Self-Study Programme 549

The Touran 2016
Body and Safety Features
Design and function
The new Touran

The success story of the MQB is clear to see in the design of the Touran 2016. The intensive work on the proportions has continued impressively in the new expressive Volkswagen design vocabulary. The vehicle appears to have been stretched as its overall length has grown and it has a longer wheelbase.

Consequently, the new Touran looks very modern and stands out with its harmonious MPV proportions and generous space.

The D-pillar, being a typical, characteristic brand design element, has been configured to look considerably more powerful and also more dynamic than the previous model. The angle in the side window shape and the elegant sloping roof line make it look noticeably lower than before.

The design and details at the front are very powerful and striking. The combination of “sportiness” and “prestige” is expressed very well in this area.
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**Body**

**Body structure**

The body is an all-new development. It is based on the modular transverse matrix platform. An increased usage of press-hardened steel sheets and ultra-high-strength hot-formed steels guarantees a high level of crash safety combined with a low body weight. Resistance spot welding is used in the lower area of the B-pillar reinforcement. The rear section of the centre tunnel has been flattened off. This has created more room in the second row footwell.

The cross member with pedestrian protection has been made wider for the active pedestrian protection system.

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**Proportion of steel sheets according to strength**

- 35% < 160 MPa soft steel
- 24% < 220 MPa high-strength steel
- 19% < 420 MPa higher-strength steel
- 17% < 1,000 MPa ultra-high-strength steel
- 5% > 1,000 MPa ultra-high-strength hot-formed steel

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**Strengths of steel sheets**

- < 160 MPa soft steel
- < 220 MPa high-strength steel
- < 420 MPa higher-strength steel
- < 1,000 MPa ultra-high-strength steel
- > 1,000 MPa ultra-high-strength hot-formed steel
There are three different versions of the roof:
- Closed without roof rails
- Closed with roof rails
- With cut-out for panoramic sliding sunroof and with roof rails

The fastening point for the seat belt and the belt guide for the centre seat on the second seat row are located on the roof cross member.
Vehicle floor

Compared with the Golf SV, the vehicle floor has been raised 31 mm inside the body. This enables a higher seat position. The Touran has a 110 mm longer wheelbase than the Golf SV. This has been achieved by making the rear cross member 110 mm longer.
Additional brackets with threaded holes are welded on and a reinforced centre cross member is fitted to mount the third seat row. The ultra-high-strength hot-formed rear longitudinal members have been softened in places to absorb energy in rear-end collisions.
Body assembly

Front end design
The design corresponds to that of the modular transverse matrix vehicles.

Radiator grille
The radiator grille with its covers is clipped from the front into the bumper.

Wheel housing liners
The front wheel housing liners are equipped with
- Sound-insulating fleece
- A cover for changing the front fog light bulbs
- A clip-on spoiler to improve the drag coefficient
- A brake cooling duct (guided brake cooling air)

Bumper cover
The bumper cover is bolted on at the sides and from underneath. It is clipped into the retaining strip along the top.
The sensors for the parking distance warning and the park assist steering systems, the headlight washer system and the front fog lights are installed in the bumper cover.

Bumper cross member
The wider bumper cross member with the widened pedestrian protection system is new.
The pedestrian protection system is clipped onto the bumper cross member.

Lock carrier
There are two different lock carriers depending on the installation position of the radiator.
Bonnet latch

The Bowden cable used to operate the bonnet lock can be disconnected behind the headlight on the driver’s side.

Gas strut

A gas strut is used to open the bonnet.

Hinges

The bonnet is secured to the body with two single-pivot hinges each using two bolts. It can be adjusted via the large screw holes.

Wings

The wings are secured on separate retaining plates along the top. This creates a flexible wing edge. This is important for pedestrian protection.
Body assembly

Doors

The doors consist of the outer panel, the inner panel and the door impact bars. A mounting bracket with a new design has been integrated into the door. The mounting bracket secures the door handle and holds it in position. The lock cylinder on the driver’s door is secured by a bolt with washer. A new special tool T10539 is used to remove the door handles without a lock cylinder. The door hinges can be detached by loosening a bolt. The exterior mirror is bolted to the door shoulder line. An integrated sun blind is available for the rear door trim.
Windows

The windows on the Touran can be made of green tinted glass or dark tinted glass from the B-pillar back. The windscreen has a sound-insulation film and can be equipped with windscreen heating. The windscreen heating uses tungsten wires. The front side windows, the rear side windows and the rear window are force-fitted and bonded.

