

The Touareg



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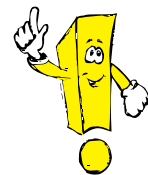
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New !



Important/Note!



The Self-Study Program provides you with information regarding designs and functions.

The Self-Study Program is not a Repair Manual.

For maintenance and repair work, always refer to the current technical literature.

A Luxury Utility Vehicle

Together with the advent of the Passat W8 and the Phaeton, the Touareg will complete the trio in Volkswagen's luxury class product strategy. The Touareg is a luxury utility vehicle with outstanding off-road capabilities, that easily satisfies business and travel requirements.

The Touareg's adaptability to extreme and varying driving conditions is a result of such features as the continuous electronically controlled four-wheel drive, high-torque engines, and a dual wishbone chassis.

Self-study programs will be available for the following topics:

- SSP 89J303: The Touareg Electrical System
- SSP 89M303: The Touareg 6-Speed Manual Transmission
- SSP 89K303: The Touareg 6-Speed Automatic Transmission
- SSP 89G303: The Touareg Heating, Ventilation and Air-Conditioning System
- SSP 89H303: The Touareg Suspension and 4XMOTION System
- SSP 89N303: The Touareg V10 TDI Engine
- SSP 89P303: The Touareg V10 TDI Engine Management System



SSP297/001

Introduction

Touareg

The Volkswagen Touareg has the name of a traditional African desert tribe that has made a name for itself in Africa trading in precious goods.

The proud Tuareg, with their camel caravans and their mysterious veils, embody the ideal of limitless freedom under the mercilessly tough conditions of the desert.

The name Tuareg (or Touareg) means “free people.”

Its name was selected to characterize the Volkswagen Touareg as an exclusive off-road vehicle that proves itself as easily in a rocky riverbed as on the highway.

With its excellent on- and off-road characteristics and its elegant progressive design, the Touareg is equally as suitable for off-road use as it is for business, recreation, and travel.



Off-Road Capability

To test the off-road characteristics of the Touareg, an off-road test track was specially built in Ehra, Germany near Wolfsburg. Here, this multifaceted vehicle could show its stuff.

The test track consists of:

- A short off-road stretch.
- A climbing hill with a section of shelves.
- A dry river bed simulation.
- A torsion module.
- A shallow basin for water-hazard simulation.

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

- Traction.
- Torsion of the body structure.
- Acceleration behavior and driving on inclines.
- Supply of operating fluids.
- Engine drag torque.
- Suspension comfort.
- Impermeability to the elements.
- Noise emission in load situations.
- Ground clearance.
- Bumper design.



SSP297/103-056

Introduction

Features

Innovation

- On- and off-road capability.
- Air suspension.
- Two-part tailgate.
- Modular roof rack system.
- Acceleration assistant.
- Hill descent assistant.
- Fully galvanized self-supporting body structure.
- Engine Braking Control (EBC).
- Engine and body sealing systems enable good fording capability.

Power

- Powerful engine range including a V10 diesel engine that will be available later.
- Six-speed automatic transmission for continuous four-wheel drive with central differential and gear reduction level. A six-speed manual transmission will be available later.
- Central differential lock.
- High-performance braking system.
- Roof load capacity up to 220 pounds (100 kg).
- Fuel tank volume 26.4 gallons (100 liters).
- Towing capacity 7716 pounds (3500 kg).
- Acoustically optimized interior.



Introduction

Safety

- Electronic Stabilization Program (ESP).
- Electronic Brake Pressure Distribution (EBPD).
- Front, head, and side airbags.
- Electric crash management with Battery Switch-Off Relay J655.
- Antilock Braking System (ABS).
- Traction Control System (TCS).
- Hydraulic Braking Assistant.
- Pedestrian protection taken into account in body design.
- Extensive seat belt system.
- Child seat fasteners standard.

Comfort

- Four-zone Climatronic, two-zone Climatronic, or manual air-conditioning system.
- Radio navigation system with off-road functionality.
- Eight- or 12-position seats.
- Comfortable back seat.
- Large cargo load space volume with adjustable net.
- Convenient electrical sockets.
- Air-conditioned glove compartment.
- Comfort interior lighting.
- Adjustable steering wheel.



SSP297/003-004

Introduction

Specifications

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



SSP297/005

- **Length**
187.17 inches (4754 mm)
- **Width**
75.91 inches (1928 mm)
- **Height**
67.05 – 67.95 inches (1703 – 1726 mm)
(depending on the engine)
- **Roof load capacity**
220 pounds (100 kg)
- **Towing capacity**
7716 pounds (3500 kg)
- **Fuel tank volume**
26.4 gallons (100 liters)
- **Front track width**
64.76 – 65.28 inches (1645 – 1658 mm)
(depending on the engine)
- **Rear track width**
65.24 – 65.53 inches (1657 – 1664.5 mm)
(depending on the engine)
- **Permitted gross vehicle weight**
6283 – 6790 pounds (2850 – 3080 kg)
(depending on the engine)
- **Curb weight**
4881 – 5564 pounds (2214 – 2524 kg)
(depending on the engine)
- **Cargo load space**
Except V10 TDI:
19.6 – 55.4 cubic feet (555 – 1570 liters)
V10 TDI:
19.4 – 53.8 cubic feet (550 – 1525 liters)
- **Drag coefficient**
0.38 to 0.42 C_d
(depending on the engine)

Off-Road Driving

The off-road capability of the Touareg is proven by the following data:



Ford depth is the depth of water the vehicle can slowly drive through without the engine taking on water or water entering the vehicle.



SSP297/043

Maximum climbing capability: 45 degrees



SSP297/060

Maximum possible lateral inclination: 35 degrees



SSP297/006

Maximum ground clearance:
Steel suspension: 9.33 inches (237 mm)
Air suspension: 11.81 inches (300 mm)



SSP297/007

Maximum driveable angle of slope:
Steel suspension: 28 degrees
Air suspension: 33 degrees



SSP297/008

Maximum driveable ramp angle:
Steel suspension: 22 degrees
Air suspension: 27 degrees



SSP297/009

Maximum possible ford depth:
Steel suspension: 19.69 inches (500 mm)
Air suspension: 22.83 inches (580 mm)

Engines

3.2-Liter V6 Gasoline Engine

The 3.2-liter V6 gasoline engine, a further development of the 2.8-liter V6 engine, is also used in the Phaeton in some markets. Due to the off-road capability of the vehicle, some of the components had to be modified.

Engine Management

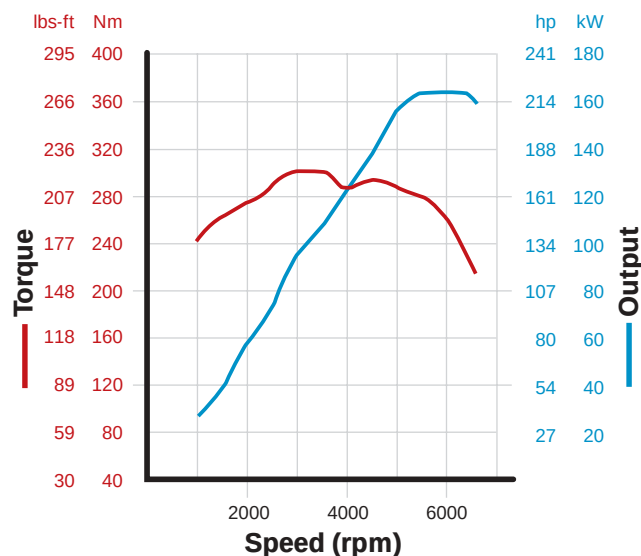
- Motronic ME 7.1.1 engine management system.
- Exhaust gas system with two preliminary catalytic converters and a main catalytic converter.
- Control of the internal exhaust gas recirculation via the camshaft adjustment.
- Second-generation On-Board Diagnosis (OBD II) with MIL.



SSP297/044

Technical Data – 3.2-Liter V6 Gasoline Engine

- **Engine code**
BAA
- **Type**
VR engine with four valves per cylinder
- **Displacement**
194.6 cu in (3189 cm³)
- **Bore**
3.31 in (84 mm)
- **Stroke**
3.78 in (95.9 mm)
- **Compression ratio**
11.25:1
- **Maximum power output**
217 bhp (162 kW) @ 5400 – 6400 rpm
- **Maximum torque**
224 lbs-ft (305 Nm) @ 3200 rpm
- **Engine management**
Motronic ME 7.1.1
- **Firing sequence**
1-5-3-6-2-4
- **Fuel type recommendation**
Premium unleaded gasoline (91 AKI)
- **Exhaust treatment**
Three-way catalytic converters with constant fuel-air mixture regulation



SSP297/045



The specified power data is only possible if 91 AKI fuel is used. A reduction in power output must be expected if lower grade fuel is used.

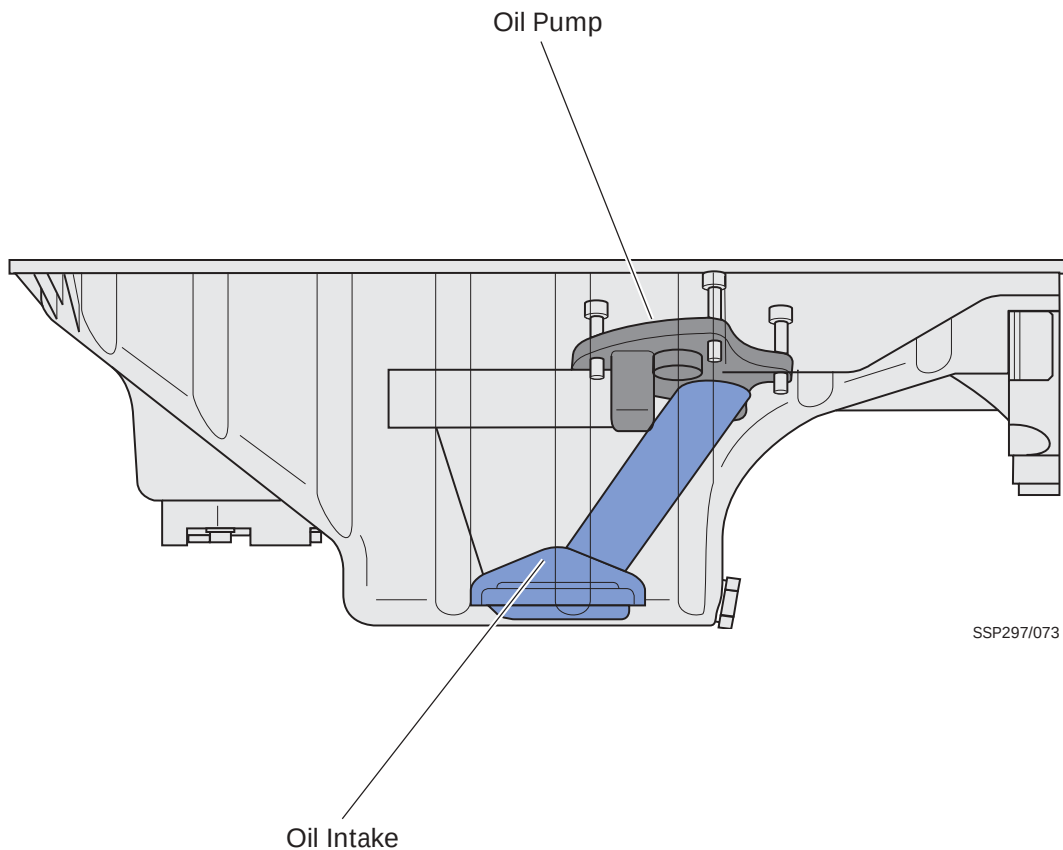
Engines

Mechanical Innovations

Due to the off-road capability of the Touareg, special demands are made when driving on steep inclines and fording streams. To meet these demands, certain components have been modified compared to those used in the same engine in the Phaeton.

Oil pan

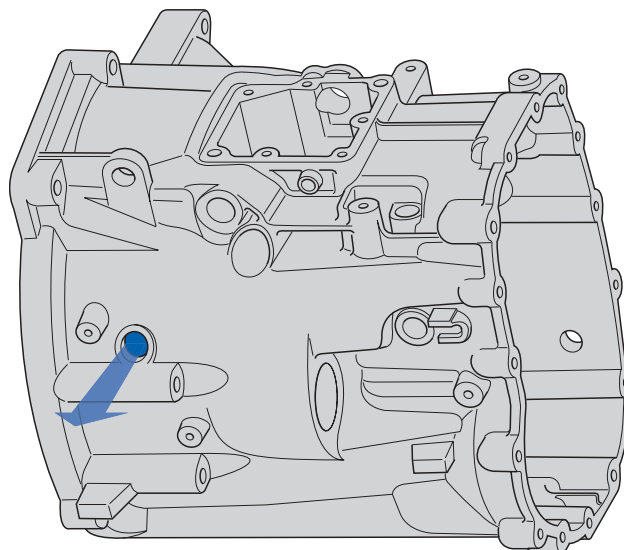
A new deeper oil pan ensures that there is always sufficient oil being pumped through the engine lubrication system, regardless of the inclination of the vehicle. The oil pump has been adapted to the new oil pan in the area of oil intake.



Seals

In vehicles with the manual transmission that will be available later, the dual-weighted flywheel must be prevented from standing in water for a long time. For this reason, the joint between the transmission bell housing and the engine is sealed against water intrusion. If water gets past the seal and 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 rotation of the dual-weighted flywheel.

