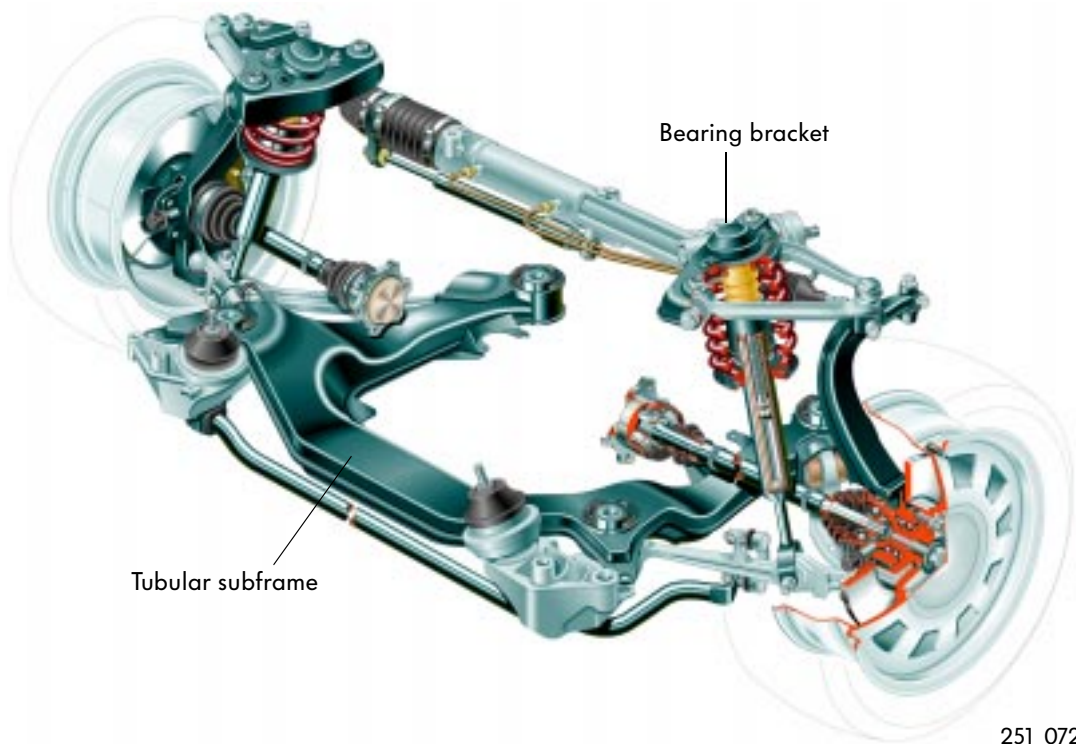


Running Gear

The four-link front suspension

The FRONT AXLE is a four-link front suspension. It has been accommodated to the modified vehicle dimensions and axle loads, as compared to the previous Passat.



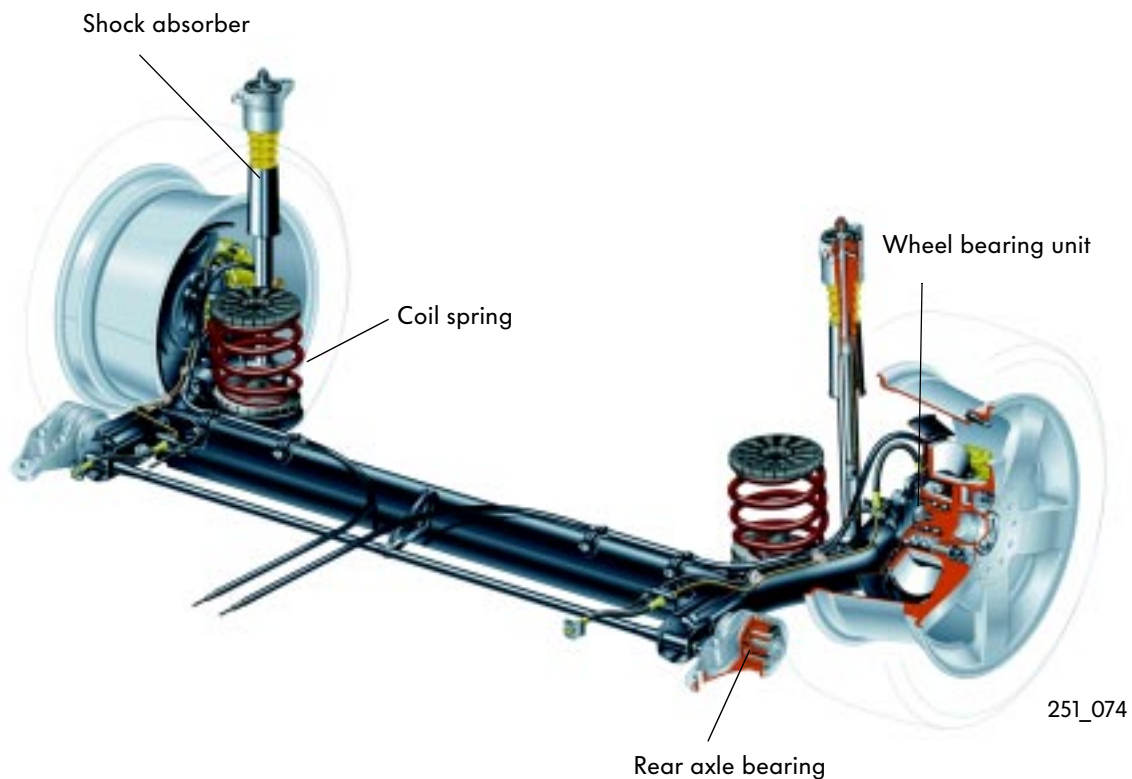
The rack-and-pinion steering system

The new Passat has
HYDRAULIC POWER STEERING as standard.



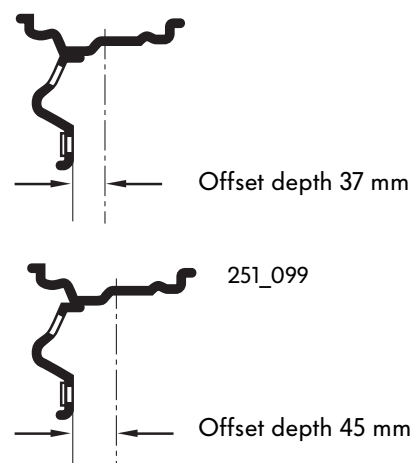
The torsion beam rear axle

In the TORSION BEAM REAR AXLE, the spring/damper settings have been adapted to the modified axle loads.



Modified offset depth

Rim offset depth was reduced to 37 mm from 45 mm, with the result that the wheel is now flush with the body exterior. Wheels fitted with winter tyres with ET45 offset depth can still be used, except on the Passat 2001 with large brake discs. This model has a wheel fitted with a winter tyre in size 6Jx16 ET40.



Running Gear

The brakes

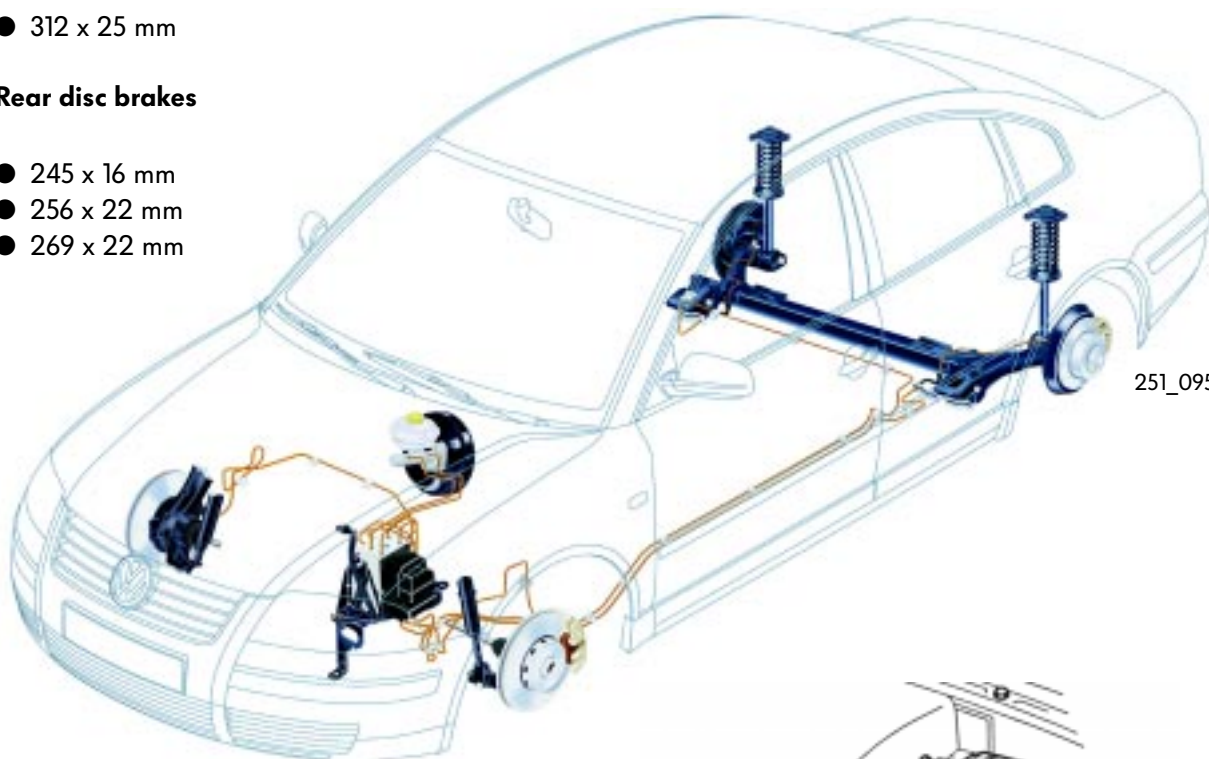
The front and rear disc brakes are configured for excellent deceleration under braking. New, larger brakes will therefore be used in the new Passat depending on engine type.

