Service Training

Commercial Vehicles

Self-study programme 463

The Amarok 2010

The Amarok sees Volkswagen Commercial Vehicles taking a direct step into the medium category pick-up segment as well. Not only is the Amarok the fourth model series from the Volkswagen Commercial Vehicles arm, it is also the first 1-tonne class pickup developed in Europe. The new model combines the robustness demanded from a pickup with innovative technology, high safety standards and top values in terms of consumption, comfort and ergonomics.

This self-study programme provides you an overview of this new vehicle in the model range from Volkswagen Commercial Vehicles.

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Please also refer to self-study programmes
464 "The Amarok 2010 - Powertrain and drive concept" and
455 "2.0 l TDI engines in the T5 2010".

The self-study programme presents the design and function of new developments!
The content will not be updated.

Current testing, setting and repair instructions can be found in the provided service literature.

Important note

At a glance

The production site of the Amarok 2010

The Amarok is produced in Argentina, in the Pacheco plant. The Suran is produced in Pacheco as well as the Amarok.
The plant covers an area of about 710,000 m^2, of which about 100,000 m^2 is covered by buildings and production halls. The production site houses the production lines for the various vehicle models, and the plant has its own bodyshop and paintshop as well as a test track.
A production volume of up to 100,000 Amarok vehicles every year is planned at the Pacheco plant.

What does Amarok mean?

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The naming

The name Amarok originates from the language of the Inuit, the aboriginal inhabitants of the Arctic region of central and north-eastern Canada as well as Greenland. It means an enormous wolf from Inuit mythology, which is a solitary night-time hunter.
In Latin based terms, the name is also associated with the literal meaning "he loves the rocks".

The name Amarok is associated with:

- Power
- Durability and toughness
- Successful capability of robustness and intelligent technology

Overview

Amarok with single cab s463_189

Amarok with double cab s463_190

The most striking features of the Amarok

- Available with single or double cab
- 1 petrol and 2 diesel engines can be selected for specific markets
- 6-speed manual gearbox
- Either non-permanently or permanently engaged 4MOTION drive or rear-wheel drive
- Robust running gear configuration
- Rigid rear axle with leaf suspension and two suspension characteristics
- Trailer load of max. 2,800 kg
- Wide loadbed

The equipment lines of the Amarok 2010

The Amarok is supplied in three equipment lines:

- Basic
- Trendline
- Highline

Basic

The Amarok "basic" is the equipment line with the most typical commercial vehicle characteristics. The basic equipment of the Amarok provides:

- 16-inch steel wheels
- Manual window regulators
- Manual door locks
- Manual mirror adjustment
- Black grained front bumper, handles and exterior mirrors
- Either with single cab or double cab

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Trendline

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This equipment line is also referred to as a dual use vehicle. It is appealing both for out-and-out commercial vehicle operation and for private customers.
The Trendline version of the Amarok is equipped with:

- 16-inch alloy wheels
- Electric windows
- Electric locks
- Electric mirror adjustment
- Front bumpers, handles and exterior mirrors in body colour

Highline

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The Highline version is the top-of-the-line pickup, and meets the requirements of even highly demanding customers.
The main external characteristics of the Highline equipment version are:

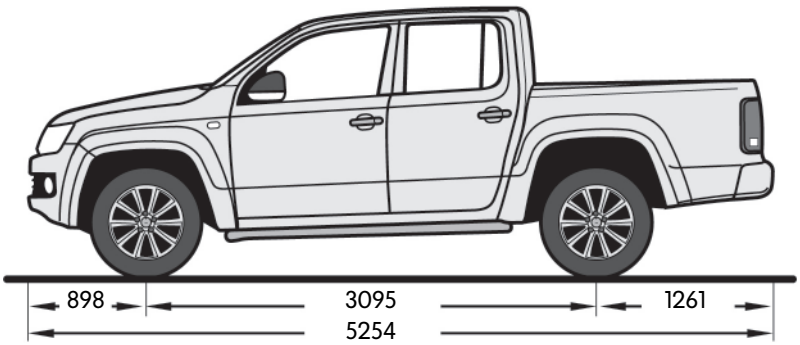
- 17-inch alloy wheels
- Flared wheel arches
- Climatronic air-conditioning system
- Some interior trim in leather
- Front bumper in chrome look
- Handles in body colour
- Exterior mirrors with partial chrome
- Side protection tube*
- Styling bar*
- Front underbody guard*

* Optional equipment

Technical data

Exterior dimensions

Amarok with double cab



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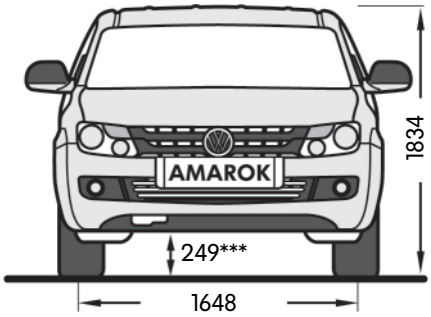

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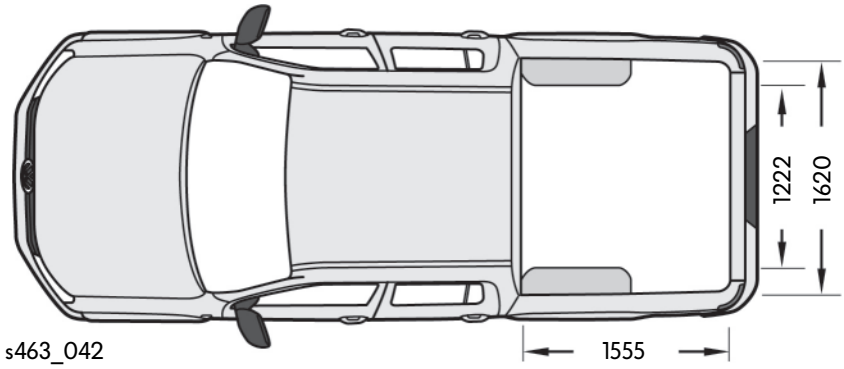

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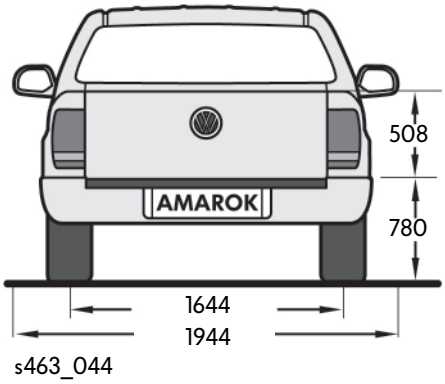

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[All values in mm]

Exterior dimensions

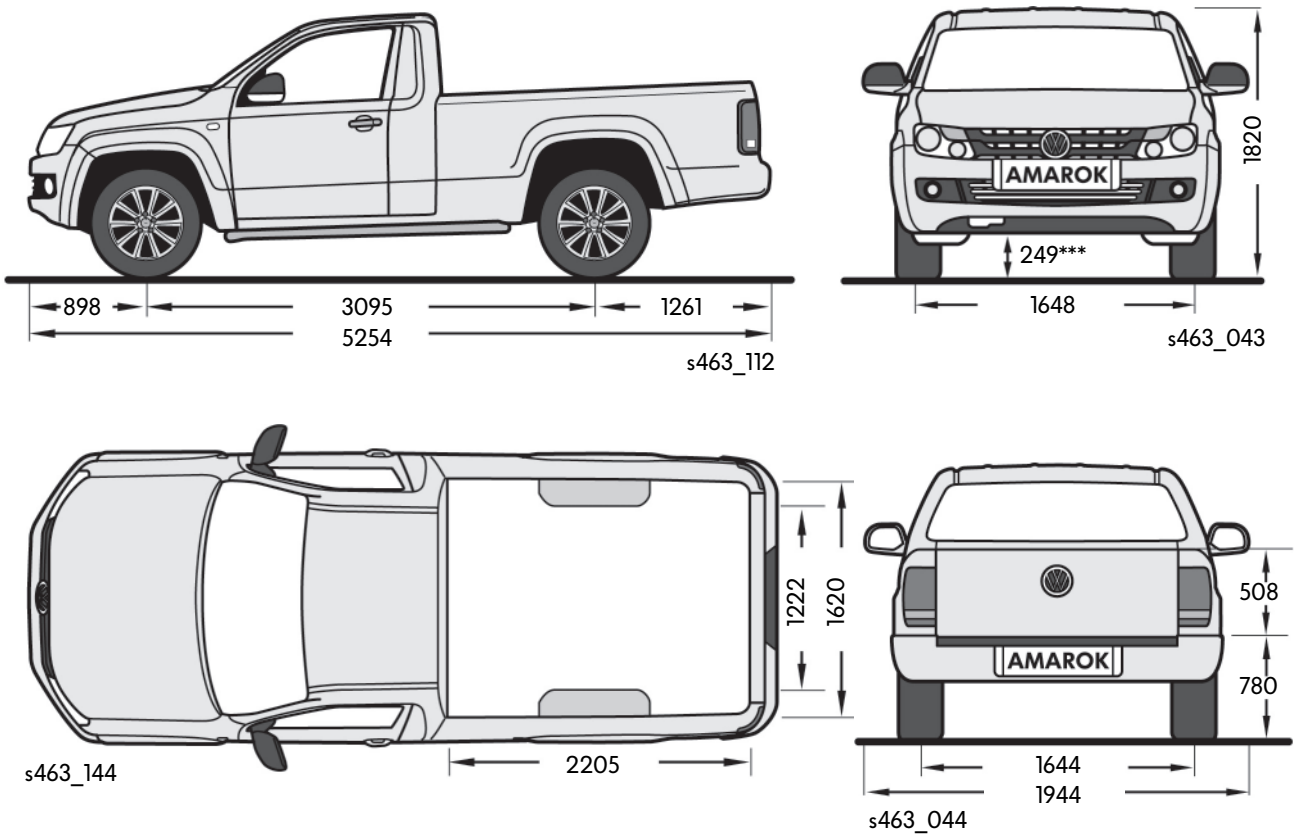
Length	5254 mm
Width	1944 mm
Height	1834 mm
Wheelbase	3095 mm
Track width at the front	1648 mm
Track width at the rear	1644 mm
Length of loadbed	1555 mm
Width of loadbed	1620 mm
Loadbed	2.52 m^2
Loading width between the wheel houses	1222 mm
Height of tailboard	508 mm

Weights/additional data

Gross vehicle weight rating	3040 kg*
Unladen weight with driver	2178 kg*
max. payload	660 - 1000 kg**
max. rear axle load	1860 kg
Trailer load braked, max.	2800 kg
max. roof load	100 kg
max. permitted combination weight	5500 kg
max. drawbar load	120 kg

* 2.0 l 120 kW biturbo 4MOTION non-permanently engaged, heavy duty
** Depending on the rear axle configuration
*** ML1 (driver only)

Amarok with single cab



[All values in mm]

Exterior dimensions

Length	5254 mm
Width	1944 mm
Height	1820 mm
Wheelbase	3095 mm
Track width at the front	1648 mm
Track width at the rear	1644 mm
Length of loadbed	2205 mm
Width of loadbed	1620 mm
Loadbed	3.57 m^2
Loading width between the wheel houses	1222 mm
Height of tailboard	508 mm

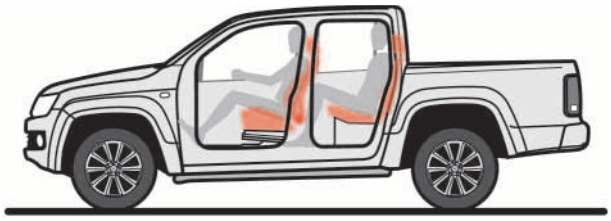
ML1 - ML3 = Measurement loads 1 to 3
The technical data relates to measurement conditions defined acc. to DIN 70020.

Interior dimensions

Amarok with double cab

Interior dimensions

Number of seats	5
Front legroom	1019 mm
Rear legroom	865 mm
Front headroom	1026 mm
Rear headroom	1008 mm
Front entry height	520 mm
Rear entry height	529 mm
Front seat height	331 mm
Rear seat height	364 mm



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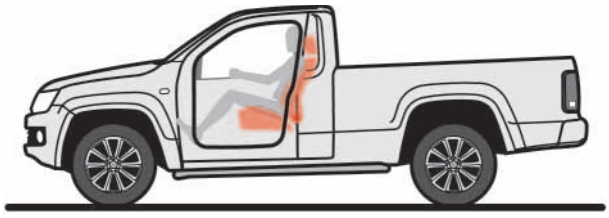
Amarok with single cab

Interior dimensions

Number of seats	2
Front legroom	1019 mm
Front headroom	1026 mm
Front entry height	520 mm
Front seat height	331 mm



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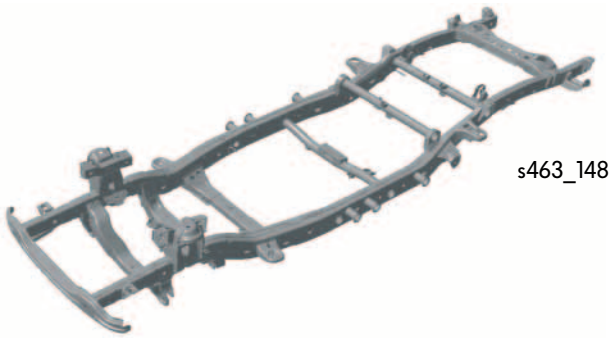
Further technical data

Turning circle	12.95 m
Ground clearance at front	249 *** mm
Fording depth	500 mm
Tank volume	80 l
Coefficient of air resistance	0.43 c_w

*** ML1

The frame construction

The Amarok has a sturdy ladder frame, two versions of which are produced for the layout with single or double cab. Both versions differ in terms of the side impact protection as well as the number and location of mounting points for the loadbed (cargo box) and the cab body. This means the loadspace is connected to the frame structure independently from the cab.



