Service Training

Self-study Programme 417

The Passat CC 2009

Volkswagen has developed its first four-door coupé on the basis of the 2006 Passat. The new Passat CC - Comfort Coupé combines the dynamics of a sports car and the comfort of a saloon without making compromises.
The advantage of this concept is that you do not have to go without all-round comfort nor without a sporty elegant design. All requirements are met in one car.

The Passat CC is therefore more than just a sporty saloon. It is a 4-door/4-seater with striking coupé looks and sporty engines.
The Passat CC stands for

- elegance & style,
- sportiness and
- dynamism.

It is therefore aimed at two groups of buyers:

- the saloon drivers, who are fed up of the normal, plain saloons, but will not accept any loss of functionality,
- the coupé drivers, who do not understand why design and dynamics should not be functional and comfortable.

S417_002

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

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

NEW

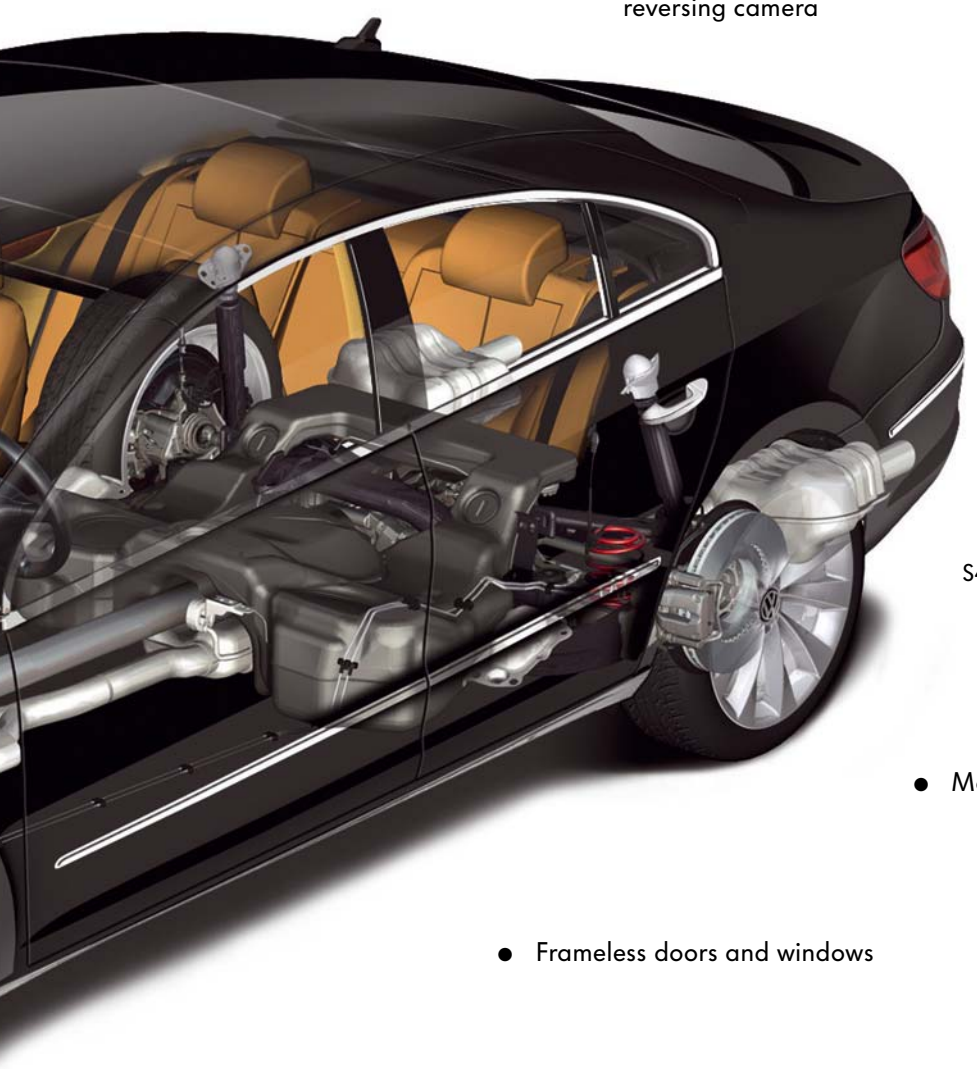
Important Note

Contents

The Passat CC 2009

- Front windscreen with acoustic enhancement
- Active climatised seat with integrated ventilation for driver and front passenger
- Multi-function steering wheel (MFW)
- New RCD 310 module radio generation
- Lane Assist
- Media Device Interface box (MDI)
- DCC adaptive chassis control

- Tilting panorama sunroof
- Pivoted badge with mounting for reversing camera
- Optical park assist (OPS)



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- Mobility tyres
- Frameless doors and windows
- UMPP Low telephone preparation with audio streaming

Technical data

Exterior dimensions and weights

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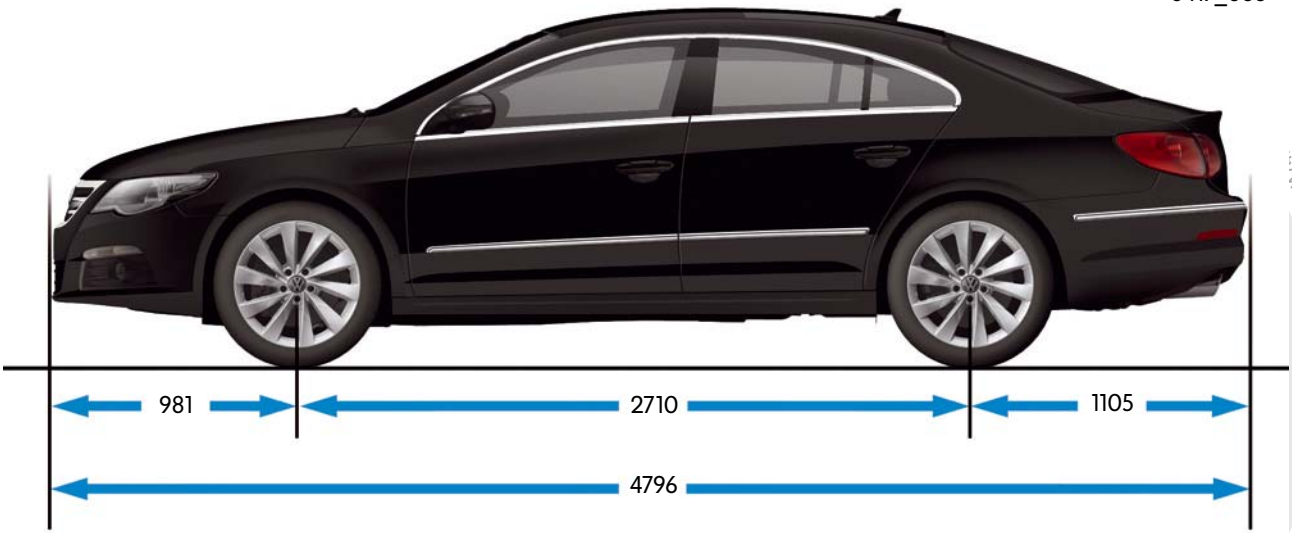

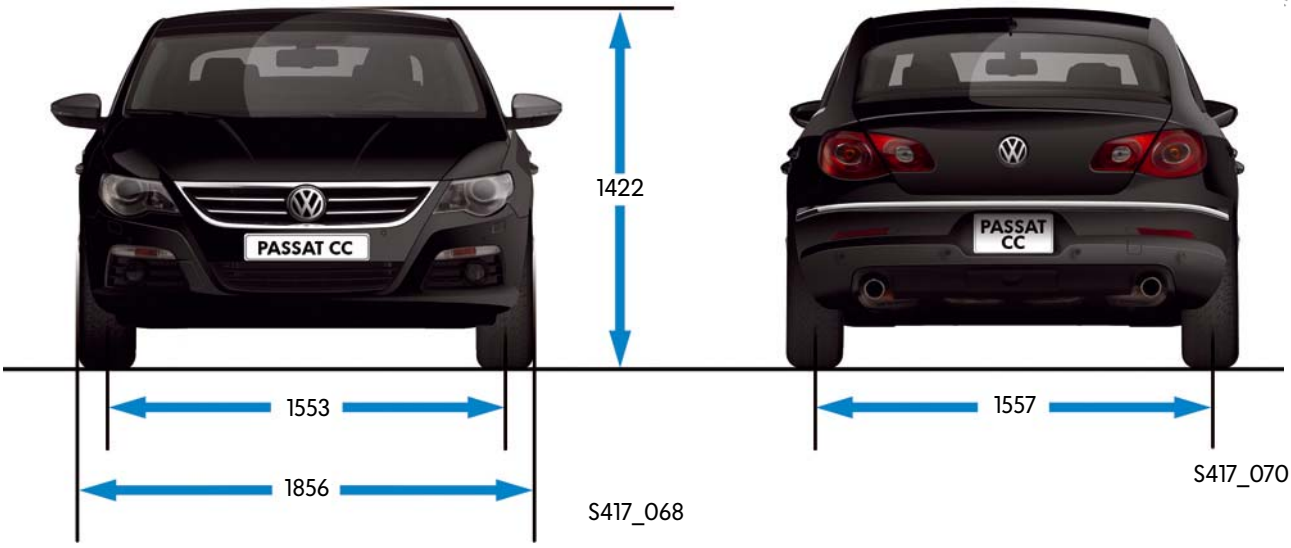

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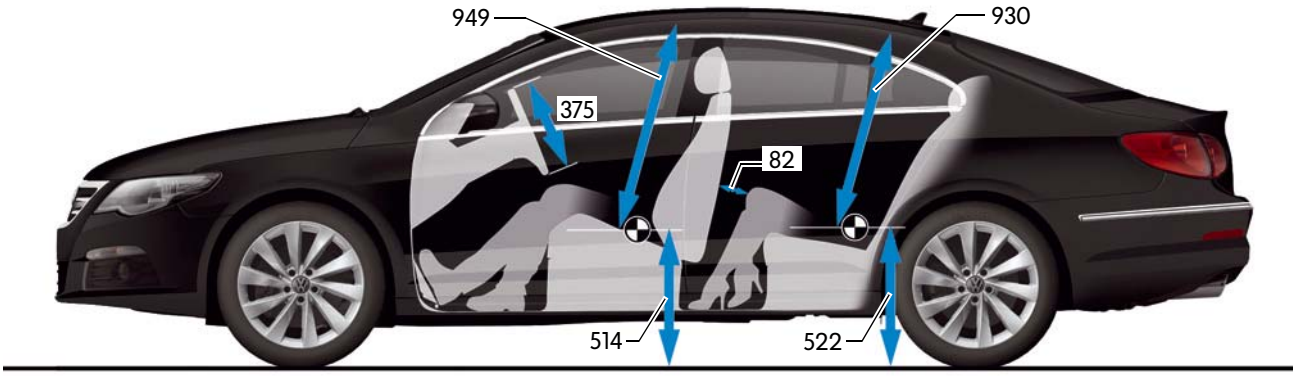
Exterior dimensions

Length	4796 mm
Width	1856 mm
Height	1422 mm
Wheelbase	2710 mm
Track width at front	1553 mm
Track width at rear	1557 mm

Weights/further data

Kerb weight without driver	1430 kg
Tank capacity	70 l (4MOTION 68 l)
Drag coefficient	0.297 c_w

Interior dimensions



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Interior dimensions and volumes

Interior length	max. 1790 mm
Boot volume	535 l

Front headroom	949 mm
Rear headroom	930 mm
Front elbow room	1422 mm
Rear elbow room	1389 mm

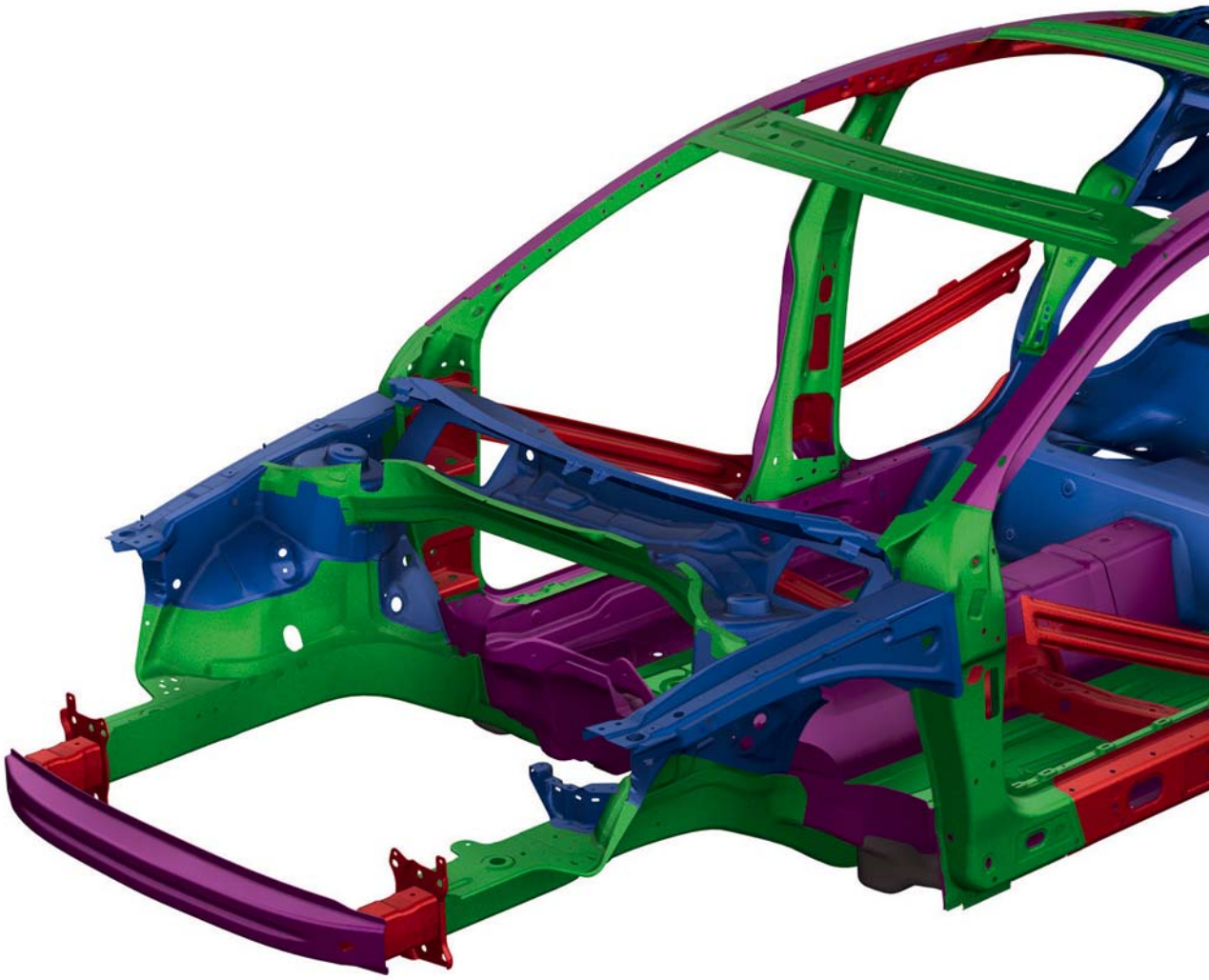
Body

Body structure

The body structure of the Passat CC is based on the body of the 2006 Passat saloon.
Compared with the saloon, the Passat CC with its typical coupé design is a few centimetres shorter, wider and longer. The roof stretches in a shallow radius from the A-pillar far beyond the C-pillar.

The body structure has been modified for this reason. The following are new parts:

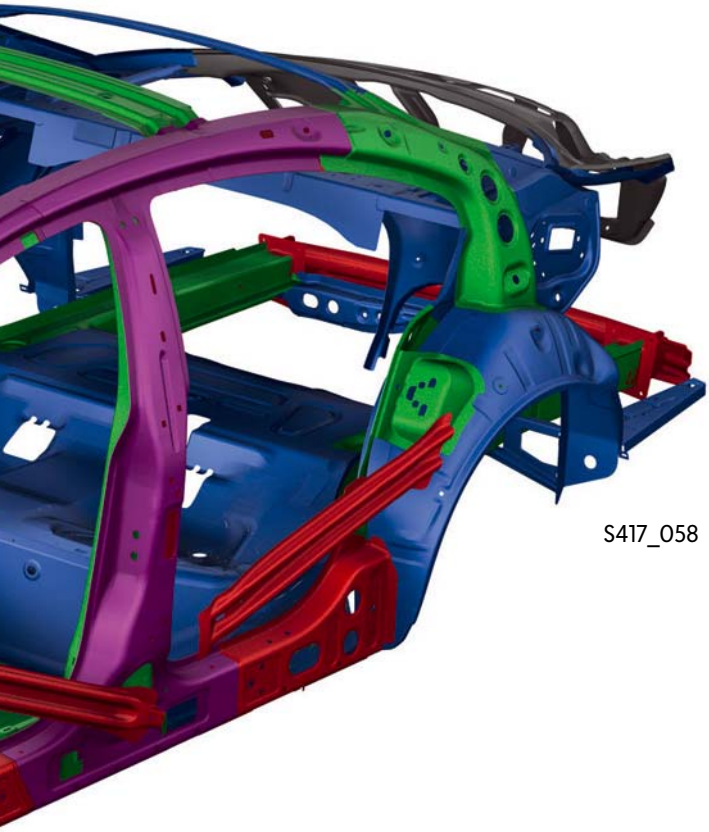
- the top left and right longitudinal members
- the window cross members
- the rear panel
- the A-pillar reinforcement



The Passat CC sees the use of high to ultra-high-strength thermoformed steel panels continue. Using ultra-high-strength thermoformed steel panels allows the body weight to be reduced without losing strength.

The distribution of steel sheet qualities in the Passat CC are identical to that in the Passat saloon.

The pie chart shows the substantial proportion of higher strength and ultra-high-strength thermoformed steel panels as percentages.



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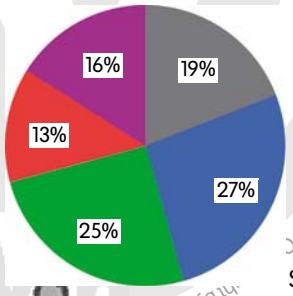
Sheet quality distribution



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Legend

- Steel panels up to 140 MPa
- High-strength steel panels from 180 to 240 MPa
- Higher-strength steel panels from 260 to 320 MPa
- Ultra-high-strength steel panels from 340 to 700 MPa
- Ultra-high-strength, thermoformed steel panels over 1000 MPa

New body features

Tilting panorama sunroof

The optional tilting panorama sunroof consists of a large glass roof and a roof control unit to operate it. The large glass roof is a single-piece glass lid driven by an electric motor.
The roof controls are in a module mounted in the car headliner.
Tinted glass and a fabric blind ensure a pleasant climate and good protection from the sun.

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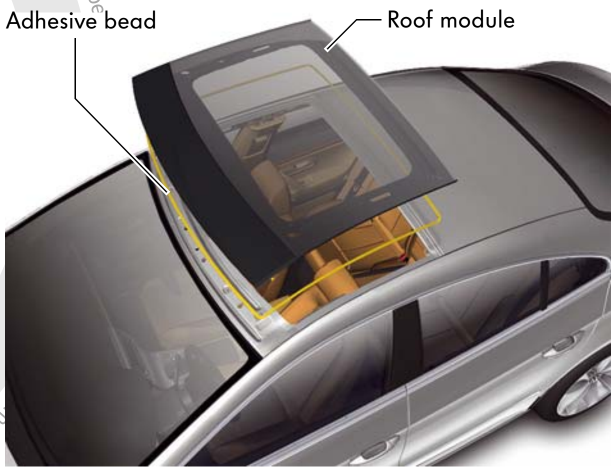
Module construction

The tilting panorama sunroof is assembled as a top-load system. This means a roof module is fitted or cemented to the body-in-white from above. This allows the glass areas to span a large section of the roof creating a fully glazed look.