Front disc brakes

- 280 x 22 mm
- 288 x 25 mm
- 312 x 25 mm

Rear disc brakes

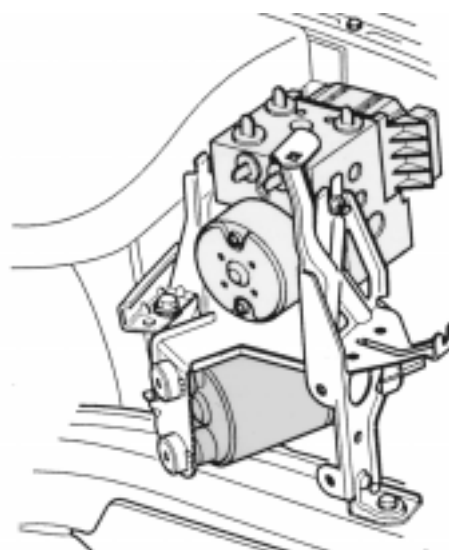
- 245 x 16 mm
- 256 x 22 mm
- 269 x 22 mm



251_095

Bosch 5.3 anti-lock braking system

The new Passat still has a Bosch 5.3 anti-lock braking system with ESP. This system allows the driver to maintain control over the vehicle at all times, even in critical driving situations.



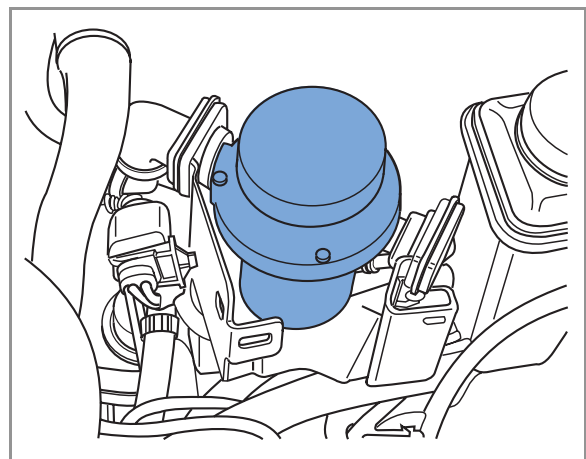
251_098

The electronic vacuum pump

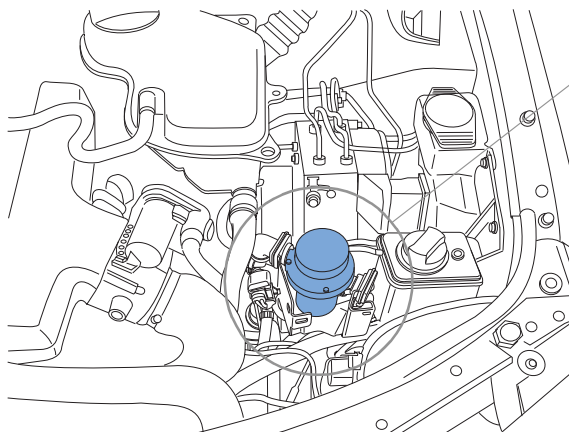
All petrol engines which have automatic transmission conforming to exhaust emission standard EU4 will have an electrical vacuum pump for brake servos.

This pump is required:

because not enough vacuum is provided for the brake booster via the intake manifold during the cold-starting phase.



251_058b



251_058a

The electrical vacuum pump makes for reliable pneumatic brake boosting.

It is activated by the engine control unit as required.



For more detailed information, refer to the separate SSP on the electrical vacuum pump.



Running Gear

Four-wheel drive

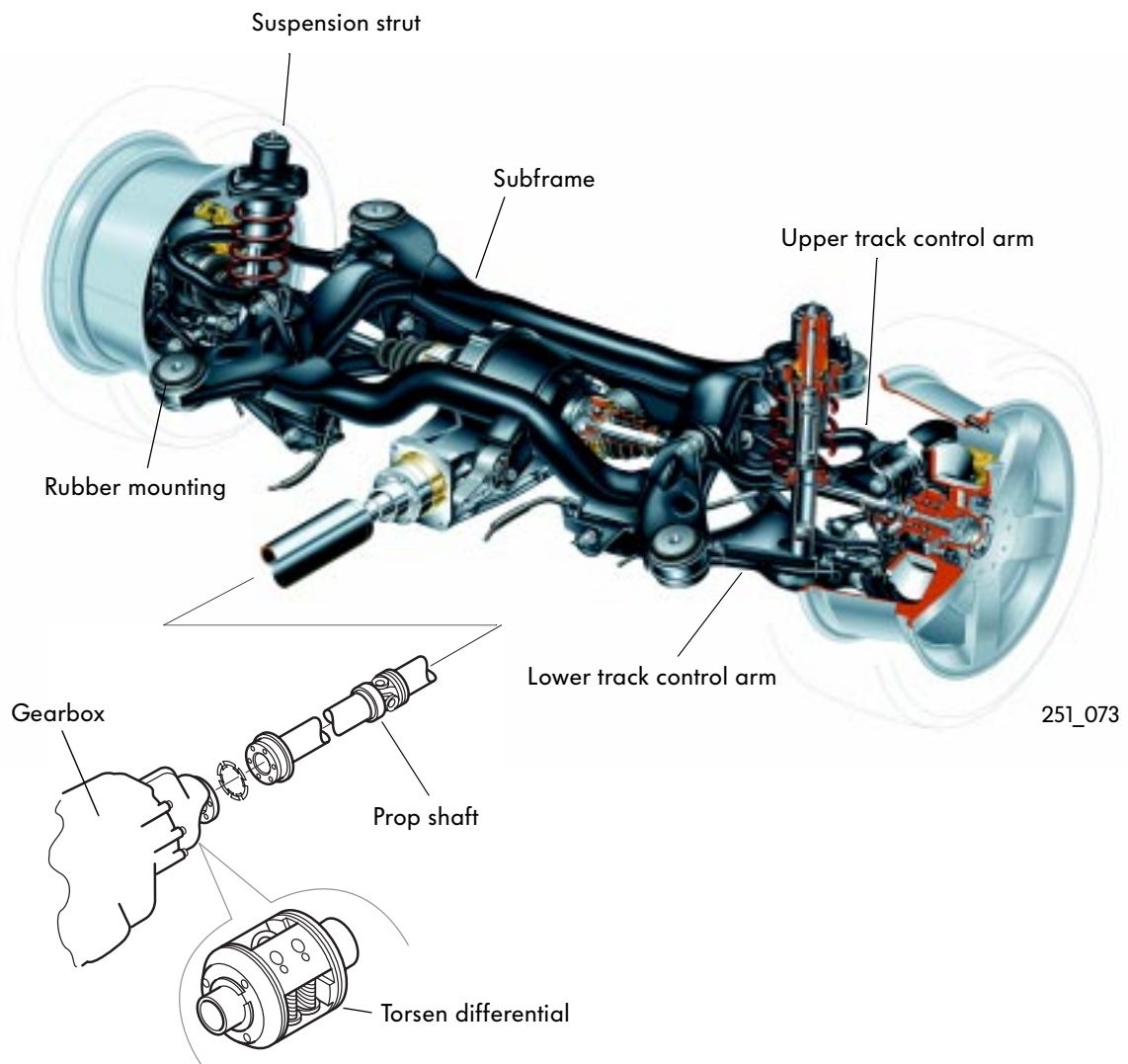
The double wishbone rear suspension

The 4-wheel-drive version of the Passat has a double wishbone rear suspension with a closed tubular subframe attached to which are the track control arms for wheel location and the differential.

Insulating bonded rubber bushes provide good acoustic isolation from the vehicle body.

The flat-type construction of the rear axle provides a spacious interior.

This type of construction proved successful in the predecessor model.



251_093

The Electrics

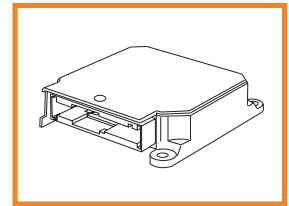
The vehicle electrical system

is distributed, as in the Passat 97.

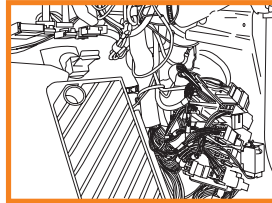
The fitting locations of the fuse holders, relay carriers, auxiliary relay carriers and connector stations have been adopted without change.

The wiring harnesses have been extended to include new systems (solar roof, distance control, dynamic navigation with TV etc.) and the connector stations have been reorganised accordingly.