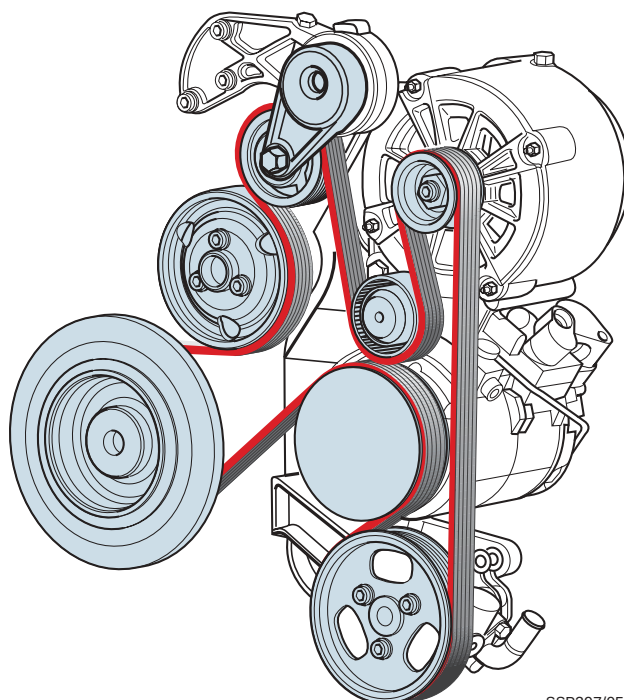
The front crankshaft seal has an additional sealing lip. It prevents the intrusion of water and dirt into the crankcase.



SSP297/074

Belt drive

The accessory belt drive is designed for more belt-to-pulley contact. This prevents the belt from slipping when driving through water.



SSP297/051

Engines

4.2-Liter V8-5V Gasoline Engine

The 4.2-liter V8-5V engine was optimized and further developed for the Touareg, especially for off-road use.

Touareg 4.2-Liter V8-5V Engine Modifications

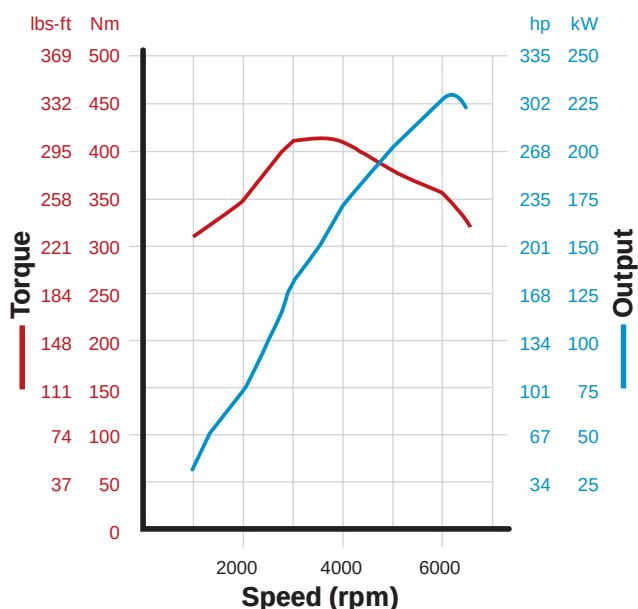
- Three-stage variable intake manifold.
- Double-flow intake with dual hot film air mass meters.
- Water-cooled 190-amp generator.
- Fording seals.
- Crankcase with large flange piece.
- Crankshaft with 10-hole flange.
- New oil filter module.
- Single poly-V-ribbed accessory drive belt with seven grooves.
- Engine accessories with fording capability.
- Off-road capable oil intake.
- Return flow-free fuel system.



SSP297/101

Technical Data – 4.2-Liter V8-5V Gasoline Engine

- **Engine code**
BHX
- **Type**
V8 engine with 90-degree V-angle and five valves per cylinder
- **Displacement**
254.6 cu in (4172 cm³)
- **Bore**
3.33 in (84.5 mm)
- **Stroke**
3.66 in (93 mm)
- **Compression ratio**
11:1
- **Maximum power output**
306 bhp (228 kW) @ 6200 rpm
- **Maximum torque**
302 lbs-ft (410 Nm) @ 3000 – 4000 rpm
- **Engine management**
Motronic ME 7.1.1
- **Firing sequence**
1-5-4-8-6-3-7-2
- **Fuel type recommendation**
Premium unleaded gasoline (91 AKI)
- **Camshaft adjustment**
Inlet camshaft adjustment



SSP297/072



The specified power data is only possible if 91 AKI fuel is used. A reduction in power output must be expected if lower grade fuel is used.

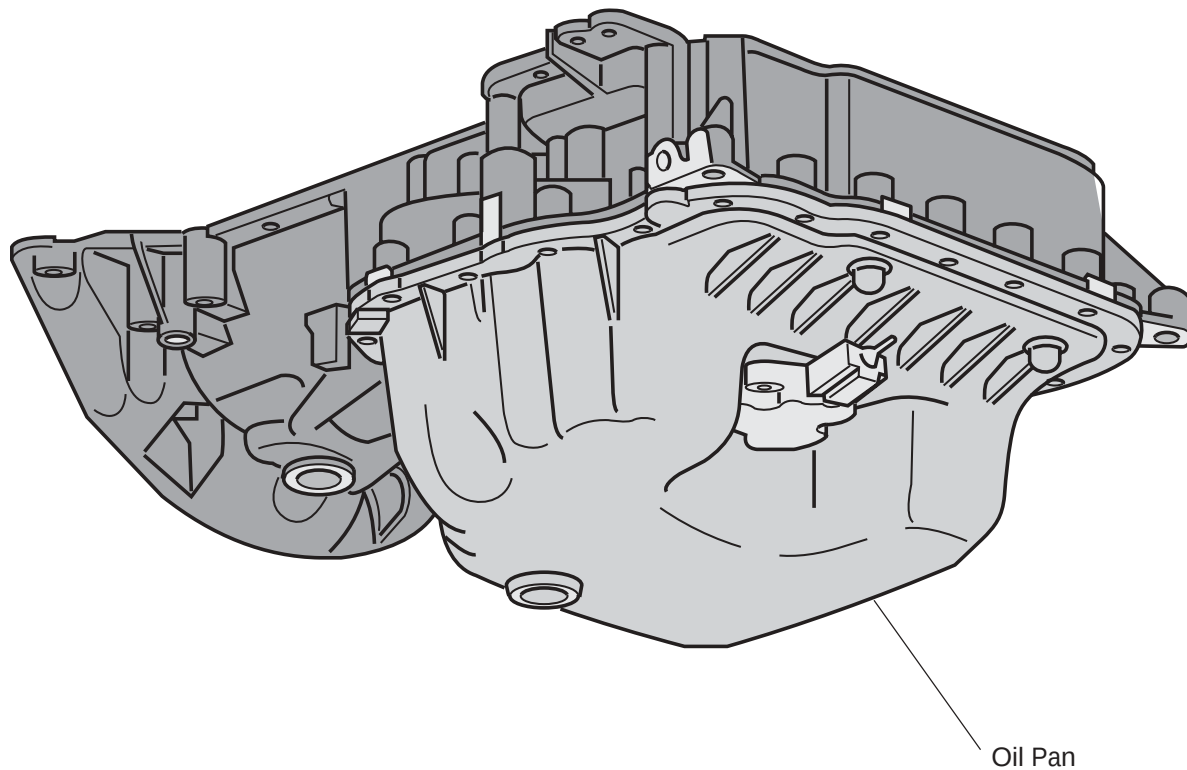
Engines

Mechanical Innovations

Among other things, the oil intake on the 4.2-liter V8-5V engine has been adapted to off-road use. During extreme climbs and driving across slopes an optimum oil supply must be guaranteed at all times.

Oil intake

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

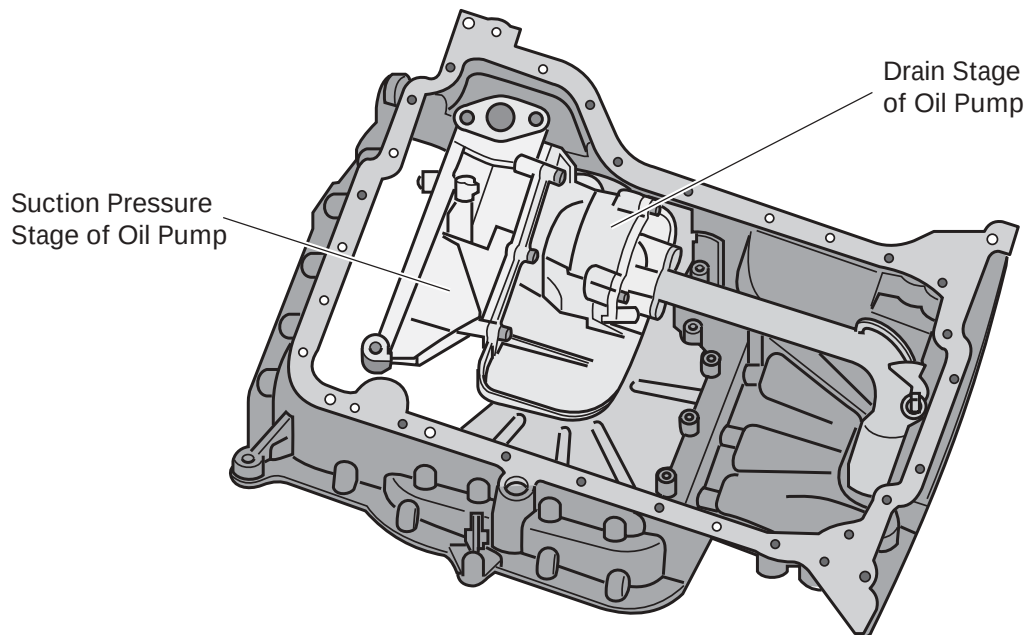


SSP297/102

Oil pump

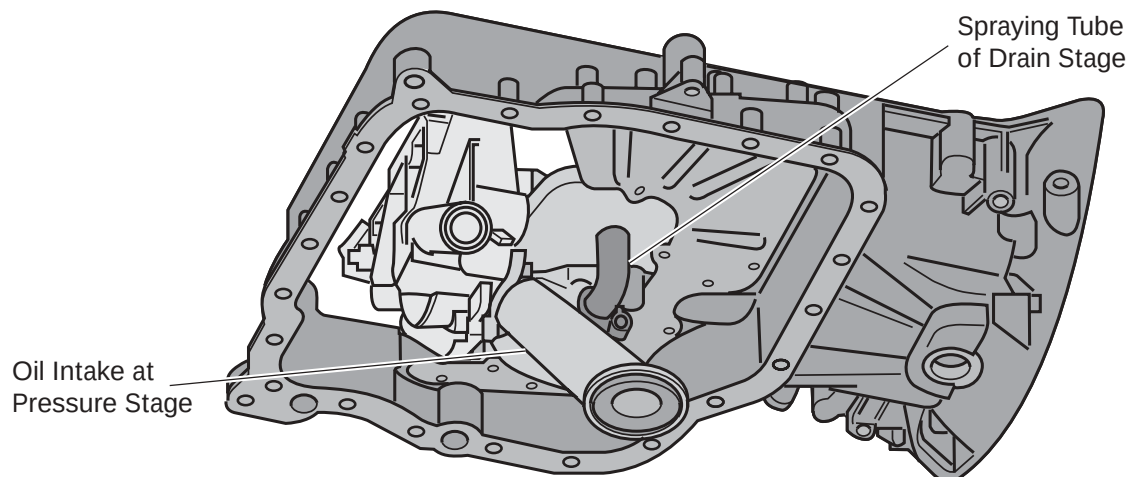
The oil pump with a drain stage supplies the engine with oil during extreme off-road driving.

The drain stage stores the oil from the rear oil pan in front of the pressure pump. This ensures optimum intake at all times.



SSP297/099

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



SSP297/100

Engines

5-Liter V10 TDI Diesel Engine (Late Availability for the North American Market)

The 5-liter V10 TDI engine is a recently developed diesel engine. Combining an innovative lightweight construction with enormous power, it is equipped with the pump-jet injection system.

Mechanical Innovations

- Cylinder block made of aluminum with a gray cast iron bearing tunnel.
- Joining of cylinder head and cylinder block via tie-rod screw connection.
- Balancer shaft for reducing vibrations.
- The oil pump, water pump, generator, and camshafts are gear driven.

Engine Management

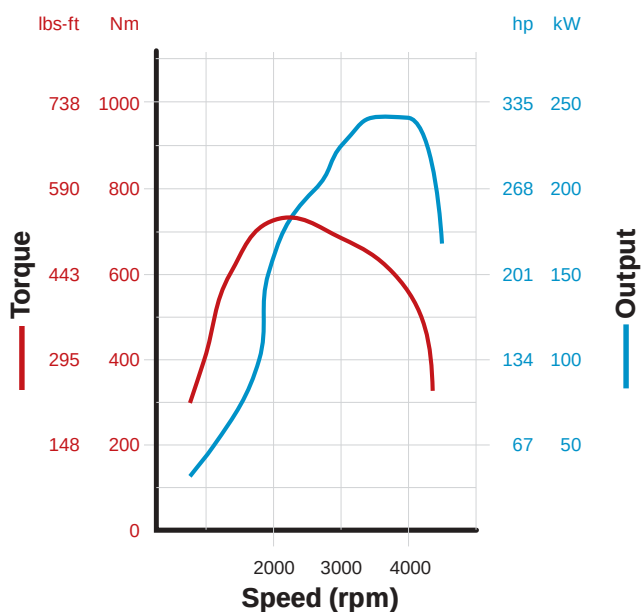
- Dual control module concept.
- Charged by two adjustable turbochargers.
- Pneumatically-controlled exhaust gas recirculation valves.