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The engine mounts and the connections for the suspension links are welded onto the frame.
No high and ultra-high strength steels are used for constructing the frame, meaning that repairs to the frame can be carried out in accordance with the applicable repair instructions using a metal active gas welding system (CO_2 welding).

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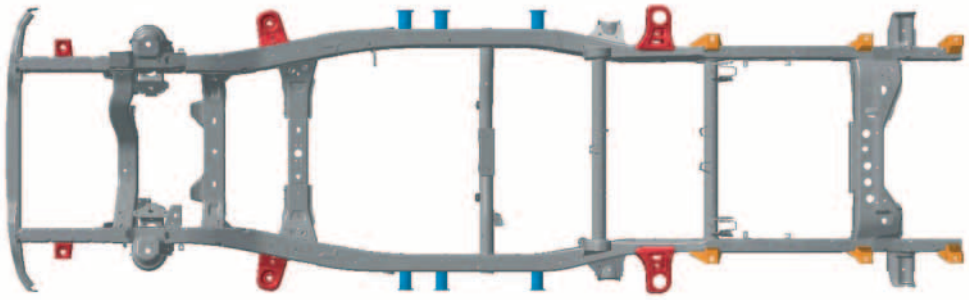

Frame structure of the Amarok with double cab

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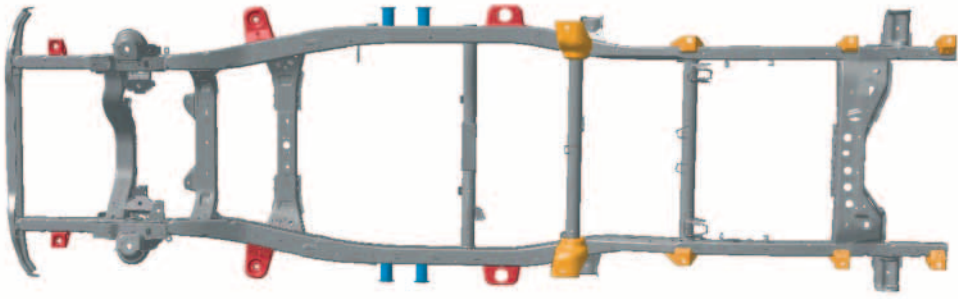

Frame structure of the Amarok with single cab

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- Cab mounting points
- Loadbed (cargo box) mounting points
- Side impact protection

The cab structure

The double cab

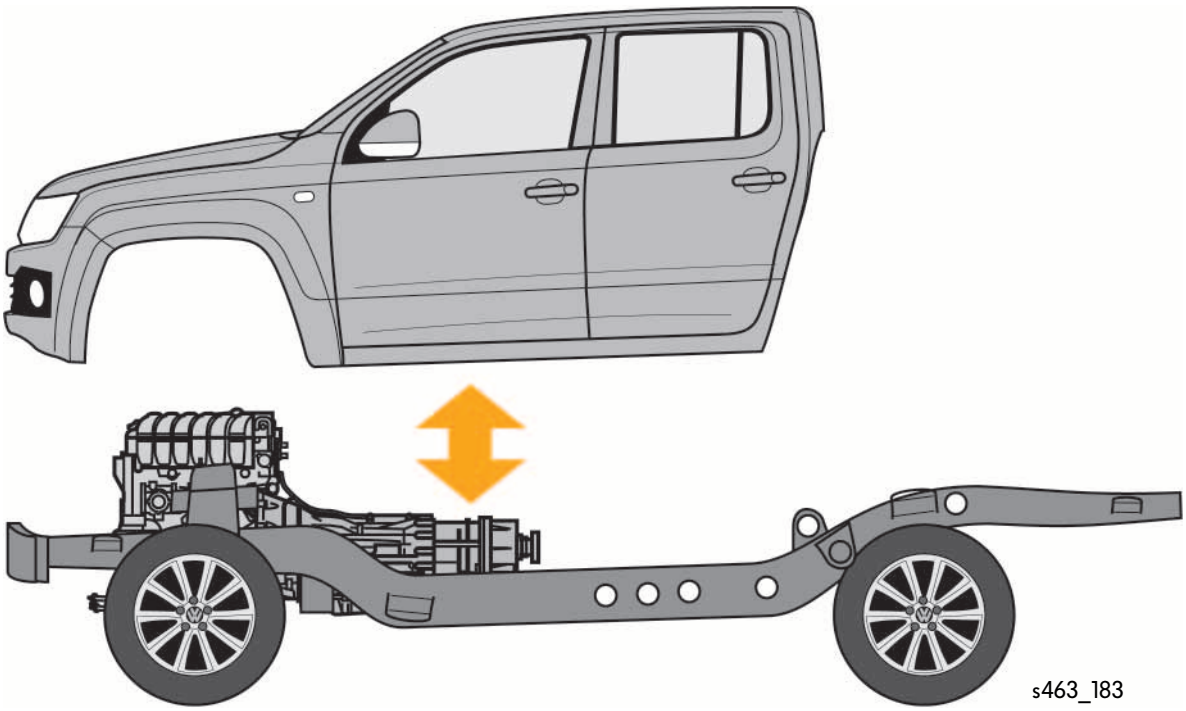
The double cab provides plenty of space for 5 people.

It is fully galvanised to protect against corrosion. The double cab is bolted onto the ladder frame at 6 connection points. It can be removed and fitted together with all its equipment.

All equipment lines can be ordered with the double cab.

The single cab

The single cab is installed as standard in the basic version. It offers room for 2 people. The single cab is also fully galvanised and can be removed and fitted together with all its equipment.



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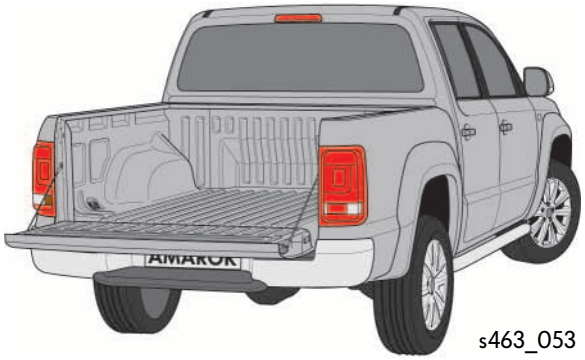
The loadbed

The loadbed (cargo box) of the Amarok has a width of 1.22 m between the wheelhouses.
This makes it possible to load a Euro pallet sideways from the rear.

Other advantages of the loadbed are the very tall side boards and what is, for a pickup, a very low loading sill.

The loadbed is fully galvanised and can be lifted off the ladder frame fully.

The difference between the loadbeds of the double/ single cabs are the size and number of the connection points on the ladder frame, as well as their locations.



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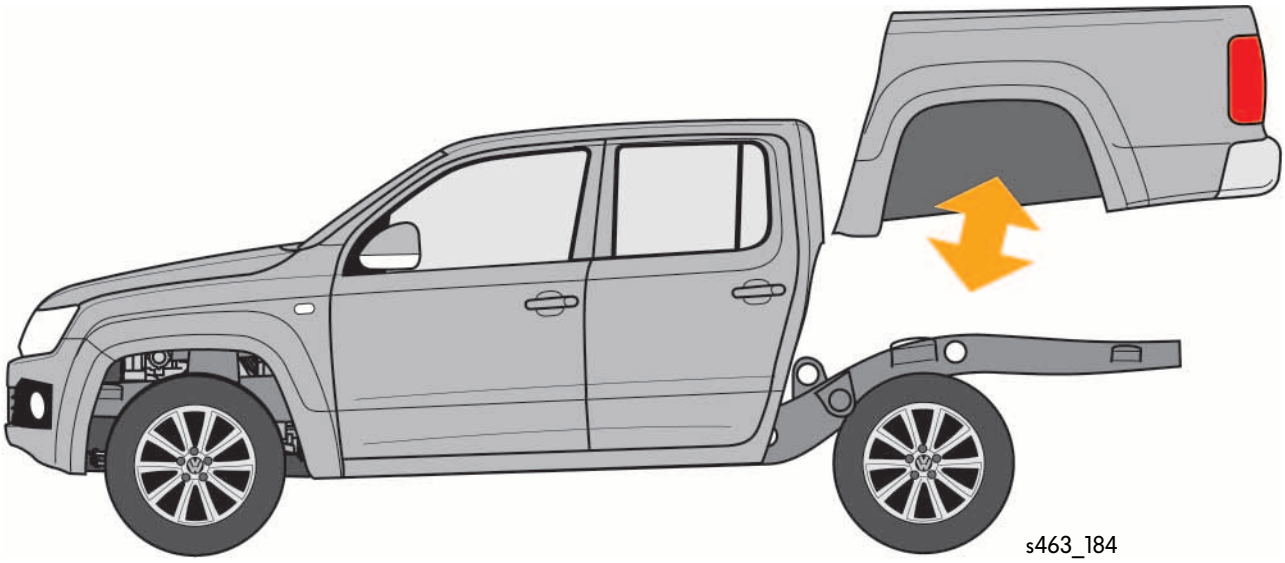

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The interior equipment

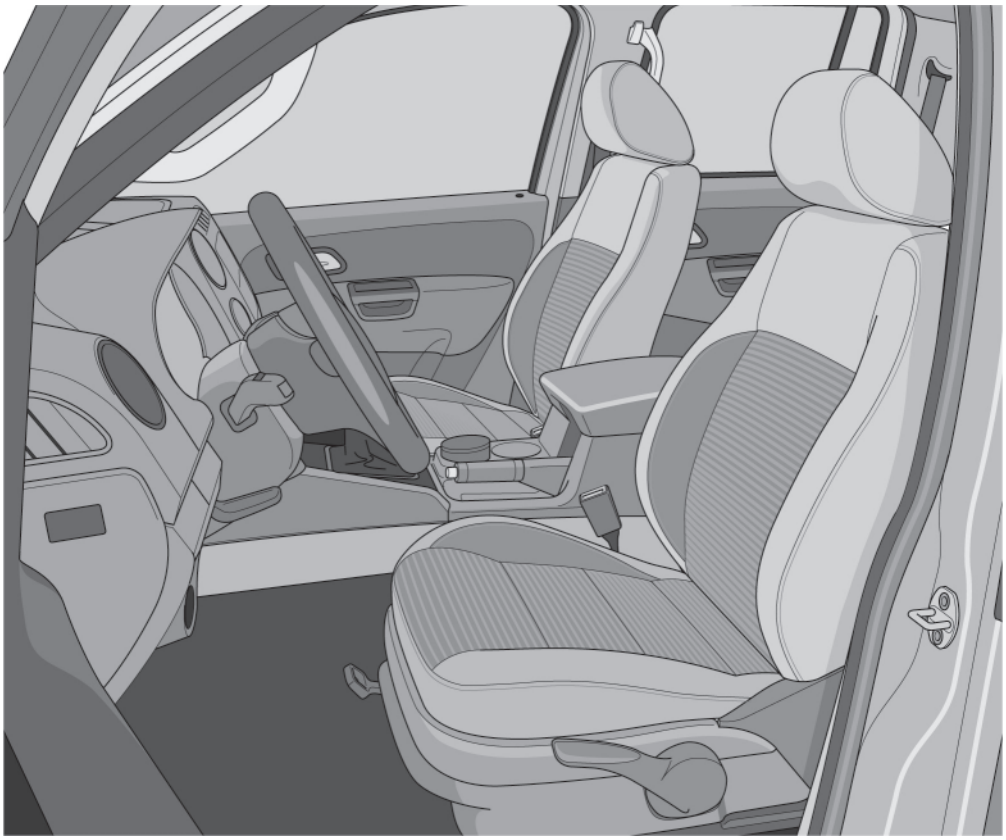
The interior of the Amarok offers generous space. The driver and front passenger seats have height adjustment. Large door apertures make it easier to get in and out. The steering wheel with adjustable rake and reach permits an ergonomic seat position to be achieved. All controls in the cockpit are clearly arranged and easy to reach.

The storage concept

The interior of the Amarok offers numerous storage opportunities in the front and rear.

Front storage

The storage concept comprises the compartments in the door trims and on the dash panel.
There is a storage compartment and cup holder in the centre console. The front cup holder is used in the smoking version for the ashtray.
The eyeglasses compartment in the headlining is installed in vehicles without an auxiliary heater. The storage concept is rounded off by drawers in the seat consoles and multi-fixing points on the dash panel.



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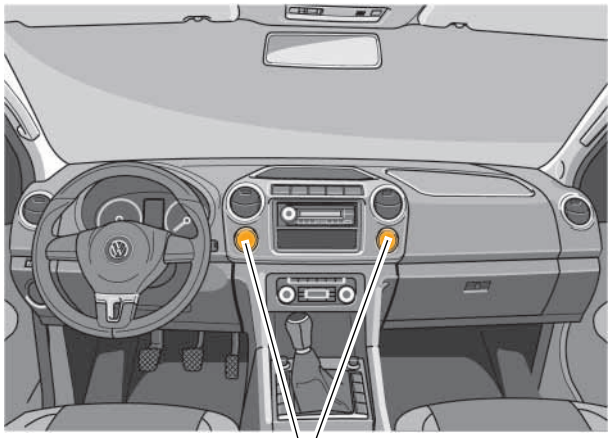

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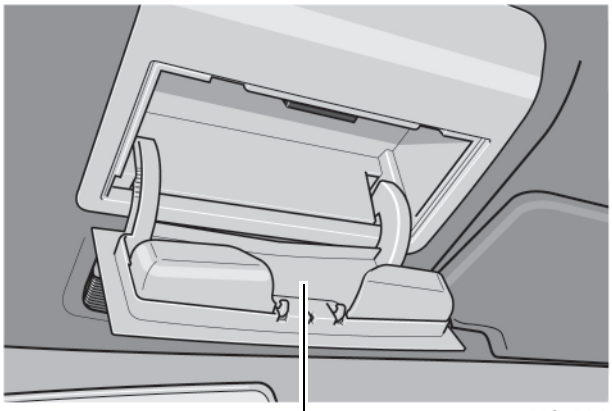
Multi-fixing points

Multi-fixing points

Approved Volkswagen accessories can be mounted on both multi-fixing points. These include picture holders, note holders, drinks holders or magnetic holders.