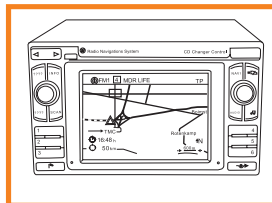
Airbag control unit
(in gearbox tunnel)



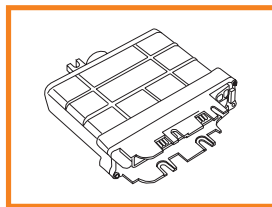
Connector station in
right A-pillar



RNS-D
radio with dynamic
navigation

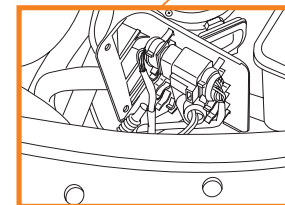
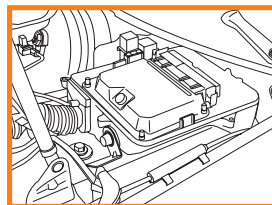


Automatic gearbox
control unit
(in footwell on right)



Electronics box in the
plenum chamber

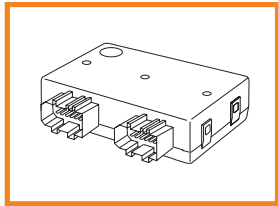
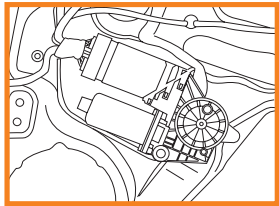
- Engine control unit
- Relay station
- Connector station
- Fuses



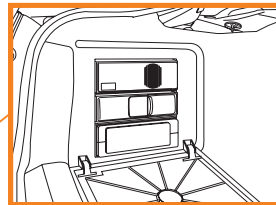
Front-end connection



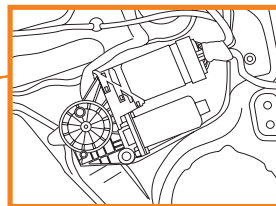
Window lifter motor with integrated door control unit



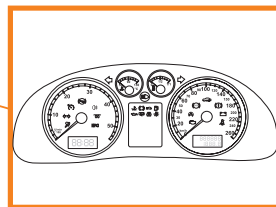
Control unit for distance control (in luggage compartment on right)



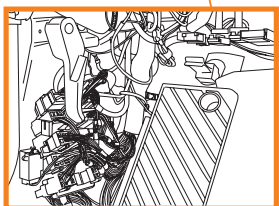
TV tuner
CD changer
DSP



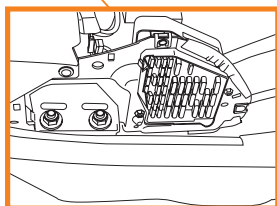
Window lifter motor with integrated door control unit



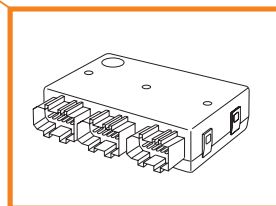
Dash panel insert with immobiliser control unit and diagnosis interface (Gateway)



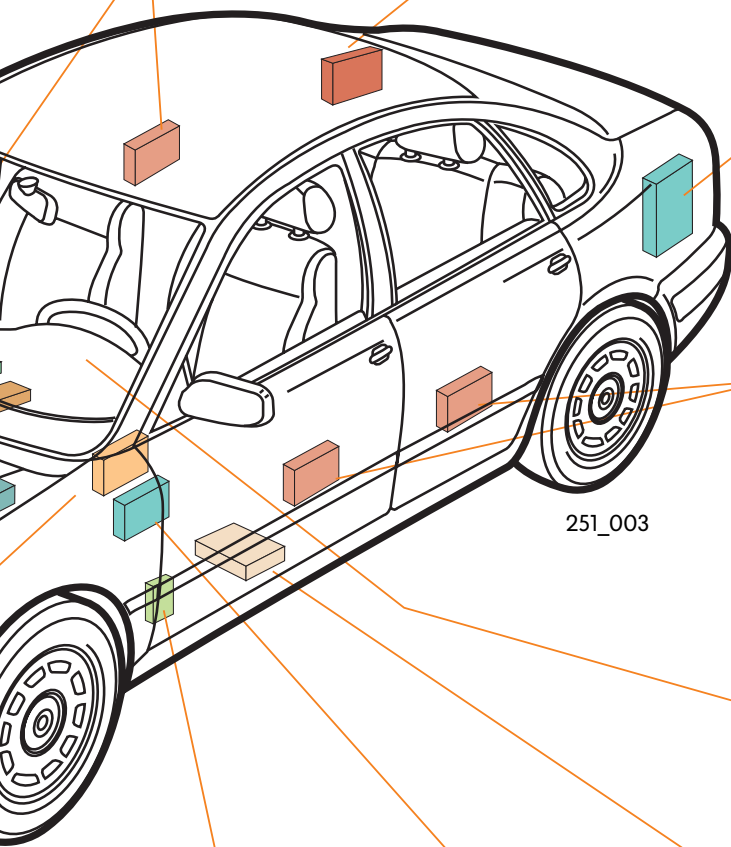
Connector station in left A-pillar



Fuse holder dash panel left



Convenience control unit in the footwell left



251_003

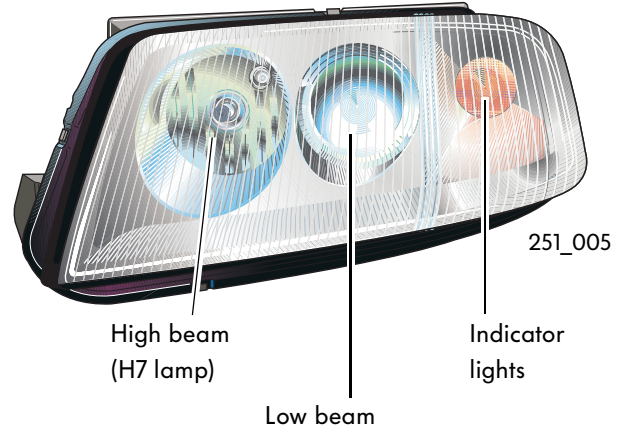


The Electrics

Headlights

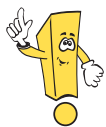
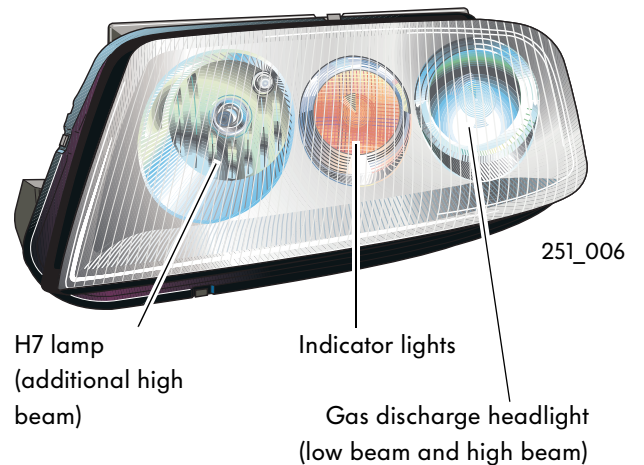
Standard headlights

Two types of headlights are available for the new Passat. The basic specification consists of a clear glass triaxial ellipsoid headlight with a H7 bulb as a high beam headlight.



Gas discharge lamp (GDL) with BI-xenon bulb

A BI-xenon headlight is available as an optional extra in place of the standard triaxial ellipsoid headlight. In this headlight module, a gas discharge lamp produces both the low and high beams. The high beam is intensified by a H7 lamp which also bridges the period until the gas discharge lamp has reached its full luminous intensity. The H7 lamp is also used for the flasher function.



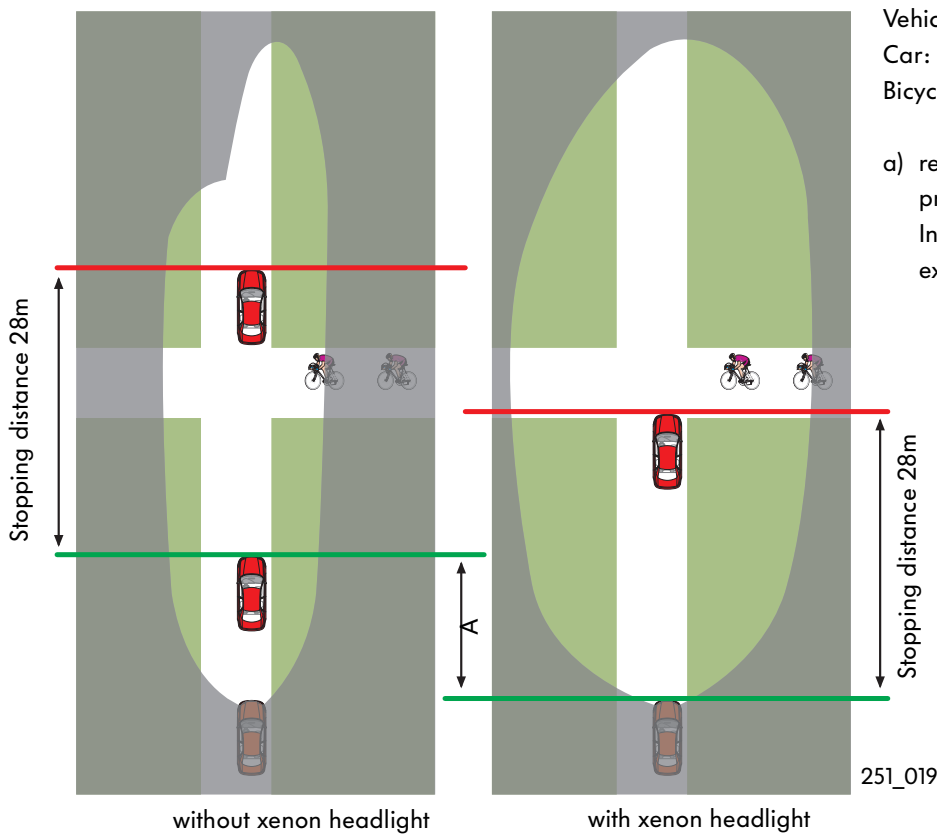
For trips in countries where vehicles drive on the left-hand side of the road, both these headlights can be adjusted from asymmetrical low beam to symmetrical low beam.

Please note the information given in the Workshop Manual.

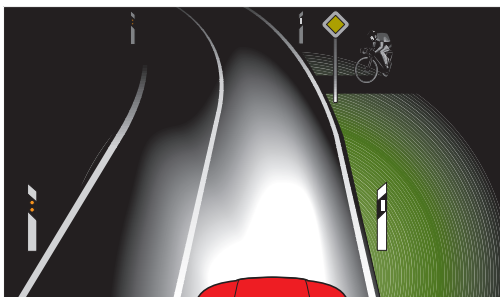
More light means more safety

The Passat, model year 2001, uses the BI-xenon headlight system. The system's improved luminous efficiency provides higher active driving safety, because hazards can now be recognised sooner.

The wider range and increased brightness of the light beam enable the driver to recognise hazards and reduce speed earlier. Provided the driver reacts in time, he will be able to stop the vehicle ahead of the hazard and thereby avoid a collision.