The fully pre-assembled module with glass lid, blind system, guide rails, mechanism, mounting frame, electric motor drive and sealing system makes assembly easier and reduces the manufacturing costs.
The mounting frame, which holds the whole system and guarantees vehicle stiffness, is made from fibre-glass reinforced plastic.

The front area of the roof between the front windscreen and the glass lid of the tilting panorama roof was integrated in the module and is gloss black.
The tilting panorama sunroof thus seems to extend the front window visually to behind the B-pillar and also contributes to the coupé-like looks of the Passat CC.



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The sealing system of the module also guarantees water drainage to the outside.
A separate water drainage system using cost intensive drainage hoses that are laid internally is not required.

Operation

The tilting panorama sunroof can be raised up to four centimetres. The tilting panorama sunroof is operated using the two tilt position buttons that are operated by pulling or pushing the roof control. The buttons are connected directly to the tilting panorama sunroof control unit.

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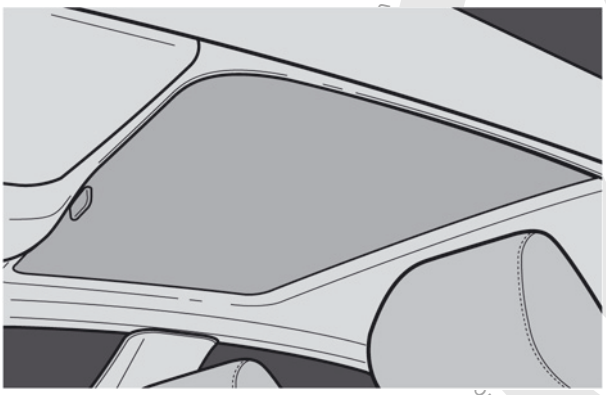
Tap mode
The tilting panorama roof is automatically moved to the tilt position or zero position. The automatic run can be cancelled by pressing or pulling the button.

Hold mode
The tilting panorama sunroof is opened or closed manually for the duration that the button is operated.

Sun blind



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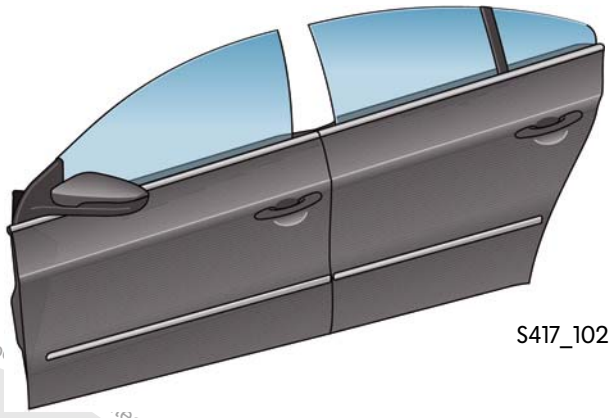
The manual sunshade system on the tilting panorama sunroof is a complete and complex development compared to conventional sunshade systems:

- An opaque blind fabric is used to increase the level of shade.
- The blind system is infinitely variable regardless of the opening position and has an additional front blind latch.
- The blind system has steel tape guides at the side to ensure that the fabric is tensioned.
- The blind roller has been carefully adapted, i.e. it is arched crossways to ensure the necessary headroom.

Frameless doors

The four doors are frameless. This allowed the roof to be lowered to create the coupé-like silhouette of the Passat CC.



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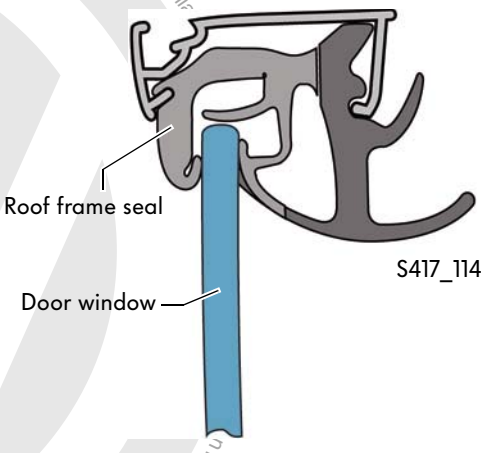
The door window fits into a 3-lip door-frame seal. The door window first needs to be lowered out of the seal before the door can be opened.
Therefore, whenever you open a door, the glass is lowered slightly.
This function in the Passat CC window regulator system is extremely fast. This is achieved, among other things, with an additional microswitch in the outside door handle. The procedure is started as soon as you pull the door handle.

Cross-section through the roof frame seal



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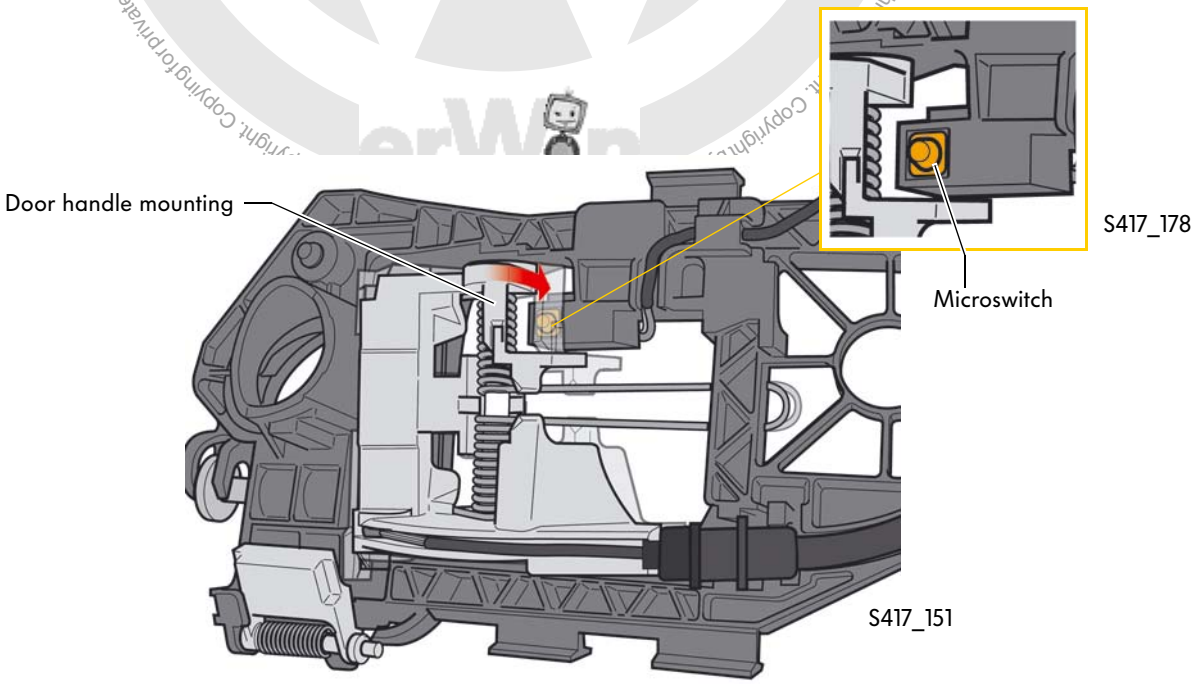

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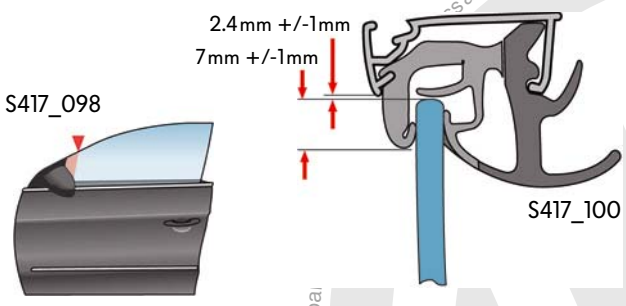
Adjustment of the door windows

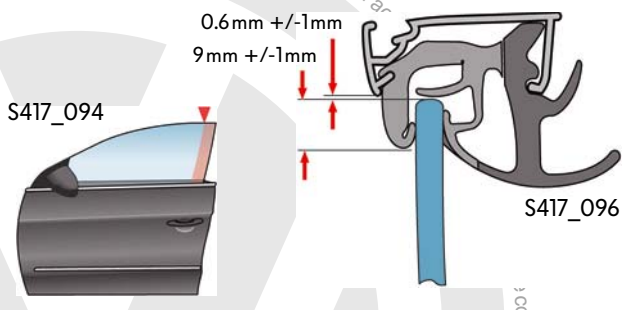
To ensure a perfect seal when the doors are closed, the longitudinal direction, tilt and height of the door windows all need to be set properly. These adjustments can only be made when the vehicle is standing on all four wheels.

Adjusting the height of the front door window

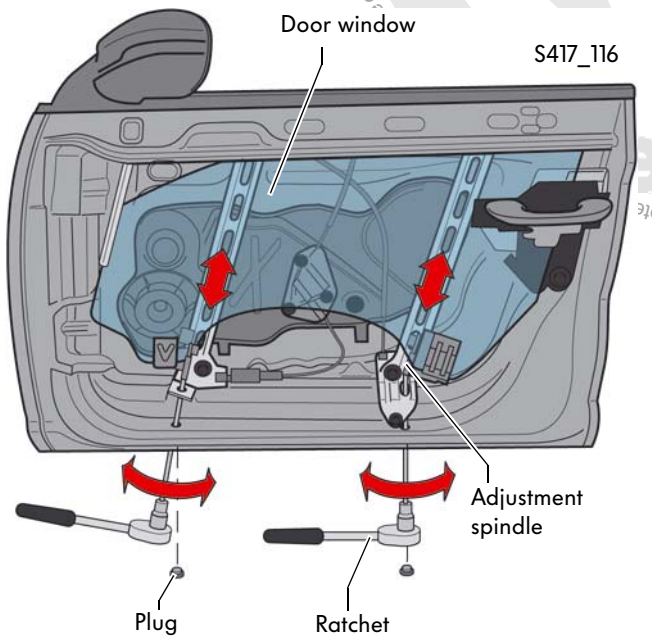
Entry depth at A-pillar



Entry depth at B-pillar



The height of the front door window needs to be adjusted if the entry depth of the window in the area of the A-pillar and in the area of the B-pillar does not coincide with the set values and the window edge does not run parallel to the B-pillar panel.



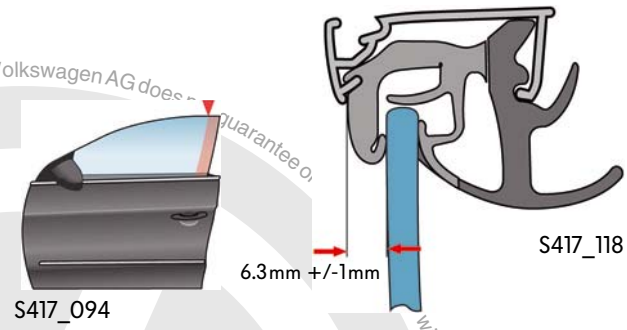
Before adjusting the height, the door window needs to be lowered completely and the plugs removed. Now you can insert the tool (ratchet) into the adjustment spindle through the adjustment openings on the left and right.

Turning clockwise moves the window downwards and turning anti-clockwise moves it upwards. One rotation corresponds with 1 millimetre. After adjustment, fit the plugs again and raise the door window.

Adjusting the tilt of the front door window

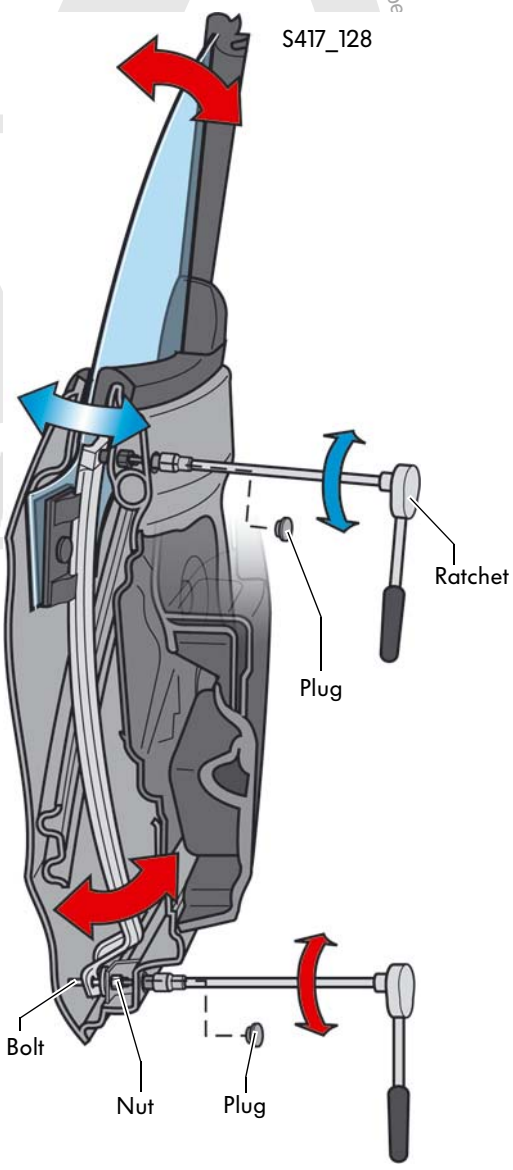
If the tilt of the window at the B-pillar does not coincide with the set value, the door window needs to be adjusted at the rear. The tilt is adjusted first at the bottom and then at the top. The respective settings can only be made once the respective plug has been removed from the adjustment opening and the nut has been loosened. Following the adjustment, the nut needs to be tightened and the plug fitted again.

Tilt of the window in the area of the B-pillar



Adjustment of tilt at top:
The setting can be made by turning the tool left or right in the adjustment spindle. One rotation corresponds with 1.25 millimetres.

Adjustment of tilt at bottom:
If you do not know to which position the adjustment spindle is set, first turn the bolt clockwise as far as it will go. The adjustment from the end position is then made with a maximum of 10 turns anti-clockwise. The construction position is approx. 3 turns anti-clockwise from the end position.

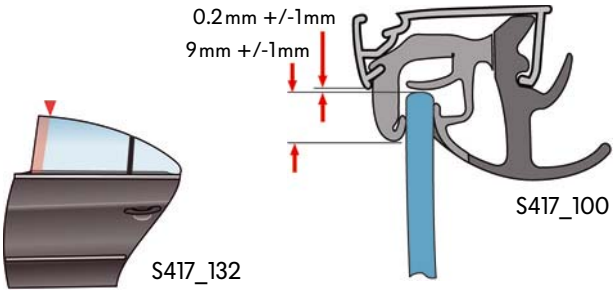


Adjustment of tilt at top

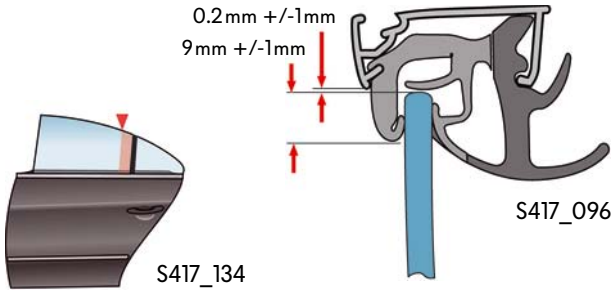
Adjustment of tilt at bottom

Adjusting the height of the rear door window

Entry depth at B-pillar



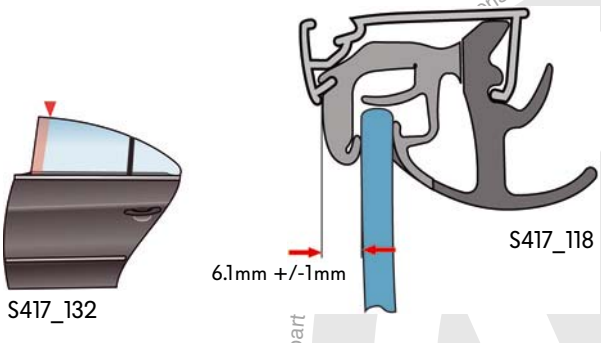
Entry depth at C-pillar



The height of the rear door window needs to be adjusted if the entry depth of the window in the area of the B-pillar and in the area of the C-pillar does not coincide with the set values and the window edge does not run parallel to the B-pillar panel. The height of the rear door window is adjusted in the same way as the height of the front door window.

Adjusting the tilt of the rear door window

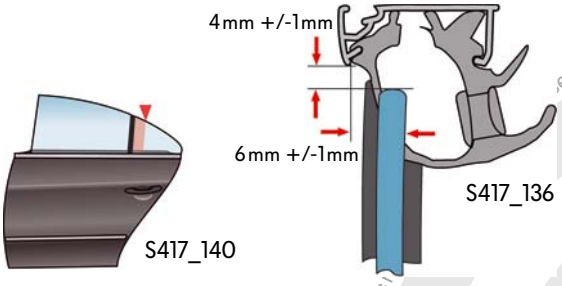
Tilt of the window in the area of the B-pillar

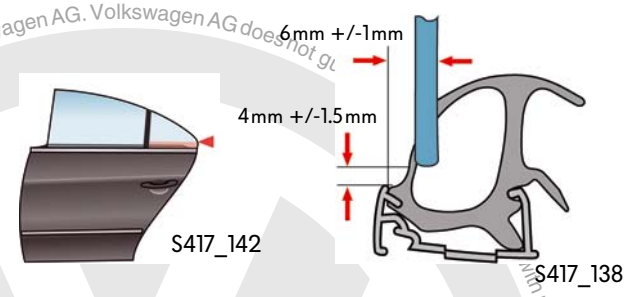


If the tilt of the window at the B-pillar does not coincide with the set value, the tilt of the rear door window needs to be adjusted. Here too, the tilt is adjusted first at the bottom and then at the top. The tilt of the rear door window is adjusted in the same way as the tilt of the front door window.

Adjusting the height and the tilt of the rear window pillar

Position of window pillar

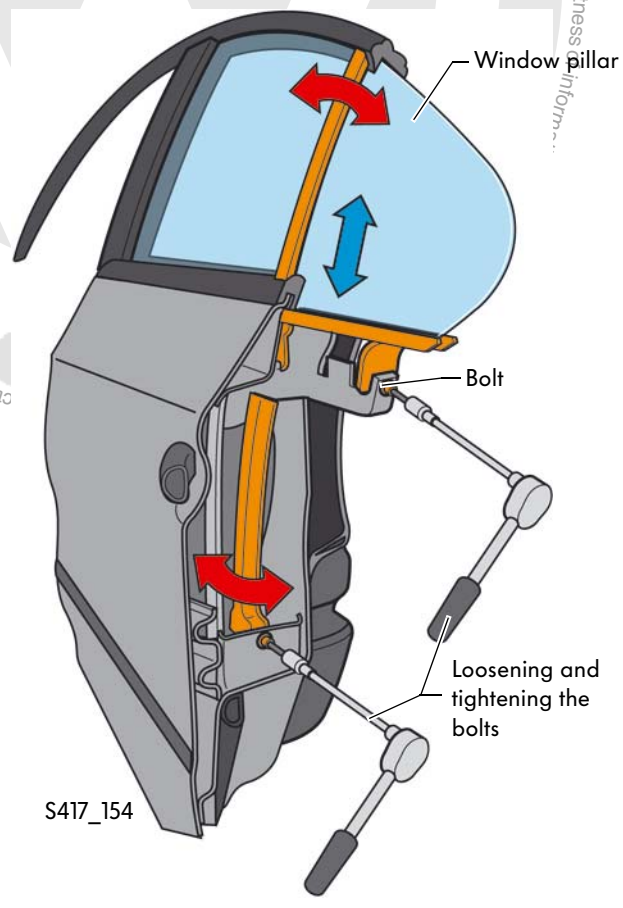




If the position of the window pillar does not coincide with the specified values, the height and tilt needs to be adjusted.