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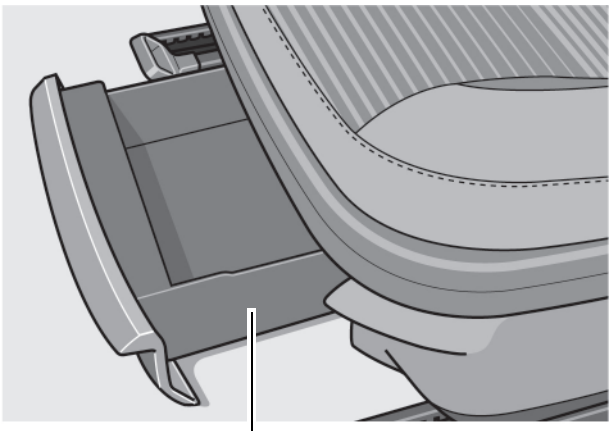
Eyeglasses storage

The eyeglasses compartment

This storage compartment is located in the vehicle headlining in vehicles without auxiliary heating.
It offers room for small and light objects, such as a pair of eyeglasses.

If the vehicle has auxiliary heating from VW Accessories then the eyeglasses compartment is not installed, and its place is taken by a roof display.



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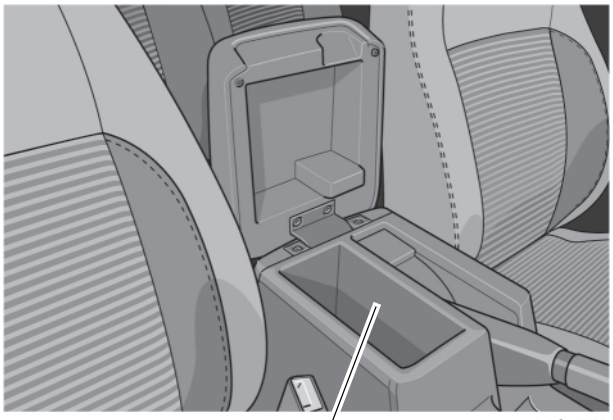
Opened drawer

The storage compartment under the front seats

The storage compartments under the driver and front passenger's seats offer additional storage space.
It is designed as a drawer and offers room for road atlases, for example.

The storage compartment in the centre console

There is also a storage compartment under the centre armrest in the Amarok Trendline and Highline.
It can be reached by folding up the armrest, and can accommodate small items.



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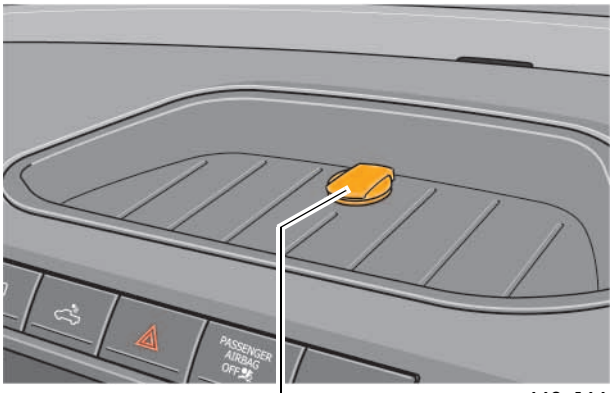
Opened storage compartment

The storage well on the dash panel

On the topside of the dash panel in the middle, there is a storage well with an integrated 12V socket.
If the Amarok is supplied without an airbag on the front passenger side, then a further storage well is fitted in the top part of the dash panel instead of the front passenger's airbag.



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12V socket

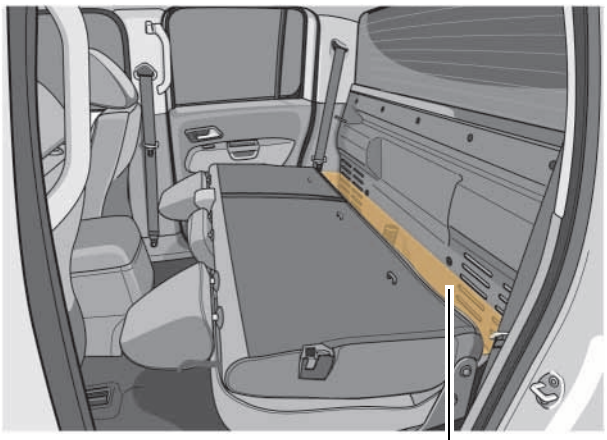
Rear storage

At the rear as well, the Amarok offers additional storage space:

- Compartments in the inside door trims
- A storage compartment in the centre console
- A storage compartment behind the rear seat bench

The storage compartment behind the rear seat bench

This storage compartment can be reached by folding the rear backrest forwards. It provides space for the warning triangle, toolkit and Tirefit set. The jack can also be fitted here as an option.



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Provided for accommodating the warning triangle and toolkit

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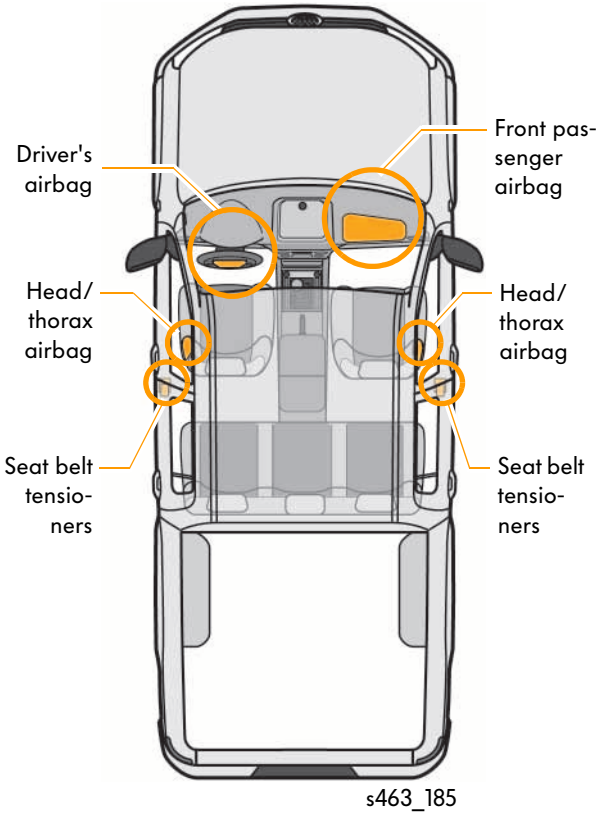
Belt tensioners and airbags

The following airbag combinations can be ordered for the Amarok in the specific markets:

- Airbag for driver
- Airbag for driver and front-seat passenger, without FSP airbag deactivation
- Airbag for driver and front-seat passenger, with FSP airbag deactivation
- with side airbag at front (head/thorax airbag)
- without side airbag
- without airbags

Rack-type belt tensioners are fitted if the vehicle is equipped with airbags.

The Amarok can be ordered with and without seat belt fastening warning.



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Rack-type belt tensioner

The Amarok uses electric belt tensioners. The seatbelt is tightened using a toothed rack inside the housing.


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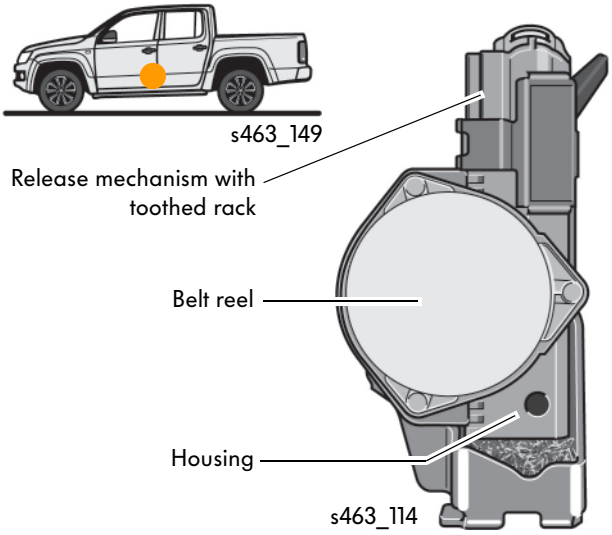

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For more information about belt tensioners, please refer to SSP 353 "Occupant protection - Passive systems".

Driver's airbag in the steering wheel

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Front passenger's airbag above the glove compartment

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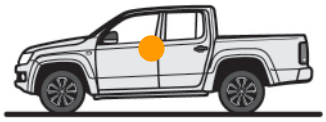
Driver and front passenger airbags

If the Amarok is equipped with driver and/or front passenger's airbags, then triggering is performed using the sensors integrated in the airbag control unit.



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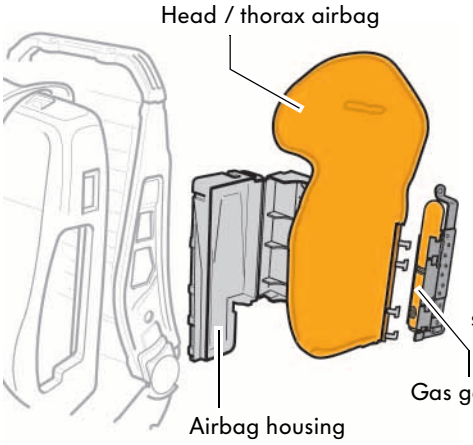
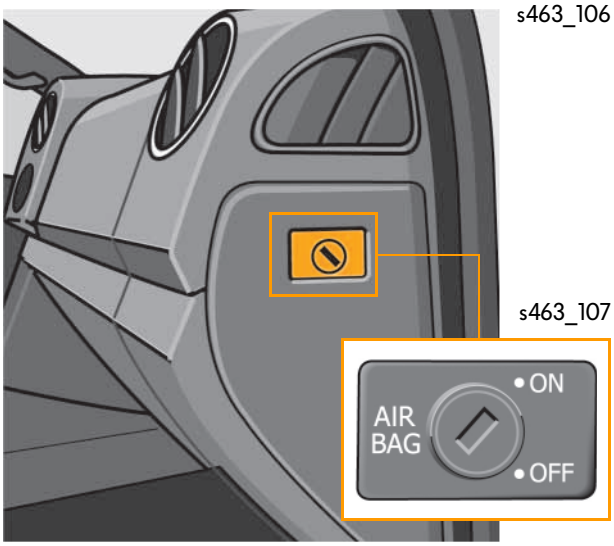


Head/thorax airbag for driver and front passenger seats

Depending on equipment, the front seats are fitted with head/thorax airbags at the sides, in the seat backrests. In case of a side impact, they protect the head and upper body against injuries caused by the bodywork.
Side-impact sensors are installed in the B-pillars, which are responsible for triggering.



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Deactivation of the front passenger airbag

The key-operated switch for airbag deactivation of the front passenger airbag is installed on the end of the dash panel on the front passenger side.

Power units

The Amarok 2010 is available with three engine variants:

- 2.0l 120kW TDI engine with biturbo unit
- 2.0l 90kW TDI engine with VTG turbocharger
  (VTG - exhaust turbocharger with variable turbine geometry)
- 2.0l 118kW TSI engine

The 2.0l 120kW TDI engine with biturbo unit

Special features

- Exhaust manifold module with biturbo unit
- Cylinder block with additional cooling galleries
- Piston with cooled ring groove

This engine achieves its maximum torque of 400Nm at 1500rpm.
The maximum power of 120kW is achieved at 4000rpm.

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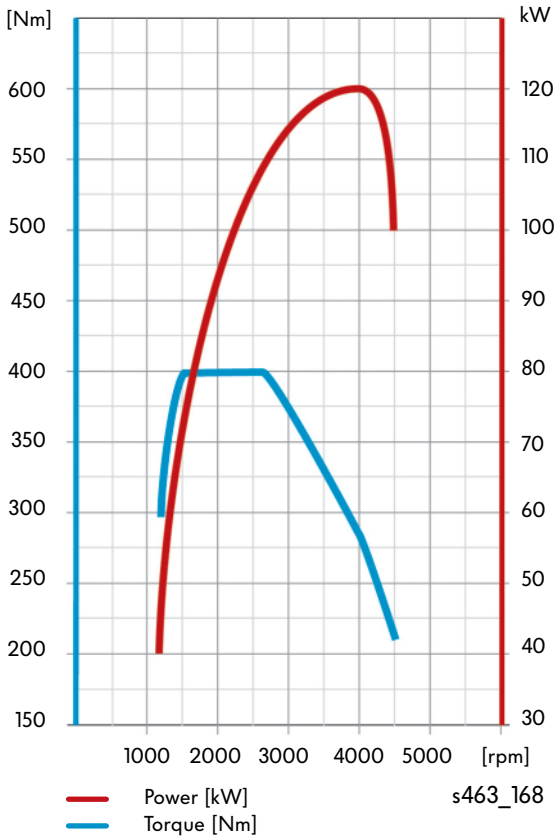
Technical data

Engine code	CDCA
Design	4-cylinder diesel engine
Cubic capacity	1968cm^3
Bore	81mm
Stroke	95.5mm
Valves per cylinder	4
Compression ratio	16.5 : 1
Max. power	120kW at 4000 rpm
Max. torque	400Nm at 1500 to 2500 rpm
Engine management	EDC 17CP 20
Turbocharger	Biturbo unit
Injection system	Common rail
Diesel particulate filter	no: EU3, EU4 yes: EU5, PL5
Exhaust gas recirculation	yes
Emissions standard	EU3, EU4, EU5, PL5

Power and torque curve



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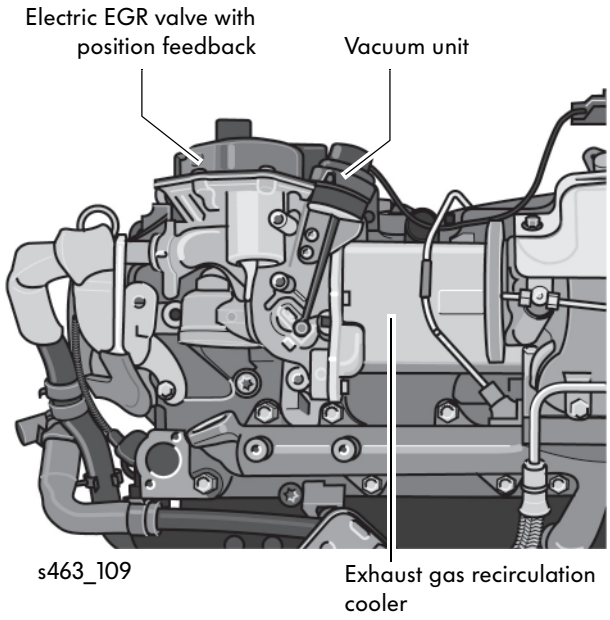
Technical features

Exhaust gas recirculation

Exhaust gas recirculation in the 2.0l 120kW TDI engine is controlled by an electrically operated exhaust gas recirculation valve (EGR valve) with position feedback. The bypass flap of the exhaust gas recirculation cooler is actuated by a vacuum unit.