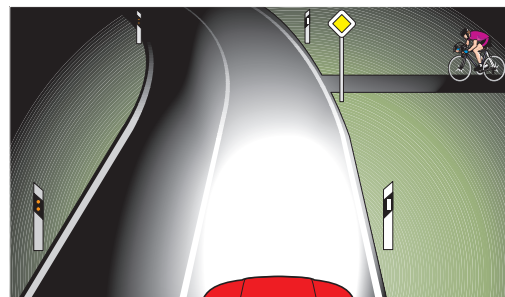


251_020



Without xenon headlights, the driver does not see the cyclist until much later.

251_021



With xenon headlights, the driver sees the cyclist earlier and still has enough time to reduce speed.

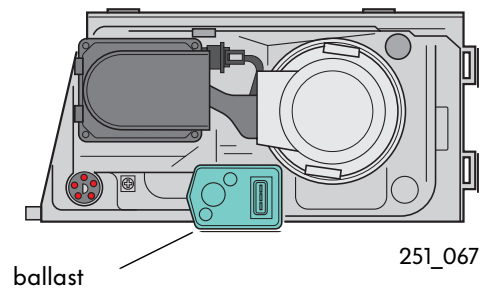


The Electrics

Design of a BI-xenon headlight module

The headlight module comprises:

- electronic ballast (EVG)
- headlight range control motor
- conventional light bulbs
- gas discharge headlight module
- housing with bonded clear glass lens

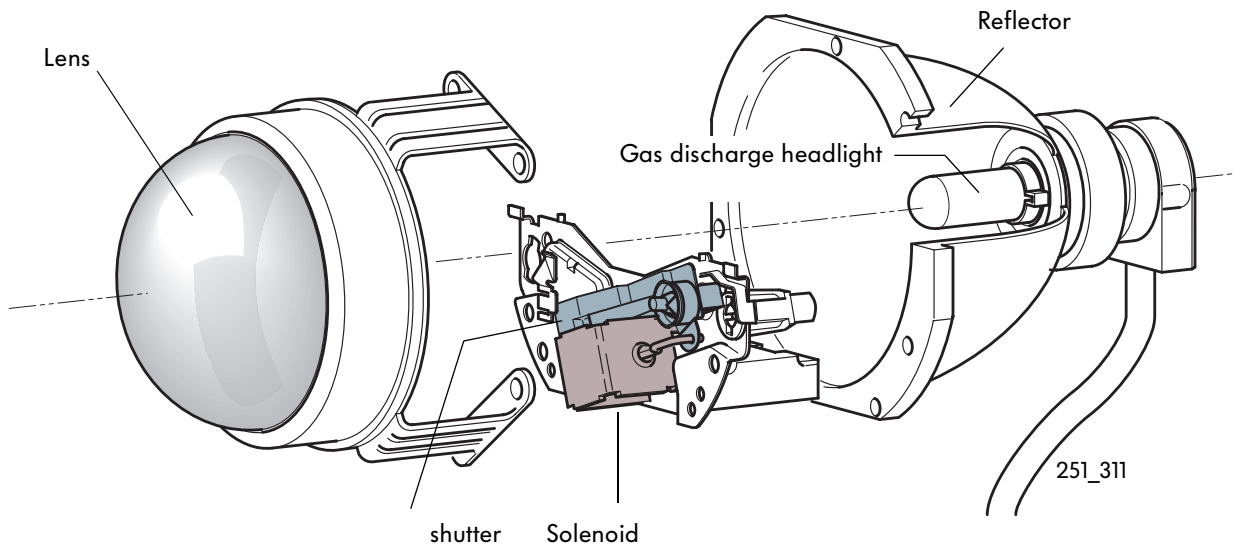


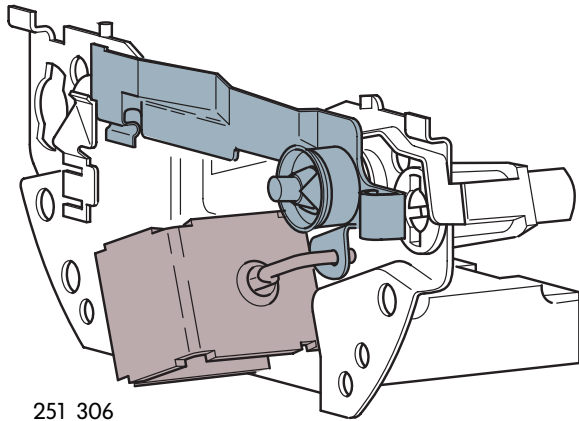
Until now, no single gas discharge headlight has been capable of producing both low and high beams. Hence, it was not possible to adjust the light/dark boundary while driving.

In the high beam setting, the mechanism allows all of the light generated in the lamp to pass through.

A solenoid-operated mechanical shutter is used to produce the xenon low and high beams.

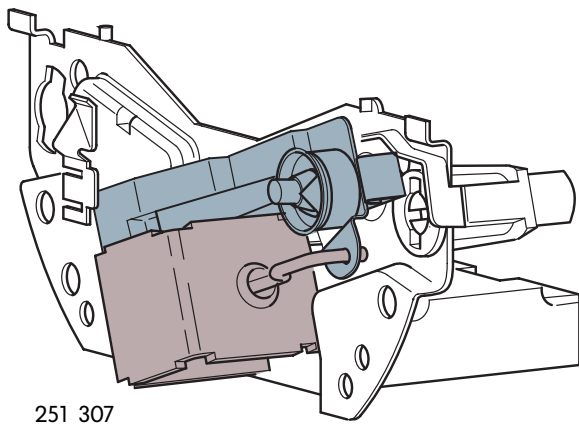
This mechanism screens off a portion of the light generated in the lamp to produce the low beam.





The shutter screens off part of the light cone generated.

(light/dark boundary)



The shutter is electromagnetically adjusted to produce the high beam. The entire light cone now becomes effective. The H7 lamp is also switched on.



Statutory requirements

Where gas discharge headlights are used in a vehicle, the following auxiliary equipment is required to be installed to avoid dazzling other road users:

- a headlight cleaning system
- automatic headlight range control

The Electrics

Automatic dynamic headlight range control (LWR)

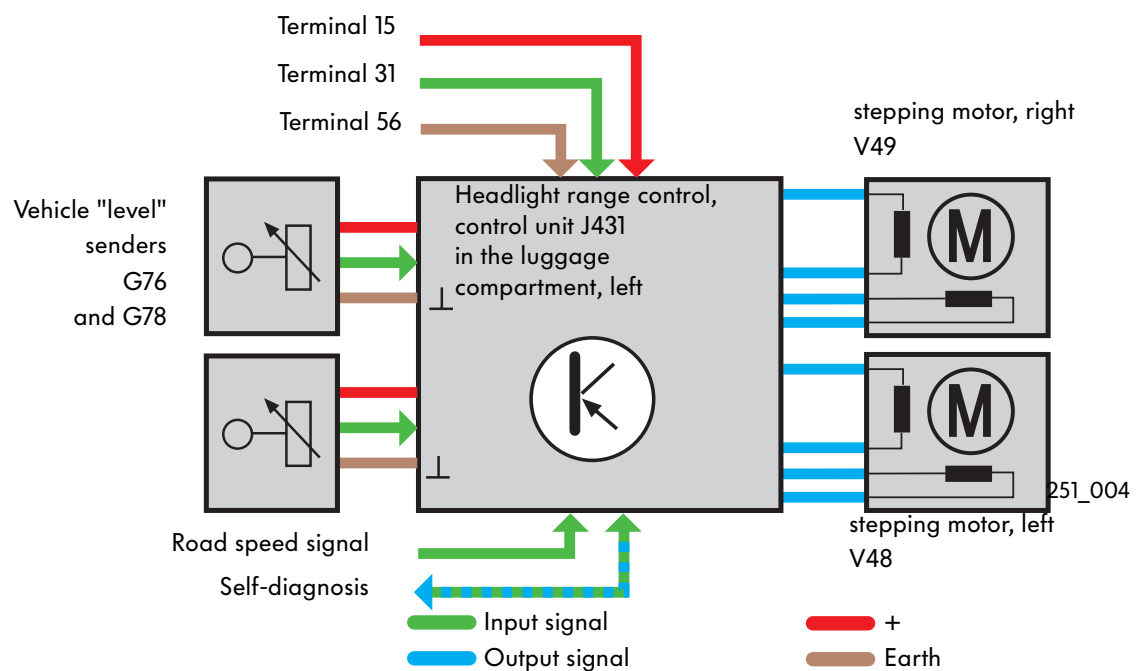
The Passat 2001 with BI-xenon headlights has automatic headlight range control.

Task

The task of the automatic headlight range control is to adjust the headlights to compensate for variation in ride height as a function of payload.

The automatic headlight range control also compensates for variation in headlight range caused by dynamic effects under braking and acceleration, for example.

The headlight range control system comprises:



Function:

Headlight range control, control unit J431 receives signals from two level sensors (one on the front axle and one on the rear axle) and the road speed signal. Having evaluated the signals, the system activates the control motors in the headlights and thereby compensates for variation in vehicle level.

The headlight control motors are configured as stepping motors. They can perform the full range of headlight adjustments within approximately 1 second.

The control unit has self-diagnostic capability and can be addressed with address word 55.

The dash panel insert

The dash panel insert is the Group dash panel insert with blue backlighting and translucent red dials.

The modified design and chrome-bezeled instruments stand out. The instruments are now operated by stepping motors.

The dash panel insert is available in three versions. They mainly differ with regard to the display options in the central display.



Selector lever range indicator

251_049





New functions

- Integrated third-generation immobiliser control unit (see Immobiliser)
- The interface to the CAN databus, i.e. the dash panel insert, is connected to the drivetrain CAN databus and convenience CAN databus. The rev counter is activated by signals from the drivetrain CAN bus, for example, and the status of the doors/tailgate can be displayed in the dash panel insert via the convenience CAN bus.
- The diagnosis interface (Gateway) in the dash panel insert is necessary for communication between the various CAN databuses. Diagnosis data is also transferred via CAN through this interface to the K-wires (see CAN networking).



