

Service.



## Self-Study Programme 297

# Touareg



After the Passat W8 and the innovative Phaeton, the Touareg completes the trio in Volkswagen's luxury class product strategy. The Touareg is primarily an exclusive off-road vehicle, but it also satisfies the requirements for business and travel limousines.

The Touareg's adaptability to extremely varying driving conditions is a result of, for example, the continuous electronically controlled four-wheel drive, high-torque engines and its dual wishbone chassis.



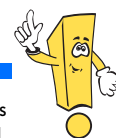
S297\_001

There are separate self-study programmes on the following topics:



- SSP 298: The Touareg, Electrical System
- SSP 299: 6-Speed Manual Gearbox O8D
- SSP 300: 6-Speed Automatic Gearbox 09D
- SSP 301: The Touareg Heating/Air-Conditioning System
- SSP 302: The Touareg Four-Wheel Concept
- SSP 303: The V10 TDI Engine
- SSP 304: Electronic Diesel Control EDC 16

**NEW**



**Caution Note**



**The self-study programme depicts the design and operation of new developments! Contents will not be updated.**

Current testing, adjustment and repair instructions may be found in the appropriate service material.



<b>In a nutshell</b> . . . . .	<b>4</b>
<b>Body</b> . . . . .	<b>10</b>
<b>Passenger protection</b> . . . . .	<b>22</b>
<b>Drive units</b> . . . . .	<b>26</b>
<b>Power transmission</b> . . . . .	<b>32</b>
<b>Chassis</b> . . . . .	<b>40</b>
<b>Electric system</b> . . . . .	<b>42</b>
<b>Heating and air-conditioning</b> . . . . .	<b>44</b>
<b>Radio and navigation</b> . . . . .	<b>48</b>
<b>Service</b> . . . . .	<b>54</b>



# In a nutshell

---



## The name Touareg

The name Tuareg (or Touareg) means "free people". Thus, the Volkswagen Touareg has the name of a traditional African desert tribe that has made a name for itself in Africa due to its trade in precious goods. The proud Tuareg, with their camel caravans and the mysterious appearance of their face veils, stand for the dream of limitless freedom under the mercilessly tough conditions of the desert.

The name was selected to characterise the Touareg as an exclusive off-road vehicle that proves itself as much in a rocky river bed as on the motorway. With its excellent on- and offroad characteristics and its elegant-progressive design, the Touareg is just as suitable as an off-road vehicle as a business, recreational and travel vehicle.





## Offroad capability

To test the offroad characteristics of the Touareg, an offroad test track was specially built in Ehra (near Wolfsburg), Germany. Here, the multifaceted vehicle could show its stuff.

The test track consists of:

- a short offroad stretch,
- a climbing hill, a section of which with shelves,
- a dry river bed simulation,
- a torsion module
- and a shallow basin.

The Touareg was tested and optimised on the test track for the following characteristics, among others:

- traction,
- torsion,
- acceleration behaviour and driving on inclines,
- supply of operating fluids,
- engine drag torque,
- suspension comfort,
- impermeability,
- noise emission in load situations,
- ground clearance
- and bumpers.



S297\_056



# In a nutshell



## Touareg

### Technical equipment

- off- and onroad suitability
- electronic differential block (EDB)
- 4-corner air suspension
- two-part tailgate
- modular roofrack system
- acceleration assistant
- mountain decline assistant
- fully galvanised, self-supporting body
- engine braking control (EBC)
- good fordability due to diverse seals

### Power

- powerful engine range with V10 diesel engine
- 6-gear automatic or manual gearbox for continuous four-wheel drive with central differential and reduction level
- central differential lock
- high-performance braking system
- roof load up to 100 kg
- fuel tank volume 100 l
- trailer load 3500 kg
- acoustically sealed interior

S297\_003





## Safety

- Electronic Stability Programme (ESP)
- Electronic Brake Pressure Distribution (EBPD)
- front, head and side airbags
- electric crash management with battery cut-off relay
- Anti-lock Braking System (ABS)
- Traction Control System (TCS)
- Hydraulic Braking Assistant (HBA)
- pedestrian protection taken into account
- extensive belt system
- Isofix retainers as standard
- electronic immobiliser

## Comfort

- 4C-Climatronic, 2C-Climatronic or manual air-conditioning system
- radio navigation system with offroad functionality
- 8- or 12-position seats
- comfortable back seat
- large boot volume with variable luggage net
- sockets
- electrically swivellable towbar
- air-conditioned glove compartment
- comfort interior lighting
- adjustable steering wheel
- easy operability of all systems

S297\_004



# In a nutshell

## Technical data

The figure shows the dimensions of the Touareg with a V6 engine.



S297\_005

## Dimensions and weights

Length	Approx. 4,754 mm
Width	Approx. 1,928 mm
Height	from 1,703 to 1,726 mm*
Roof load	100 kg
Trailer load	3,500 kg
Tank volume	100 l

Front track width	from 1,645 to 1,658 mm*
Rear track width	from 1,657 to 1,664.5 mm*
Total permitted weight	from 2,850 to 3,080 kg*
Dead weight	from 2,214 to 2,524 kg*
Boot space	from 555 to 1,570 l**
Drag coefficient	from 0.38 to 0.42 c <sub>w</sub> *

\*depending on the engine

\*\* for V10 TDI: from 550 to 1,525 l



## Offroad driving

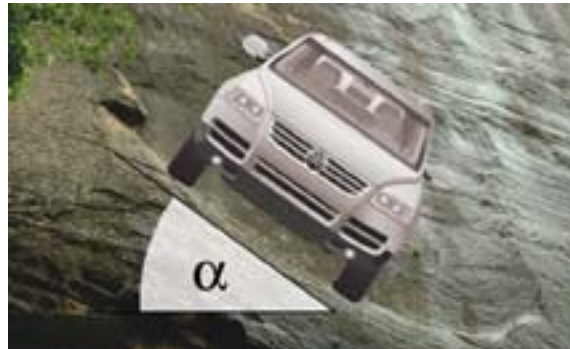
The offroad capability of the Touareg is proven by the following data:

S297\_043



Maximum climbing capability: 45°  
(= 100% slope)

S297\_060



Maximum possible lateral inclination: 35°

S297\_006



Ground clearance:  
Steel suspension max.: 237 mm  
Air suspension max.: 300 mm

S297\_007



Drivable angle of slope:  
Steel suspension max.: 28°  
Air suspension max.: 33°

S297\_008



Drivable ramp angle:  
Steel suspension max.: 22°  
Air suspension max.: 27°

S297\_009



Possible ford depth:  
Steel suspension max.: 500 mm  
Air suspension max.: 580 mm

### What does "ford depth" mean?

The ford depth indicates through what water height a vehicle can slowly drive without the engine taking on water or water entering the vehicle.



# Body

## The Touareg's raw body

The body of the Touareg is a completely new, self-supporting construction. It is designed to attain a rigidity that is as static and dynamic as possible. To accomplish this, a series of special sheet metals were used, such as:

- High-strength sheet metals: These sheet metals, made of special steel, are more stable than "normal" sheet metals without causing an increase in weight.
- Tailored blanks: Sheet metals that have different thicknesses depending on the loads where they are used.

Instead of the usual ladder frame, the body has integrated longitudinal bearers that run through the vehicle. In the front and the rear, they are manufactured from tailored blanks.

C-rails with fastening points for roof racks are set into the roof.

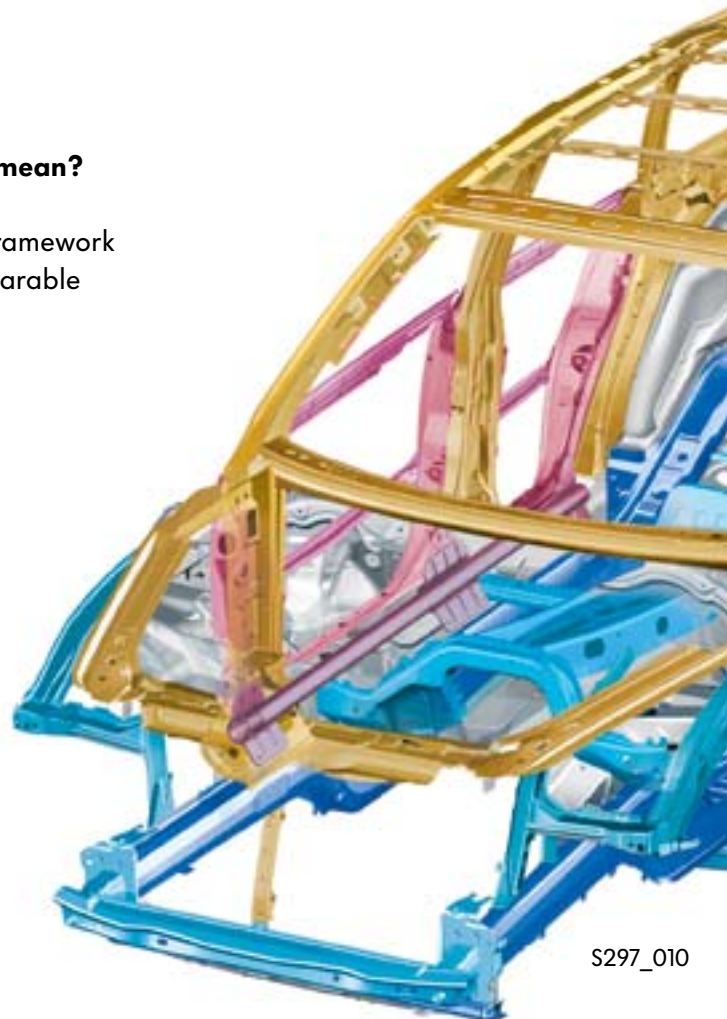
Cavities have been made for the gas shock absorbers in the tailgate.

### What does "self-supporting" mean?

In a self-supporting body, the framework and the structure form an inseparable unit.

### Static rigidity

The body of the Touareg has a very high static rigidity. It does not warp, even during offroad driving, where large forces affect the body. The chassis can be optimally designed; the doors and flaps always close without problems, even with the tightest gaps.



S297\_010

To improve the look of the vehicle, the roof is connected to the side parts by laser soldering. As a result, the seam is unnecessary.

### Safety aspects

In addition to the measures mentioned above, the body was designed to survive crashes well using profiles and an auxiliary frame. In the sills (side members), tubes with a wall thickness of 3 mm were installed, which optimised the side-post crash behaviour. Overall, the crash behaviour of the Touareg is similar to that of a very good automobile – unusual for such a vehicle.

In addition, the roof structure is reinforced to increase the safety for the occupants during a rollover.



### Dynamic rigidity

The high dynamic torsion rigidity of the body results in favourable vibration characteristics and thus excellent driving comfort.

#### Legend:

- violet = side crash area
- yellow = passenger compartment
- dark blue = frame structure
- light blue = crash areas

# Body

## Bodywork attachments

### Engine bonnet

The engine bonnet is completely constructed of aluminium. The outer plate is 1.15 mm thick, the inner plate 0.9 mm. This thickness is novel for an inner plate.

### Mud wings and bumper

The mud wings and the bumper are made of plastic. The wall thickness of the mud wings varies between 2.7 and 3.4 mm. The plastic that is used is resistant against high paint temperatures. This permits painting of the bumpers together with the body as a whole.

### Windows

The windscreen consists of acoustic glass; an electric heater is an option. As an optional extra, privacy windows are available. Here, the glass to the rear of the B-pillar is darkened by 35%.

### Legend:

blue = aluminium parts  
brown = plastic

### Mud flap bench

The mud flap bench is screwed in and can be then adjusted. This results in low gap thicknesses.

### Sliding/flip-up roof

The vehicle is available with two types of roof:

- a solar roof and
- a glass roof.

Both systems were already used in the Volkswagen Passat.



### Rear window module

The rear window module is made up of glass and a sheet metal frame. The parts have a new, special technique of plastic extrusion coating. In order to avoid providing a starting point for intruders, the hinges are covered by a spoiler. This consists of glass-fibre-reinforced plastic which expands only slightly when exposed to heat. This results in low gap thicknesses in this case also.

### Side window module

The side window is connected to the panel and the trim plate by plastic extrusion coating. Setscrews are also injected into the module. The entire module is screwed to the body.



### Door modules

The door modules (doors with mounting parts) are installed as a single unit in the doors. They can be adjusted. In order to attain the fordability of the Touareg, the doors are sealed thrice.