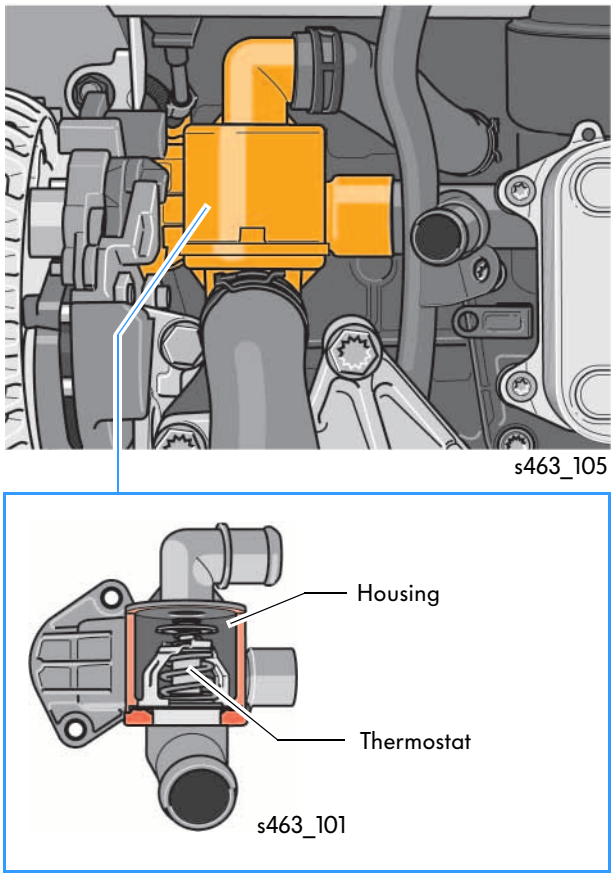


The cooling circuit

The thermostat

The 2.0 l TDI engines in the Amarok use an externally located 4/2-way thermostat.
The thermostat and housing are one component and can only be renewed together.

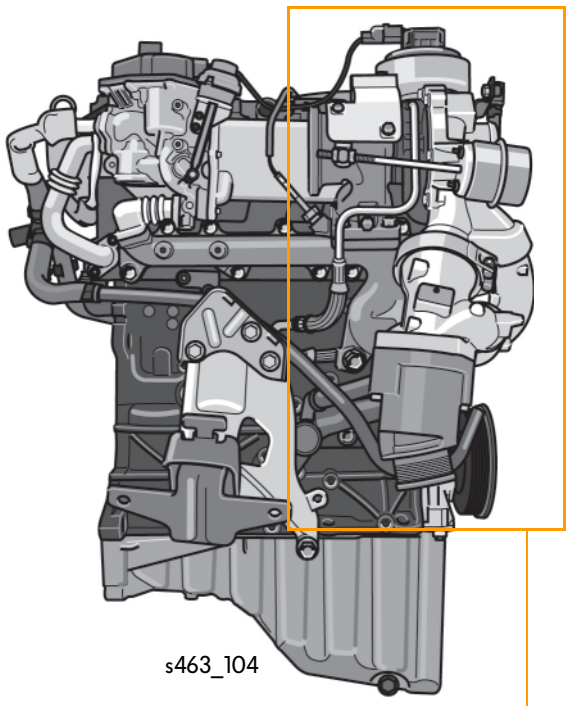
The thermostat on the engine



Detailed information about the structure of 2.0l TDI engines can be found in self-study programme 455
"The 2.0 l TDI engines in the T5 2010".

The biturbo unit

The biturbo unit of the 2.0l TDI engine with 120kW has a combination of low-pressure and high-pressure exhaust turbocharger to provide the charge pressure to meet all performance requirements.
The charge pressure is controlled using a control flap, a waste gate and a compressor bypass.



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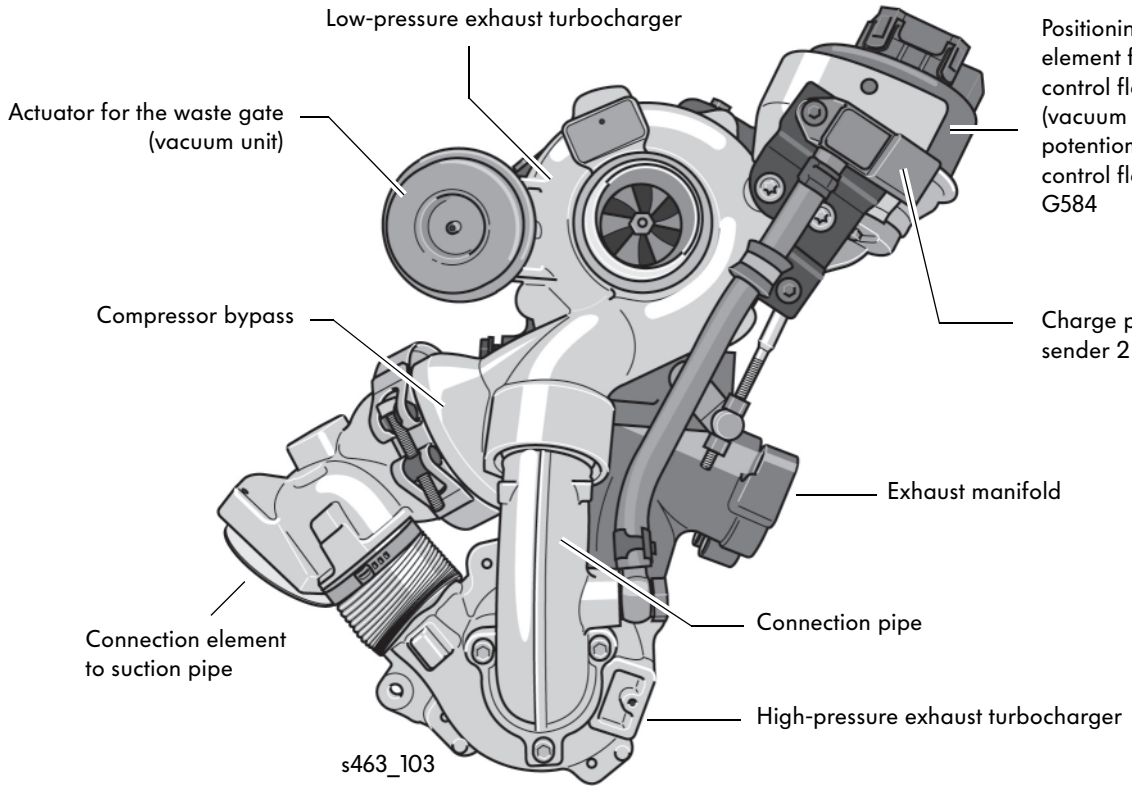

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Detailed information about how the biturbo unit and the charge control function can be found in self-study programme 455 "The 2.0 l TDI engines in the T5 2010".

The 2.0l 90kW TDI engine with VTG exhaust turbocharger

Special features

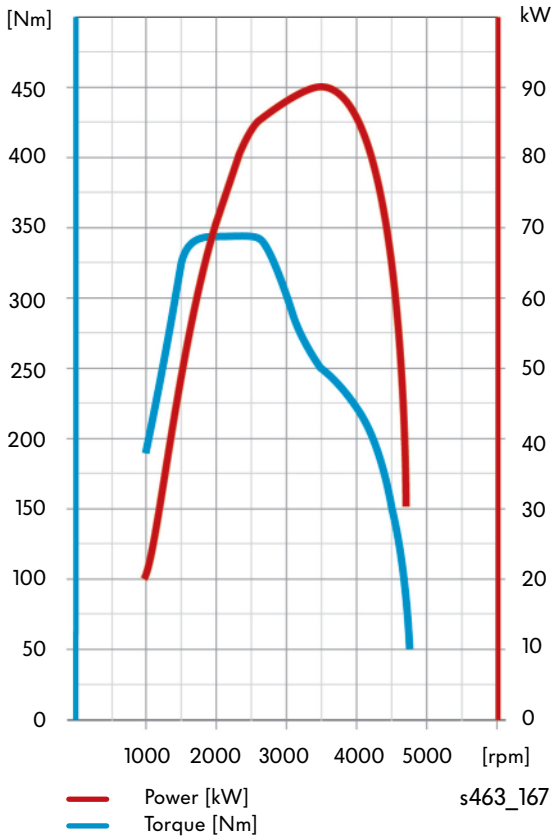
- Common rail injection system
- Diesel particulate filter (EU 5)
- Exhaust gas recirculation through the cylinder head
- Plastic inlet manifold
- Exhaust turbocharger with variable turbine geometry (VTG exhaust turbocharger)

s463_191

Technical data

Engine code	CDBA
Design	4-cylinder diesel engine
Cubic capacity	1968 cm^3
Bore	81mm
Stroke	95.5mm
Valves per cylinder	4
Compression ratio	16.5 : 1
Max. power	90kW at 3500 rpm
Max. torque	340Nm at 1750 to 2500 rpm
Engine management	EDC 17CP 20
Turbocharger	VTG exhaust turbocharger
Injection system	Common rail
Diesel particulate filter	no: EU3, EU4 yes: EU5, PL5
Exhaust gas recirculation	yes
Emissions standard	EU3, EU4, EU5, PL5

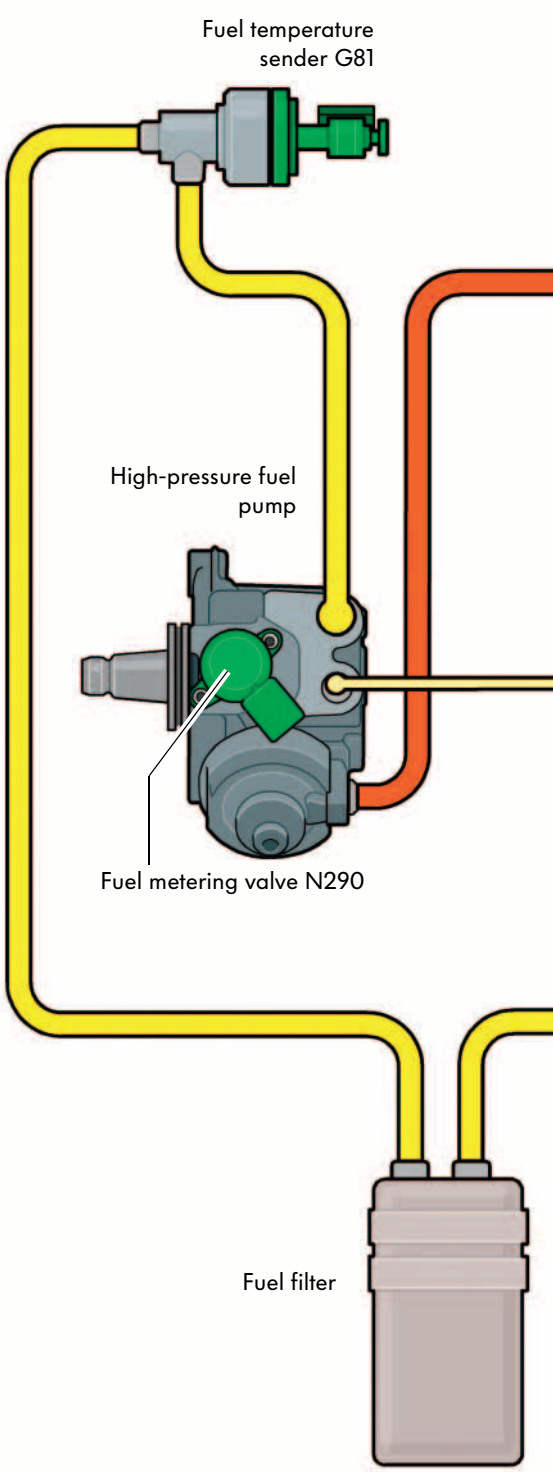
Power and torque curve



The fuel system

A Bosch common rail injection system is installed in the Amarok with 2.0l TDI engine (90kW and 120kW). The injection pressure is from 230 to 1800bar depending on the operating status.

The return pressure in this case is 4.5 – 6.0bar, depending on the operating pressure.
The fuel return from the injectors and the high-pressure accumulator is supplied to the fuel supply prior to the fuel filter. This means the fuel is preheated.

