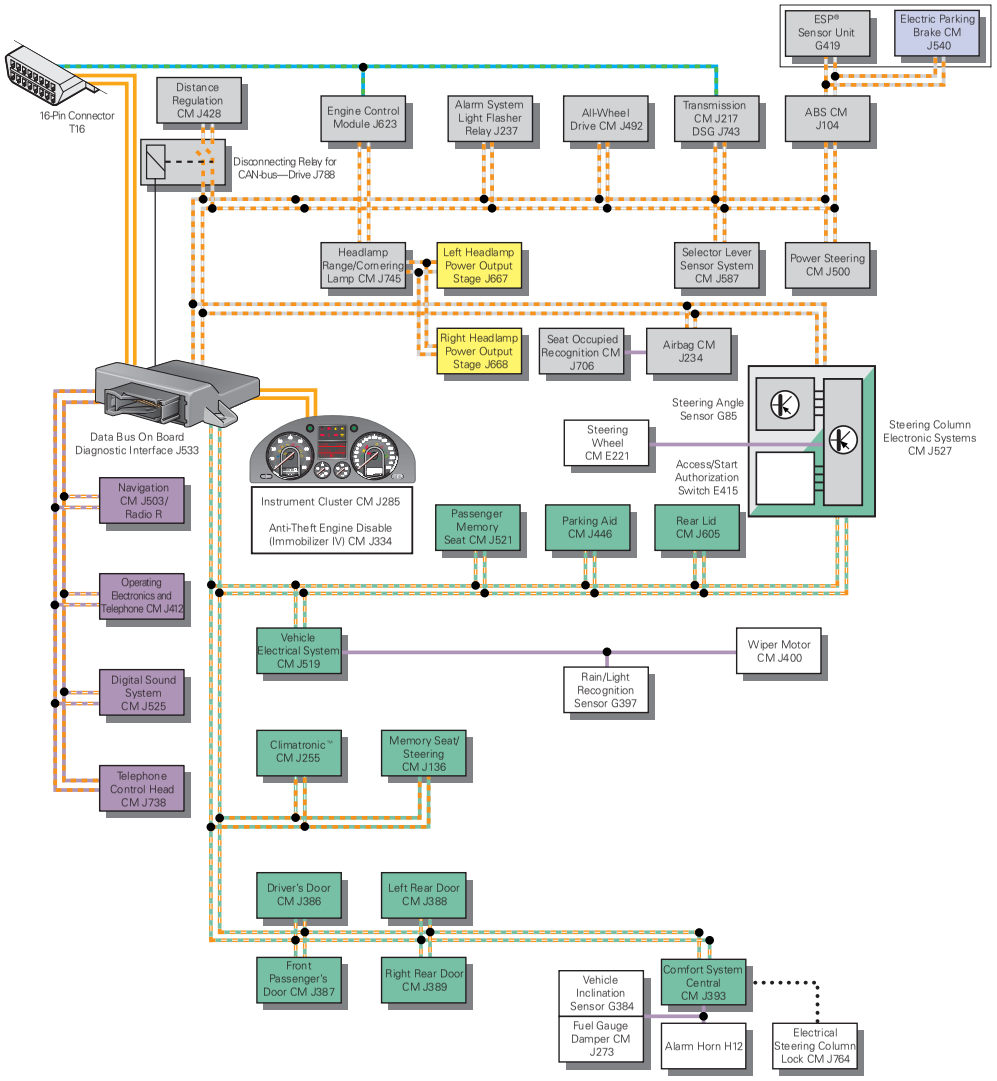

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E221 Control Module in Steering Wheel
E415 Access/Start Authorization Switch
G85 Steering Angle Sensor
G384 Vehicle Inclination Sensor
G397 Rain/Light Recognition Sensor
G419 ESP® Sensor Unit
H12 Alarm Horn
J104 ABS Control Module
J136 Memory Seat/Steering Column Adjustment Control Module
J217 Transmission Control Module
J234 Airbag Control Module
J237 Alarm System Light Flasher Relay
J255 Climatronic™ Control Module
J273 Fuel Gauge Damper Control Module
J285 Instrument Cluster Control Module
J334 Anti-Theft Immobilizer Control Module
J386 Driver's Door Control Module
J387 Front Passenger's Door Control Module
J388 Left Rear Door Control Module
J389 Right Rear Door Control Module
J393 Comfort System Central Control Module
J400 Wiper Motor Control Module
J412 Operating Electronics and Telephone Control Module
J428 Distance Regulation Control Module
J446 Parking Aid Control Module
J492 All-Wheel Drive Control Module
J500 Power Steering Control Module
J503 Radio/Navigation Display Control Module
J519 Vehicle Electrical System Control Module
J521 Passenger Memory Seat Control Module
J525 Digital Sound System Control Module
J527 Steering Column Electronic Systems Control Module
J533 Data Bus On Board Diagnostic Interface
J540 Electric Parking Brake Control Module
J587 Selector Lever Sensor System Control Module
J605 Rear Lid Control Module
J623 Engine Control Module (ECM)
J667 Left Headlamp Power Output Stage
J668 Right Headlamp Power Output Stage
J706 Seat Occupied Recognition Control Module
J738 Telephone Control Head Control Module
J743 Direct Shift Gearbox (DSG) Mechatronic
J745 Headlamp Range/Cornering Lamp Control Module
J764 Electrical Steering Column Lock Control Module
J788 Disconnecting Relay for CAN-bus—Drive
R Radio
T16 16-Pin Connector

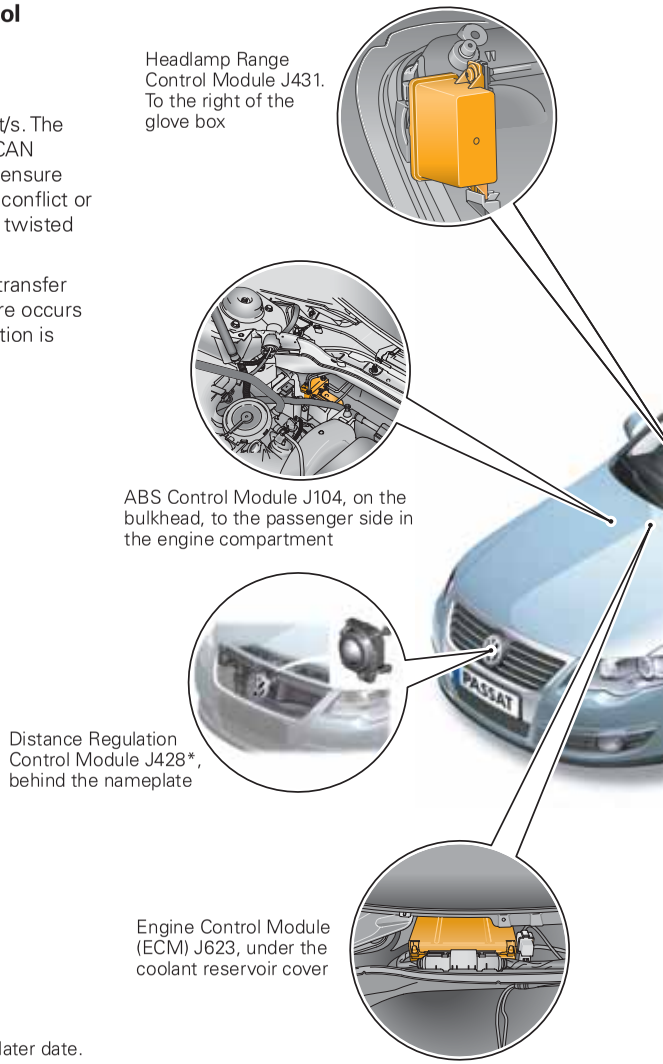
Data Bus System

Drivetrain CAN-Bus Control Modules

Control Module Locations

The data transfer rate is 500 kbit/s. The data is transferred through the CAN high wire and CAN low wire. To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

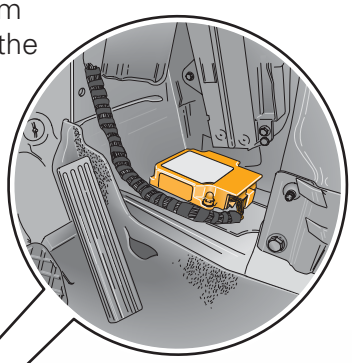
The Drivetrain CAN-bus cannot transfer data over a single wire. If a failure occurs with either wire, no communication is possible.



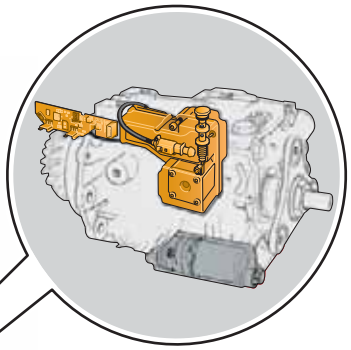
* This feature will be available at a later date.

Data Bus System

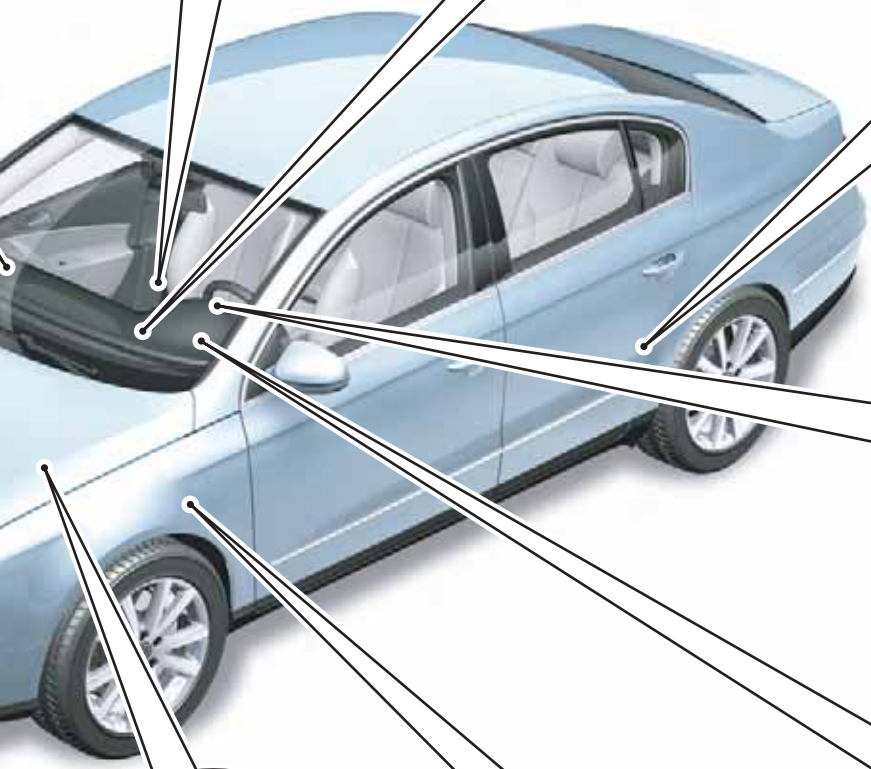
Selector Lever Sensor System Control Module J587, under the front of the center console

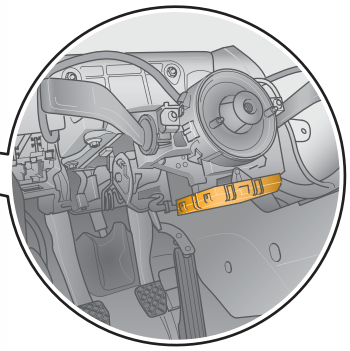


Airbag Control Module J234, under the front of the center console

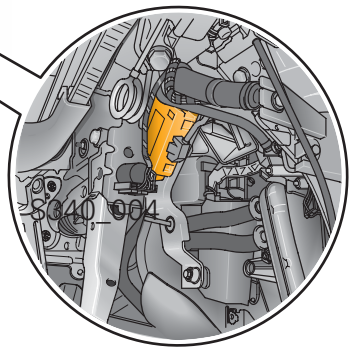


All-Wheel Drive Control Module J492*, on the Haldex® clutch, in front of the rear axle

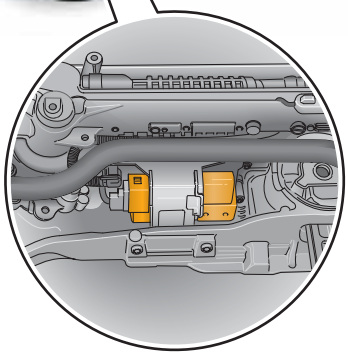




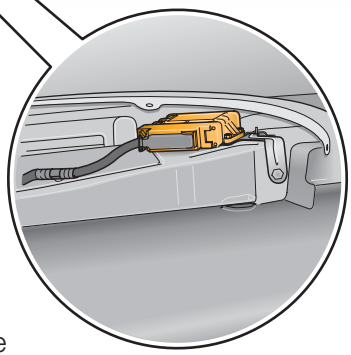
Steering Column Electronic Systems Control Module J527, under the steering column switch



Data Bus On Board Diagnostic Interface J533, under the lower left of the instrument panel



Power Steering Control Module J500, on the steering gear close to the bulkhead



Transmission Control Module J217, in the left front wheel well

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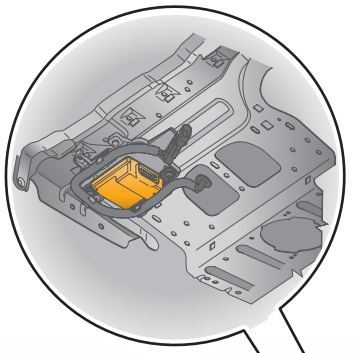
Data Bus System

Comfort CAN-Bus Control Modules

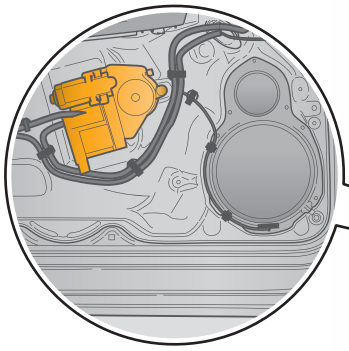
Control Module Locations

The data transfer rate is 100 kbit/s. The data is transferred through the CAN high wire and the CAN low wire. To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

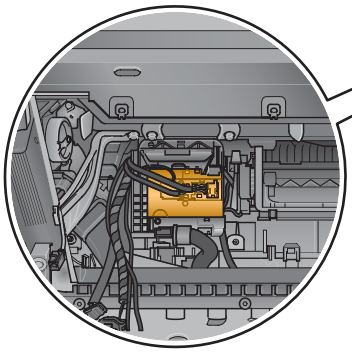
The comfort CAN-bus cannot transfer data over a single wire. If a failure occurs with either wire, no communication is possible.