The Electrics

New warning lamps:

Designation	Symbol	Function
Selector lever lock K169		serves to remind the driver to depress the brake. The selector lever lock on automatic transmissions is released in this way
Door/tailgate open warning lamps (K116/K123-K127)		indicates open doors/tailgate. In vehicles with a multifunctional display, this warning is issued as a symbol.
Cruise control system warning lamp K31		comes on when the cruise control system (CCS) is switched on. For vehicles with cruise control system only.
Exhaust emissions warning lamp K83		<p>If a fault detrimental to exhaust gas quality occurs in the vehicle, the fault is saved to fault memory and the exhaust emissions warning lamp is activated.</p> <p>The exhaust emissions warning lamp begins to flash if there is a danger of the catalyst becoming damaged due to misfiring.</p>



Third-generation immobilisation

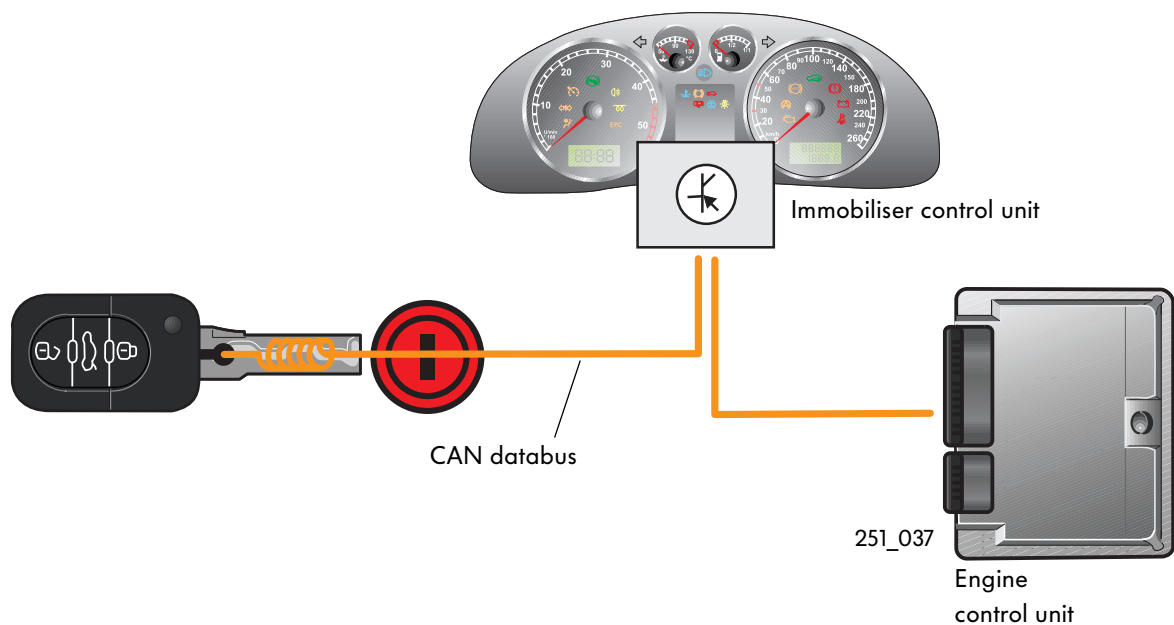
Function

The first phase (key recognition) is identical to that of function immobiliser II. However, the mode of communication between the engine control unit and the immobiliser control unit has changed.

The engine control unit generates a number (variable code) by means of a random-number generator.

The engine control unit and the immobiliser control unit each calculate a result based on a table of formulae. The engine control unit compares the result returned by the immobiliser control unit with its own result. This process of communication takes place along the CAN databus.

If the results match up, the immobiliser control unit allows the engine to be started.

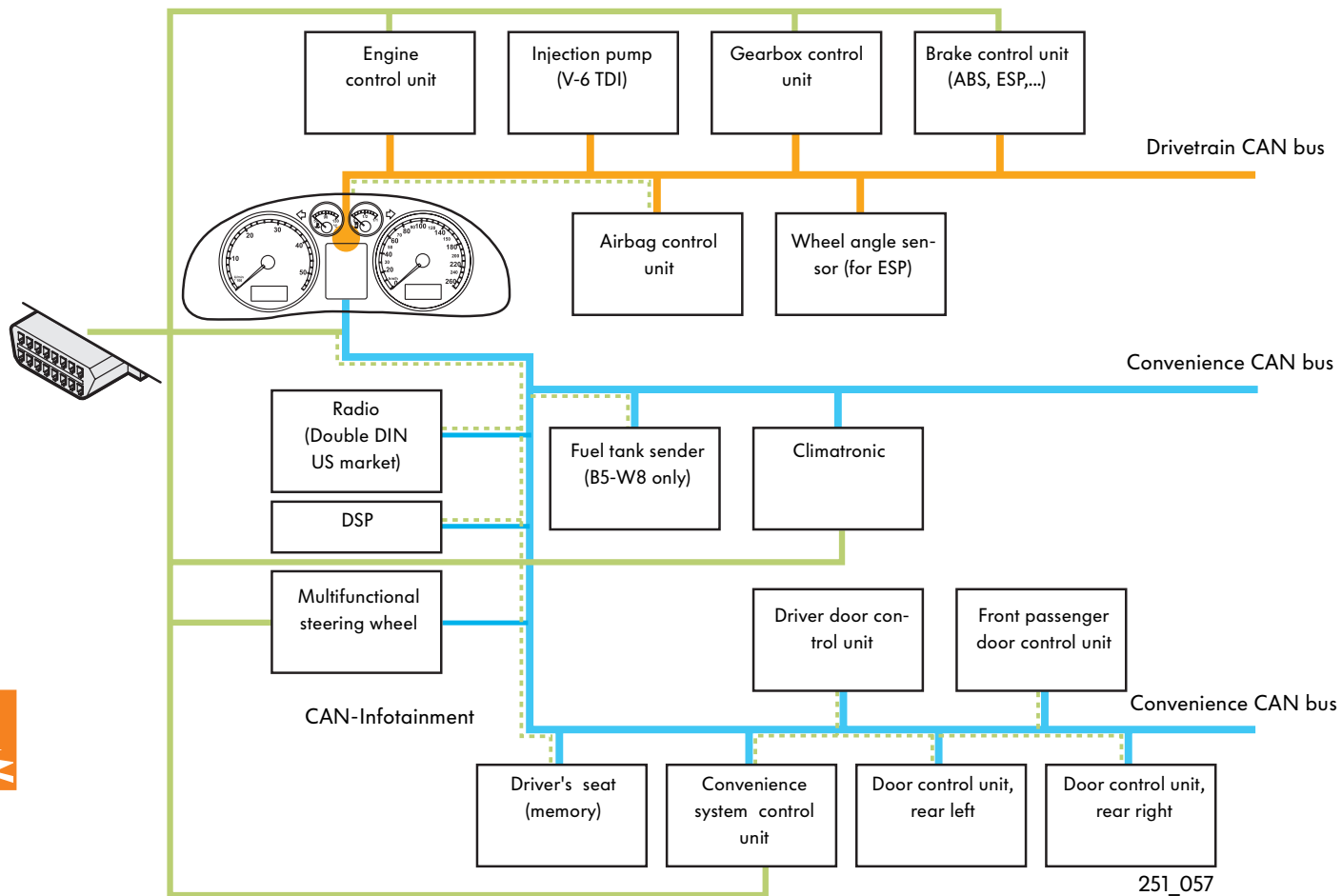


General notes:

- The keys are marked W3.
- For service personnel, the key adaption procedure is unchanged. The keys are electronically locked while being adapted. As a result, they cannot be used to open any other vehicle.
- The adaptation procedure in case of component parts replacement has changed.

The Electrics

Networking of CAN systems



The diagnosis interface (Gateway) is integrated in the dash panel insert and has the following tasks:

- To transfer diagnosis data from the drivetrain CAN bus and convenience CAN databus to the K-wire so that they can be used by the self-diagnosis. This is a basic requirement for self-diagnosis of certain systems (the memory seat does not have its own K-wire, for example).
- To facilitate communication/data exchange between users of a databus and between users of different databus systems.

The Gateway must be informed of the CAN users by means of the "Encode control units" function.

The address word for the Gateway control unit is 19.

All control units from the drive train are connected to the drivetrain CAN bus (highspeed).

All control units for convenience systems are connected to the convenience CAN bus and infotainment CAN bus (physically one databus = low-speed).

The transmission rates of CAN High-speed and Low-speed are 500 kBaud and 100 kBaud respectively, i.e. 500 000 bits or 100 000 bits are transmitted per second.



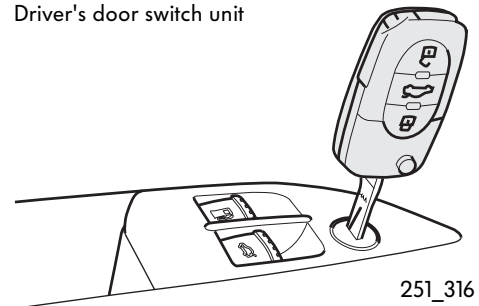
The Electrics

Convenience system

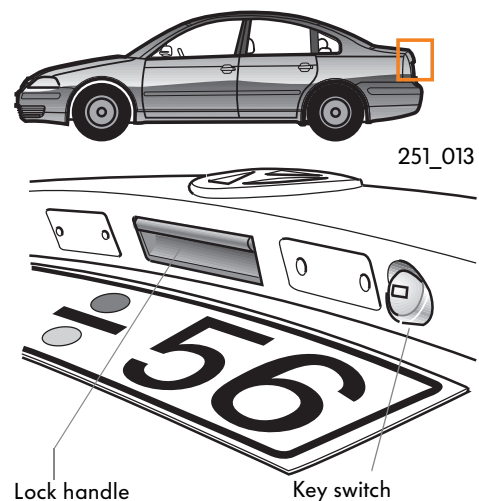
The convenience system was modified as follows:

- Standard radio wave remote control with additional button for tailgate remote release (RLR)
- The lock cylinder on the front passenger's side has been deleted.
- New tailgate locking concept
 - The tailgate can be released:
 - by pressing the button in the new driver's door switch unit. This function can be disabled by key switch.
 - by means of the handle switch in the tailgate. This function can be disabled by the key switch in the tailgate.
 - The radio wave remote control.