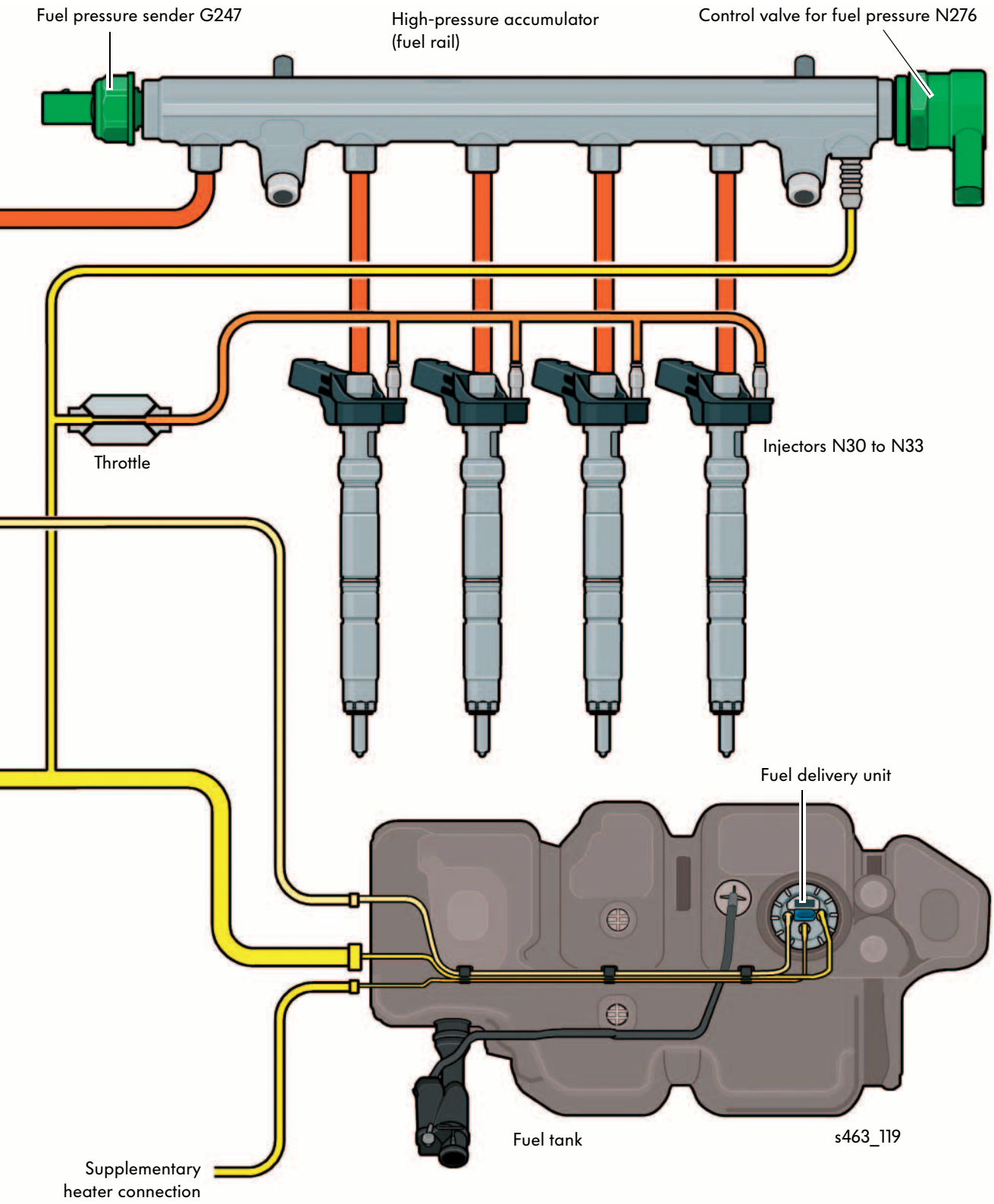


Fuel high-pressure with 230 to 1800bar

Return pressure from the injectors of 4.5 – 6.0bar

Preliminary pressurisation between additional fuel pump and high-pressure fuel pump of 6bar

Supply and return pressure


Fuel pressure sender G247
High-pressure accumulator (fuel rail)
Control valve for fuel pressure N276
Throttle
Injectors N30 to N33
Fuel delivery unit
Fuel tank
s463_119
Supplementary heater connection

The 2.0l 118kW TSI engine

Special features

- Belt-driven coolant pump module
- Upright filter on the top side of the engine
- Counter-rotating balancing shafts integrated into the cylinder crankcase

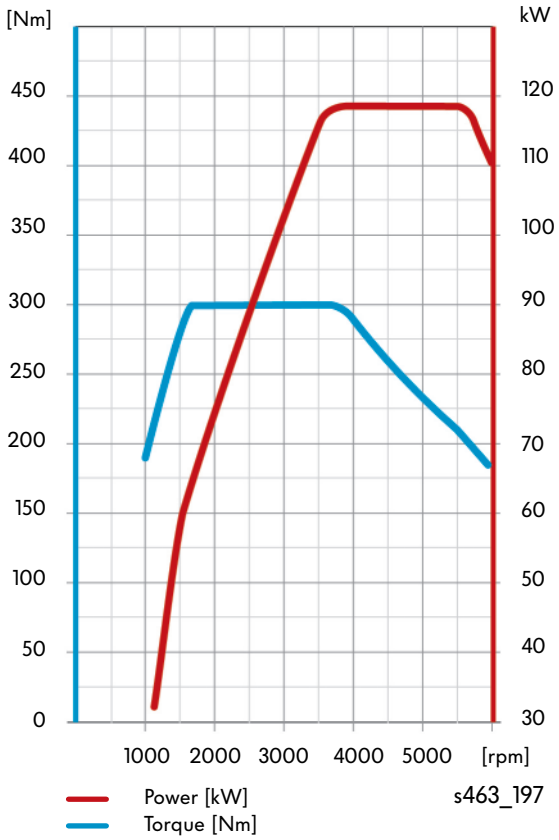
s463_072

For more information about the 2.0l TSI engines, please refer to self-study programme 401 "The 1.8l 118kW TFSI engine with timing chain".

Technical data

Engine code	CFPA
Design	4-cylinder petrol engine
Cubic capacity	1984cm^3
Bore	82.5mm
Stroke	92.8mm
Valves per cylinder	4
Max. power	118kW at 3800 to 5500 rpm
Max. torque	300Nm at 1600 to 3750 rpm
Turbocharger	Exhaust turbocharger with wastegate
Emissions standard	EU2 ddk., EU4

Power and torque curve



s463_117

The Amarok 2010 is available in three drive variants:

- With rear-wheel drive only
- With non-permanently engaged four-wheel drive
- With permanently engaged four-wheel drive

Therefore, the powertrain in the Amarok does not solely feature the standard 6-speed manual gearbox but, as an option, non-permanently engaged four-wheel drive with part-time transfer box or permanently-engaged four-wheel drive with Torsen transfer box.

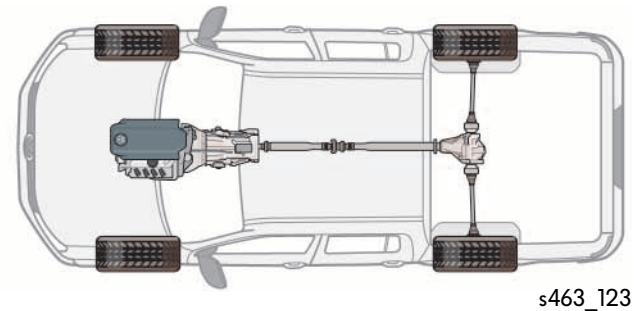
The gearbox, transfer box and both final drives are maintenance-free.

For detailed information about the structure and mode of function of the drive, please refer to self-study programme 464 "The Amarok 2010 - Powertrain and drive concept".

Overview of the drive configurations

Rear-wheel drive

This is the basic version of the driveline, and is optionally available with an electrically operated, mechanical differential lock.



s463_123

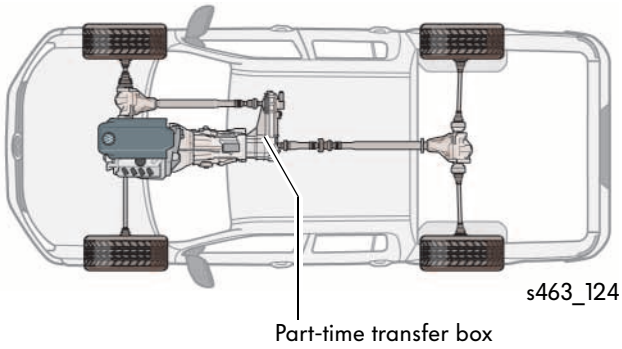
Non-permanently engaged four-wheel drive

This driveline configuration is a robust system that is specifically designed for offroad use.
It has a part-time transfer box which permits two gear stages:

1. Electrical engagement of front-wheel drive (4x4 HIGH)
2. Front-wheel drive engagement and an additional reduction stage (4x4 LOW).

A mechanical rear-axle differential lock is available as an option.

4MOTION s463_143



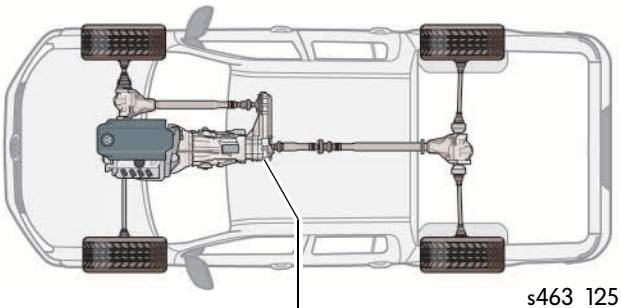
s463_124

Part-time transfer box

Permanent four-wheel drive

This variant of the driveline is a robust, solely mechanical system which is equally at home both onroad and offroad. Its heart is a Torsen transfer box with limited-slip interaxle differential.
A mechanical rear-axle differential lock is available as an option.

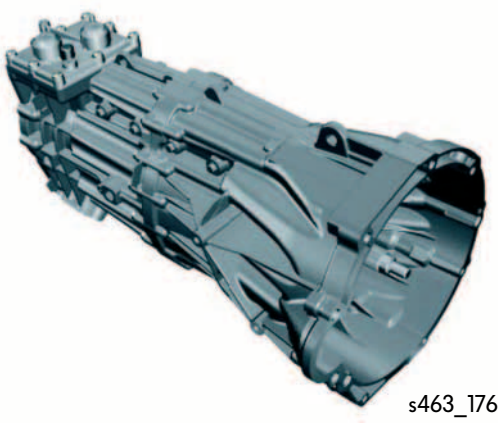
4MOTION s463_142



s463_125

Transfer box

The powertrain components



s463_176

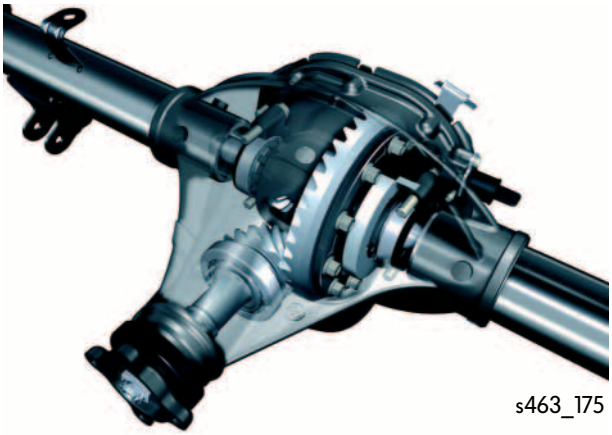
The 6-speed manual gearbox 0C6

The 6-speed manual gearbox is a 3-shaft gearbox. It has an input shaft, a coaxial output shaft and a lay-shaft. The gearbox is fitted inline, and can transmit a torque of 400 Nm. The gearshift transfer is by way of a selector linkage that is completely decoupled. This means the movements of the gearbox are not transmitted to the selector lever. The gearbox has a lifetime oil fill. The 6-speed manual gearbox is used with all engines in the Amarok.

s463_177

The front final drive

The front final drive features a bevel gear drive, and is offered with two ratios, 4.1 and 4.3. The ratio depends on the engine power. The diameter of the crown wheel is 195 mm for permanently engaged four-wheel drive and 175 mm for the non-permanently engaged four-wheel drive.



s463_175

The rear final drive

The bevel gear drive of the rear final drive is offered with two different ratios, depending on the engine power.

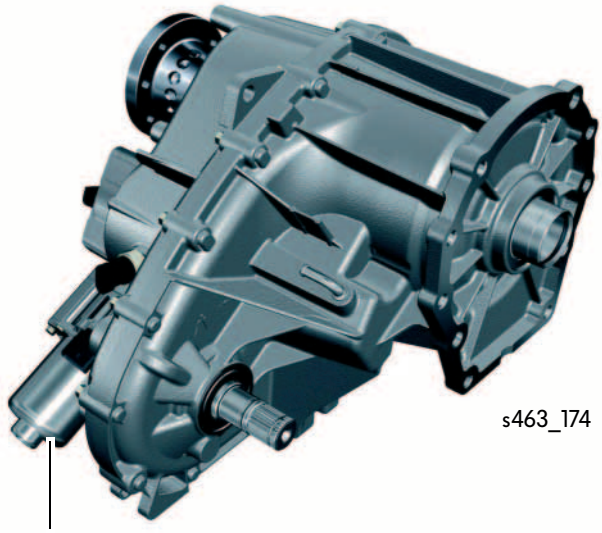
An electrically actuated, mechanical differential lock is available as an option for all vehicles.

The transfer box

The transfer box that is flange-mounted on the manual gearbox distributes the input torque from the gearbox to the front and rear axles.

