

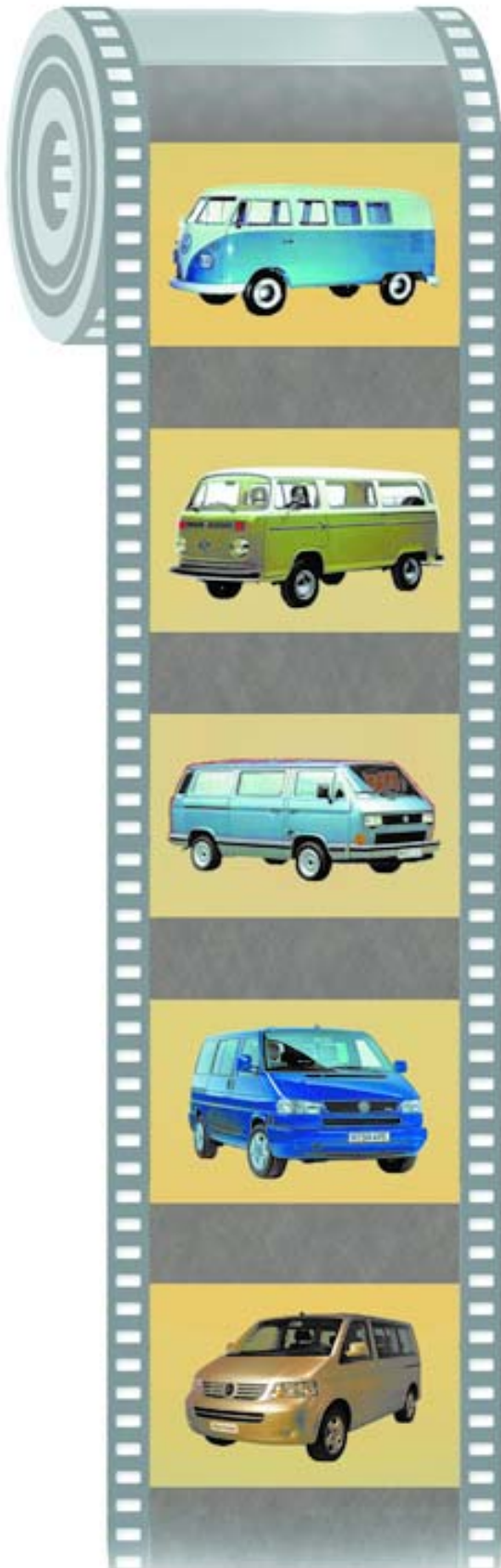
Service.



Self-study programme 310

The Transporter 2004





- 1950 In March 1950, series production of the first VW Transporter starts at a rate of 10 vehicles per day. For engine and axles, standard parts from the VW Beetle are used. The vehicle is characterised by a self-supporting body on a ladder frame chassis and it is driven by a rear engine with rear wheel drive.

- 1967 The T2 continues the success of the Transporter series further. Single piece windscreen and larger windows offer more light and greater driving safety. Dimensions and load capacity increase. For the first time, a side sliding door is installed.

- 1979 With a new body design, the T3 (T25) offers more space, improved all-round view and greater active and passive safety. Load volume and payload capacity increase. A new front axle provides improved road handling and safety.

- 1990 With the T4, a completely new vehicle concept with front wheel drive and front transverse mounted water-cooled engine is introduced.

- 2003 The new Transporter is launched on the market. The great variety ranges from drop-side and panel van variants up to the Multivan. It is again a trendsetter in its class.

310_002

NEW



Important Note



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

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

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Brief overview



The Transporter 2004

It started with an idea in 1947 by the Dutch importer, Ben Pons, to construct a small Transporter. This was realised with the first "Bulli" in 1950 and continually improved upon. The Transporter 2004 is now available in a wide range of variants.

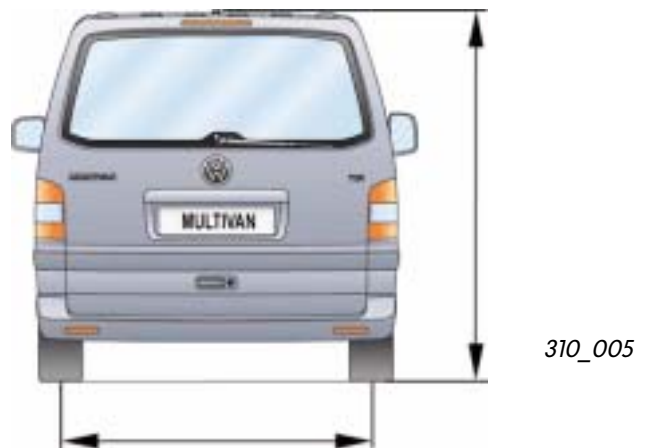
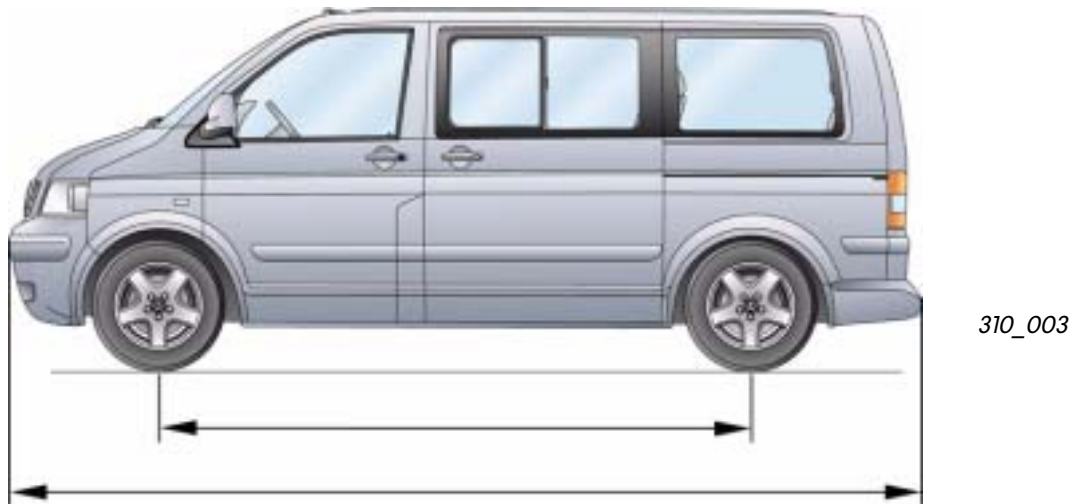


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Highlights

- Extensive product range
- Two sliding door concept (sliding doors on each side)
- Low profile roof rails
- Variable interior concept
- Improved devices for driving, comfort and safety
- Decentralised onboard electrical system
- 3 zone Climatronic
- Reduced fuel consumption
- Extensive range of power units with petrol and diesel engines
- 6-speed manual or 6-speed automatic gearboxes
- Joystick gear selection
- Improved crash safety

Technical data (Multivan)



For data about other variants, please refer to the latest sales literature.

Measurements and weights charts

Unladen weight	2109 to 2474 kg depending on equipment level
Gross weight	2850 to 3000 kg depending on equipment level
Wheelbase	3000 mm
Turning circle diameter	11.9 m
Load rating	451 to 801 kg depending on equipment level
Maximum towing capacity	2500 kg
Maximum roof load capacity	100 kg

Body




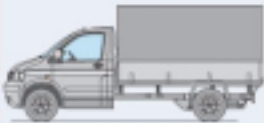

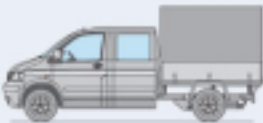

Transporter 2004 model range



		Panel van	Kombi	Shuttle	Multivan
Wheelbase	3000 mm				
	3400 mm				

The Transporter 2004 is produced in a wide spectrum of designs:

- As a people carrier, the vehicle is available as the Kombi, Shuttle, Multivan or RV.
- In the other versions, it serves mainly as a means of goods transportation.
- Within the product range, models are available as short and long wheelbase versions.

Recreation vehicle	Drop-side with cab	Chassis with cab	Drop-side with double cab	Chassis with double cab
				
				



310_007

- The vehicles vary in their payload capacity due to different areas of application.
- At a later date, a four-wheel drive version (4motion) will also be on offer.



The further contents of this publication are focused on the description of the Multivan.

Body

Basic body structure

A sturdy basic body structure is a prerequisite for vehicle safety and comfort.

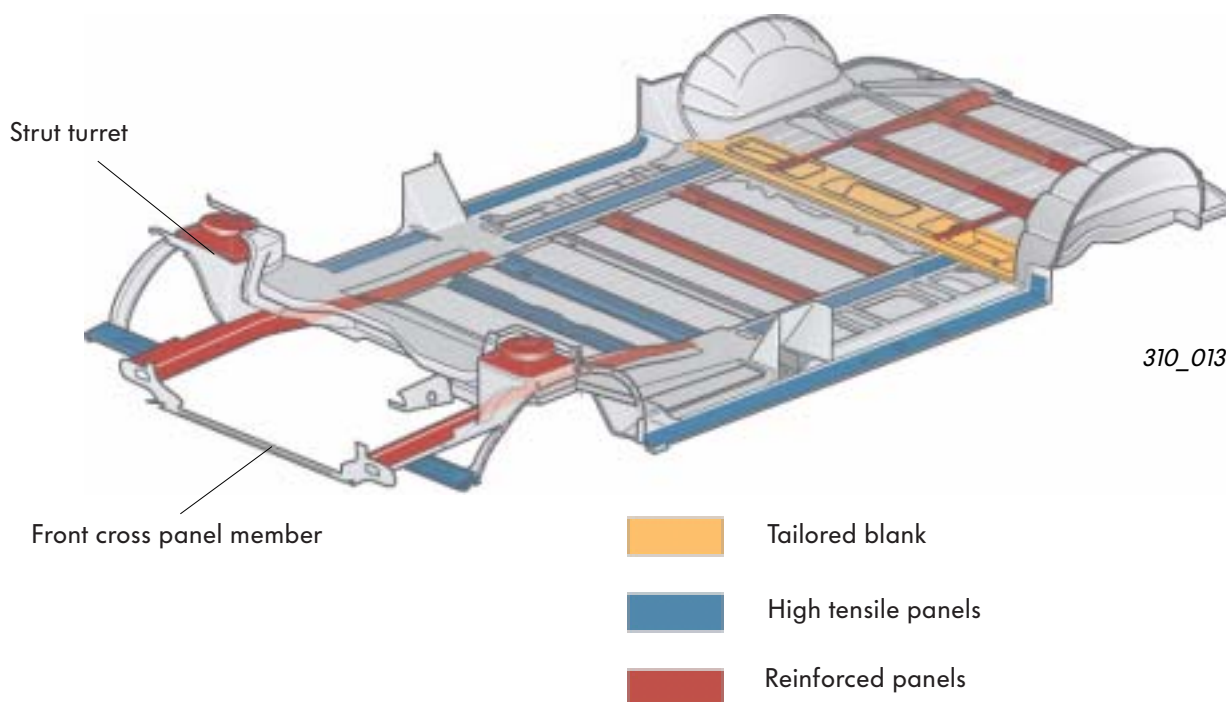
A body structure with a high level of rigidity and high level of crash safety was attained by the use of high tensile and reinforced panels, tailored blanks, laser welding and one piece side panels.

The high rigidity of the body is also a prerequisite for:

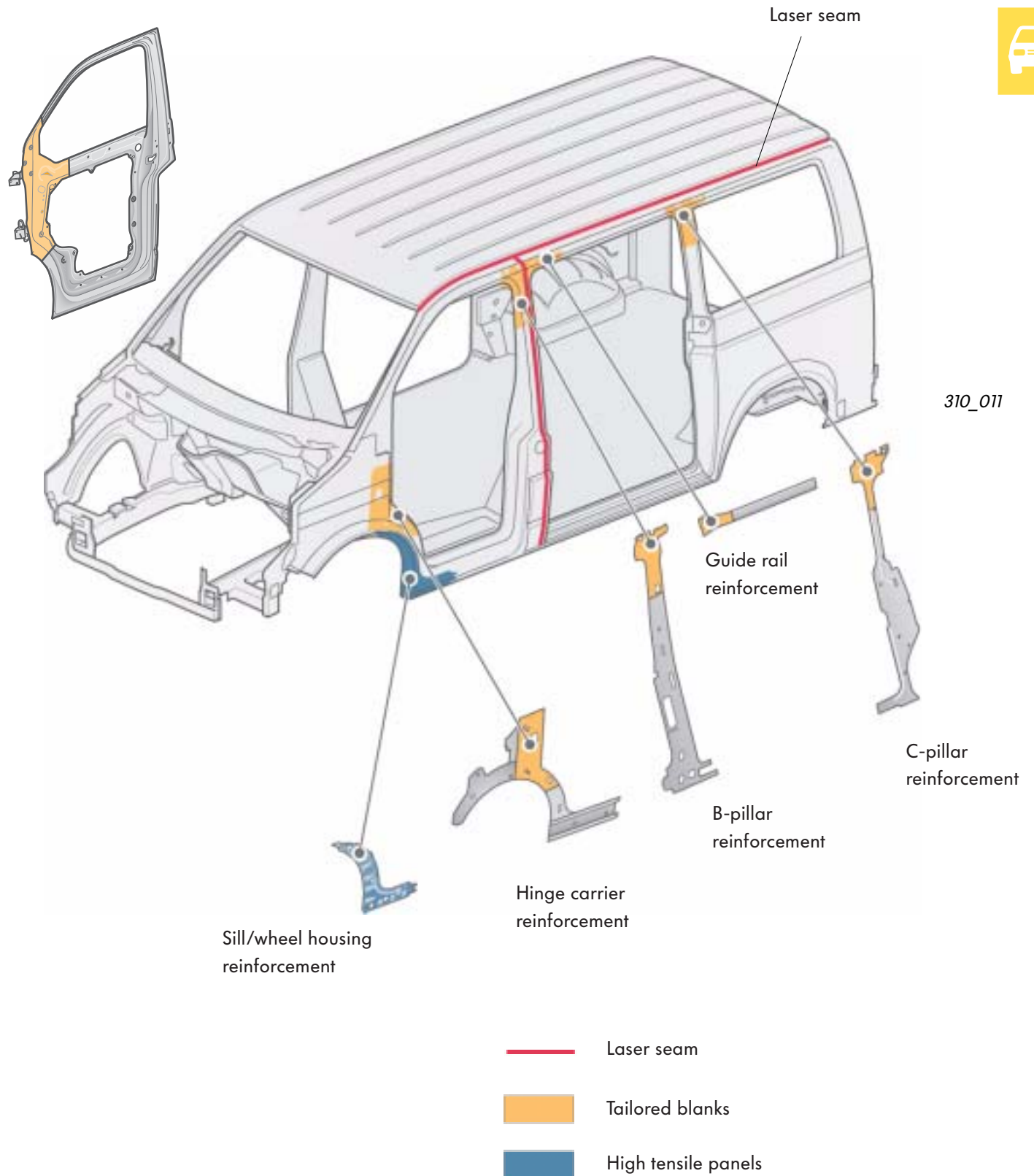
- High level of comfort in interior
- Tight shutlines for doors, bonnet and tailgate
- Perfect functioning of doors, bonnet and tailgate
- High durability
- High level of driving comfort

The extensive use of galvanised panels makes it possible to offer a guarantee against rust perforation for 12 years.

Floor system



Body



Body

Underbody covering

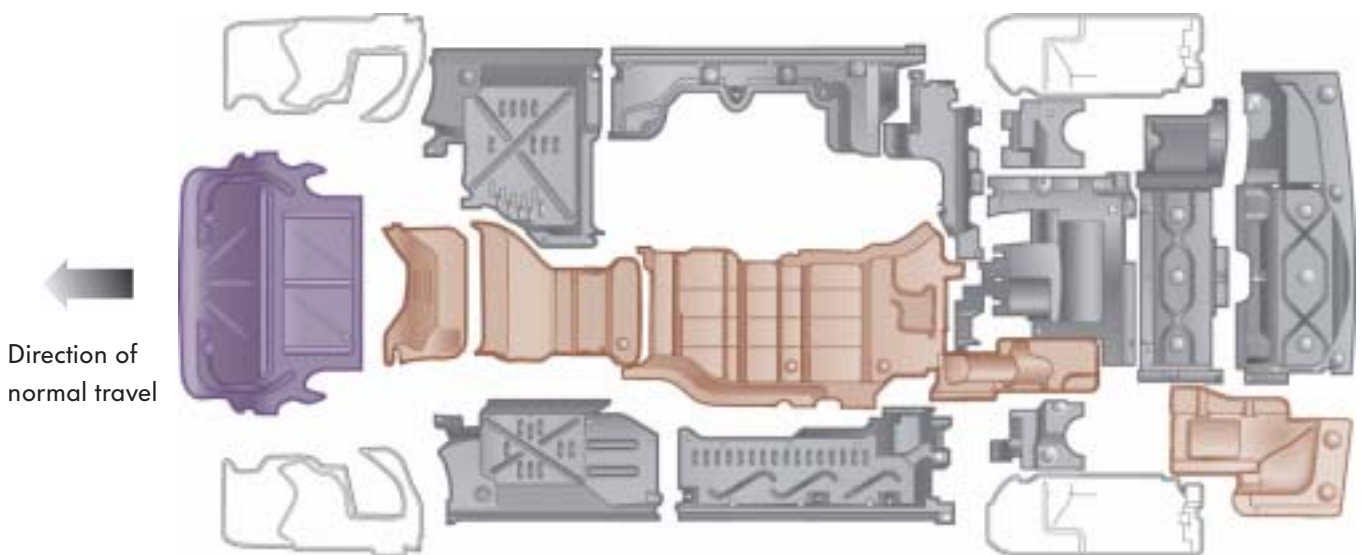
The underbody covering of the Multivan is made up of the following parts:

- Underbody trim
- Heat shield
- Insulation tray

They meet high demands in terms of weight, cdvalue, recycling, heat and noise insulation.

The quantity of PVC (polyvinylchloride) on the underbody was reduced in favour of an underbody trim made from polypropylene (with long fibreglass elements).

Some of the heat shields of the exhaust system also act as noise insulation thanks to their sandwich construction.



310_014



Underbody trim



Insulation tray

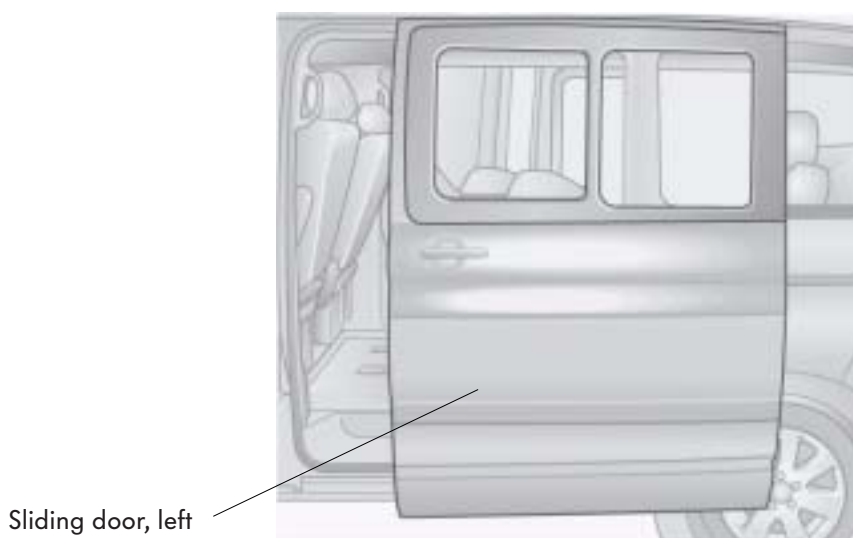


Heat shield

Sliding door

The Multivan has a sliding door on the front passenger's side. A sliding door is also available on the driver's side as an optional extra.