Before an adjustment is made, the plug and the panelling cap need to be removed and the bolts loosened. The height is adjusted by raising or lowering the window pillar. The tilt is adjusted by pivoting the window pillar.

Following the adjustment, the bolts need to be tightened and the plug or panelling cap fitted again.



Adjusting the tilt

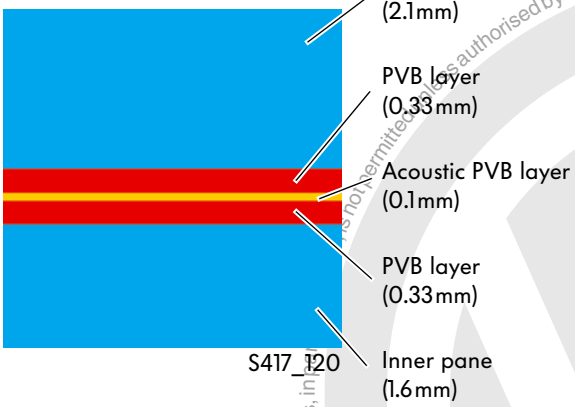
Adjusting the height

Acoustically enhanced front windscreen

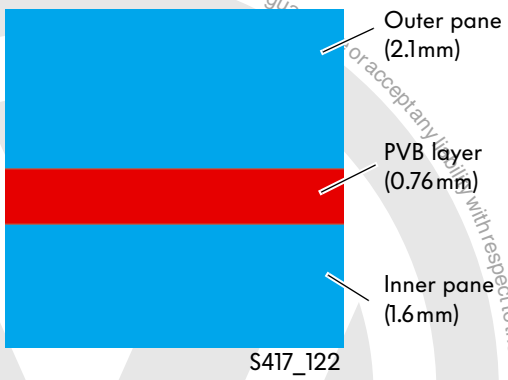
The Passat CC has an acoustically enhanced front windscreen as standard. This front windscreen allows the very good aeroacoustic values for the Passat saloon to be further reduced.

The total thickness of the windscreen with the acoustic enhancement is the same as the conventional front windscreen. An additional acoustic film has simply been used here.

Acoustically enhanced front windscreen



Conventional front windscreen



The abbreviation PVB stands for polyvinyl butyral. PVB is a synthetic material.

Interior

Front seats

Active climatised seats with integrated ventilation for the driver and front passenger are available as an option for the Passat CC. The ventilator motors are in the seat base and backrest. The air is supplied through moulded ducts in the seat and backrest cushions. The air is then distributed across the cover and shaped foam base. The ventilation is provided using the air from the vehicle interior. The seat ventilation provides a cooling effect depending on the temperature. The system is controlled by a switch that is located immediately next to the seat adjustment controls. You can set three ventilation levels (low, medium and high) individually.
Parallel to the seat ventilation, you can also switch the seat heating on whenever necessary.

The active climatised seat is an electrically adjusted 6- or 12-way seat on the driver's side and, on the passenger's side, a manually adjusted seat or electrically adjusted 12-way seat.

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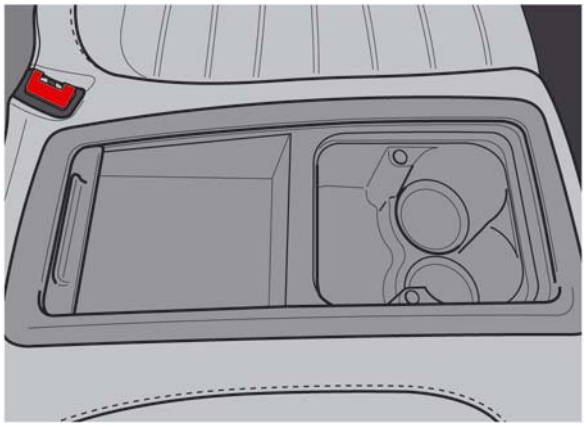
Rear seats

S417_124

The rear seats in the Passat CC are a fixed full seat bench with two seats.
A storage compartment has been integrated in the middle area where you cannot sit. There is a storage compartment for the first aid box in the centre armrest. A lockable through-load aperture is available as an option.



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Occupant Protection

Safety equipment

The Passat CC has the same equipment as the Passat saloon with airbags, belts and belt tensioners. The airbags have simply been adapted to the new vehicle contours.

- driver and front passenger airbag
- Front passenger airbag can be deactivated using a key switch in the glove compartment
- Belt locks on driver's and front passenger side with belt query
- Belt tensioners on the front seats as standard, optional for the rear seats
- Seats with belt tension limiters, front and rear
- Rear side airbags, optional
- 2 pressure sensors for side crash detection, in the front doors

Top Tether

The Passat CC is equipped with the Top-Tether system as standard. The Top-Tether system is used for additional child seat anchoring on the rear seat bench and is in the rear parcel shelf.

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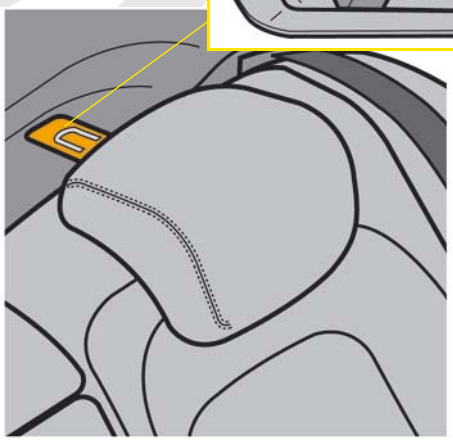

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- Head airbags

- 2 acceleration sensors in the vehicle longitudinal direction in the airbag control unit, 1 acceleration sensor in vehicle crossways direction in airbag control unit

- 2 acceleration sensors for side crash detection, in C-pillar area

Passat CC 2009 engine range

The engine range for 2008 comprises two common-rail diesel engines delivering 103kW and 125kW as well as three petrol engines with direct injection that deliver between 118 and 220kW and are already in production for the Passat saloon, Passat R36 and Tiguan models. The engine control units are networked via the powertrain CAN and have been adapted due to new functions like, for example, Lane Assist or damper control.

The 6-speed manual and 6-speed automatic that are already used in production as well as the 6- and 7-speed Direct Shift Gearbox are available. For reasons of comfort, the 6-speed Direct Shift Gearbox has been modified for use with the 3.6l 220kW FSI engine. It has longer gear ratios and the 6th gear is configured as Economy.

S417_104

The specific engines are:

- the 1.8l 118kW TSI engine with 4-valve technology,
- the 2.0l 147kW TSI engine with 4-valve technology,
- the 3.6l 220kW FSI engine with 4-valve technology,
- the 2.0l 103kW CR TDI engine with diesel particulate filter,
- the 2.0l 125kW CR TDI engine with diesel particulate filter.

The specific gearboxes are:

- the 6-speed manual gearbox 02S,
- the 6-speed manual gearbox 02Q,
- the 6-speed automatic gearbox 09G,
- the 7-speed Direct Shift Gearbox 0AM,
- the 6-speed Direct Shift Gearbox DSG 02E

You will find detailed information on the engines in the following self-study programmes:
No. 360 “The 3.2 ltr. and 3.6 ltr. FSI engine”,
No. 401 “1.8l TFSI 16v 118kW engine”,
No. 403 “The 2.0 ltr. TDI Engine with Common Rail Injection System”.

You will find detailed information on the gearboxes in the following self-study programmes:
No. 308 “The Direct Shift Gearbox 02E”,
No. 309 “6-speed automatic gearbox 09G/09K/09M”,
No. 390 “The 7-speed Direct Shift Gearbox 0AM”.

The 1.8l 118kW TSI engine with 4-valve technology

The 1.8l TSI engine EA888 is a technically optimised further development of the familiar 4-cylinder engine series EA113. Proven engine components have been specially developed further. The engine has already been used in the Golf GTI.

S417_034

Technical features

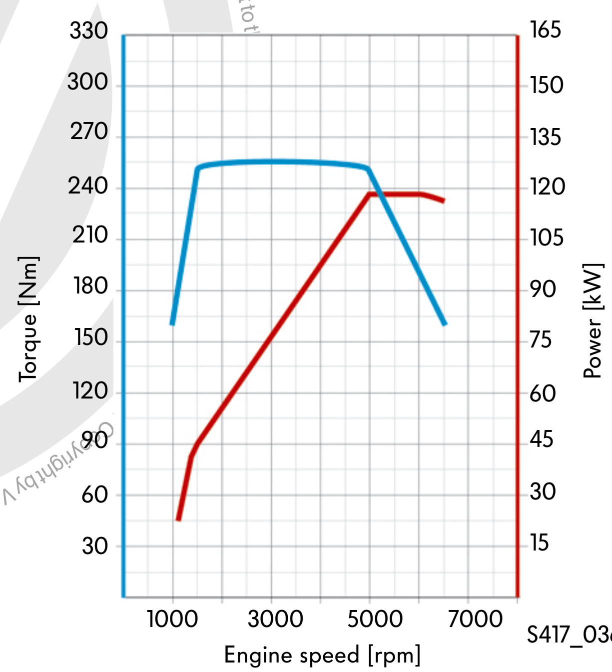
- Improved pedestrian protection
- Considerable comfort and acoustic improvement
- Balancer shaft system with two shafts that are mounted in three bearings and offset vertically
- Reduced maintenance due to modified location of oil filter module
- Configuration of basic engine for a very wide performance spectrum
- The turbocharger pressure canister can be exchanged and adjusted.

You will find further information on this engine in self-study programme 401 “1.8l TFSI 16v 118kW engine”.

Technical data

Engine codes	BZB
Type	4-cylinder in-line engine
Displacement	1798 cm³
Bore	82.5 mm
Stroke	84.2 mm
Valves per cylinder	4
Compression ratio	9.6:1
Maximum output	118 kW at 5000 to 6200 rpm
Maximum torque	250 Nm at 1500 to 4200 rpm
Engine management	Bosch Motronic MED 17.5
Fuel	Super unleaded RON 95 (normal unleaded RON 91 with reduction in performance)
Exhaust gas treatment	Starter catalytic converter close to engine, main catalytic converter, a step-type Lambda probe after the starter catalytic converter
Emissions standard	EU4

Torque and power diagram



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The 2.0l 147kW TSI engine with 4-valve technology and turbocharger

The 2.0l TSI engine is also part of the EA888 inline four-cylinder engine range. It is identical to the 1.8l TSI engine with only the displacement being increased.

S417_074

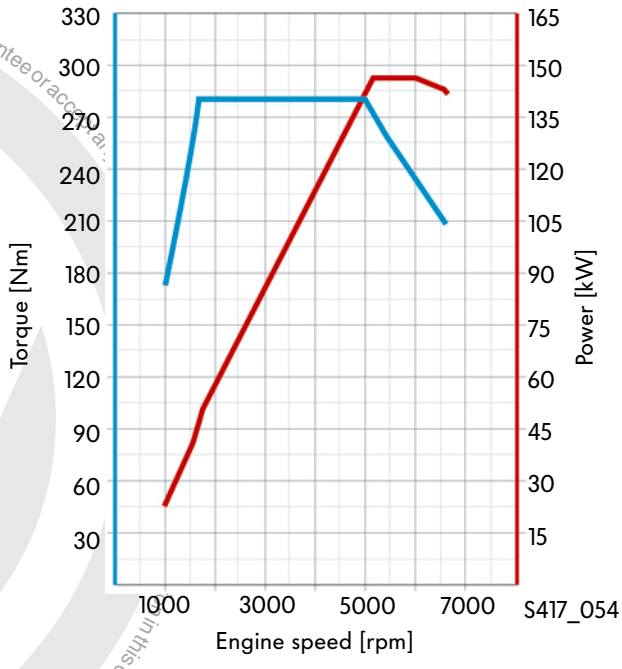
Technical features

- The larger displacement has been achieved with modified pistons, connecting rods and crankshaft.
- The turbocharger pressure canister can NOT be exchanged and adjusted.

Technical data

Engine codes	CAWB
Type	4-cylinder in-line engine
Displacement	1984cm³
Bore	82.5mm
Stroke	92.8mm
Valves per cylinder	4
Compression ratio	9.6:1
Maximum output	147kW at 5100 to 6000 rpm
Maximum torque	280Nm at 1700 to 5000 rpm
Engine management	Bosch Motronic MED 17.5
Fuel	Super unleaded RON 95 (normal unleaded RON 91 with reduction in performance)
Exhaust gas treatment	Starter catalytic converter close to engine, main catalytic converter, a step-type Lambda probe after the starter catalytic converter
Emissions standard	EU4

Torque and power diagram



The 3.6l/220kW FSI engine with 4-valve technology

The 3.6l 220kW FSI engine with 4-valve technology comes from the VR engine range.

S417_042

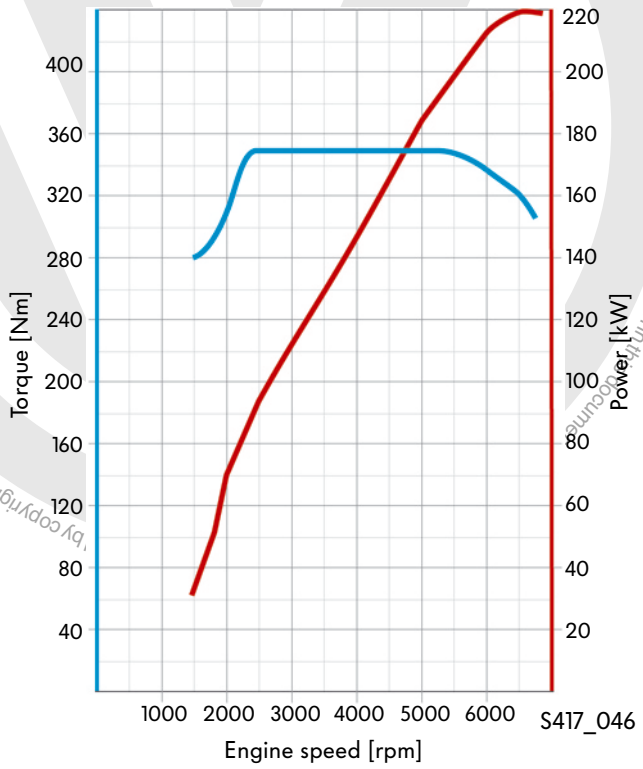
Technical features

- Outside dimensions have been kept
- FSI petrol direct injection
- Four-valve technology with roller rocker arms
- Internal exhaust gas recirculation
- Two-piece plastic variable intake manifold
- Lightweight crankcase made from grey cast iron
- Forged steel crankshaft and forged aluminium pistons
- Camshaft driving chain with integrated drive for high-pressure fuel and vacuum pump
- Continuous inlet and exhaust camshaft timing adjustment

Technical data

Type	6-cylinder VR engine
Displacement	3597 cm^3
Bore	89 mm
Stroke	96.4 mm
V angle	10.6°
Valves per cylinder	4
Compression ratio	11.4 : 1
Maximum output	220kW at 6600 rpm
Maximum torque	350Nm at 2400 – 5000 rpm
Engine management	Motronic MED 9.1
Fuel	Super Plus unleaded at RON 98 (Super unleaded at RON 95 with reduction in performance)
Exhaust gas treatment	Two three-way catalytic converters with Lambda control
Emissions standard	EU4, LEV2

Power and torque development graph



S417_046

The 2.0l 103kW CR TDI engine with 4-valve technology

The new 2.0l/103kW TDI engine with common rail injection system was used for the first time in the Tiguan.
It is based on the 2.0l TDI engine with 4-valve technology and unit injector system.

S417_010

Technical features

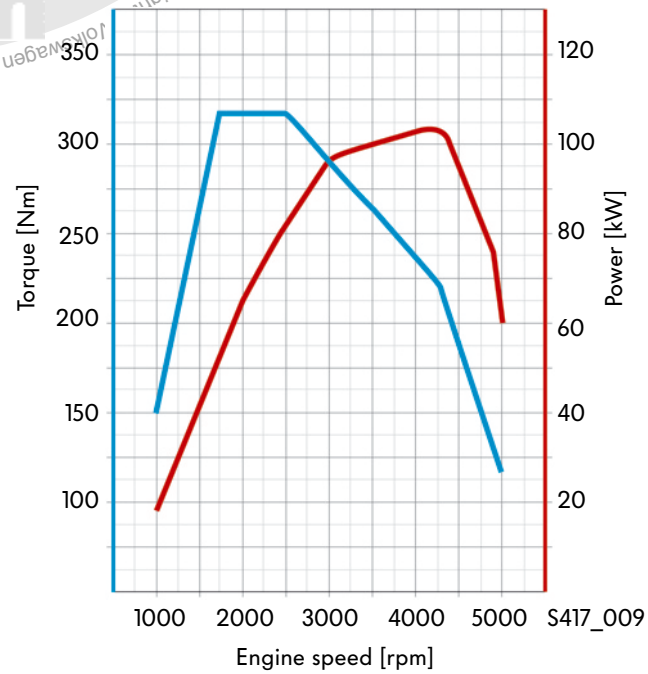
- Common rail injection system with piezo injectors
- Diesel particulate filter with upstream oxidation catalytic converter
- Intake manifold with swirl flap adjustment
- Electric exhaust gas recirculation valve
- Adjustable turbocharger with travel feedback
- Low-temperature exhaust gas recirculation cooling

You will find further information on this engine in self-study programme no. 403 “The 2.0ltr. TDI Engine with Common Rail Injection System”.

Technical data

Engine code	CBAB
Type	4-cylinder in-line engine
Displacement	1968cm^3
Bore	81mm
Stroke	95.5mm
Valves per cylinder	4
Compression ratio	16.5:1
Maximum output	103kW at 4200 rpm
Maximum torque	320Nm at 1750 to 2500 rpm
Engine management	Bosch EDC 17 (common rail fuel injection system)
Fuel	Diesel, in accordance with DIN EN 590
Exhaust gas treatment	Exhaust gas recirculation, oxidation catalytic converter and diesel particulate filter
Emissions standard	EU4

Torque and power diagram



The 2.0l/125kW CR TDI engine with diesel particulate filter

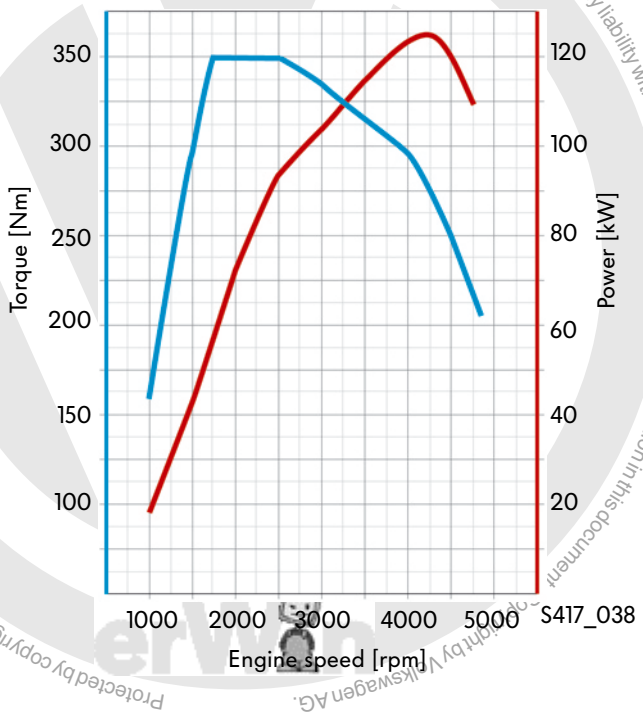
The 2.0l 125kW CR TDI engine with diesel particulate filter corresponds, to a great extent, with the 2.0l 103kW CR TDI engine with 4-valve technology. However, it has a larger turbocharger and the software in the engine control unit has been adapted for increased performance.