Driver's door switch unit



Tailgate locking concept



The key switch in the non-visible part of the tailgate has three tasks:



1. Basic position
The tailgate can be opened by means of the lock handle.



2. Service position
In this position, the tailgate cannot be opened by the lock handle.



3. Mechanical emergency opening

251_038

The CAN databus introduced in the convenience system (Low-speed) of the Passat '97 has been modified as follows:

- the transmission rate has been increased to 100 kBaud from 62.5 kBaud.
- Interface to convenience CAN databus and connection to dash panel insert. This allows an open door to be represented symbolically in the dash panel insert, for example .

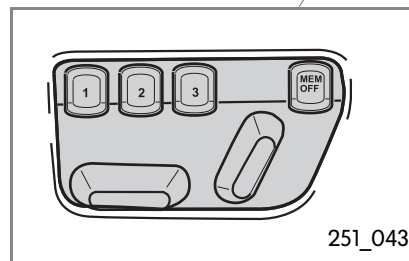
Memory seat

The electronic seat adjustment was improved in the following areas:

- The memory control unit now has a nonvolatile memory which retains stored seating positions while the battery terminals are disconnected.
 - It is no longer necessary to initialise the seat after having disconnected a battery.
 - The tone generator emits an acknowledgement signal after the seating position is stored.
- The tone generator is no longer built into the memory control unit, rather it is activated via CAN databus in the dash panel insert.

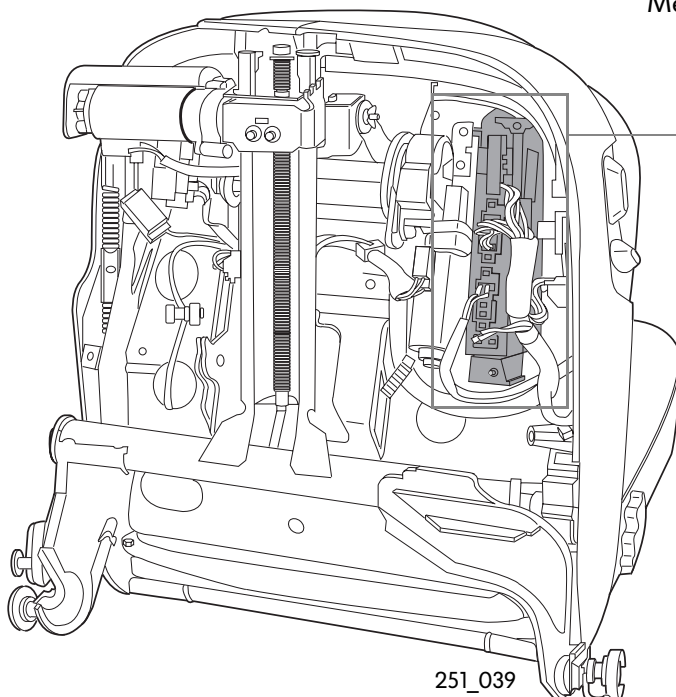


251_086



251_043

Operator switches for seat adjustment and Memory



Seat/mirror position control unit, driver's side J394

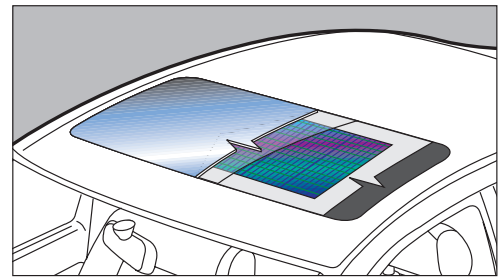
251_039



The Electrics

Sliding roof/solar roof

The solar roof generates electric current via integrated solar cells. This powers the fresh air blower, which cools down the vehicle interior to approx. 20°C. The system operates when the ignition is off and when the sliding roof is open or tilted.

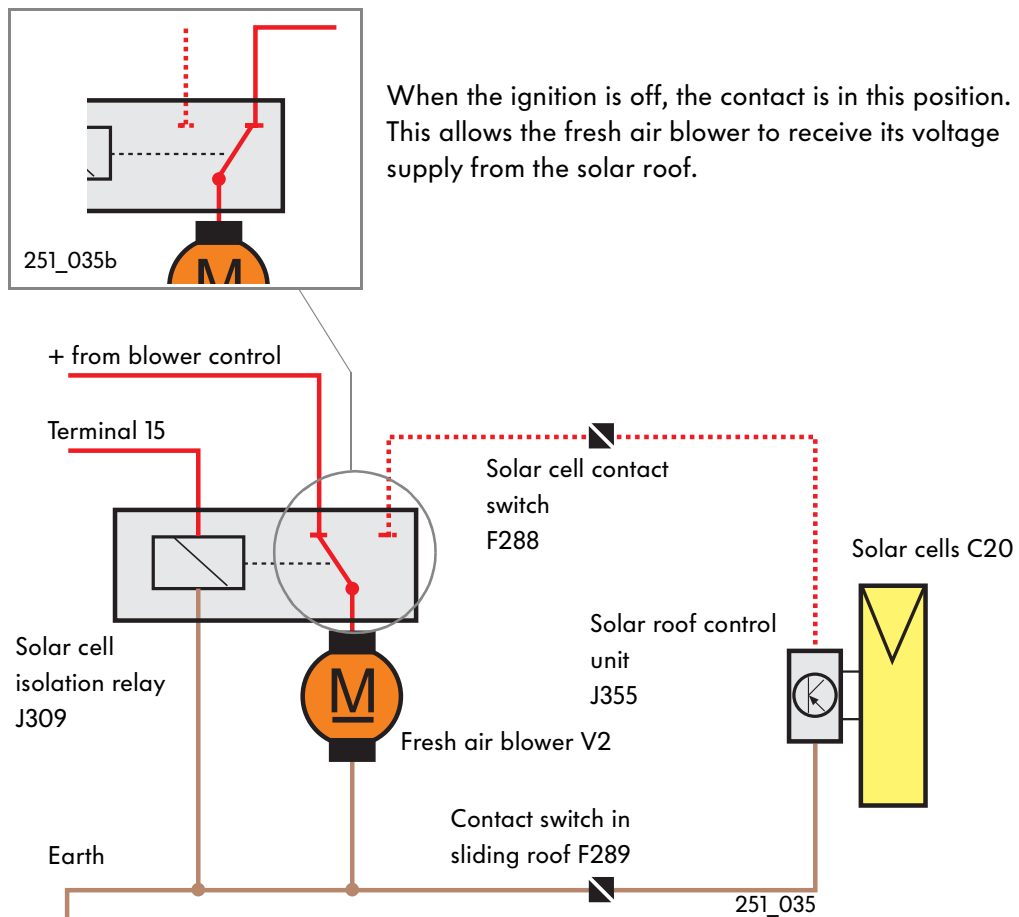


251_040

A DC/DC converter is mounted on the underside of the sliding roof.

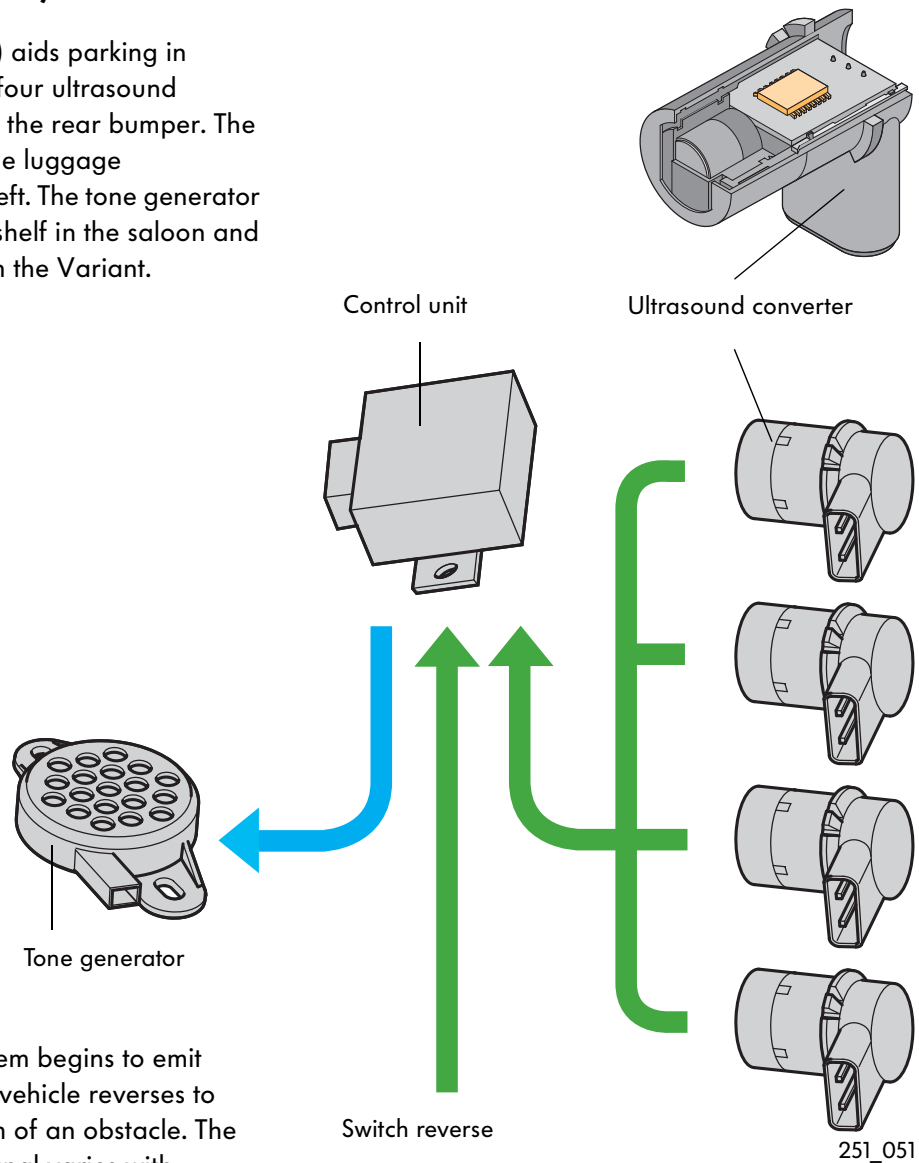
The DC/DC converter serves the purpose of current/voltage adaptation between the solar generator (solar module) and the blower. It converts the high voltage and low current intensity which the solar module supplies into a low voltage and high current intensity since the blower motor requires a very high starting current.