S297\_011

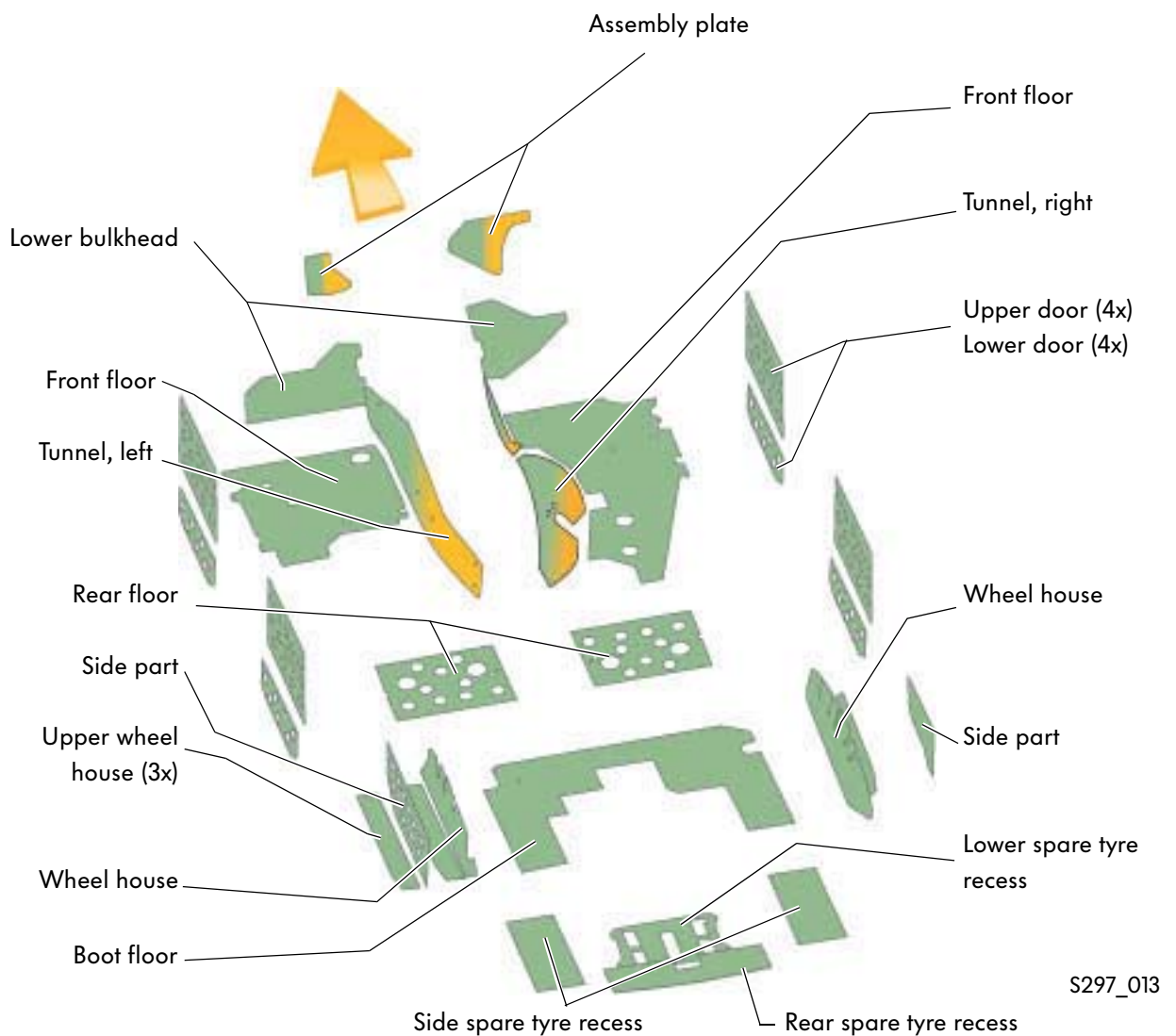


S297\_012

# Body

## Body insulation

Two acoustic insulation packages were developed for the Touareg. The package for petrol engines consists of bitumen foil sound deadening. For diesel engines, four of the sound deadening parts were designed as a bitumen-aluminium sandwich foil.



S297\_013

### Legend:

green = bitumen plastic foil

green/orange = diesel engines: aluminium sandwich foil, otherwise: bitumen plastic foil

## Towbar

Four different systems are available for the Touareg:

- a rigid design,
- a USA design with a square seat to fasten a separate towing ball,
- a design with a removable hitch ball, and,
- as the highlight, an electrically swivellable design.



### Electrically swivellable towbar

The electrically swivellable towbar is installed as a unit behind the bumper cover. The operating unit for the system consists of a rocker button in the right-hand side panel in the boot.

The swivellable towing ball can be extended/retracted only under the following conditions:

- The vehicle must be stationary.
- The engine/ignition must be switched off.
- The tailgate and/or the rear window must be open.
- The towing ball is extended/retracted by pressing the rocker switch appropriately.

In the extended position, the socket is to the right of the towing ball. It is automatically brought into the rest position when the towing ball is retracted.



In order to avoid damage, the towing ball should be brought into the rest position when the system is not in use.

S297\_055



Further information about the electrically swivellable towbar can be found in SSP 298 "The Touareg Electrical System"



S297\_046

# Body

## Tailgate

The tailgate of the Touareg is divided into two parts, consisting of an individual flip-up rear window and the tailgate itself.

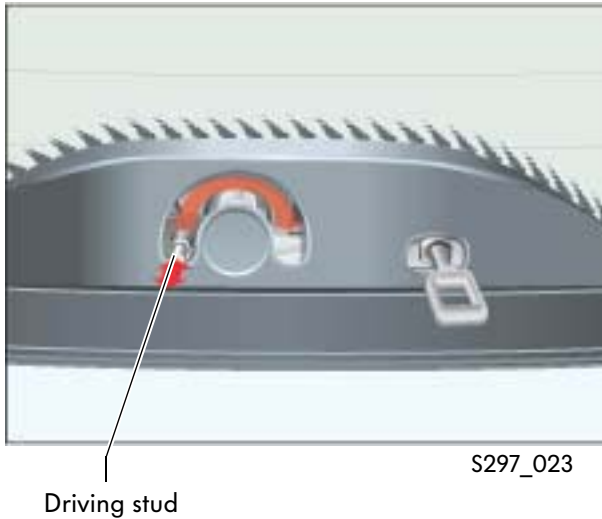
The rear window and the tailgate are reconnected by a locking mechanism when they come into contact.



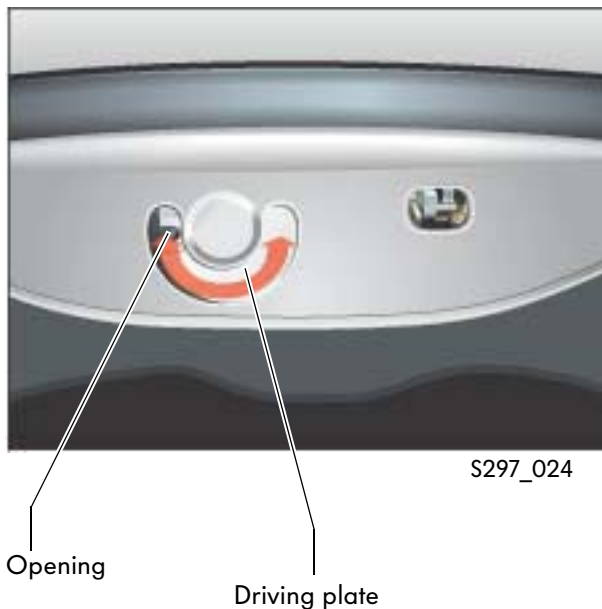
Two pairs of gas shock absorbers ensure comfortable opening and closing of the rear window and the tailgate; these are attached to the body so that they are invisible from the outside.



### Driving stud on rear window



### Driving plate on tailgate



### Rear window wiper

The motor for the rear window wiper is located in the tailgate, while the wiper is installed in the rear window.

For this reason, there are two connections in the tailgate: one for locking the rear window and the tailgate and one for the connection between the window wiper and its motor.

When the rear window is flipped up, the window wiper may twist. As a result, the position of the driving stud changes in such a way that it no longer fits in the hole of the driving plate. In this case, the spring-loaded driving stud is pressed back so that nothing is damaged.

As soon as the window wiper motor is started, the driving plate turns and the driving stud locks into the opening.

In this way, the window wiper and its motor are easily disconnected and then reconnected.



# Body

## Front seats

The front seats of the Touareg have their own sporty characteristics, such as raised side cushions. They are heated by the electric seat heater using a carbon heating element.

In order to satisfy customer demands in a luxury vehicle, the upholstery of the seats is first-class. Many different cloth fabrics can be ordered, as can several leather versions.

In addition, the front seats are integrated in the Memory Package: the seat position and the Easy-Entry setting can thus be saved for different profiles.

In the basic version, the Touareg comes with 8-position seats; the comfort design has 12-position seats.

## 8-position seat

In the 8-position seat, seat adjustment is carried out manually.

It has the following possible adjustments:

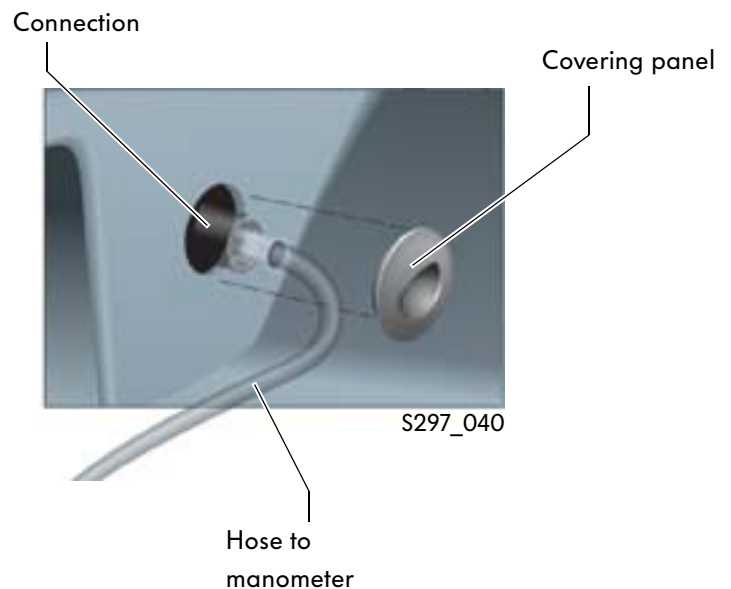
- Back-to-front direction
- Seat height
- Backrest inclination
- Headrest



S297\_025

## Compressed air connection

Under the passenger seat in the seat console, there is a connection for the air compressor. For example, a manometer can be connected here.



## 12-position seat

The 12-position seat has the following additional possible adjustments:

- Seat horizontal inclination
- Lordosis support

All adjustments other than the head-rest height are made electrically.

## What does "lordosis" mean?

"Lordosis" means the forwards curvature of the spinal cord. The human spinal cord has two lordoses, one in the neck area and one in the loin. A pathologically strengthened lordosis causes a saddle back.

S297\_026

# Body

## Rear bench

The rear of the Touareg is equipped with a bench. It is designed for three persons, providing a head rest and a 3-point belt for each position.

There is a central arm rest in the backrest of the central seat; this has an integrated compartment for a ski sack.

The entire rear bench can be heated. The backrests of the rear bench can be folded forwards separately at a 2:1 ratio.



S297\_015



S297\_014

## Luggage net

The luggage net of the Touareg is located in its own cassette. This can be mounted either behind the rear bench or – if the bench is folded down completely – behind the driver's and passenger's seats.

The net can be pulled out and anchored in the roof liner.



S297\_052



S297\_053

## Roofrack

In order to mount a roofrack, two chamfered C-rails are inserted into the roof of the Touareg; the carriers can be inserted into these rails. The carriers can be inserted only in the openings in the centre.



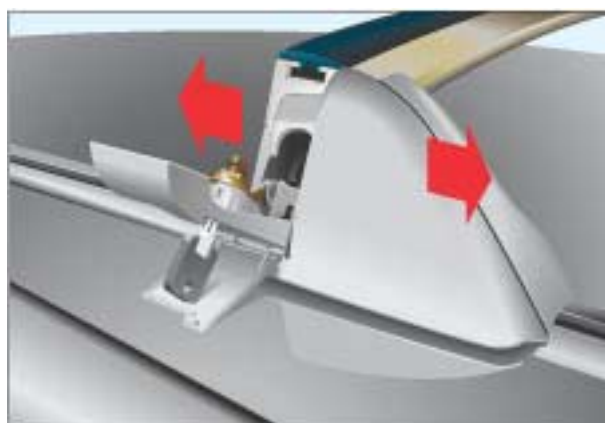
The supports have a lockable tensioning mechanism: When the lock is open and the flap disengaged, the carriers are pushed into the desired position. The carriers are fastened by closing the flap and the lock. The carrier can be locked only in the area of the recesses.

If the lock is closed, the carrier is fastened.



S297\_018

If the lock is open, the carrier can be moved.



S297\_019



To avoid damage to the paint, the key for moving the carrier must be pulled out.