Passenger Memory Seat Control Module J521, under the front passenger seat

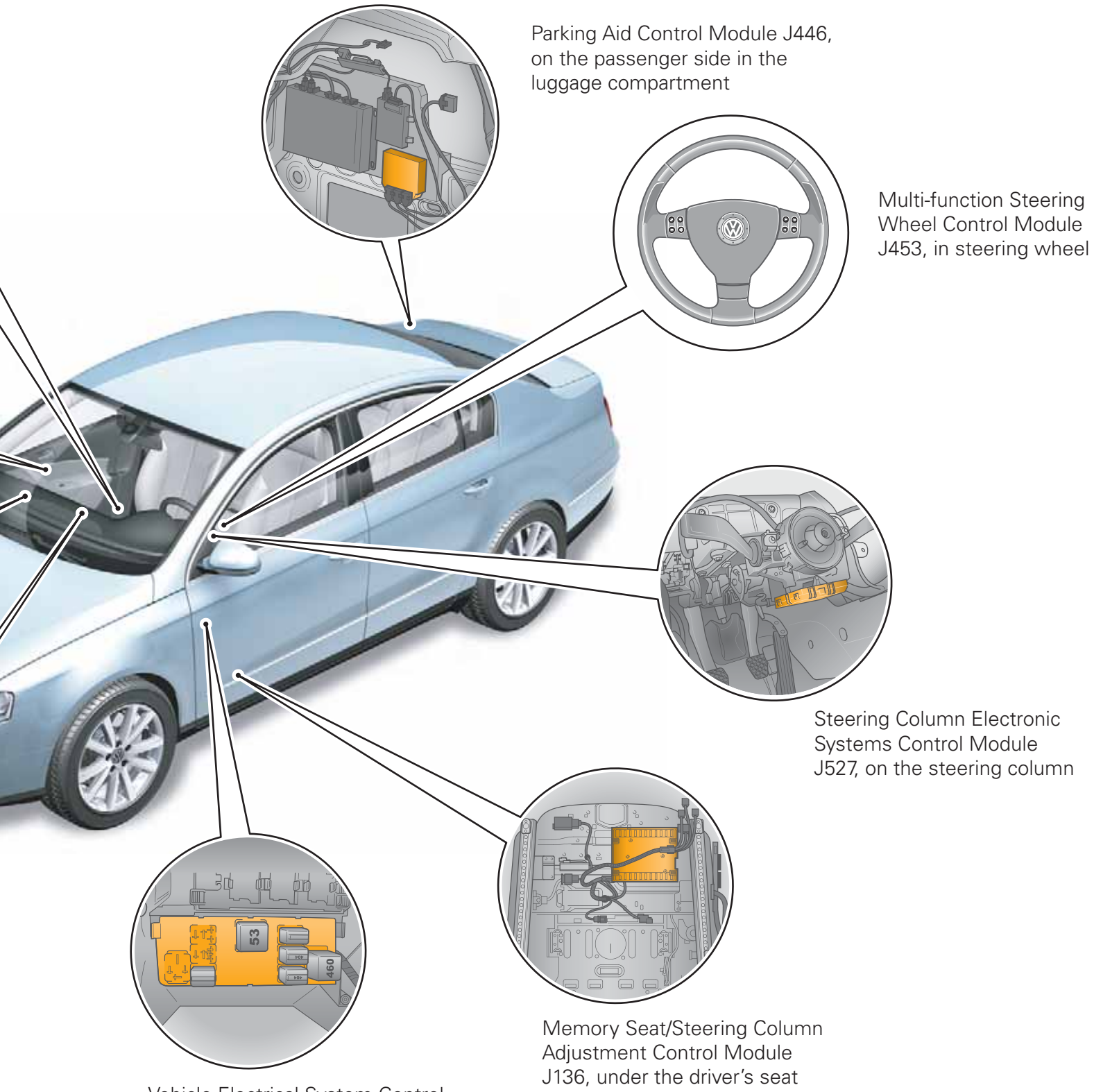


Control modules in the doors J386–J389



Comfort System Central Control Module J393, under the right side of the instrument panel

Climatronic Control Module J255, in the center of the instrument panel



Parking Aid Control Module J446, on the passenger side in the luggage compartment

Multi-function Steering Wheel Control Module J453, in steering wheel

Steering Column Electronic Systems Control Module J527, on the steering column

Memory Seat/Steering Column Adjustment Control Module J136, under the driver's seat

Vehicle Electrical System Control Module J519, on the relay holder under the instrument panel

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Data Bus System

Infotainment, Instrument Cluster and Diagnosis CAN-Bus Control Modules

Infotainment CAN-Bus

The data transfer rate is 100 kbit/s. The data is transferred through the CAN-bus high wire and the CAN-bus low wire. To ensure reliable communication without conflict or interference, the CAN-bus wires are twisted together.

Instrument Cluster CAN-Bus

The transfer rate for this CAN-bus is 500 kbit/s. Information is exchanged between the Instrument Cluster Control Module J285 and the Data Bus On Board Diagnostic Interface J533 via the instrument cluster CAN-bus. These are the only control modules in this data bus system.

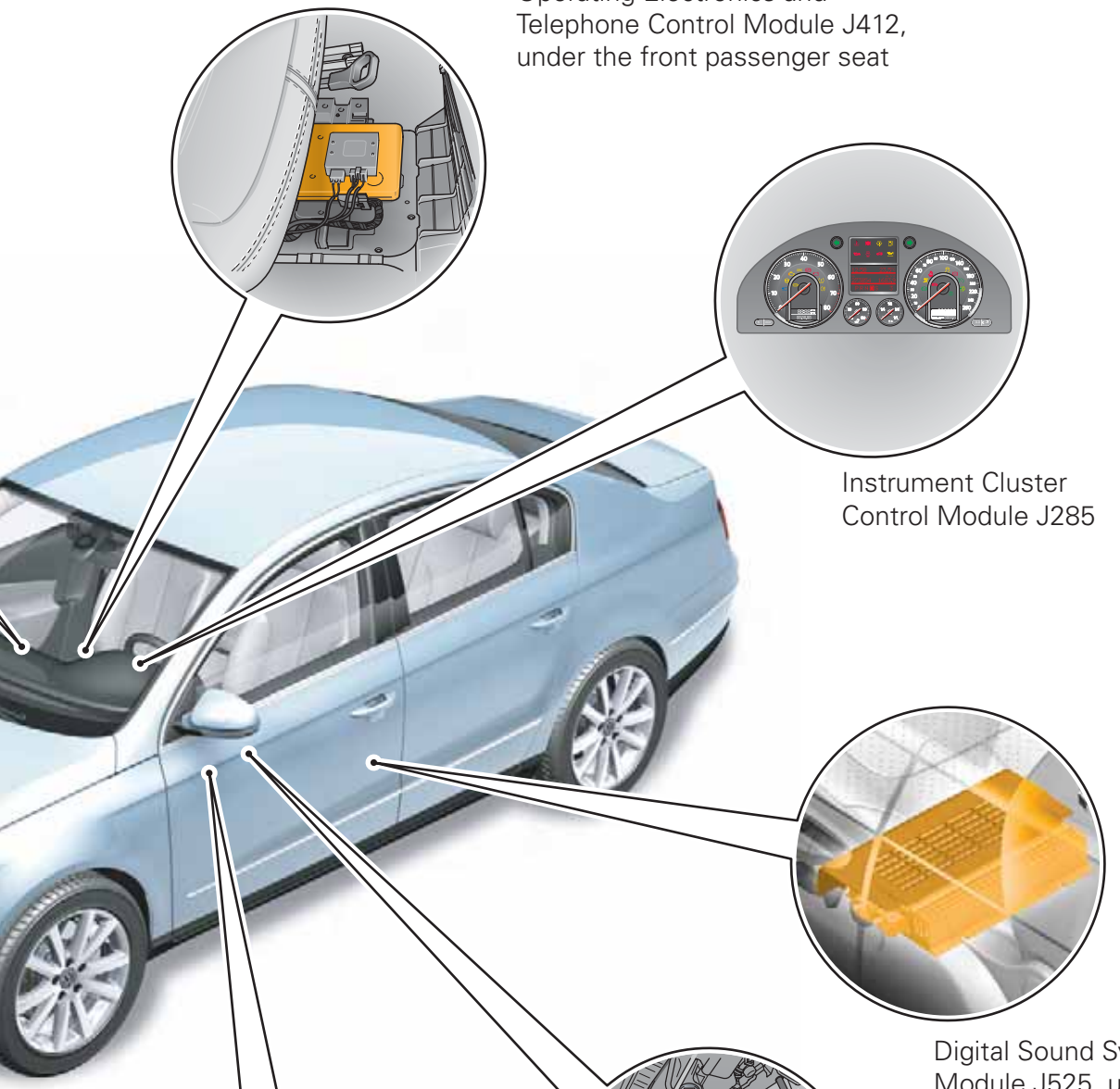
Diagnosis CAN-Bus

The transfer rate for this CAN-bus is 500 kbit/s. The transfer of data between the VAS 5051/5052 scan tool and Data Bus On Board Diagnostic Interface J533 is through the diagnosis CAN-bus.

These CAN-buses cannot transfer data over a single wire. If a failure occurs with either wire, no communication is possible.

Radio/Navigation Display Control Module J503, in the center of the instrument panel

CD changer R41, in glove compartment



Operating Electronics and Telephone Control Module J412, under the front passenger seat

Instrument Cluster Control Module J285

Digital Sound System Control Module J525, under the driver's seat

Data Bus On Board Diagnostic Interface J533, in the driver side footwell, close to the pedals

16-Pin Connector T16, under the driver side of the instrument panel

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Data Bus System

Sub-Bus Systems

LIN Bus

The Local Interconnect Networks (LINs) are sub-networks of the 2006 Passat's electrical system.

LIN bus systems communicate over a single wire which allows bi-directional communication between the master control module and its slave control modules.

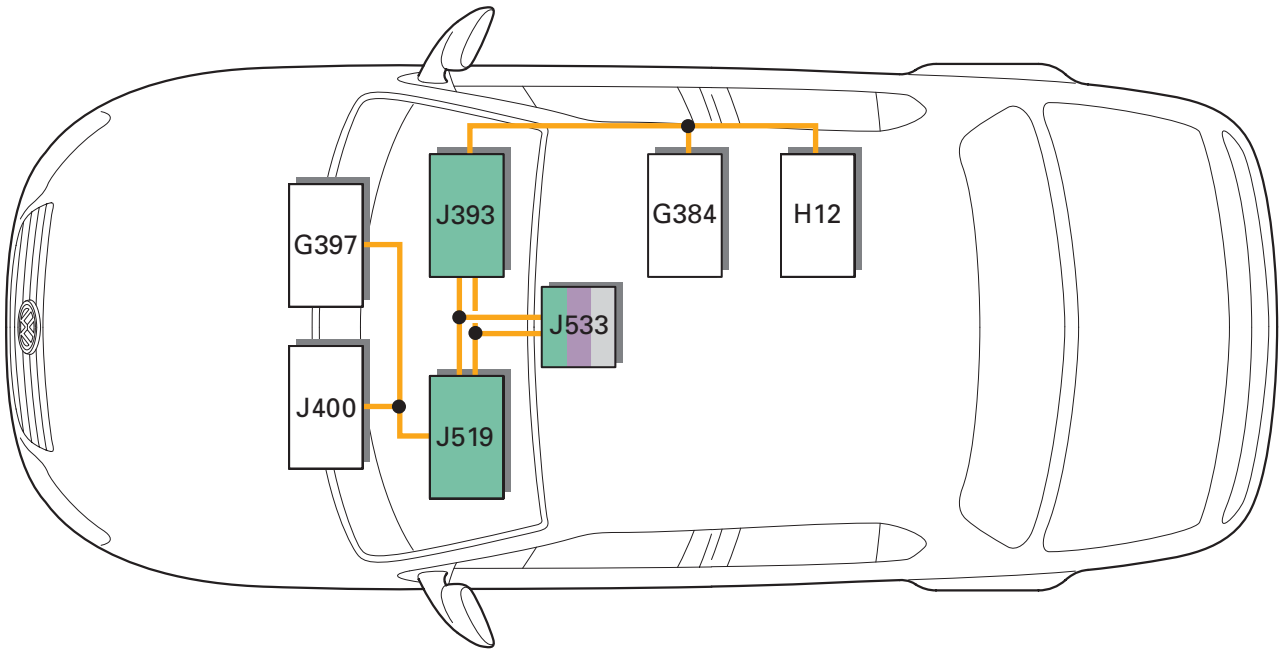
Any coding or basic settings of slave control modules must be done through the master. This is the only way to access the slave control modules via the VAS 5051/5052.