The double sided version is also referred to as a two sliding door concept. On this version there is no folding table on the left sidewall.



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The sliding door is a completely new development and has the following features:

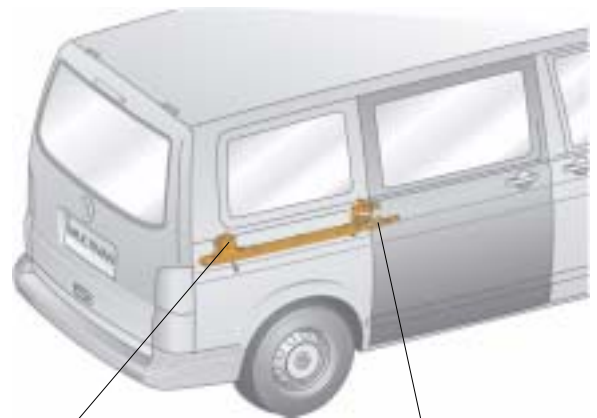
- The sliding door is operated manually. It can also be equipped with an electric power latching system.
- As an optional extra, the vehicle can be fitted with an electric sliding door with integrated electric power latching system.
- Operation of the electric sliding door is possible from the driver's seat via the switch in the instrument panel, from inside and out via the door handle or via the radio remote control.

Body

Electric sliding door

The Transporter can be equipped as an option with an electric sliding door.

The door is opened and closed by a cable system. The system consists of two cables, pulleys and a reel which has an electric motor flanged to it. The door is connected to the cable system by means of a hinge joint.

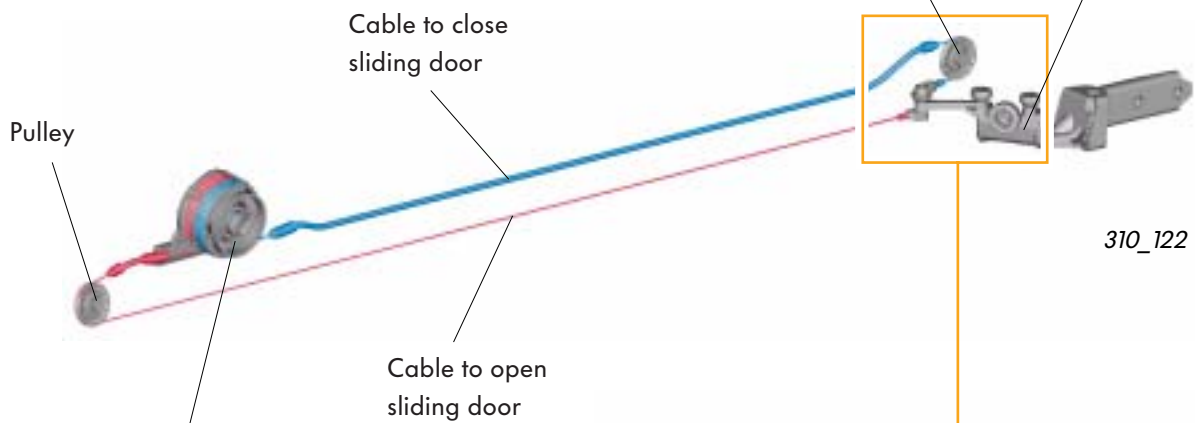


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Reel on sliding door motor

Hinge joint

Design of cable system



310_122

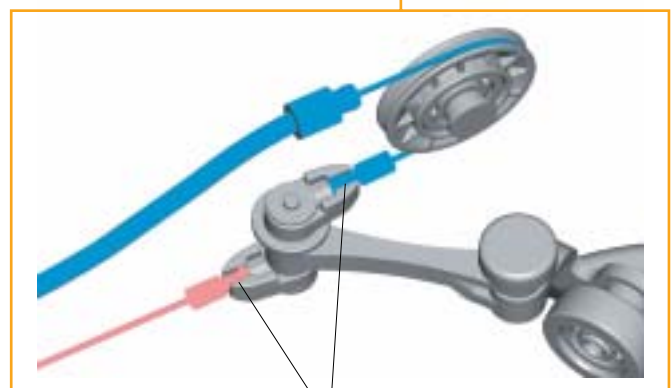
Pulley

Cable to close sliding door

Cable to open sliding door

Reel on sliding door motor

Pulley



Cable attachment points

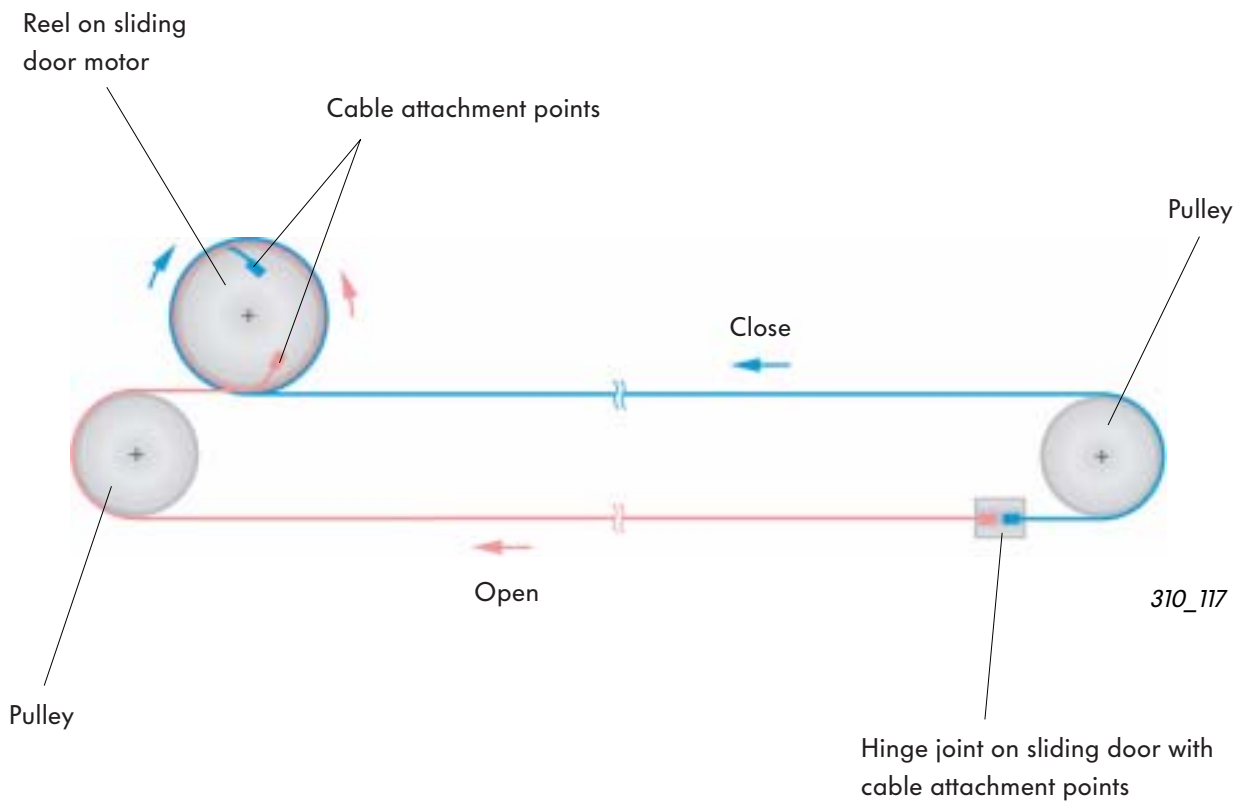
310_123

Function

As the doors open and close under cable tension, two cables are necessary. One cable is responsible for pulling the door open and the other is responsible for pulling the door closed.

One end of the cable is attached to the motor pulley. The cable is reeled around the pulley here. The other end of the cable is attached to the hinge joint.

By actuation of the sliding door motor, the door is pulled open or closed via the relevant cable. The motor direction of rotation is determined by the sliding door control unit.

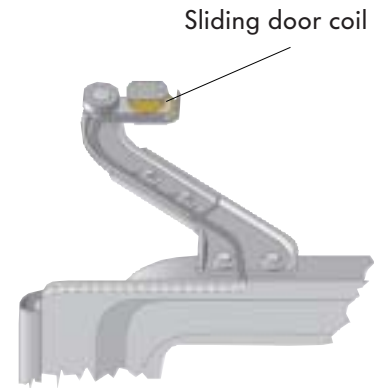


If the electric sliding door operation fails, the door can still be opened and closed using manual force.

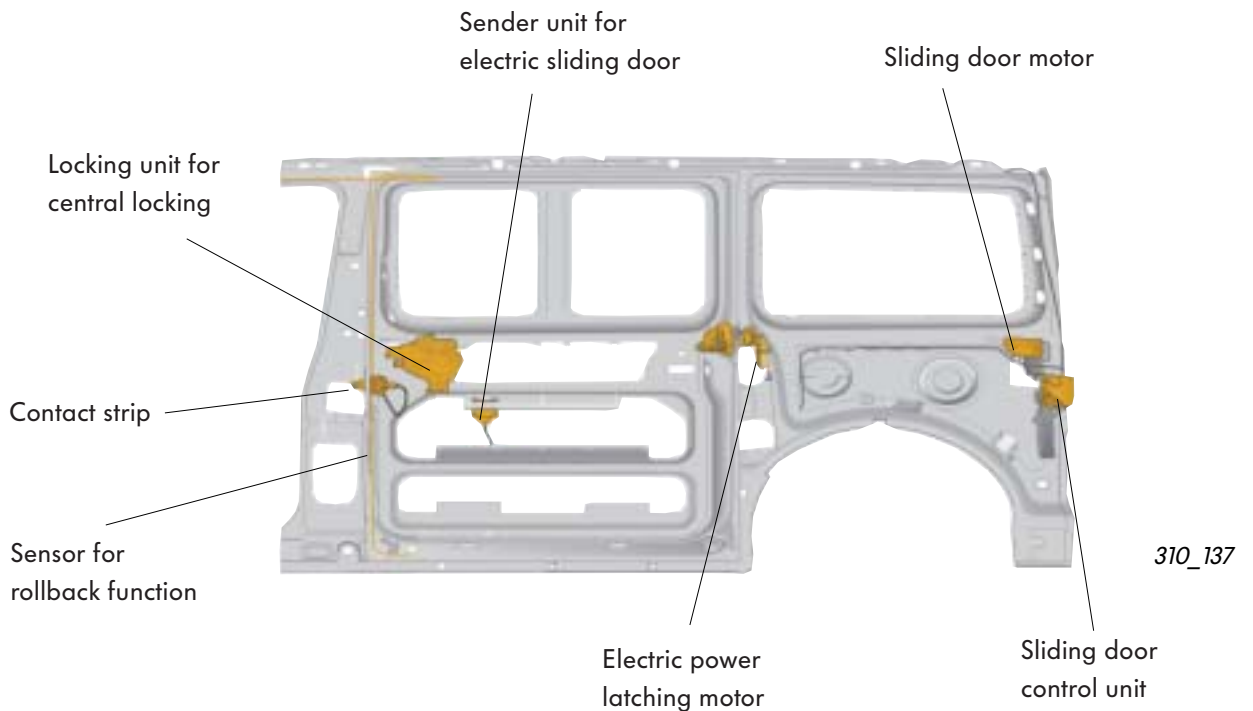
Body

Actuation of electric sliding door

Signals are transferred between the sliding door components and the sliding door control unit via a sliding door coil and sliding door reader coil on the upper sliding door guide. Electric operation is via the operating buttons on the interior, the door handles or radio remote control.



Overview of components



Sliding door rollback function

Two systems of protection are used:

- The passive system reacts to any drop in the speed of the sliding door motor. The result is that the door will stop moving or rollback to the open position.
- Response of the active system in the door seal results in the door being completely opened.



You can find more details about the electric sliding door in self-study programme 311 "The Transporter 2004, Electrical system".

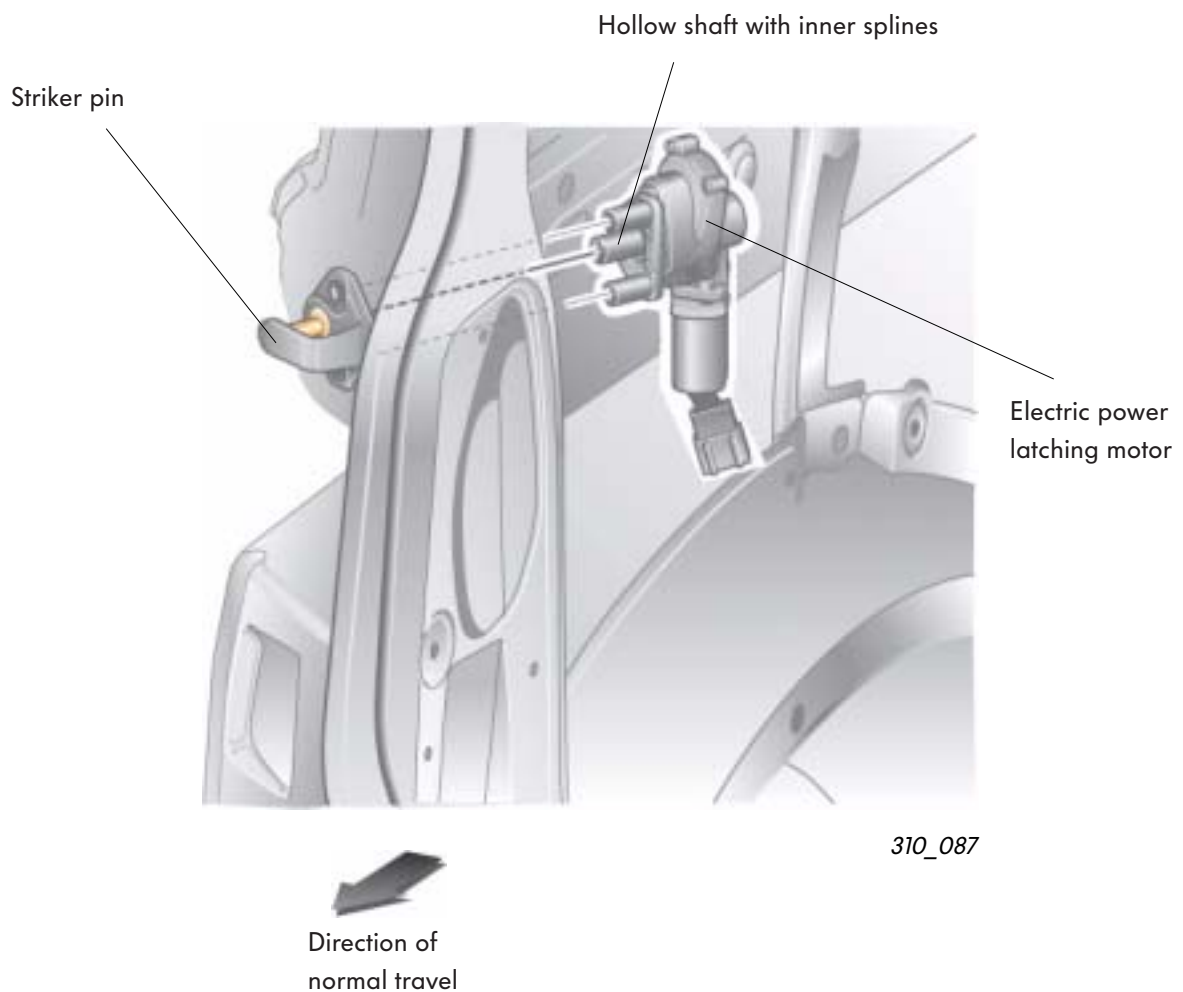
Sliding door electric power latching system

To ease opening and closing of the sliding doors, an electric power latching system can be selected as an optional extra.

Body

The electric power latching system is installed in the C-pillar and consists of a power latching motor and a striker pin.

The power latching motor is connected directly to the eccentric bolt of the striker pin via a hollow shaft with inner splines.



Body

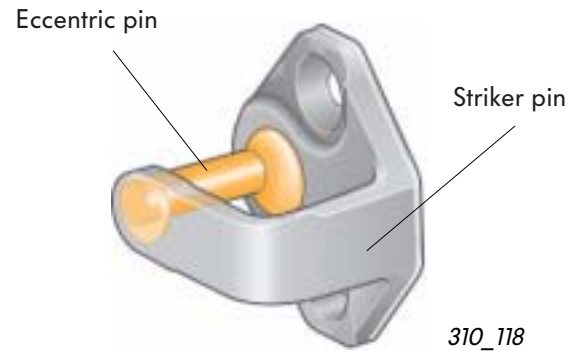
Function

When the hollow shaft turns on the power latching motor, this movement is transferred to the eccentric bolt.



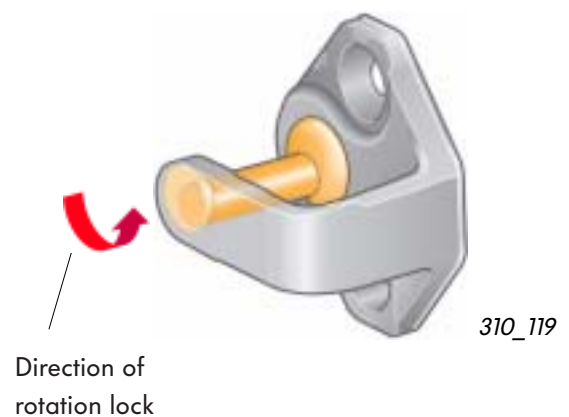
Rest position

When the door is unlocked or opened, the eccentric pin is in the rest position.



Locking

When the sliding door is placed in the prelock position, the power latching motor is actuated after locking. The hollow shaft of the power latching motor turns the eccentric pin. The rotation of the pin pulls the door into the end position where it is held.



The function of the electric power latching system in the sliding door is described in detail in the multimedia program entitled "The Transporter 2004".

Tailgate

The tailgate is installed as standard in Multivan and light commercial vehicles with enclosed body.

As an optional extra, the tailgate can also be installed with an electric power latching system.



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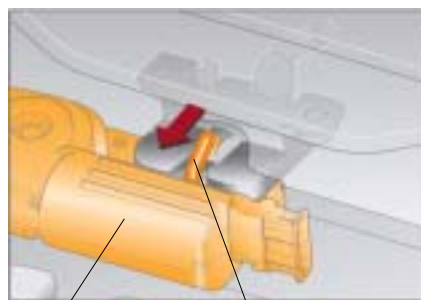


Tailgate electric power latching system

The electric power latching system eases closing of the tailgate and contributes towards comfort.