# Passenger protection

## Airbag system

### Airbags

The following airbags are installed in the Touareg:

- Driver and (front) passenger airbag (approx. 64 l and 120 l filling volume),
- Driver and front passenger side airbags (approx. 11 l filling volume),
- Head airbags (approx. 22 l filling volume).

There are no side airbags in the rear of the vehicle. There, the passengers are protected by head airbags that stretch along the entire length of the vehicle. Due to their design, the head airbags are also called curtain airbags.

The airbag technology (design, activation technique, etc.) is the same as in the Phaeton.

### Crash sensors

Two Early Crash sensors are located in the front of the Touareg; these detect an accident and its magnitude early and transfer the data on to the control unit.

In this way, the airbags are activated if the accident is severe.

The Early Crash sensors detect the longitudinal acceleration. An additional sensor of this type is located in the airbag control unit in the centre console.

In addition, four traverse acceleration sensors are fastened to the sides of the vehicle.





S297\_020

### **Airbag control device**

The airbag control device is located in the centre console. It receives the signals of the six crash sensors, evaluates the data and, in the case of an accident, can trigger the following actions:

- tightening the belts,
- activating the airbags,
- blasting off the battery cables,
- activating the hazard light system,
- switching off the fuel pump and
- opening the central locking system.



Depending on the magnitude of the crash, the airbags are triggered in two stages.

### **Airbag deactivation**

The front and the side airbags for the front passenger can be deactivated using the ignition key. To do this, there is a lock in the centre console next to the selection switch for the automatic gearbox; with this, the ignition key can be used to set two positions (airbag on/ airbag off).

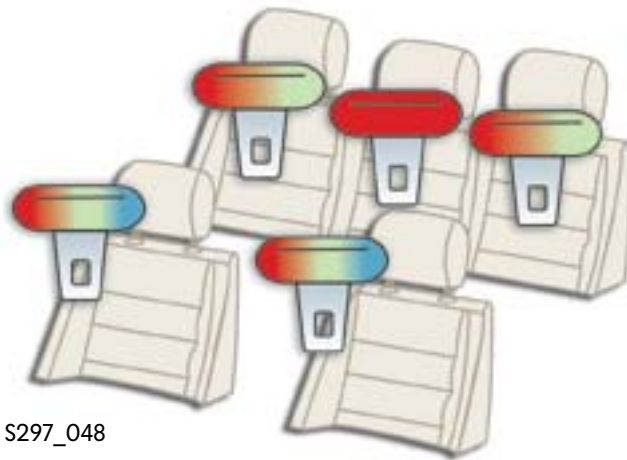
For safety reasons, a light in the dash panel insert lights up when the airbags are deactivated.

# Passenger protection

## Restraining systems

### Belts

Three-point retracting seat belts are located at all five seats in the Touareg. The belt lock and the belt limit stop are located in the seat. The height of the belt can be mechanically adjusted at all outer seats; as the top equipment option, an electric belt height adjustor and a comfort mechanism are available for the front seats.



S297\_048

### Ball seat belt tensioner and belt tension limiter

Ball seat belt tensioners are used at all four outer seats. They are pyrotechnically ignited. In addition, the driver and front passenger belts have belt tension limiters.

Due to the latter, the belts are at first tensioned during a collision to provide early binding of the passengers to the vehicle structure.

After a certain belt force has been attained, the belt relaxes a bit.

This provides another way of reducing the collision energy.

#### Legend:

- red = Three-point retracting seat belts
- green = ball seat belt tensioner, mechanical belt height adjustment
- blue = Belt tension limiter and belt-use detection, optional comfort mechanism and electric belt height adjustment

### Belt use detection

There is a belt-use detection system for the driver and the front passenger. It ensures that a warning signal is issued if the driver does not use the seat belt when operating the vehicle.

In co-operation with the comfort mechanism, the belt-use detection system is used to determine which spring of the comfort mechanism is used: When the belt lock is closed, a soft spring provides high belt comfort. If the belt is released, it rolls up quickly and safely due to a more rigid spring.



## Child seat fasteners

Isofix child seat fasteners are attached to the front passenger seat as well as to the outer seats of the rear bench.

## Additional notes

The collision area at the dash panel is optimised at knee height for the driver and the front passenger.

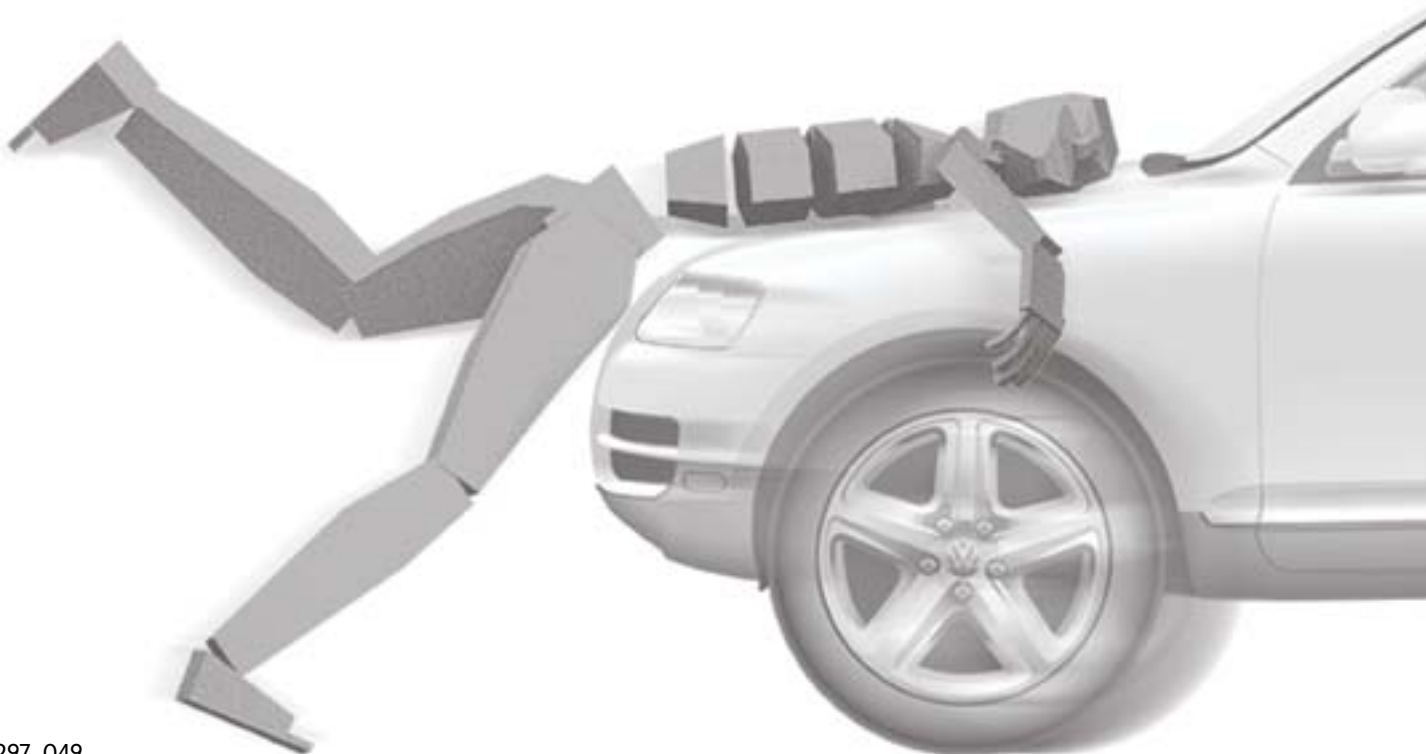
Corners and sharp edges have been avoided; panelling and absorber parts deform in such a way that the risk of injury is minimised.



## Pedestrian protection

Due to the vehicle contour, the selected material (e.g. aluminium bonnet and plastic mud flaps) and the space between the bonnet and the engine, pedestrian protection has been taken into account.

In terms of pedestrian protection, the body is designed in such a manner that it deforms strategically and quickly reduces energy.



S297\_049

# Drive units

## 3.2l V6 petrol engine

The 3.2l V6 petrol engine, a further development of the 2.8l V6 engine, is also installed in the Phaeton. Due to the offroad capability of the vehicle, some of the components had to be modified.

### Engine management technical features

- Bosch Motronic ME 7.1.1
- Exhaust gas system with two preliminary catalytic converters and a main catalytic converter
- Control of the internal exhaust gas recirculation via the camshaft adjustment
- European On Board Diagnostic System (EOBD) with exhaust gas indicator light

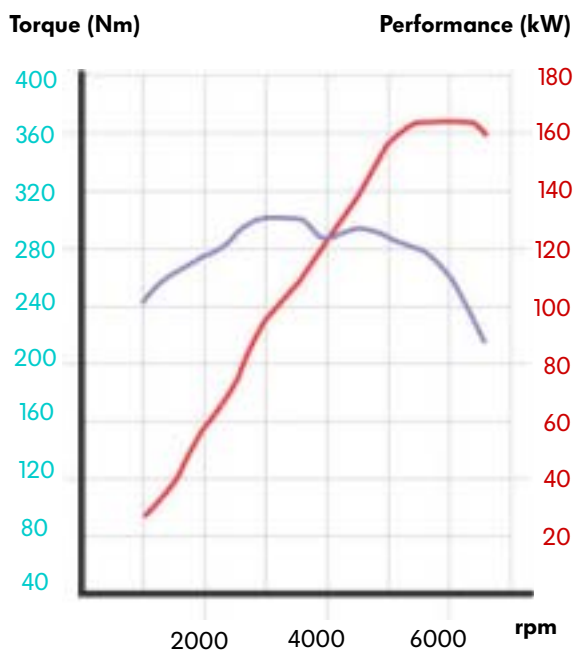


S297\_044

### Technical data 3.2l V6 engine.

Engine code	AZZ
Construction	VR engine
Displacement	3,189 cm <sup>3</sup>
Bore	84 mm
Stroke	95,9 mm
Valves per cylinder	4
Compression ratio	11.25:1
Max. output	162 kW at 5400-6400 rpm
Max. torque	305 Nm at 3200 rpm
Engine management	Bosch Motronic ME 7.1.1
Fuel	ROZ 98 (reduced performance with ROZ 95)
Exhaust gas treatment	Three-way catalytic converters with constant Lambda regulation
Exhaust emission standard	EU 4

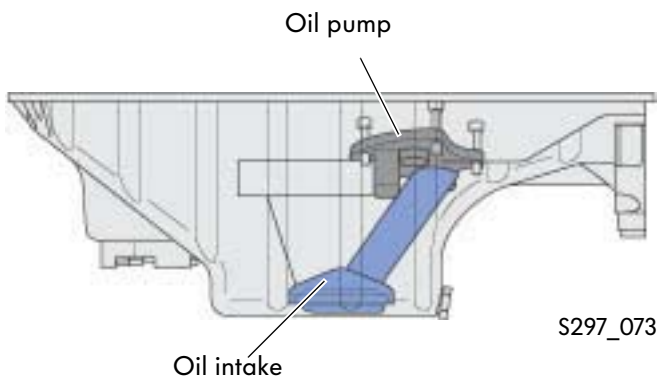
### Torque and performance chart



S297\_045

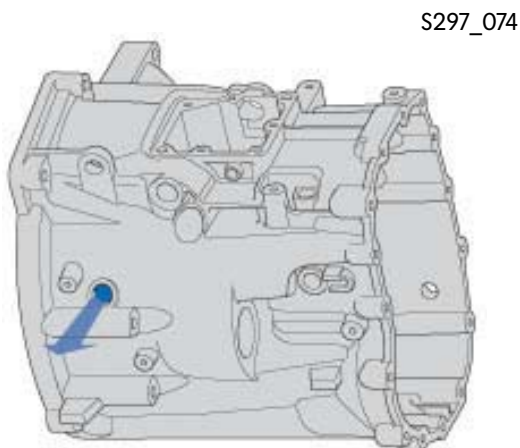
## Engine mechanics technical features

Due to the offroad capability of the Touareg, special demands are made in terms of inclination and fordability. To fulfil these demands, certain components have been modified compared to those in the same engine in the Phaeton.



### Oil pan

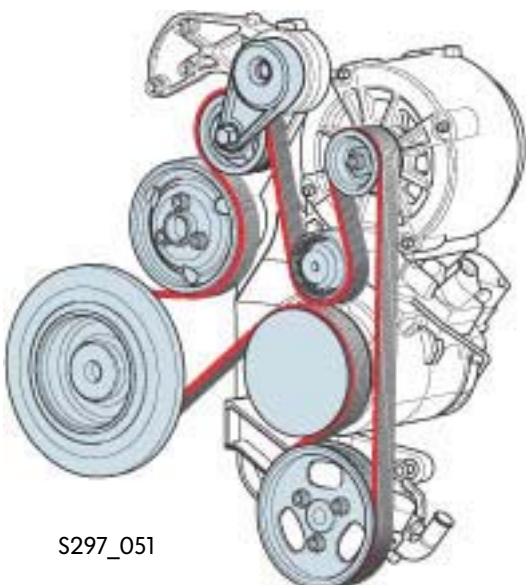
A new, deeper oil pan ensures that there is always sufficient engine oil to be taken in at every inclination of the vehicle. The oil pump has been adapted to the new oil pan in the area of oil intake.