SSP297/021

Technical Data – 5-Liter V10 TDI Diesel Engine

- **Type**
V engine, with 90-degree V-angle and two valves per cylinder
- **Displacement**
300 cu in (4921 cm³)
- **Bore**
3.19 in (81 mm)
- **Stroke**
3.76 in (95.5 mm)
- **Compression ratio**
18:1
- **Maximum power output**
308 bhp (230 kW) @ 4000 rpm
- **Maximum torque**
553 lbs-ft (750 Nm) @ 2000 rpm
- **Engine management**
EDC 16
- **Firing sequence**
1-6-5-10-2-7-3-8-4-9
- **Fuel type recommendation**
Diesel 49 CZ minimum or biodiesel
- **Exhaust treatment**
Exhaust gas recirculation and oxidation catalytic converter



SSP297/022



The specified power data is only possible if the specified fuel is used. A reduction in power output must be expected if lower grade fuel is used.

Fuel Supply

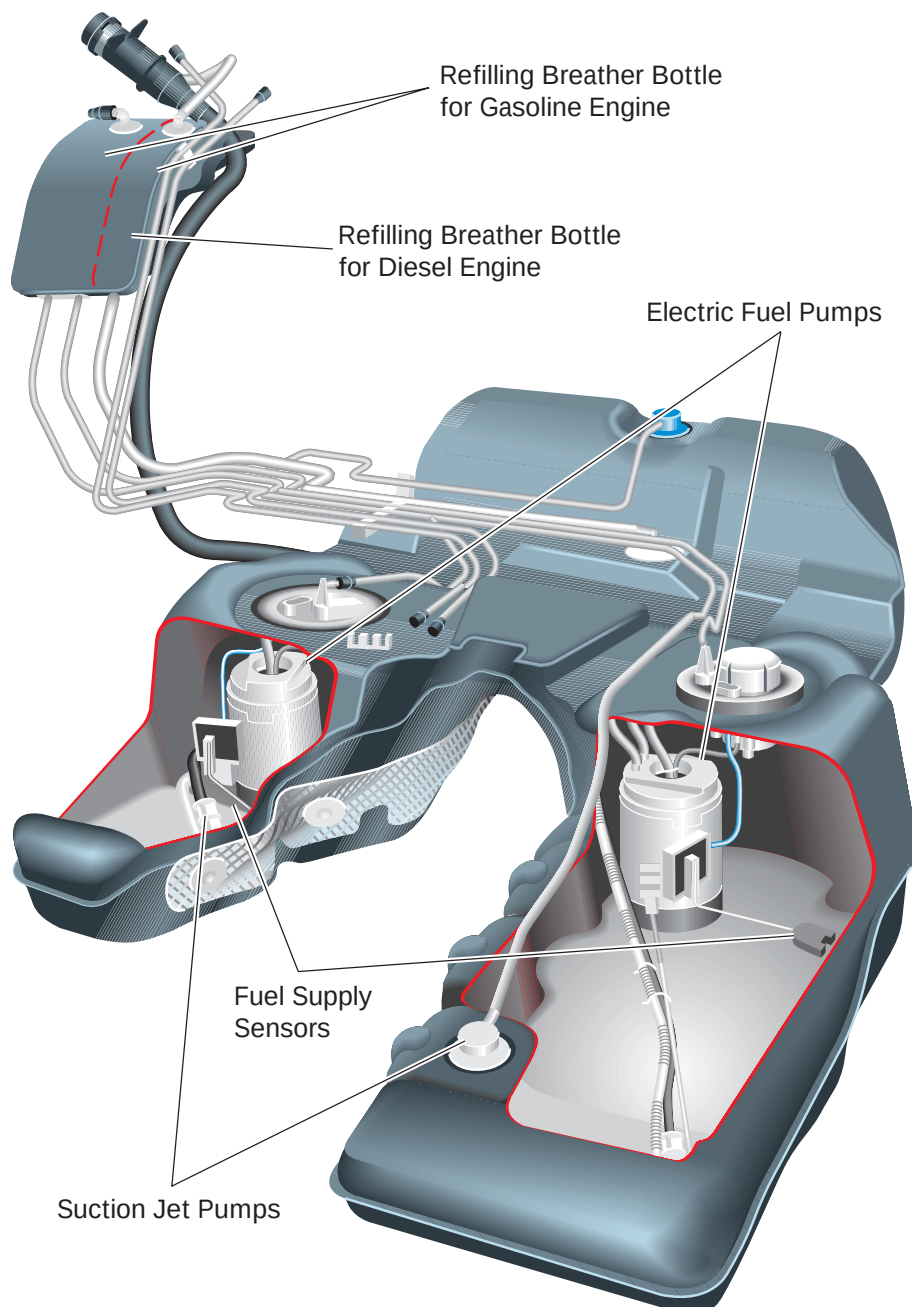
Fuel Tank

In order to use the available installation space to the greatest extent possible, the fuel tank consists of a main chamber and a secondary chamber.

Each chamber has an electric fuel pump and a suction jet pump. There is a sender

for the fuel supply on each of the two electric fuel pumps.

The fuel tanks for gasoline and diesel engines differ mainly in the sizes of their refilling breather bottles and in the attached lines.



SSP297/042

Six-Speed Automatic Transmission 09D

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

It was developed at AISIN, the famous Japanese manufacturer of automatic transmissions, and is also manufactured by them.

The tuning and adaptation of the transmission and the Transmission Control Module J217 to the Touareg was carried out in co-operation with Volkswagen engineers.



SSP297/083

09D 300 036D

AISIN AW
CO. LTD
JP AN1
SERIAL NO.

02DQ300074

TR-60SN

090402

EXQ

Manufacturer

Serial Number of Manufacturer

Spare Parts Number

AISIN Model Number

Production Date

Transmission Code

SSP297/089

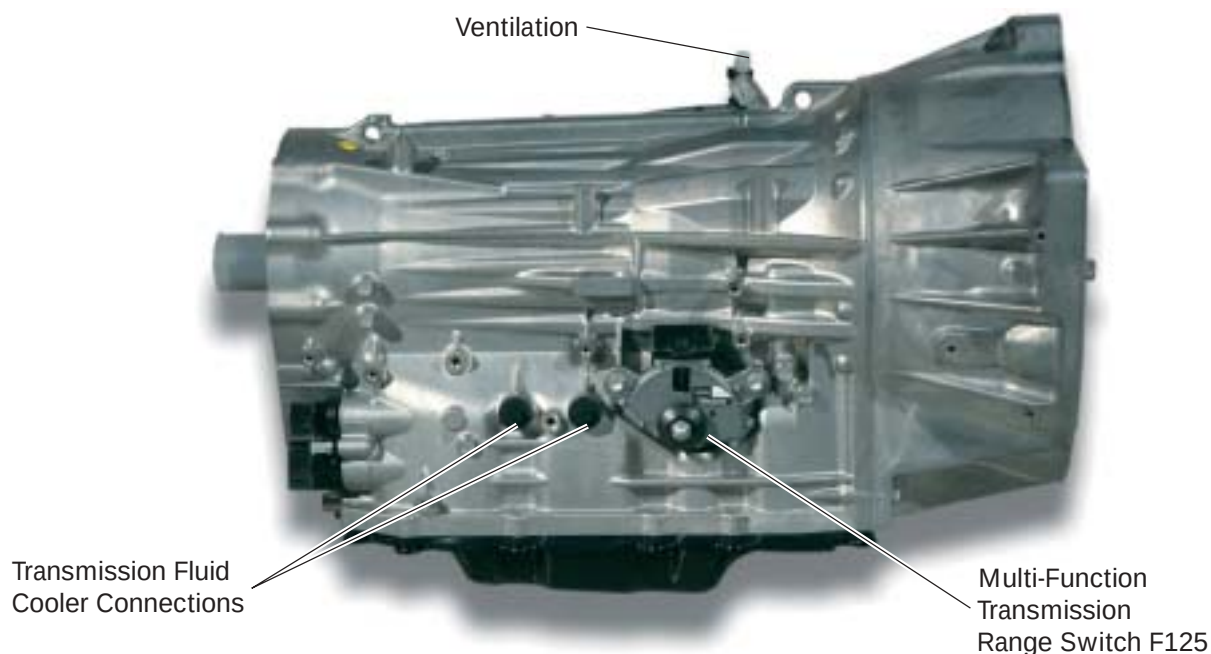
Transmissions

Special features of the six-speed automatic transmission 09D include:

- Shifting programs integrated into the Transmission Control Module J217 that depend on driver and driving situations, as well as shifting programs that depend on driving conditions. The shifting programs are controlled by fuzzy logic.
- Lock-up torque converter.
- Lifetime automatic transmission fluid.
- Axle drive is located outside of the automatic transmission.
- The hill-holder function keeps the vehicle from rolling back, making it easier to stop on an upslope.
- Selector lever Tiptronic.

Technical Data – Six-Speed Automatic Transmission 09D

- **Volkswagen designation**
AG6 09D
- **Automatic transmission fluid**
Lifetime fill
- **Maximum torque transmission**
553 lbs-ft (750 Nm)
- **Weight**
214 – 243 pounds (97 – 110 kg)
Depending on engine type, including fluid
- **Emergency operation**
Third and reverse gears in case of control module failure



SSP297/084

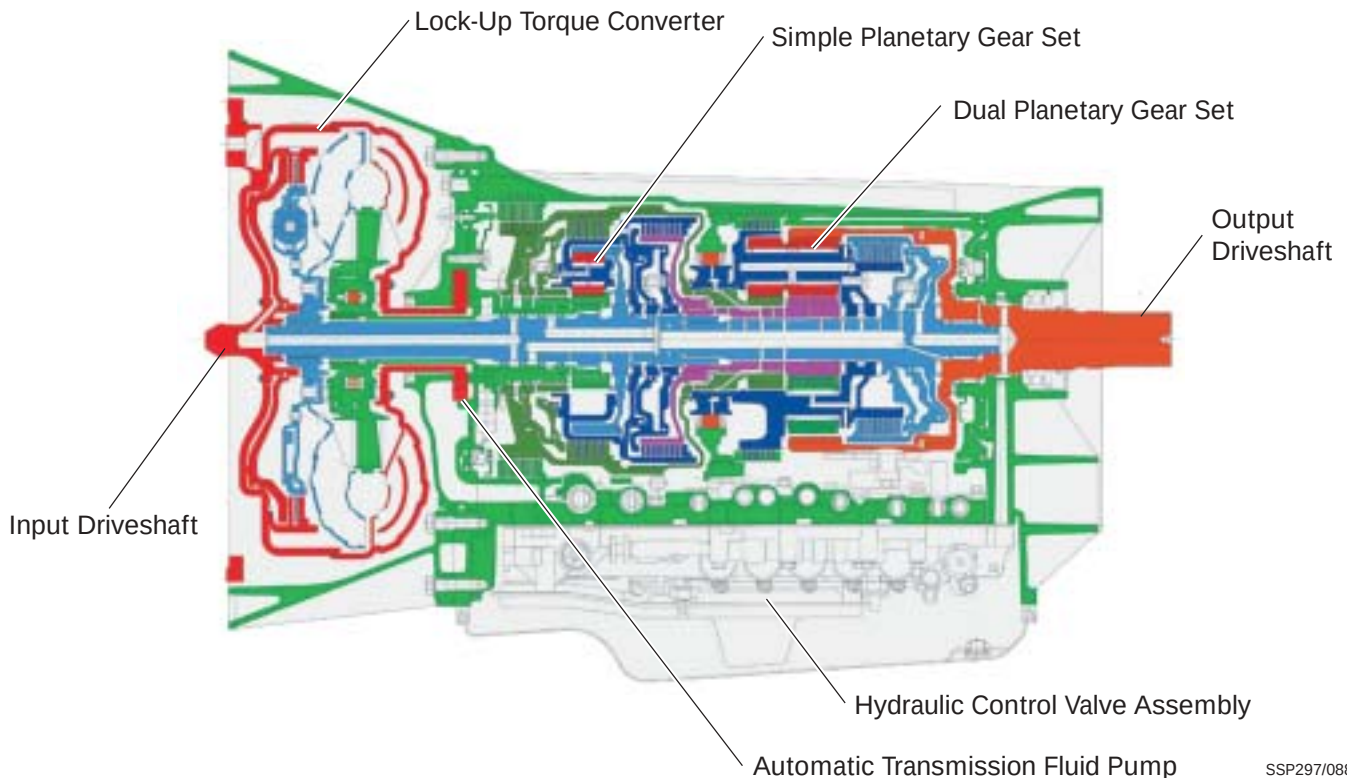
Design – Six-Speed Automatic Transmission 09D

In its basic design, the six-speed automatic transmission 09D is similar to other automatic transmissions.

Major components include:

- Lock-up torque converter
- Automatic transmission fluid pump
- Simpson design simple planetary gear set
- Ravigneaux design dual planetary gear set
- Three multi-disc couplings
- Two multiple-disc brakes
- Hydraulic control valve assembly

Component Locations



External axle drive



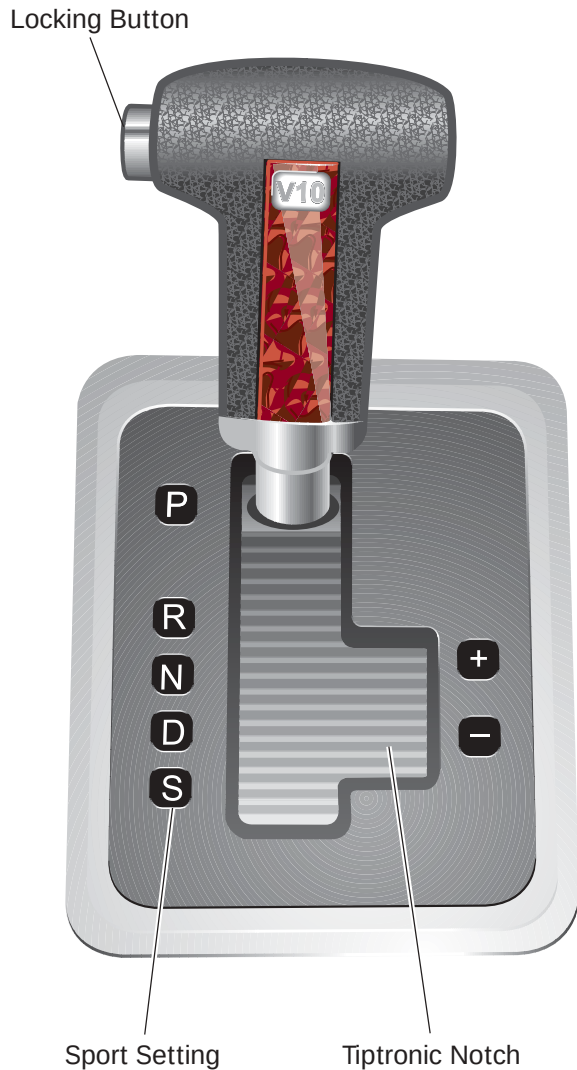
The Touareg application uses an external axle drive that is unique for Volkswagen.