Function

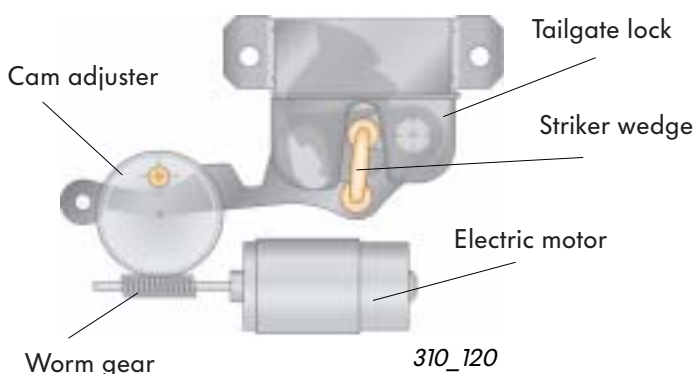
The drive unit consists of an electric motor, mechanical drive system and a striker wedge. When the tailgate lock engages in the prelock position, the electric motor is actuated and the tailgate is pulled into the fully locked position.



310_094

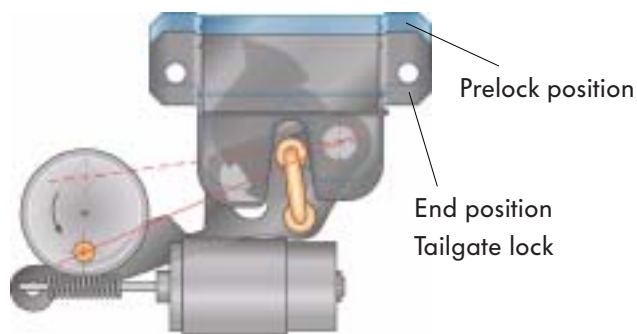
Drive unit Striker wedge

Striker wedge in "prelock position"



310_120

Striker wedge in "end position"



310_121



The function of the electric power latching system in the tailgate is described in detail in the multimedia program entitled "The Transporter 2004".

To open the tailgate in an emergency, please refer to the operating instructions.

Body

Wing doors

Commercial vehicles can be equipped with wing doors as an optional extra.

The system is designed so that the left door has to be opened prior to the right door. The exterior handle of the left door is integrated in the light mounting.

The doors can be opened up to an angle of 90°. As an option, an opening angle of 250° is possible.

Exterior handle



Magnetic door holder

Opening lever on wing doors

The right door has an opening lever, which is integrated in the body contour.



Opening lever

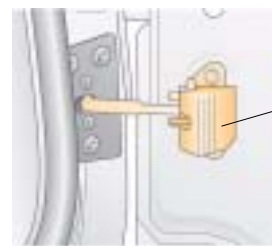
310_077

Wing door holder

The door holder allows the doors to be opened and held in the following positions:

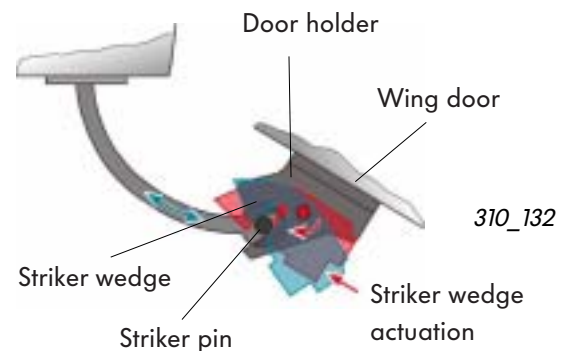
90° - Via the holder/unlocking mechanism on the door (beneath cover cap)

250° - By pressing cover cap, striker wedge is moved and striker pin released. The wing door can now be fully opened to the magnetic door holder on the body.



Door holder with cover cap

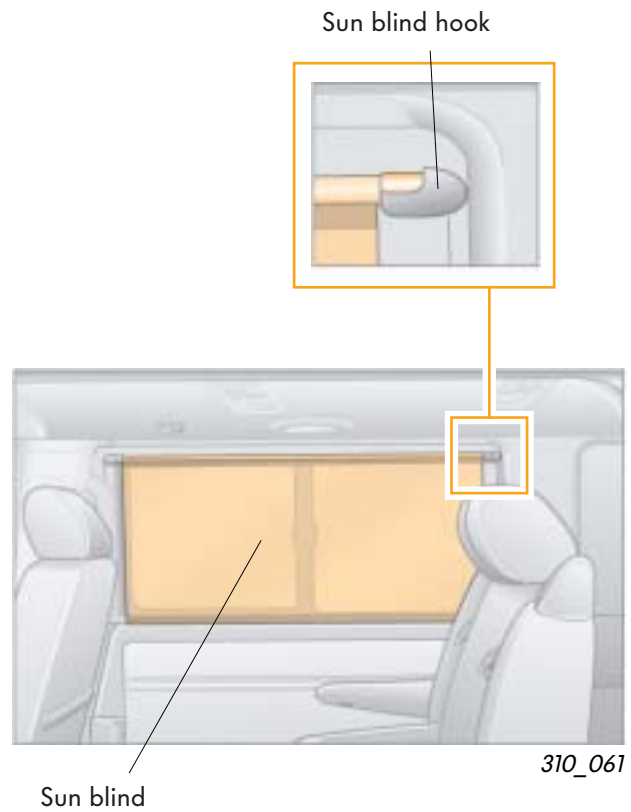
310_078



Sun blind

On the sliding door windows and also rear windows, sun blinds can be pulled up from the side panel trim and hooked in place at the top of the window.

The sun blinds considerably reduce sunlight from entering the interior and thereby reduce the build up of heat.

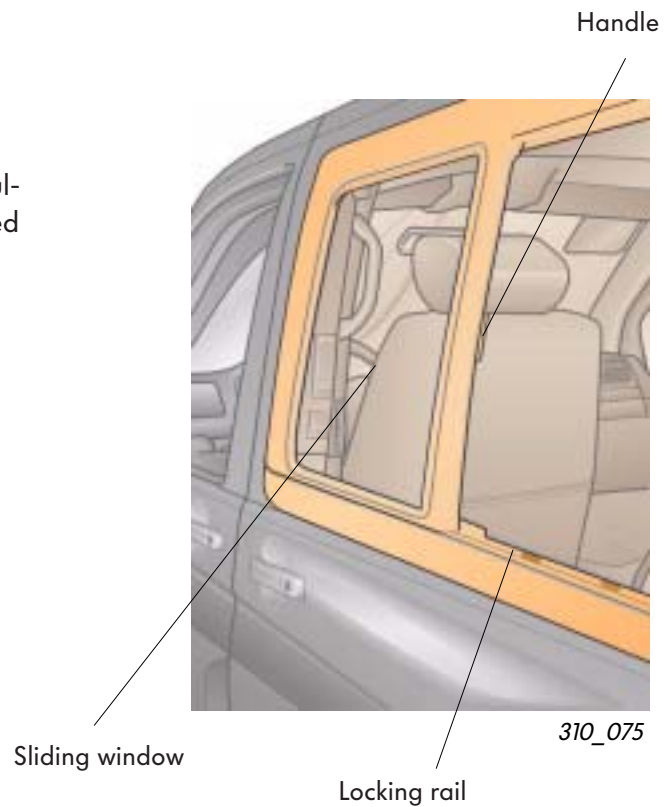


Sliding window

In the sliding door, there is a sliding window, which closes flush with the outer body.

To open, the handle of the sliding window is pulled inwards and the window can then be pushed back.

The sliding window can be placed in several positions thanks to a multi-holed locking rail.



Body

C-profile rail in roof of Multivan

The C-profile rails can be found on the left and right along the roof and are so-called because of the shape of the profile. They allow accessories to be attached. The roof carrier required for this is inserted in the C-profile of the rail at the rear end and pushed into the desired position. The recesses are protected by cover caps.

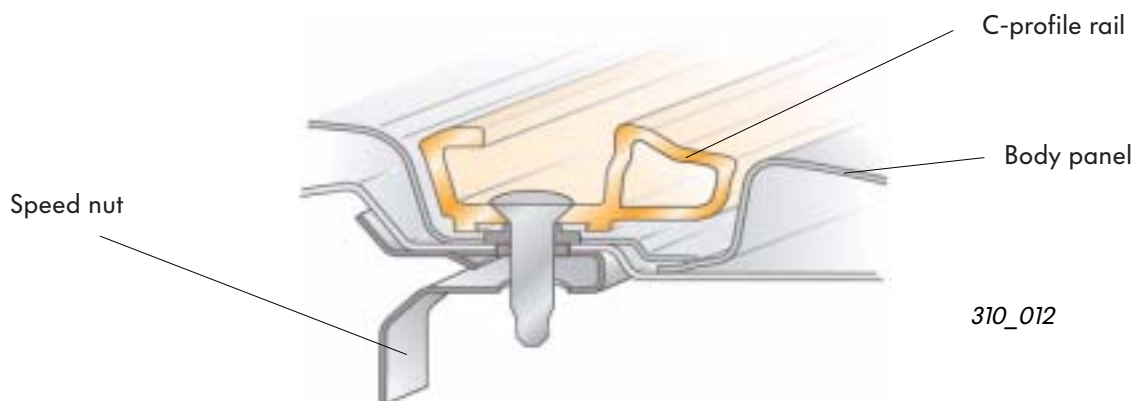
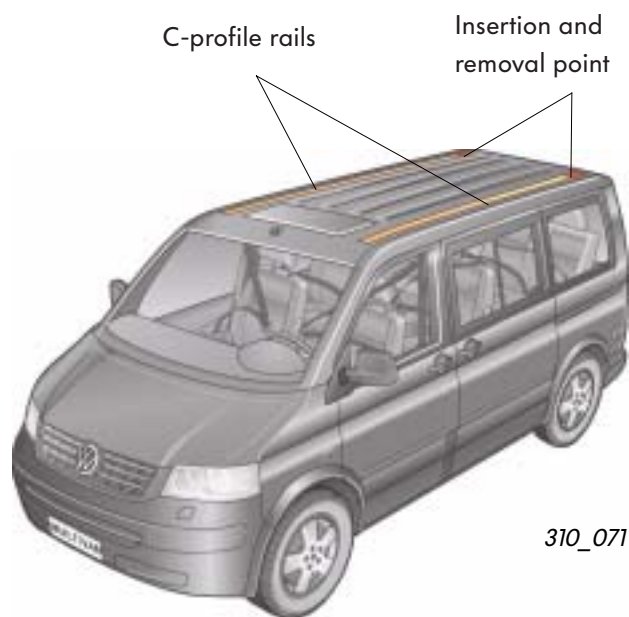


Commercially available roof attachments, such as

- roof box,
- ski holder,
- load carrier,
- bike rack or similar

can be attached to the rails.

The roof can withstand a maximum of 100 kg.



The commercial vehicle variants feature 4 mounting plates in the roof instead of the C-profile rails. These mounting plates are closed with sealing bolts. Retrofitting of C-profile rails is possible as the bodywork is made ready for this purpose.

Seats in the Multivan

The interior of the Multivan is distinguished by its variable seating arrangement and sturdy workmanship.

Driver and front passenger seat

The driver and front passenger seats are height adjustable single seats with armrests. Integrated in the backrest are the side airbag and lumbar support.

In addition to the pockets on the rear of the backrest, the seats also feature side storage compartments.

A special feature of the driver's seat is the handbrake attached to the seat's base frame.

Under the seat frames, a second battery (driver seat) and a CD player (front passenger seat) can be installed.



Commercial vehicles can be equipped with a double bench seat as an optional extra on the front passenger side.



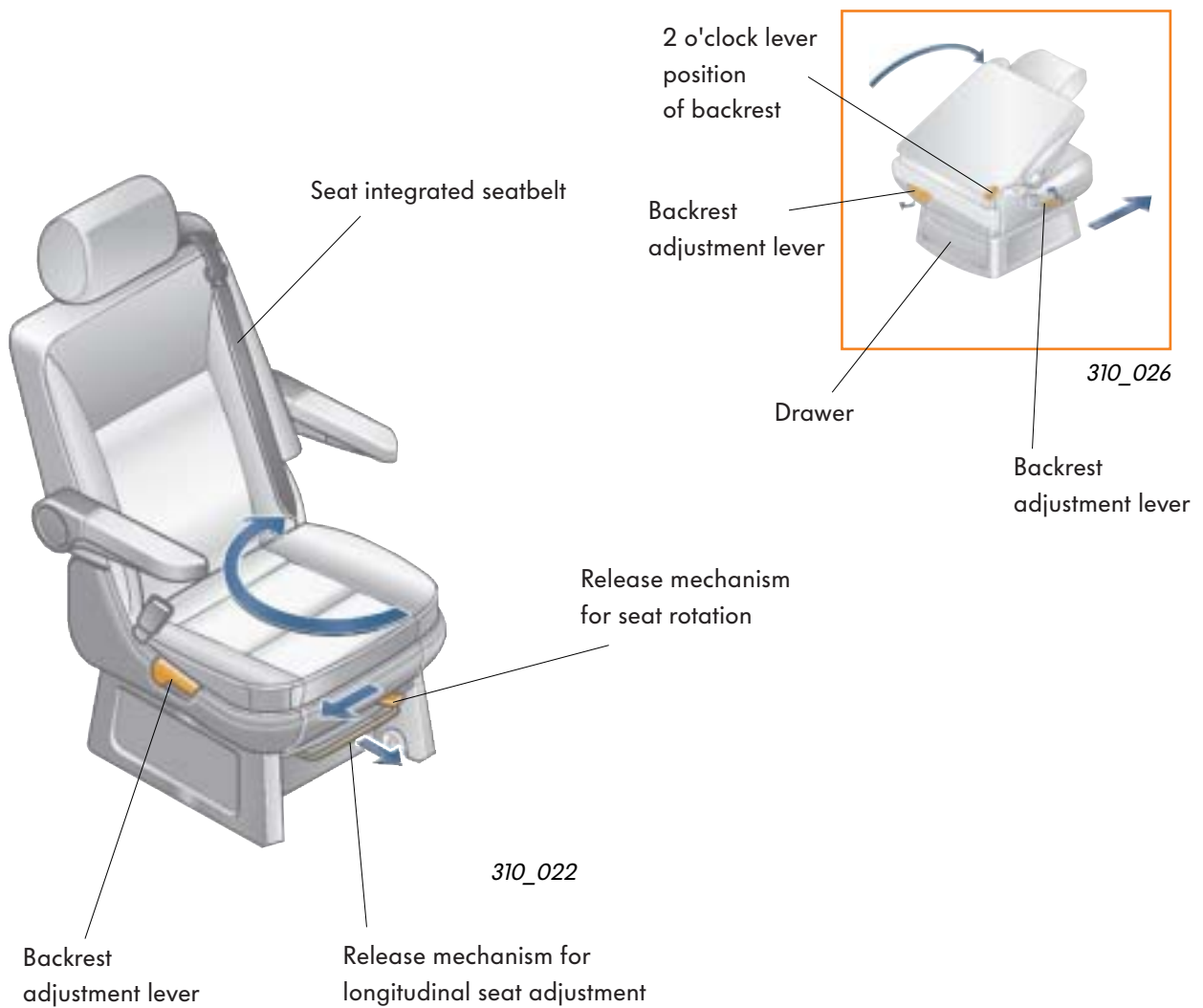
Body

Single seats in passenger compartment

Single seats are installed in the passenger compartment that can be rotated by up to 180°. They are available either for the 1st or 2nd seat row in the passenger compartment.

The seats feature three point seatbelts, armrests, head restraints and Isofix mountings for child seats.

The backrests of the single seats can be folded down completely and placed in the table position.

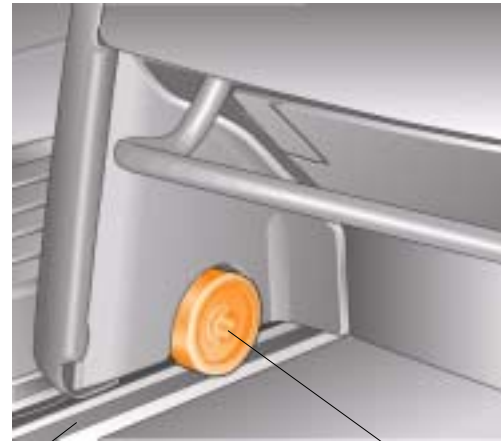


For more details about the operating lever function, please refer to the operating instructions.

Seat guide in floor

A rail system in the floor of the vehicle allows the seat to be adjusted in the longitudinal plane. It consists of guide rail and cover strip.

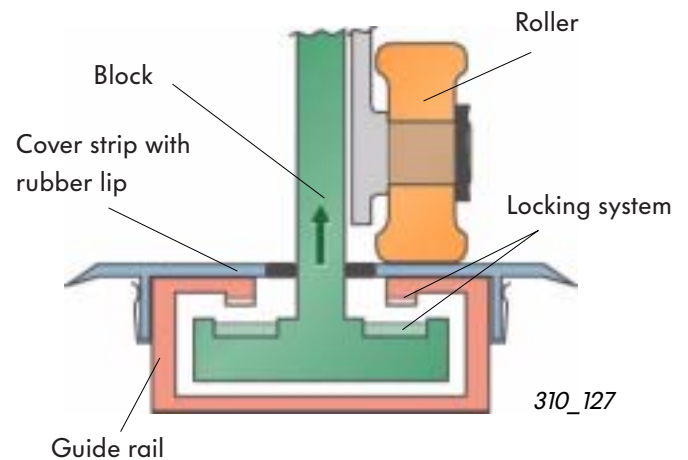
The seat is equipped with four rollers. It is moved on 2 rails. 2 rollers per rail roll along the cover strip.



310_124



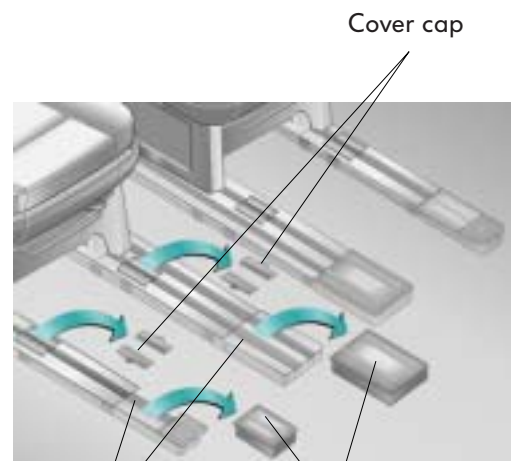
The roller runs along the cover strip. The guide movement is assured by a block, which runs in the guide rail. Locking elements in the block and guide rail allow the seat to be locked in different positions.



310_127

The seats can be inserted or removed at the front of the rail system.

The blocks of the seats differ in length at the front and rear and thereby prevent incorrect installation of the seats.



310_024

Guide rail Cover cap

Body

3-seater fully reclining bench seat

In addition to the single seats in the passenger compartment, there is also a 3-seater fully reclining bench seat. This is also equipped with three-point seatbelts, head restraints and Isofix child seat mountings in the outer seats.

Three drawers can be found under the rear bench seat, which are accessible both from the front and the rear. The luggage compartment cover is of the removable retractable type and is integrated in the bench seat.