### Seals

In vehicles with a manual gearbox, the dual-weighted flywheel must be prevented from standing in water for a long time. For this reason, the bell housing is sealed against the engine. If water nevertheless enters the bell housing when driving through water for a long time, it is expelled through an opening on the side of the bell housing by the turning movement of the dual-weighted flywheel.

The crankshaft gasket on the belt drive side has an additional sealing lip. It prevents the intrusion of water and dirt into the crankcase.



### Belt drive

The belt drive of the auxiliary assemblies has an enlarged looping angle on the pulleys. This prevents slipping of the belt when driving through water.



# Drive units

## 4.2l V8 petrol engine

The V8 engine was optimised and further developed especially for the Touareg, especially for offroad use.

### Modifications to the Touareg

- Three-stage variable intake manifold
- Double-flow intake with dual HFM
- Water-cooled 190 A alternator
- Fording seals
- Crankcase with large flangepiece
- Crankshaft with 10-hole flange
- New oil filter module
- Poly-V drive with 7 grooves
- Fordable auxiliary assemblies
- Offroad-capable oil intake
- Return flow-free fuel system
- Operating safety at 100% incline or decline and 70% lateral slope

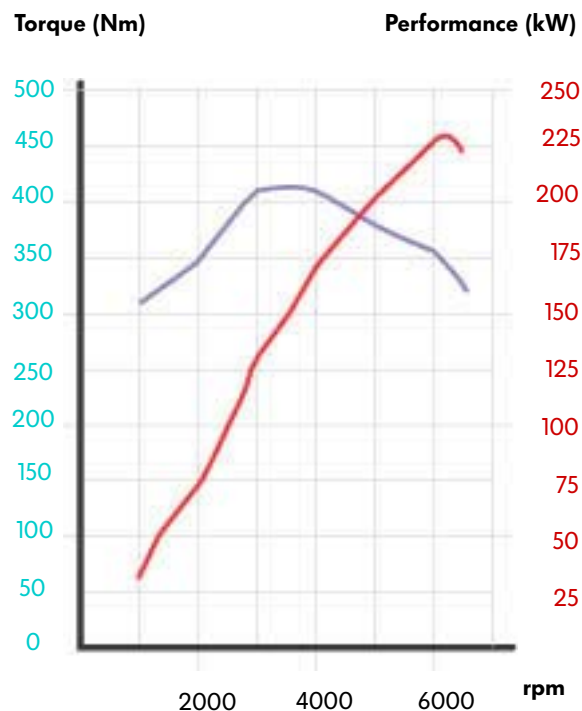


S297\_101

### Technical data 4.2l V8 engine

Engine code	AQF
Construction	V8 engine with 90° V-angle
Displacement	4,172 cm <sup>3</sup>
Bore	84.5 mm
Stroke	93 mm
Valves per cylinder	5
Compression ratio	11:1
Rated power	228 kW at 6200 rpm
Rated load torque	410 Nm at 3000 to 4000 rpm
Engine management	Bosch Motronic ME 7.1.1
Fuel	ROZ 98/95 (emergency operation with ROZ 91)
Camshaft adjustment	Inlet camshaft adjustment
Exhaust emission standard	EU 4 / LEV

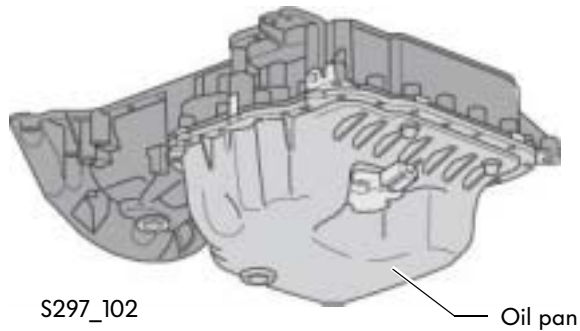
### Torque and performance chart



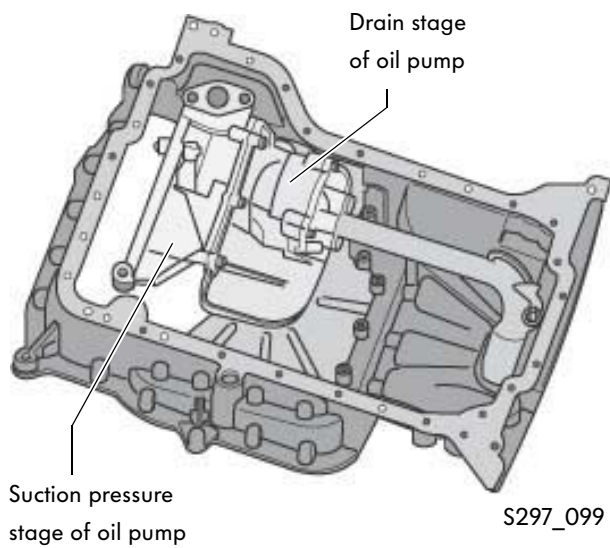
S297\_072

## Offroad-capable oil intake

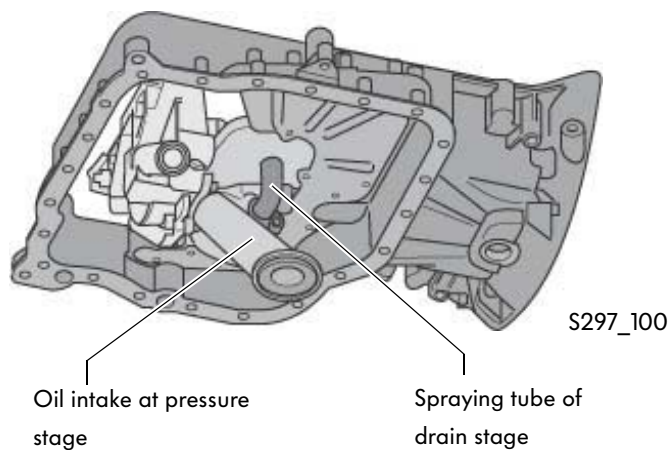
Among other things, the oil intake was adapted to offroad use. During extreme climbs and driving perpendicular to slopes, an optimum oil supply must be guaranteed at all times.



A deep oil pan ensures safe oil intake when driving up and down slopes.



The oil pump (with a drain stage) supplies the engine with oil during extreme offroad driving. The drain stage stores the oil from the rear oil pan in front of the pressure pump. This ensures optimum intake at all times.



The spraying tube of the drain stage separates the air out of the oil that is transported from the rear oil pan.



# Drive units

## 5l V10 TDI engine

The V10 TDI engine is a newly developed diesel engine. It is equipped with the pump-jet injection system and combines innovative light-weight construction with enormous power.

### Engine mechanics technical features

- Cylinder block made of aluminium with an end bracket made of grey cast-iron
- Joining of cylinder head and cylinder block via tie-rod screw connection
- Balancer shaft for reducing vibrations
- Drive of control and auxiliary assemblies using gearwheels



S297\_021

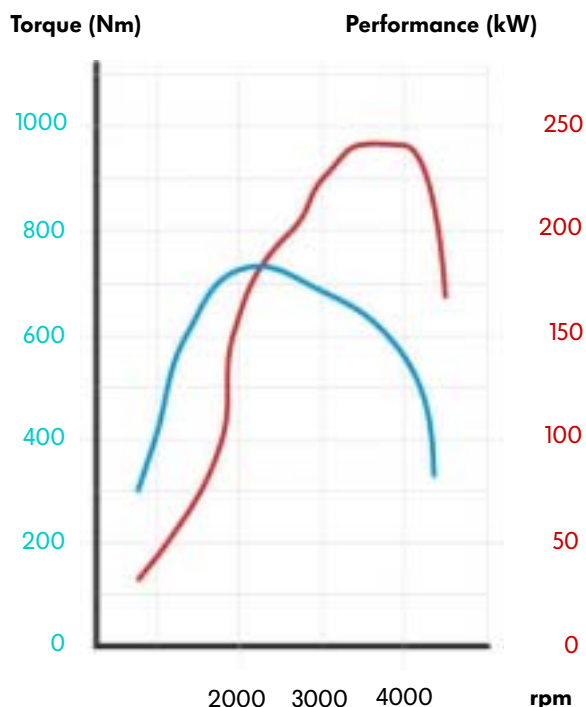
### Engine management technical features

- Two motor controllers
- Charged by two adjustable turbochargers
- Exhaust gas recirculation is carried out by pneumatically activated exhaust gas recirculation valves combined with electrically activated intake manifold flaps

### Technical data

Engine code	AYH
Construction	V engine, 90° V-angle
Displacement	4,921 cm <sup>3</sup>
Bore	81 mm
Stroke	95.5 mm
Valves per cylinder	2
Compression ratio	18:1
Max. output	230 kW at 4000 rpm
Max. torque	750 Nm at 2000 rpm
Engine management	Bosch EDC 16
Fuel	Diesel min. 49 CZ or biodiesel
Exhaust treatment	Exhaust gas recirculation and oxydation catalytic converter
Exhaust emission standard	EU 3

### Torque and performance chart

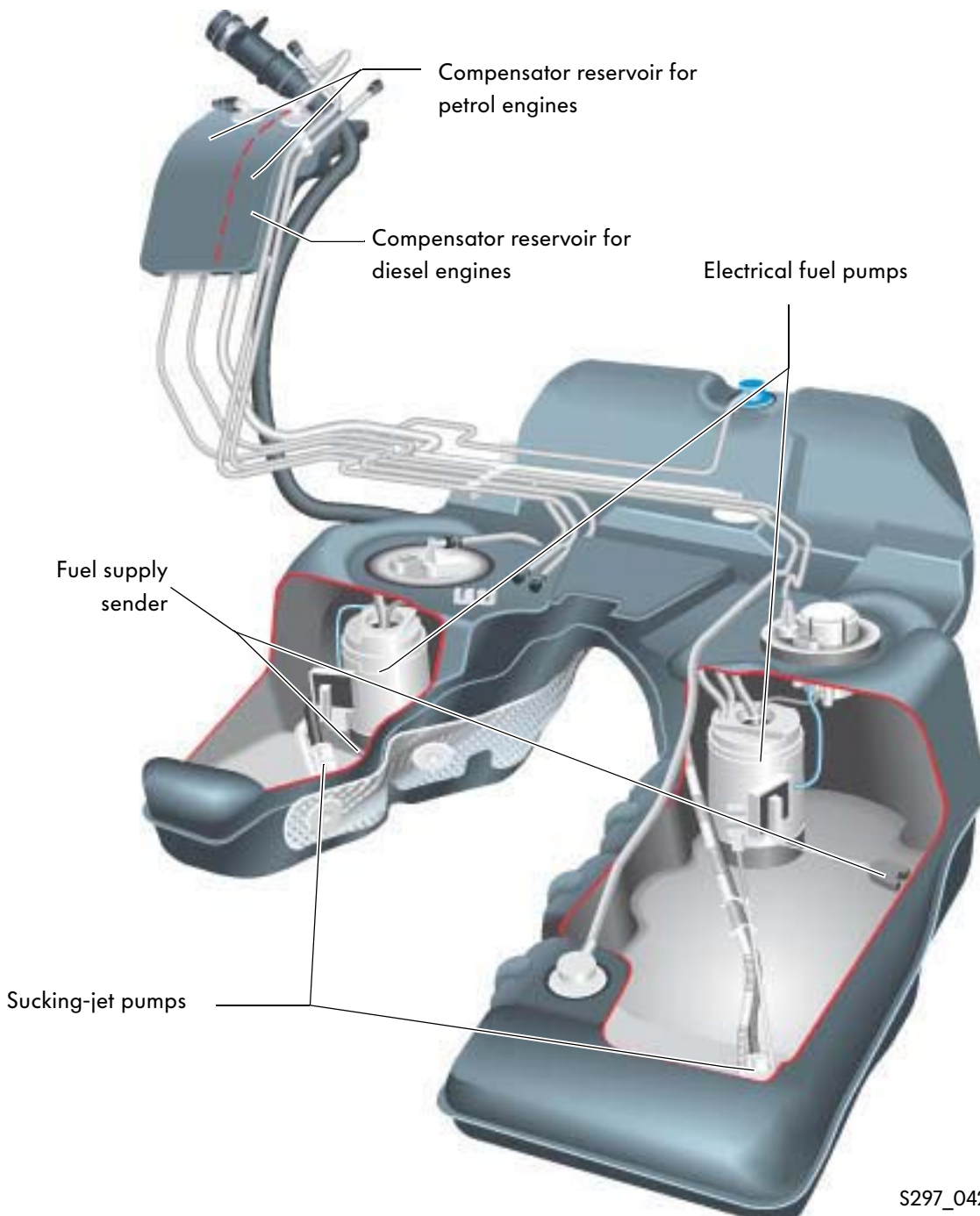


S297\_022

## Fuel tank

In order to utilise the available installation space to the greatest extent possible, the fuel tank consists of a main chamber and a secondary chamber. Both chambers have an electrical fuel pump and a sucking-jet pump. There is a sender for the fuel supply on each of the two electrical fuel pumps.