The LIN master control module can be one of several in use on the 2006 Passat (J519, J527, and J393). These master control modules interface through the CAN-bus, communicating with and sometimes controlling up to 16 slave control modules through a single wire LIN bus.

Slave control modules supply information to or act on commands from the LIN master control module.

All OBD functions of the slave modules (coding, adaptation, Measuring Value Blocks, and output tests) are also carried out through the master control module.

LIN Bus System



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Key

G384 Vehicle Inclination Sensor
G397 Rain/Light Recognition Sensor
H12 Alarm Horn
J393 Comfort System Central Control Module
J400 Wiper Motor Control Module
J519 Vehicle Electrical System Control Module
J533 Data Bus On Board Diagnostic Interface

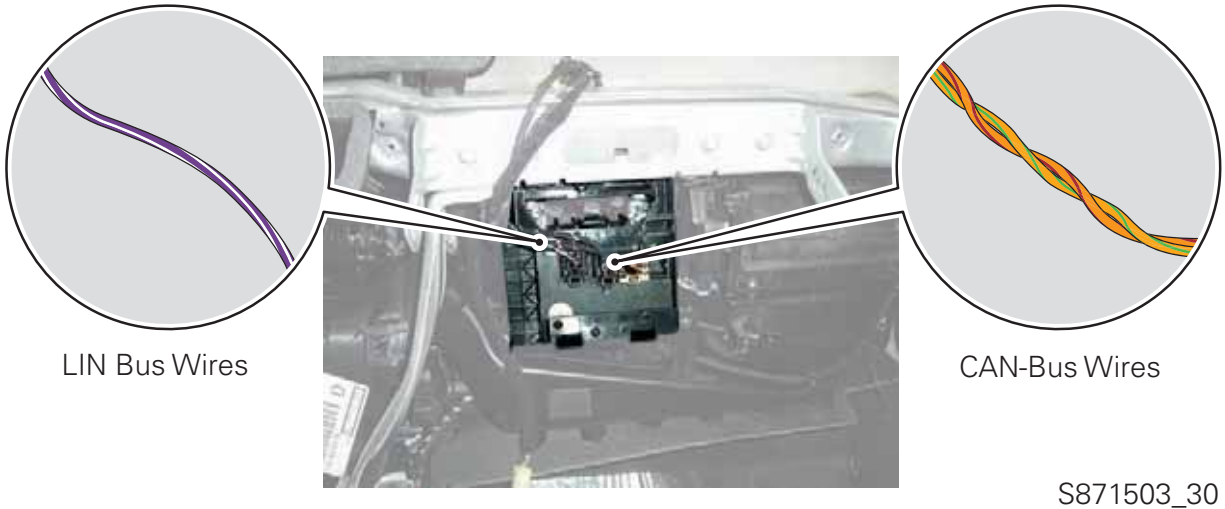
Windshield Wiper Example

Rain/Light Recognition Sensor G397 senses moisture on the windshield. G397 relays this information through the LIN to Vehicle Electrical System Control Module J519, which sends a command to Wiper Motor Control Module J400 to activate the windshield wipers through the same LIN.

J400 then sends a signal back to J519 that the wipers are ON and at which speed (interval rate). G397 then sends a signal that the windshield is dry to J519, which sends a signal to J400 to stop wiping.

J400 sends a signal back to inform J519 that the wipers are now in park position and are awaiting further commands.

Comfort System Central Control Module J393, which often is used as a LIN Bus Master Control Module



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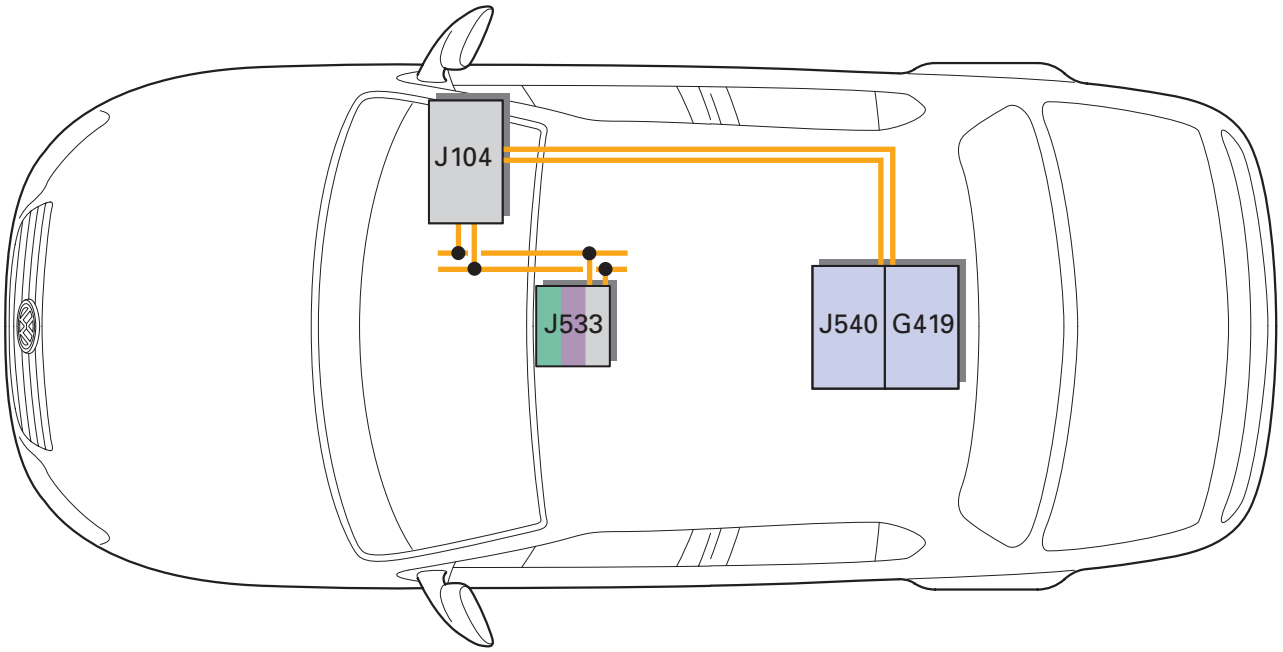
Electric Parking Brake CAN-Bus Systems

The data transfer rate is 500 kbit/s. The transfer occurs on the CAN high wire and the CAN low wire. To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

The Electric Parking Brake CAN-bus cannot transfer data over a single wire. If a failure occurs with either wire, no communication is possible.

Electric Parking Brake CAN-Bus System



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Key

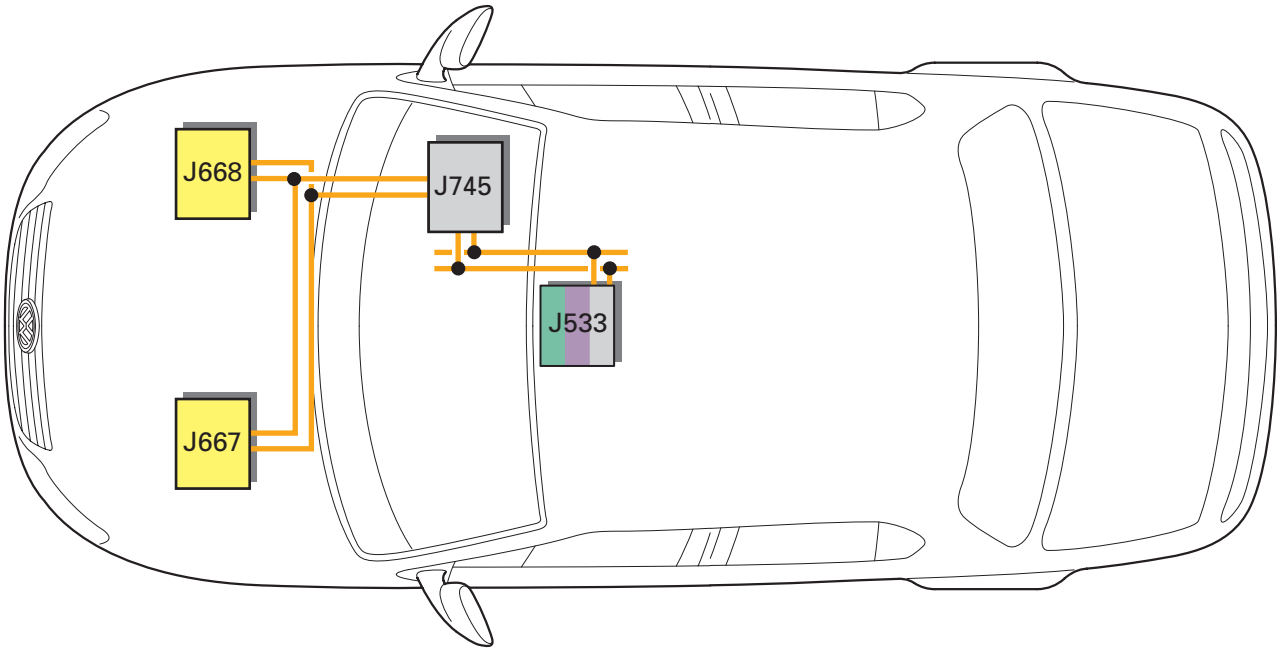
J104 ABS Control Module
J533 Data Bus On Board Diagnostic Interface
J540 Electric Parking Brake Control Module
G419 ESP Sensor Unit

Adaptive Front Lighting System CAN-Bus

The data transfer rate is 500 kbits/s. The transfer occurs on the CAN high wire and the CAN low wire. To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

The Adaptive Front Lighting System CAN-bus cannot transfer data over a single wire. If a failure occurs with either wire, no communication is possible.

Adaptive Front Lighting System CAN-Bus



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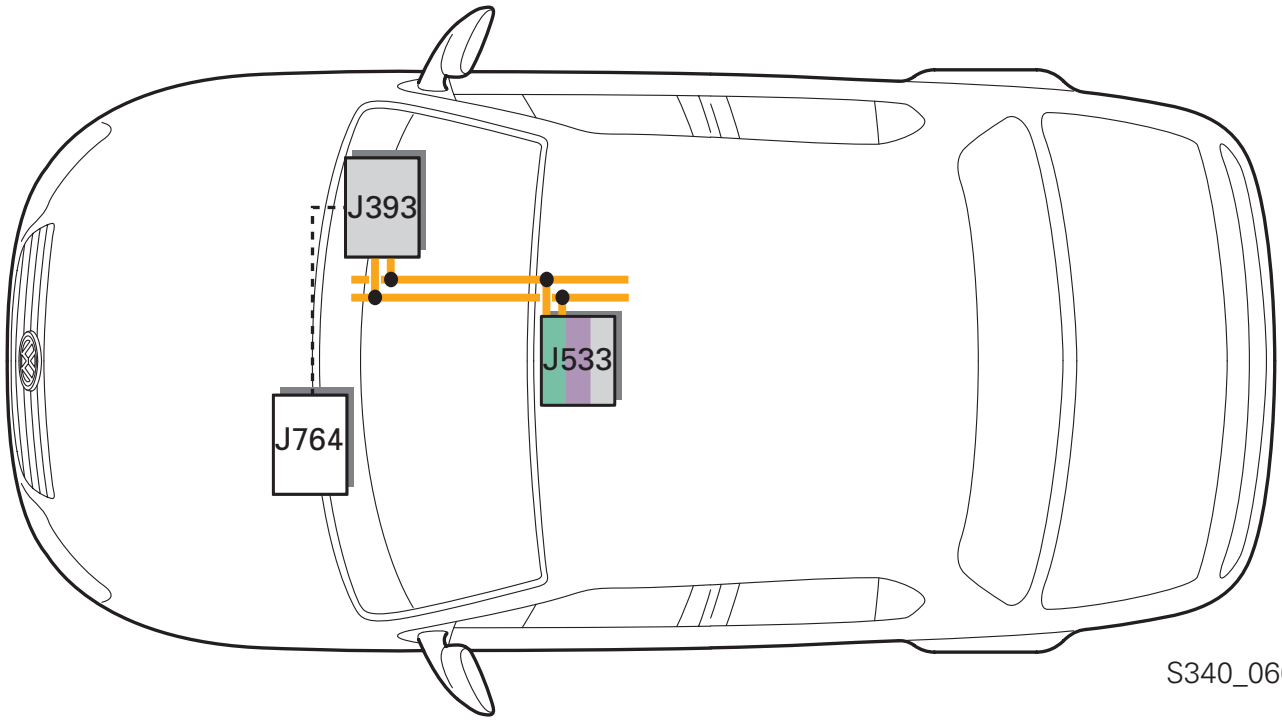
Key

J533 Data Bus On Board Diagnostic Interface
J667 Left Headlamp Power Output Stage
J668 Right Headlamp Power Output Stage
J745 Headlamp Range/Cornering Lamp Control Module

Data Bus System

Serial Data Bus

The serial data bus transfers data through a single wire between the Electronic Steering Column Lock Control Module J764 and the Comfort System Central Control Module J393. The serial data bus system improves the theft protection over the use of the LIN data bus system.