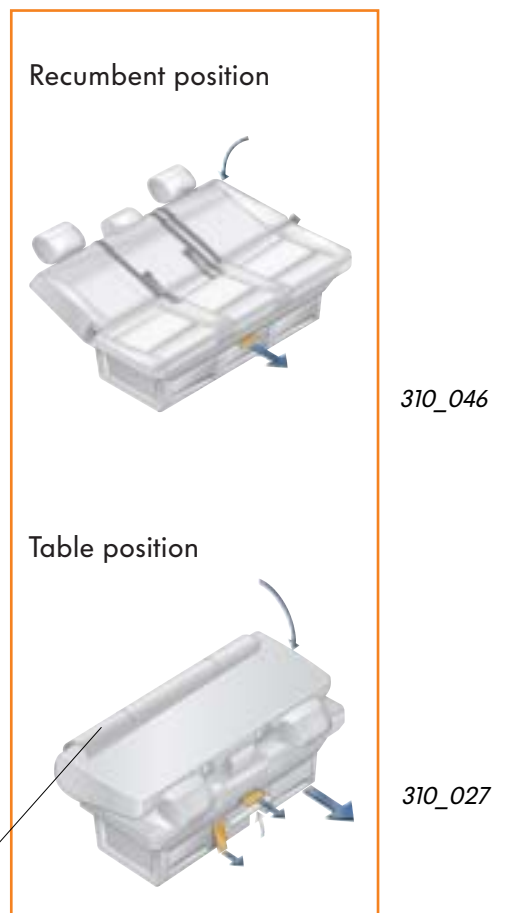
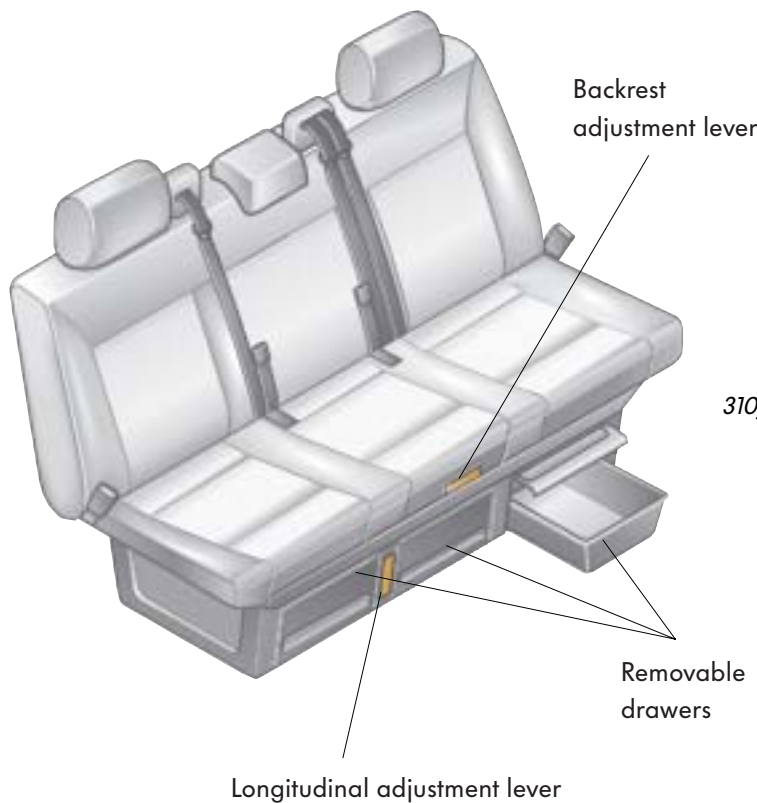
For reasons of safety, longitudinal movement of the 3-seater fully reclining bench seat is only possible in the passenger compartment when the backrest is placed in the forward table position.

Adjustment positions of the 3-seater fully reclining bench seat are as follows

- Seating position
- Table position (backrest folded completely forwards)
- Recumbent position (180°).

In the recumbent position, the seat part is raised, which forms a level surface.

Seating position



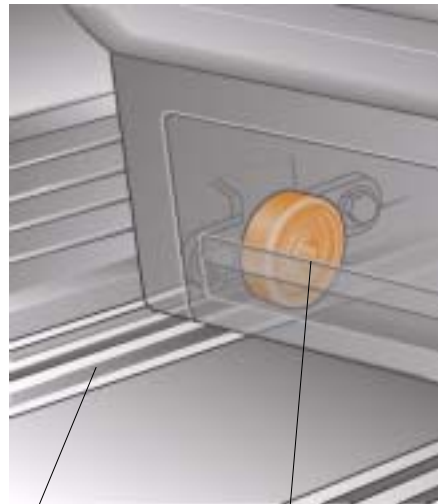
Privacy roller blind

Bench seat guide in floor

The 3-seater fully reclining bench seat is also incorporated in the rail system.

The bench seat is equipped with 8 rollers. It is moved on 4 rails. 2 rollers run along the cover strip on each rail.

Adjustment of the seat by means of rollers and blocks is the same as that on single seats.



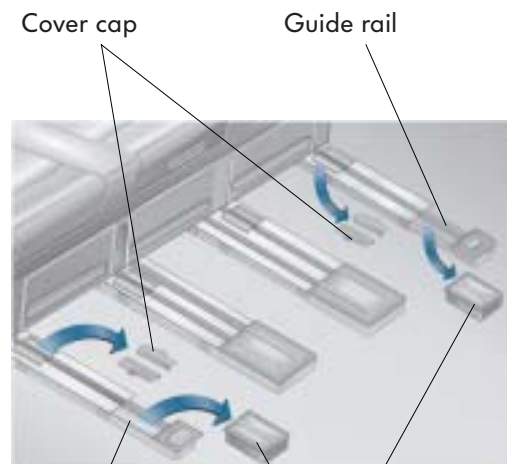
Cover strip

Roller

310_126

Removal and installation of the bench seat is done in the same way as with single seats at the front end of the rail system. To do this, only the rail covers must be removed.

Incorrect installation is prevented here too by differing seat block sizes.



Cover cap

Guide rail

Guide rail

Cover cap

310_125



Body

Commercial vehicle seats

The commercial vehicle range also features a wide variety of seats.



Driver/front passenger seat (fixed)



Driver/front passenger seat (height adjustable)



Front passenger double bench seat



For information about the various seat configurations in commercial vehicles, please refer to the multimedia program entitled "The Transporter 2004".

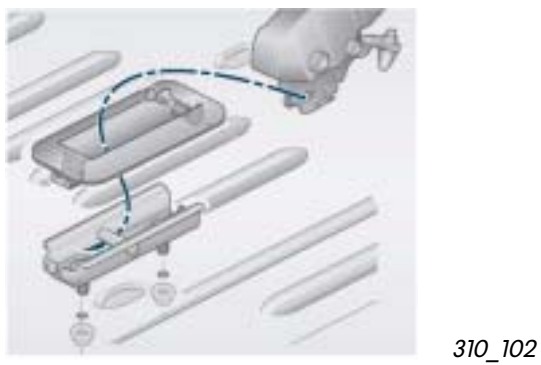
2-seater bench seat



Easy entry seat

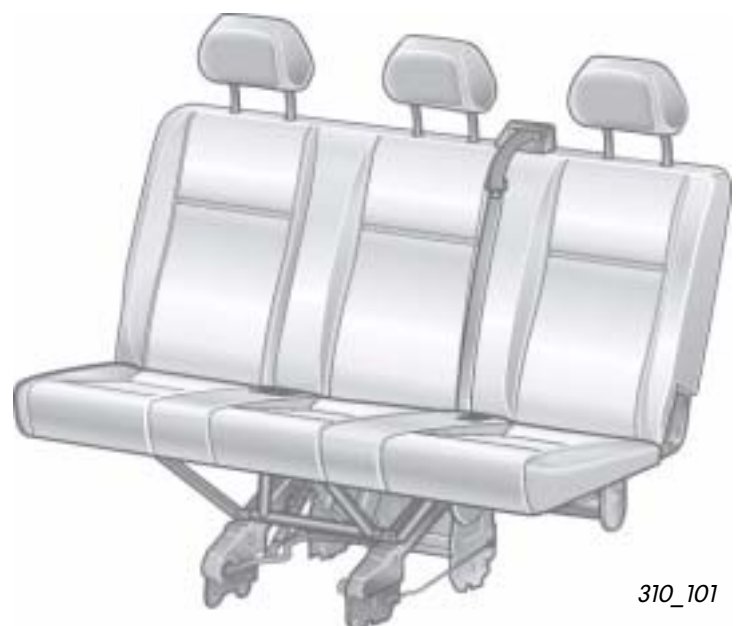


Seat mounting in passenger compartment



On commercial vehicles, mounting of the seats in the passenger compartment is via quick release catches in the body floor. Each type of seat is equipped with 4 mountings.

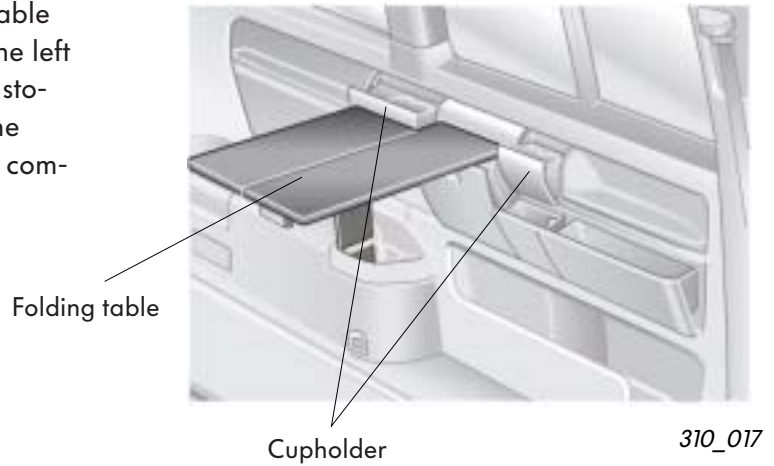
3-seater bench seat



Body

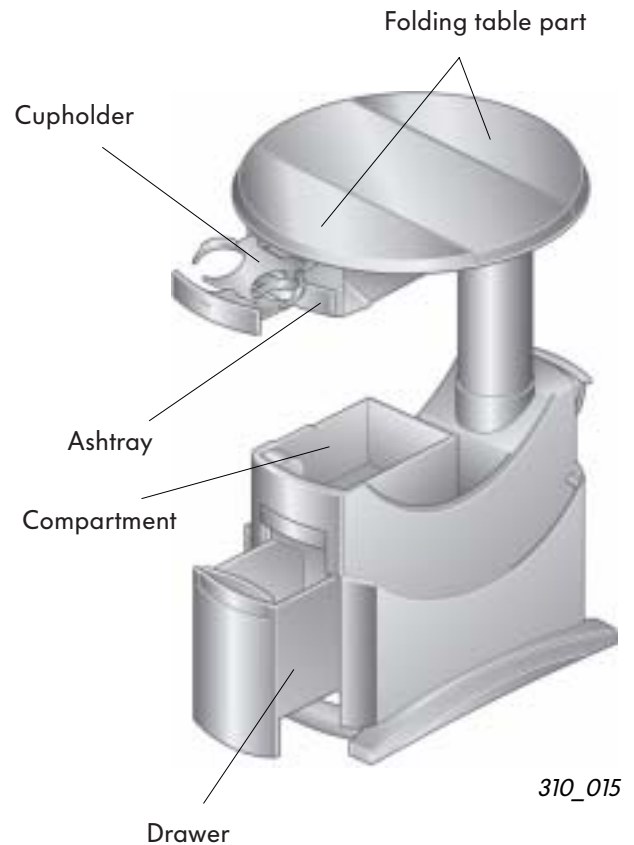
Table design

In the passenger compartment, a folding table can be pulled out and folded down from the left side panel trim. Two cupholders and other storage compartments are located around the table and contribute considerably towards comfort.



A folding table cannot be installed in the side of the Multivan with the two sliding door design due to the second sliding door. Therefore, a separate folding centre table is mounted in the floor rail system. The table can be moved longitudinally in these rails.

A gas filled strut lifts the table up out of the folded down position at the press of a button. Press another button and two double cupholders and an ashtray will open. A compartment, a drawer and a bottle storage facility are integrated in the table base.



For details of the table functions, please also refer to the multimedia program entitled "The Transporter 2004".

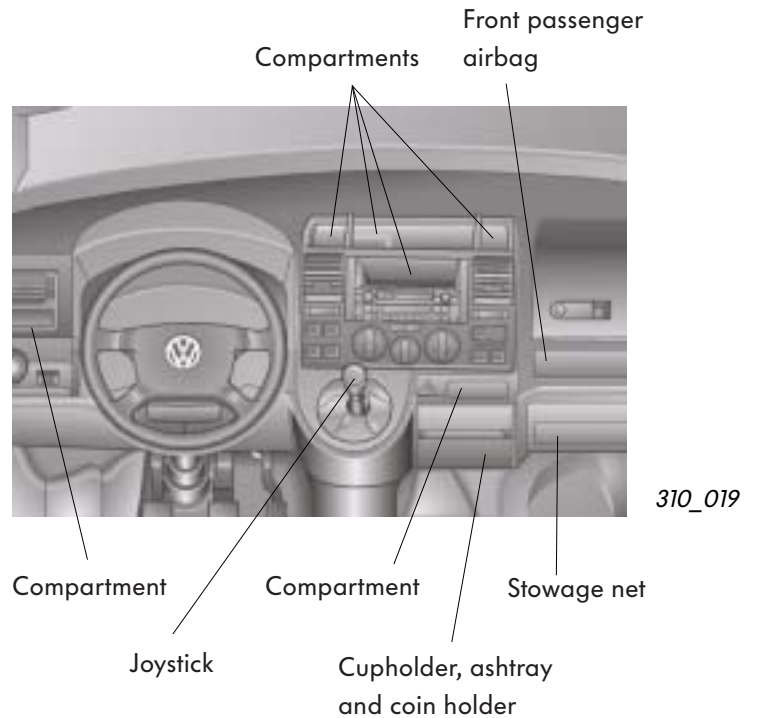
Dash panel

The dash panel has been completely redesigned and there are different types for the Multivan and commercial vehicles. This affects the exterior design, the materials used and also the extent and finish of equipment components.



Commercial vehicle dash panel:

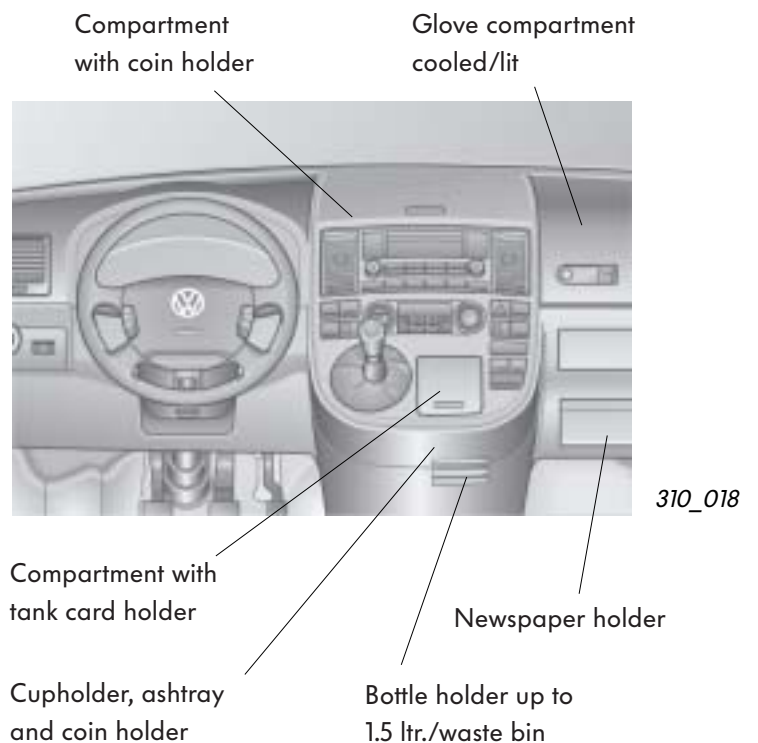
- In place of the familiar tunnel design, gears are selected on the new Transporter via a lever integrated in the dash panel - a joystick.
- Ergonomic and optimal gear selection position.
- Improved access between driver and front passenger and also to passenger compartment in rear thanks to joystick gear selection.
- Plentiful and diverse stowage facilities.



Multivan dash panel:

On the Multivan, the dash panel is also equipped with:

- Compartments next to selector lever
- Upper compartment in centre of dash panel, which is closed with a cover
- 1.5 ltr. bottle holder or waste bin
- Airbag deactivation for front passenger airbag (in glove compartment)



Occupant safety

Occupant safety

Occupant safety is guaranteed by the airbag system with two full size airbags on the driver's and front passenger's side, side and curtain airbags, seatbelts, belt tensioners and child restraint system (Isofix).

The front passenger's airbag is attached to the dash panel behind a trim strip.

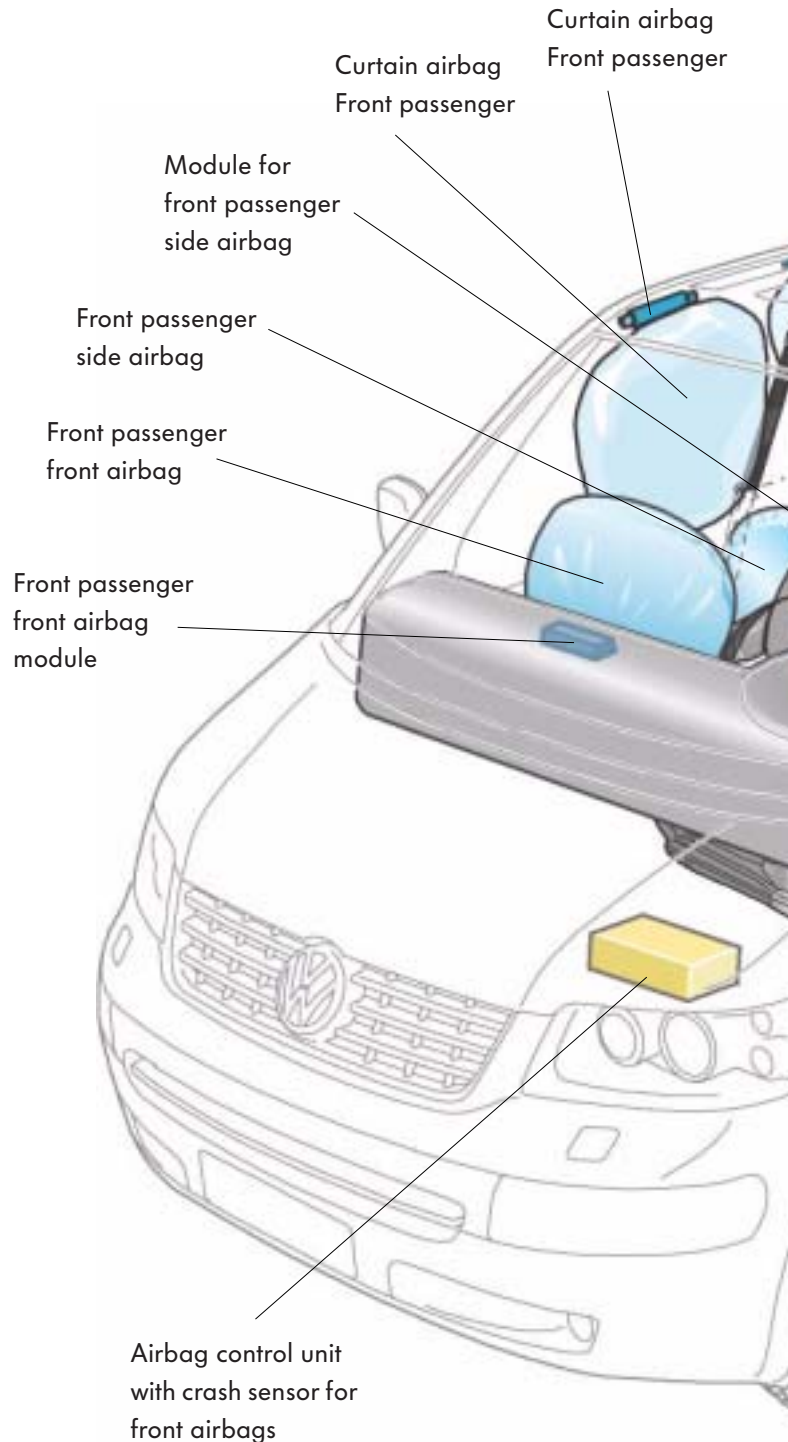


Airbag switch in glove compartment (Multivan)