The fuel tanks for petrol and diesel engines differ mainly in the size of the compensator reservoir and in the attached lines.



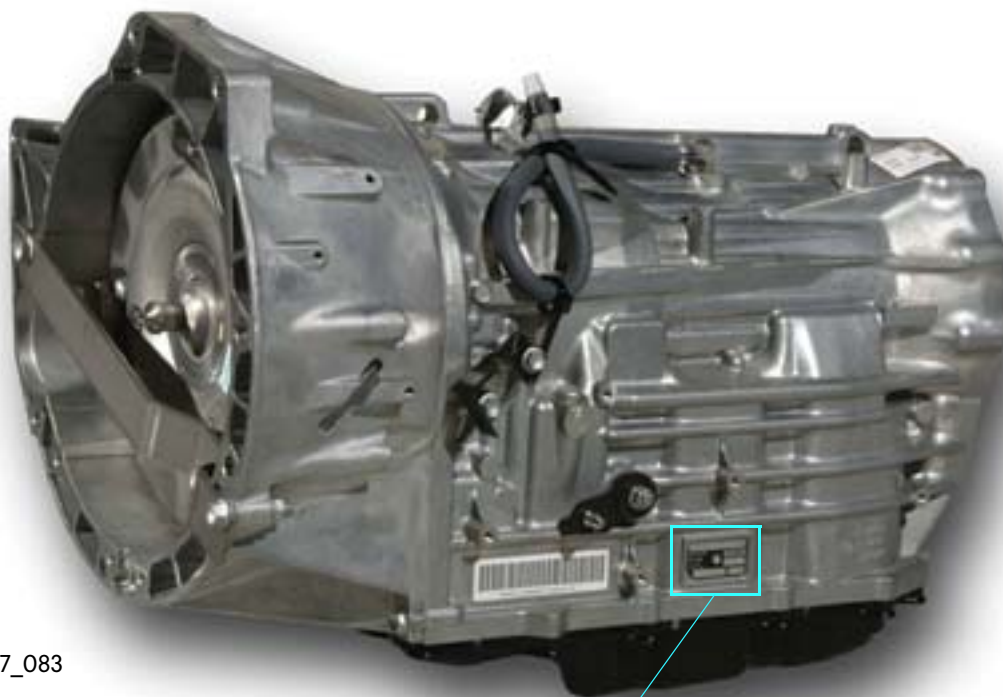
S297\_042

# Power transmission

## 6-speed automatic gearbox 09D

Compared to the 5-speed automatic transmission, the 09D 6-speed automatic transmission provides a reduction of fuel consumption and thus a reduction of exhaust gas emissions, as well as a reduction of noise, all at significantly improved acceleration values.

It was developed at AISIN, the famous Japanese manufacturer of automatic gearboxes, and is also manufactured by them. The tuning and adaptation of the gearbox and the control unit to the Touareg was carried out in co-operation with Volkswagen engineers.



S297\_083

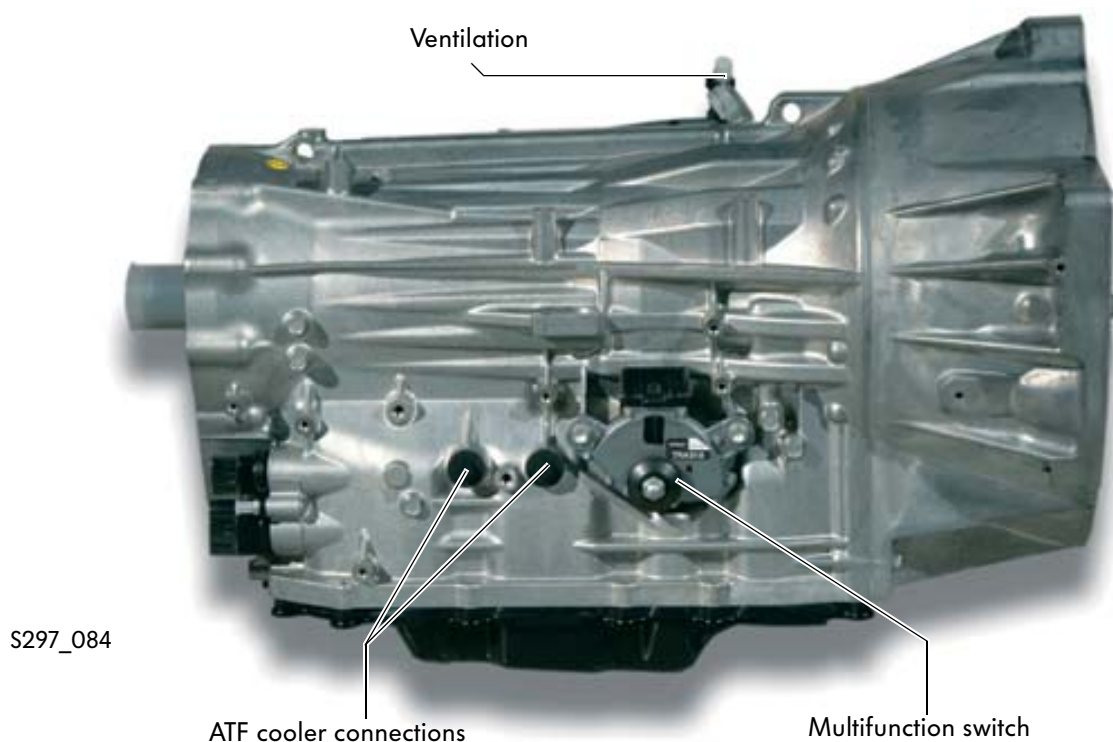


S297\_089



### Special gearbox features include:

- Switching programmes integrated into the control unit that depend on driver and driving situations as well as switching programmes that depend on driving impedance. The switching programmes are controlled by fuzzy logic.
- Controlled transformer bypass coupling.
- Lifetime ATF filling.
- Axle drive is located outside of the automatic gearbox.
- The hill-holder function secures the vehicle from rolling back and permits hills to be approached comfortably.
- Selector lever and steering wheel Tiptronic.



### Technical data

Volkswagen designation		AG6 09D
Gearbox codes	with V10 TDI engine with V6 engine	EXG EXL
ATF		Lifetime filling
ATF filling amount	with V10 TDI engine with V6 engine	12 litres 9.6 litres
Maximum torque transmission		750 Nm
Weight	depending on the engine type, including ATF	97 kg -110 kg
Emergency run	in case of defective control unit	3rd gear and R gear



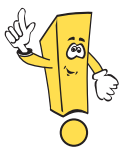
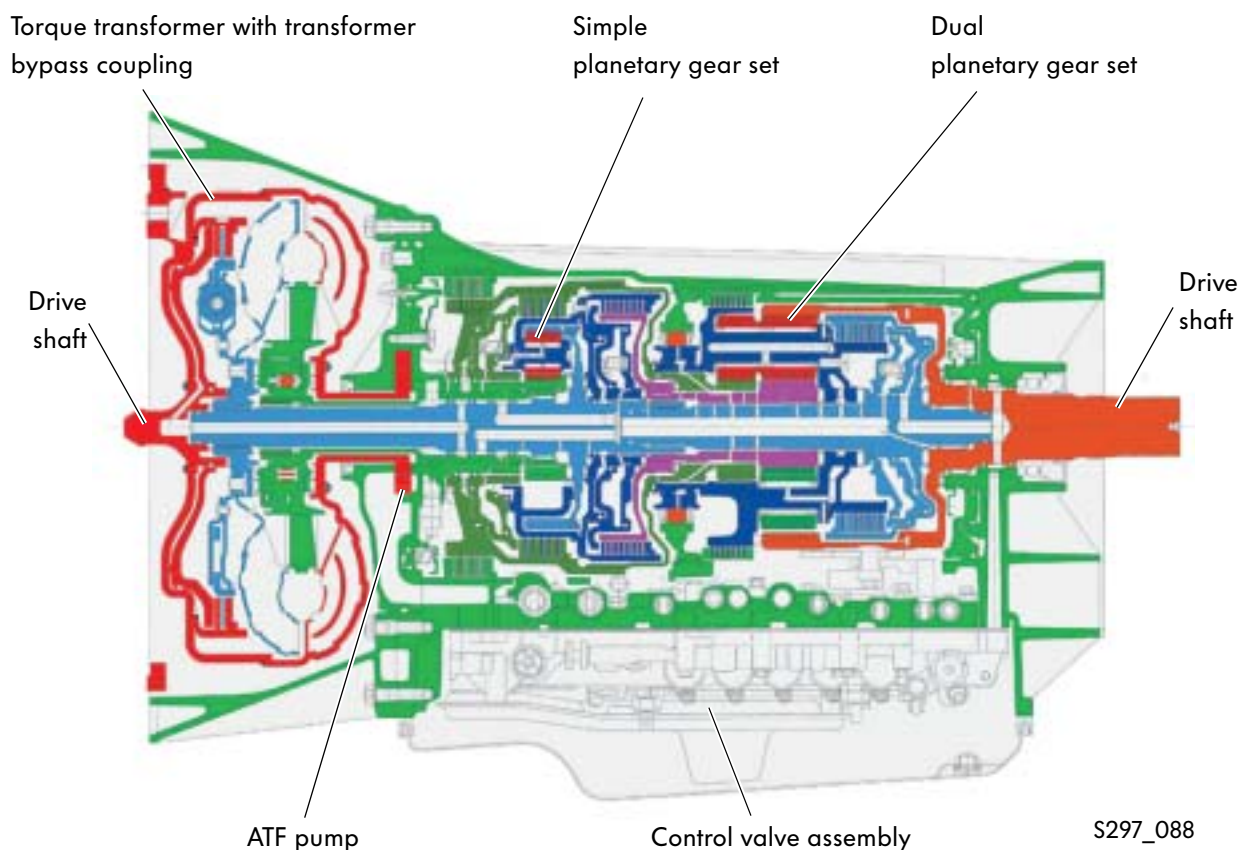
# Power transmission

## Design of automatic gearbox

In its basic design, the 6-gear automatic gearbox does not differ from other automatic gearboxes. It consists of:

- the torque transformer with transformer bypass coupling,
- the ATF pump,
- a simple planetary gear set according to Simpson,
- a dual planetary gear set according to Ravigneaux,
- three multi-disc couplings,
- two multiple disc brakes and
- the control valve assembly.

## Overview of the installation location of certain components



A novelty at Volkswagen is the external axle drive. From the drive shaft of the automatic gearbox, the torque of the engine enters a transfer gearbox that is flanged onto the automatic gearbox. In the transfer gearbox, the torque is divided into equal parts, or according to requirements, to the drives of the front and rear axles.

## Selector lever settings

### P - Parking

To move the selector lever out of the Park setting, the ignition must be switched on. In addition, the foot brake and the locking button on the selector lever must be pressed.

The ignition key can be removed only in this setting.

### R - Reverse

The locking button on the selector lever must be pressed to switch into reverse.

### N - Neutral

The gearbox is idling in this position.

If the selector lever is in this position for a long time, the magnet for the selector lever becomes active and the foot brake must be pressed to activate the lever.

No power is being transmitted to the wheels.

### D - Drive

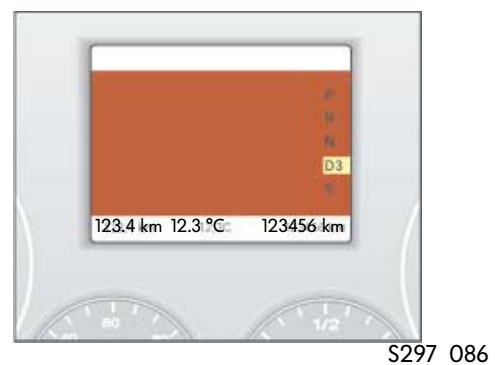
In the Drive position, the forwards gears are switched automatically.

### S - Sport

The control unit selects gears automatically according to a sporty switching characteristic curve. The individual gears are extended further.

### Selector lever position and gear display.

After the ignition is switched on, the current selector lever position is displayed in the dash panel insert.



In positions "D" and "S", the gear selected in the gearbox is also displayed.



# Power transmission

## Tiptronic

The Tiptronic in the Touareg is available as a selector lever Tiptronic as well as a steering wheel Tiptronic.

The current gear is displayed in the dash panel insert if the Tiptronic is active.