S417_010

Technical data

Engine code	CBBB
Type	4-cylinder in-line engine
Displacement	1968 cm^3
Bore	81mm
Stroke	95.5mm
Valves per cylinder	4
Compression ratio	16.5:1
Maximum output	125kW at 4200 rpm
Maximum torque	350Nm at 1750 to 2500 rpm
Engine management	Bosch EDC 17 (common rail fuel injection system)
Fuel	Diesel, in accordance with DIN EN 590
Exhaust gas treatment	Exhaust gas recirculation, oxidation catalytic converter and diesel particulate filter
Emissions standard	EU4

Torque and power diagram

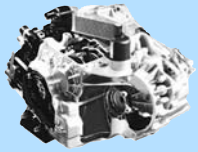
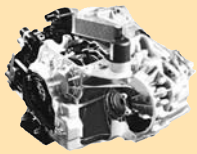
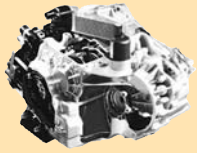


S417_038

Engines

Engine/gearbox combinations

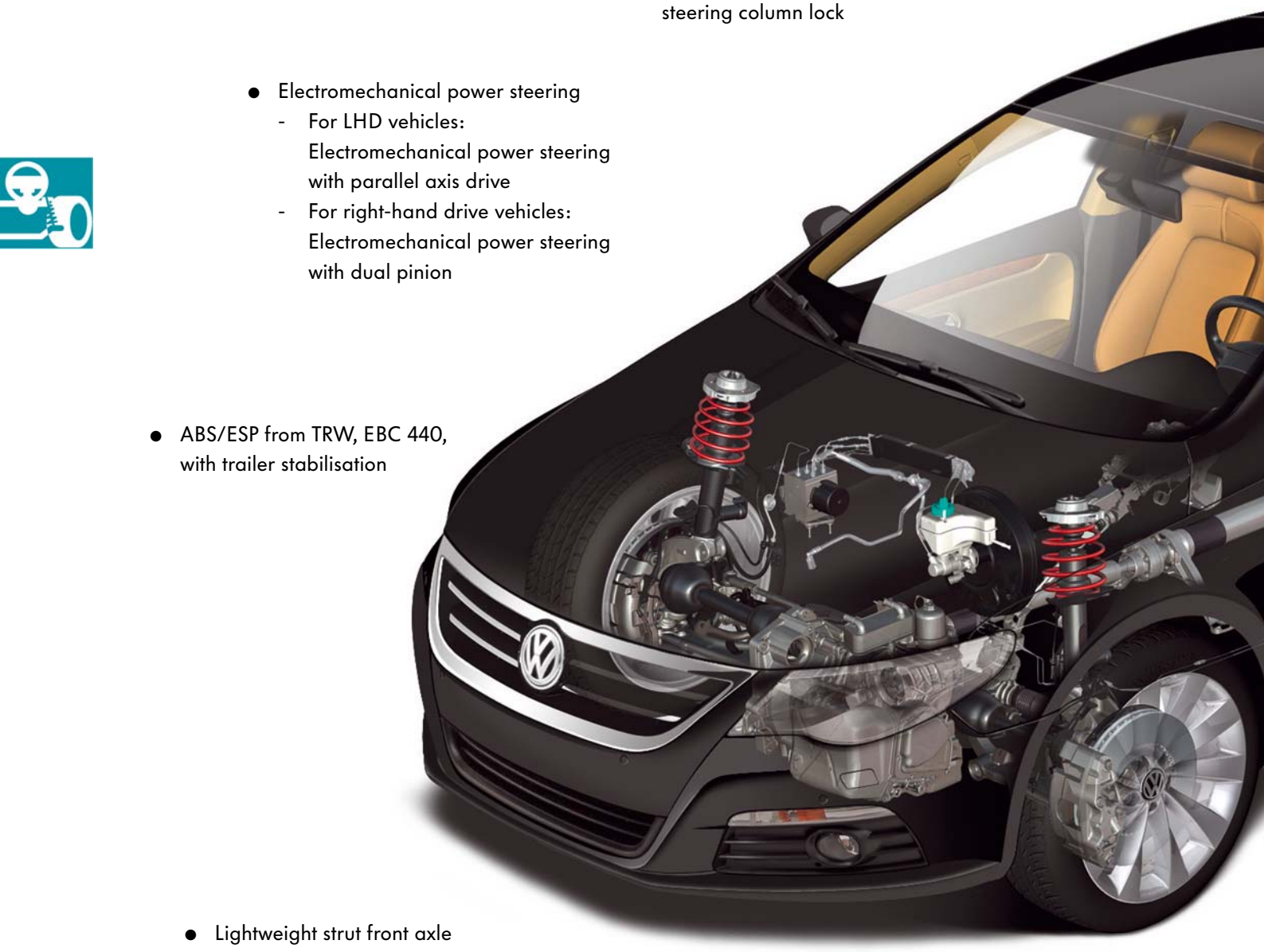
Petrol engine / Diesel engine	6-speed manual gearbox MQ250-6F 02S	6-speed manual gearbox MQ350-6F 02Q
 1.8l 118kW TSI engine with 4-valve technology		
 2.0l 147kW TSI engine with 4-valve technology		
 3.6l 220kW FSI engine with 4-valve technology		
 2.0l 103kW CR TDI engine with diesel particulate filter.		
 2.0l 125kW CR TDI engine with diesel particulate filter.		

6-speed automatic gearbox AQ250-6F 09G	7-speed direct shift gearbox DQ-200-7F 0AM	6-speed direct shift gearbox DQ250-6F DSG 02E front-wheel drive	6-speed direct shift gearbox DQ250+ -6A DSG 02E four-wheel drive
			
			
			
			
			

Overview of chassis

The chassis of the Passat CC is essentially based on the chassis of the Passat 2006. By using the modern McPherson strut front suspension, the four-link rear axle, the electromechanical steering with parallel-axis drive from the Tiguan and the electromechanical parking brake, Volkswagen is employing thoroughly tested technology. The chassis components are supplemented by standard mobility tyres and through the DCC adaptive chassis control.

- Safety steering column with electrical steering column lock



- Electromechanical power steering
  - For LHD vehicles: Electromechanical power steering with parallel axis drive
  - For right-hand drive vehicles: Electromechanical power steering with dual pinion

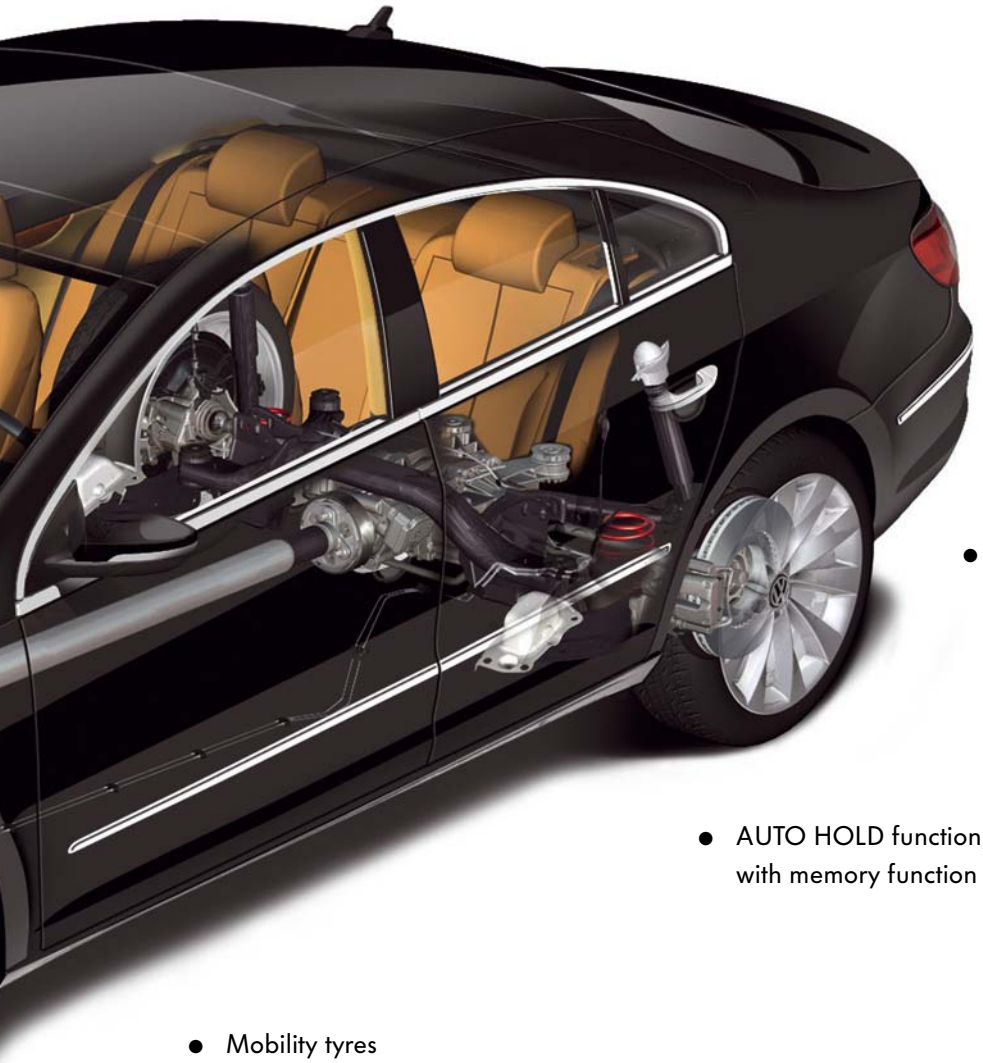
- ABS/ESP from TRW, EBC 440, with trailer stabilisation

- Lightweight strut front axle

- DCC adaptive chassis control

Systems that have been taken from the Passat 2006 include:

- Dynamic auto release
- Tyre pressure monitor system, standard with V6 engine
- Standard tyre pressure monitor display



- Four-link rear axle

S417_144

- Electromechanical parking brake with planetary gear

- AUTO HOLD function, with memory function

- Mobility tyres

You will find further information on the DCC adaptive chassis control in self-study programme no. 406 “DCC Adaptive Chassis Control”.

DCC adaptive chassis control

When it comes to suspension systems, the rule is that a truly noticeable gain in sportiness always comes at the cost of comfort and vice versa. It would therefore be ideal to have a chassis that can constantly adapt itself to the road conditions and the respective needs of the driver. An electrically adjusted suspension system is required for this, however. It is available with the Passat CC, but is only standard with the V6 engine. Not just the damper recognition, but also the configuration of the electromechanical power steering is the controlled. The new system is called DCC adaptive chassis control.

It has three programmes “Normal”, “Sport” and “Comfort”. These are selected using a button to the right of the gear selector. However, the fact that the driving properties are further (permanently) improved in “Normal” mode by the DCC adaptive chassis control is apparent.

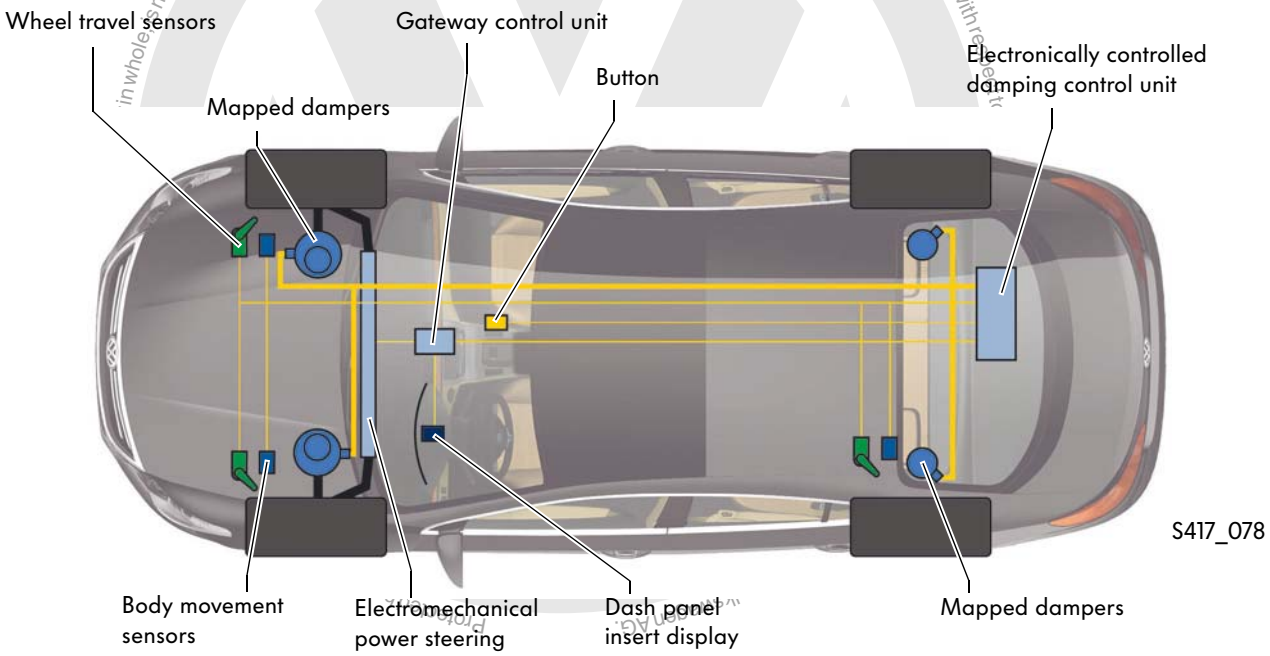
The suspension is constantly adapted to the road and the driving situation. The DCC adaptive chassis control also reacts to acceleration, braking and steering procedures.

S417_080

The conflict of aims between a sporty harder ride and a comfortable configuration has therefore been solved. This is noticeable for drivers and passengers due to the considerably better ride comfort also in “Normal” mode.

In the “Sport” programme, however, the Passat CC becomes an agile sports car as the suspension becomes considerably harder and the steering assistance is reduced simultaneously with a more direct configuration.

The “Comfort” mode is a stark contrast. In particular on bad roads and when driving slowly, the comfort is improved decisively. The suspension characteristics are now similar to those of a luxury saloon like the Phaeton.



The components of the DCC adaptive chassis control include four mapped dampers, a gateway control unit as an interface to the CAN data networks in the Passat CC, the electronically controlled damping control unit, three sensors for measuring the wheel travel and three sensors for measuring the body movement.
The “Normal”, “Sport” and “Comfort” modes are displayed in the dash panel insert.

You will find further information on the DCC adaptive chassis control in self-study programme no. 406 “DCC Adaptive Chassis Control”.

Mobility tyres

The Passat is fitted with special tyres from Continental. The tyre called “Conti Seal” is a mobility tyre. If foreign bodies penetrate the tread, they are enclosed by a viscous sealant.
Holes up to 5mm in diameter that are left when you remove the foreign body are sealed safely. The sealing function lasts the life of the tyre.

The otherwise conventional tyres are given a locally firm, highly viscous polymer layer inside the tyre around the tread in an additional production step.

Unlike other mobility solutions, for example, run-flat tyres with reinforced walls (SST, Self Support Tire) or asymmetric rim systems (PAX), the mobility tyre does not have any concept-related disadvantages like increased rolling resistance, acoustic and mechanical comfort effects or poor uniformity.

S417_052

S417_082

S417_084

Foreign body

Highly viscous polymer layer

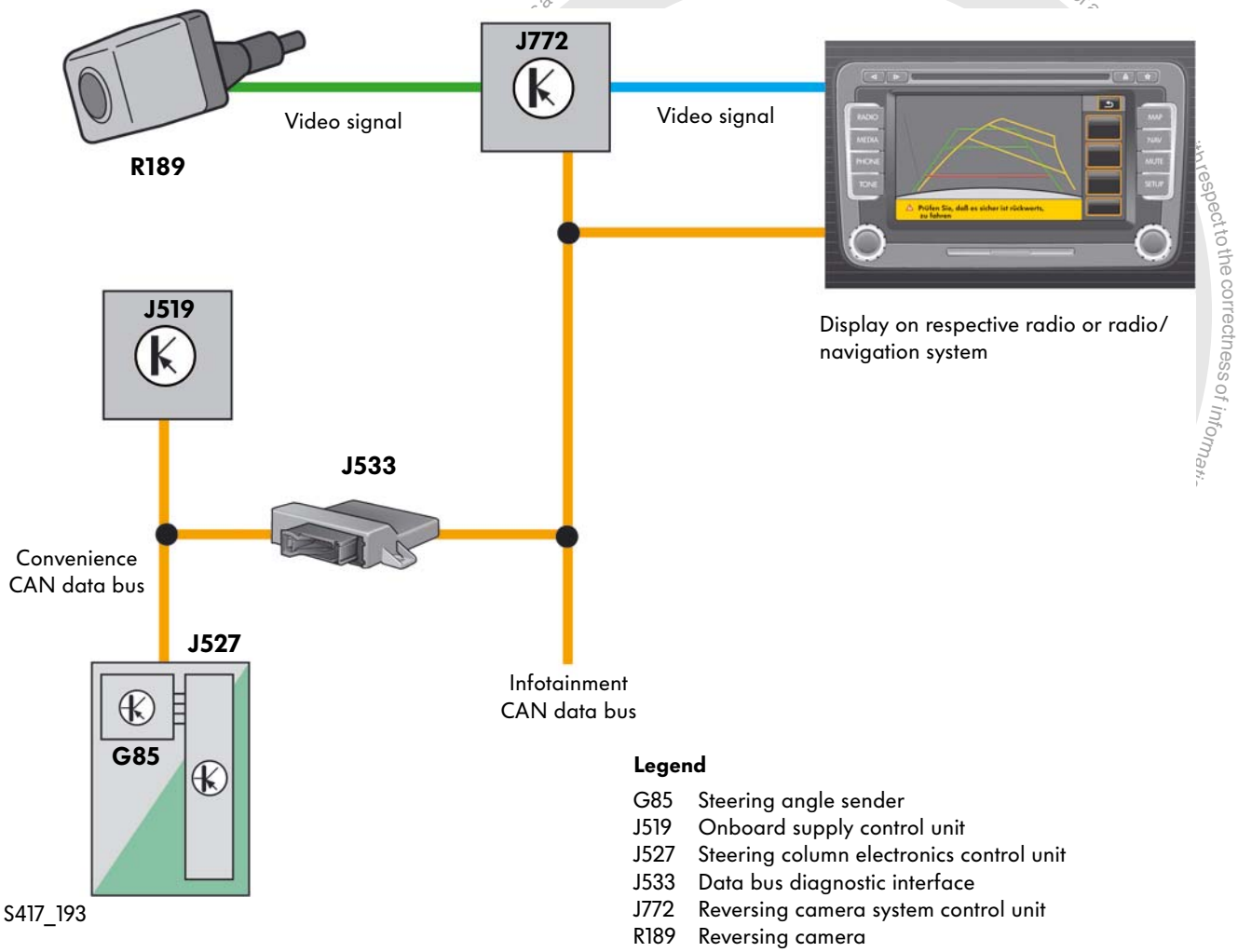
Reversing camera system

The reversing camera system supports the driver while reversing by showing the driver the traffic situation behind the vehicle on a screen.

The reversing camera system consists of the following components:

- reversing camera,
- reversing camera system control unit and
- display screen (e.g. radio or radio/navigation system with reversing camera input).

Design



Legend

G85	Steering angle sender
J519	Onboard supply control unit
J527	Steering column electronics control unit
J533	Data bus diagnostic interface
J772	Reversing camera system control unit
R189	Reversing camera

Convenience electrics

Reversing camera

Two familiar systems have been combined on the Passat CC in a very compact area. The pivoted badge that is used to open the boot lid manually is also the mount for the reversing camera.
The camera is well protected from rain, dirt and the elements behind a protective flap inside the pivoting badge while reverse gear is not selected.

When you select reverse gear, the camera swings out electromechanically, the protective flap and the badge fold out and the camera covers the area behind the vehicle with its wide-angle lens.