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Key

J533 Data Bus On Board Diagnostic Interface
J393 Comfort System Central Control Module
J764 Electronic Steering Column Lock Control Module

Vehicle Electrical System Control Module J519

Location

The Vehicle Electrical System Control Module J519 is located under the left side of the instrument panel and forms a single module with the relay holder.

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Versions

The Passat's Vehicle Electrical System Control Module J519 is available in two versions.

- **High Version**
  With fog lamps or Bi-Xenon headlights and personalization.
- **Medium Version**
  All other models

Electrical System

Features

The Vehicle Electrical System Control Module J519 controls the following:

- **Exterior light control** and bulb monitoring
  A bulb failure is indicated by a corresponding indicator light or as a text message in the instrument panel display
- **Comfort lighting** with
  Coming Home
  After the vehicle doors are closed, the vehicle is illuminated by its lights

  Leaving Home
  The vehicle is illuminated by its lights. For a period of time when the remote control is used to unlock the vehicle

  Dimmable instrument lighting

  Backlighting
- **Interior lighting control**
  Terminal 30G, which supplies voltage to the interior lights, is switched on by the vehicle electrical system control module
- **Fuel pump power**
  When the driver side door is opened, the Vehicle Electrical System Control Module J519 supplies voltage to the fuel pump

  After the engine is started, the engine control module supplies this voltage
- **Windshield wiper**
  The Vehicle Electrical System Control Module J519 sends CAN-bus signals to the Wiper Motor Control Module J400
- **Windshield and rear window washer pump**
- **Turn signal control**
- **Electrical load management**
  Shutdown under 11.8 V
- **Exterior light control**
- **Rear window defroster**
- **Windshield defroster**
- **Terminal control**
  The vehicle electrical system control module terminal 75x via the relief relay for X-contact. Terminal 15 is controlled via the relay for voltage supply terminal 15 in the electric box. Terminal 50 is controlled via the relay for voltage supply terminal 50 in the electric box

Exterior Lighting

Headlights

The shape of the 2006 Passat's headlight is different than the traditional round design. The "Big eye" look is formed by tubes around the low beam lights.

A large angular high beam reflector improves high beam performance over the previous Passat design.

H7 Headlights

The standard headlights are halogen. H7 lamps are used in both the low beam and in the high beam.

Voltage stabilization by the electrical control module increases the life of the H7 lamps.

Xenon Headlights

Bi-Xenon headlights are an option on the 2006 Passat.

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S340_016

Warning!

High Voltage–The physical and mechanical properties of HID (Xenon) bulbs are very sensitive. Internal pressure of HID glass bulb may exceed 1,450 psi (100 bar) (in operation). Bulb temperature may exceed 1,292°F (700°C).

Danger of explosion and burning–The control modules for HID lamps must never be operated (headlights turned on) without an HID lamp.

HID bulbs must only be operated (headlights turned on) when installed in the headlight housing.

Always wear safety glasses and gloves when removing and installing HID bulb.

Never look directly at an operating HID bulb. The UV emissions of an HID bulb are approximately 2.5 times that of a comparable halogen bulb.

Refer to current service information and follow all safety cautions.

Electrical System

Taillights

The Passat's taillights are split lights with round elements.

Taillights in the Side Panel

The rear light unit, integrated in the side panel, consists of LEDs and provides the tail, brake and turn signal light functions.

LED lighting provides faster response times, better signal patterns and more even lighting than incandescent bulbs.

Lights in the Trunk Lid

A rear fog light is located on the left side of the trunk lid and a backup light is located on the right and left side.

Incandescent bulbs are used for these lights.

Supplemental Lighting

A third brake light located above the rear window and turn signals located in the outside rear view mirrors provide other drivers with additional visual information.

LEDs are used for these lights.

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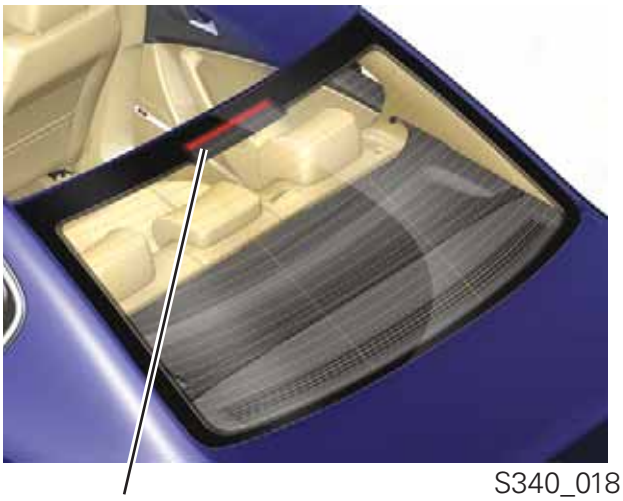

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LEDs cannot be serviced separately. If service is required, replace the entire unit.

Light Switch

The Vehicle Electrical System Control Module J519 controls lighting based on the light switch's position. The light switch provides a signal to the Vehicle Electrical System Control Module J519 that is used to activate the selected lights.

Light Switch without Automatic Headlights

The selected lighting is activated when terminal KI.75 is set to active.

Light Switch with Automatic Headlights

The color of the automatic headlight symbol is **red** when the light switch is not set to the "Automatic Headlight" position.

When the light switch is set to the "Automatic Headlight" position, and the sensor detects night or darkness, the symbol is **green**.

If the sensor detects daylight or brightness, the symbol is **light green**.

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S340_020

For detailed information on the light switch and the indicator lights, please reference the operating instructions in the vehicle owner's manual.

Turn Signal Operation

The 2006 Passat turn signal lights flash in the following modes:

- Hazard warning
- Crash
- Directional
- Comfort
- Central locking system
- Theft warning system

The operating modes are prioritized, so that a higher priority mode can be activated even if a lower mode is already active.

Priority 1	Hazard warning
Priority 2	Crash
Priority 3	Directional and comfort
Priority 4	Theft warning system and central locking system

Hazard Warning

The "Hazard Warning Flasher On" signal is sent from the hazard light switch to the Vehicle Electrical System Control Module J519. This signal is sent regardless of terminal 15 status.

Crash

The crash flasher activates automatically when the airbag control module detects a crash.

Directional

The directional flasher is activated by the Vehicle Electrical System Control Module J519 when it receives a signal from the Steering Column Electronic Systems Control Module J527 or the flasher switch.

Comfort

If the flasher switch is activated for less than one second, three directional flashes occur. If during these flashes, the switch is activated again, in the same direction, for less than one second, three more flashes occur.

This function can be activated through either Multi-Function Indicator (MFI) or by using the VAS Scan Tool.

Theft Warning and Central Locking

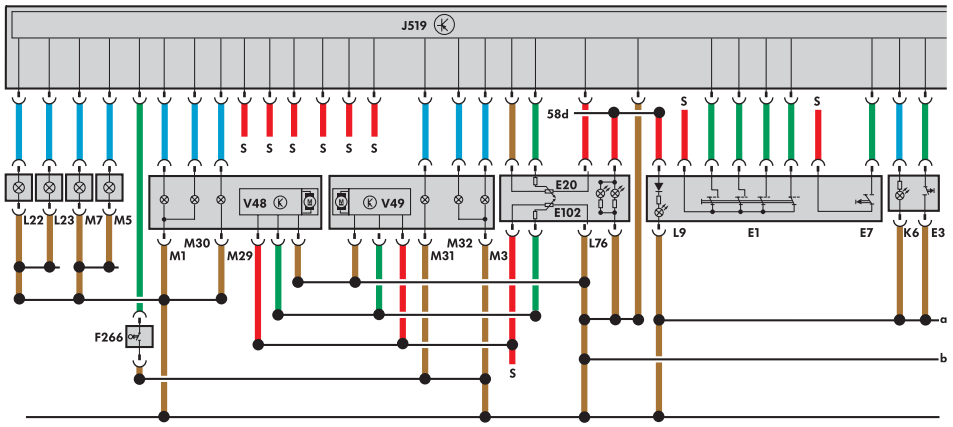
These flash functions are requested of the Vehicle Electrical System Control Module J519 by the Comfort System Central Control Module J393 via the CAN-bus if the corresponding function is activated.

Exterior Lighting Circuit Diagram

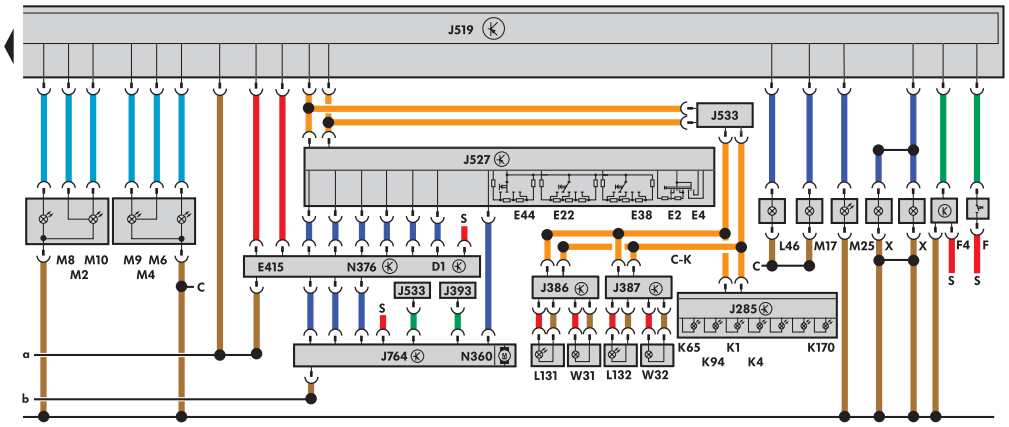
Key

D1	Anti-Theft Immobilizer Reading Module
E1	Light Switch
E2	Turn Signal Switch
E3	Emergency Flasher Switch
E4	Headlamp Dimmer/Flasher Switch
E7	Fog Lamp Switch
E20	Instrument Panel Illumination Dimmer Switch
E22	Windshield Wiper/Washer Switch
E34	Rear Window Wiper Switch
E38	Windshield Wiper Intermittent Regulator
E44	Windshield and Headlamp Washer Pump Switch
E102	Headlamp Adjuster
E415	Access/Start Authorization Switch
F	Brake Light Switch
F4	Back-Up Light Switch
F266	Front Hood Switch
J285	Instrument Cluster Control Module
J362	Anti-Theft Immobilizer Control Module
J386	Driver's Door Control Module
J387	Front Passenger's Door Control Module
J393	Comfort System Central Control Module
J519	Vehicle Electrical System Control Module
J527	Steering Column Electronic Systems Control Module
J533	Data Bus On Board Diagnostic Interface
J764	Electronic Steering Column Lock Control Module
K1	High Beam Indicator Lamp
K4	Parking Light Indicator Lamp
K6	Emergency Flasher Indicator Lamp
K65	Left Turn Signal Indicator Lamp
K94	Right Turn Signal Indicator Lamp
K170	Lamp Failure Indicator Lamp
L9	Headlamp Switch Illumination
L22	Left Front Fog Lamp
L23	Right Front Fog Lamp
L46	Left Rear Fog Lamp
L76	Push Button Illumination
L131	Driver's Exterior Mirror Turn Signal Lamp
L132	Front Passenger's Exterior Mirror Turn Signal Lamp
M1	Left Parking Lamp
M2	Right Taillamp
M3	Right Parking Lamp
M4	Left Taillamp
M5	Left Front Turn Signal Lamp
M6	Left Rear Turn Signal Lamp
M7	Right Front Turn Signal Lamp
M8	Right Rear Turn Signal Lamp
M9	Left Brake Lamp
M10	Right Brake Lamp
M17	Right Back-Up Lamp
M25	High-mount Brake Light
M29	Left Low Beam Headlamp
M30	Left High Beam Headlamp
M31	Right Low Beam Headlamp
M32	Right High Beam Headlamp
N360	Steering Column Lock Actuator
N376	Ignition Switch Key Lock Solenoid
S	Fuse
V48	Left Headlamp Beam Adjustment Motor
V49	Right Headlamp Beam Adjustment Motor
W31	Left Front Entry Light
W32	Right Front Entry Light
X	License Plate Light

Input signal
Output signal
Plus
Ground
Data bus



S340_021

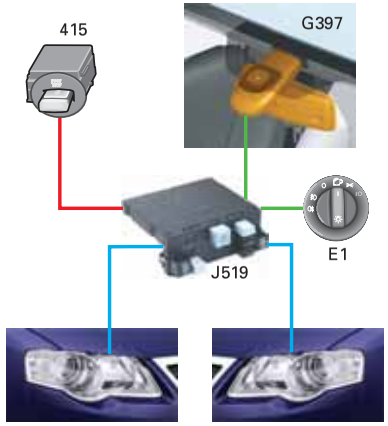


S871503_20

Automatic Headlights

Photoelectric Function

When Light Switch E1 is in the "Automatic Headlight" position, the Rain/Light Recognition Sensor G397 will automatically measure the ambient light conditions. For example, when entering a tunnel or dark area it will automatically switch on the driving lights by sending a signal to the Vehicle Electrical System Control Module J519.