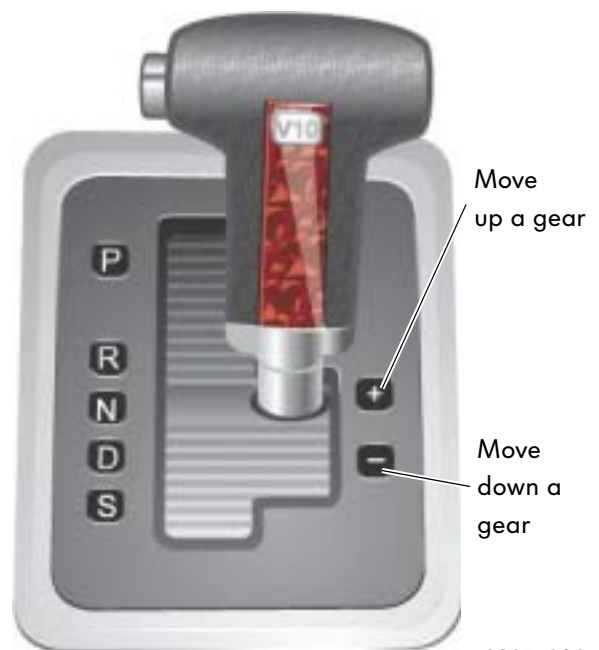


S297\_029

## Selector lever Tiptronic

The automatic transmission is in Tiptronic after the selector lever is moved from the "D" position into the "Tiptronic aisle".

Gear changes can now be effected by moving the selector lever.



S297\_030

## Steering wheel - Tiptronic

The steering wheel switches offer an optimal ergonomic actuation for gear selection.

Here you use:

- the switch on the right to move up a gear and
- the switch on the left to move down a gear.

If the selector switch is in the "D" or "S" setting while the steering wheel switches are pressed, the control unit for the automatic gearbox enters the Tiptronic mode.

The control unit automatically reverts to the previously selected "D" or "S" programme if the steering wheel switches are not pressed again.



S297\_085

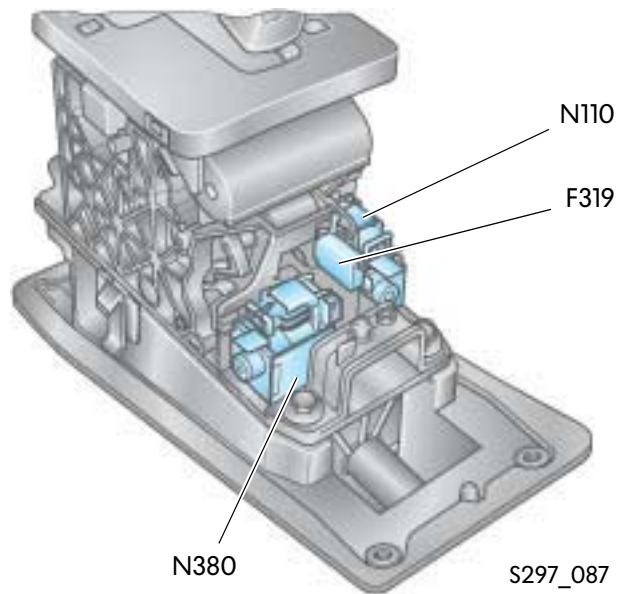
## Selector lever locks

The function of the selector lever lock and the ignition key removal lock is identical to that in the Phaeton. The selector lever is locked by

- the magnet for selector lever lock N110 and
- the magnet for selector lever lock P N380.

As in the Phaeton, the ignition key can be removed only when the selector lever is in the "P" position.

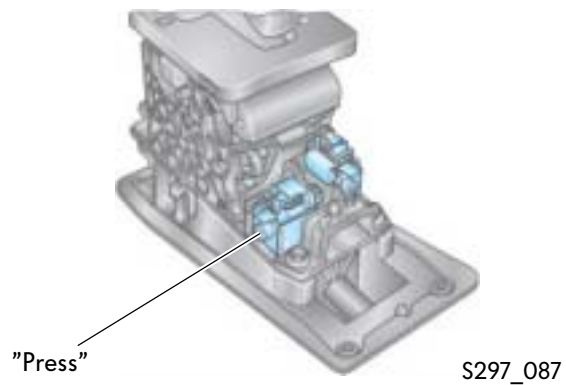
The switch F319 signals to the access and start authorisation relay that the selector lever is in the "P" position.



If the magnet for selector lever lock P N380 is defective, then the selector lever cannot be moved out of the "P" position.

Therefore, the disablement has to be manually unlocked for towing the vehicle.

The selector lever has to be simultaneously moved out of the "P" position.



Further information about the functions can be found in SSP 270 "The Phaeton", in the chapter about automatic gearboxes.

# Power transmission

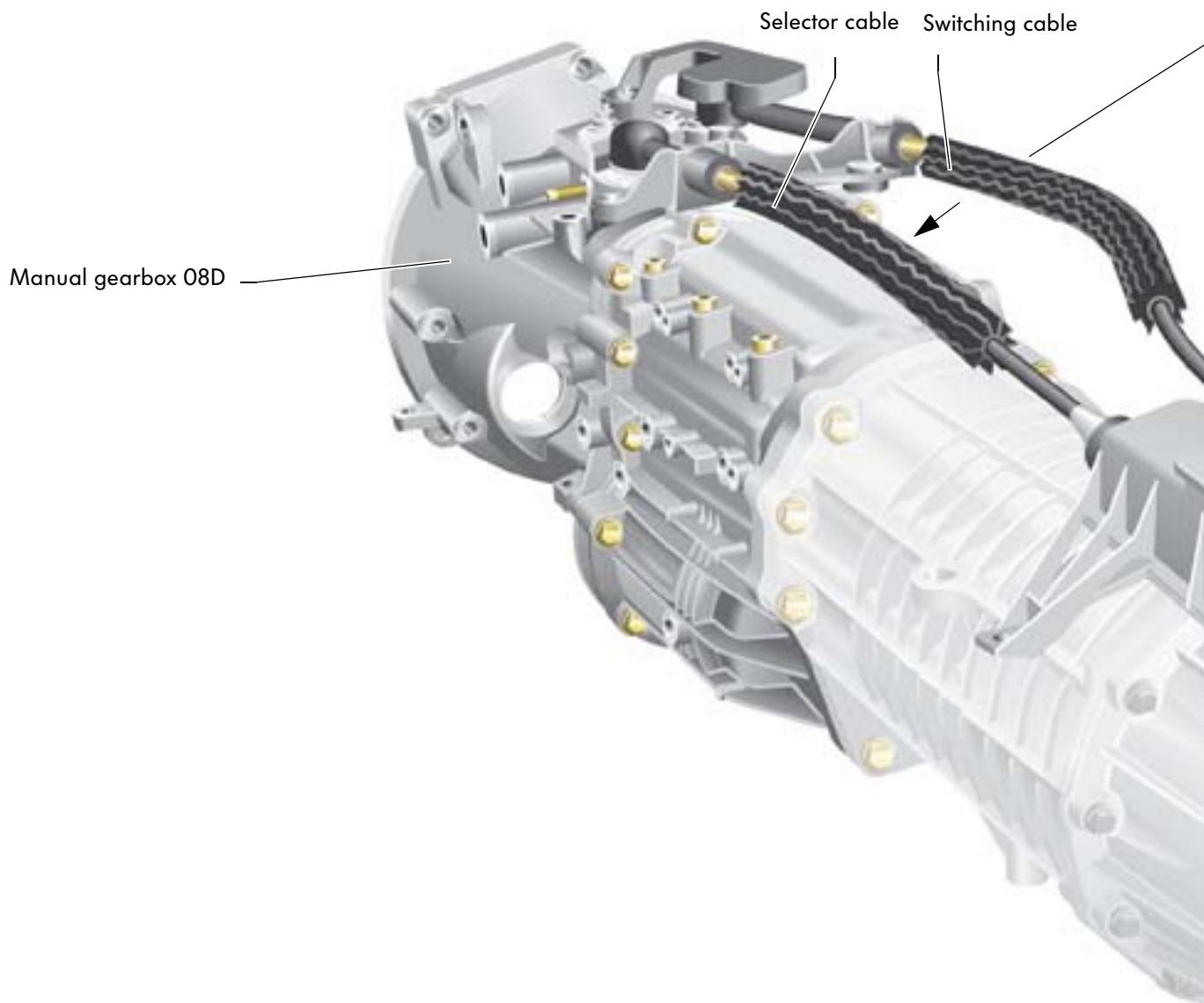
## 6-speed manual gearbox 08D

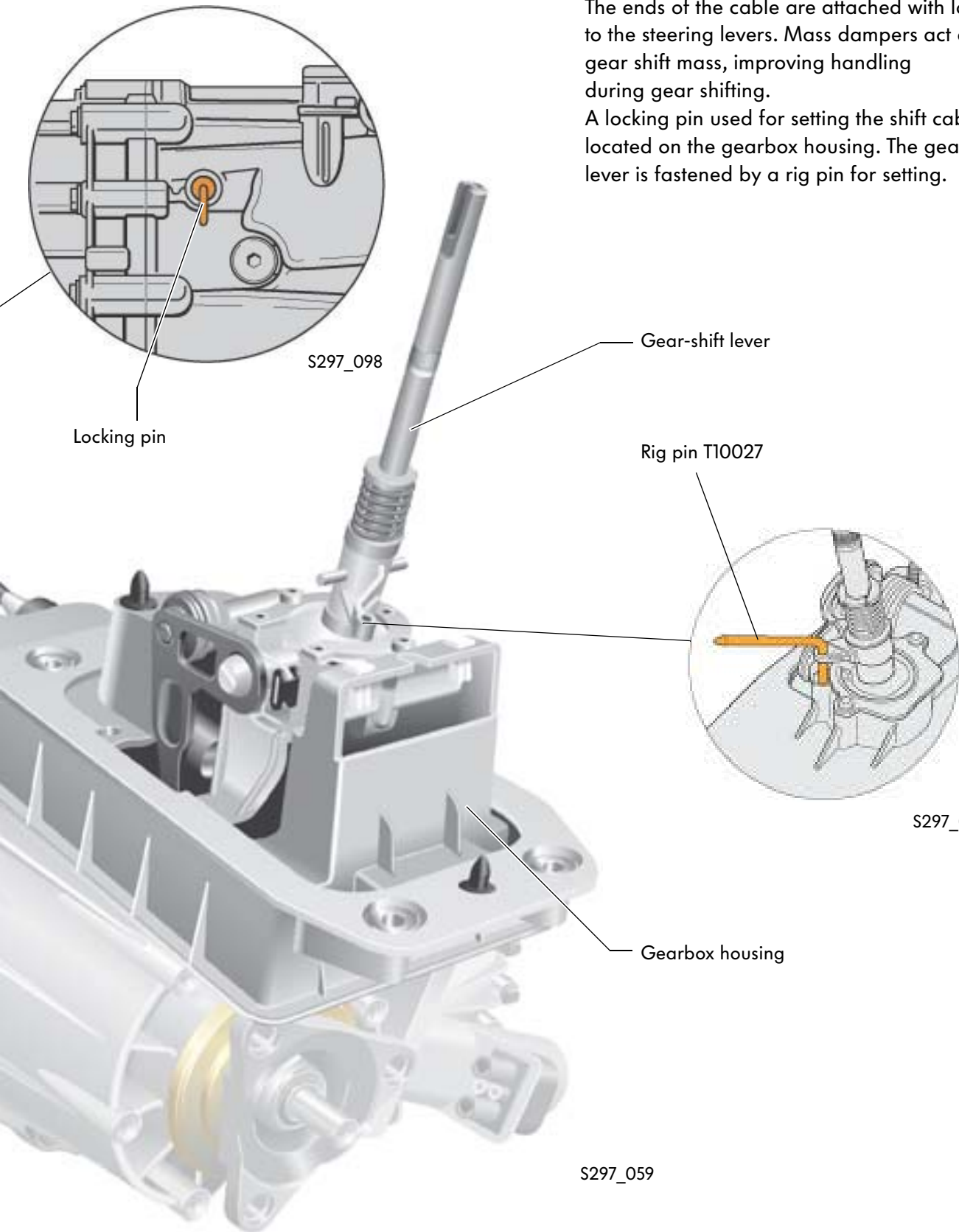
The 6-gear manual gearbox was developed just for the Touareg, especially for offroad use.

The manual gearbox 08D belongs to the standard equipment and is provided with the V6-cylinder petrol engine and the 5R-cylinder TDI diesel engine.

To improve comfort, the tried-and-tested cable control is used here.

There is a special holder on the gearbox housing; this is used to attach the cable and to activate the selector shaft.





The ends of the cable are attached with locknuts to the steering levers. Mass dampers act as a gear shift mass, improving handling during gear shifting.

A locking pin used for setting the shift cables is located on the gearbox housing. The gear-shift lever is fastened by a rig pin for setting.