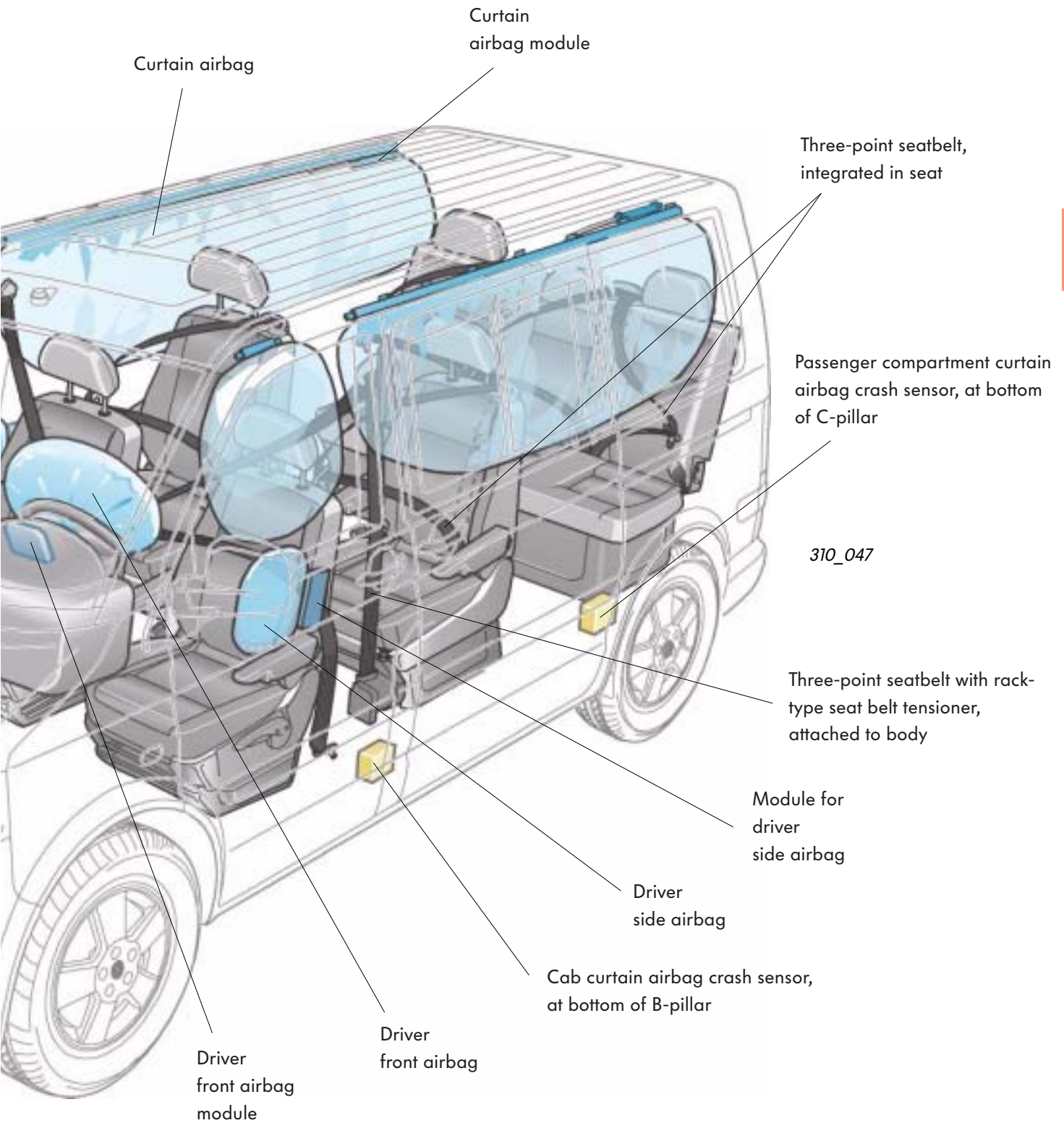
310_063

Front passenger airbag behind trim strip

A key switch in the glove compartment can be used to switch the front passenger airbag off in the Multivan.



On commercial vehicle variants, the seatbelts are integrated in the body at the outer positions and in the seat at the inner positions.



Child locks are fitted in the Multivan to the fixed and rotating single seats and in commercial vehicles to the outer seats of the first seat row of the passenger compartment.

Occupant safety

Rack-type seat belt tensioner

In the new Transporter, a rack-type seat belt tensioner is installed on the driver and front passenger side instead of the familiar ball-type belt tensioner.

Task

The belt tensioners make the seatbelts taut against the wearer's body in a front collision and keep the body pressed against the backrest. In this way, the slack between belt and body is reduced on impact.

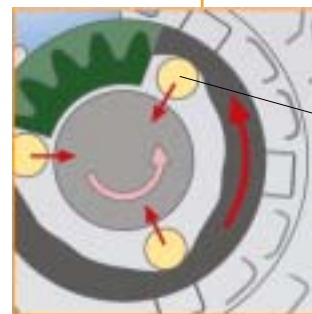
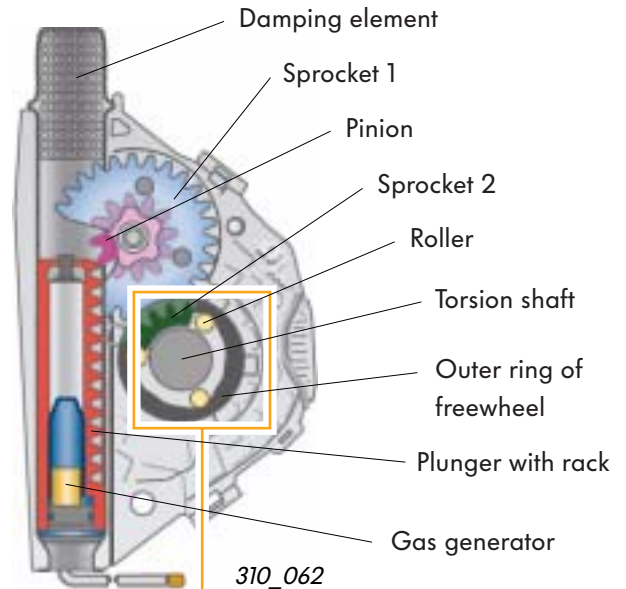
Function

The signal from the airbag control unit ignites the detonator of the propellant. The plunger is connected to the rack. The build-up of pressure forces the plunger upwards. The rack turns the sprockets 1 and 2 on the pinion.

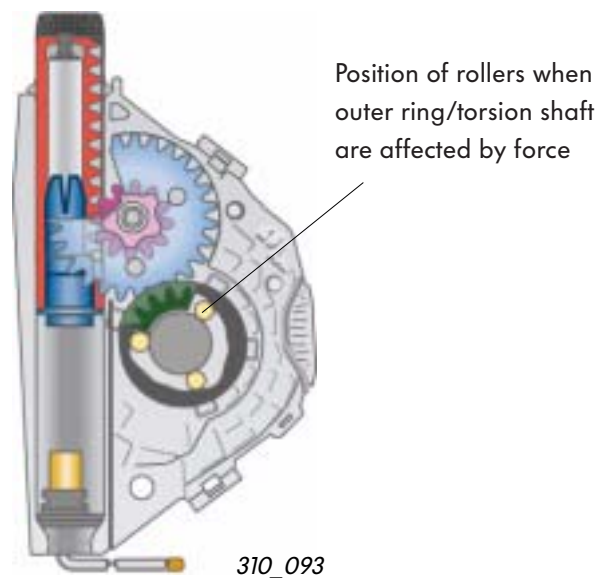
Sprocket 2 is fixed to the outer ring of the torsion shaft freewheel. If the outer ring now turns, the rollers are pushed inwards until force has built up between the outer ring and the torsion shaft. The rotary movement is now transferred to the torsion shaft and the belt is drawn in.

Belt tension is complete when the plunger with rack has reached the damping element.

Rest position



End of triggering




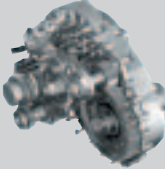
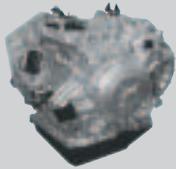








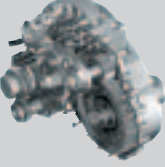
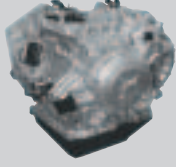


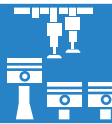
Engine and gearbox combinations

The range of power units covers two petrol and four diesel engines with unit injectors. The engines are installed transversally.

There are two manual gearboxes and there is one automatic. At a later stage, 4motion all-wheel drive will be offered.

1) Only in conjunction with 4motion

Engine		5-speed manual gearbox 02Z	6-speed manual gearbox 0A5	6-speed automatic gearbox 09K
 2.0ltr./85 kW petrol engine AXA				
 3.2ltr./170 kW petrol engine BDL			 1)	
 1.9ltr./63 kW TDI engine AXC				
 1.9ltr./77 kW TDI engine AXB				
 2.5ltr./96 kW TDI engine AXD				
 2.5ltr./128 kW TDI engine AXE				



Power units

2.0ltr./85 kW petrol engine

The engine, used widely in the Group, was adapted for installation in the Transporter, e.g. in the location of the dipstick and design of oil sump.

Technical properties

- Jets for piston cooling
- Oil pump is chain driven by crankshaft
- Electric heated crankcase breather
- Secondary air system

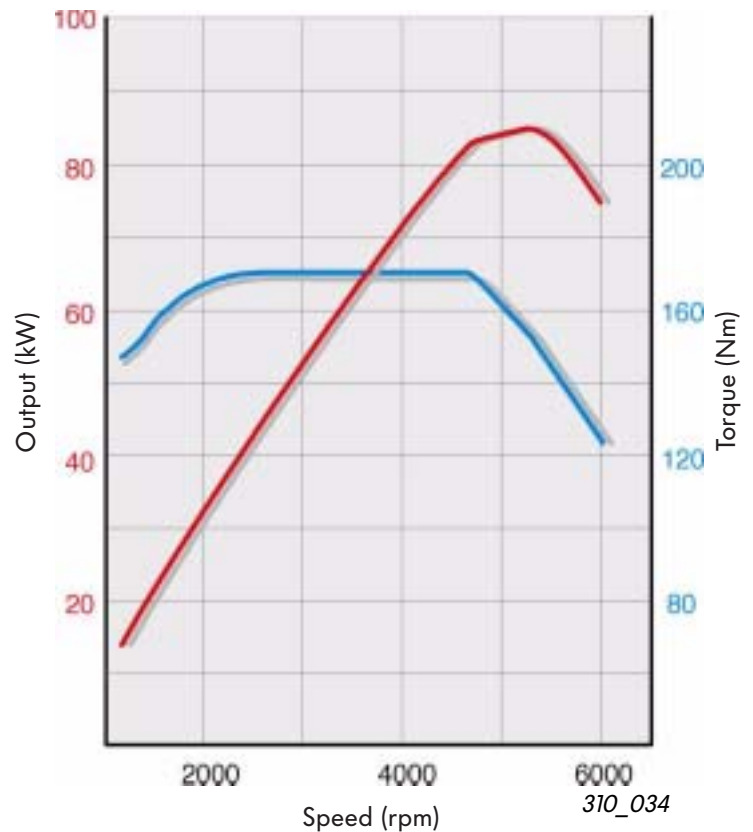


310_030

Technical data

Engine codes	AXA
Displacement	1984 cm ³
Type	4-cylinder in-line engine
Valves per cylinder	2
Bore	82.5 mm
Stroke	92.8 mm
Compression ratio	10.3 : 1
Max. output	85 kW at 5200 rpm
Max. torque	170 Nm at 2700 to 4700 rpm
Engine management	BOSCH Motronic ME 7.5
Fuel	Super unleaded with 98 RON (95 RON with reduced output)
Exhaust gas treatment	Starter and normal catalytic converter Lambda probes with continual Lambda control, exhaust gas recirculation
Emissions standard	EU 4

Torque and power development diagram



310_034

3.2ltr./173 kW V6 petrol engine

The engine is a further development of the 2.8ltr. V6 engine from Volkswagen.

Technical properties

- Continually variable inlet and exhaust camshafts via fluted variator
- Optimised inlet and exhaust ports
- Larger inlet and exhaust valves
- Optimised intake manifold
- Continual Lambda control by means of 2 broadband Lambda probes in front of advanced main catalytic converters and 2 step-type Lambda probes installed after the catalytic converters
- Control of internal exhaust gas recirculation by means of variable valve timing
- Secondary air system



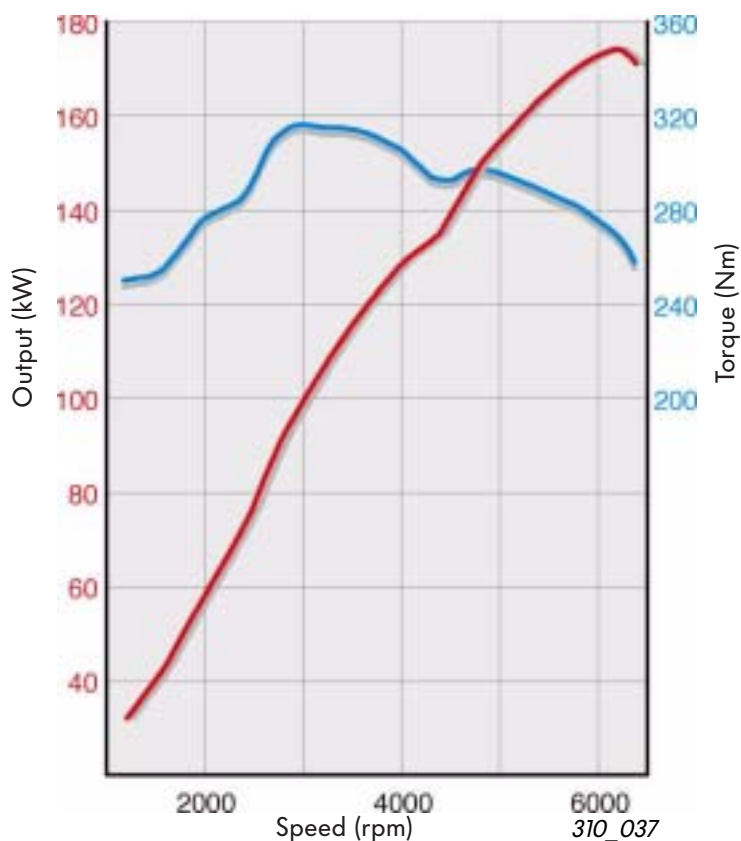
310_031



Technical data

Engine codes	BDL
Displacement	3189 cm ³
Type	6-cylinder V engine (15° V angle)
Valves per cylinder	4
Bore	84.0 mm
Stroke	95.9 mm
Compression ratio	11.25 : 1
Max. output	173 kW at 6200 rpm
Max. torque	315 Nm at 2950 rpm
Engine management	BOSCH Motronic ME 7.1.1
Fuel	Super unleaded with 98 RON (95 RON with reduced output)
Exhaust gas treatment	Starter and normal catalytic converter Lambda probes with continual Lambda control, exhaust gas recirculation
Emissions standard	EU 4

Torque and power development diagram



310_037

Power units

1.9ltr./63 kW diesel engine with unit injector system

This engine is very similar to the 74 kW variant installed in cars. Constructional alterations were necessary for installation in commercial vehicles.

Technical properties

- Vertical oil filter module
- VTG turbocharger
- Charge air cooling



The 1.9ltr./63 kW engine is the entry class version for commercial vehicles.

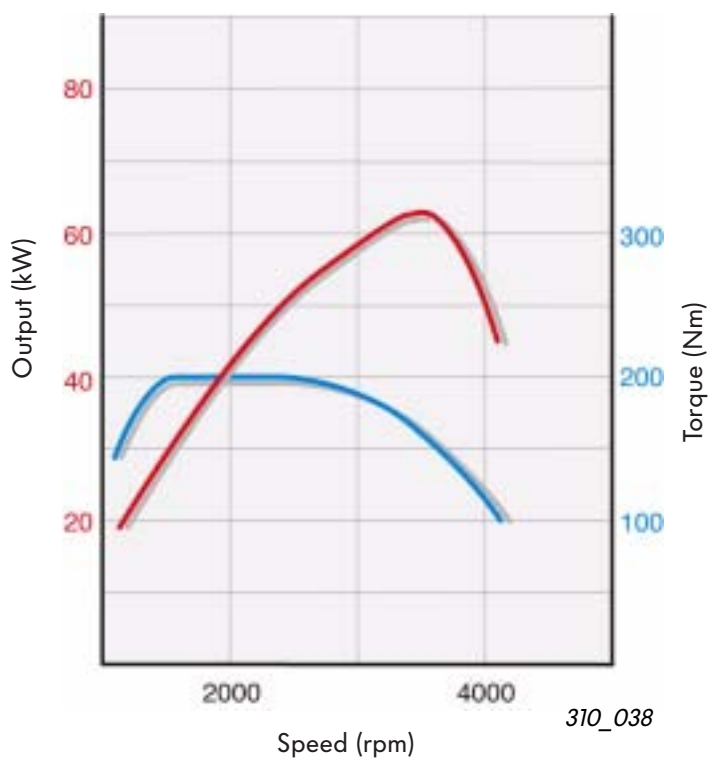


310_032

Technical data

Engine codes	AXC
Displacement	1896 cm ³
Type	4-cylinder in-line engine
Valves per cylinder	2
Bore	79.5 mm
Stroke	95.5 mm
Compression ratio	18.0 : 1
Max. output	63 kW at 3500 rpm
Max. torque	200 Nm at 1750 to 2750 rpm
Engine management	BOSCH EDC 16
Fuel	At least 49 CN diesel or biodiesel
Exhaust gas treatment	Exhaust gas recirculation and oxidising catalytic converter
Emissions standard	EU 3

Torque and power development diagram



310_038

1.9ltr./77 kW diesel engine with unit injector system

This engine is very similar to the 74 kW variant installed in cars. Constructional alterations were necessary for installation in commercial vehicles.

Technical properties

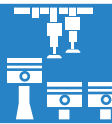
- Vertical oil filter module
- VTG turbocharger
- Charge air cooling



The 1.9ltr./77 kW engine is the entry class version for the Multivan.