From the automatic transmission output driveshaft, the torque of the engine enters a transfer case that is bolted onto the transmission housing.

From the transfer case, the torque is transmitted to the drives of the front and rear axles according to traction requirements.

SSP297/088

Transmissions



SSP297/028

Selector Lever Positions

P – Parking

To move the selector lever out of the “P” position, the ignition must be turned on. In addition, the brake pedal and the locking button on the selector lever must be pressed.

The ignition key can be removed only when the lever is in this position.

R – Reverse

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

N – Neutral

The transmission is idling in this position. If the selector lever is in this position for a long time, the Shift Lock Solenoid N110 for the selector lever becomes active and the brake pedal must be pressed to activate the lever.

No power is being transmitted to the wheels.

D – Drive

In this position, the forward gears are shifted automatically.

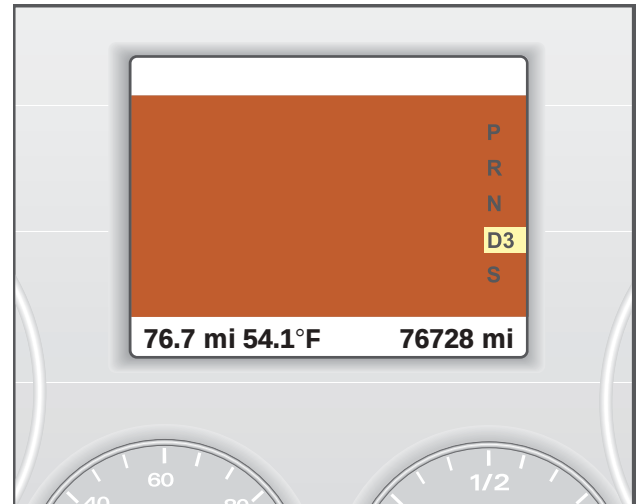
S – Sport

The Transmission Control Module J217 selects gears automatically according to a sporty shifting characteristic curve. The shift points occur at higher engine speeds resulting in longer intervals in each gear and brisker acceleration.

Shift Program and Gear Indicator on Display Unit in Instrument Cluster Y24

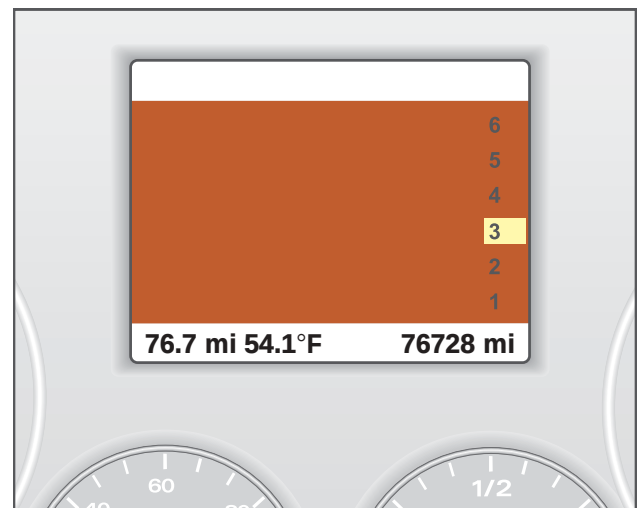
After the ignition is turned on, the current selector lever position is displayed in the Display Unit in Instrument Cluster Y24.

In positions “D” and “S” the gear selected in the transmission is also displayed.



SSP297/086

The gear being used is shown on the display if the automatic transmission is in the Tiptronic shift program.



SSP297/029

Transmissions

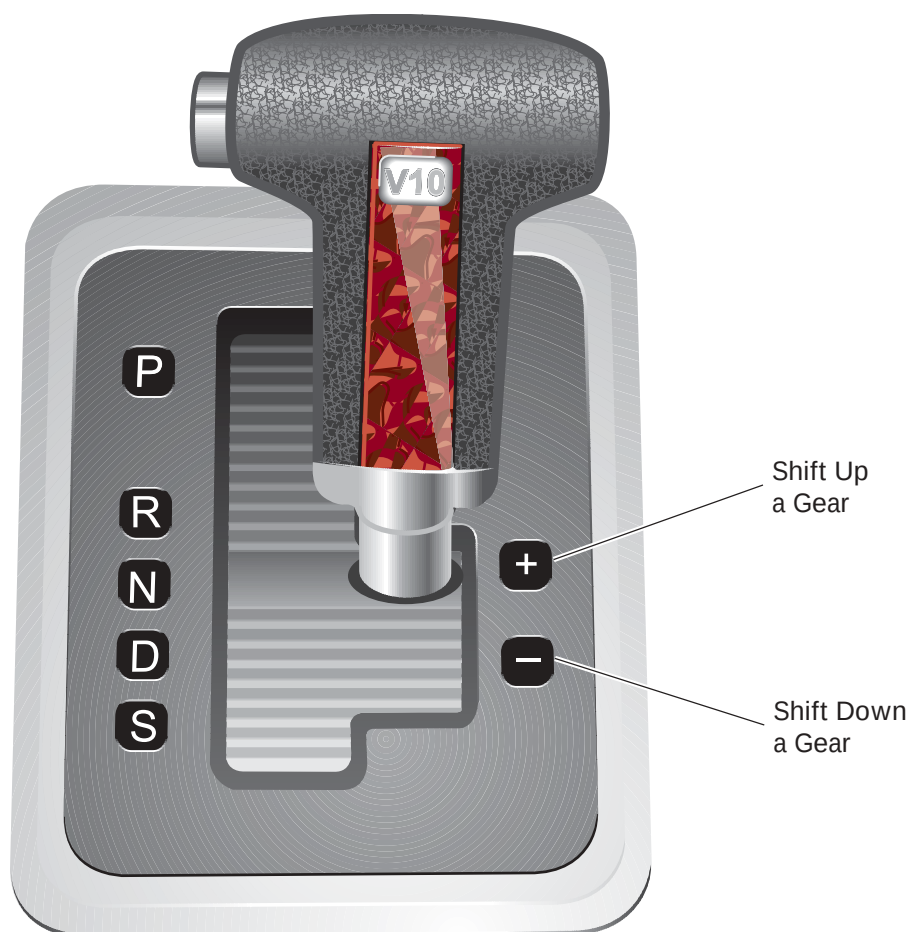
Selector Lever Tiptronic

On the Touareg, Tiptronic gear selection is operated by the selector lever.

The automatic transmission is switched to the Tiptronic mode by moving the selector lever to the right from the “D” position into the Tiptronic notch.

Gear changes are then made by moving the selector lever.

Moving the selector lever forward shifts up a gear, moving the lever back shifts down a gear.



SSP297/030

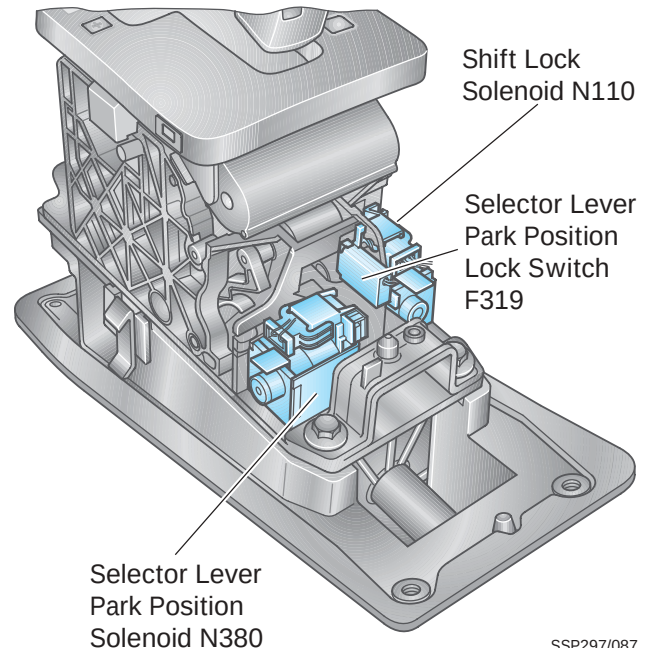
Selector Lever Locks

The selector lever is locked by:

- Shift Lock Solenoid N110
- Selector Lever Park Position Solenoid N380

The ignition key can be removed only when the selector lever is in the “P” position.

The Selector Lever Park Position Lock Switch F319 signals to the Access/Start Control Module J518 that the selector lever is in the “P” position.



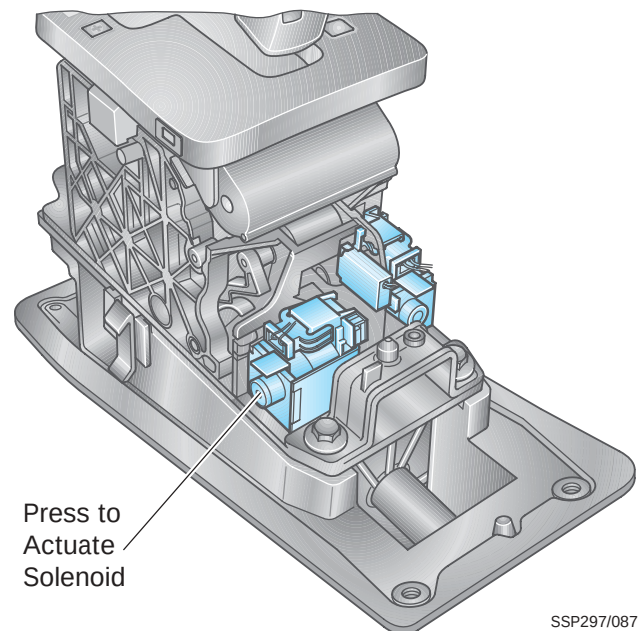
SSP297/087

Effect of failure

If one of the signals fails or the Shift Lock Solenoid N380 is defective, then the selector lever cannot be moved out of the “P” position. The selector lever must be manually unlocked to allow moving of the vehicle.

To manually unlock the selector lever:

- The selector lever covering must be removed and the solenoid actuated by hand.
- The selector lever must be simultaneously moved out of the “P” position.



SSP297/087

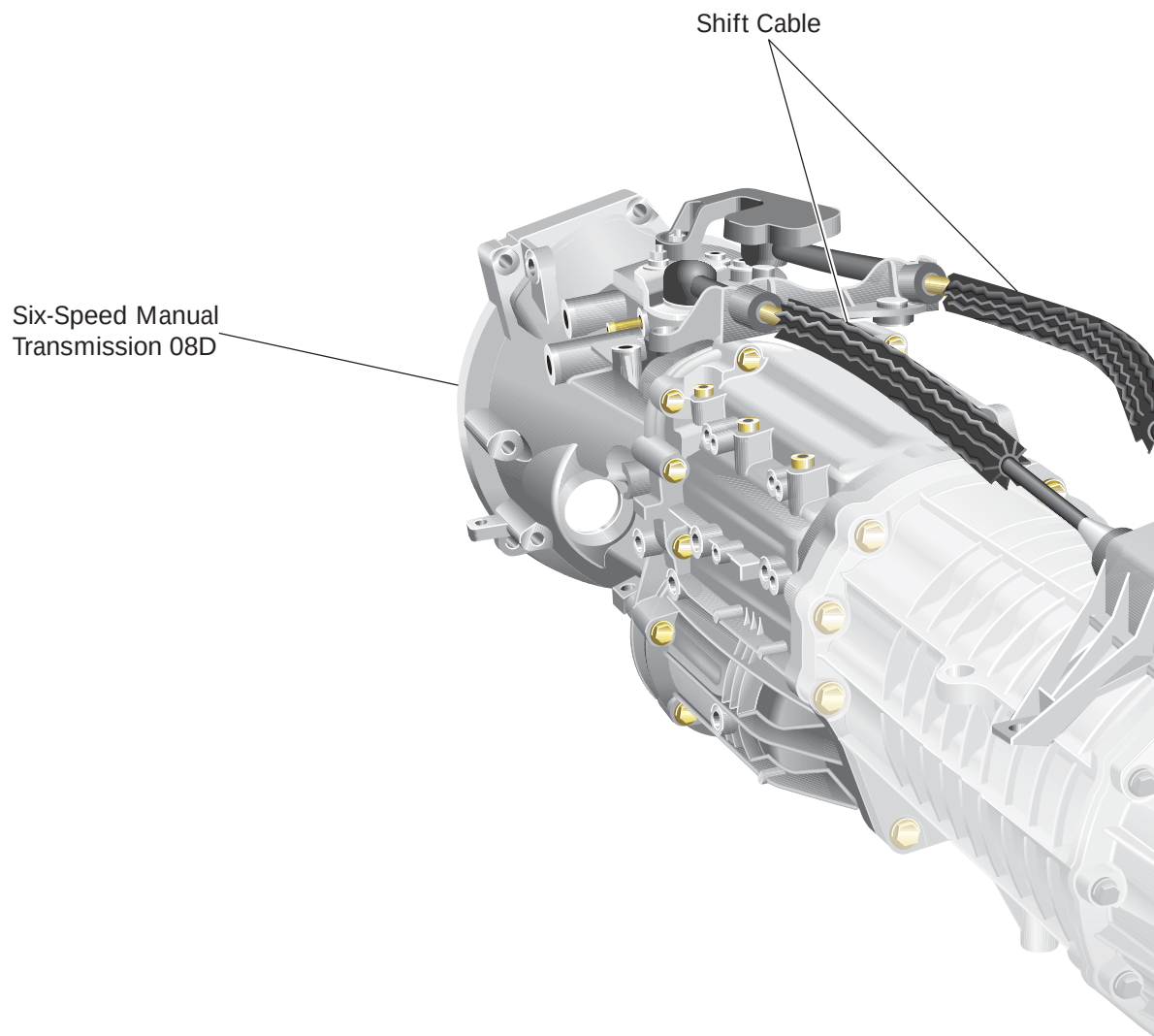
Transmissions

Six-Speed Manual Transmission 08D (Late Availability in the North American Market)

The six-speed manual transmission 08D was developed just for the Touareg, especially for off-road use.