The part-time transfer box

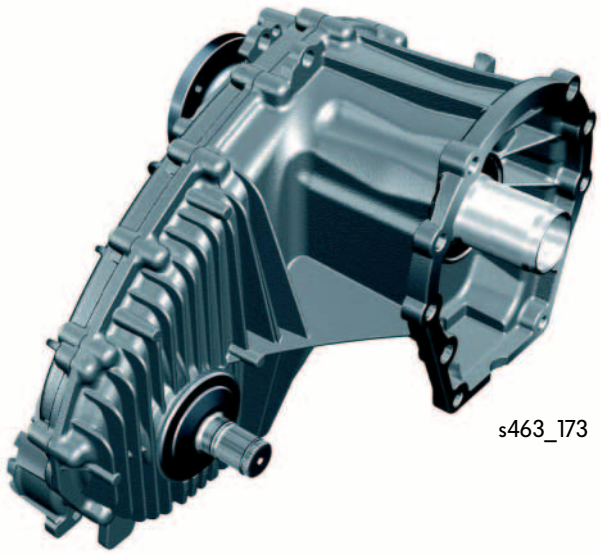
The part-time transfer box makes it possible to engage the front final drive (4x4 HIGH) and the additional reduction stage for four-wheel drive (4x4 LOW) electrically. It establishes a rigid connection to the front axle.
The engagement procedure is performed using a servo motor which engages the gear stages using two separate locking collars.



s463_174

The transfer box

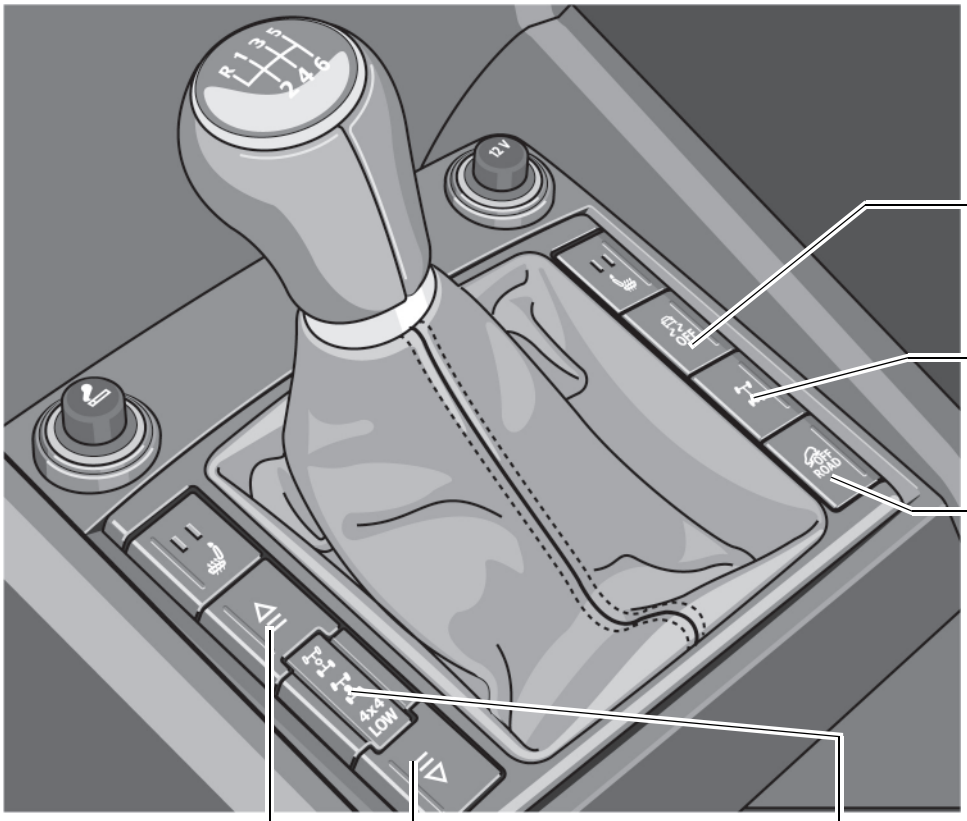
The transfer box utilised uses a planetary gearbox that permits permanent four-wheel drive with differential compensation between the front and rear axles. The drive torques are dynamically distributed with 40% to the front axle and 60% to the rear axle.



s463_173

For detailed information about the structure and mode of function of the 6-speed manual gearbox, please refer to self-study programme 464 "The Amarok 2010 - Powertrain and drive concept".

The controls for chassis regulation



TCS and ESP button E256

Rear differential lock switch F121

Driving programme button E598

s463_049

Switch for chassis programme E631

Running gear programme switch E631

Display unit for drive programme with the symbols (from above):
- Rear-wheel drive activated (4x2)
- Four-wheel drive activated (4x4 HIGH)
- Reduction stage activated (4x4 LOW)

The buttons for activating and deactivating the drive ranges, the differential lock and the offroad drive programme are positioned on the centre console. The drive programme switch means there is no need for a second selector lever.

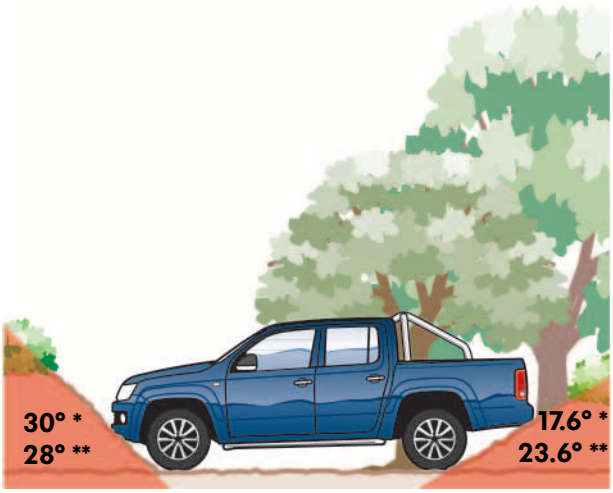
The activated drive ranges are represented on the display unit by the corresponding function lighting.

The offroad drive programme is fitted as standard in all vehicles.

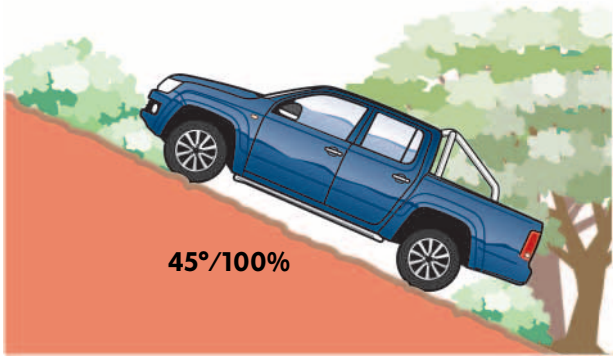
The running gear performance

The robust design of the bodywork and chassis means that the Amarok 2010 offers outstanding offroad capabilities in its four-wheel drive versions.

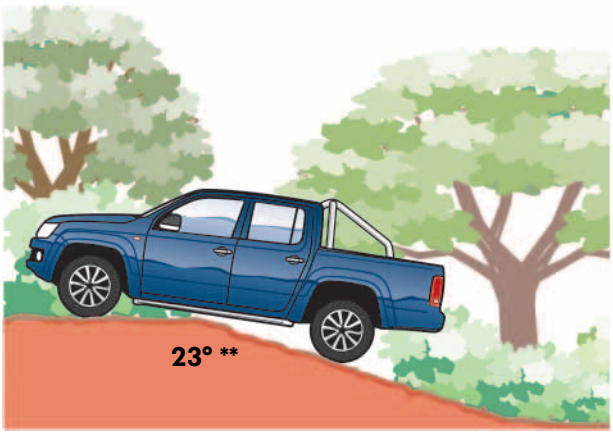
Offroad capabilities



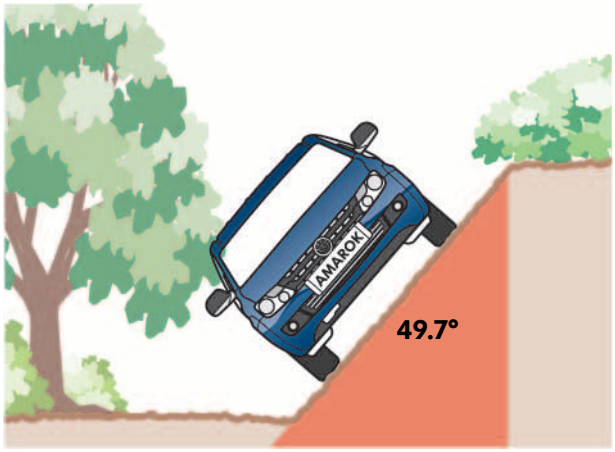
Entry angle to gradients front and rear s463_045



Hill-climbing ability s463_046



Ramp angle (without underbody guard) s463_047



Side lean s463_048

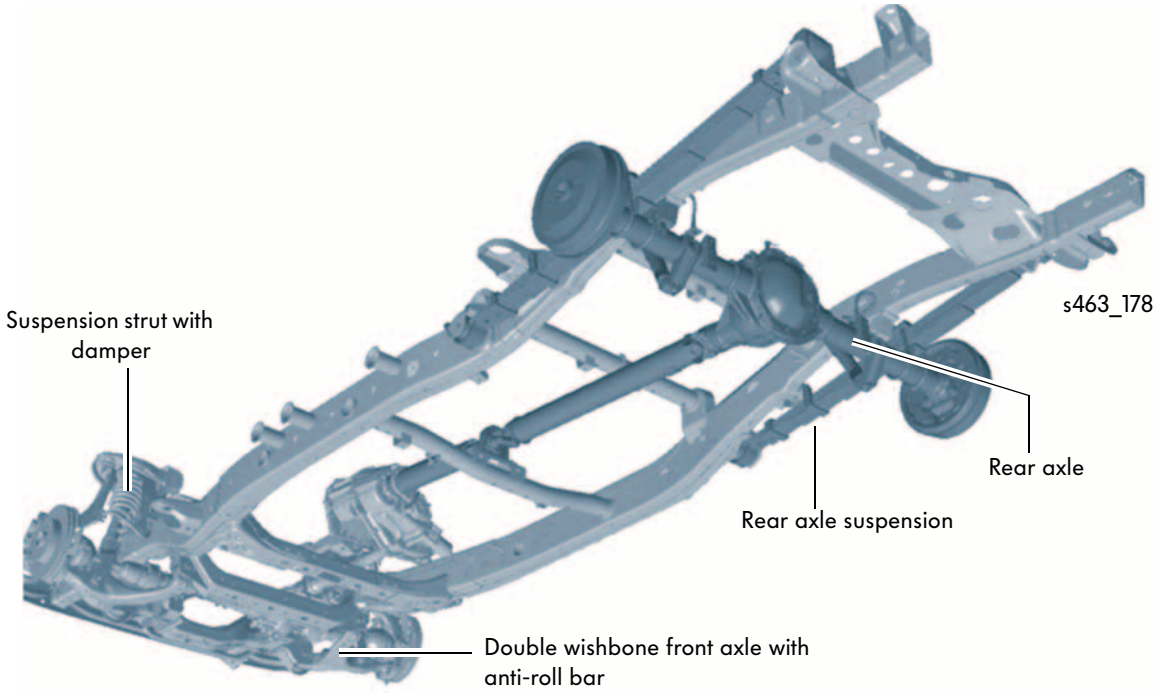
Additional data

Turning circle	12.95 m
Ground clearance at front	240 mm
Fording depth	500 mm

* Entry angle to gradients at rear: 22° without bumper, 17.6° with bumper; ML3

** ML1

The running gear components of the Amarok 2010



The running gear of the Amarok 2010 meets the exacting requirements based on commercial vehicles.

The properties of the Amarok 2010 running gear are as follows:

- Front axle
  - Independent suspension
  - 16-inch dual piston brake
- Rear axle
  - Rigid axle
  - Leaf springs and shock absorbers
  - Simplex drum brake

Running gear

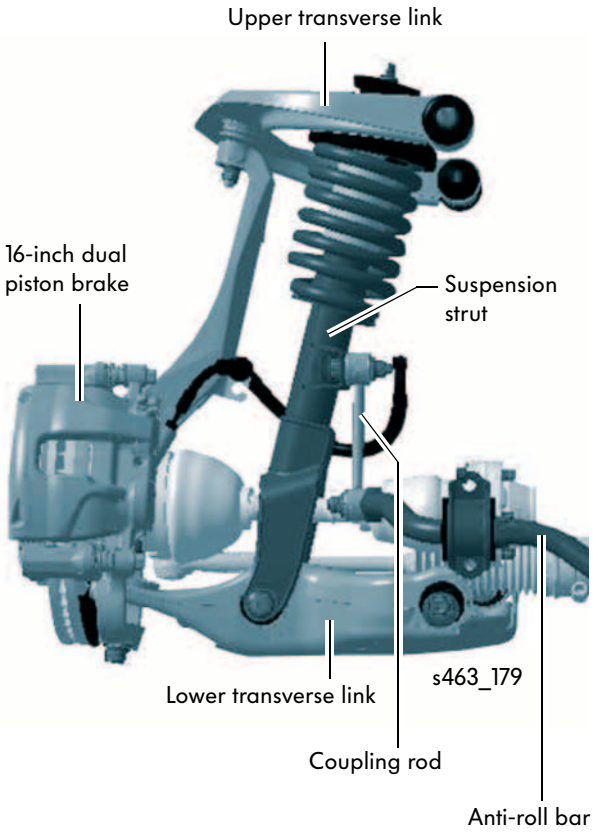
The front axle

The front axle of the Amarok is a robust double wishbone axle with anti-roll bar. The anti-roll bar is connected to the shock absorbers using coupling rods.