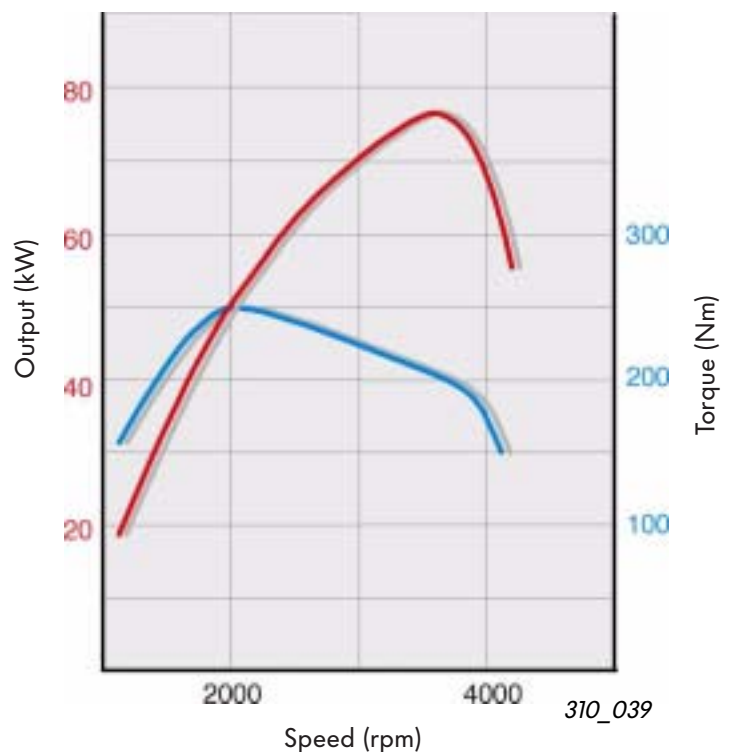
310_032



Technical data

Engine codes	AXB
Type	1896 cm ³
Type	4-cylinder in-line engine
Valves per cylinder	2
Bore	79.5 mm
Stroke	95.5 mm
Compression ratio	18.0 : 1
Max. output	77 kW at 3500 rpm
Max. torque	250 Nm at 2000 rpm
Engine management	BOSCH EDC 16
Fuel	At least 49 CN diesel or biodiesel
Exhaust gas treatment	Exhaust gas recirculation and oxidising catalytic converter
Emissions standard	EU 3

Torque and power development diagram



310_039

Power units

2.5ltr./96 kW diesel engine with unit injector system

Technical properties

- Aluminium cylinder block
- Cylinder head with cross flow principle
- Timing and ancillary drive system via spur gears
- Vertical oil filter module
- Exhaust gas recirculation on automatic gearbox with additional cooler
- VTG turbocharger



310_033

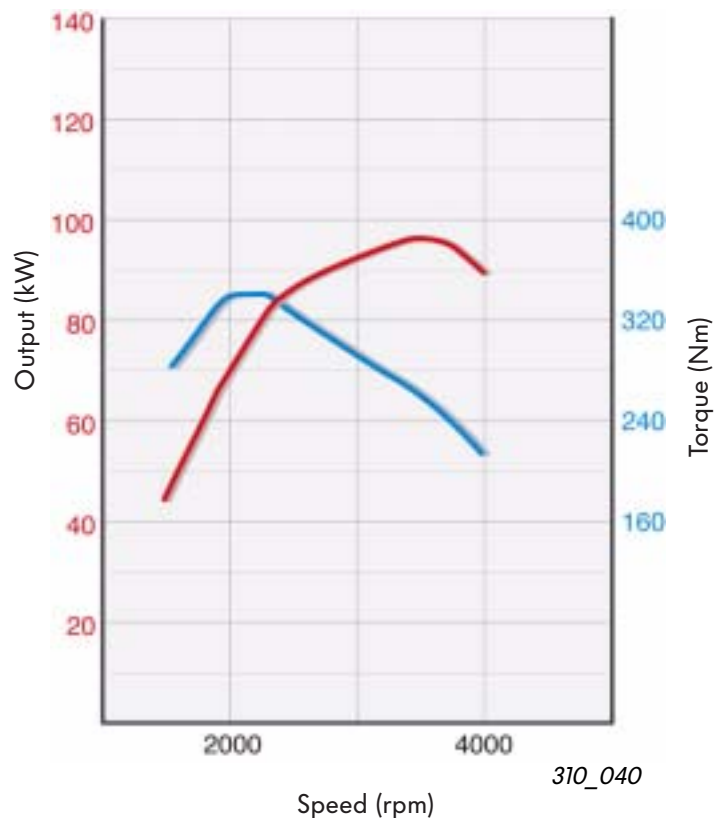


Additional detailed information about the engine can be found in self-study programme 305 "The 2.5ltr. TDI engine" and also 304 "The electronic diesel control EDC 16".

Technical data

Engine codes	AXD
Displacement	2460 cm ³
Type	5-cylinder in-line engine
Valves per cylinder	2
Bore	81 mm
Stroke	95.5 mm
Compression ratio	18.0 : 1
Max. output	96 kW at 3500 rpm
Max. torque	340 Nm at 2000 to 2300 rpm
Engine management	BOSCH EDC 16
Fuel	At least 49 CN diesel or biodiesel
Exhaust gas treatment	Exhaust gas recirculation, starter and main catalytic converter
Emissions standard	EU 3

Torque and power development diagram



310_040

2.5ltr./128 kW diesel engine with unit injector system

This engine is very similar to the 96 kW variant. The differences in power are achieved by the following changes.

Technical properties

- More powerful VTG turbocharger
- Adapted dual mass flywheel



310_033

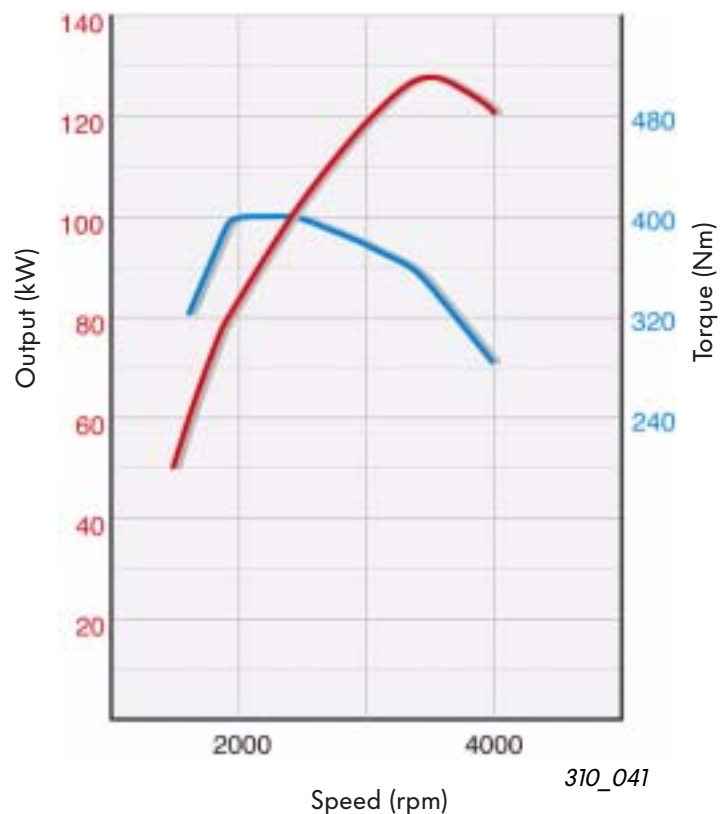


Additional detailed information about the engine can be found in self-study programme 305 "The 2.5ltr. TDI engine" and also 304 "The electronic diesel control EDC 16".

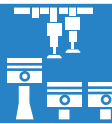
Technical data

Engine codes	AXE
Displacement	2460 cm ³
Type	5-cylinder in-line engine
Valves per cylinder	2
Bore	81 mm
Stroke	95.5 mm
Compression ratio	18.0 : 1
Max. output	128 kW at 3500 rpm
Max. torque	400 Nm at 2000 to 2300 rpm
Engine management	BOSCH EDC 16
Fuel	At least 49 CN diesel or biodiesel
Exhaust gas treatment	Exhaust gas recirculation, starter and main catalytic converter
Emissions standard	EU 3

Torque and power development diagram



310_041



Power transmission

Manual gearbox

Two manual gearboxes are installed in the Transporter 2004, the 02Z and the 0A5. They are designed for transverse installation in the vehicle.

02Z gearbox

The gearbox is a further development of the 02J type. It features 5 gears and is installed in conjunction with 4-cylinder engines. The gearbox can transmit a maximum of 250 Nm torque.

Compared to the 02J gearbox, gear selection was converted to joystick type and a reinforced reverse gear with optimised selection comfort was developed.

The gearboxes differ in construction, maximum torque and number of gears.

The speed signal is transmitted from the ABS system. On versions with tachographs, the road speed sender is still used.



310_035

0A5 gearbox

The gearbox was developed for use with 5-cylinder engines and for the V6 engine and is a completely new development. It features 6 gears and can transmit a maximum of 500 Nm torque.

The compact gearbox is suitable for transverse installation thanks to the 4-shaft design.

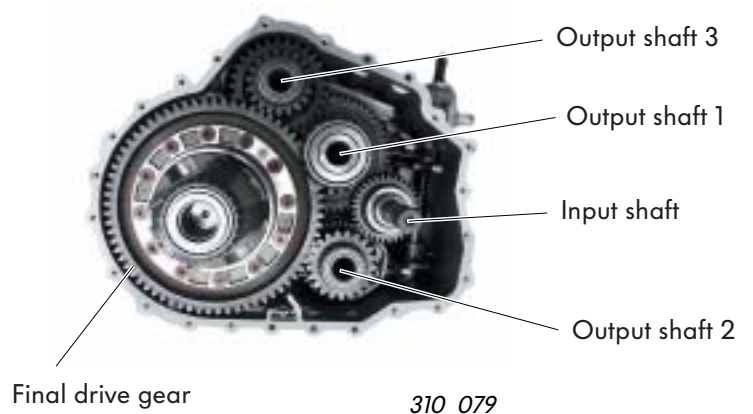


310_036

4-shaft design

The shafts are permanently engaged with the final drive gear.

Depending on which gear is selected, the flow of power is transmitted from the input shaft to one of the output shafts.



310_079

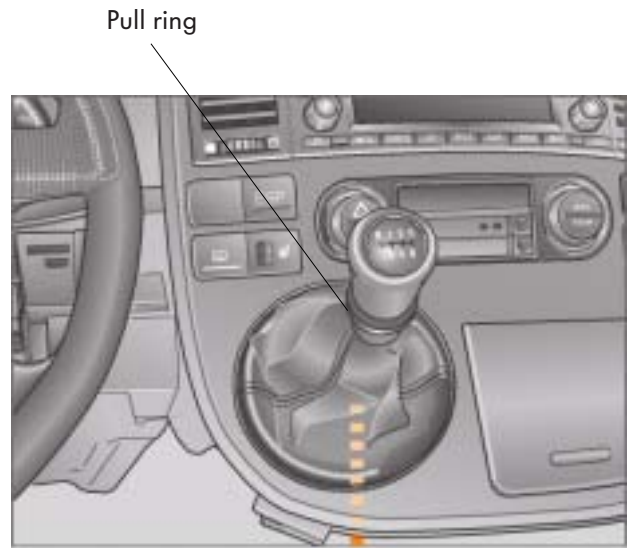


Power transmission

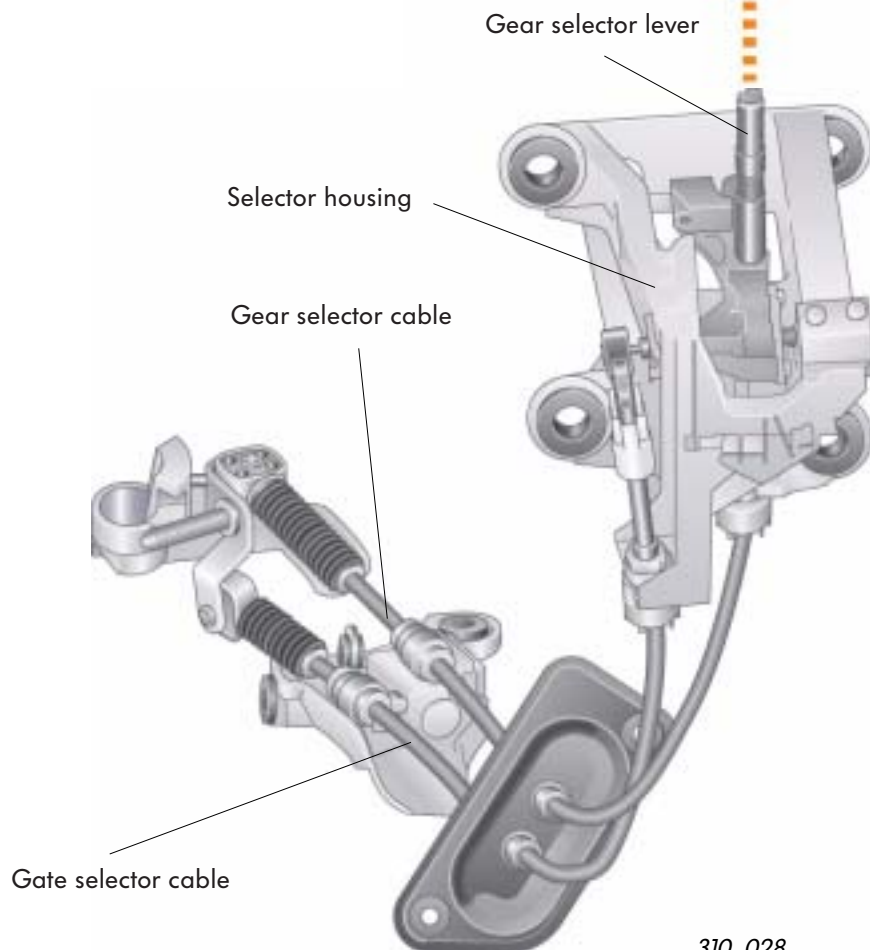
Gear selector mechanism - mechanical gear-box

The gear selector mechanism for mechanical gearboxes is cable operated. Unlike the previous model, the gear selector mechanism is housed in the dash panel and features a joystick.

The procedure of pushing down on the gear lever to engage reverse, common in many Group vehicles, now involves pulling a ring upwards on the lever to engage the gear.



310_095



310_028

Automatic gearbox 09K

The newly developed gearbox is installed in conjunction with the 3.2ltr. V6 and 2.5ltr. TDI engines and features 6 gears. It can transmit a maximum 400 Nm of torque.

Gear selection is via Tiptronic.



310_044



Automatic gear selector mechanism

The Tiptronic is designed as a gate selector Tiptronic type and is installed in the same position as the mechanical gear selector mechanism.

Gear stages P-R-N-D-S can be selected.

Furthermore, the Tiptronic can also be selected manually. To allow this, the Tiptronic gate features (+) to change up and (-) to change down.



310_090

Running gear

Running gear in general

The running gear of the new Transporter was extensively redeveloped compared to the previous model and fulfills very high demands for driving requirements.

Crash optimised foot pedal cluster, decoupled from steering, in modular design

New steering column

McPherson front suspension with decoupled subframe

4 engine and gearbox mounting points
(engine and gearbox mounting on body side
pendulum support on subframe side)



Front and rear anti-roll bars



For details about the anti-roll bar, please also refer to the multimedia program entitled "The Transporter 2004".

Conti Teves MK 25, ABS with EDL, TCS
and EBD, ESP with brake assist system



310_048

Ventilated brake discs
at front and rear

Active wheel speed senders

Handbrake lever on
driver's seat console



Special running gear packages are also available for different applications with adapted spring/shock response (e.g. sporty running gear) or uprated for greater loads.



Running gear

Front axle

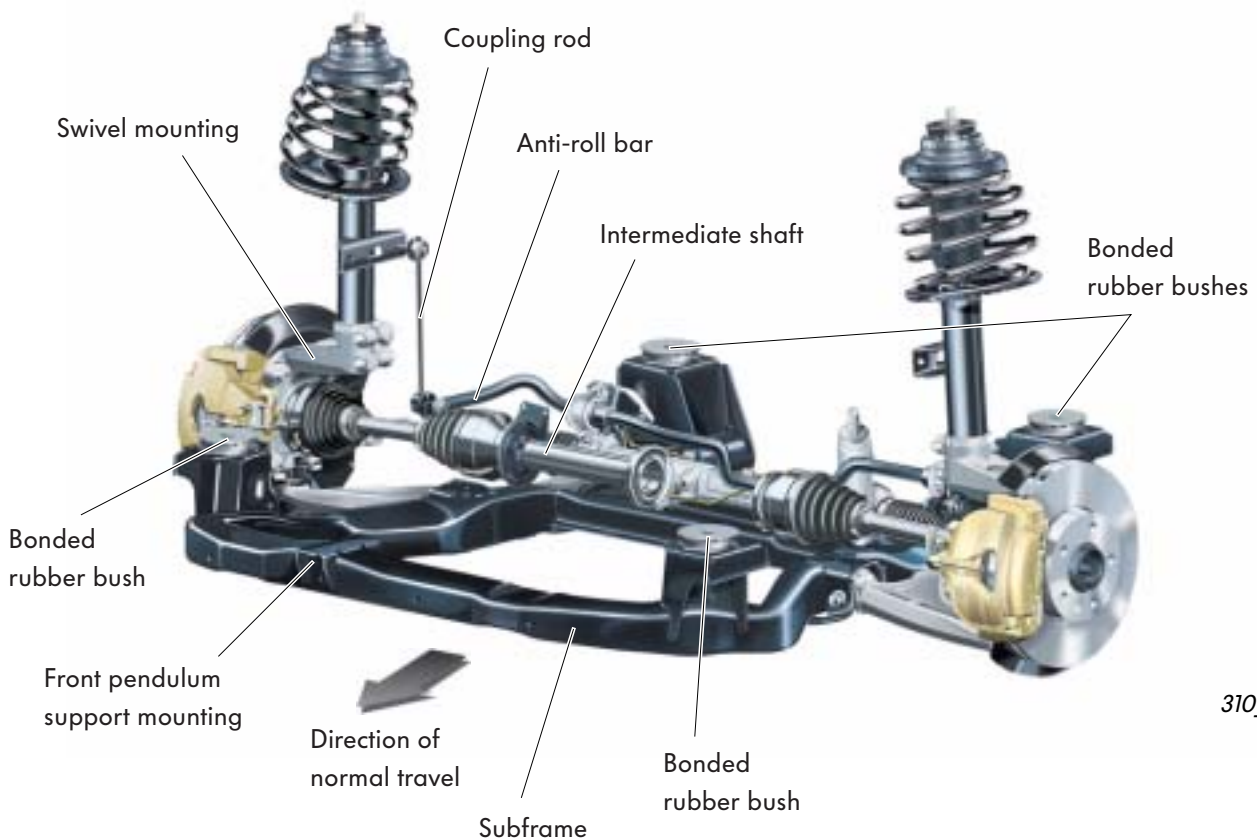
The front axle is a new development.

Technical features are:

- 4 engine and gearbox mountings with two engine and gearbox mountings on the body and two pendulum supports on the subframe.
- Tubular subframe design with 4 bonded rubber bushes attached to body, steering box housed in subframe, insulation tray is also attached here.
- Decoupling of road surface influence on body by means of subframe, this also supports crash safety.
- Anti-roll bar above each coupling rod, connected to suspension strut.
- Wheel bearings feature two rows of angular contact ball bearings with integrated wheel hub.
- Active wheel speed senders, sensor integrated in wheel bearing seal.
- Suspension struts connected to swivel mounting via two clamp bolts each side.
- Intermediate shaft designed for all 4-cylinder and 5-cylinder in-line engines as hollow shaft, V6 engine has solid shaft.