An electronic circuit in the DC/DC converter only enables the fresh air blower motor if the voltage is above a threshold value of 2 V. This avoids damage to the blower bearings.



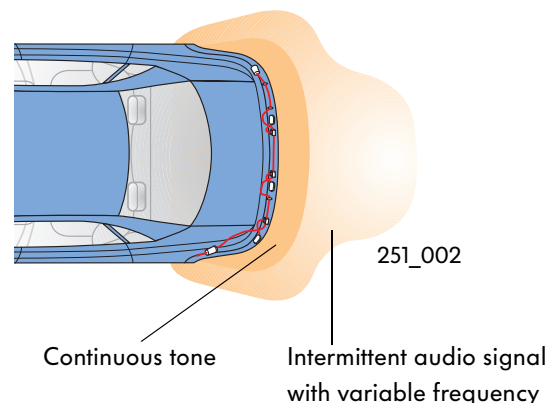
Distance control (ADK)

The distance control (ADK) aids parking in reverse. For this purpose, four ultrasound converters are built into in the rear bumper. The control unit is located in the luggage compartment on the rear left. The tone generator is under the rear window shelf in the saloon and built into the control unit in the Variant.



The distance warning system begins to emit acoustic signals when the vehicle reverses to within a distance of 1.60 m of an obstacle. The frequency of the audio signal varies with decreasing distance to the obstacle. The intermittent audio signal becomes a continuous tone when the vehicle reverses to within 20 cm of the obstacle.

The system is active as soon as the ignition is turned on and reverse gear is selected.



The Electrics

The radio navigation system

MFD radio navigation system with dynamic route guidance

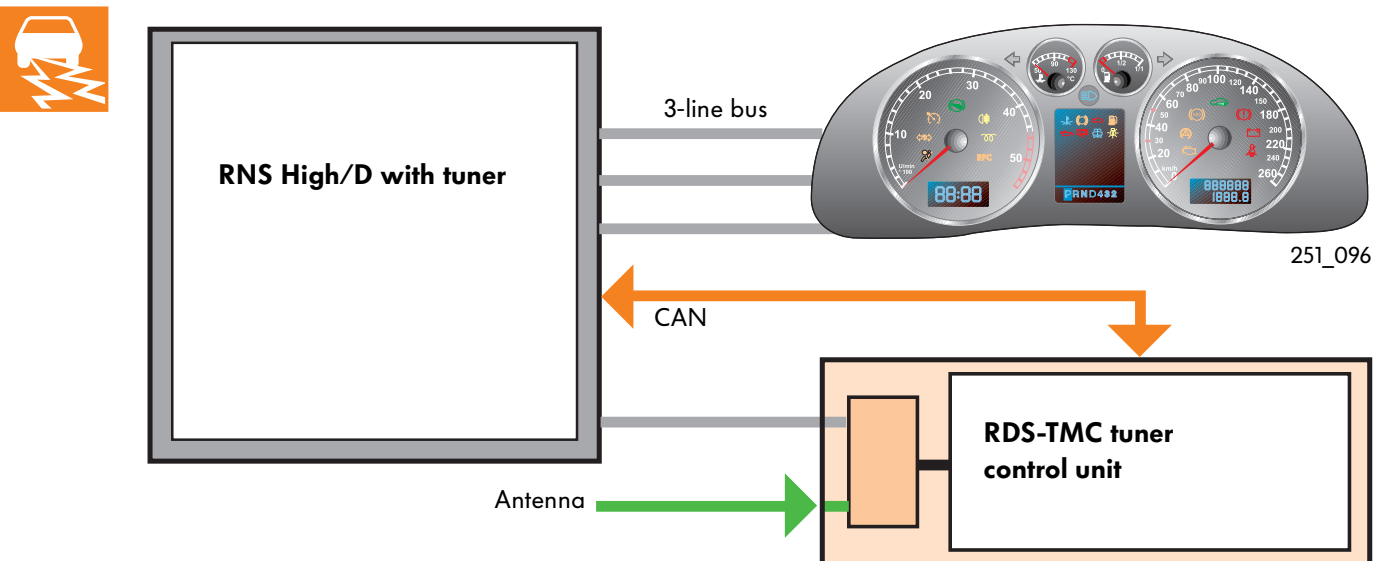
The traffic data used by the system is based on the RDS TMC service which is supported by radio stations and soon to be available throughout Europe. Use of a RDS-TMC control unit allows the driver to freely select a radio station for data reception. This means that TMC data and normal radio are received with different receivers.

All traffic information available within a radius of approx. 200 km is utilised. If the dynamisation function is activated by traffic conditions, the driver is informed of this by the announcement: „The route is being recalculated on the basis of traffic information!“

Traffic delays (road closures, traffic jams and slow-moving traffic) are visualised in the map and are displayed as text messages.

Glossary

- MFD = multifunctional display
- RDS = Radio Data System
- RNS - High/D = radio navigation with 5" screen and D for dynamic navigation
- TMC = Traffic Message Channel
- CAN = CAN bus with proprietary protocol, incompatible with the CAN databus protocol to VW' specification
- GPS = Global Positioning System



A radio navigation system with dynamic route guidance is also available as two-colour display (low-end). In this system the RDS-TMC tuner is integrated in the radio navigation system.

Radio navigation with dynamic route guidance

Dynamic route guidance

- Automatic rerouting to avoid traffic delays
- The system assesses traffic delays (road closure in both directions, traffic jam, slow-moving traffic) on the basis of the driving time remaining to destination
- No driver intervention is necessary and the driver can concentrate fully on the road ahead.

In comparison to older systems, which can only display the position of the vehicle on the planned route (static route guidance), the new navigation system also displays information on traffic conditions and updates the planned route to a destination in the event of traffic delays (dynamic route guidance).

To facilitate vehicle navigation, a GPS receiver and a direction sensor are fitted in the vehicle. The system determines and displays the exact location of the vehicle based on acquired data and a digital map. The route guidance function permits navigation to pre-entered destination. By processing digital traffic information broadcast by radio stations the system can reroute the vehicle to avoid traffic delays. The driver is only required to enter his destination. The system takes care of the rest.

The system constantly collects traffic data, even when the ignition is off. The system therefore offers the driver up-to-the-minute traffic information, which can be retrieved when needed. Traffic information is provided in text, graphic or audio form.

Since received traffic data first has to be converted into voice in the system, traffic information is available in a range of languages.

The dynamic navigation system is addressed with the same address word as the standard navigation system (37) .



The Electrics

TMC services

What is a TMC service?

A TMC (Traffic Message Channel) service is the net result of the activities undertaken by a service provider to broadcast traffic information. To make use of these services, the road user only requires an RDS-TMC receiver.

Services provided in Europe

European TMC services - public and private - are already available. A network providing European-wide coverage was in place by early 2000. Each service relates to a country in which it provides either regional or nationwide coverage. By agreement, all national or international service providers provide cross-border traffic information for long-distance drivers.

Public and private

TMC services for broadcasting general traffic information are freely available in all European countries.

These messages relate to road safety and various traffic delays. Europe's free and public services are collectively known as the "ALERT Service". Other TMC services will not be provided free of charge.

These services relate to value-added information or messages intended for special user groups.



How TMC services work

- Code numbers (TMC Location) have been assigned to all sections of motorways and major trunk roads.
- Traffic events (road closure, traffic jam, slow-moving traffic) have event codes (TMC Events) corresponding to the extent of the traffic delay (e.g. length of tailback).
- The navigation computer can refer the TMC Locations and Events to the maps which it uses for navigation purposes by means of a conversion table.
- All data are broadcast nationwide in the same form.
- As soon as the system receives information on traffic delays on sections of the planned route, it reevaluates their viability. If the system deems recalculating the route necessary, it may include a detour where required.

Radio navigation system with TV

The TV function is an extended function of the navigation system. All terrestrial programs can be received with the TV tuner.

Terrestrial programs are all programs that can be received using a normal antenna, and not programs that can only be received by satellite.

The TV tuner is compatible with all current broadcasting standards such as PAL, NTSC or Secam. The broadcasting standard used for TV reception in the country of delivery is preset at the factory. Teletext is also possible.

Currently available stations are identified automatically. The system automatically tunes into the frequency band which provides optimal reception. When the vehicle leaves a broadcasting area and enters, for example, an area with no radio reception or a silent zone, it enters automute mode.

The equipment includes a preinstalled wiring harness for connecting external equipment such as a video recorder or a notebook. However, this connection is currently unavailable to the user.

The TV is inactive while the vehicle is running.

The TV tuner has a self-diagnosis function which is activated by address word 57.