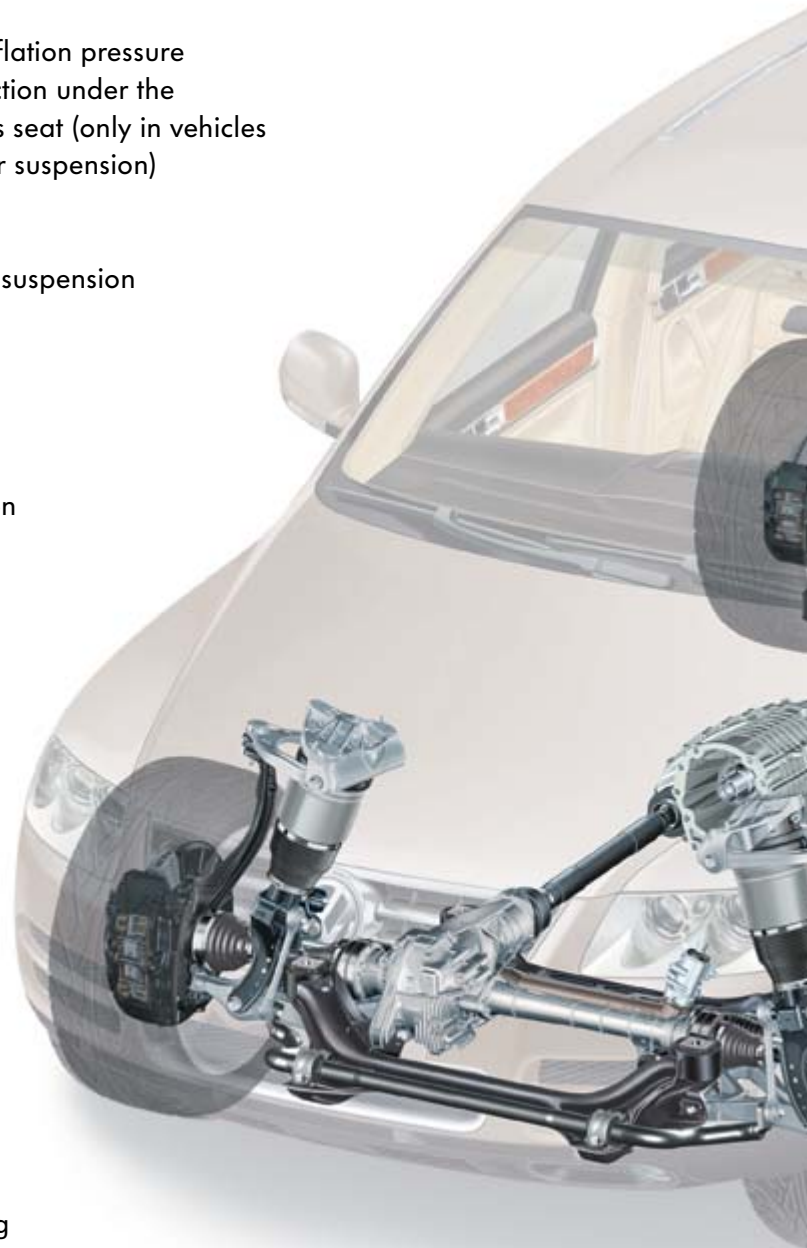
# Chassis

## Chassis

The chassis, with its continuous four-wheel drive, provides excellent offroad driving due to its central differential with reduction stage.

But it also ensures the highest driving comfort on normal roads due to its individual rear wheel suspension.

- Tyre inflation pressure connection under the driver's seat (only in vehicles with air suspension)
- Dual wishbone front suspension
- Dual wishbone rear suspension with divided upper wishbone
- Front and rear anti-roll bars
- Independent wheel suspension
- Air suspension with regulated damping optional, standard equipment in V10 TDI







- Rear transverse lock and longitudinal lock

- Foot parking brake, Duo servo drum brake

- Ventilated disc brakes (front and rear)

- Hill incline assistant  
Hill decline assistant

- Conti Teves MK25, ESP system with braking assistant and 4-wheel EDL

S297\_061

- Tyre pressure control, optional



For more detailed information on the chassis, see SSP 302 "The Touareg Four-Wheel Drive Concept"



# Electric system

## Comfort and safety electronics

The comfort and safety electronics are based on that of the Phaeton. Here, we will discuss certain components and installation locations.



For more detailed information and notes, see SSP 298 "The Touareg Electrical System", which describes the functions.

Door control unit driver (left) and front passenger (right)

Starter battery under the driver's seat

Door control unit left and right rear

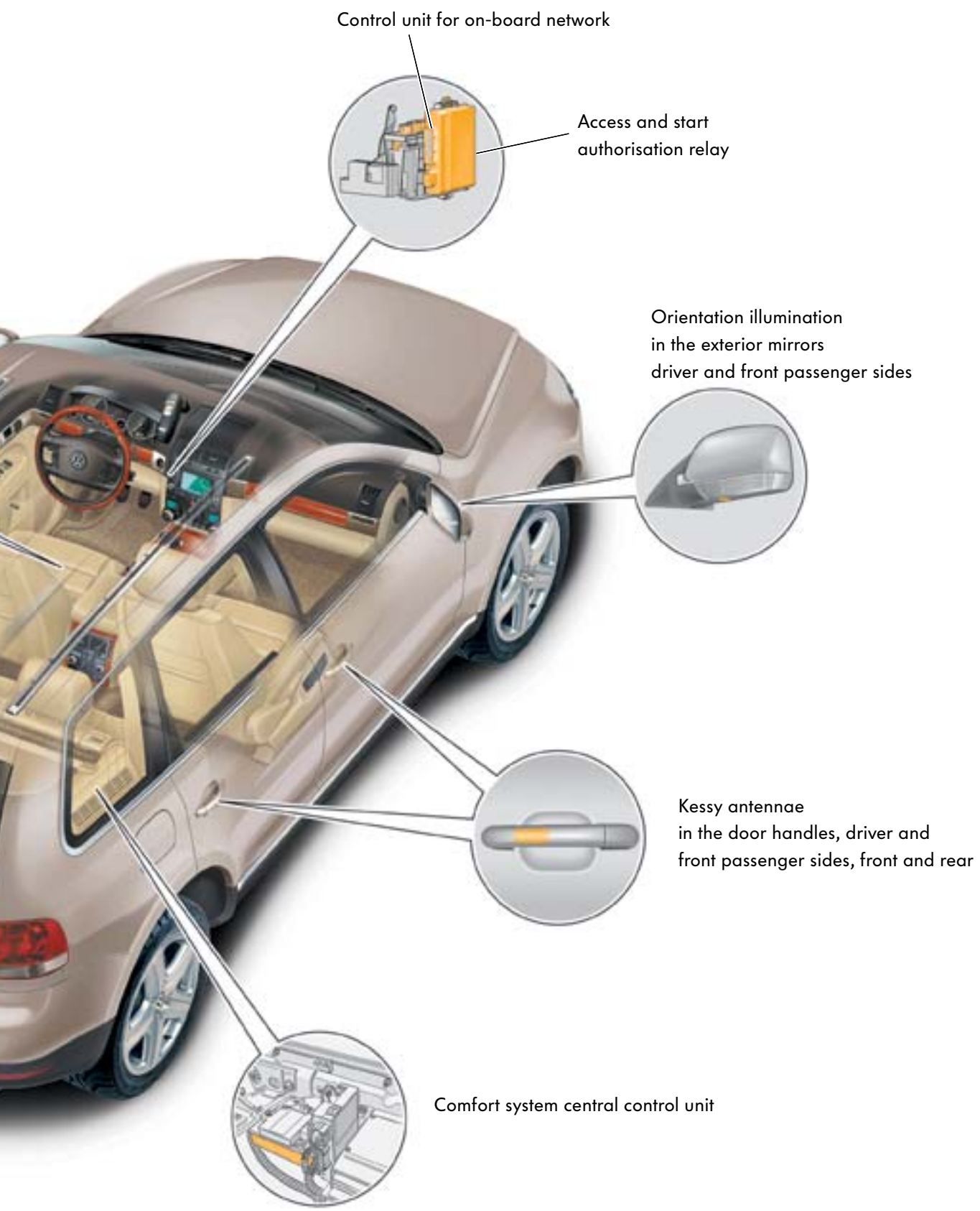
Kessy antenna at 8° loading base with 4C-Climatronic

Kessy antenna at 8° loading base

Kessy antenna at 0° loading base

On-board network battery in boot (optional), in vehicles with V10 TDI engine series





S297\_050

# Heating/air-conditioning system

## Air-conditioning in the Touareg

A total of three different equipment versions are available for the air-conditioning of the vehicle interior in terms of temperature control, air distribution and regulation of the air amount. Depending on the desired comfort, there are two air-conditioning systems with automatic control.

- 4C-Climatronic with 4-zone air-conditioning
- 2C-Climatronic with 2-zone air-conditioning

The temperature range available in both systems is between 16°C and 29.5°C.

The third variant is the standard manually controllable air-conditioning system.

The following characteristics are available in all the variants:

- air side-controlled heating function,
- residual heat function,
- dust and pollen filter with activated carbon,
- air-conditioned glove compartment.

The figure shows the Touareg with a 4C-Climatronic.



S297\_057

Despite different functions, the designs of the three variants are based on one another; this simplifies repairs and maintenance.

At first glance, one can differentiate the variants by the varying designs and appearances of the operating and display units.

Front operating and display unit



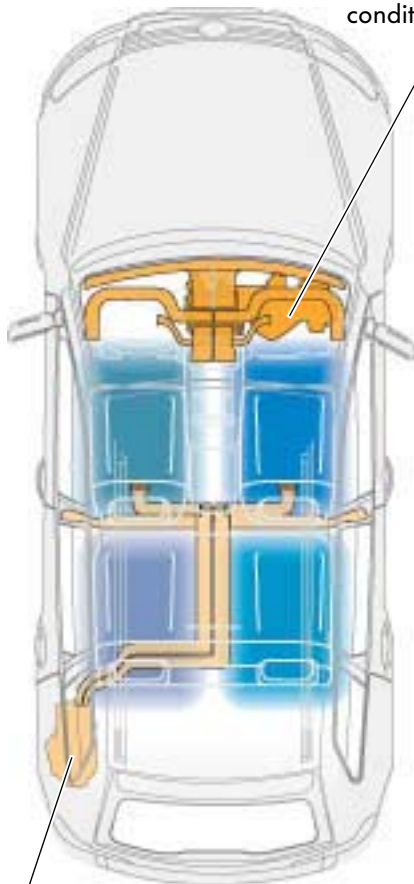
S297\_033

Rear operating and display unit



S297\_038

Front air-conditioning unit



S297\_035

Rear air-conditioning unit

## 4C-Climatronic

This system has two operating and display units. The front operating and display unit is located in the dash panel; this can be used mainly to select the settings for the climate zones of the front passenger compartment. The operating and display unit located in the rear centre console can be used to select the settings for the climate zones of the rear passenger compartment.

Two air-conditioning units are used to condition the passenger compartment.

The front air-conditioning unit is located below the dash panel; it conditions the front passenger compartment.

The rear air-conditioning unit is located behind the side panel in the left-hand side of the boot; it is used to condition the rear seats.

Both air-conditioning units have one evaporator, one heat exchanger and one blower each. Therefore, the temperature and the air amount can be independently set for the front and rear climate zones.

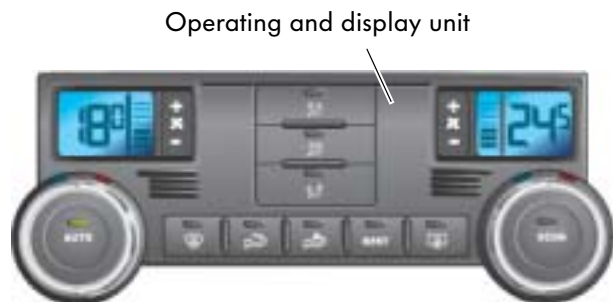
A multitude of ventilation flaps in the air-conditioning units and the air distribution housings are electromechanically set, permitting individual air distribution.



# Heating/air-conditioning system

## 2C-Climatronic

The 2C-Climatronic has an operating and display unit in the dash panel.