On front axle, only tracking can be adjusted. Further detailed information can be found in the workshop manual.



310_049

Rear axle

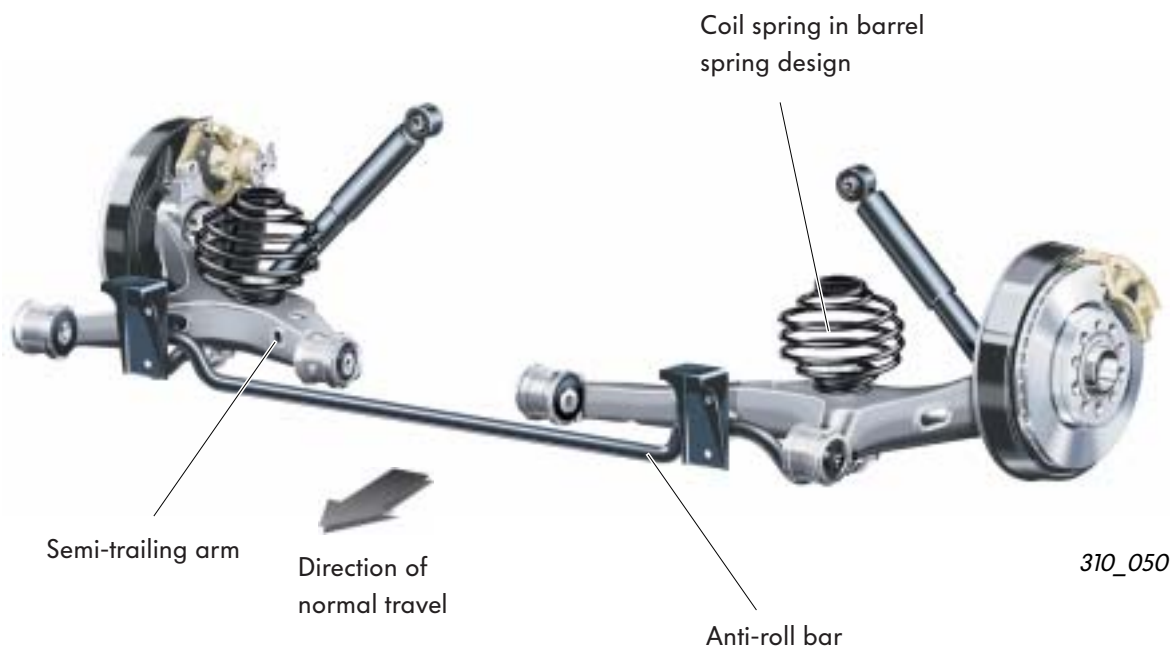
The well proven semi-trailing arm rear axle with independent suspension from the previous model was further developed in detail and refined.

Technical features are:

- Cast semi-trailing arms house wheel bearings. Wheel bearings are same as those used in front axle.
- Coil springs in barrel spring design, with linear or progressive response depending on model.
- Active wheel speed sensors, sensor integrated in wheel bearing seal (same part as used on front axle).



At a later date, a four-wheel drive version (4motion) with Haldex coupling (Haldex II) will be introduced.

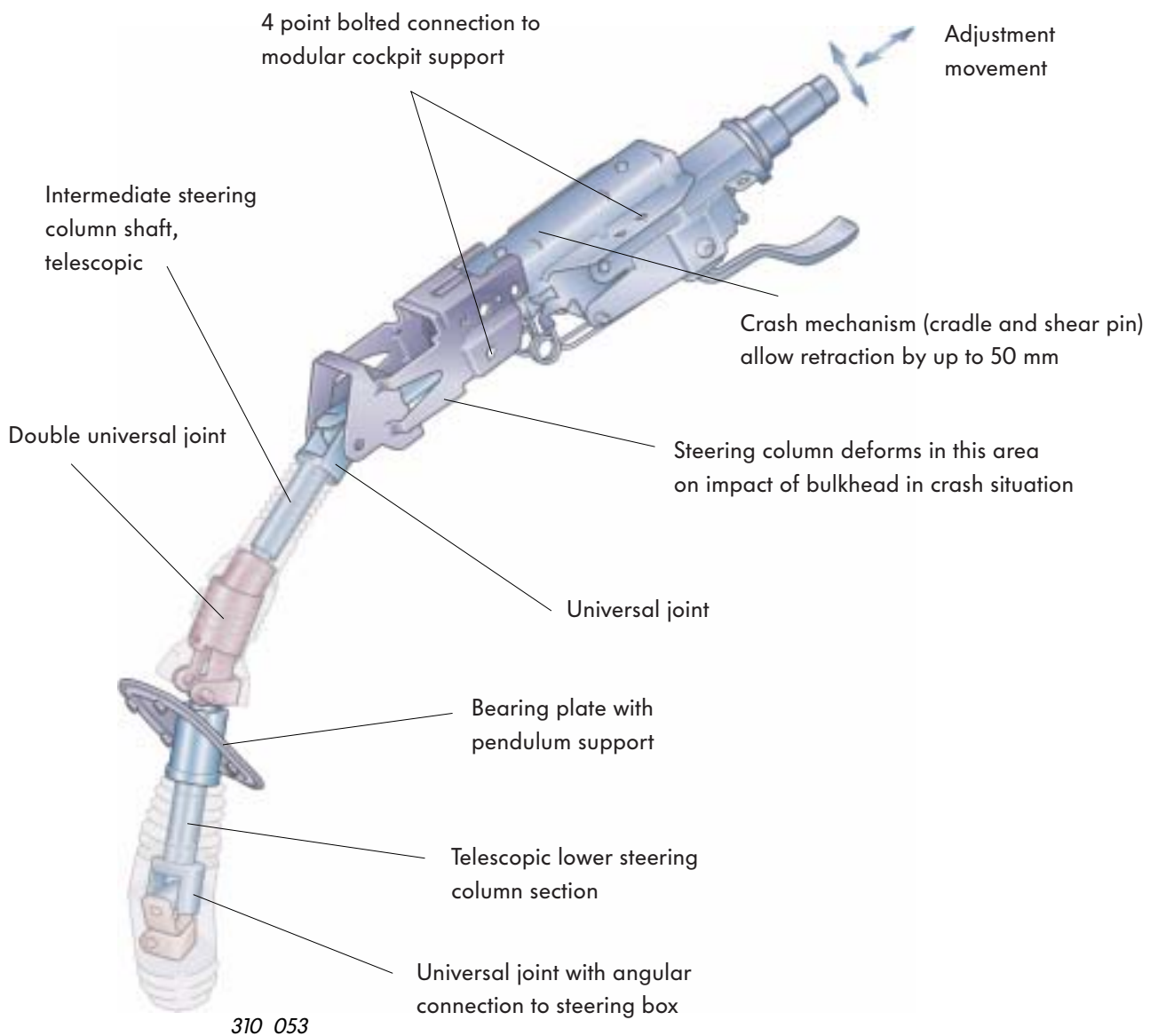


Running gear

Steering column

The safety steering column features three angle points with two simple universal joints and one double universal joint. Unlike the fixed steering column of the previous model, this steering column has height and rake adjustment. It features a crash mechanism, which allows the steering column to retract by up to 50 mm (with force recognition) on impact of the driver against the steering wheel in an accident.

In order to balance the elastic movements of the subframe, which is joined to the body, the bottom part of the steering column is telescopic. The pendulum support of the bearing plate, bolted to the floor panel, absorbs the up and down movement of the lower steering column section affected by the subframe.



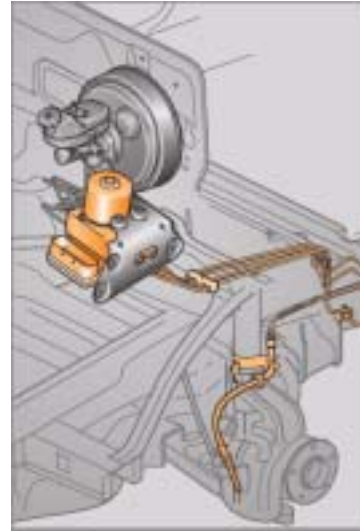
Brake system

For the braking system of the Transporter 2004, the MK 25 design from Conti Teves was installed.

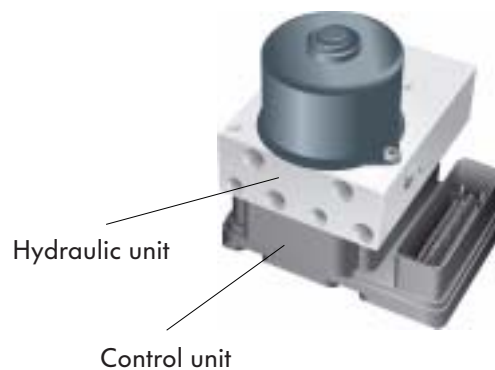
The system features anti-lock braking system (ABS), electronic differential lock (EDL), traction control (TCS) and electronic brake force distribution (EBD) as standard.

Vehicles designed as people carriers can also be equipped optionally with the electronic stabilisation programme (ESP).

Integrated in the ESP is an active brake servo and a pneumatic brake assist system (travel sensor in vacuum chamber).



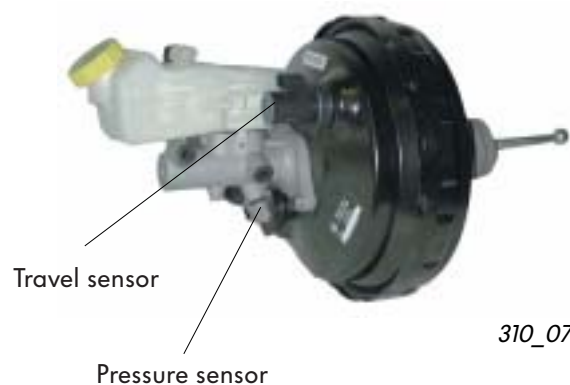
310_138



310_068

Brake servo

The brake servo is of the tandem type in 9" or 10" versions. Conti Teves is the manufacturer of this equipment.



310_073



To understand the basics of the design and function of the brake servo, refer to self-study programme 276 "The Phaeton - Automatic proximity control".



Running gear

Front brakes

On the front axle, the Transporter 2004 features a 16" brake system. The ventilated brake discs are \varnothing 308 x 29.5 mm in dimension. From 170 kW, a 17" system is installed which is \varnothing 333 x 32.5 mm in dimension.



310_128



Rear brakes

A 16" brake system is installed on the rear axle. The ventilated disc brakes are \varnothing 294 x 22 mm in dimension.



310_129

Pneumatic brake assist system

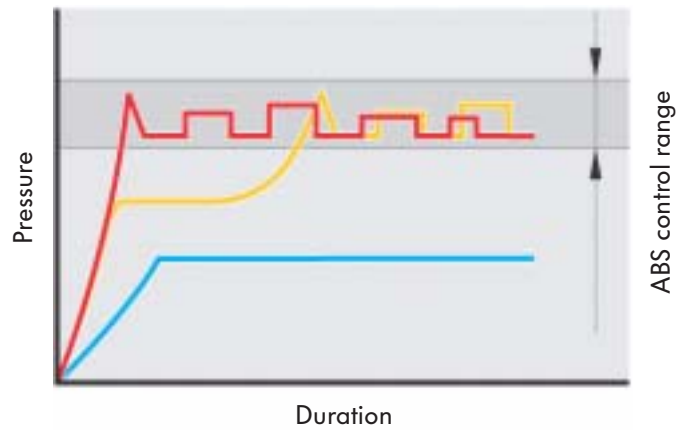
The brake assist system is installed exclusively in conjunction with ESP.

The role of the brake assist system is to support the driver in emergency braking situations. In addition to normal functioning of the brake servo, the version with brake assist system features a coil, a release switch and a travel sensor.




Function

The travel sensor serves as a means of detecting the speed at which the brake pedal has been pressed. This sensor signal is picked up and evaluated in the ESP control unit. If the actuating speed is $> 120 \text{ mm/s}$, the control unit applies voltage to the coil and the brake servo can provide maximum support. This means that the force applied through the brake pedal is reduced. In this way, greater pressure is built up in the brake system.

The brake assist system is deactivated when the control unit, via the release switch, detects that the force at the brake pedal is reduced.



310_082

-  Normal braking
-  Emergency braking, without brake assist system
-  Emergency braking, with brake assist system



You can find more detailed information about the brake assist system in self-study programme 264 "The brake assist system".

Electrical system

The data bus network

Description

The control units of the Volkswagen Transporter are connected to each other via the CAN data bus network.

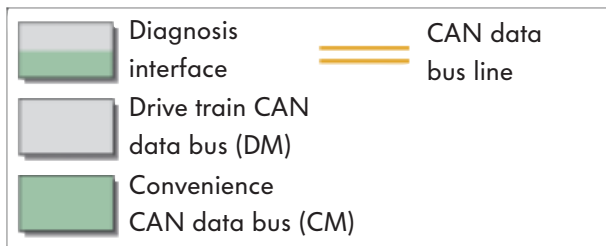
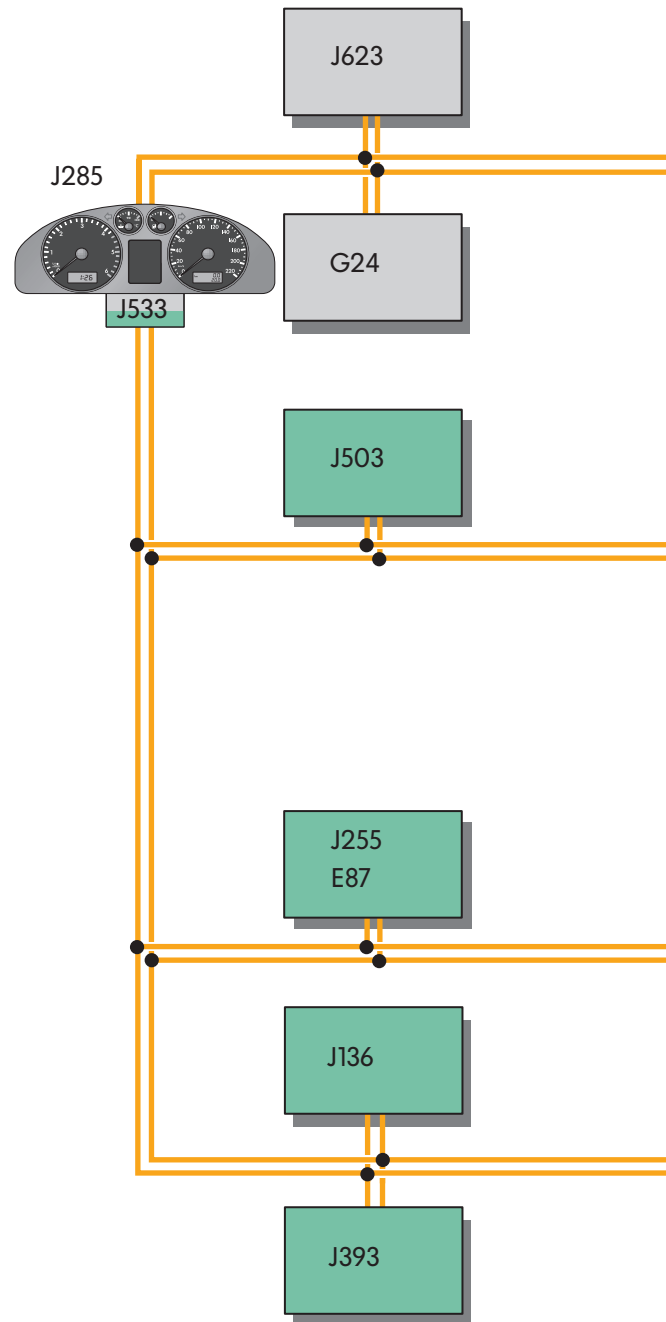
The network makes it possible to exchange data between the control units.

Information is sent via the CAN data bus in digital form instead of via discrete cable connections.

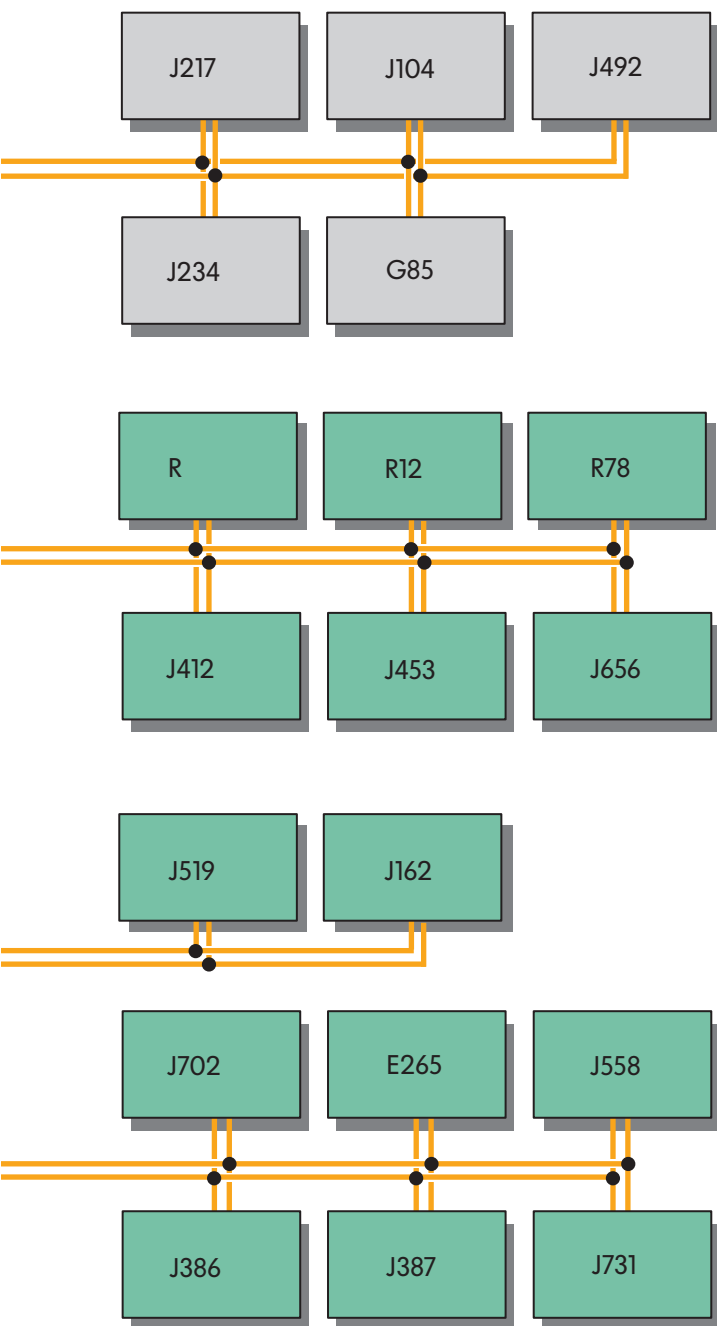
This makes it possible for other control units to access the information.

The CAN data bus is split into two single systems, the drive train CAN data bus and the convenience CAN data bus.

Both bus systems are connected to each other via the data bus diagnosis interface (Gateway) J533 in the dash panel insert and this allows the exchange of data.