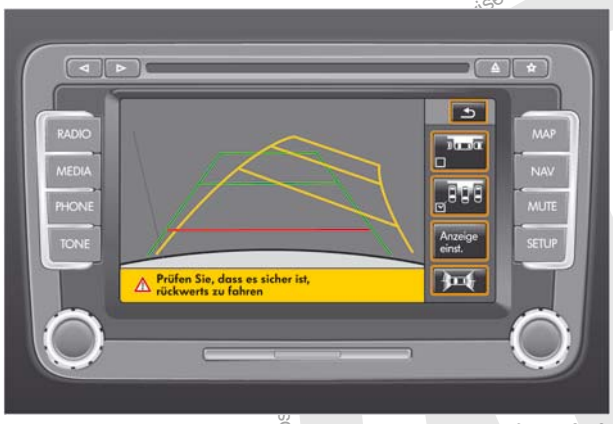
The boot lid cannot be opened while the reversing camera is extended. This is prevented by the “open boot lid” switch signal being suppressed by the camera electronics so that it is not forwarded to the convenience control unit. If you still want to open the boot despite the camera being extended, you have to do so manually using the button in the driver’s door.

When you deselect reverse gear, the reversing camera will fold back in after 9 seconds.
The picture is also still displayed on the screen during this time. If a different menu is required before the end of these 9 seconds, you can switch the screen over on the respective radio or radio/navigation system.

S417_092

Reversing camera system control unit

“Park box” mode



S417_242

“Parallel” mode

S417_244

The reversing camera system control unit has the task of processing the images supplied by the camera and preparing them for output on the display screen of your radio or radio/navigation system.

This includes rectifying the supplied image and adding the static and dynamic helper lines that depict the vehicle with and without steering wheel turn.

Two parking modes are available for the Passat CC:

- for reverse parking in “park box” mode
- for parallel parking in “parallel” mode

The mode should be selected using the buttons on the corresponding radio or radio/navigation system before you start the parking procedure.

You will find further information on the design and function of the reversing camera system in self-study programme. 407 “The Reversing Camera System”.

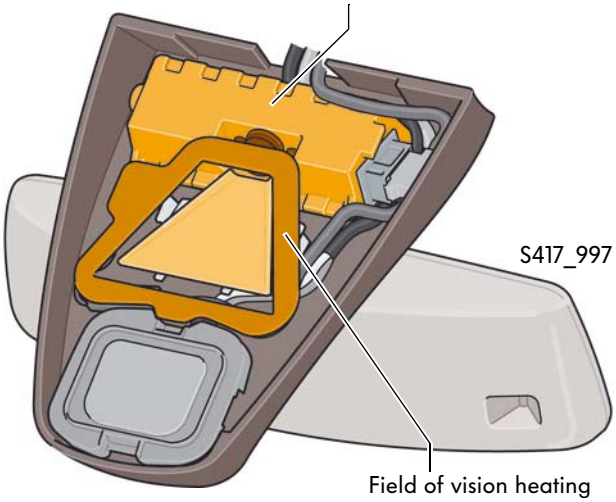
Lane assist

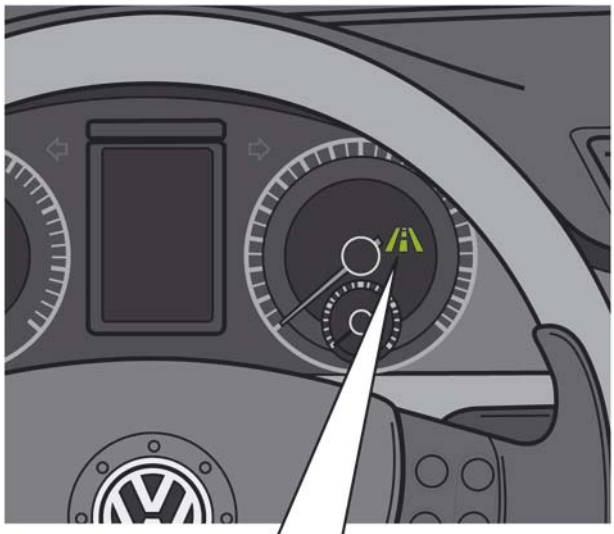
Lane Assist is another driver-assistance system like, the ACC adaptive cruise control or Front Assist (for shortening braking distance 2).
The Lane Assist system has the task of automatically correcting the steering via the drive for the electromechanical power steering if the vehicle is in danger of leaving the lane.
The Lane Assist system monitors the road ahead of the vehicle with the aid of a greyscale camera.

If the road has recognisable lane markings or if the contrast between the road and roadside as well as the centre marking is strong enough, the Lane Assist system will calculate a virtual lane taking safety aspects into account.

If the vehicle seems to be leaving this virtual lane, there is an automatic steering correction. A maximum steering moment of up to 3Nm is applied. If this is not sufficient or the correction intervention takes too long, the driver is warned about the situation by a vibration, among other things, and is asked to take over the steering.

You will find detailed information on the function and operation of the Lane Assist system in self-study programme no. 418 “Lane Assist”.





Warning lamp for Lane Assist

Lane Assist
switched off

Lane Assist
switched on and
in active mode

Lane Assist
switched on and
in passive mode

S417_998

Components and operation

The greyscale camera in the Lane Assist control unit is the centrepiece of the Lane Assist system.
Other system components are the Lane Assist warning lamp and the field of vision heating for Lane Assist.
The warning lamp indicates the operating mode of the Lane Assist system.
The field of vision heating for Lane Assist ensures that the area of the windscreen in the camera image does not fog up or become covered with condensation.
This ensures that the camera can see the road ahead properly.

The Lane Assist can be switched on and off with the button for driver assistance systems on the front of the turn signal lever. If the Lane Assist system recognises clear road boundaries within its system limits, the system switches to the active operating mode in which steering correction can be performed.

If road markings cannot be detected or other operating conditions are not fulfilled, the Lane Assist system will switch to passive mode. Now there will be no steering correction or warning, the system will, however, continue to monitor the road and immediately switch back to active mode once the conditions for this have been met, i.e. a clear lane can be recognised among other things.

Multifunction steering wheel

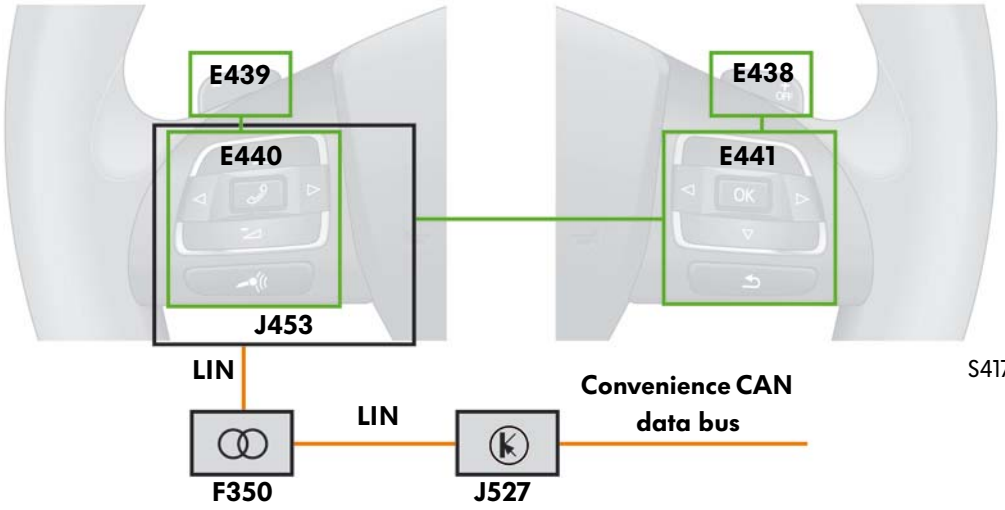
A new multifunction steering wheel is being used in the Passat CC. The familiar horn button and the integrated driver airbag unit are located in the centre of the multifunction steering wheel. There are now 6 instead of 4 multifunction buttons to the left and right. This increases the user-friendliness. The back function can be used directly with a new button.

The new multifunction steering wheel has 12 multifunction buttons. These buttons are used to operate among other things:

- the radio or navigation unit,
- the telephone and
- the cruise control system

S417_146

There are two more controls on the back of the multifunction steering wheel in the form of paddles. If the car has an automatic or DSG gearbox, these buttons can be used to select the gear.



S417_252

The electrical connection between the steering wheel electronics and the onboard supply is formed by a coil connector in the steering wheel. Data is transferred between the two components via the LIN data bus.

Legend

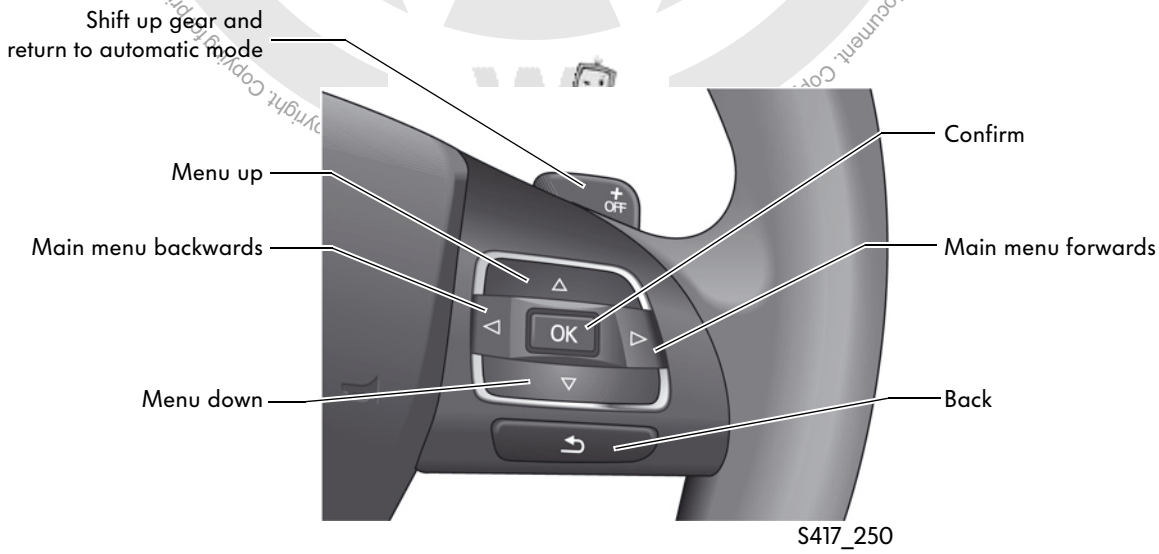
E438 - Tiptronic switch in steering wheel to shift up
E439 - Tiptronic switch in steering wheel to shift down
E440 - Multifunction buttons on left in steering wheel
E441 - Multifunction buttons on right in steering wheel
F350 - Coil connector
J453 - Multifunction steering wheel control unit
J527 - Steering column electronics control unit

Button assignment

Buttons on left

S417_248

Buttons on right



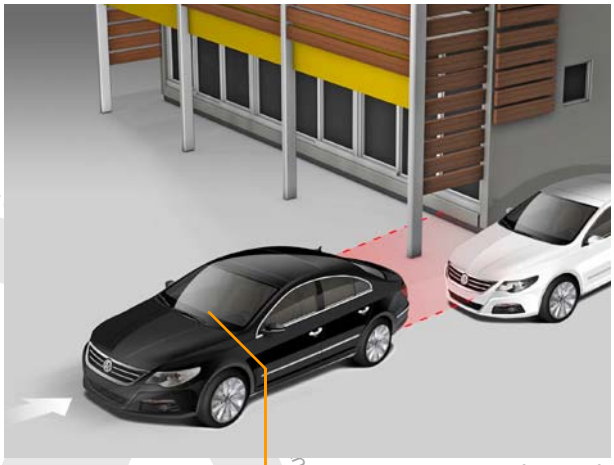
S417_250

Optical parking system

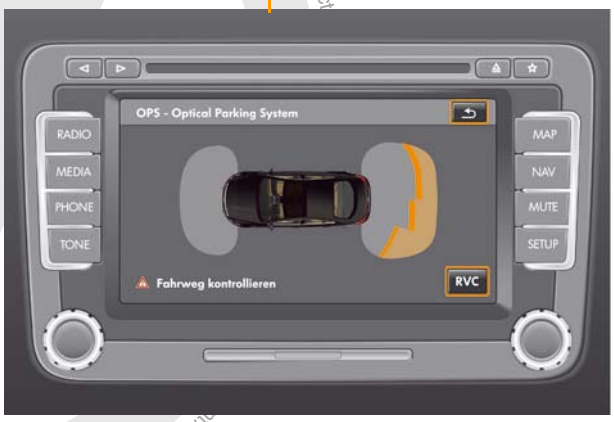
The optical parking system (OPS) is being used for first time in the Passat CC. It is a software expansion for the parking aid.

The park distance control system uses ultrasound sensors and an acoustic warning to help the driver judge the distance from other parked cars or obstacles. Only the warning from the sensor closest to the obstacle is supplied.

The optical parking system does not only generally detect obstacles in front of or behind the vehicle, but also its position in the scanning area. Now the driver is supported not only acoustically, but also optically. During the parking manoeuvre, OPS displays a diagram of the vehicle on the radio or navigation system screen that is surrounded by coloured areas. These coloured areas show the exact position and distance from obstacles for the driver.
The OPS allows a low-cost graphic display to be provided without discrete display elements (e.g. LED bar). The driver can quickly detect the position of the obstacles and navigate more precisely. The picture is switched off above 15km/h.



S417_179



S417_181

Function

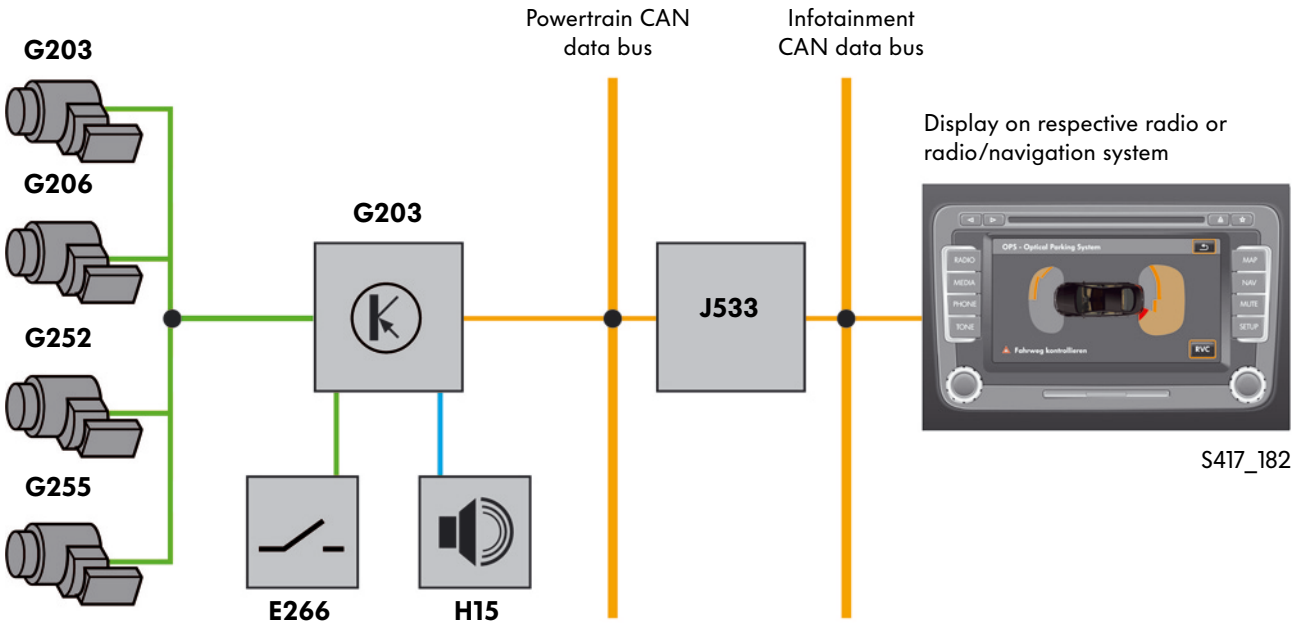
The optical parking system is activated using the parking aid button or by selecting reverse gear. Using the four ultrasound sensors that are located at the front and rear, the distance from an object in front of and behind the vehicle is determined by the parking aid control unit.

If the vehicle reaches a specific distance from this object, there is an acoustic warning from the rear parking aid warning buzzer.

OPS is achieved by the parking aid control unit evaluating the distance information according to sector and transferring it to the screen.

The BAP operating and display protocol is used on the CAN bus for this.

The received data is converted into a graphical display in the BAP-compatible RCD 310/510 radio or RNS 510 navigation system.



Legend

E266 - Parking aid button
G203 - Rear left parking aid sender
G206 - Rear right parking aid sender
G252 - Front right parking aid sender
G255 - Front left parking aid sender
H15 - Parking aid warning buzzer
J446 - Parking aid control unit
J533 - Data bus diagnostic interface

The radio systems in the Passat CC 2009

The RCD 310 and RCD 510 radio systems as well as the RNS 300 and RNS 510 radio navigation systems are available for the Passat CC.

RCD 310 radio

- FSTN monochrome display, (FSTN=Film-Super-Twisted-Nematic, i.e. liquid-crystal display)
- Twin tuner with phase diversity
- Integrated DAB tuner (digital radio) (depending on equipment)
- Integrated CD drive
- Media support for MP3 and WMA audio data (with ID3-Tag)
- Optical parking system (OPS)
- Climate control information
- RDS FM/AM Europe radio
- Two or four loudspeakers with up to 20 Watt output can be connected
- GALA speed-dependent volume control
- Self-diagnosis and loudspeaker diagnosis
- TP button; stations that do not broadcast TP information will be displayed with “No TP”.
- CAN
- BAP operating and display protocol
- Convenience coding

S417_218

S417_184

Button assignment for version with DAB

Combination and expansion possibilities

- Universal mobile phone preparation
- Support of display on dash panel insert via the BAP operating and display protocol as well as the DDP display data protocol
- External amplifier can be controlled
- Control via multifunction steering wheel (MFW) and multifunction display (MFD)
- External CD changer (without MP3 support)
- Audio input interface (AUX-IN)
- Media Device Interface (MDI)

The ID3 tag is additional information that can be contained in MP3 audio files. ID3 stands for “Identify an MP3”. “Tag” is simply a label attached to the file. MP3 files can, but do not have to contain ID3 tags. The ID3 tag is part of the MP3 file. The most important content of the ID3 tag is the artist, the name of the album and the name of the music track.

RCD 510 radio

S417_210

Combination and expansion possibilities

- External sound amplifier
- Support of display on dash panel insert via the BAP operating and display protocol as well as the DDP display data protocol
- Universal mobile phone preparation
- Compatible, external telematics units
- Control via multifunction steering wheel
- External CD changer (without MP3 support)
- Media Device Interface (MDI)
- Touch-sensitive 6.5" TFT colour screen with a resolution of 400 x 240 pixels
- Twin-tuner for FM, TP and RDS reception
- Integrated aerial diversity for two aerials
- AM reception
- Two or four loudspeakers with up to 20 Watt output can be connected
- Integrated 6-CD changer
- Integrated memory for TIM information (depending on equipment)
- Integrated DAB tuner (digital radio) (depending on equipment)
- SDARS tuner (SAT radio) (depending on equipment)
- Integrated SD memory card reader (SD=Secure Digital)
- Media support for MP3 and WMA audio data
- Audio input interface (AUX-IN)
- Interface for connecting a reversing camera in the radio unit version
  RCD 510 RVC (Rear View Camera)
- Self-diagnosis and loudspeaker diagnosis
- Display of climate control conditions (information displayed temporarily)
- Optical parking system (OPS)

RNS 300 radio/navigation system

- 5" monochrome display
- Two or four loudspeakers with up to 20 Watt output can be connected
- RDS FM/AM Europe radio
- FM single tuner with an aerial
- Integrated CD drive (MP3-compatible)
- Display of navigation symbols on dash panel insert (only on Highline version of dash panel insert control unit)
- Route guidance using symbols and speech
- Navigation without inserted navigation CD (corridor function)
- Dynamic guidance with TMC
- CD navigation
- Media support for MP3
- BAP operating and display protocol

S417_216

Combination and expansion possibilities

- Universal mobile phone preparation
- Support of display on dash panel insert via the BAP operating and display protocol as well as the DDP display data protocol
- Optionally combinable with multifunction steering wheel
- Optionally combinable with external CD changer (CDC)
- Media Device Interface (MDI)

You will find detailed information on the RNS 300 radio/navigation system in self-study programme no. 397 “2007 Radio/Navigation Systems”.