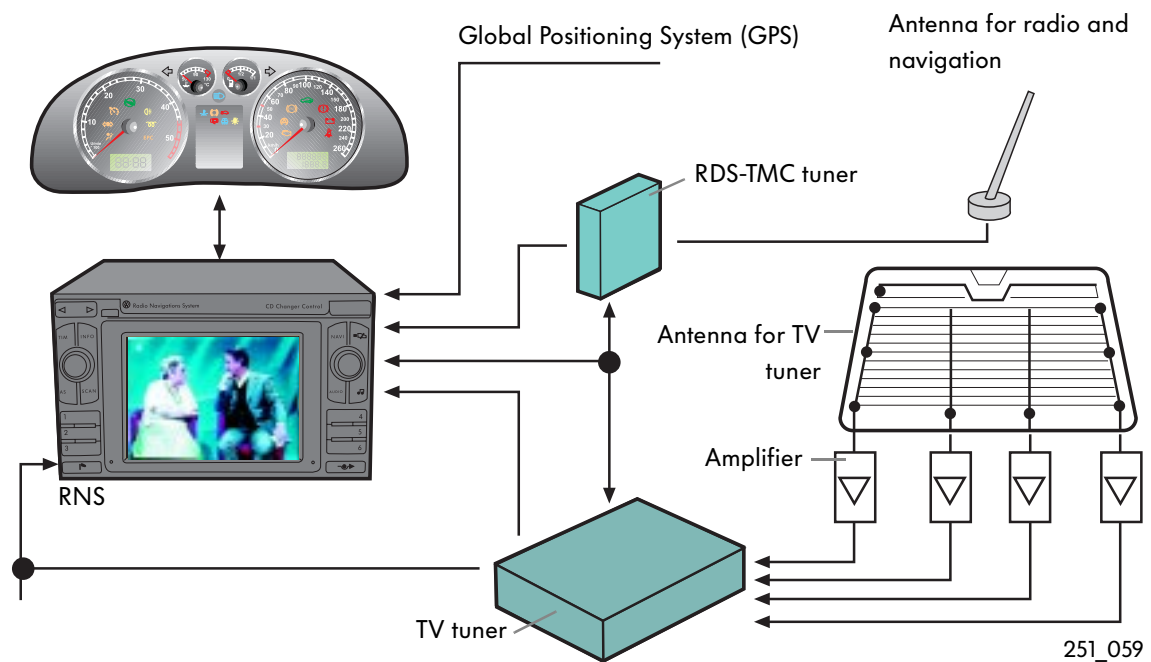


The Electrics

Dynamic navigation with TV tuner

The system which provides dynamic navigation and TV tuner includes the following components:

- radio navigation system (RNS) with multifunctional display
- window aerial with amplifier
- TV tuner with control unit in the luggage compartment on the left



The antenna for the TV tuner is integrated in the rear window in the saloon and in the two rear side windows in the Variant.

Pre-installed wiring harness for telephone installation

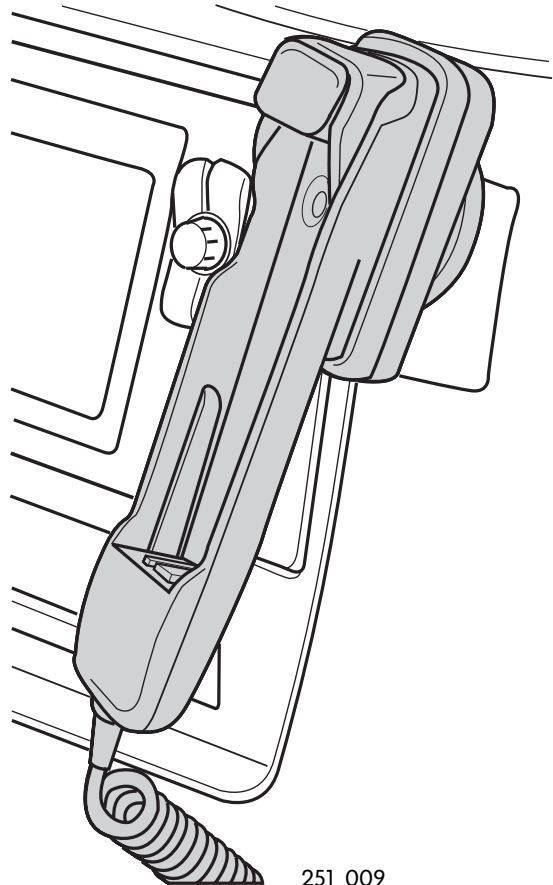
A wiring harness for connecting a mobile phone is available for the Passat 2001. The mobile phone rest is attached to the dash panel. The mobile phone is connected to an interface box fitted below the armrest.

The interface box is the interface between the mobile phone, the vehicle electrical system and the antenna.

When the mobile phone is placed in the rest, the driver can make a telephone call using the hands-free facility. The radio enters automute mode while a phone call is being conducted.

The telephone number can be dialled on the mobile phone. Voice dialling is also possible if the mobile phone provides this facility.

The mobile phone rest is available in two versions.



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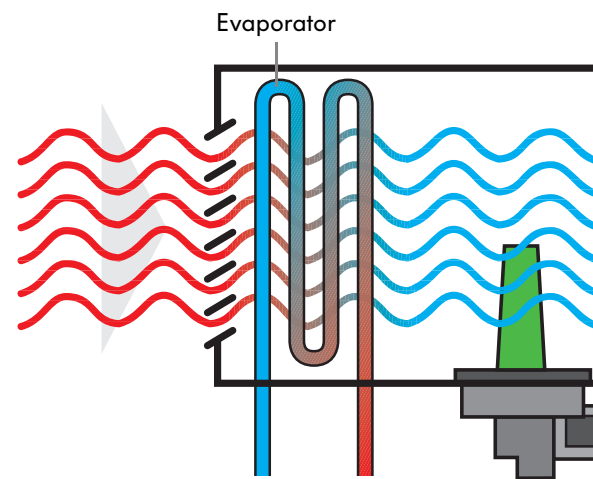


The Electrics

The heating and air conditioning system

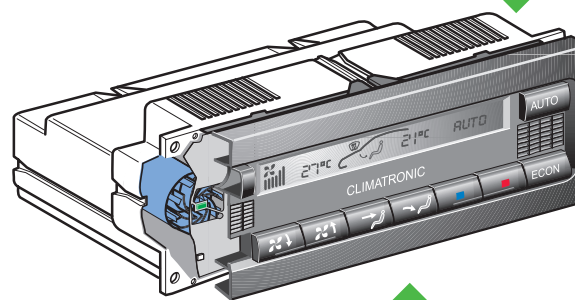
The Climatronic air conditioning system has been provided with an additional temperature sensor, as compared to the previous model.

The temperature sensor is built in the air duct on the outlet side of the evaporator. It is designated "Evaporator vent temperature sender G263". This sensor provides the Climatronic control unit with a continuous stream of data on the air temperature on the outlet side of the evaporator.



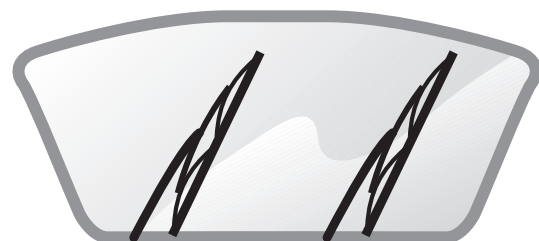
Signal from temperature sensor to control unit

Climatronic control unit
(behind the operating unit)



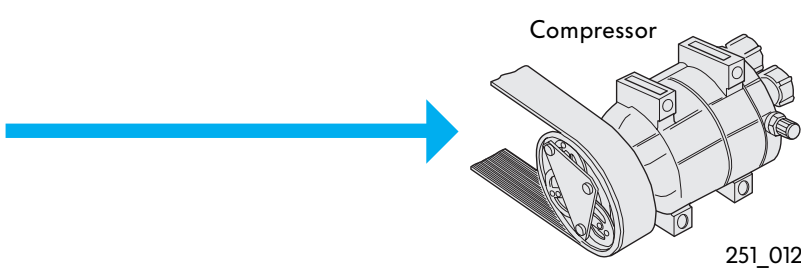
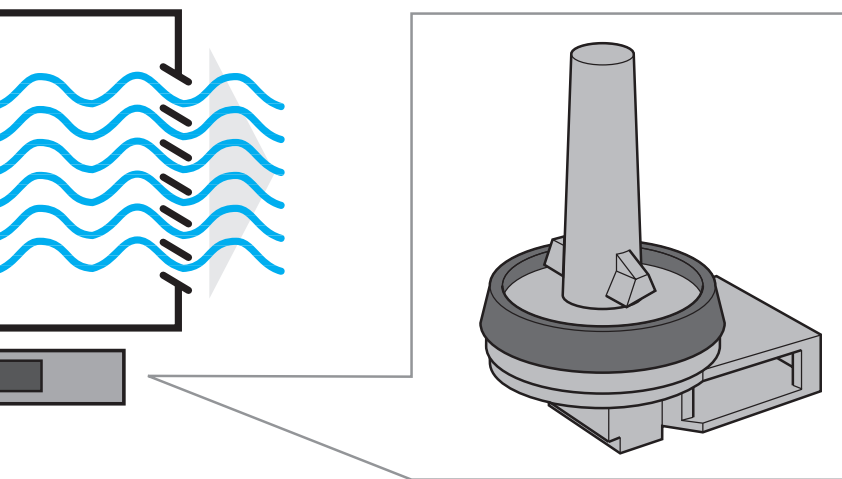
Climatronic has an additional new feature:

The Climatronic control unit receives a signal from the wiper motor. When the wiper motor is running, blower output and temperature are raised slightly so as to avoid windscreen fogging.



Windscreen wiper system

This allows the ambient temperature (G17 and G89) and the air outlet temperature on the outlet side of the evaporator to be checked and the control unit to control compressor shutoff more precisely. Dehumidification of the vehicle interior is improved because the air is dried more quickly. Windscreen fogging is thereby largely eliminated.



Self-diagnosis

A fault in the temperature sensor is entered in the control unit's fault memory. The signal from the sensor can be checked in the self-diagnosis data block.

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