S340_067

Key

E1	Light Switch
E415	Access/Start Authorization Switch
G397	Rain/Light Recognition Sensor
J519	Vehicle Electrical System Control Module
L123	Left Low Beam Lamp
L124	Right Low Beam Lamp
L125	Left High Beam Lamp
L126	Right High Beam Lamp

Rain Function

The rain function switches the driving lights on whenever the front wiper is active for more than 5 seconds and the light switch is in the "Automatic Driving Light Control" position. The driving light switches off when no wiper action occurs for more than 255 seconds.

S340_023

Vehicle Lighting

Emergency Light Operation

If the processor malfunctions, J519 is no longer able to activate the lighting system. A separate circuit activates the following lamps:

- Brake lights
- Parking lights
- Low beam lamps

Additional Light Function

When necessary the brake lights and the rear turn signals operate as follows:

Lights	Operating Mode
Left and right rear brake lights	On as taillight—dimmed to 10%
Left and right rear turn signals	On as taillight—dimmed to 15%

Data Bus On Board Diagnostic Interface J533

Due to the complexity of vehicle functions, large amounts of data must be exchanged. To ensure optimal data exchange, several data bus systems are required.

The Data Bus On Board Diagnostic Interface J533 acts as the interface for the various CAN-bus systems and allow information to be exchanged between the bus systems.

Location

The Data Bus On Board Diagnostic Interface J533 is located under the left side of the dashboard, above the accelerator pedal.

Master Functions

The Data Bus On Board Diagnostic Interface J533 manages the following master functions:

- Terminal 15 continued running for Drivetrain CAN-bus
- Sleep and wake-up modes for the data bus systems

The run-on mode can last between ten seconds and fifteen minutes. The run-on length of time depends on the data being transferred.

The run-on period ends when J533 sends the sleep command.

S340_028

Transport Mode

During transport to dealerships, power consumption is reduced to protect the battery.

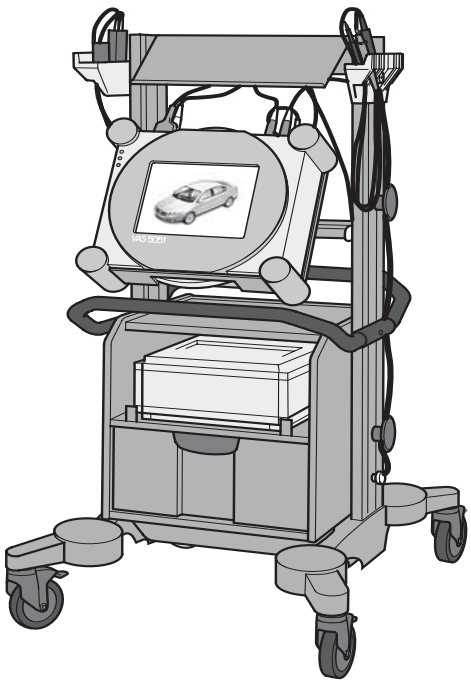
Activating the transport mode isolates the following systems and components:

- Central locking system
- Power windows
- Radio
- Multi-function steering wheel
- Remote control
- Tilt sensor
- Safe-LED in the door
- Interior light delay
- Seat memory
- Air conditioning

The transport mode is switched ON and OFF with the VAS 5051 Scan Tool.

An active transport indication shows in the display of the instrument cluster when transport mode is active.

The transport mode is only available during the vehicle's first 93 miles (150 km).
After reaching this mileage, the J533 automatically switches transport mode OFF. Transport mode cannot be turned ON again after 93 miles (150 km) is reached.



S871503_09

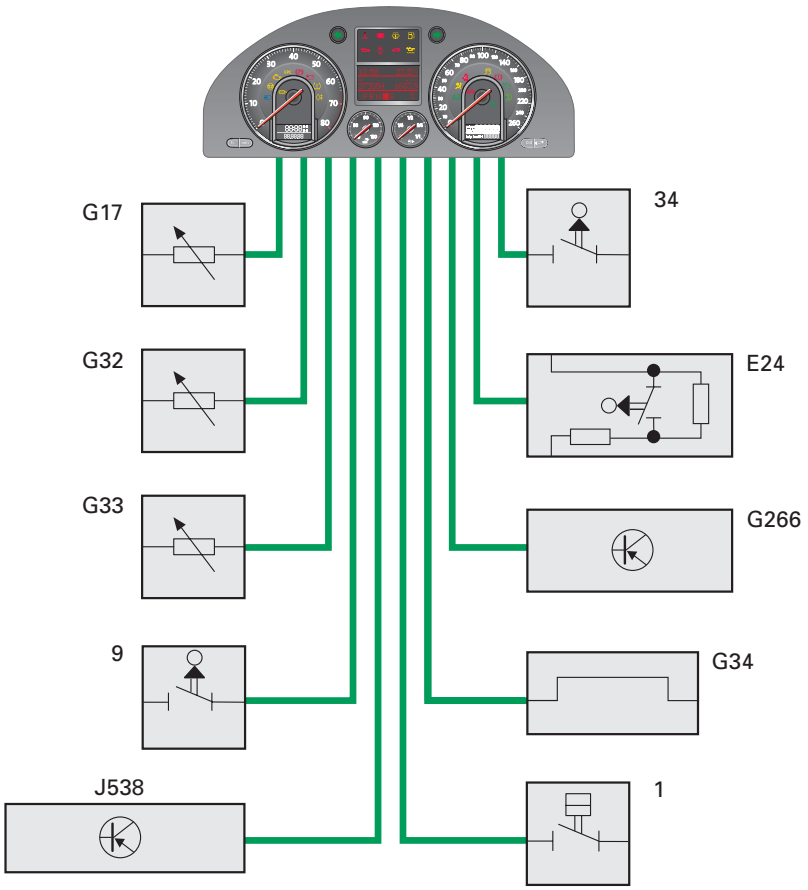
Instrument Cluster Control Module J285

Function

The Instrument Cluster Control Module J285 receives information for the display module and the indicator lights from the various control modules through the Data Bus On Board Diagnostic Interface J533 and through the CAN-bus for the instrument cluster.

Additional sensor signals are sent to Instrument Cluster Control Module J285 through separate wires. The following sensors send separate signals:

- F1 Oil Pressure Switch
- F9 Parking Brake Warning Light Switch
- F34 Brake Fluid Level Warning Switch
- G17 Outside Air Temperature Sensor
- G32 Engine Coolant Level (ECL) Sensor
- G33 Windshield Washer Fluid Level Sensor
- G34 Left Front Brake Pad Wear Sensor
- G266 Oil Level Thermal Sensor
- J538 Fuel Pump (FP) Control Module



S340_030

Display Unit Versions

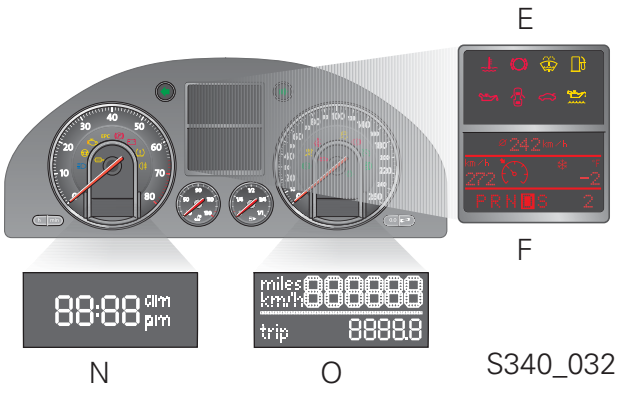
There are two versions of the Display Unit in Instrument Cluster Y24.

All versions have:

- Tachometer (A) G5
- Speedometer (B) G21
- Engine Coolant Temperature (ECT) Gauge (C) G3
- Fuel Gauge (D) G1

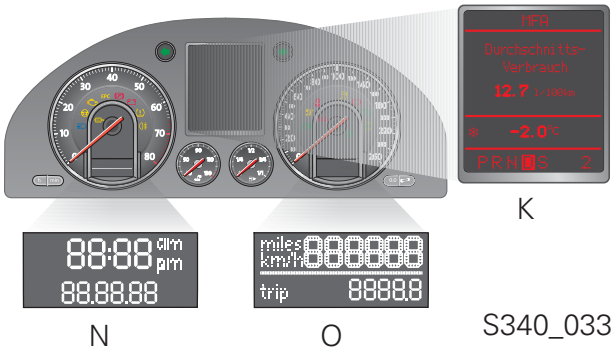
Midline Version

The midline version of Y24 consists of eight LED indicator lights (E), one mini-dot display (F), one LCD in the speedometer (O) and one LCD in the tachometer (N).



Highline Version

The highline version of Y24 consists of one dot-matrix display (K), one LCD in the speedometer (O) and one LCD in the tachometer (N).



Warning Lights in the Instrument Cluster

Symbol	Warning Light	Midline	Highline	Warning Message or Description
	Airbag	X	X	Airbag fault Airbag belt pretensioner deactivated
	Antilock Braking System (ABS)	X	X	ABS
	Brake pad wear indicator	X	Pictogram	Check brake pad
	Low brake fluid	X	X	Stop! brake fluid Operator's manual
	Preheating (diesel engines)	X	X	Engine malfunction–bring in for service Exhaust gas–bring in for service
EPC	Electronic Power Control (exhaust gas)	X	X	Engine malfunction–bring in for service Exhaust gas–bring in for service
	Oil pressure warning	Flashing	Flashing Pictogram	Stop–no oil pressure, turn engine OFF See operator's manual 3x audible warning
	Electric steering Electronic steering lock	X	X	Illuminates in yellow and red Lock steering Move steering Steering lock! Bring in for service
	Electronic brake power distribution	X	X	3x audible warning
	Parking brake system/ electric parking brake	X	X	Press brake pedal!
	Electric parking brake Warning light	X	X	Parking brake error! See operator's manual
	ESP TCS	X	X	ESP/TCS inactive–solid ESP/TCS event–flashing
	Left turn signal	X	X	Audible warning
	Right turn signal	X	X	Audible warning
	High beam headlights	X	X	
	Cruise control system CCS	X	X	

Symbol	Warning Light	Midline	Highline	Warning Message or Description
	Bulb failure	X	X	Constantly on: Bulb failure Flashing: Headlamp leveling or AFS defective
	Trunk lid open	X	Pictogram	Trunk lid open 1x audible warning at speed greater than 3.7 mph (6 km/hr)
	Door open	X	Pictogram	Door open! Warning buzzer, 1 time at speed greater than 3.7 mph (6 km/hr)
	Low fuel level	X	Pictogram	Please refuel 1x audible warning
	Coolant level low/coolant temperature high	X	Pictogram	Stop! Check coolant level, See operator's manual 3x audible warning
	Alternator low voltage output	X	X	
	Engine check On Board Diagnostics (OBD)	X	X	Engine malfunction–bring in for service Exhaust gas–bring in for service
	Hood open	X	Pictogram	Door warning! Hood! Warning buzzer 1 time if speed greater than 3.7 mph (6 km/hr)
	Oil level low	X	X	Check oil level Oil sensor–bring in for service
	Tire pressure monitoring	X	Pictogram	1x audible warning
	Shift lock	X	X	
	Seat belt	X	X	Please fasten seat belt Chime
	Daytime running light	X	X	
	Fuel cap off or missing	X	X	
	Washer fluid low	X	X	Fill with washer fluid 1x audible warning

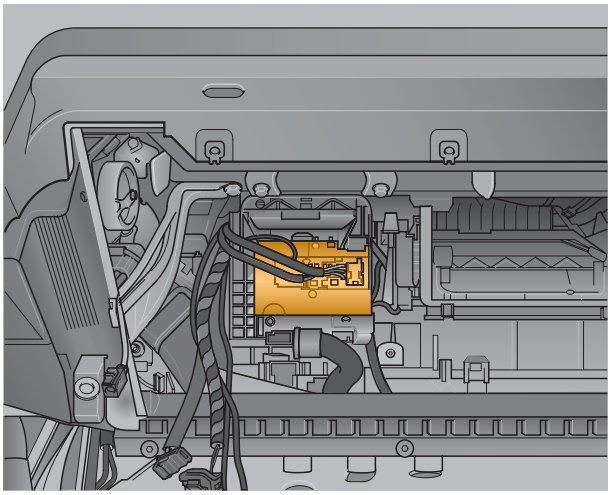
Comfort System Central Control Module J393

Location

The Comfort System Central Control Module J393 is located beneath the instrument cluster, on the passenger side behind the glove compartment.