RNS 510 radio/navigation system

S417_214

Combination and expansion possibilities

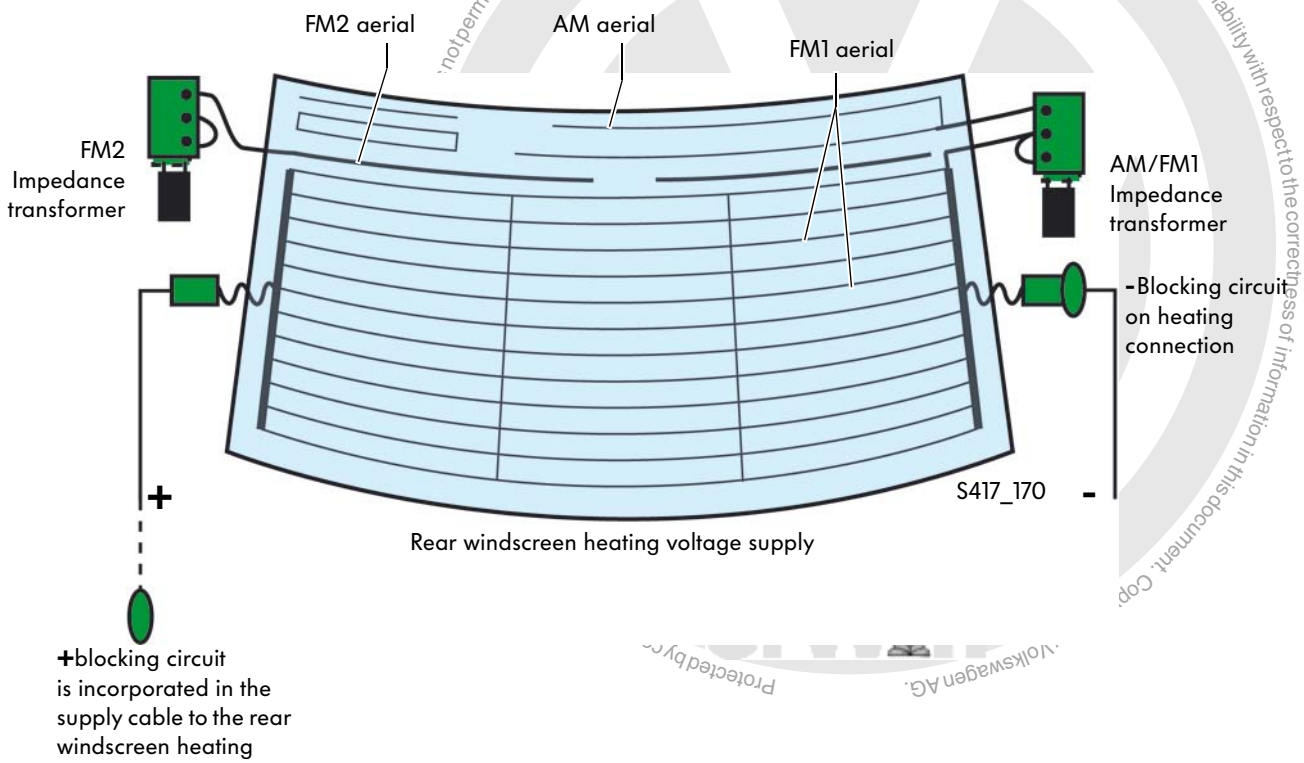
- Controllable via multifunction steering wheel
- Support of display on dash panel insert via the BAP operating and display protocol as well as the DDP display data protocol
- Optionally combinable with Volkswagen sound and Dynaudio as well as Volkswagen TV tuner
- Display of navigation symbols by the dash panel insert control unit (Highline)
- Video or TV playback from external sources, e.g. DVD player, reversing camera
- Transfer of video signals for external display units, e.g. rear-seat entertainment (RSE)
- Audio playback of external sources like, e.g. CD players, iPods
- Universal mobile phone preparation
- Media Device Interface (MDI)
- Touch-sensitive 6.5" multi-colour display (MFD) with a resolution of 800 x 480 pixels
- Two or four loudspeakers with up to 20 Watt output can be connected
- RDS, FM and AM Europe radio
- FM twin tuner with two aerials
- Integrated DAB tuner (digital radio) (depending on equipment)
- SDARS tuner (depending on equipment)
- Integrated DVD drive for navigation, audio and video
- Integrated drive hard for storing navigation and audio data
- Integrated SD memory card reader
- Media support for MP3 and WMA audio and video data
- Map display in 2D, 3D bird's eye view and topographical view
- Navigation function with map, split screen and speech
- TMC function (the current traffic messages are stored), dynamic navigation (Europe, North America)
- Off-road functions
- 3 user interfaces (styles) can be programmed, encoded depending on model at factory
- Display of climate control conditions (information displayed temporarily)
- Optical parking system (OPS)

You will find detailed information on the RNS 300 radio/navigation system in self-study programme no. 397 "2007 Radio/Navigation Systems".

Aerial concept in Passat CC 2009

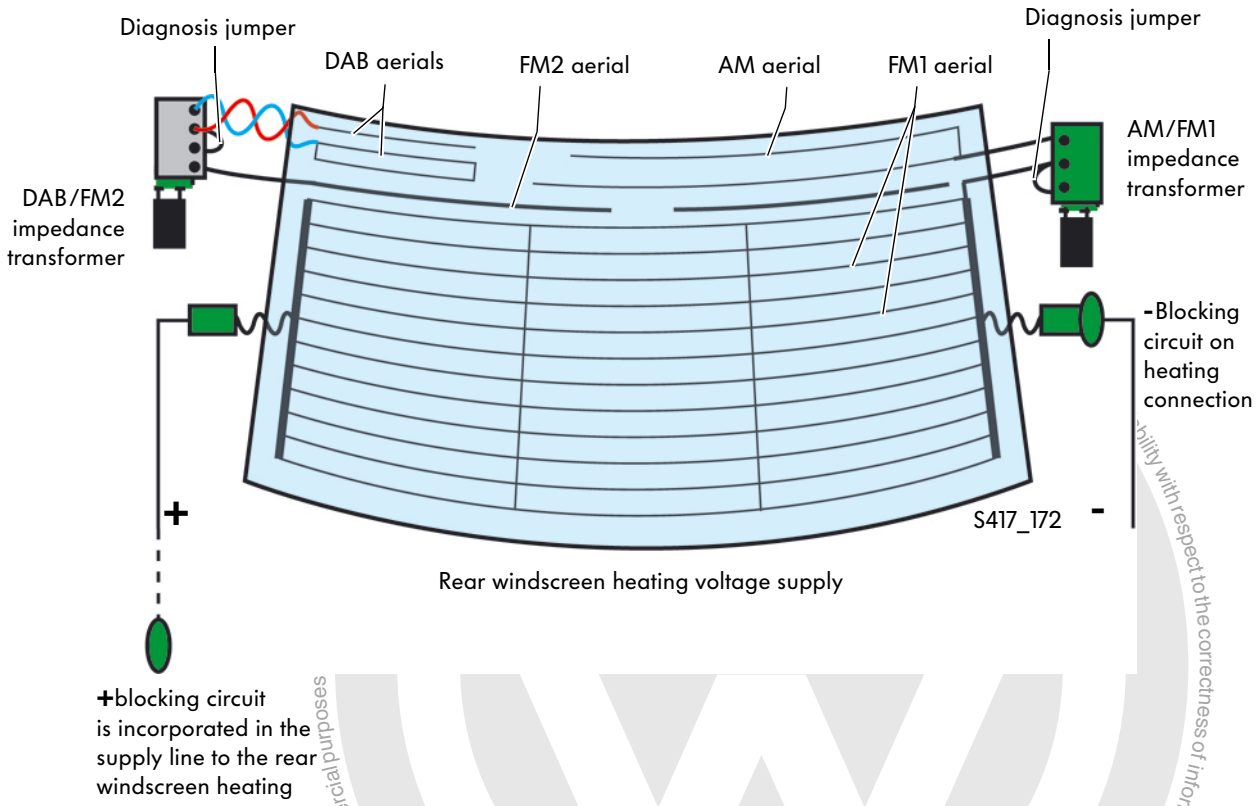
Several aerials are integrated in the rear windscreen of the Passat CC. The aerials for navigation (GPS), telephone (GSM) and auxiliary heating (FFB) are accommodated in a roof aerial.
The impedance transformer (amplifier) for the AM and FM systems are mounted in the C-pillars on the left and right. The connections to the aerial amplifiers are adapted to the equipment in the vehicle. Only the connections that are actually required by the infotainment components (radio, telephone, navigation, TV, etc.) are provided on the window. The different radio tuner principles lead to different FM aerial systems being fitted in the vehicle.

Aerial version without DAB



The minus blocking circuit is connected directly to the minus connection of the rear windscreen heating (right).
The plus blocking circuit is in the supply cable of the rear windscreen heating connection (left).
As the aerial structure for AM does not have a connection to the heating structure, an AM blocking circuit is not required.

Aerial version with DAB

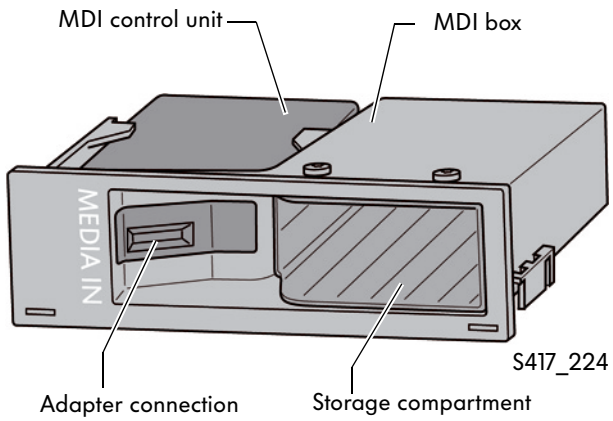


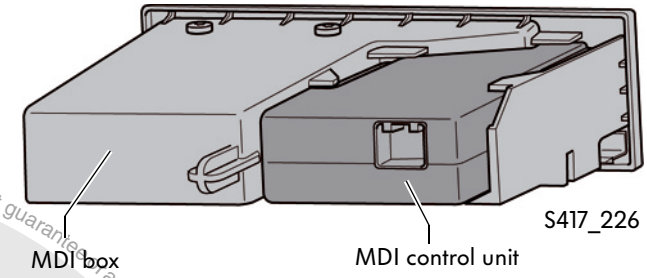
Media Device Interface box

The media device interface, or MDI for short, allows passengers in the Passat CC to connect their mobile audio or multimedia devices, e.g. iPod, MP3 players or USB sticks, to the infotainment system and display, select and play the audio content over the vehicle speaker system or the infotainment monitors.

Location

The MDI control unit is accommodated in a plastic case of the MDI box. The MDI box has a safe and anti-slip facility for you to place the mobile multimedia device and is single DIN size. The MDI box is fitted in space for the CD changer. Thus, only one device can be fitted at any one time in the Passat CC.

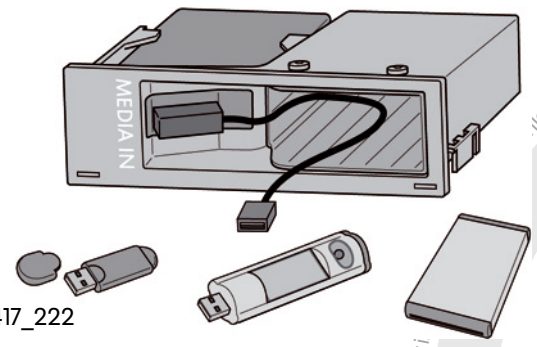




Connection possibilities

The mobile device is connected depending on the type with a special adapter cable that is optionally connected to the central interface, the adapter connection. The following audio formats are currently supported and can thus be played back: MP3, WMA and OGG Vorbis (license-free audio data compression Codec). The AAC format that is also supported is a licensed format from Apple.

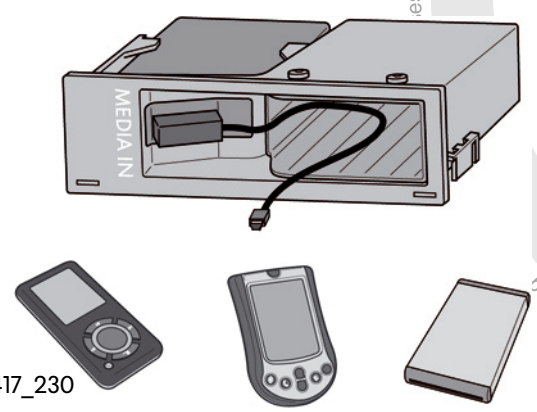
Connection possibilities with USB adapter cable



S417_222

USB sticks, MP3 player and USB hard drives can be connected via the USB adapter cable.

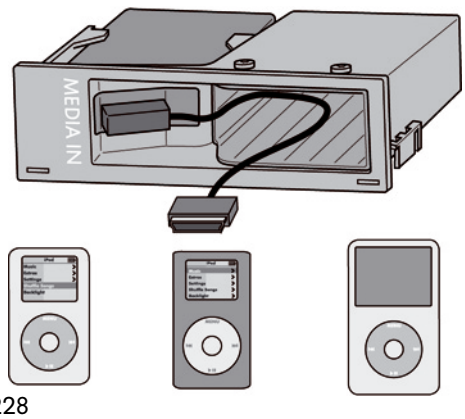
Connection possibilities with mini USB adapter cable



S417_230

MP3 players, telephone/communicators and MiniUSB hard drives can be connected via the mini USB adapter cable.

Connection possibilities with adapter cable for iPod



S417_228

Different iPods can be connected via the adapter cable for iPod.
On the display unit, which has to support the operating and display protocol (BAP), the same audio playback lists are shown as on the iPod.

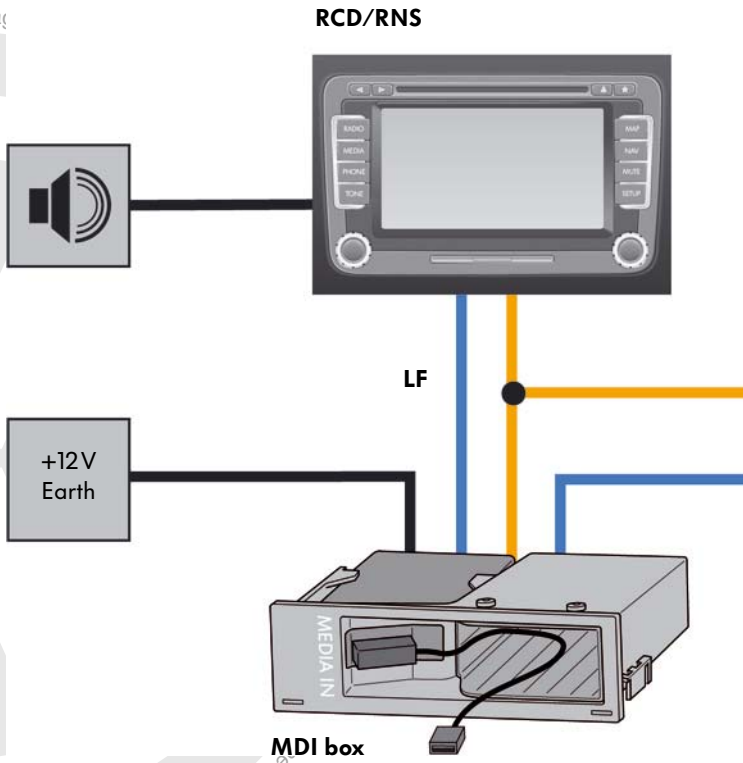
Radio, Navigation and Telephone

Task

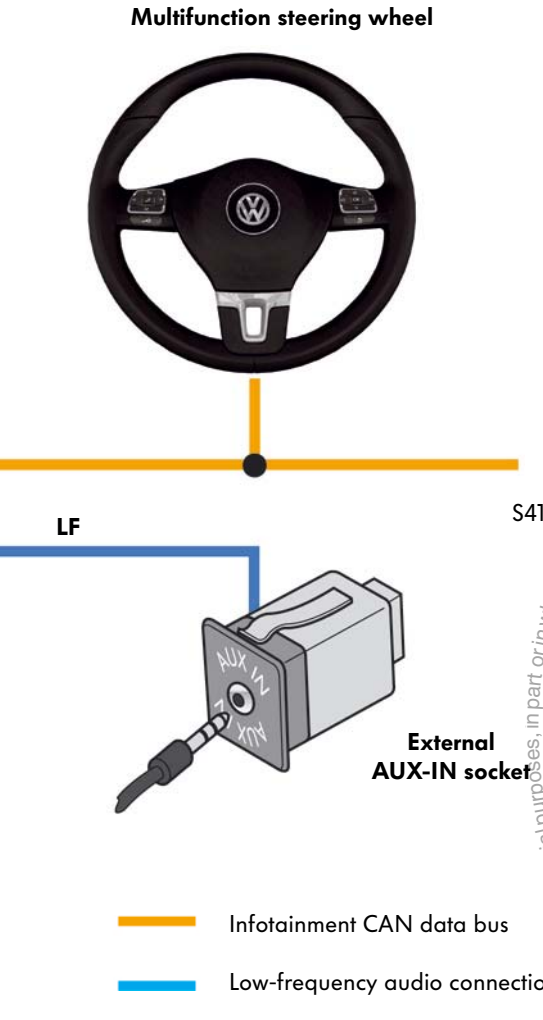
The media device interface is an interface control unit for connecting a wide range of media devices to the vehicle's infotainment network.

As an interface control unit, the MDI has to ensure that the media unit is adapted to the vehicle infotainment system both on the physical side (connector compatibility) and also by the software. Furthermore the infotainment system has to be informed by the MDI that a new data memory is available from which music, for example, can be read and played back.

Finally the MDI should allow the recognised unit to be controlled via the radio or radio/navigation system.



If only the AUX-IN socket is fitted in the vehicle, it is connected directly to the AUX input of the fitted RCD/RNS radio or navigation system. If the vehicle also has a Media-Device-Interface, the optional AUX-IN socket is connected to the MDI box as the AUX input of the radio is already occupied by the MDI.



How it works

The MDI box is connected to the vehicle data network via the infotainment CAN data bus and is connected directly to the 12-volt power supply. The connected media devices are thus also loaded automatically.

The adapter connection and an additional external audio input (AUX-IN) serve as inputs.

Using the MDI requires a display device with operating and display protocol (BAP) as it can only be controlled with this via the CAN bus. The MDI itself does not have a control facility. BAP-compatible devices are currently the RDC 510 and RCD 310 as well as the RNS 510.

To tackle the many tasks, the MDI box has a range of internal software and hardware modules.
In addition to a diagnosis and a CAN data bus interface to the vehicle system, the MDI has a separate decoding module for the MP3, WMA, OGG and AAC (Apple) audio formats.

The MDI also has a control module to recognise the provided data, interpret the control signals for the connected devices like iPod or MP3 player and translate them for the infotainment controls like, for example, the touch screen of the RCD 510 and RNS 510.

On this user interface, the user can then navigate through the folders or playlists.