The following aerials are integrated into the rear window:

- AM (amplitude modulation)
- FM (frequency modulation)
- TV

The windscreen heating is used to prevent any fogging on the inside and outside of the glass surface. It can help defrost a layer of ice.
Body assembly

Panoramic sliding sunroof

The Touran can be equipped with a panoramic sliding sunroof measuring 1.34 m² (+ 0.24 m² compared with previous model) from Webasto. It also features ambient lighting. The front sunroof panel has a tilt and slide function. The rear sunroof panel is fixed.

The sunroof panel has a tilt height of 32mm, which is considerably higher than before. The drive motors for the sunroof panel and the sun blind are identical. They are installed in the sunroof frame from below. The sunroof roller blind is made of opaque fabric and is installed from above. It automatically opens when the sunroof panel is opened.

Ambient lighting

The ambient lighting for the panoramic sliding sunroof, which can be dimmed via the infotainment system display, consists of light strips along the sides. They provide indirect lighting of the closed blind and use LED technology.
Assembly overview

- Sunroof panel
- Rear sunroof panel
- Outer seal
- Wind deflector
- Tilting mechanism, right
- Tilting mechanism, left
- Rear section
- Sunroof cable
- Electrical wiring
- Sliding sunroof adjustment control unit J245
- Cross strut
- Cable for sunroof roller blind
- Sunroof roller blind control unit J394
- Sunroof roller blind
Tailgate

The tailgate is attached to the body by means of single-pivot hinges. It is opened with a button in the handle trim. The tailgate lock is equipped with an electric power latching system. The rear window is framed by the roof spoiler with side spoilers (flaps). The side spoilers are bonded directly to the tailgate. The tail light clusters are split between a fixed section and a section on the tailgate.
Electrically operated tailgate

An electrically operated tailgate is available for the Touran 2016.

The system is made up of the following components:

- The remote control
- The tailgate remote release button E233 in the driver’s door trim
- The tailgate handle release button E234
- One spindle drive on each side
- The power latching system in the lock
- The button to close tailgate in luggage compartment E406 (located in the tailgate trim)
- The sensor strips
- The tailgate control unit

The spindle drive ensures very quiet running and smooth movements. Combined with the power latching system in the tailgate lock, these features make the tailgate functions easy to use.

You can open the tailgate via the tailgate handle release button E234 or the remote control key. You close it with the tailgate button in the luggage compartment E406 or the remote control key. The opening height of the tailgate can be programmed.

Further information on the electrically operated tailgate can be found in Self-study Programme no. 449 “The Touareg 2011.”
Easy Open

The “Easy Open” function is an extension of the Keyless Access system functions. It allows you to open the electrically operated tailgate without touching it as the system can detect a specific gesture. This function is achieved by installing a capacitive sensor, which recognise specific gestures in the area behind the vehicle, underneath the rear bumper. You stand behind the vehicle and sweep a leg quickly towards the bumper and back. Your shin will enter and exit the area in which the capacitive sensor can detect movement (tailgate power opening sender). The “Easy Open” function will then open the tailgate if:
- A remote control key for authorisation is located within an area not exceeding 1.5m to the rear of the vehicle.
- The vehicle is stationary.
- The engine and ignition are off.
Towing bracket

The Touran has a towing bracket with a manually operated hinged ball head.

The electric hinged tow coupling attachment button E474 is located in the right-hand luggage compartment trim. When you press it, the ball neck will fold out and will then need to be moved into the towing position manually (by hand/with your foot) and engaged (locking mechanism). Pressing the button again unlocks the ball neck and you then need to move it manually into its rest position (behind the bumper cover).
Body assembly

Dash panel and centre console

The dash panel in the Touran has been given a more driver-oriented layout compared with the previous model. The upper area of the dash panel features a soft surface produced using slush moulding. A storage compartment with a lid is located in this area. The chrome-edged vents have been integrated centrally. A storage compartment with interface for mobile telephone is located in the centre console that rises up towards the front. The mobile telephones placed there are connected to the external aerial.

Rear centre console

The vents, the rear air conditioning operating unit and a drawer have been integrated into the rear centre console. You will also find a 12-V socket and a USB interface there.
There is an additional compartment with a lid on the front passenger side. This is used as a storage or media compartment according to the equipment.

**Media compartment**

The media compartment with the control unit J794 is located above the glove compartment.

**Centre console**

The multifunction centre console is equipped with:
- Jumbo box
- Net in front passenger footwell
- Two cup holders
- Large storage compartment in front of the gear lever including USB interface, AUX-IN and 12-V socket
Front seats

Manually or electrically adjustable front seat

The manually or electrically adjusted front seat has the following adjustments:

1. Longitudinal adjustment: optimum distance from pedal cluster
2. Backrest adjustment: straight spine position
3. Height adjustment: optimum view of the road
4. Seat rake adjustment: optimum straight spine position/circulation in the legs
5. Longitudinal and height adjustment of head restraint: optimum protection in an emergency

Adjustment is either manual or electric.