The Comfort System Central Control Module J393 performs the following functions:

- Control of the central locking system
- Activation of the rear door control devices
- Activation of the fuel cap release
- Activation of the trunk lid release
- Activation of the theft warning system through the LIN bus
- Activation of the tire pressure monitoring
- Activation of the immobilizer system
- Activation of the access/start authorization system



S340_034

On the 2006 Passat, Comfort System Central Control Module J393 combines the functions of tire pressure monitoring, the Anti-Theft Immobilizer Control Module J362 and the Access/Start Control Module J518.

The Comfort System Central Control Module J393 is also the master control module of the LIN data bus for the theft warning system. The theft warning system includes the Alarm Horn H12 and the Vehicle Inclination Sensor G384.

Central Locking System

The Comfort System Central Control Module J393 controls all central locking system functions. The central locking system includes the doors, the trunk lid and fuel cap door.

The central locking system can be set to function in two modes. Please refer to the table below.

Unlocked	The doors can be opened from both the inside and the outside.
Locked	The doors can be opened only from the inside using the door handle one time.

Locking Positions

The central locking system can be operated by the emergency switch located in the driver side door, the individual interior locking buttons and the remote control on the vehicle key.

The individual door control modules activate the motors for the central locking system in the driver side and the passenger side doors; the Comfort System Central Control Module J393 activates the rear doors, the trunk lid and the fuel tank door.

Central Locking System Operation

If the vehicle is locked using the interior locking buttons, the LED in the button will light. The doors can be opened from the inside by operating the door handle one time.

If single door opening is activated and the key is used for opening, only the driver side door will unlock. If the key is turned a second time, still only the driver side door will unlock.

If the OPEN or LOCK button on the remote control is pressed 200 times while outside of its reception area, the remote control function will be suspended. To unlock, the OPEN button on the remote control must be pressed while the vehicle key is used to unlock the vehicle (within one minute).

Vehicle Immobilizer IV

What is Included in Vehicle Immobilizer IV?

Vehicle Immobilizer IV is not a single control module but instead is a function. It includes:

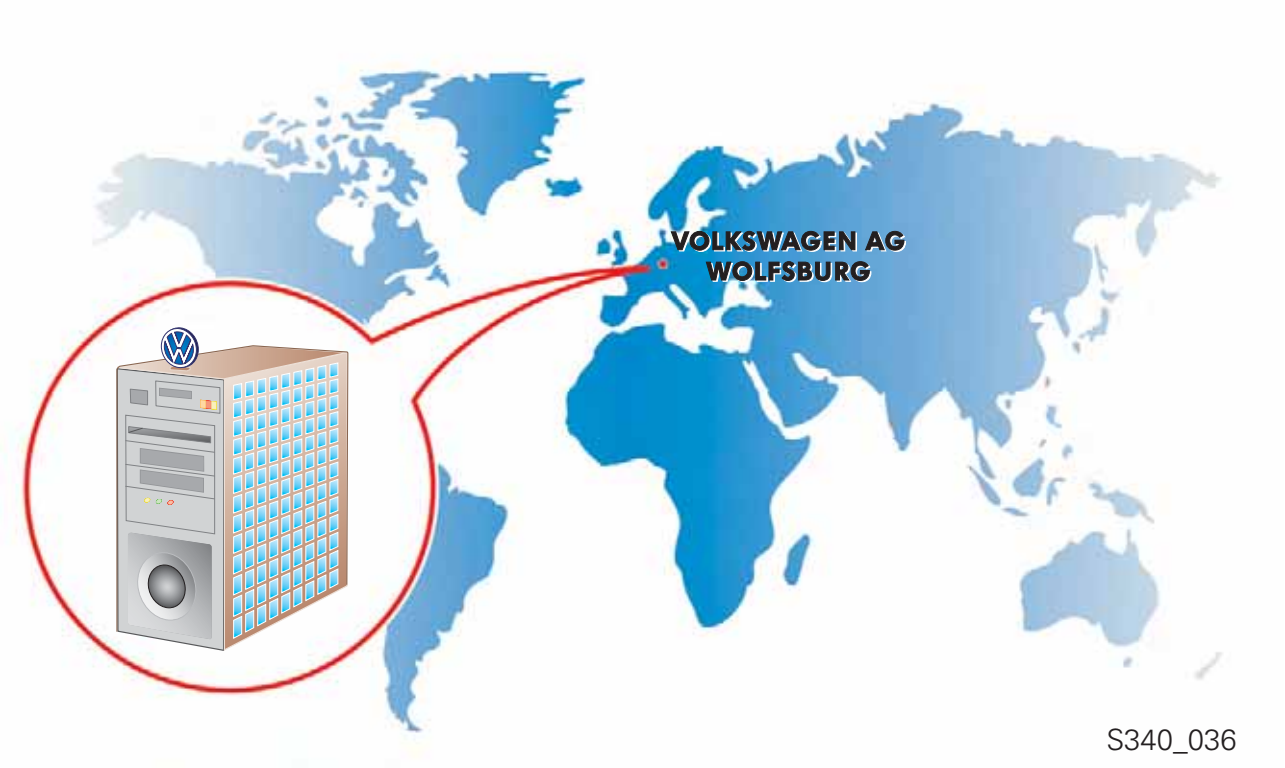
- Filing all theft-related features of the control modules in the FAZIT central database in Wolfsburg
- Communication of the comfort system central control module, in which the vehicle immobilizer is integrated, with the additional components involved
- Encryption of the data communication between the individual control modules

FAZIT Central Database

An essential component of Vehicle Immobilizer IV is the FAZIT central database at Volkswagen in Wolfsburg.

FAZIT stands for "Vehicle Information and Central Identification Tool." All theft-relevant data of the control modules that are integrated in the "Vehicle Immobilizer" function are stored in this database.

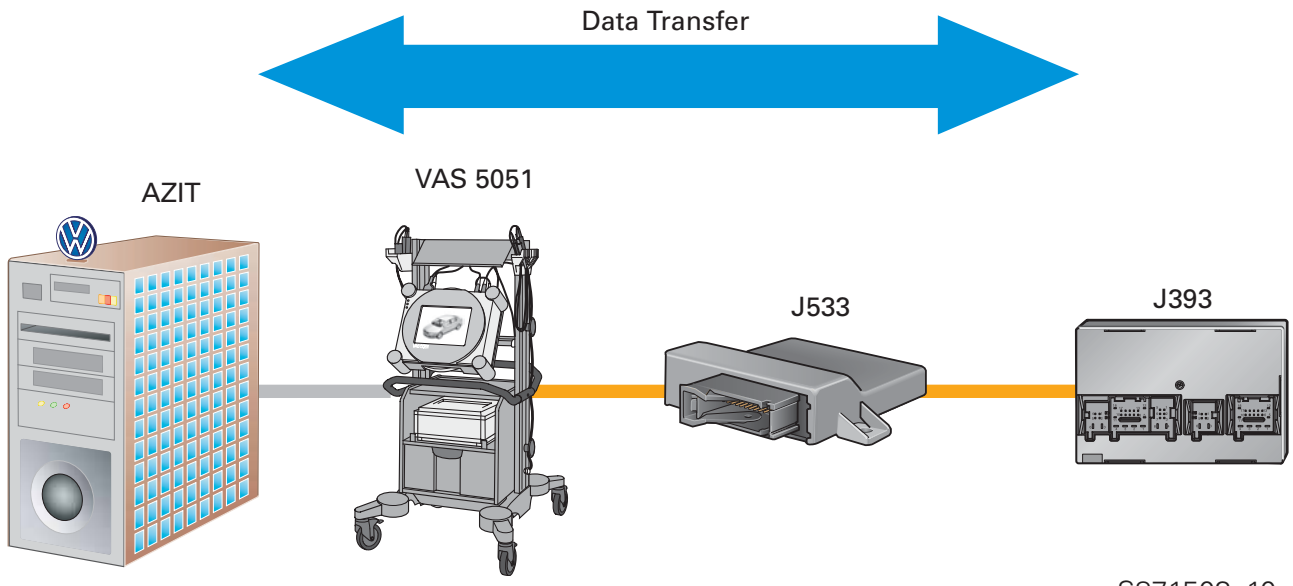
It is not possible to adapt the participating control modules without an online connection to FAZIT.



S340_036

Data Transfer

- Only the online query by the diagnostic tester transfers the data safely, rapidly and reliably into the vehicle
- All of the components participating in the vehicle immobilizer must be learned online



S871503_10

Key

J393 Comfort System Central Control Module
J533 Data Bus On Board Diagnostic Interface

Components of the Vehicle Immobilizer

Comfort System Central Control Module J393

The vehicle immobilizer function is part of the Comfort System Central Control Module J393.

If replaced, Comfort System Central Control Module J393 must be initialized.

Electronic Steering Column Lock Control Module J764

Authorization for locking and unlocking the steering column is provided by the "Vehicle Immobilizer" function in Comfort System Central Control Module J393.

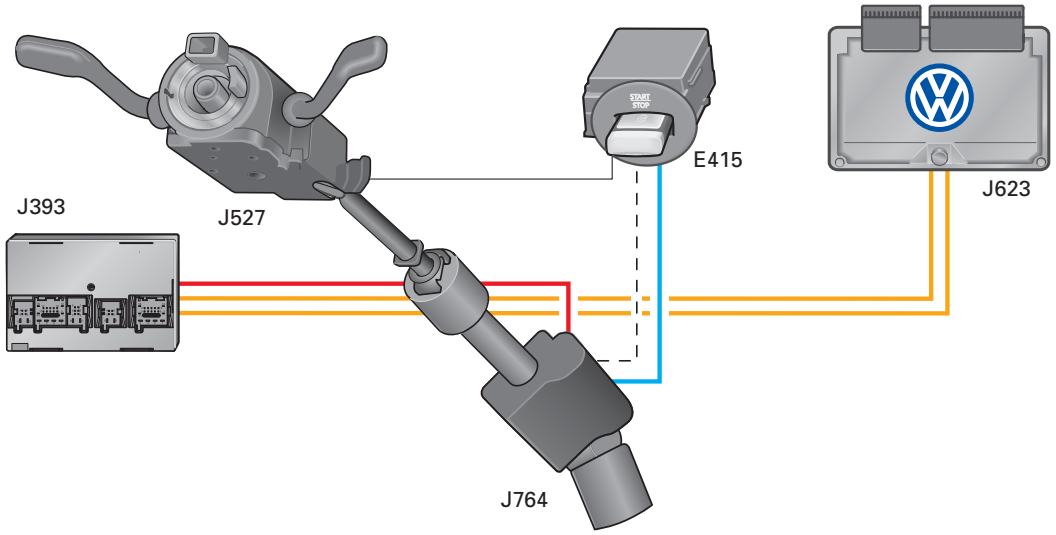
If Electronic Steering Column Lock Control Module J764 is replaced, it must be initialized together with Comfort System Central Control Module J393.

Access/Start Authorization Switch E415

The read coil for reading the transponder in the vehicle key part of the Access/Start Authorization Switch E415. E415 does not require initialization after replacement.

Engine Control Module (ECM) J623

The Engine Control Module J623 is part of the Vehicle Immobilizer. Engine operation requires clearance from the Comfort System Central Control Module J393 through the drivetrain CAN-bus. If replaced, Engine Control Module (ECM) J623 must be initialized.



S340_038

Key

E415	Access/Start Authorization Switch
J393	Comfort System Central Control Module
J527	Steering Column Electronic Systems Control Module
J623	Engine Control Module (ECM)
J764	Electronic Steering Column Lock Control Module

- Read coil line
- CAN-bus Drive
- S-contact
- Signal-coded voltage supply

Control Modules Replacement

Replacement control modules that are part of the Vehicle Immobilizer system must be initialized through the FAZIT database.