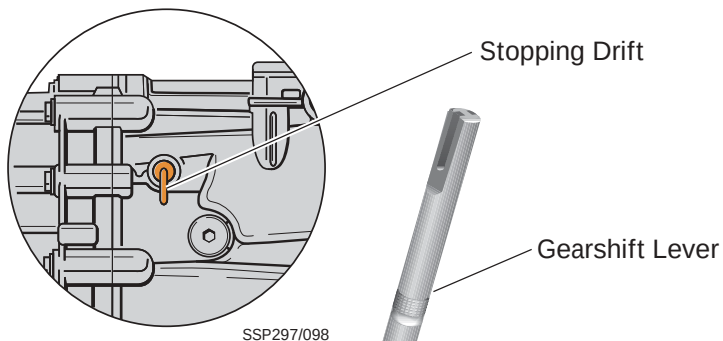
This manual transmission is standard equipment for Touaregs equipped with the 3.2-liter V6 gasoline engine or the 5-liter V10 TDI diesel engine.

For smooth operation it is actuated by shift cables instead of mechanical linkage. A special support on the transmission housing provides for shift cable mounting and for the actuation of the shifter shaft in the transmission.



Transmissions

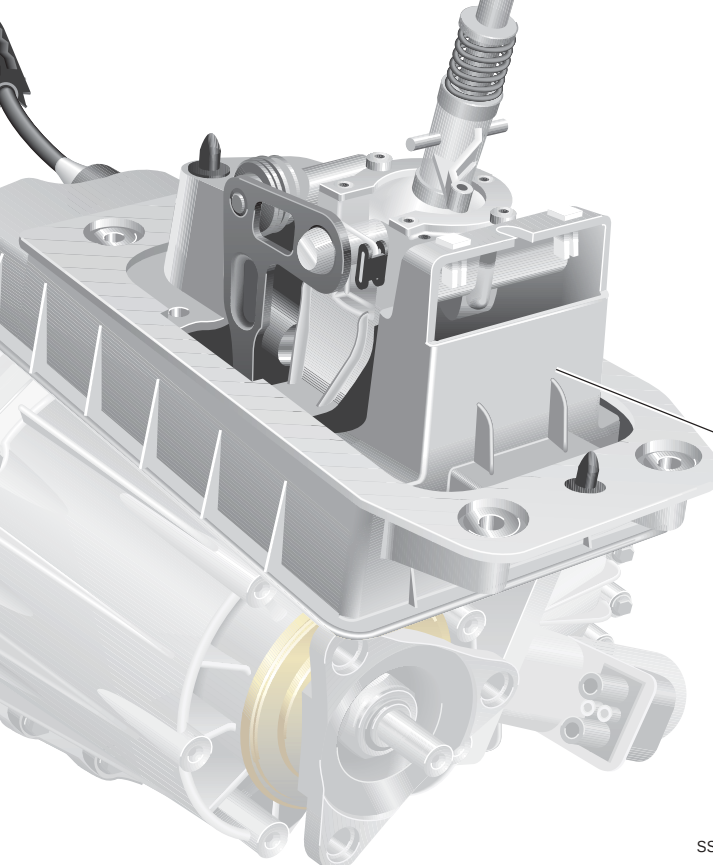
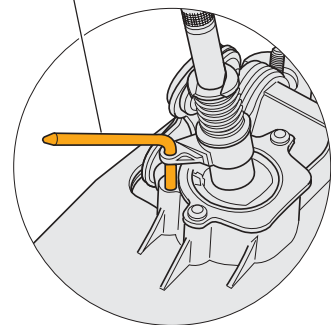
The ends of the shift cables are attached with locknuts to the control levers. Mass dampers smooth out the shifting movements and absorb vibrations.



To ensure proper adjustment or replacement of the shift cables:

- The gearshift lever must be locked in place in the left neutral position using the adjustment drift T10027 before the shift cables are loosened.
- At the transmission housing, a stopping drift located on the bearing housing at the shifter shaft end must be turned clockwise to hold the shifter shaft in the left neutral position.

Adjustment Drift T10027



Running Gear

Touareg Chassis Overview

The Touareg chassis has excellent off-road driving characteristics with the 4XMOTION system. It has continuous four-wheel drive and a central differential with a reduction stage.

It also ensures the highest levels of driving comfort on normal roads with its four-wheel independent suspension.

Touareg chassis features include:

- Tire 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 attenuation (standard equipment on vehicles with the 5-liter V10 TDI diesel engine, optional on other models).





- Rear transverse lock and longitudinal lock.
- Dual-servo foot-pedal-actuated drum parking brake.
- Ventilated disc brakes front and rear.
- Hill incline assistant and hill descent assistant.
- Conti Teves MK25 Electronic Stabilization Program (ESP) system with braking assistant and four-wheel Electronic Differential Lock (EDL).



For more detailed information on the chassis, refer to *The Touareg Suspension and 4XMOTION System*, Self-Study Program Course Number 89H303.

SSP297/061

Body

Body Structure

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

- 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 load-bearing members 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.

There are cavities in the tailgate for the gas-filled support struts.

For a seamless appearance, the roof is connected to the side structure by laser soldering.



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



Static Rigidity

The body of the Touareg has a very high static rigidity. It does not flex or twist, even during off-road driving, where large forces affect the body. The chassis is designed so that the doors, hood, and tailgate always close without problems, even with the tightest gap tolerances.

Dynamic Rigidity

The high dynamic torsional rigidity of the body results in both favorable vibration characteristics and driving comfort.

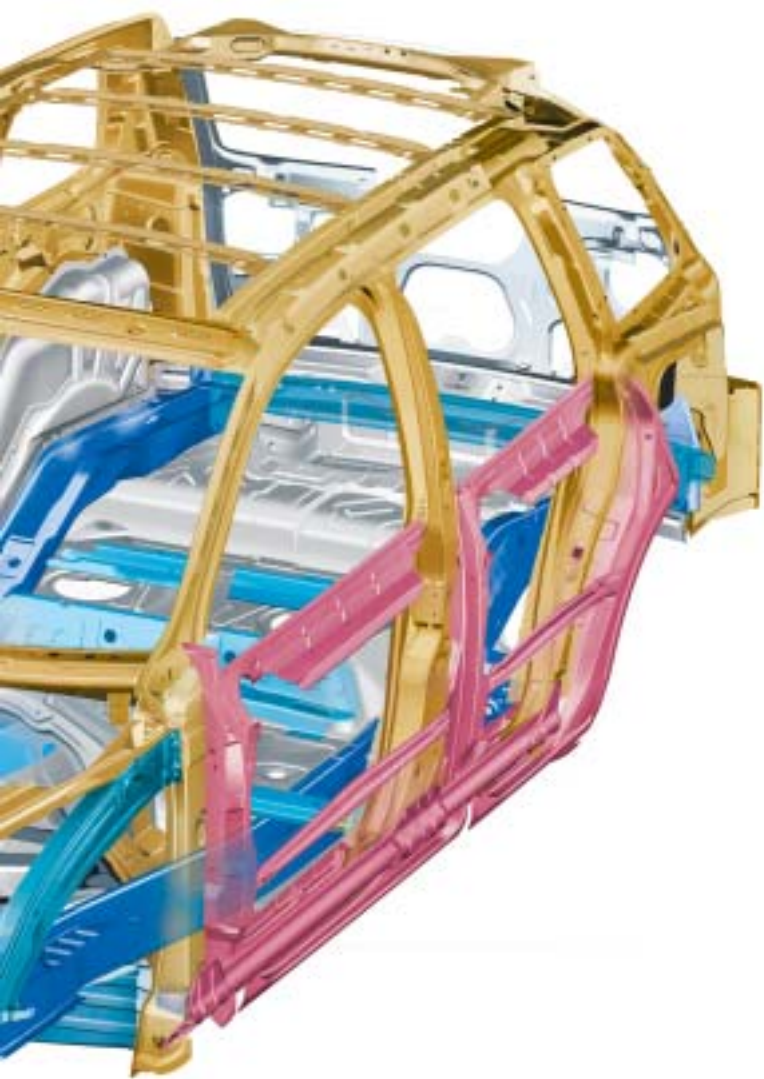
Safety Aspects

The body is designed to survive crashes well using profiles and an auxiliary frame.

In the sills (side members), tubes with a wall thickness of 0.118 inch (3 mm) are installed, which optimize the side-post crash behavior.

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

Overall, the crash behavior of the Touareg is similar to that of a luxury sedan – unusual for such a vehicle.



SSP297/010

- Side Crash Area
- Passenger Compartment
- Frame Structure
- Crash Areas

Body

Body Attachments

Engine Hood

The engine hood is made entirely of aluminum. The outer hood sheet metal panel is 0.045 inch (1.15 mm) thick. The thickness of the inner panel is unusual at 0.035 inch (0.9 mm).

Fenders and Bumpers

The front fenders and front and rear bumpers are made of plastic. The wall thickness of the fenders varies between 0.106 inch and 0.134 inch (2.7 mm and 3.4 mm). The plastic that is used is resistant to high painting process temperatures. This permits painting of the bumpers with the rest of the body.

Front fender brackets

The front fender brackets are attached with screws and can then be adjusted. This results in narrow installation gap tolerances.

Sunroof

The Touareg is available with a glass tilt and slide sunroof.

This sunroof system is like the one used in the Volkswagen Passat.

Windows

The windshield consists of acoustic glass. An electric windshield heater is available as an option.

Privacy side and rear windows are also available as an option. With this feature, the glass from the B-pillar back is darkened by 35%.



Rear window module

The rear window module is made up of glass and a sheet metal frame. These parts feature a special new technique called plastic extrusion coating.

To avoid providing a starting point for thieves, the hinges are covered by a spoiler. This consists of glass-fiber-reinforced plastic which expands only slightly when exposed to heat. This results in narrow gap tolerances here as well.



SSP297/011



Side window module

The side windows are connected to the panels and the trim plate by plastic extrusion coating.

Setscrews are also incorporated into the modules. The entire module is screwed to the body.

Doors

The doors are installed to the body as modular units with all of their components assembled.

Doors can be adjusted for a precise fit to the body openings.

The doors are sealed three ways to ensure the fording capability of the Touareg.



SSP297/012

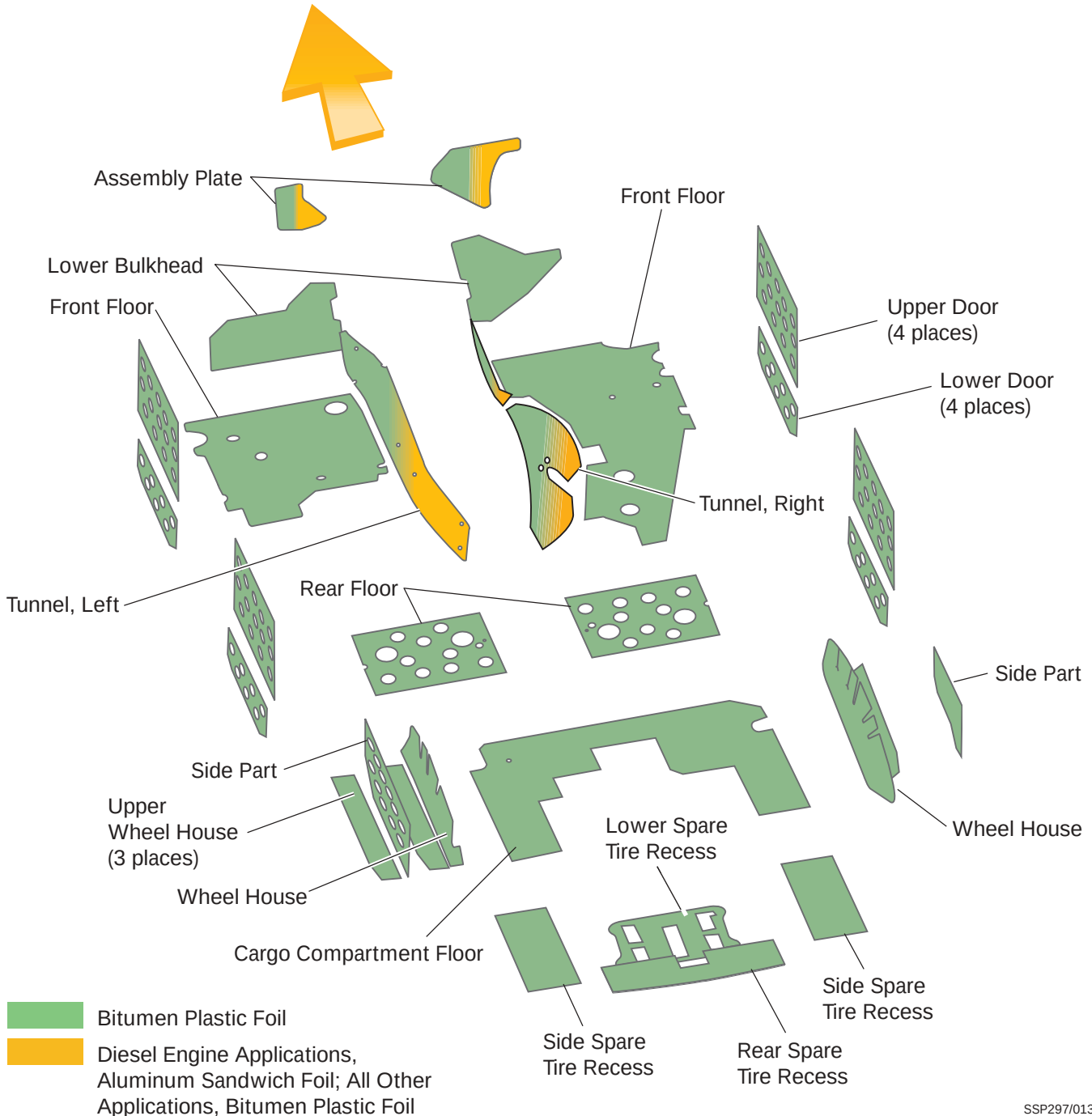
Body

Body Insulation

Two acoustic insulation packages were developed for the Touareg.