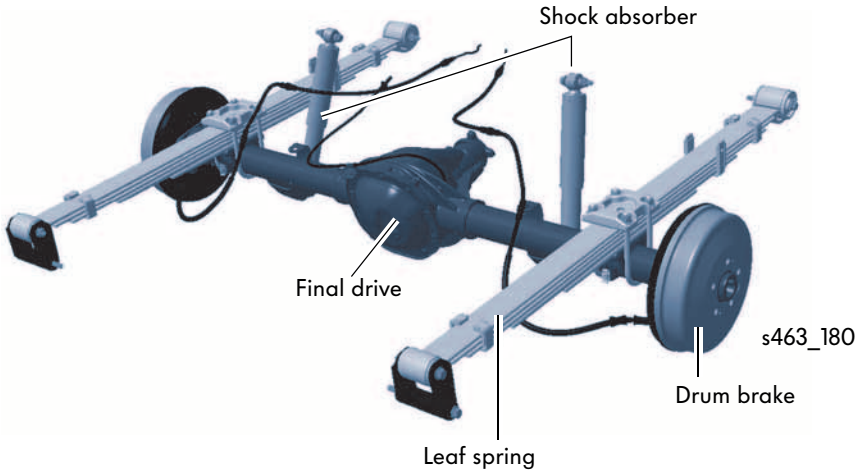
The front axle components are bolted onto the ladder frame.

A 16-inch double piston brake designed as a floating calliper brake ensures good deceleration.

The Amarok is equipped with hydraulic power steering.



The rear axle



The rear axle of the Amarok is a rigid axle, as is typical in commercial vehicles. Leaf springs and shock absorbers provide a high payload and secure cornering.

The rear axle is available with comfort suspension or heavy duty suspension.

The suspension

Two versions are available for the suspension on the rear axle:

- Comfort suspension
- Heavy duty suspension

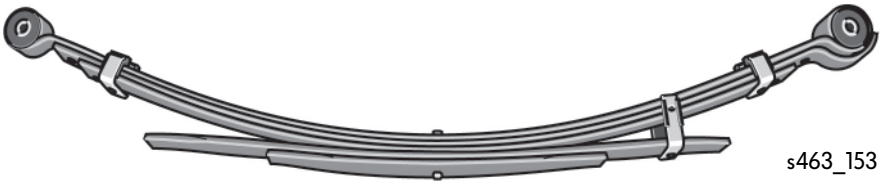
The comfort suspension

s463_154

This consists of two 2+1 spring packs and offers:

- Better driving comfort
- a lower weight (approx. 10kg per spring pack)
- Better vibration and noise comfort due to low friction between the leaf spring layers

The heavy duty suspension

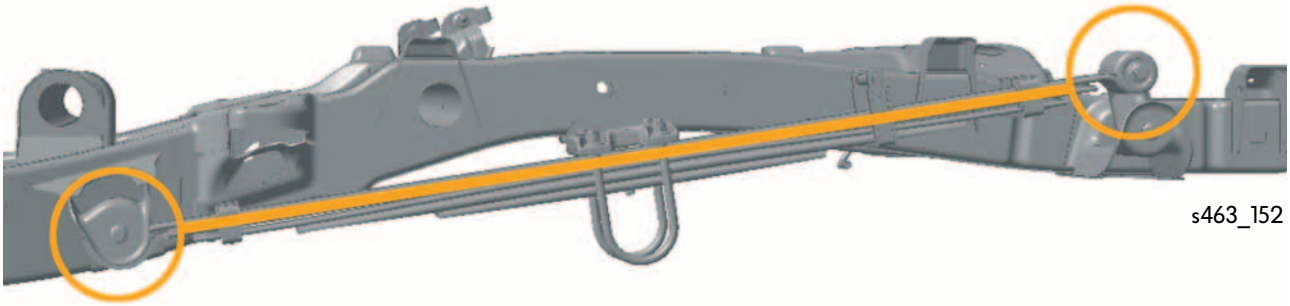


s463_153

This consists of two 3+2 spring packs and offers:

- Higher payload
- High overload protection
- Generous performance margin when driving on very poor roads

Connection of the suspension to the body frame



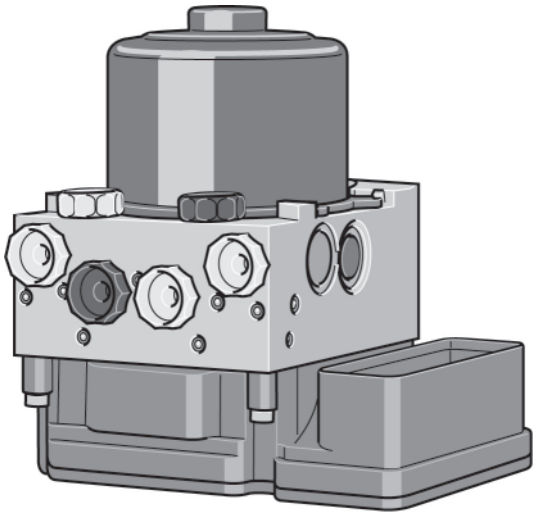
s463_152

A particular feature of the suspension connection is that the rear attachment points of the spring packs on the frame structure are located higher up than the front attachment points.

This design measure enables:

- Loadbed on a lower level
- Taller side boards for the loadbed
- Greater cornering stability due to lower vehicle centre of gravity

The electronic brake system



ABS unit s463_155

The ABS/ESP system in the Amarok is controlled by the MK25AXT unit made by Continental Teves.

The ABS unit and ABS control unit are combined into one component.

The electronic brake system includes the following functions:

- Traction control system TCS
- Anti-lock braking system ABS
- Electronic differential lock EDL
- Electronic brake force distribution EBD
- Engine drag torque control (MSR)
- Yaw rate reduction GRR+
- Hydraulic braking assistant HBA
- Rear axle full braking HVV
- Brake disc drying function BSW
- Brake prefill
- Option hill descent control
- Optional hill-hold assist
- Trailer stabilisation*
- Offroad ABS
- Emergency warning flash

* If tow hitch preparation fitted

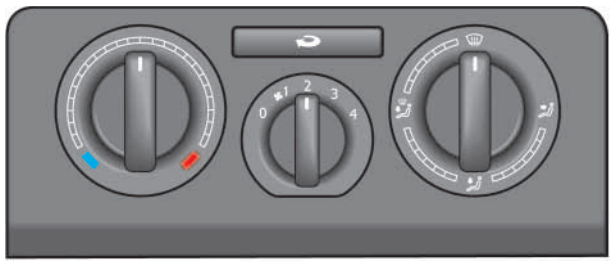
Heating and air conditioning

The equipment variants

The Amarok can be equipped with manual heating, semi-automatic Climatic or the fully automatic Climatronic.

Manual heating and ventilation

- Manual setting of air distribution and temperature
- Flexible shafts for adjusting the flap mechanism on the heater
- Manual setting of blower speed
- Recirculating air flap operated by a servo motor



s463_181

The semi-automatic Climatic air conditioning system

- Manual adjustment of the air distribution and fan speed
- Manual temperature preselection
- Temperature measurement by interior sensor
- Automatic control of temperature to achieve the specified value as quickly as possible and keep it constant

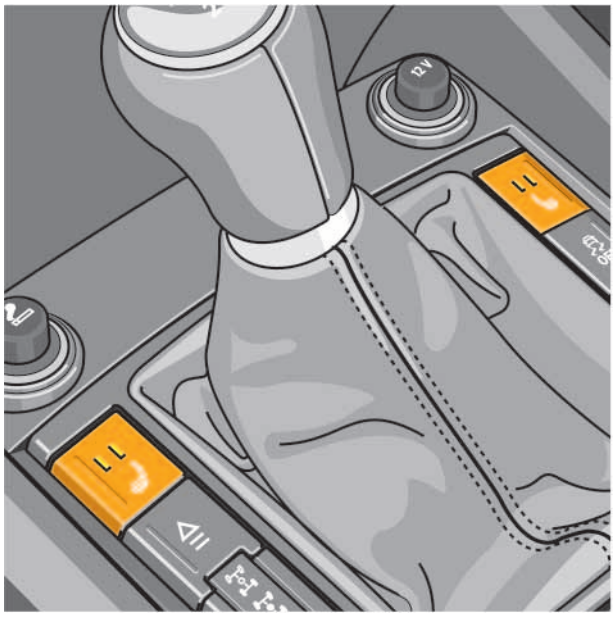
s463_182

Fully automatic Climatronic air conditioning system

s463_034

- Fully automatic adjustment of air distribution flaps, blower speed and adjustment of interior temperature in two zones
- "Auto High" automatic mode with optimised air quantity control:
  - For rapidly reaching the set temperatures in the passenger compartment
  - To counteract possible fogging of the windows
- "AUTO Low" automatic mode with air quantities adjusted for acoustic comfort and smooth temperature control
- All important influencing and disruption variables (e.g. position of the sun, exterior temperature) are registered by the electronic control unit and taken into account in the temperature control
- The air distribution is displayed on the RCD 310, 510, RNS 315 infotainment devices

Operation of the seat heating



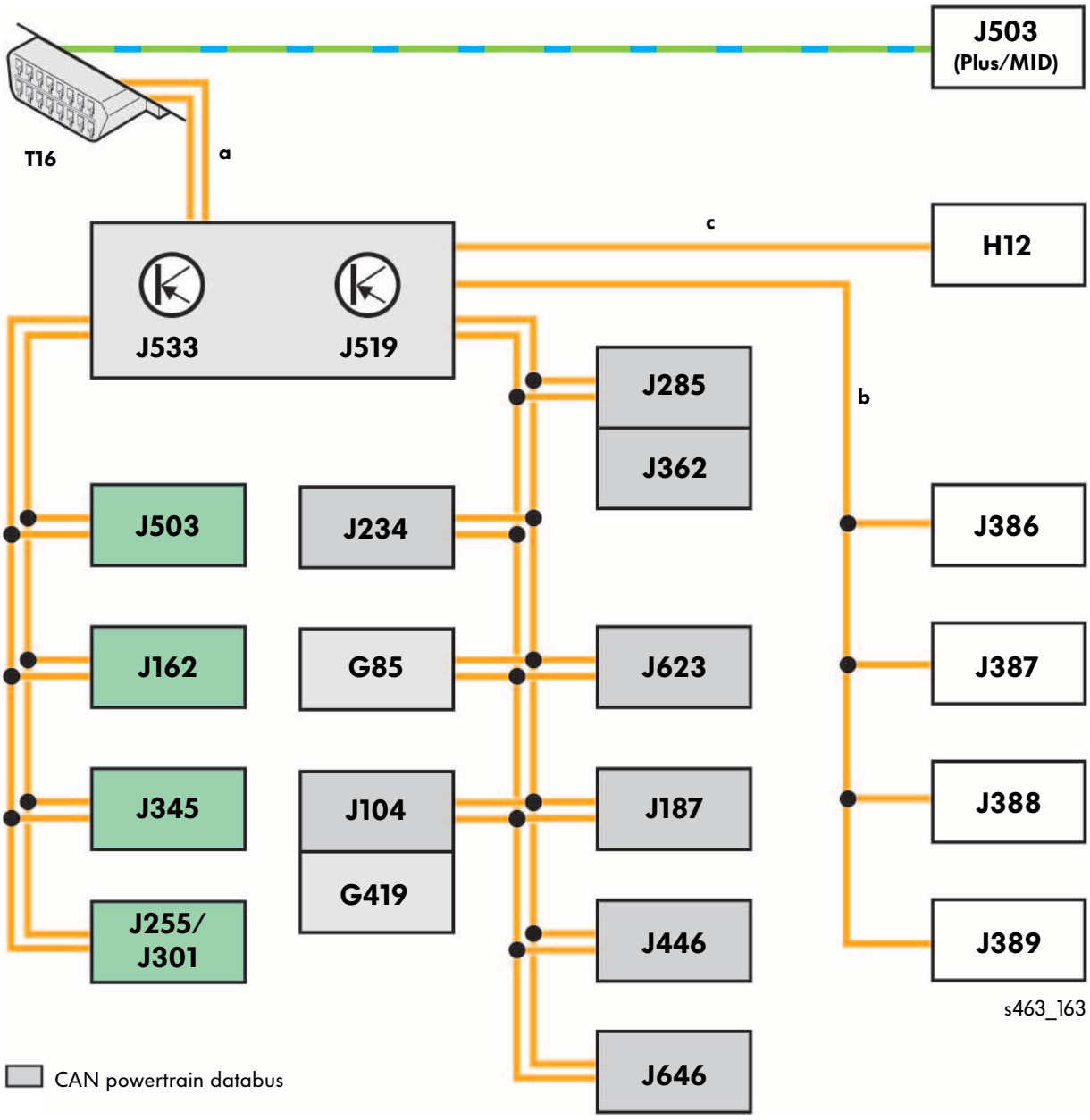
Control buttons for the seat heating in the centre console

s463_193

The seat heating can be switched on when the command is given by the onboard supply control unit (load management).
The heating elements are activated by the control unit for seat heating.

The buttons for operating the seat heating are located in the button panels on the left and right of the selector lever in the centre console. If the seat heating is switched off and the button is pressed once, this means the seat heating is switched on at level 2. Another press switches the seat heating back one level and a third press deactivates the seat heating.