6. The electrically adjusted front seat also has an electrical four-way lumbar function.

Ergonomic active seat

The ergonomic active seat is available for the driver and front passenger. It has the following adjustments:

1. Longitudinal adjustment
2. Height adjustment
3. Seat rake adjustment
4. Seat depth adjustment: optimum support for the upper thighs
5. Backrest adjustment
6. Electric four-way lumbar support with electrical massage function (lumbar support height and depth electrically adjusted): ideal support for the spine
7. Longitudinal and height adjustment of head restraint
Centre seats (second seat row)

The second seat row is made up of three free-standing, separately folding individual seats.

The individual seats have the following adjustments:
- Longitudinal adjustment (approx. 200mm)
- Backrest tilt (five positions)
- Backrests with luggage compartment floor function
- Adjustable headrests

The folding centre armrest is located in the centre seat. It is standard in the Comfortline equipment level and above.

All seats in the second seat row can be folded into the luggage compartment floor position as standard. This creates a flat cargo area at the same height as the luggage compartment floor in the third seat row.

The outer seats in the second seat row can be heated in the Comfortline and Highline equipment levels.

The Easy Package function for the outer seats in the seven-seater makes it easier to climb in and out of the third seat row. The seat can be folded forwards with the release lever. At the same time, it moves forward and engages in the Easy Package position.

The outer seats are also available with integrated child seats, which have a seat cushion that folds upwards. This reveals a non-slip step for the child’s feet. The child is provided with additional side support by the fold-out side bolsters and side head restraints.
Rear seats (third seat row)

The third seat row is made up of two independently folding individual seats. A flat cargo floor that joins the cargo box and second seat row without any steps or gaps is created when you fold the seats down. You can detach the seat belts from the seats and store them in the D-pillar so that they do not get in the way when you are loading the vehicle.

The seat is released in the middle of the vehicle using the release lever at the top of the backrest and folded forward. A special kinematic mechanism allows the seat cushion to move downwards and provide space for the head restraint so it does not need to be removed. You can therefore expand the cargo area by folding down the seats completely in next to no time. The backrest is not locked into the luggage compartment floor position.

The seats can be unfolded again just as easily. They are unfolded with the pull-loop.
Luggage compartment

Luggage compartment volume

The backrests for the second and third seat rows and the front passenger seat can be folded down individually or all at the same time. They then create an extensive cargo area.

![Second and third seat row not folded down (137 litres)](s549_105)
![Third seat row folded down (644 litres)](s549_103)
![Second and third seat row folded down (1,857 litres)](s549_101)

Luggage compartment floor system

The luggage compartment is equipped with a variable luggage compartment floor. It can be moved to an upper or lower position using one hand.

Luggage compartment management

There is a new rail system for luggage compartment management. It consists of a net hung between two rods that can be pushed to variable positions along side rails and be used as a bag or for storage.

The luggage compartment light can be removed and used as a torch.
Body assembly

Stowage facilities

The interior has been designed to be functional. All available space has been utilised in an ideal way for stowage. The Touran can therefore have up to 47 stowage compartments.

- Storage net on the passenger side of the centre console
- Roof console with front and rear storage compartment
- Storage compartment with lid on the dash panel
- Storage compartment with media interfaces in front of the gear lever
- Open storage compartment at the top on the driver’s side
- Storage compartments in all doors at front for 1.5-litre bottles at rear for 1-litre bottles
- Drawers at the front under the left and right front seats
- Storage compartments in the centre armrest
- Cup holders in the centre console
Storage compartment with two cup holders in the side trim for third seat row

Storage pockets on backs of front seats

Bag hook on right of luggage compartment

Storage compartment between seats in third row

Storage compartment with two cup holders in the side trim for third seat row
Safety features

Occupant protection

The following occupant protection features are available for the Touran 2016:

• Single-stage driver airbag
• Single-stage front passenger airbag with deactivation switch
• Front side airbags
• Rear side airbags in the rear seat backrests
• Curtain airbags for five- and seven-seater
• Knee airbag on driver side
• Three-point seat belts with tensioners on front seats
• Three-point seat belts with tensioners on outer seats of second seat row
• Three-point seat belts on third seat row
• Proactive occupant protection system
• Belt force limiters on front seats and outer second row seats
• Top tether system
• The seats on the second and third seat rows are equipped with ISOFIX child seat anchors.
• Seat belt reminder
• Crash sensors

Seat belt reminder

The Touran has a seat belt reminder system for all seats.

The seat belt reminder informs the driver visually and acoustically via the multifunction display in the dash panel insert whether the passengers in the rear compartment have fastened their seat belts.