The package for vehicles equipped with gasoline engines consists of bitumen plastic foil sound deadening.

For vehicles with diesel engines, four of the sound deadening parts are designed as a bitumen-aluminum sandwich foil.



SSP297/013

Tailgate

The tailgate of the Touareg consists of a separate flip-up rear window and the tailgate itself.

The rear window and the tailgate are secured by a locking mechanism when the window is closed.

Two pairs of gas-filled struts ensure comfortable opening and closing of the rear window and the tailgate. They are attached to the body so that they are invisible from the outside.



Body

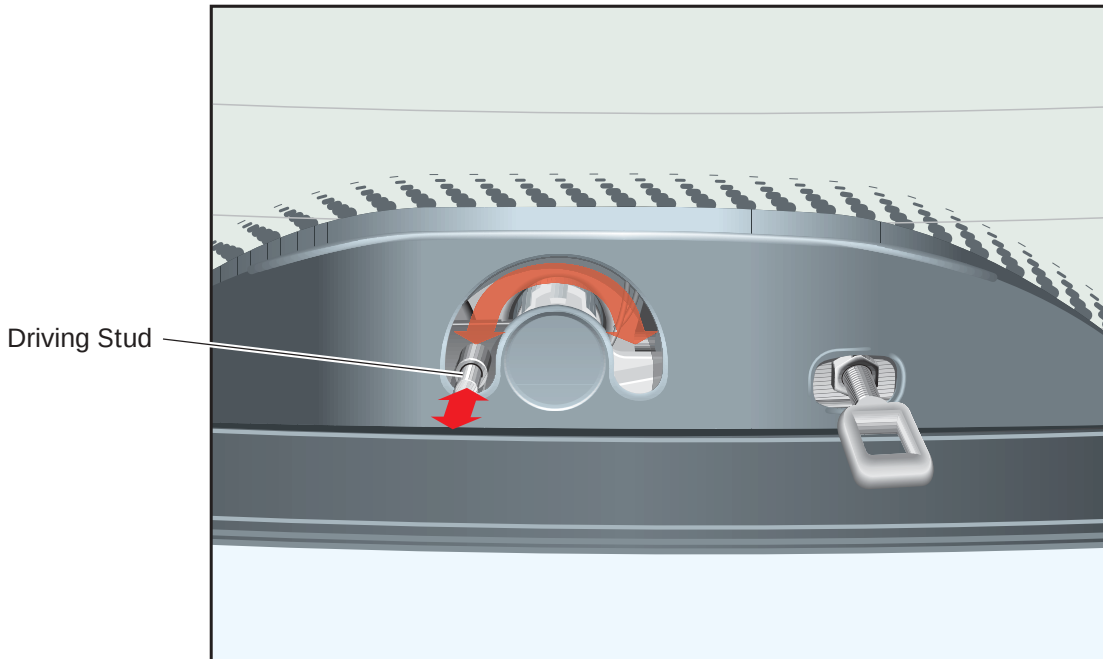
Rear Window Wiper

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 is a drive mechanism between the rear window wiper and the motor.

When the rear window is flipped up, the window wiper may rotate. 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.

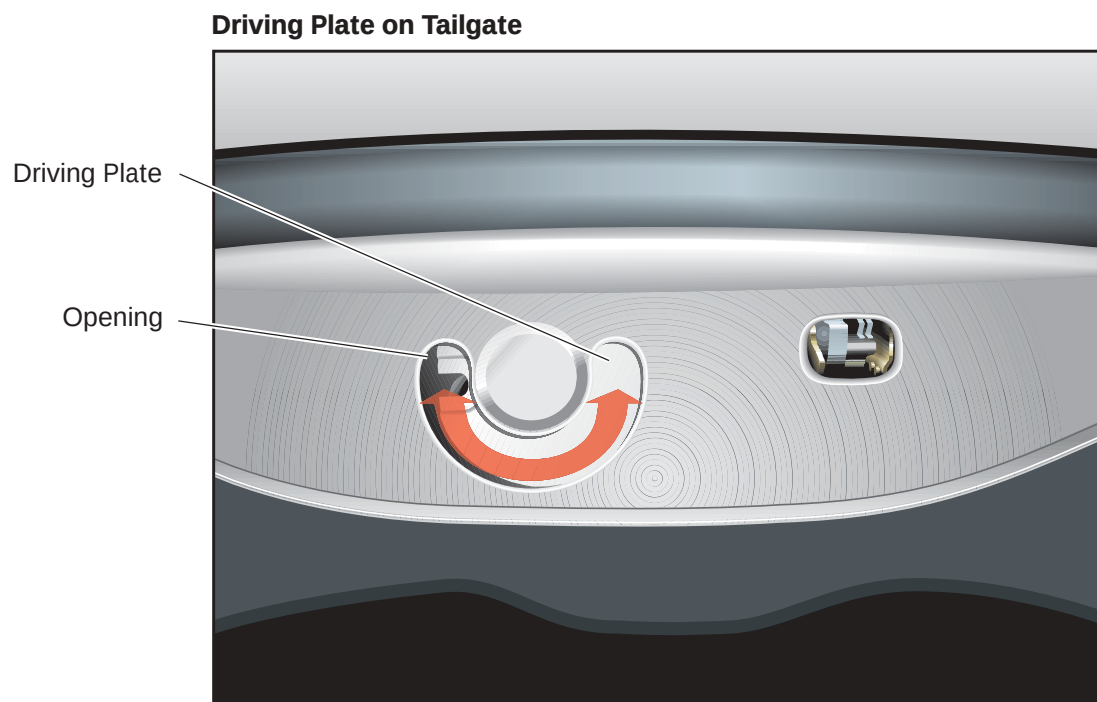
Driving Stud on Rear Window



SSP297/023

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

In this way, the window wiper mechanism and its motor are easily disengaged and re-engaged.



SSP297/024

Body

Roof Rack

In order to mount a roof rack, two chamfered C-rails are embedded into the roof of the Touareg.

The roof rack carrier supports are inserted into these rails at the openings in the center.



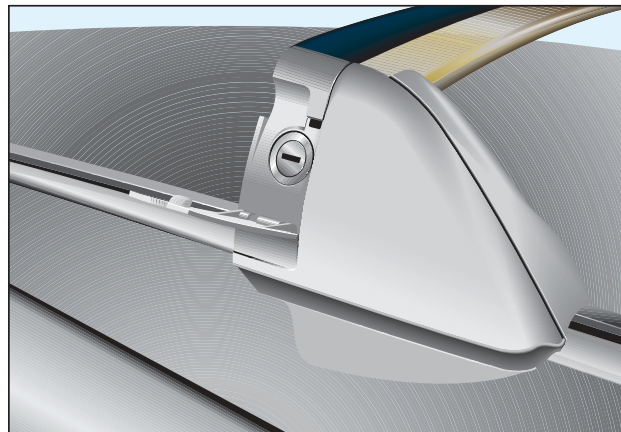
Each support has a lockable tensioning mechanism:

- When the lock is open and the flap disengaged, the carriers can be pushed to the desired positions with the supports on each end at matching recesses in the rails.
- The carriers are fastened by closing the flaps and the locks on the supports.



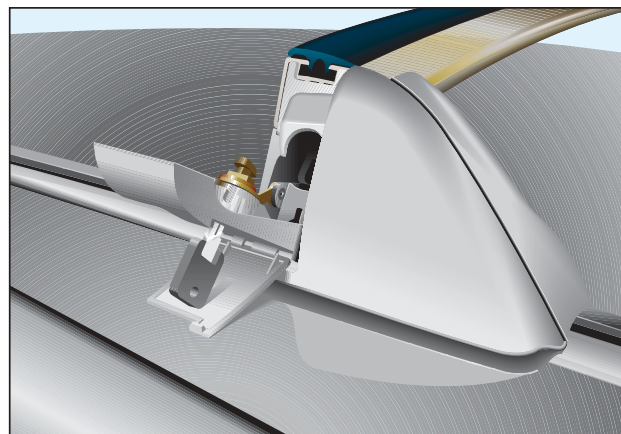
To avoid damage to the paint, the key for unlocking the carrier supports should be removed before moving the carriers.

If the lock is closed, the carrier is fastened.



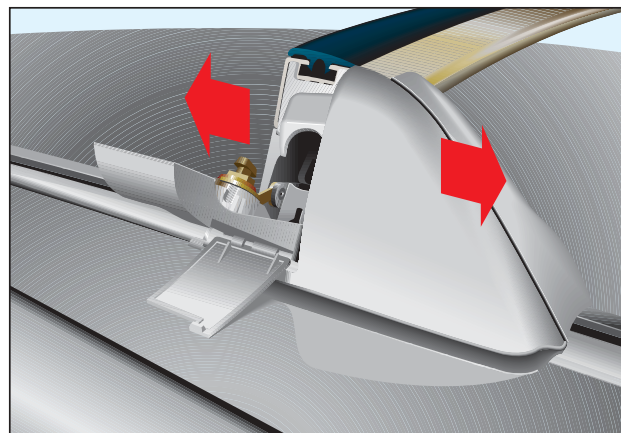
SSP297/018

Use the key to open the lock.



SSP297/019a

Remove the key before moving the carrier.



SSP297/019b

Occupant Protection

Airbag System

Airbags

The following airbags are installed in the Touareg:

- Driver airbag – approximate filling volume of 2.26 cubic feet (64 liters).
- Front passenger airbag – approximate filling volume of 4.24 cubic feet (120 liters).
- Driver and front passenger side airbags – approximate filling volume of 0.39 cubic feet (11 liters).
- Curtain airbags – approximate filling volume of 0.78 cubic feet (22 liters).

There are no side airbags in the rear of the vehicle. Rear seat passengers are protected by curtain airbags mounted along the entire length of the vehicle.

Crash Sensors

Two external longitudinal acceleration sensors are located in the front of the Touareg. These detect an accident and its magnitude early and transfer the data on to the Airbag Control Module J234. The airbags are activated if the accident is severe.

External acceleration sensors detect the longitudinal acceleration. An additional sensor of this type is located in the Airbag Control Module J234 in the center console.

In addition, four external lateral acceleration sensors are fastened to the vehicle.



Occupant Protection



SSP297/020

Airbag Control Module J234

The Airbag Control Module J234 is located in the center console. It receives the signals of the six crash sensors and evaluates the data. In the case of an accident, it can trigger the following actions:

- Tightening the seat belts.
- Activating the airbags.
- Separating the battery positive lead from contact with the battery terminal.
- Activating the hazard warning light system.
- Turning off the fuel pump.
- Unlocking the vehicle through the central locking system.

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

Occupant Protection

Restraining Systems

Seat 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. An electric belt height adjuster and a comfort mechanism for the front seats is available as an option.

Ball seat belt tensioner and belt tension limiter

Ball seat belt tensioners are used at all four outer seats. They are pyrotechnically activated.

The driver and front passenger seat belts have belt tension limiters.

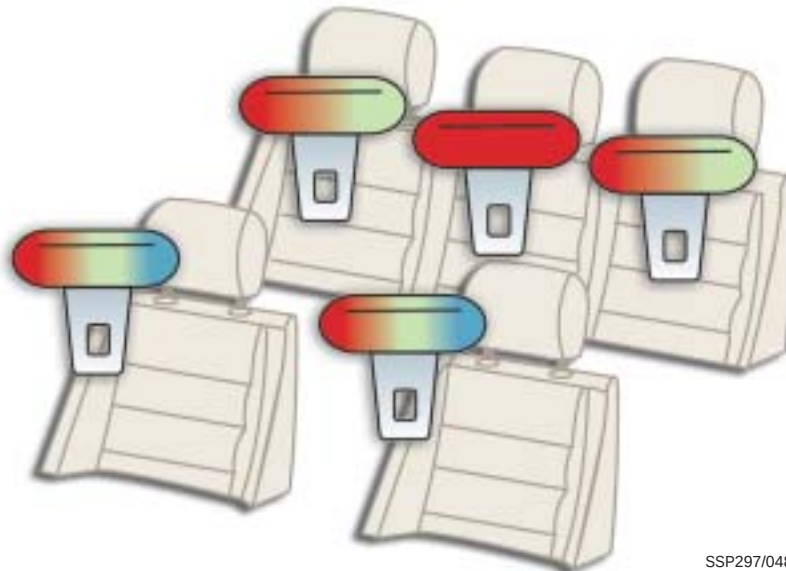
With tension limiters, the belts are at first tensioned during a collision to optimize the position of the occupant in the seat.