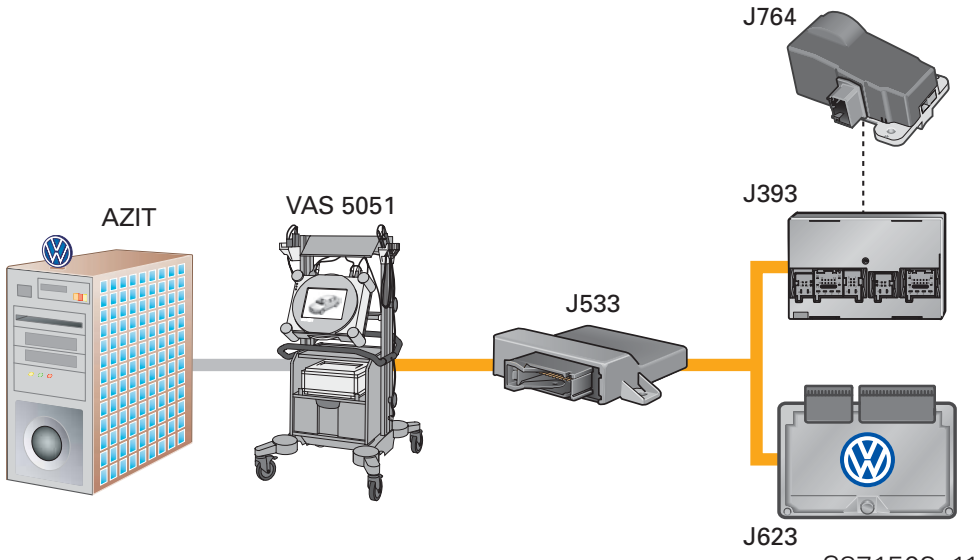
These modules are initialized as follows:

Comfort System Central Control Module J393

- Request data via online connection
- VAS tester receives the data
- Data downloaded into the control module
- Adapt the control module
- Adapt the vehicle key

Engine Control Module (ECM) J623, Electronic Steering Column Lock Control Module J764, and Comfort System Central Control Module J393

- Request data via online connection
- VAS tester receives the data
- Data downloaded into the control module
- Exchange of data between control module and FAZIT
- Adapt the vehicle key



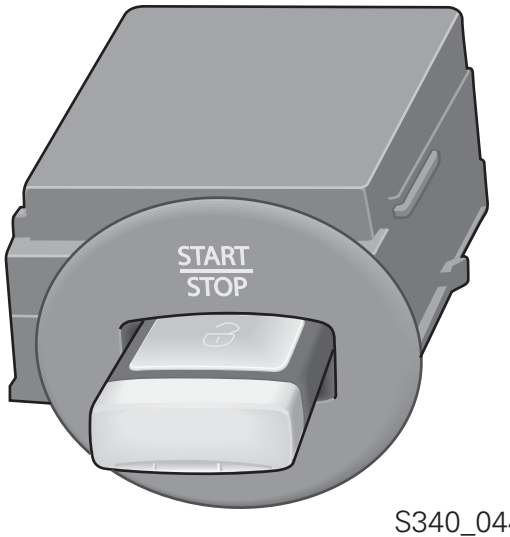
Key

J393 Comfort System Central Control Module
J527 Steering Column Electronic Systems Control Module
J533 Data Bus On Board Diagnostic Interface
J623 Engine Control Module (ECM)
J764 Electronic Steering Column Lock Control Module

Start/Stop Operation

Access/Start Authorization Switch E415

The Access/Start Authorization Switch E415 is part of the entry system. It receives the ignition key, converts the insertion motion into electrical signals and accepts or rejects the electronic identification of the ignition key by the reading coil.



S340_044

Ignition Key

The ignition key starts the vehicle with an insertion movement rather than a rotational movement.

S340_042

Emergency Key

The emergency key is located inside the ignition key.

The emergency key is used to open the driver side door when it is not possible to open it with the remote control. A key ring opening is also part of the emergency key. The opening is exposed when the emergency key is in the second stop position.

S340_043

Key Positions

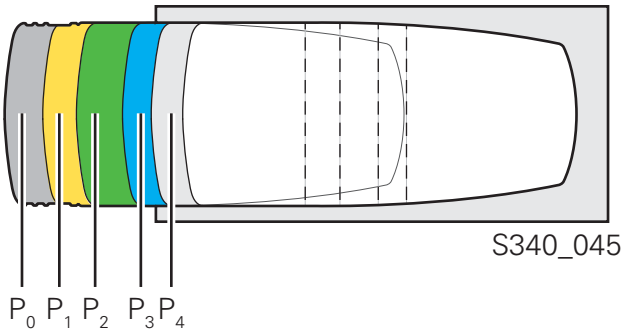
The various starting operations are activated by insertion of the ignition key into the Access/Start Authorization Switch E415.

S340_041

Insertion Positions

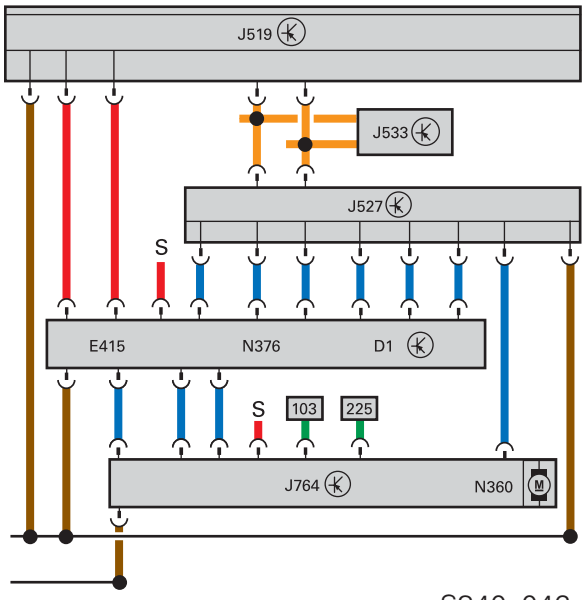
Insertion of the ignition key activates the following switch positions:

- P_0 Off
- P_1 S-contact on
- P_2 Terminal 15 on
- P_3 Terminal 15 Driving
  (The ignition key moves this position automatically after startup)
- P_4 Terminal 50 on



S340_045

System Diagram



S340_046

Key

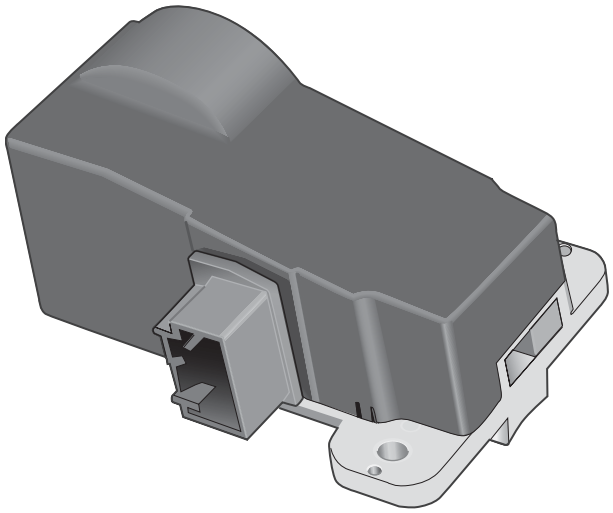
D1	Anti-Theft Immobilizer Reading Module
D2	Anti-Theft Immobilizer Reading Coil
E415	Access/Start Authorization Switch
J362	Anti-Theft Immobilizer Control Module
J519	Vehicle Electrical System Control Module
J527	Steering Column Electronic Systems Control Module
J533	Data Bus On Board Diagnostic Interface
J764	Electronic Steering Column Lock Control Module
N376	Ignition Switch Key Lock Solenoid

Electronic Steering Column Lock Control Module J764

Control Module Operation

The Electric Steering Column Lock Control Module J764 receives power from the Comfort System Central Control Module J393. Release, locking and diagnosis are also controlled through a serial data bus connection to the Comfort System Central Control Module J393.

To provide the necessary margin of safety, authorization to the electrical steering column locking system must be provided by three independent control modules and the ignition lock.



S340_047

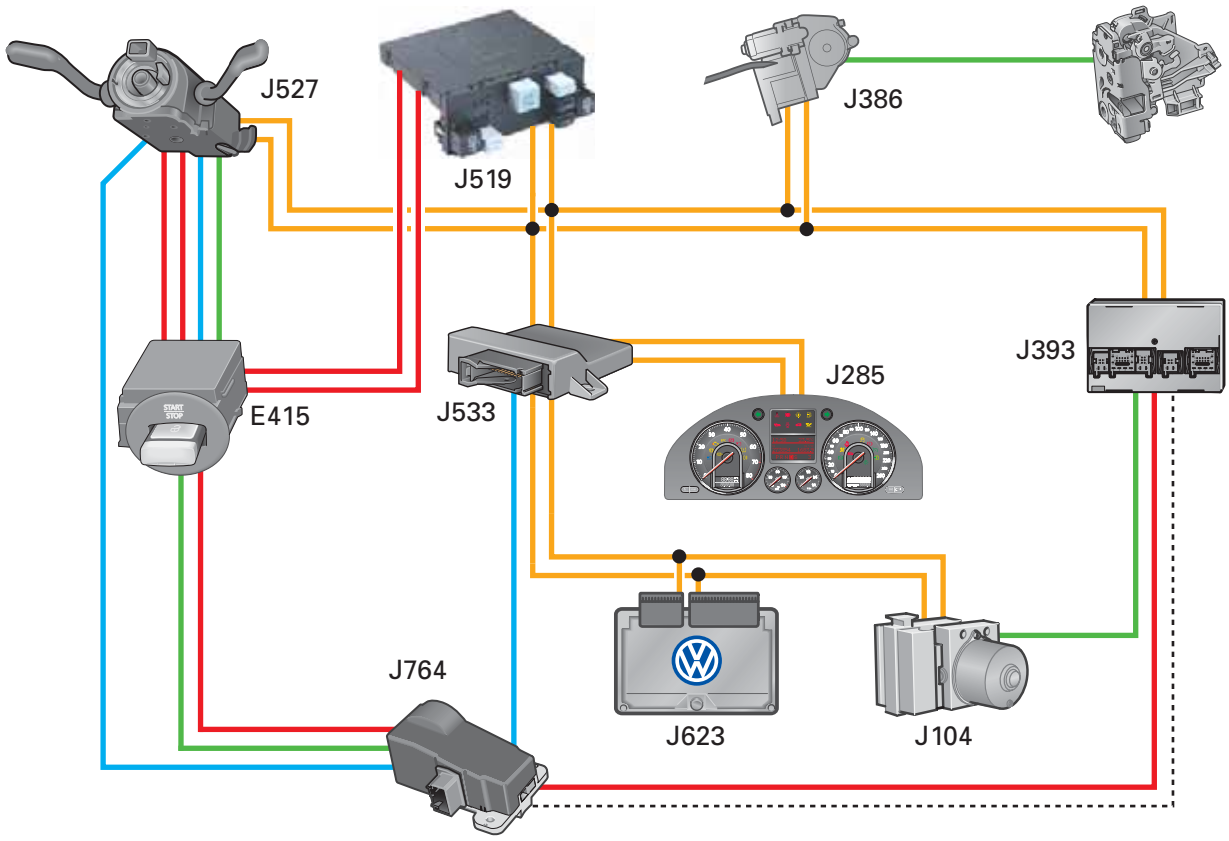
Lock/Release

The following conditions must be met:

- The vehicle immobilizer must recognize an authorized key
- Data Bus On Board Diagnostic Interface J533 (speed = 0 mph; rpm = 0 rpm)
- Steering Column Electronic Systems Control Module J527 (terminal 15 off; speed = 0 km/hr)
- Comfort System Central Control Module J393 (terminal 15 off; CAN signals from J533 and J527 OK)
- Access/Start Authorization Switch E415 (S-contact off, terminal 15 off)
- Electronic Steering Column Lock Control Module J764 (checks if both speed signals from J533 and J527 are OK)

The electrical steering column lock releases only if the vehicle immobilizer recognizes an authorized key. Terminals 15 and 50 are not activated until after the electrical steering column lock has been released.

System Diagram



Key

E415	Access/Start Authorization Switch
J104	ABS Control Module
J285	Instrument Cluster Control Module
J386	Driver's Door Control Module
J393	Comfort System Central Control Module
J519	Vehicle Electrical System Control Module
J527	Steering Column Electronic Systems Control Module
J533	Data Bus On Board Diagnostic Interface
J623	Engine Control Module (ECM)
J764	Electronic Steering Column Lock Control Module

- CAN-bus
- Output signal
- Input signal
- Power
- Serial data bus

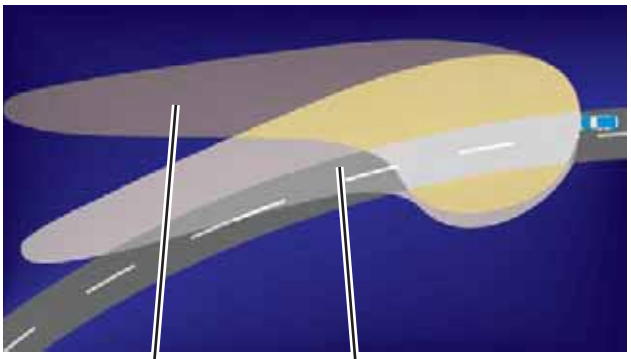
Adaptive Front Lighting System

The adaptive front lighting system consists of moving front lights and a stationary front lights.

The adaptive front lighting system is an option on the 2006 Passat.

Moving Front Lights

The moving front lights are synchronized electronically with the position of the steering wheel and illuminate road curves while turning.



S871503_31

Stationary Front Lights

The stationary front lights provide side lighting when turning at intersections. An auxiliary light located in the headlight is activated during specific turning situations.

Conventional Low Beam Lighting

S340_024

Adaptive Stationary Low Beam Side Lighting

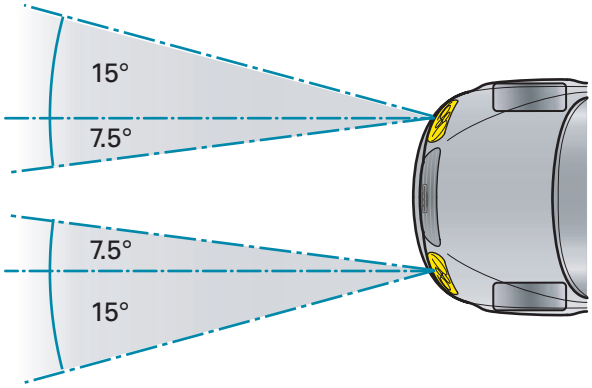
S340_025

Moving Front Light Operation

The low beam headlight unit swivels horizontally, driven by an integrated electric motor.