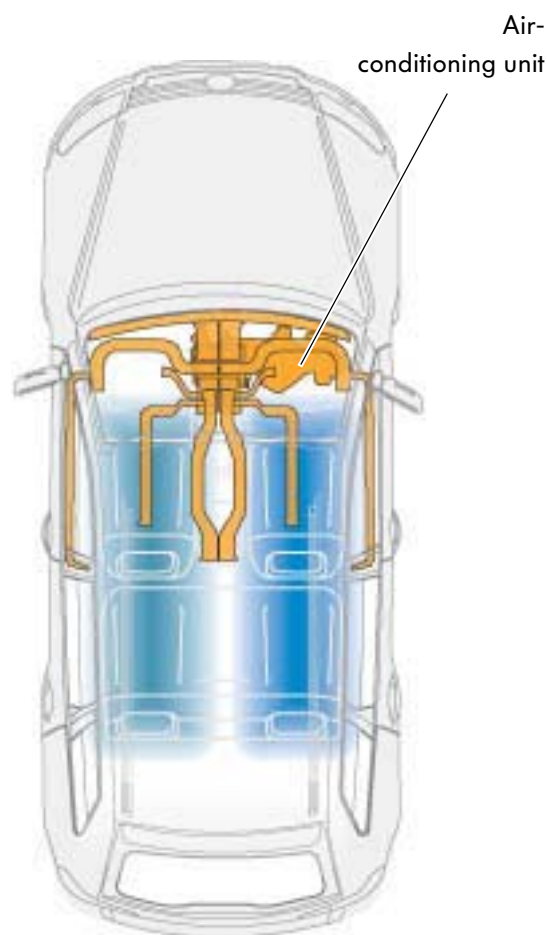
S297\_036

Compared to the 4C-Climatronic, there are the following differences in automatic operation:

- The temperature can be independently set for the left-hand and right-hand passenger compartments.
- The air amount and air distribution are set uniformly for the entire passenger compartment.

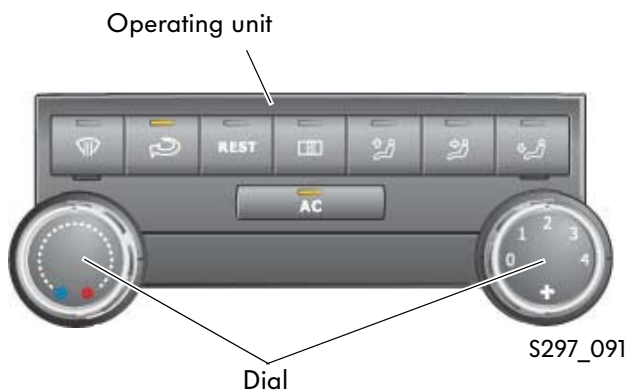
In terms of construction, the 2C-Climatronic differs from the 4C-Climatronic mainly by:

- the use of an air-conditioning unit below the front dash panel,
- an air duct through the front doors to the air outlets in the B-pillar,
- an air duct through the centre console to the air outlets in the rear centre console.



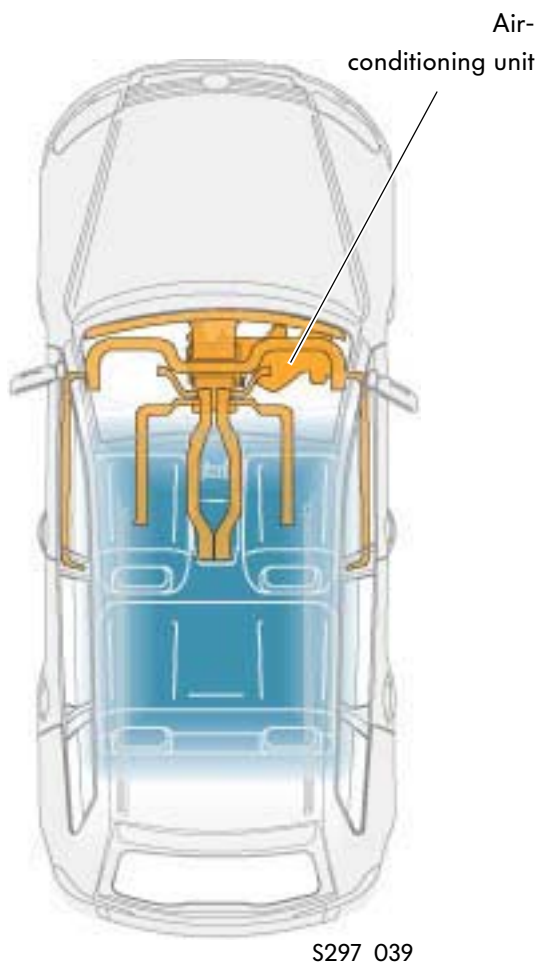
S297\_037





## Manual air-conditioning system

Using the operating unit in the dash panel, the occupants can set the air-conditioning of the entire interior according to their individual wishes.



In the manual air-conditioning system, the entire passenger compartment is uniformly conditioned. There is no automatic climate control for the temperature, air distribution or air quantity.

The structural features of the air ducts are generally the same as those of the 2C-Climatronic.



Due to safety regulations regarding collision protection, the knobs and buttons of the operating and display units are constructed in such a manner that, in the case of a collision, they can be pressed into the unit by penetrating break-out points.

During installation, pay special attention that you do not exert pressure on the knobs and buttons; otherwise, these break-out points may break.

For more detailed information on the air-conditioning system variants, please consult SSP 301 "The Touareg Heating/Air-Conditioning System".

# Radio and navigation

## Delta radio system

With small deviations, the Delta radio system corresponds to the Delta radio system that can be found, for example, in the 2003 Passat model.

The main difference to this system is the design of the user interface, with a larger display and overall dimensions that were adapted to the dash panel.

There are further modifications in the arrangement of the function keys and their designations.

The sound settings in this system are selected using the buttons "Sound" and "B/F" for Balance and Fader. After the button is pressed, the corresponding menu appears in the display; the sound settings can be changed by turning the right-hand knob/button.



S297\_041



Due to safety regulations regarding collision protection, the knobs and buttons are constructed in such a manner that, in the case of a collision, they can be pressed into the unit by penetrating break-out points.

During installation, pay special attention that you do not exert pressure on the knobs and buttons; otherwise, these break-out points may break.

For more detailed information on the Delta radio system, please consult SSP 251 "The Passat W8" and the corresponding operating instructions.



## The RN S2 radio/navigation system

The radio/navigation system in the Touareg is a further development that is technically based on the MFD radio/navigation system, which can be found, for example in the 2003 Golf model.

In terms of appearance, the design, the user interface and the overall dimensions have changed.



Knobs/buttons

S297\_054

The most important differences are:

- enlarged 6.5 inch colour display,
- function keys with new designations and functions,
- TMC tuner integrated in the unit,
- audio-capable CD drive,
- modular connector plug with central lock,
- plug- and colour-coded connector plug for FM/AM and GPS antennae inlets,
- signal transfer via the CAN bus infotainment system between the control unit for TV/radio/navigation and the diagnostic interface in the dash panel insert,
- offroad function,
- position-finding display with compass display.



Due to safety regulations regarding collision protection, the knobs and buttons are constructed in such a manner that, in the case of a collision, they can be pressed into the unit by penetrating break-out points.

During installation, pay special attention that you do not exert pressure on the knobs and buttons; otherwise, these break-out points may break.



# Radio and navigation

## Operation of RN S2 radio/navigation system

The functions of new and – compared to the MFD radio/navigation system – modified key designations are described and summarised below.



\*If the optional CD changer is equipped, it is activated.

## Offroad navigation

In addition to the menus for entering the destination and the path to the destination that have been used previously in the radio/navigation system, RN S2 provides a further navigation option with the menu "Offroad tour".

It is especially useful during offroad driving where digital information is not available. This function is implemented using software and uses the system components used previously.

Navigation display		
New address	Destination	Dest. on map
Last dest.	Hunting	Position dest.
From dst. mem.	lodge	Travel guide
Special dests.		Offroad tour
To flagged dst.		Edit memory
Destination		back with ESC

S297\_075



S297\_065

The transition between the two navigation types (standard and offroad) occurs automatically; however, the RN S2 does not automatically switch back to standard navigation. Offroad navigation can be selected using function key "Offroad tour" in the "Destination" submenu. The offroad functions have the following possible selections:

- Recording, calling up and editing GPS-coded offroad tours.
- Placing waypoints, and assigning names to them, within tours to mark special locations (e.g. "Hunting lodge", see flag 5 in the figure).
- Display of the next waypoint by a red flag and an arrow.
- Compass display with position information in degrees, minutes and seconds.
- Reverse function: The recorded waypoints can also be driven in the opposite direction.



Some of the offroad functions are shown on the following pages.



The offroad function will not be available when the vehicle is introduced to market. It is planned that the missing offroad function be implemented via a software update for all RN S2 radio/navigation units at a later point in time.

# Radio and navigation



S297\_092

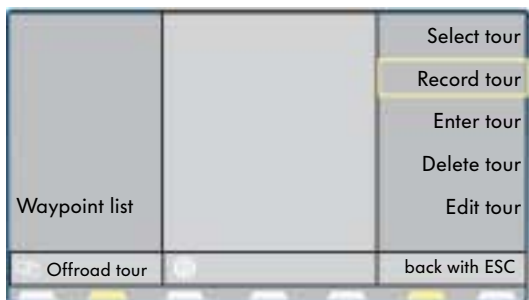
## Starting offroad navigation

After navigation has been started using the main menu button "NAVI", the submenu "Destination" must be selected.



S297\_075

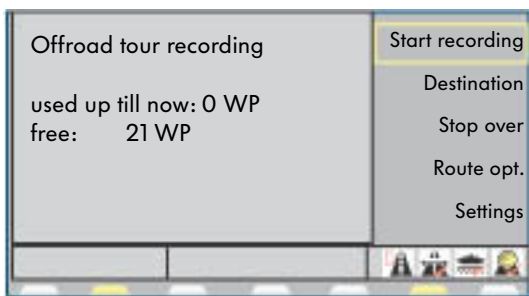
The submenu "Destination" has the function "Offroad tour", with which the offroad functions can be started.



S297\_079

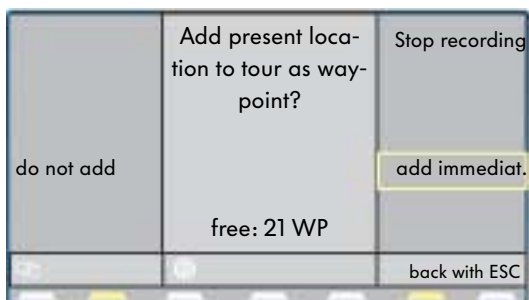
## Recording an offroad tour

Using the function "Record tour", a new offroad tour can be created. Up to 7 tours can be stored.



S297\_078

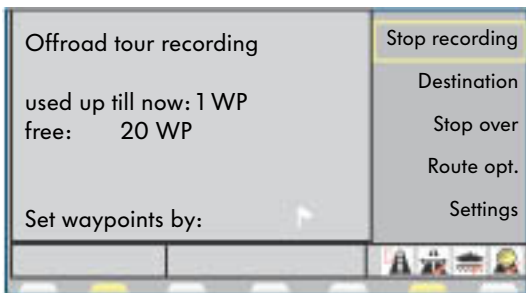
The recording starting point is selected separately. By pressing the "Flagged destination" button, individual waypoints (WP) can be set.



S297\_075

As shown in the figure to the left, a query appears asking if you would like to mark the starting point of the tour as a waypoint.

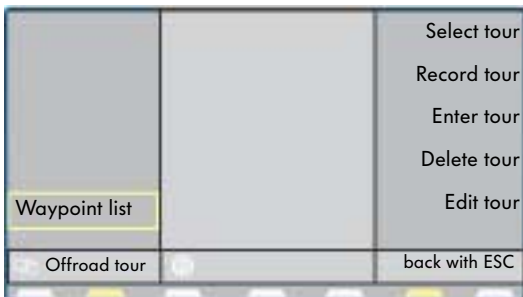




S297\_080

## Waypoints

The memory of the navigation system allows a total of 50 waypoints to be stored. In the example shown, a tour in which one waypoint has already been set and 20 points are still free is recorded.



S297\_077

A maximum of 40 waypoints can be stored in a tour. The waypoints of all tours are stored in a list; they can be called up using the function "Waypoint list".



S297\_081

During active destination guidance, waypoints of the current tour can be called up using the function "Route list". An acoustic signal confirms that a waypoint has been reached.



S297\_082

## Driving tours in the opposite direction

This function can be used to return to the starting point of a tour.

The stored waypoints are driven in the opposite direction.



S297\_095

## Destination guidance using offroad tours

In addition to the display in which the next waypoint is indicated by a red flag, an arrow within the display shows the direction that is to be driven. Voice output is not used in destination guidance.



## New operating equipment

- Portal calibre supplement VAS 5007/16
- Spring tensioning unit VAS 6046
- Spring bracket VAS 6046/3
- Uptake kit for scissors lifting table VAS 6131/5
- Hydraulic cylinder VAS 6178 to remove the wheel bearing and the front wishbone
- Guide angle plug set VAS 6215
- Mudguard protector VAS 6225



S297\_097







Only for internal use © VOLKSWAGEN AG, Wolfsburg  
All rights reserved  
000.2811.17.20 Issued 09/02

♻️ No chlorine was used to bleach this paper during manufacture.