After a certain belt force has been attained, the belt relaxes a bit. This provides another way of reducing the amount of collision energy transferred to the vehicle occupant.

Belt-use detection

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

Along with the comfort mechanism, the belt-use detection system is used to determine which spring of the comfort mechanism is used. When the belt latch is engaged, a soft spring provides comfort to the occupant wearing it. When the belt latch is released, the belt rolls up quickly and safely using a more rigid spring.



SSP297/048

-  Three-Point Retracting Seat Belts
-  Ball Seat Belt Tensioner, Mechanical Belt Height Adjustment

-  Belt Tension Limiter and Belt-Use Detection, Optional Comfort Mechanism and Electric Belt Height Adjustment

Child Seat Fasteners

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

Interior Trim

The collision area at the instrument panel is optimized at knee height for the driver and the front passenger.

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

Pedestrian Protection

The body contour, the selected materials for body panels like aluminum for the hood and plastic for the fenders, and the space between the hood and the engine, all provide some measure of pedestrian protection.

The body structure is designed to deform strategically and quickly reduce energy upon impact.

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.

To satisfy customer requirements for fine appointments in a luxury vehicle, the upholstery of the seats is first-class. Many different cloth fabrics are available, as are several leather versions.

In addition, the front seats are integrated into the memory package. The seat position and the easy-entry setting can be saved for different user profiles.

The Touareg comes with 8-position seats as standard equipment. Models with comfort equipment have 12-position seats.



SSP297/025

8-Position Seat

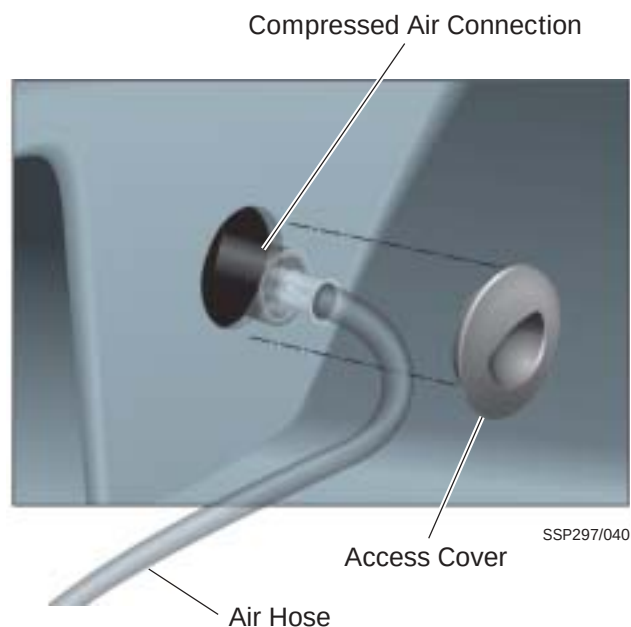
For the 8-position seat, seat adjustment is done manually.

It has the following possible adjustments:

- Seat backward and forward.
- Seat height.
- Seatback inclination angle.
- Headrest height.

Compressed Air Connection

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



12-Position Seat

The 12-position seat has the following adjustments in addition to those of the 8-position seat:

- Seat inclination angle.
- Lumbar support.

All adjustments except the headrest height are made electrically.



SSP297/026

Seats

Rear Bench Seat

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



SSP297/015

There is a central armrest in the backrest with an integrated compartment for a ski sack.

The entire rear bench seat can be heated. The backrests can be folded forward separately.



SSP297/014

Cargo Net

The cargo net of the Touareg is located in its own storage compartment.

It can be mounted either behind the rear bench seat, or...



SSP297/052

...if the bench is folded down completely, behind the driver and front passenger seats.

The net can be extended and anchored to the roof headliner from either of these positions.



SSP297/053

Air Conditioning System

Air Conditioning in the Touareg

Three different air conditioning systems are available for the Touareg. They primarily differ in terms of temperature control, air distribution, and regulation of the volume of air distributed throughout the interior of the vehicle.

There are two air conditioning systems with automatic control:

- Four-zone Climatronic
- Two-zone Climatronic

The temperature range available in both these systems is 61°F to 85°F (16°C to 29.5°C).

The third variant is the standard manually controlled air conditioning system.

The following characteristics are common to all three systems:

- Separate temperature control for each side of the vehicle.
- Residual heating function.
- Activated-charcoal dust and pollen filter.
- Air conditioned glove compartment.

Despite their variations, the three systems are based on each other. This simplifies repairs and maintenance.

The different systems can easily be recognized by their controls.

Due to safety regulations regarding collision protection, the knobs and buttons of all three A/C system control modules are designed to give way in the event of a collision.

On impact they will collapse into the face of the modules by shearing off at break-out points.



Pressure must not be exerted on these knobs and buttons during installation or the break-out points may break.

The illustration shows the Touareg with a four-zone air conditioning system.



SSP297/057

Air Conditioning System

Four-Zone Climatronic

This system has two control modules.

The Climatronic Control Module J255 is located in the instrument panel.

This can be used mainly to select the settings for the climate zones of the front passenger compartment.



SSP297/033

The Rear A/C Control Head (Climatronic) E265 located in the rear center console can be used to select the settings for the climate zones of the rear passenger compartment.



SSP297/038

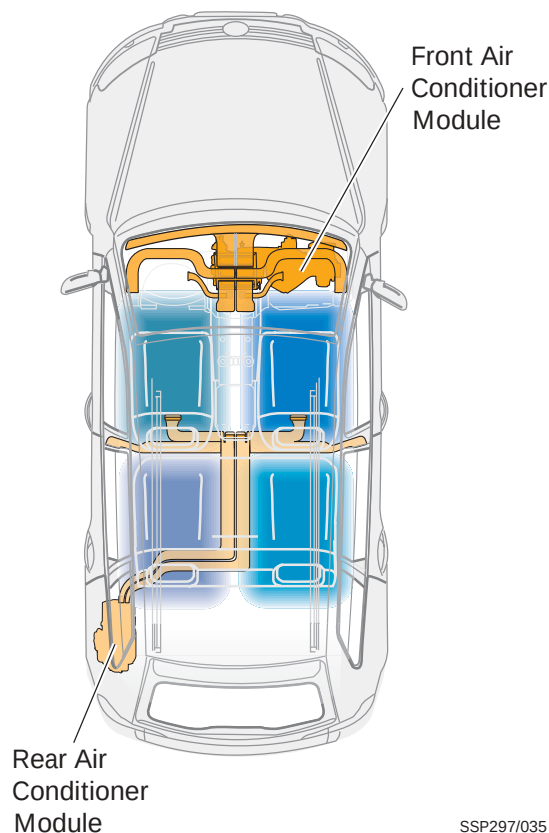
Two separate modules are used to condition and distribute the air in the passenger compartment.

The front air conditioner module is located below the instrument panel. It serves the front passenger compartment.

The rear air conditioner module is located behind the side panel in the left-hand side of the cargo area. It serves the rear seats.

Each air conditioner module has its own evaporator, heat exchanger, and blower. Therefore, the temperature and the fan speeds can be independently set for the front and rear climate zones.

Ventilation flaps in the air conditioner modules and the air distribution ducts are electro-mechanically set, permitting individual control of air distribution to the four zones.



SSP297/035

Air Conditioning System

Climatronic Control Module J255

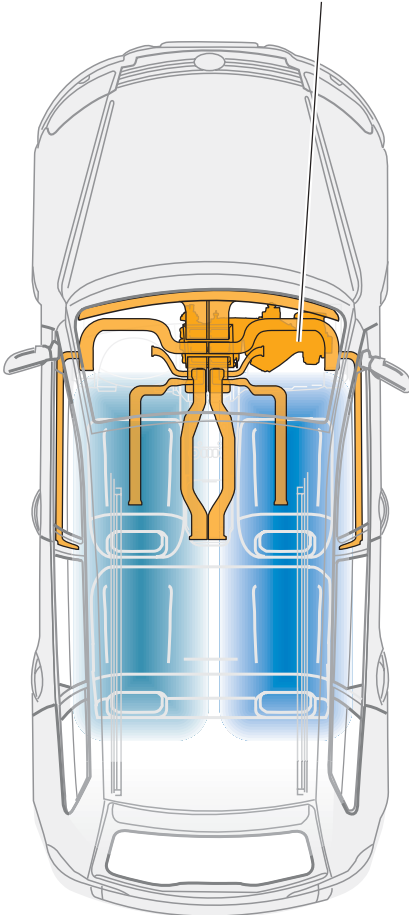


SSP297/036

Two-Zone Climatronic

The Climatronic Control Module J255 in the two-zone Climatronic system is also located in the instrument panel.

Air Conditioner Module



SSP297/037

Compared to the four-zone Climatronic system, there are the following differences in automatic operation:

- The temperature can be set separately for the left and right sides of the passenger compartment.
- The fan speed and air distribution are set uniformly for the entire passenger compartment.

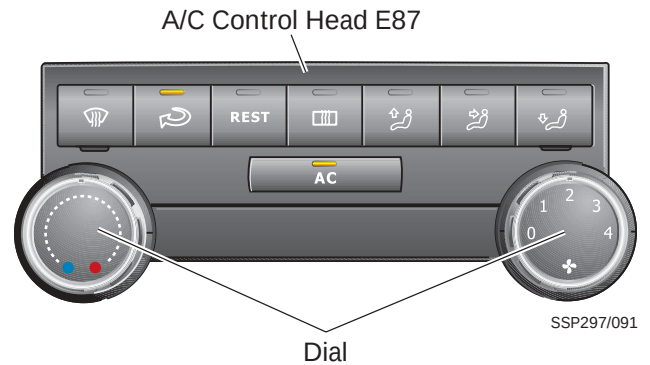
The design of the two-zone Climatronic system differs from the four-zone system mainly by:

- The use of a single air conditioner module below the instrument panel.
- Air ducts through the front doors to the air outlets in the B-pillars.
- Air ducts through the center console to the air outlets in the rear center console.

Air Conditioning System

Manual Air Conditioning System (Not Available in the North American Market)

Using the A/C Control Head E87 in the instrument panel, the occupants can set the air conditioning of the entire interior according to their wishes.



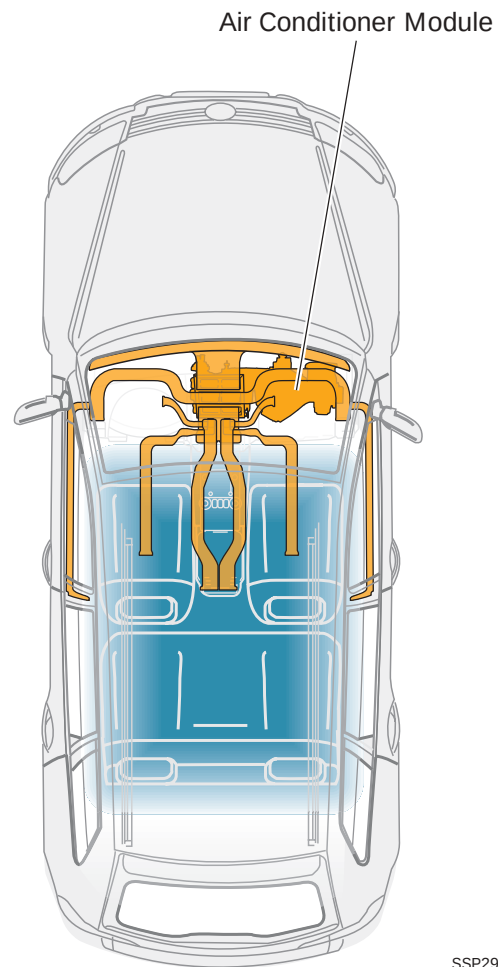
In this manually controlled system, the entire passenger compartment is uniformly air conditioned.

There is no automatic climate control for the temperature, air distribution, or fan speed.

The structural features of the air ducts are generally the same as those of the two-zone Climatronic system.



For more detailed information on the air conditioning system, refer to *The Touareg Heating, Ventilation and Air-Conditioning System*, Self-Study Program Course Number 89G303.



Electrical System

Convenience and Safety Electronics

Overview

The comfort and safety electronics used on the Touareg are based on those of the Phaeton.

Components are located throughout the vehicle.



The Touareg will use the convenience entry system but **NOT** the convenience start function. You must use the vehicle key to start the engine.