310_135



Key

- G24 Tachograph
- G85 Steering angle sender
- E87 Climatronic/air conditioning operating and display unit
- E265 Rear Climatronic operating and display unit
- J104 ABS with EDL control unit
- J136 Seat adjustment control unit with memory function
- J162 Heater control unit
- J217 Automatic gearbox control unit
- J234 Airbag control unit
- J255 Climatronic control unit
- J285 Control unit with display in dash panel insert
- J386 Door control unit, driver side
- J387 Door control unit, front passenger side
- J393 Central convenience system control unit
- J412 Operating electronics control unit, cellphone
- J453 Multi-function steering wheel control unit
- J492 Four-wheel drive control unit
- J503 Radio and navigation control unit with display unit
- J519 Onboard electrical system control unit
- J533 Data bus diagnosis interface
- J558 Sliding door control unit
- J623 Engine control unit
- J656 Voice enhancement control unit
- J702 Roof display unit
- J731 Right sliding door control unit
- R Radio:
(Delta radio only, not in commercial vehicles)
- R12 Amplifier
- R78 TV tuner



310_134

Heating, air conditioning

Climate control

In addition to the basic heating and ventilation equipment, the Transporter also features an air conditioning system. Two versions of air conditioning system are installed:

- Climatronic with 3-zone control
- Manual air conditioning system

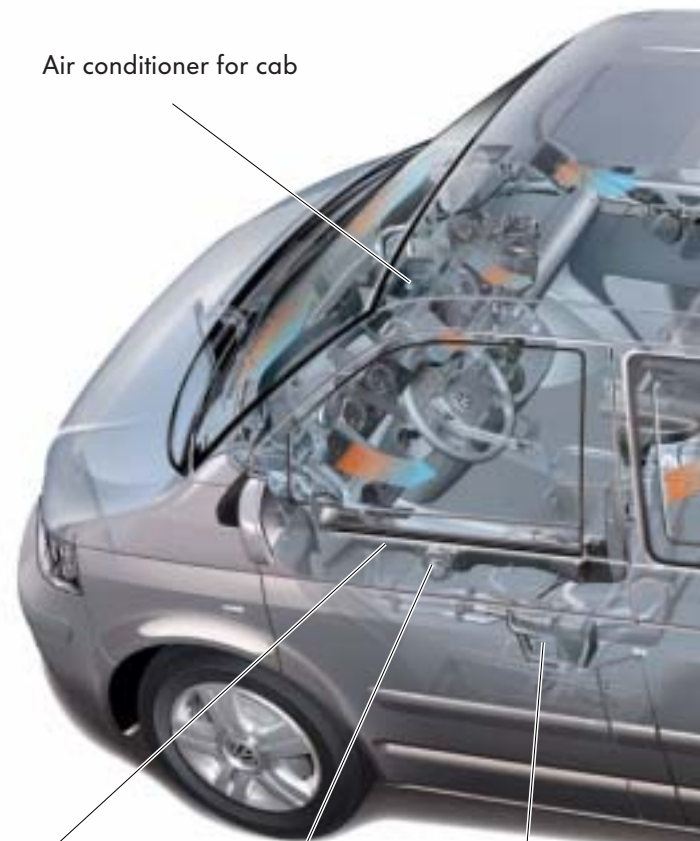
The systems have 25 % more output compared to those installed in previous models (air flow rate).

Technical features, depending on equipment level, are as follows:

- 2nd A/C unit/2nd heat exchanger or passenger compartment ventilation (commercial vehicles)
- Air channel in side doors with vents in B-pillars
- Booster fan in side doors
- Pollution sensor
- Residual heat function
- Cooled glove compartment
- Dust, pollen and activated charcoal filter



The illustration shows the Multivan with a Climatronic system.



Air channel in front doors

Booster fan in side doors

Supplementary heater



The Multivan is equipped as standard with an air conditioning system. The basic entry model has a manual air conditioning system. The Climatronic is fitted generally with a 2nd evaporator.



For details about the residual heat function, please refer to self-study programme 301 "The Touareg, Heating and air conditioning".



A/C headliner with
air distribution

Air conditioner for
passenger compartment

Auxiliary heater

310_116



Commercial vehicles with side win-
dows also have the air channel, but
there is no booster fan.

Heating, air conditioning

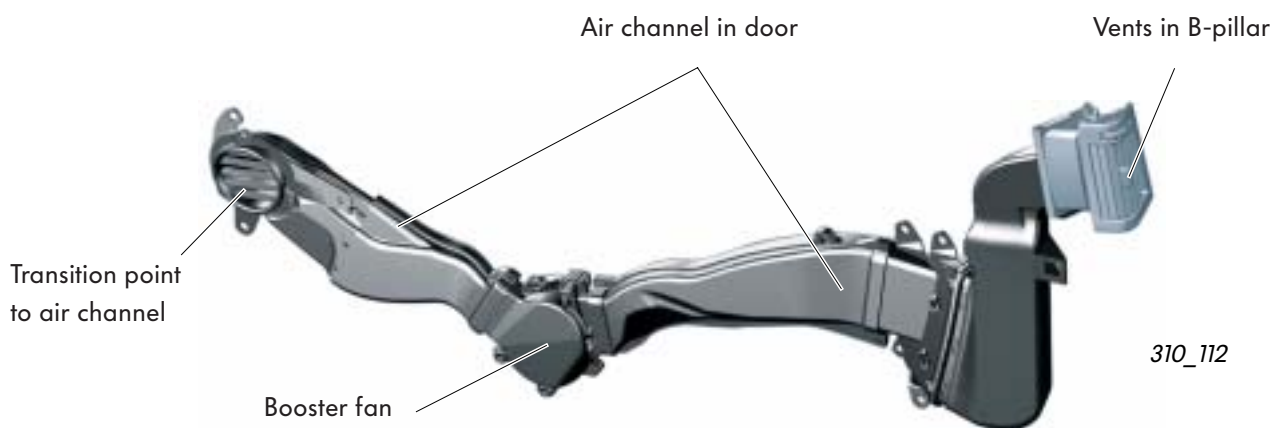
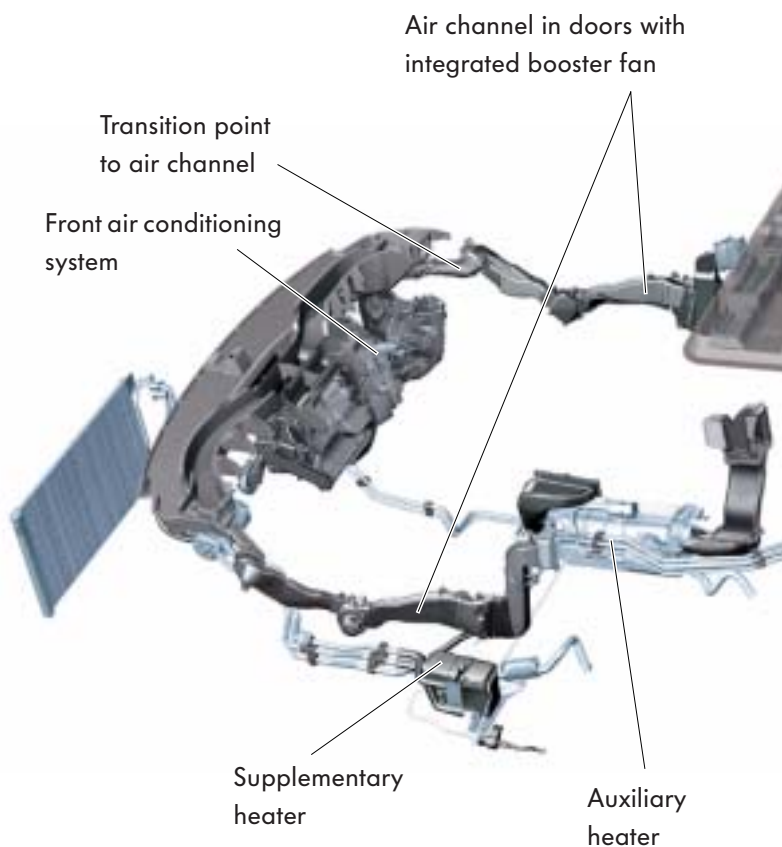
Air channel in front doors

In each of the front doors there is an air channel with transition and connection point to the vents in the B-pillar.

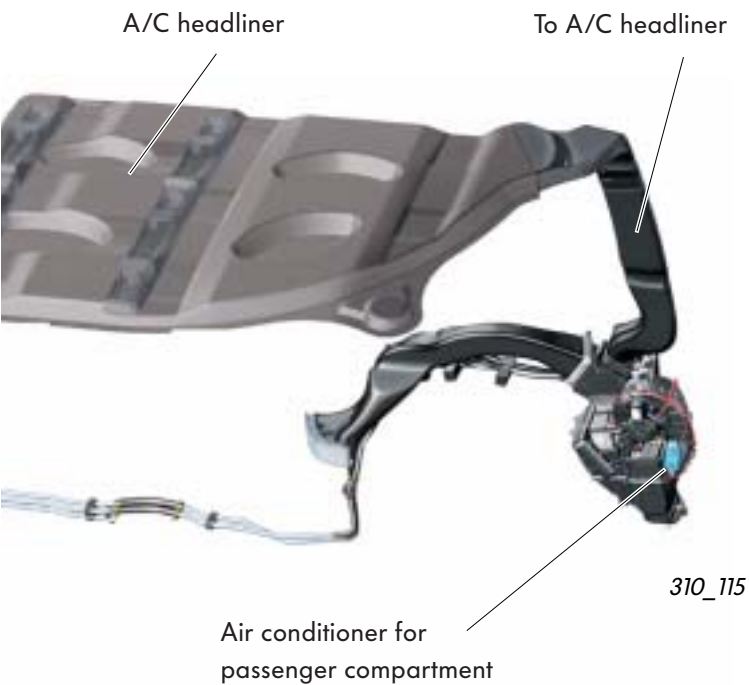
Booster fan in side doors

In the Multivan, each side door features a so-called booster fan. This is located in the air channel in the door and supplies the vents in the B-pillar with sufficient air. This means that the side windows can be kept largely free of condensation. Furthermore, climate control in the passenger compartment is thereby supported.

Actuation is automatic on the Climatronic system. The manual system has to be operated via three buttons in the A/C headliner operating unit.



For details about ventilation, please also refer to the multimedia program entitled "The Transporter 2004".



Air conditioner for passenger compartment

Depending on the equipment level, the Transporter can be equipped with an air conditioning unit for the passenger compartment. On the Multi-van, this is a standard feature.

In addition to air distribution in the bottom area, distribution is also channelled upwards to the A/C headliner.

A/C compressor variants

Manual air conditioning systems and the Climatronic have an internally controlled compressor.

An exception is the 2.5ltr./R5 TDI engine, which has an externally controlled compressor, necessary due to the design. The control function is integrated in the operating unit.



The externally controlled A/C compressor drive system is described in detail in self-study programme 305 "The R5 TDI engine".

Supplementary heater

Due to the high level of efficiency of the TDI engines, a fuel powered supplementary heater, in conjunction with a 2nd heat exchanger, is installed as standard.

As an option, this supplementary heater can be upgraded to an auxiliary heater. The heater offers the means of preselecting and remotely operating heating and ventilation for a limited period of up to 30 minutes.

Auxiliary heater

A further option for climate control is a fuel powered auxiliary heater, available as an optional extra. This can be started using the operating unit or by radio remote control. The duration of operation is unlimited.



Heating, air conditioning

3 zone Climatronic

The air conditioning system can control temperatures in three different zones.

- At the front, individual temperatures for the driver and front passenger can be selected. The operating and display unit in the dash panel is used for the setting.
- The rear passenger compartment can be controlled completely independently of the cab. The temperature in the rear is selected using the A/C headliner operating and display unit. In addition, the temperature can also be set from the cab using the REAR button on the operating and display unit.

Climatronic/air conditioning operating and display unit



"REAR" button for setting temperature in rear

310_064

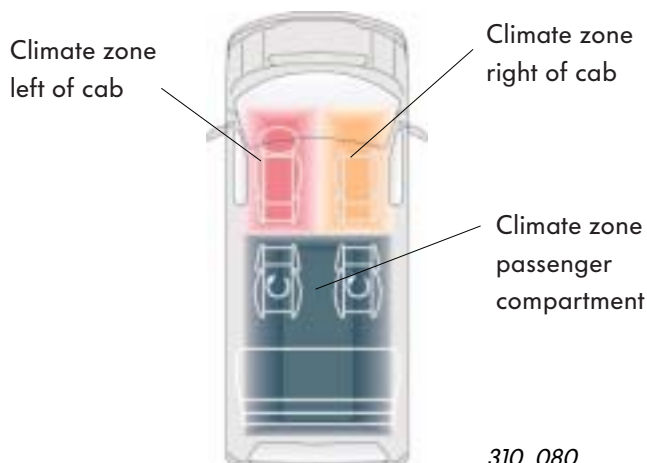
3-zone air distribution

For climate control of the cab and passenger compartment, two air conditioning units are installed.

The air conditioner for the front can be found beneath the dash panel on the right and this provides climate control for the cab. Multi-zone sensors allow different air temperatures at the left and right vents.

The air conditioner for the rear can be found in the right wheel housing and this serves as a means of climate control for the passenger compartment.

A number of air flaps in the air conditioning units and air distribution housings allow individual air distribution. This is also supported by a clever air supply system in the body.



310_080

A/C headliner

The A/C headliner has two air outlet points above each seat row in the passenger compartment. In the front outlet point, there are vents on the left and right and a Climatronic operating and display unit in the middle. The rear outlet point has three vents.

The vents have three functions:

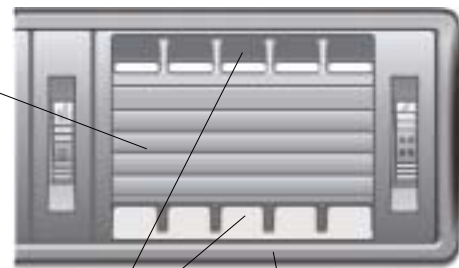
- Closed with air outlet
- Diffused outlet via openings at top and bottom of flaps
- Direct outlet through opened flaps

Rear Climatronic operating and display unit



310_066

Vents



310_103

Flaps (closed)

Openings for diffused distribution



Actuation of booster fan in front doors (+/-)

A/C headliner



310_067

Vents in B-pillar



310_104

Air outlet points

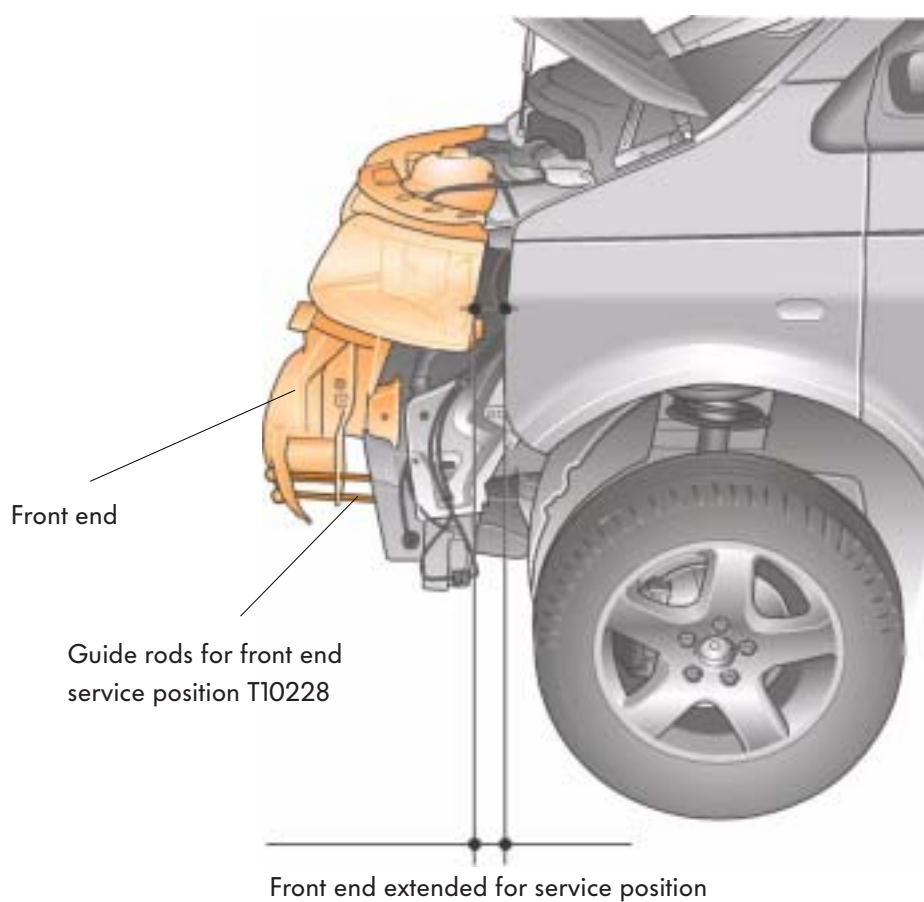
Service

New features of service

Front end in service position

Use of the guide rods for front end service position T10228 makes it possible to place the front end of the Transporter in a special service position.

This creates space for service or repair work to be carried out.



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Further detailed information can be found in the workshop manual.

Workshop equipment

No.	Designation
VAS 6236	Straightening bracket set
VAS 5007/20	Portal gauge supplement
VAS 6248	Wing protector

Special tools

No.	Designation
T10220	Engine holder for assembly stand (5-cylinder TDI)
T10221	Water pump spur gear puller (5-cylinder TDI)
T10222	Water pump puller (5-cylinder TDI)
10-222A23	Support device adapter
10-222A24	Traverse for support device
T10223	Clutch centring tool (5-cylinder TDI)
T10224	Engine holder for engine and gearbox jack (removal and installation) 5-cylinder TDI
T10225	Tool for turning over engine (5-cylinder TDI)
T10226	Crankshaft locking tool (5-cylinder TDI)
T10227	Subframe locking device
T10228	Guide rods for front end service position
T10229	Engine holder for engine and gearbox jack (removal and installation) 4-cylinder TDI
T10230	Engine holder for engine and gearbox jack (removal and installation) V6



In conjunction with the new rim design, new assembly heads have been introduced for the tyre fitting machines. For assembly head holders on wheel alignment computers, new adapters are available.

Further detailed information can be found in the workshop manual.

Diagnosis

For the new Transporter, you have the vehicle diagnosis, testing and information system VAS 5051 and vehicle diagnosis and service information system VAS 5052 at your disposal.



310_109



310_110

You can choose the following modes of operation on the vehicle diagnosis, testing and information system VAS 5051:

- Guided fault finding
- Vehicle self-diagnosis
- Test instruments

Operating mode "**Guided fault finding**" checks all installed control units, specific to a vehicle, for fault entries and automatically creates an individual test chart from the results.

This helps to locate faults in combination with ELSA information, such as current flow diagrams or workshop manuals.

Despite this, you also have the opportunity of creating your own test chart.

Using the function and component selection features, the tests selected by you will be added to the test chart and can be carried out in the diagnosis procedure in any order.

Operating mode "**Vehicle self-diagnosis**" can still be used in the same way, but further information from ELSA is not available.



More detailed information about the guided fault finding procedure and operation can be found in chapter 7 of the operating instructions for VAS 5051.



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000.2811.31.20 Technical status 03/03

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