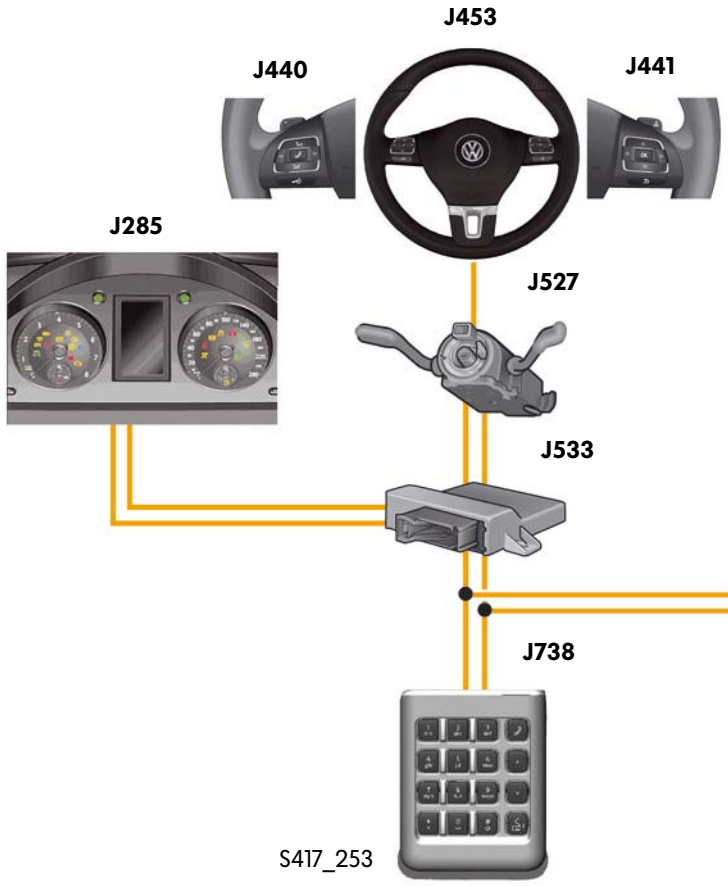
Universal mobile phone preparation

Two telephone preparations are available for the Passat CC: The UMPP Premium with Bluetooth™ as used in the 2006 Passat estate and the UMPP Low with audio streaming that is being used for the first time in the Passat CC.

Premium phone preparation with Bluetooth™

Functions

- Operation via the multifunction steering wheel and the keypad on the instrument panel
- Display of telephone information on the Highline dash panel insert
- Telephone data transfer and mobile link via Bluetooth™ transfer
- Hands-free system and audio mute
- GSM aerial directly on universal preparation amplifier module
- SIM data incl. telephone book available in universal mobile phone preparation
- Separate button module for information and breakdown calls
- The phone holder can be connected for charging purposes
- Follow-up time can be set to up to 60 minutes
- Self-diagnosis

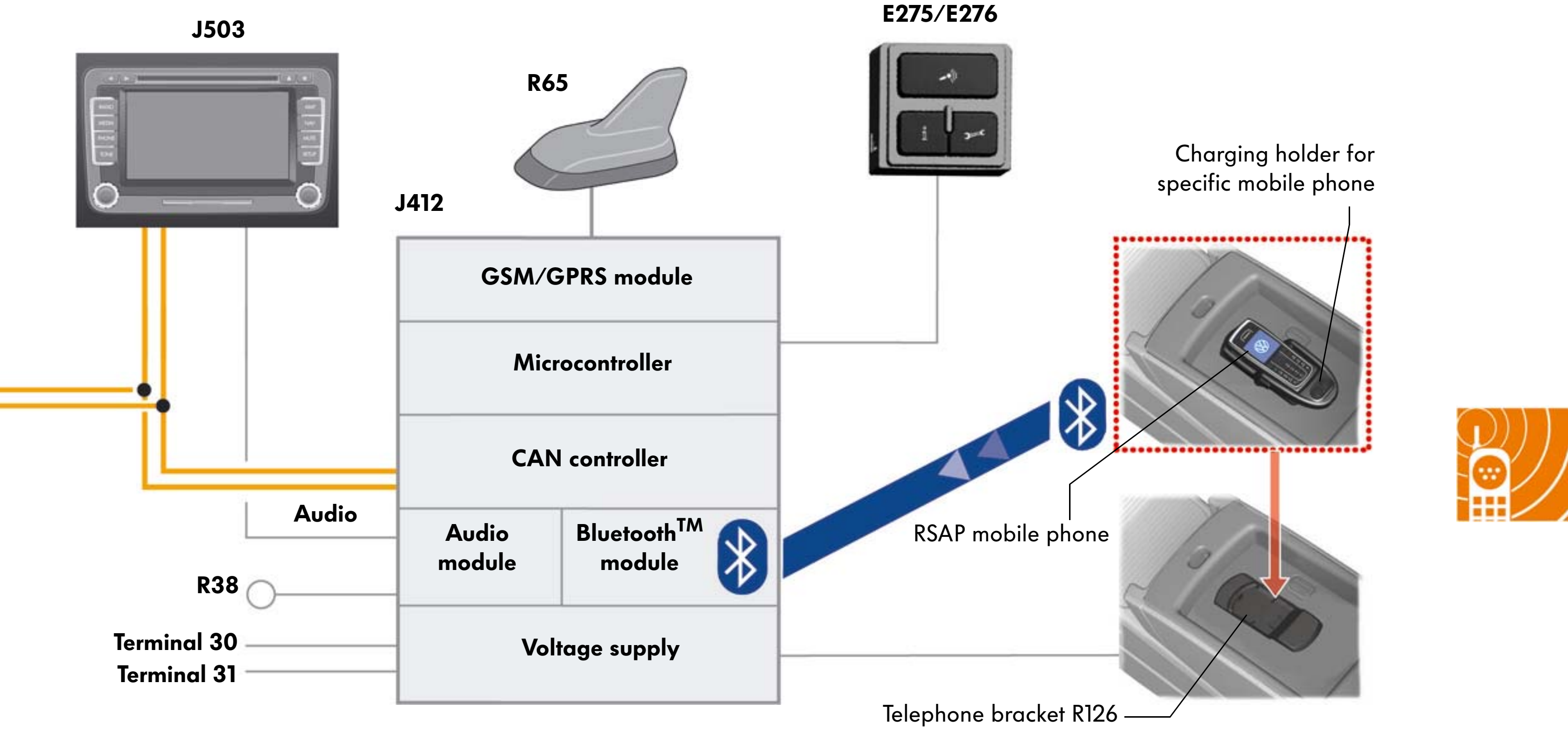


You will find further information on the premium phone preparation with Bluetooth™ in self-study programme no. 356 “The Passat Estate 2006”.

You will find more detailed information on the universal telephone preparation in self-study programme no. 345 “Universal Telephone Preparation”.

Essential technical and functional features:

- Wireless phone integration
  You can leave your phone in your jacket pocket.
- The mobile phone itself does not transmit via GSM in the car. Only Bluetooth™ remains active
- Greater reception and transmission power due to separate GSM module in universal telephone preparation control unit.
- No separate SIM card (twin card) needed for universal telephone preparation operation.
- The mobile phone needs to be programmed to use the phone system control unit before you use the system for the first time (Bluetooth™ pairing).



Legend

E275 - Breakdown assistance call button
E276 - Emergency assistance call button
E440 - Multifunction buttons on left in steering wheel
E441 - Multifunction buttons on right in steering wheel
J285 - Control unit in dash panel insert
J412 - Mobile telephone operating electronics control unit
J453 - Multifunction steering wheel control unit
J503 - Control unit with display for radio and navigation
J527 - Steering column electronics control unit
J533 - Data bus diagnostic interface
J738 - Telephone controls control unit
R38 - Telephone microphone
R65 - Telephone aerial
R126 - Telephone bracket

CAN data bus
LIN data bus
Serial cable
Optional
Bluetooth™

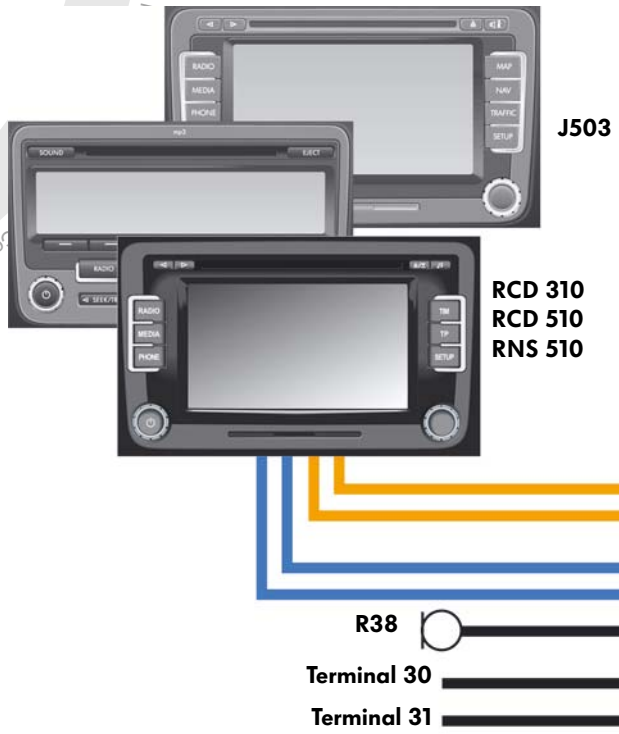
UMPP Low (Bluetooth only) with audio streaming

Bluetooth™ technology is used to connect mobile phones to the vehicle hands-free system. Two Bluetooth profiles are used for UMPP Low with audio streaming:

- HFP stands for Hands-Free Profile and is a Bluetooth profile for the telephone audio/speech channel. Pure speech data is transferred here.
- Transfer of music data is now also possible using the new Bluetooth profile A2DP audio streaming. A2DP stands for Advanced Audio Distribution Profile and is a special Bluetooth profile, just like rSAP on the UMPP Premium, that is not part of the standard Bluetooth connection. The A2DP profile allows music files to be transferred unidirectionally to the UMPP control unit via a stereo audio stream. Considerably higher data quantities are transferred than with pure speech data.

Legend

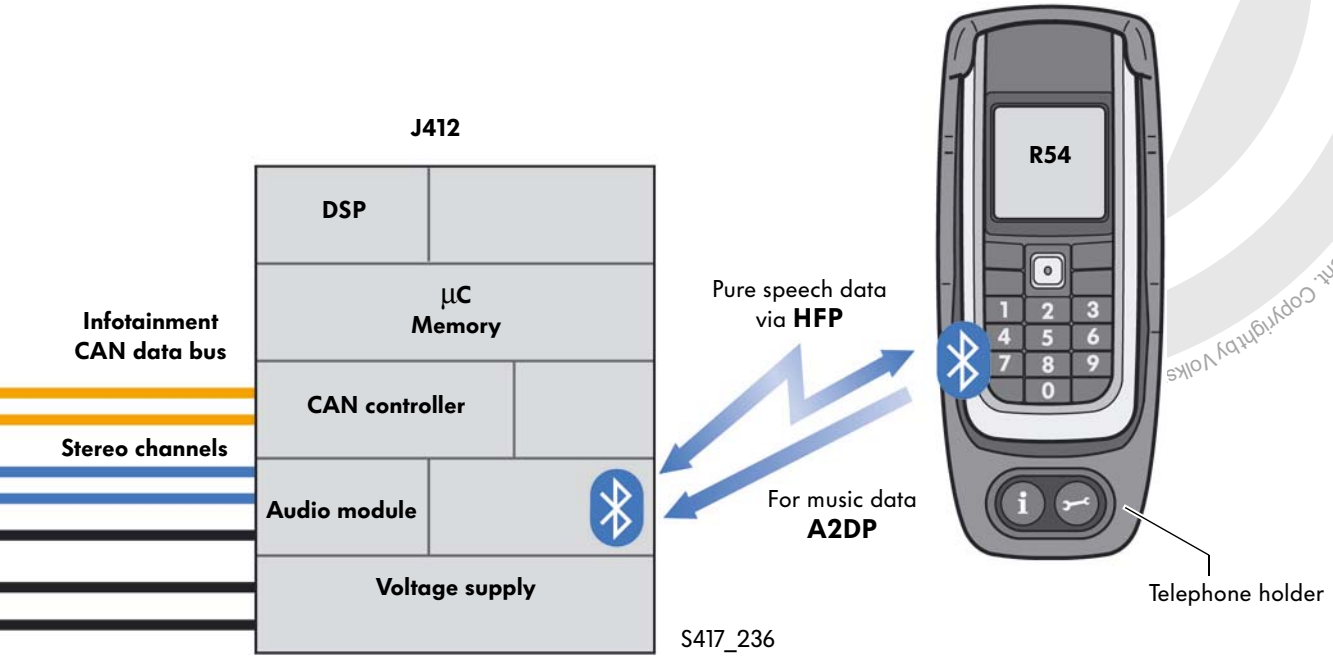
J412 - Mobile telephone operating electronics control unit
J503 - Control unit with display for radio and navigation
R38 - Telephone microphone
R54 - Mobile telephone



Mobile phones are always connected to the VW UMPP via Bluetooth. The mobile phone and the UMPP control unit therefore **need** to be paired with each other before being used for the first time.

Functions

- The operation and display is on the mobile phone.
- It has a hands-free system and radio mute switching.
- The phone is charged via the phone holder.
- The info and breakdown buttons are located on the mobile phone holder. These signals are transferred via a discreet cable connection.
- There is a CAN data bus interface to the Infotainment CAN data bus.
- Data is transferred between the mobile telephone and the mobile telephone operating electronics control unit via Bluetooth™.
- This UMPP is diagnosis compatible.
- The follow-up time can be set (max. 60 minutes).



You will find more detailed information on the universal telephone preparation in self-study programme no. 345 “Universal Telephone Preparation”.

A new telephone holder is required to charge Nokia telephones in the Passat CC.

Air conditioning

S417_159

Two different types of air-conditioning system are fitted in the Passat CC that have also already been used in the Passat 2006:

- The semi-automatic heater and air conditioner “Climatic”
- The fully automatic “2C-Climatronic” heating and air-conditioning system

Operation

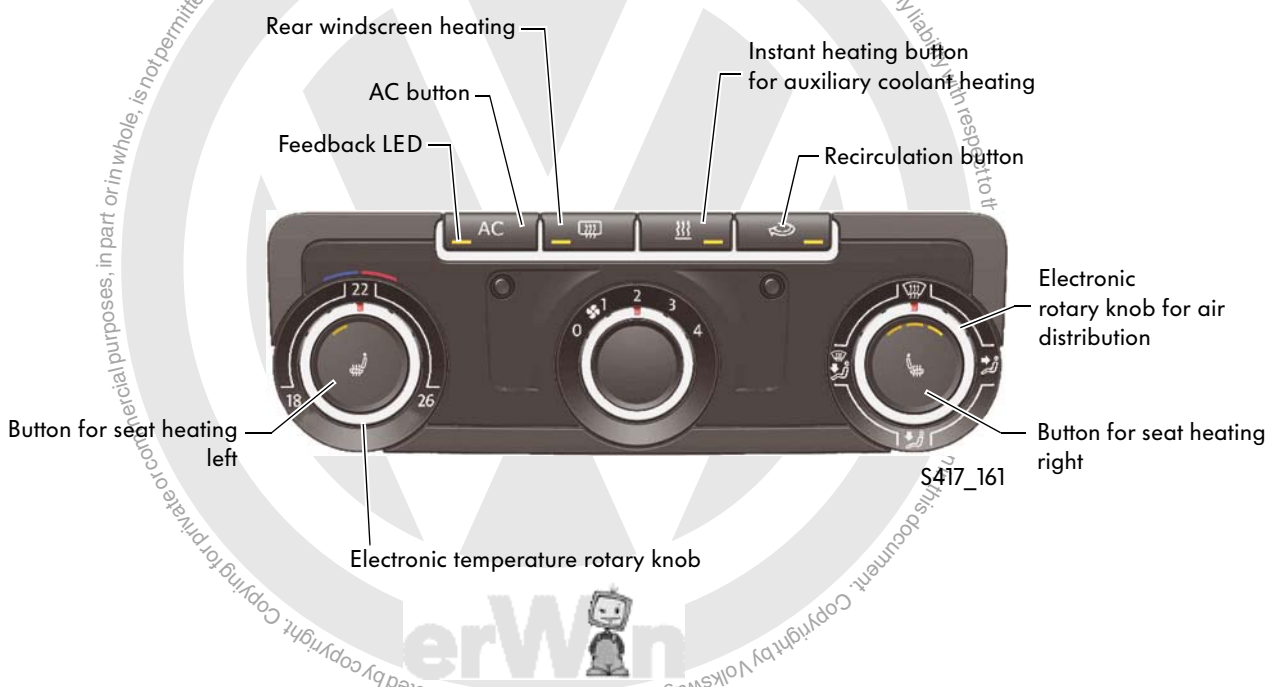
New controls are being used for the first time that come in different versions depending on the equipment fitted:

- with and without instant heating button for auxiliary coolant heating
- with and without button for seat heating
- with or without button for heated windscreen

You will find further information on the air-conditioning systems in self-study programme no. 318 “The 2004 Golf ” and in self-study programme no. 339 “The Passat 2006”.

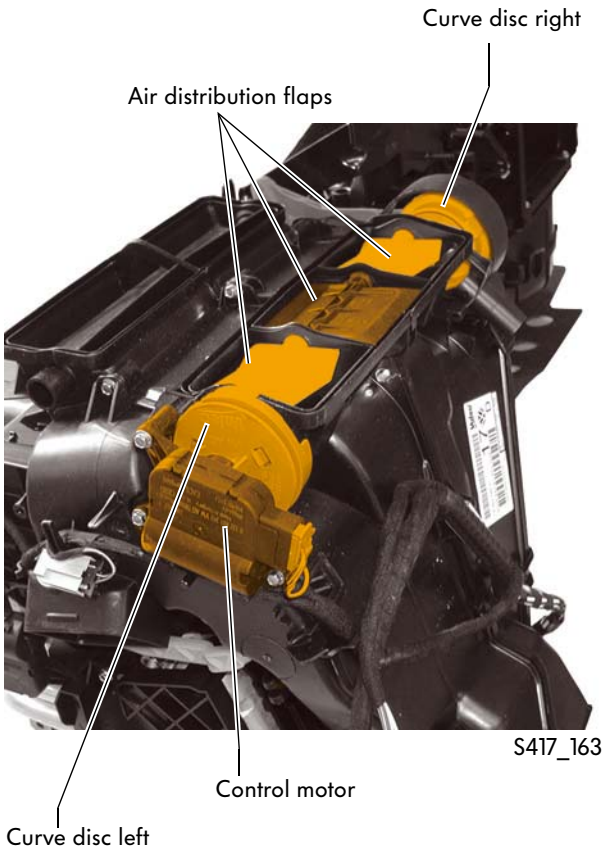
Climatic

Controls



Air-conditioning unit

The flaps for air distribution are no longer adjusted via a flexible shaft, but via an electrically operated control motor.



Heating and Air Conditioning

Climatronic

Controls

Electronic temperature rotary knob for driver's side

Electronic temperature rotary knob for front passenger's side

AUTO button with two fan modes

Feedback LED for fan speed

Automatic fresh air control

You can choose between the two modes AUTO High and AUTO Low for the automatic fresh air fan control. In these modes, not only the fan power is automatically controlled, but also the air distribution and temperature. You switch between the modes by pressing the AUTO button.

In the AUTO setting (= automatic mode), the air-conditioning control unit regulates the interior temperature to the required level using the received information quickly and easily and keeps it constant even when outside conditions change.

AUTO High

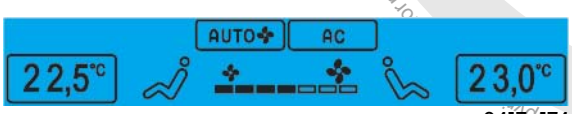
The AUTO High mode is an automatic mode with greater quantities of air. The target temperature is reached as quickly as possible. AUTO High is configured especially for a high risk of misting (high inside and/or outside humidity) and for ideal ventilation of the rear area. The right-hand LED in the AUTO button is illuminated in AUTO High mode. The fresh air fan runs in the standard characteristic curve.