Evaluation of the belt buckle information "latch plate inserted"/"latch plate not inserted" for the second and third seat rows.
The curtain airbag differs between the five- and seven-seater models.

Side airbags in the rear seat backrests

The following crash sensors are installed:

- Crash sensor for front airbag
- Crash sensors in the doors for side collision detection (pressure sensors)
- Crash sensors in the C-pillars for side collision detection (acceleration sensors)

Proactive occupant protection system

If the proactive occupant protection system identifies a potential accident situation when full brakes are applied by the activated brake assist system, the seat belts for the driver and front passenger are automatically pretensioned to give the best possible protection from the airbag and belt systems.

In highly critical and unstable driving situations, for example, during severe oversteering or understeering with ESC intervention, the side windows (up to a remaining gap) and the sunroof will also be closed. This allows the curtain and side airbags to provide optimum protection and achieve their full effect.
Safety features

Pedestrian protection

The Touran has an active bonnet for pedestrian protection.

Active bonnet

The active bonnet can reduce head injuries to pedestrians in frontal collisions with the bonnet. The bonnet is raised by the hinges, which increases the distance between the bonnet and the components in the engine compartment (e.g. cylinder block) and thus creates an additional “crumple zone”.

Crash sensors for pedestrian protection

The Touran has the following additional crash sensors to detect a collision with a pedestrian:
- Driver side crash sensor for pedestrian protection G570
- Front passenger side crash sensor for pedestrian protection G571
- Centre crash sensor for pedestrian protection G693

The sensors are mounted on the back of the bumper cover. They are acceleration sensors. They monitor 80% of the vehicle width.

The pressure hose system can detect a collision across the whole width of the cross member. It consists of a silicone hose that is closed off by two pressure sensors. When pressure is applied to the hose, the sensors detect a change in the pressure hose system and send a signal to the airbag control unit.

Triggers for pedestrian protection

The triggers for pedestrian protection are pyrotechnical components consisting of an ignition unit and a cylinder containing a piston.

The piston has a stroke of 44mm.
Function

Normal position of active bonnet hinge

If the sensors detect a collision with a pedestrian within a speed range of approximately 25 to 55 km/h, the airbag control unit J234 activates the two triggers for pedestrian protection G598 and G599 on the left-hand and right-hand side of the bonnet.

The gas pressure produced upon ignition of the pyrotechnical propellants moves the pistons inside the cylinders. The pistons are attached eccentrically to the hook. The longitudinal movement of the pistons causes the hooks to rotate. This releases the hooks against the spring pressure and the bonnet can be raised by the active bonnet hinges. The kinematics of the active bonnet hinges and a longer striker at the front of the bonnet allow the bonnet to be raised by approximately 40–60 mm.

The hinge is held in the raised position by a detent lever.

Active bonnet hinge triggered

Rear side of active bonnet hinge
Test your knowledge

Which answers are correct?

One or several of the given answers may be correct.

1. **Which statement about the B-pillar reinforcement on the Touran 2016 is correct?**
   - a) The lower area of the B-pillar reinforcement is welded using wobble seams.
   - b) MIG brazing is used in the lower area of the B-pillar reinforcement.
   - c) Resistance spot welding is used in the lower area of the B-pillar reinforcement.

2. **Which statement about the options for the roof skin on the Touran 2016 is correct?**
   - a) There is a closed variant without roof rails, a closed variant with roof rails and a variant with a cut-out for the panoramic sliding roof with roof rails.
   - b) All roof skins are supplied with mounting holes as the roof rails are standard equipment.
   - c) There is a closed variant without roof rails, a closed variant with roof rails, a variant with a cut-out for the panoramic sliding roof with roof rails and a variant with a cut-out for the panoramic sliding roof without roof rails.

3. **What is the special feature of the rear door trims?**
   - a) The rear door trims are installed with a double crash-proof clip.
   - b) A folding armrest has been integrated.
   - c) The rear door trim can be ordered with an integrated sun blind.

4. **How are the side spoilers secured to the tailgate?**
   - a) The side spoilers are bonded to the tailgate.
   - b) The side spoilers are clipped to the rear window.
   - c) The side spoilers are bolted to the tailgate.
5. **Within which speed range is the pedestrian protection system triggered?**

- a) 10 to 50 km/h
- b) 25 to 55 km/h
- c) 30 to 60 km/h

6. **Which seats have a seat belt reminder?**

- a) The seats on the second seat row
- b) The seats on the third seat row
- c) All seats

7. **Which sensors belong to the pedestrian protection system?**

- a) Pressure sensors and acceleration sensors
- b) Acceleration sensor and CISS sensor
- c) Only the acceleration sensors

Answers:
1. c); 2. a); 3. c); 4. a); 5. b); 6. c); 7. a)