Swivel Angle

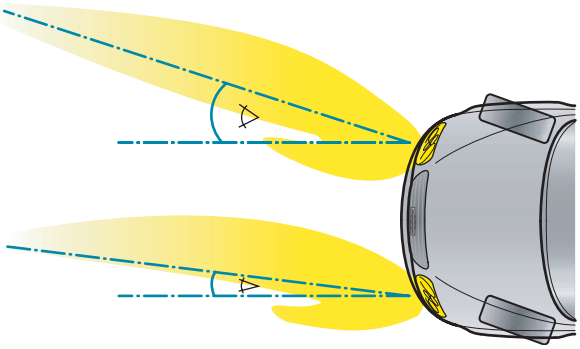
The swivel angle on the inside curve headlight is approximately 15° and approximately 7.5° on the outside curve headlight.



S340_026

Road Illumination

The different swivel angles provide the best possible illumination in curves because the headlight on the inside moves twice as far as the one on the outside of the curve.



S340_027

The headlights do not swivel at speeds below 6 mph (10 km/hr). Above 6 mph (10 km/hr), the swivel angle depends on the sharpness of the curve. This complies with the regulations that prohibit both headlights from swiveling when the vehicle is not in motion. Also, during acceleration from a stop with a constant steering angle, the headlight swivel is gradual.

Personalization

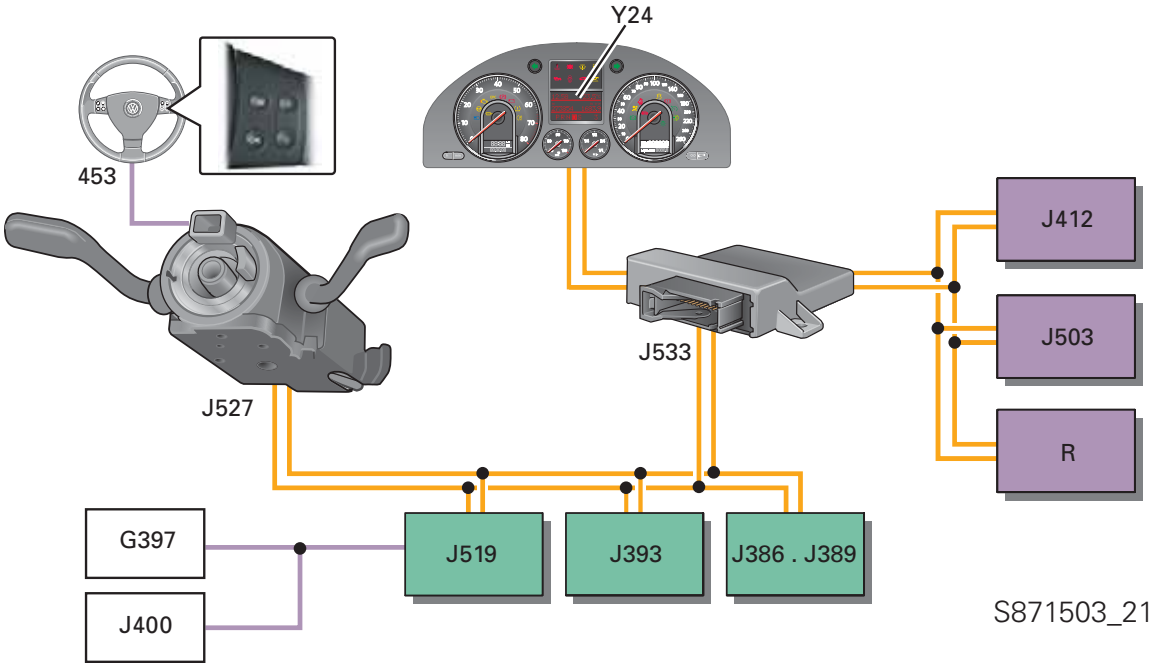
Personalization allows custom vehicle comfort and infotainment settings.

Settings for the various devices are made through the buttons on the steering wheel and the display in the instrument cluster (MFI).

The buttons on the steering wheel are used to make the settings based on the menu selections on the display in Instrument Cluster Y24. The settings are stored in Instrument Cluster Control Module J285.

The CAN-bus transfers the information between Instrument Cluster Control Module J285 in the instrument cluster and the other control modules.

Personalization Control Modules System Diagram



Key

G397 Rain/Light Recognition Sensor
R Radio
J285 Instrument Cluster Control Module
J386..J389 Door Control Modules
J393 Comfort System Central Control Module
J400 Wiper Motor Control Module
J412 Operating Electronics and Telephone Control Module
J453 Multi-function Steering Wheel Control Module
J503 Radio/Navigation Display Control Module
J519 Vehicle Electrical System Control Module
J527 Steering Column Electronic Systems Control Module
J533 Data Bus On Board Diagnostic Interface
Y24 Display Unit in Instrument Cluster

Accessing Menu Options

The following procedure allows access to the 2006 Passat's convenience options using the multi-function indicator (MFI) buttons on the steering wheel.

To access the convenience menu:

1. Press and hold the Menu button.
2. Use the Up or Down arrows to highlight "Setup" and then press the OK button to select it.
3. Use the Up or Down arrows to select "Convenience" and then press the OK button to select it.
4. Pressing the Menu button will take you to the previous menu.

For detailed information on programming, please reference the operating instructions in the vehicle owner's manual.

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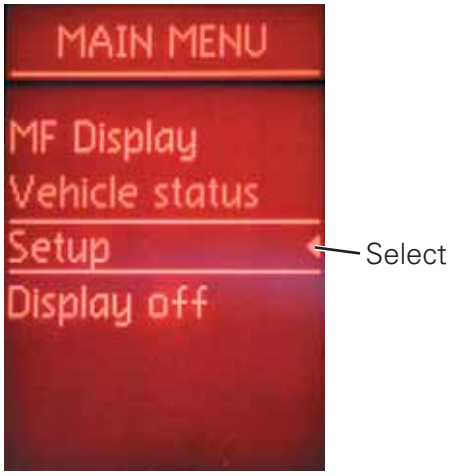

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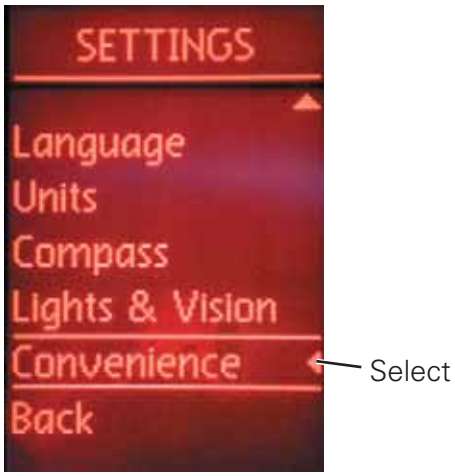


S871503_24

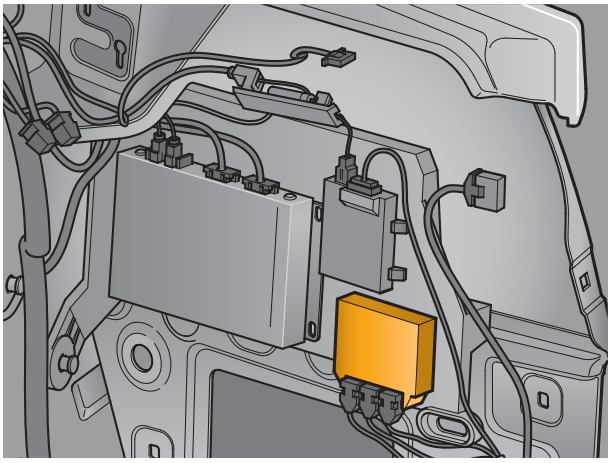
Park Distance Control

Park distance control system aids the driver when maneuvering and parking.

The system is based on 8-channel ultrasonic technology.

Control Module for Parking Aid J446

The Control Module for Parking Aid J446 is located in the luggage compartment on the passenger side.



S340_055

Park Distance Button

The button for park distance is located to the right of the shift lever. Park distance is activated by pressing the button or shifting into reverse.

Parking distance is deactivated automatically at approximately 9.3 mph (15 km/hr) or by pressing the button again.

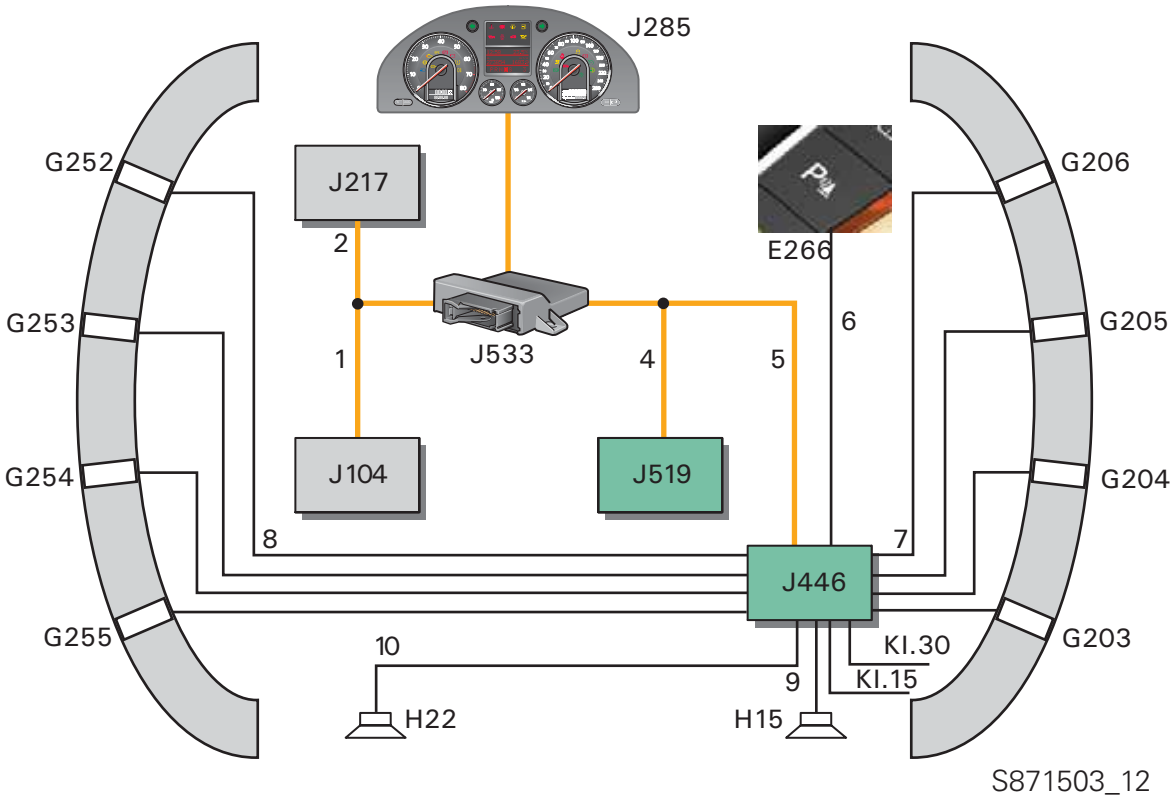
When park distance is activated the LED in the button lights yellow. The LED flashes, when an error is detected.

S340_056

Park Distance Button

Parking Assistance System Diagram

The sensors are located in the rear and front bumper and in the front grill.



Key

E266	Parking Aid Button
G203	Left Rear Parking Aid Sensor
G204	Left Rear Center Parking Aid Sensor
G205	Right Rear Center Parking Aid Sensor
G206	Right Rear Parking Aid Sensor
G252	Right Front Parking Aid Sensor
G253	Right Front Center Parking Aid Sensor
G254	Left Front Center Parking Aid Sensor
G255	Left Front Parking Aid Sensor
H15	Rear Parking Aid Warning Buzzer
H22	Front Parking Aid Warning Buzzer
J104	ABS Control Module
J217	Transmission Control Module
J285	Instrument Cluster Control Module
J446	Parking Aid Control Module
J519	Vehicle Electrical System Control Module
J533	Data Bus On Board Diagnostic Interface

Signal flow

1. Wheel speed from J104 to J446 via J533
2. Selector lever setting from J217 to J446 via J533
3. Travel speed from J285 to J446 via J533
4. KI.15 on and backup light on from J519 to J446
5. Error detected from J446 to J533
6. E266 operated
7. Signals from the sensors for rear parking assistance
8. Signals from the sensors for front parking aid
9. Activation of H15
10. Activation of H22

Notes

Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this Self-Study Program.

The Knowledge Assessment may or may not be required for Certification.

You can find this Knowledge Assessment at:

www.vwwebsource.com

From the vwwebsource.com Homepage:

- Click on the Certification tab
- Type the course number in the Search box
- Click "Go!" and wait until the screen refreshes
- Click "Start" to begin the Assessment

For Assistance, please call:

Certification Program Headquarters

1 – 877 – CU4 – CERT

(1 – 877 – 284 – 2378)

(8:00 a.m. to 8:00 p.m. EST)

Or, E-Mail:

Comments@VWCertification.com

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Printed in U.S.A.
May, 2005