AUTO Low

The AUTO Low mode is an automatic mode with smaller quantities of air. The Climatronic gently regulates the preset interior temperature giving priority to acoustic comfort.
The left-hand LED in the AUTO button is illuminated in AUTO Low mode. The fresh-air fan speed in AUTO Low mode is always one level lower than in AUTO High mode.

In automatic mode, the Climatronic system automatically adjusts the control motors for the air-distribution flaps of the air-conditioning/ heating system. The air flowing from the air-conditioning unit has the set temperature and is conducted towards the windscreen, footwell or air vents. The quantity of air is controlled steplessly via the fan speed depending on how much air is required to reach or maintain the comfortable temperature. The temperature of the air entering the vehicle is also continuously measured by the Climatronic system. By setting the target value on the two temperature rotary knobs, the occupants specify the level of the interior temperature to be set, everything else is controlled automatically by the Climatronic system.

Display on RCD310



S417_174

Status display

The LEDs in the control indicate that the respective function is activated.

Display on RCD510, RNS310 and RNS510

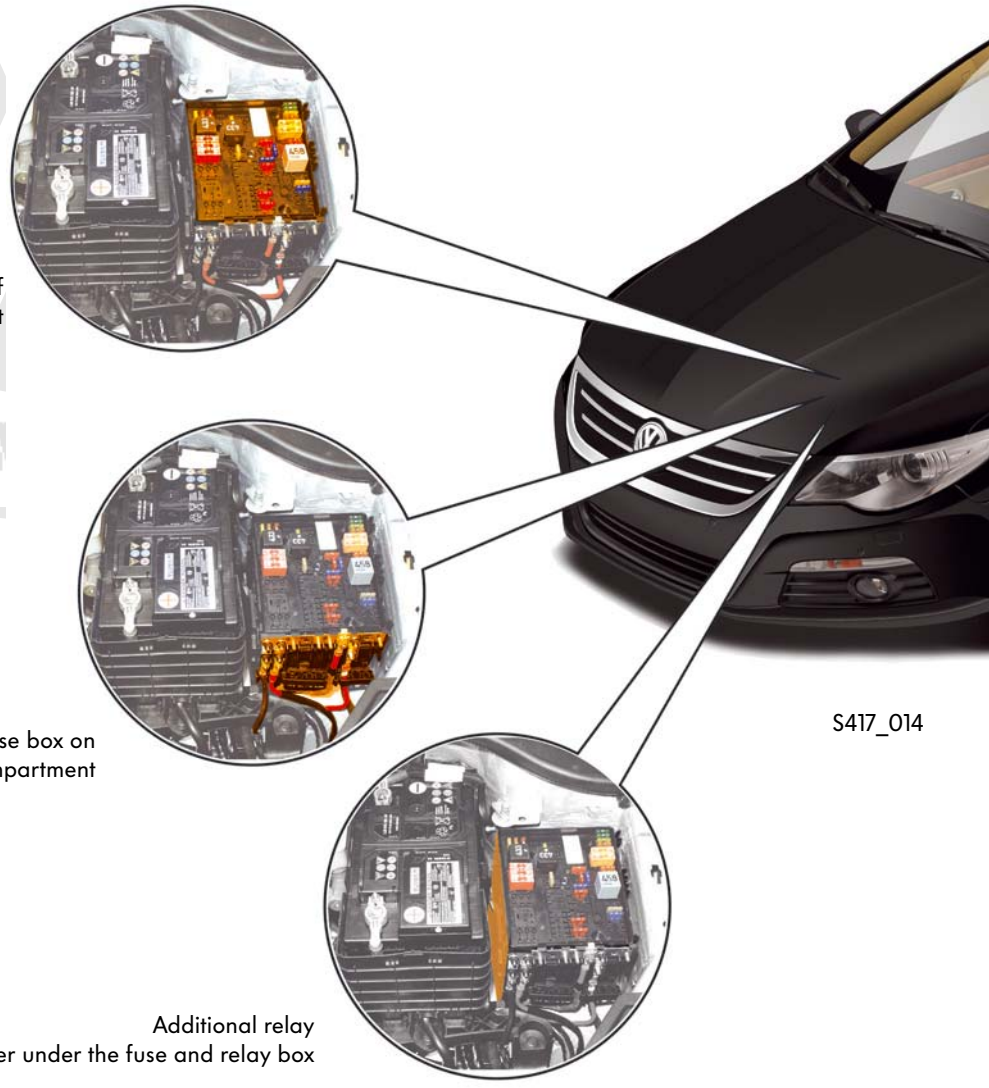
S417_176

The radio or radio/navigation screen also shows information on the Climatronic system. For example, the temperature appears as a pop-up when you adjust the temperature.

Fuse boxes and relay locations in the onboard supply

Locations

The battery is located on the left of the engine compartment or on the left of the boot depending on the equipment version.

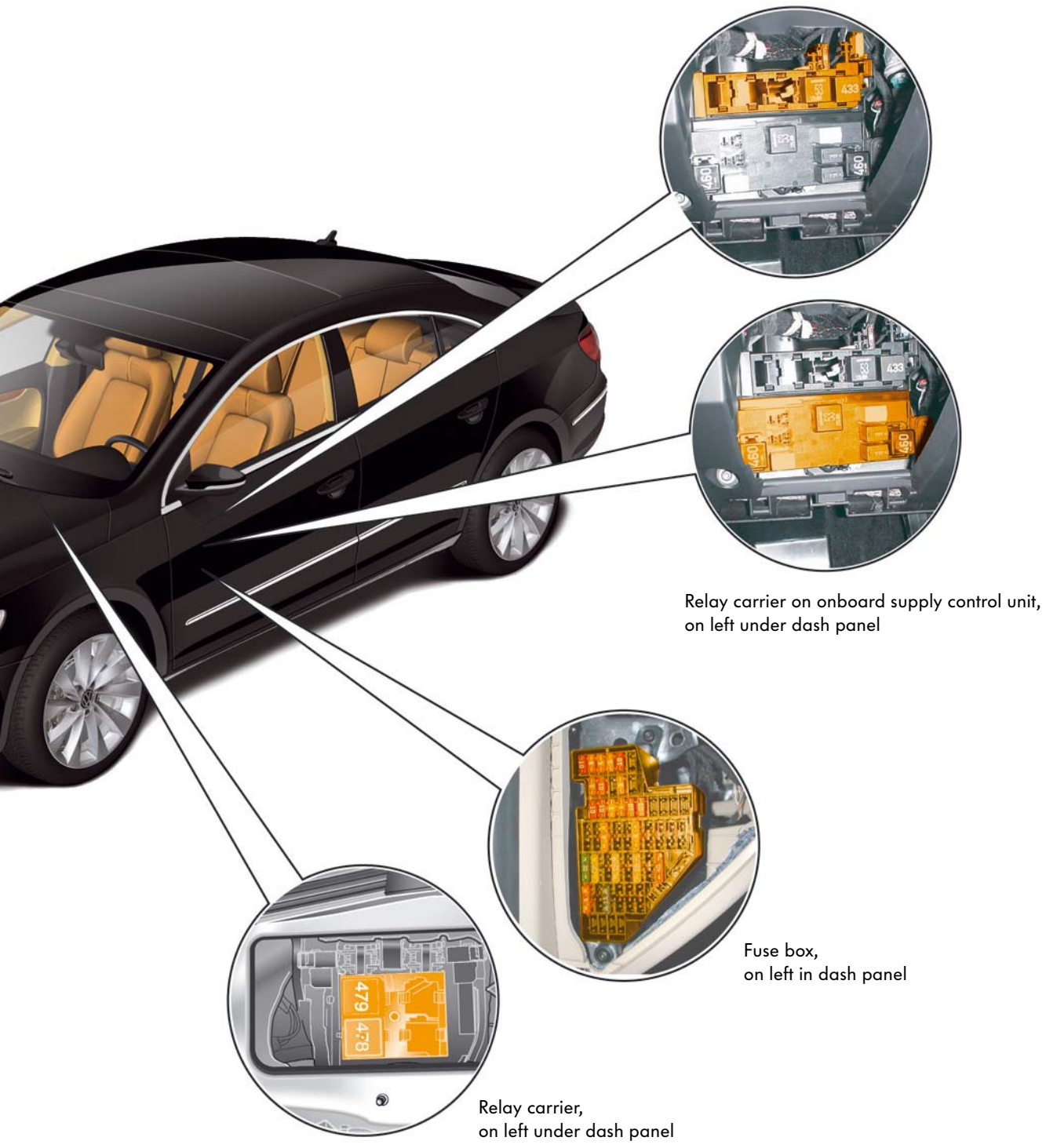


Fuse and relay box, left of engine compartment

Back-up fuse box on left of engine compartment

Additional relay carrier under the fuse and relay box

S417_014



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

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

Fuse box,
on left in dash panel

Relay carrier,
on left under dash panel

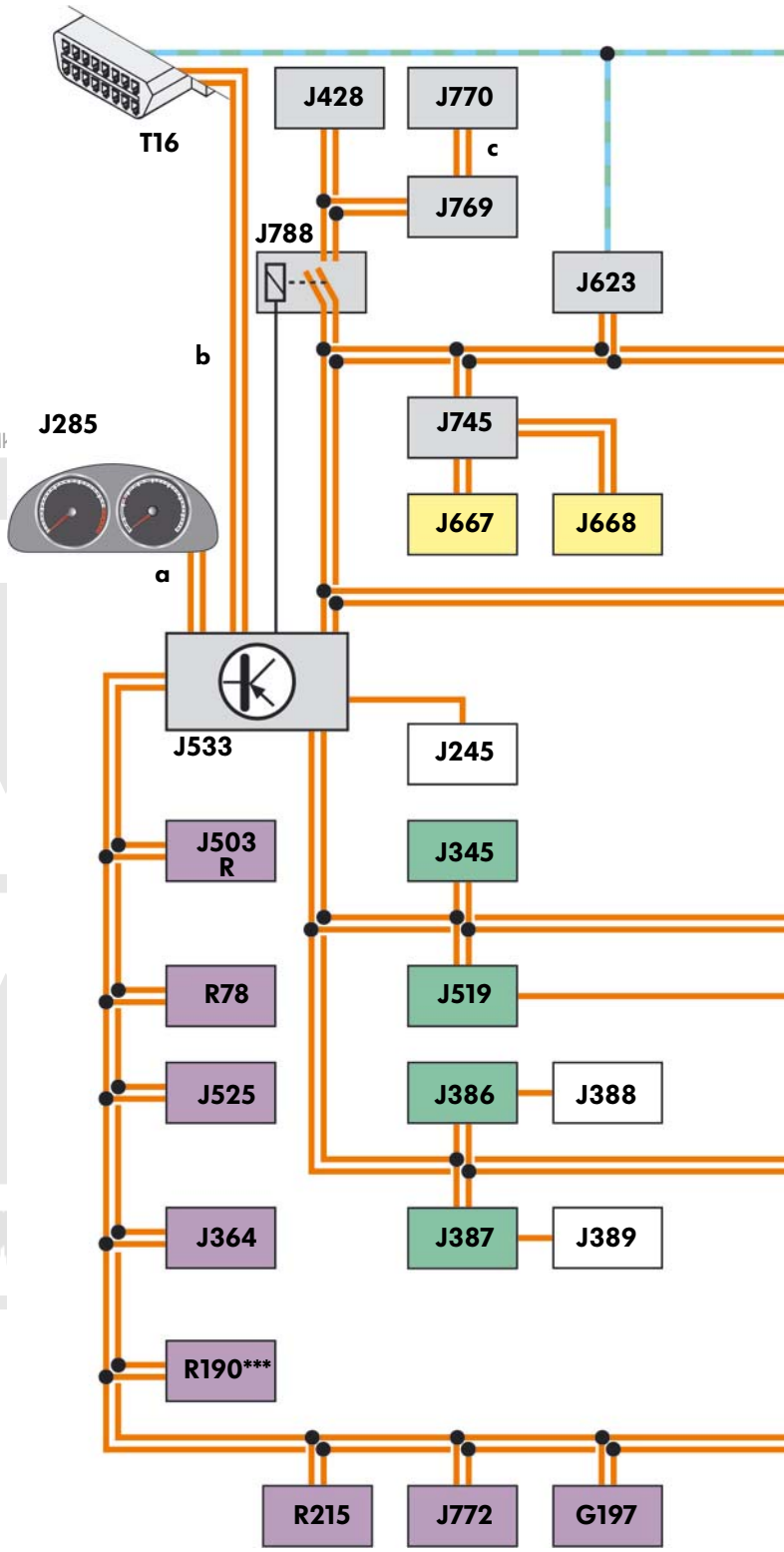
Networking concept

The data bus diagnostic interface J533 forms the interface for communication between 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

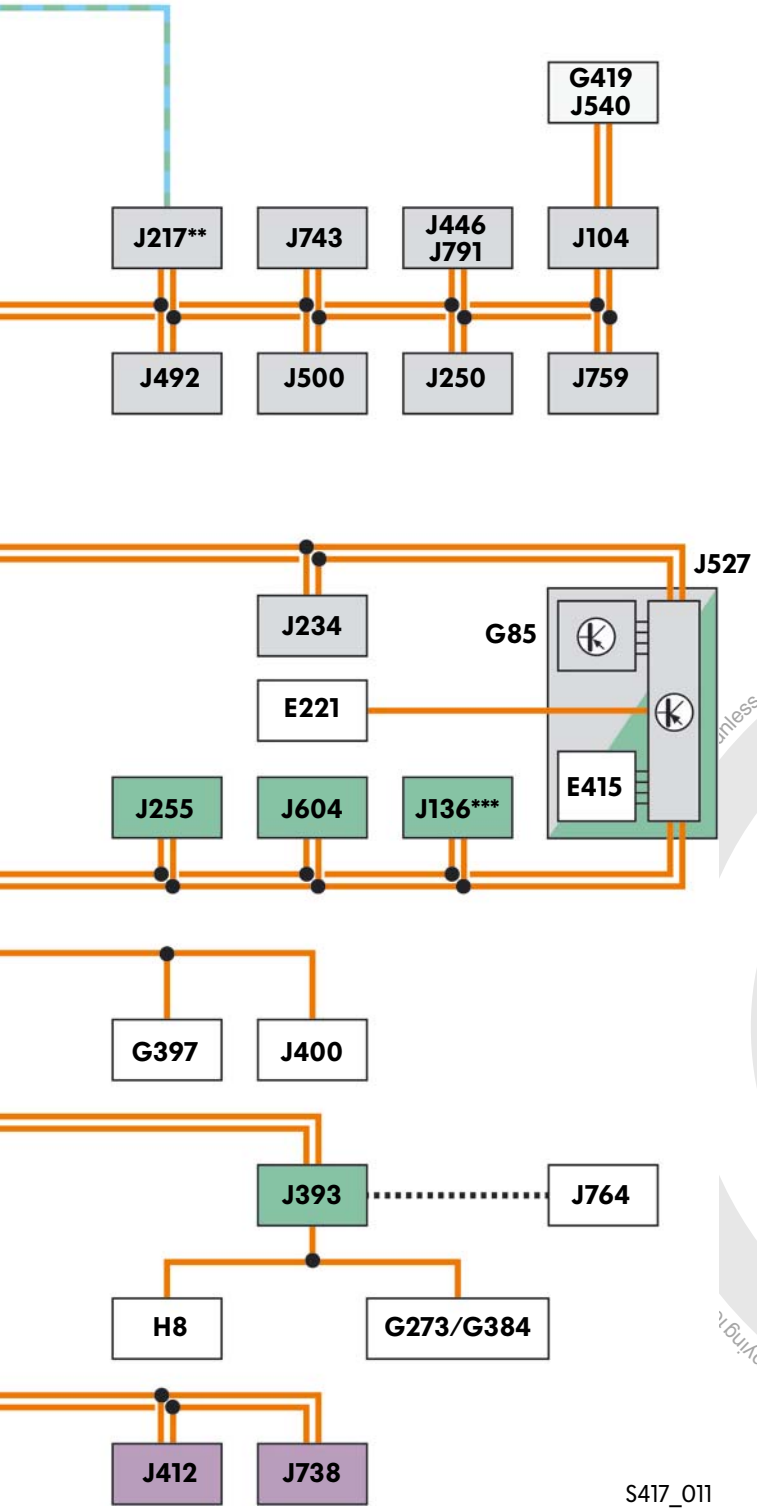
The following data bus systems are connected downstream of a CAN data bus system as sub-bus systems:

- LIN data buses
- Sensor CAN data bus
- Cornering light CAN data bus
- Lane change assist CAN data bus
- Serial data bus



Legend

	Powertrain CAN data bus
	Convenience CAN data bus
	Infotainment CAN data bus
	Sensor CAN data bus
a	Combi CAN data bus
b	Diagnostics CAN data bus
c	Lane change assist CAN data bus
	Cornering light CAN data bus
	LIN data bus
	CAN data bus line
	LIN data bus line
	Communications line
	Serial data bus cable



S417_011

Legend

E221	Operating unit in steering wheel (multifunction steering wheel)
E415	Entry and start authorisation switch
G85	Steering angle sender
G197	Magnetic field sender for compass
G273	Interior monitoring sensor
G384	Vehicle inclination sender
G397	Rain and light sensor
G419	ESP sensor unit
H8	Anti-theft alarm system horn
J104	ABS control unit
J136***	Seat and steering column adjustment control unit with memory function
J217**	Automatic gearbox control unit
J234	Airbag control unit
J245	Sliding sunroof adjustment control unit
J250	Electronically controlled damping control unit
J255	Climatronic control unit
J285	Control unit 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 supply 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
J604	Auxiliary air heater 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	Mechatronic unit for direct shift gearbox
J745	Cornering light and headlight range control unit
J759	Lane departure warning control unit
J764	Electronic steering column lock control unit
J769	Lane change assist control unit
J770	Lane change assist control unit 2
J772	Reversing camera system control unit
J788	Cut-off relay for CAN powertrain bus
J791	Control unit for parallel parking assist
R	Radio
R78*	TV tuner
R190	Digital radio satellite receiver***
R215	Interface for external multimedia devices
T16	Diagnosis connector

* Only Japan
** With automatic gearbox only
***Only North American region (NAR)

Glossary

AM

Amplitude modulation, electromagnetic wave used to transmit messages.
In amplitude modulation, the amplitude of the high frequency is varied.

BAP

The BAP operating and display protocol is used for communication between function control units and operating and display control units. BAP specifically separates the function from the display and the control.

FM

Frequency modulation, electromagnetic wave used to transmit messages.
In frequency modulation, the frequency of the carrier wave varies in step with the information signal. The amplitude remains constant.

GPS

Global Positioning System, a satellite system set up by the US Department of Defense that aids navigation.

GSM

Global System for Mobile communications
Standard for digital mobile telecommunications networks that is also used for data transfer as well as text messages (SMS).

MP3

Motion Pictures expert group layer 3 (MPEG Layer 3)
Compression standards for video, audio and image formats.

NAR

North American Region

LF

Low frequency

RDS

Radio Data System
Standardised system for transferring non-audio additional information for radio e.g. station names, audio titles etc.

SD

Secure Digital card
Small and robust memory cards, e.g. for digital photo, MP3 players etc.

SDARS

Satellite Digital Audio Radio Services
A digital radio standard for commercial satellite radio in North America.

TFT

Thin Film Transistor Display
(TFT display = flat screen).

TMC

Traffic Message Channel
A digital service in radio for transmission of traffic messages

UMPP

Universal Mobile Phone Preparation.

USB

Universal Serial Bus
Universal serial interface between different computers and peripheral devices

WMA

Windows Media Audio
Special audio format under Microsoft Windows.

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