Door Control Module, Driver Side J386
Door Control Module, Passenger Side J387

Starter Battery
(Under the Driver's Seat)

Door Control Module, Rear, Left J388
Door Control Module, Rear, Right J389

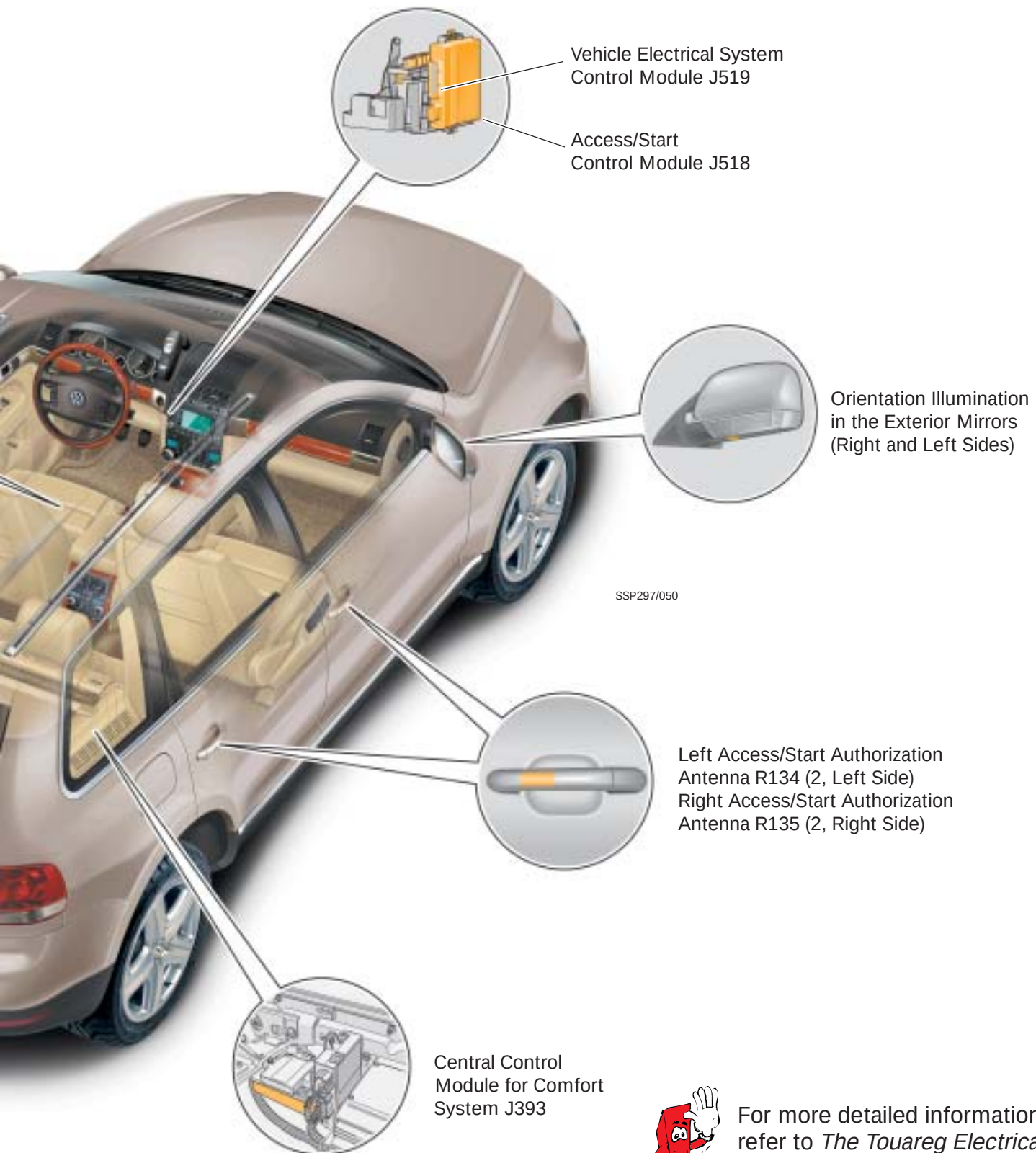
Interior Access/Start
Authorization Antenna 1 R138

Luggage Compartment Access/Start
Authorization Antenna R137

Interior Access/Start
Authorization Antenna 2 R139

On-Board Power Supply Battery
(Under Cargo Load Floor, with
Optional 5-Liter V10 TDI Diesel Engine)

Electrical System



For more detailed information, refer to *The Touareg Electrical System*, Self-Study Program Course Number 89J303.

Electrical System

Radio System

With minor differences, the radio system used in the Touareg corresponds to the radio system that can be found in other Volkswagens, such as the 2003 Passat.

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

There are also some differences 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 Fade). After the button is pressed, the corresponding menu

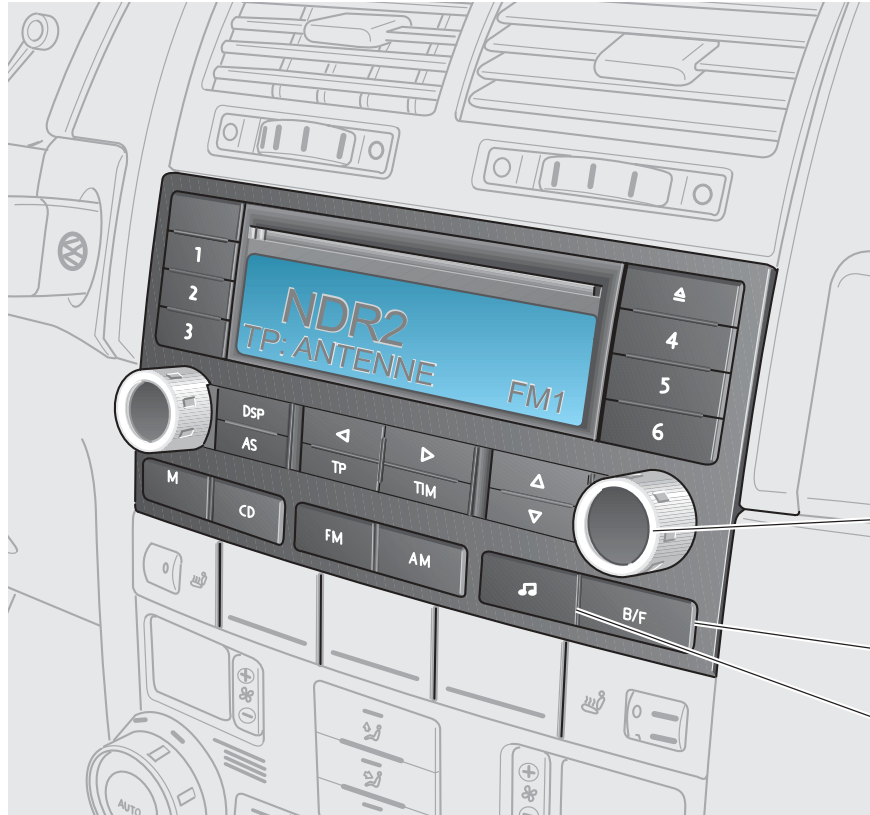
appears in the display. The sound settings can then be changed by turning the right-hand knob/button.

Due to safety regulations regarding collision protection, the knobs and buttons are designed to give way in the event of a collision.

On impact they will collapse into the face of the module by shearing off at break-out points.



Pressure must not be exerted on these knobs and buttons during installation or the break-out points may break.



Knob/Button

B/F Button

Sound Button

SSP297/041

Radio/Navigation System

The radio/navigation system found in the Touareg is new to Volkswagen.

The appearance, the user interface, and the overall dimensions are different than the Premium VI radio.

The most important differences are:

- 6.5-inch (165 mm) color display.
- Function keys with new designations and functions.
- Audio-capable CD drive.
- Central connector module with central lock.
- Color-coded connectors and sockets for FM/AM and GPS antenna inputs.
- Signal transfer via the infotainment CAN data bus system.

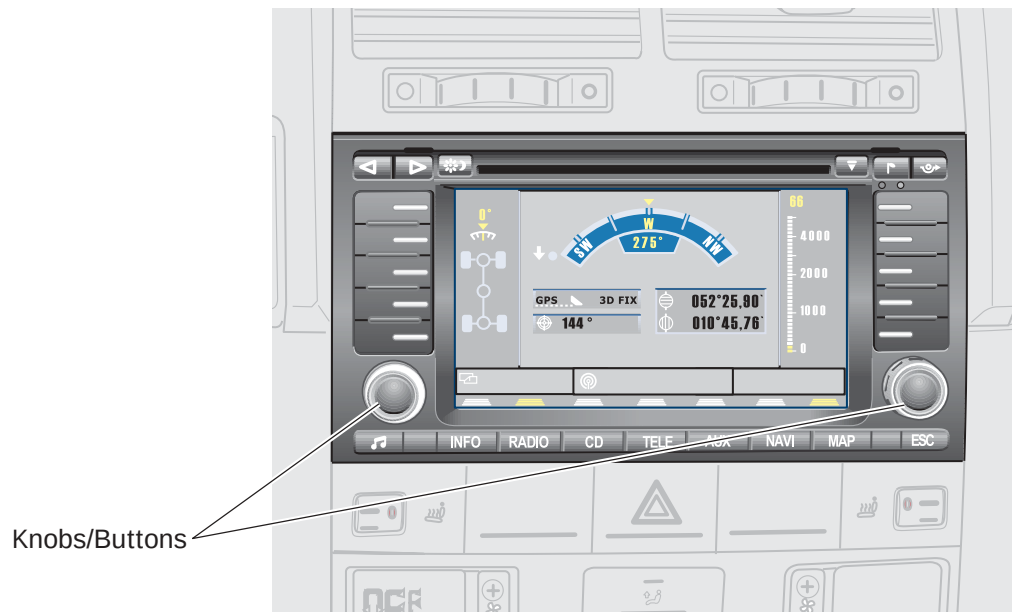
- Off-road function.
- Position-finding display with compass display.

Due to safety regulations regarding collision protection, the knobs and buttons are designed to give way in the event of a collision.

On impact they will collapse into the face of the modules by shearing off at break-out points.



Pressure must not be exerted on these knobs and buttons during installation or the break-out points may break.



SSP297/054

Electrical System

Radio/Navigation System Operation

The new function keys and button designations are described and summarized below.

Function keys to call up various functions which are shown by the adjoining symbols in the display.

Slot for an audio or navigation CD.



“RADIO” button for setting FM or AM stations.

“TELE” button for telephone.

“NAVI” calls up the navigation menu.

“ESC” key for calling up the prior or main menu.

“INFO” button for:

- System information
- Off-road display
- List of routes
- Text messages

“CD” button for calling up the menu for the audio CD. (If the optional CD changer is equipped, it is activated.)

“AUX” calls up the menu for controlling an additional connected TV tuner, audio, or video device.

“MAP” button for calling up the map display or the symbol display if a navigation CD has been inserted.

Off-Road Navigation

In addition to the menus for entering the destination and the path to the destination, the radio/navigation system provides a further navigation option with the “Off-road tour” menu.

It is especially useful during off-road driving where digital information is not available.

The transition between the two navigation types from standard to off-road occurs automatically. However, the system does not automatically switch back from off-road to standard navigation.

Off-road navigation can be selected using function key “Off-road tour” in the “Destination” submenu.

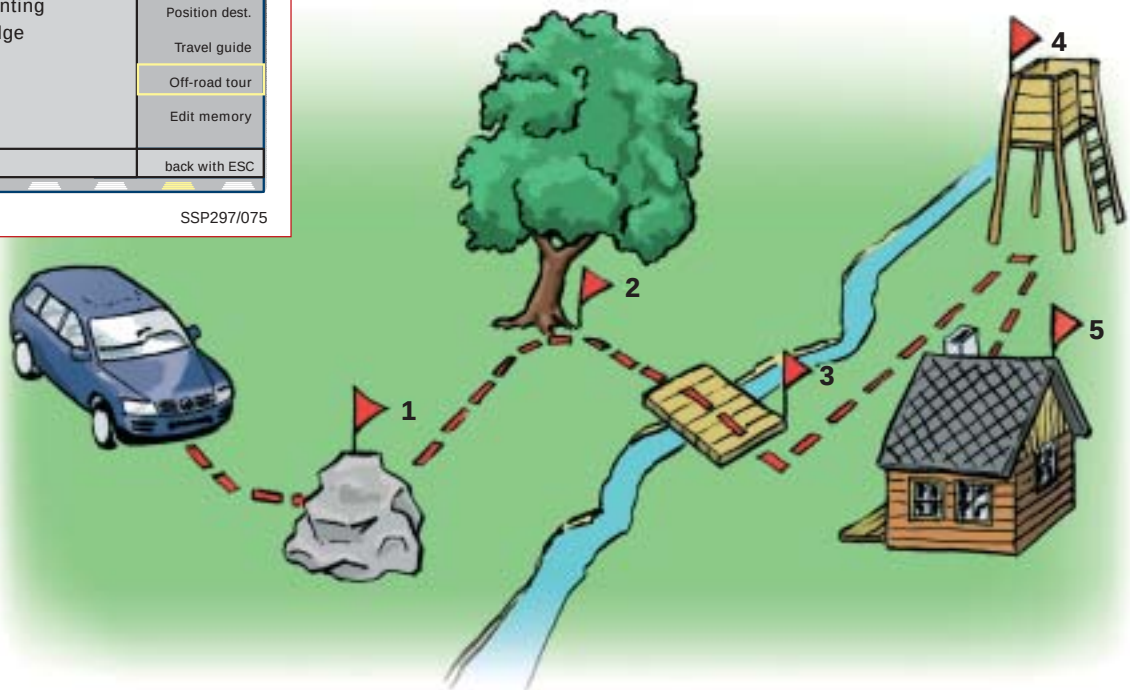
The off-road functions have the following possible selections:

- Recording, calling up, and editing GPS-coded off-road tours.
- Placing way points within tours and assigning names to them to mark special locations (e.g. “Hunting lodge,” see flag 5 in the illustration).
- Display of the next way point by a red flag and an arrow.
- Compass display with position information in degrees, minutes, and seconds.
- Reverse function enables the use of the recorded way points so that they can also be driven in the opposite direction.

Navigation Display

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

SSP297/075



SSP297/065

Notes

Notes

Knowledge Assessment

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

This Knowledge Assessment may or may not be required for Certification. You can find this Knowledge Assessment in the Learning Management Center at:

www.vwwebservice.com

For assistance please call:

Certification Program Headquarters

1-877-CU4-CERT (1-877-284-2378)

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

Or email: Comments@VWCertification.com

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