The networking concept



- CAN powertrain databus
- CAN databus comfort/infotainment
- CAN databus sensor
- LIN databus
- CAN databus cable
- LIN databus cable
- K-wire

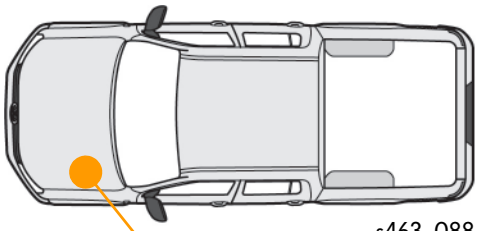
a CAN diagnostic databus
b LIN door databus
c LIN databus
Alarm system

	Name	Installation location
G85	Steering angle sender	On the steering column
G419	ESP sensor unit	In ABS control unit
H12	Alarm horn	Engine compartment, on right next to plenum chamber
J104	ABS control unit	In engine compartment
J162	Water heater control unit	Engine compartment, on left headlight
J187	Control unit for differential lock	On centre tunnel at handbrake
J234	Airbag control unit	On centre tunnel at front
J255 J301	Climatronic control unit Air conditioning control unit	In dash panel, centre
J285 J362	Control unit in dash panel insert Immobilizer control unit	In dash panel on driver side
J345	Trailer detection control unit	In dash panel on driver side
J386	Driver side door control unit	On door inner panel of driver's door
J387	Front passenger side door control unit	On door inner panel of front passenger door
J388	Door control unit rear left	On the rear left door inner panel
J389	Door control unit rear right	On the rear right door inner panel
J446	Control unit for park distance control	Front passenger A-pillar (bottom)
J503	Control unit with display unit for radio and navigation system	In dash panel, centre
J519 J533	Onboard supply control unit Databus diagnostic interface	In relay and fuse carrier on driver side
J623	Engine control unit	Engine compartment, next to battery
J646	Transfer box control unit	On bulkhead above pedal mechanism
T16	Diagnostic connection	Dash panel at bottom close to A-pillar

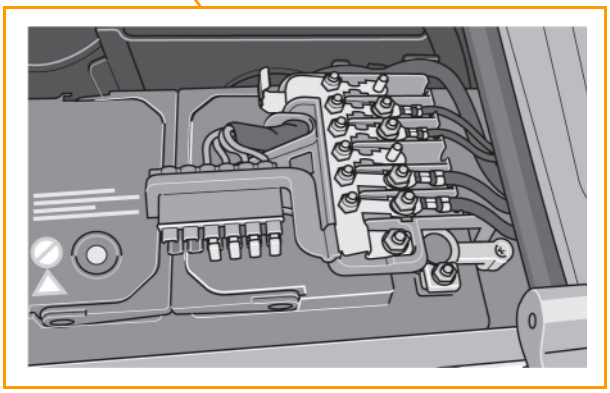
The fuse carriers in the engine compartment

The main fuses (SA) are located under a cover, connected to the battery connection cable on the positive terminal of the vehicle battery.

The fuse carrier of the SB fuses is located adjacent to it. It is protected against splash water by a closure cap.



s463_088

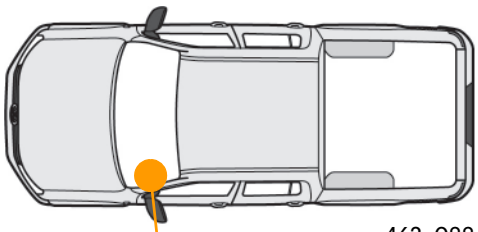


s463_136

In relay and fuse carrier in passenger compartment

The relay carrier is located on a bracket on the driver side underneath the instrument panel.
The holder is completely covered by the dash panel.

The SC fuse carrier is also attached to this holder.
The locking levers must be released in order to make the fuses accessible. Then, the fuse holder can be swivelled downwards.



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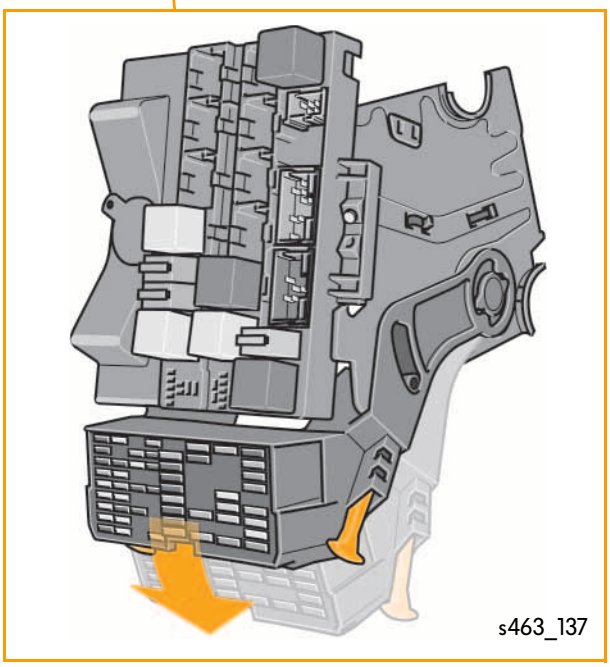

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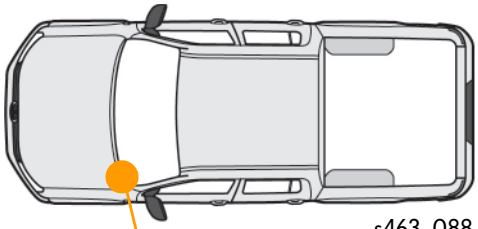

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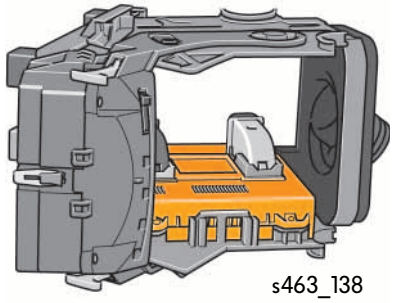


s463_138

Onboard supply control unit J519 in the holder of the relay and fuse carrier, front view

The onboard supply control unit J519

The onboard supply control unit is installed in the relay carrier/fuse carrier (SC) holder, below the dash panel on the driver side.
The control unit is connected to the onboard supply by two 73-pin connectors.

As already is the case in the T5 2010, it performs a wide range of functions for the onboard supply control unit, and includes the range of functions of a comfort control unit. The diagnostic interface for the databus J533 (gateway) is also integrated into the onboard supply control unit.

Functions

The range of functions depends on the equipment. More elaborate equipment increases the range of functions in each case, starting from the lower level of equipment by adding the functions listed in the table.
It includes the functions used in the Amarok with the current equipment - the complete range of possible functions of the onboard supply control unit is more extensive.

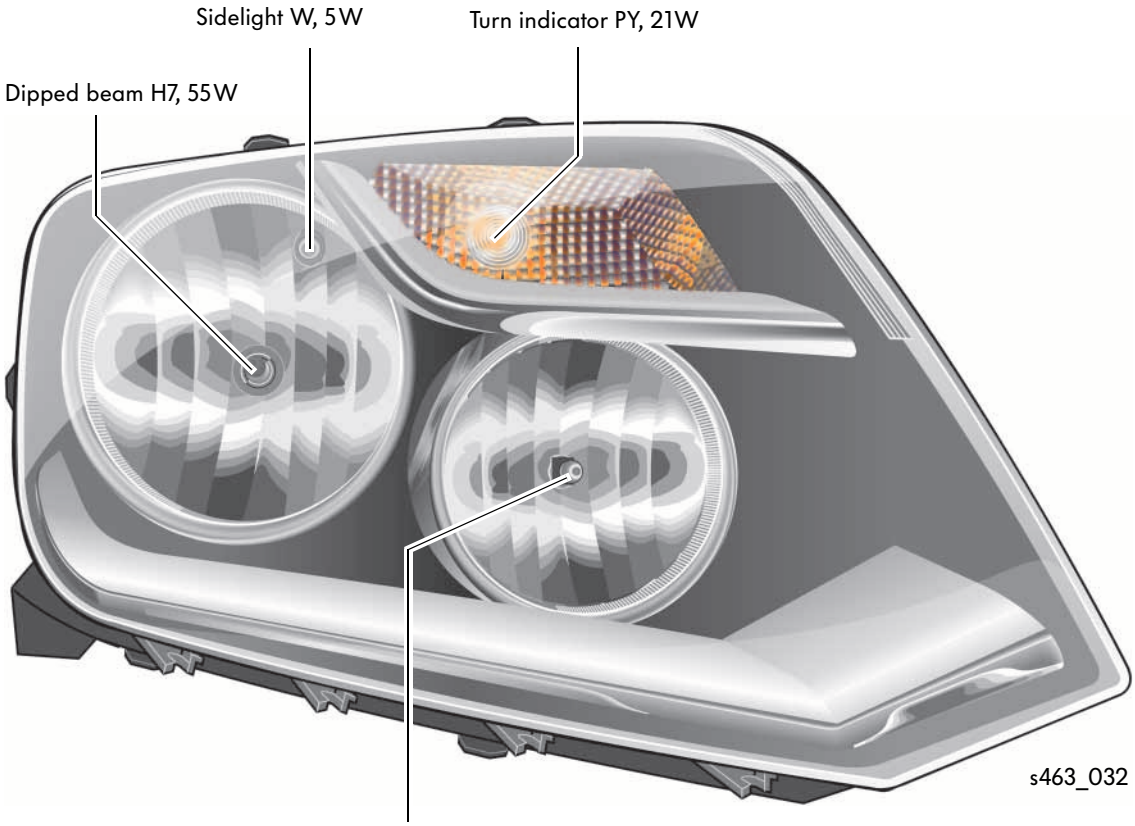
Control unit version	Range of functions in the onboard supply control unit
Basic+	- Load management, terminal control/detection - Control of the electric fuel pump - Control of the rear window heater, wiper - Control of the horn - Door contacts and interior light control - Control of the side lights and parking lights, turn indicator/hazard warning lights, brake lights - Diagnostic interface databus, CAN powertrain, CAN diagnosis
Medium+	- Central locking - Alarm system - Exterior mirror heating, seat heating enable - Comfort CAN, LIN door databus
Medium++	- Radio remote control (433 MHz or 315 MHz)
High+	- Cruise control system - LIN theft alarm databus (alarm horn)

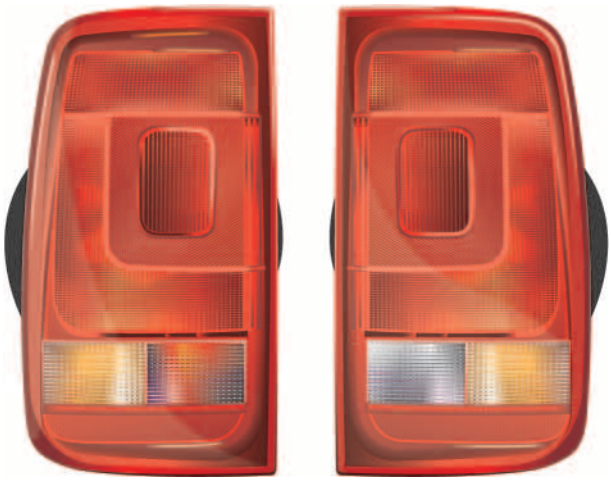
The lighting system

Headlights

Different headlights are fitted in the Amarok depending on the market and equipment:

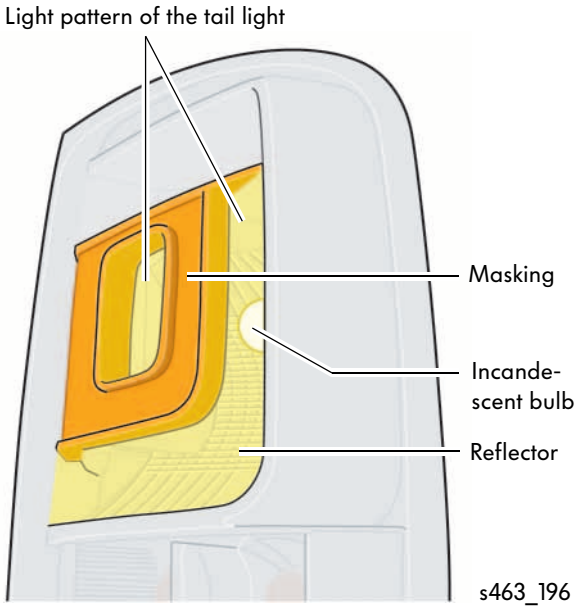
- Headlights with headlight range control with H15 bulb for main beam and daytime running light
- Headlight without headlight range control with H1 bulb for main beam
  (not for RHD vehicles)





s463_033

Creation of the light pattern for the tail light



Housing of the rear light without coloured lens

The rear lights

The rear lights of the Amarok 2010 are configured as one unit. The tail lights, brake lights, turn indicators, rear fog light, reversing light and rear reflectors are integrated here. The rear fog light is located in the left rear light unit and the reversing light in the right rear light unit.

The tail light on each side of the vehicle uses a 21W/5W bulb with double filament, because the position of the 5W filament in the bulb better corresponds to the optical requirements in the beam path than in a conventional 5W incandescent bulb. Only the 5W filament is activated for the tail light, the 21W filament is not used, and does not have an electrical connection in the bulb carrier.

The special light pattern of the rear lights consists of two light elements, and is achieved by a masking element attached in the housing of the rear lights over the reflector of the tail light.

The Amarok also introduces the emergency brake indicator function.

For more detailed information about the emergency brake indicator, please refer to self-study programme 453, "The T5 2010".

The loadspace lighting

The brake light and loadspace light are combined in one component and operate separately from one another.
The function of the brake light is done by LEDs, while the function of the loadbed light is provided by two 10W bulbs.

The loadbed lighting has an internal electronic control unit which controls the loadbed lighting and the function lighting of the button for the loadbed lighting on the basis of the switch-on and switch-off conditions.

Switch-on conditions

The following conditions must be met for switching on:

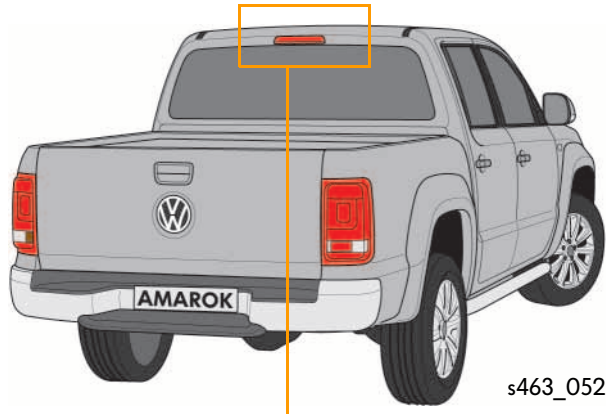
- Terminal 15 off **and**
- no undervoltage or overvoltage **and**
- Actuation of button for loadspace lighting

When the loadbed lighting is activated, this is displayed in the loadbed lighting button.

Switch-off conditions

Switching off is performed when:

- Button for loadspace lighting is pressed again **or**
- loadspace lighting "on" >15 min **or**
- terminal 15 activated **or**
- undervoltage or overvoltage



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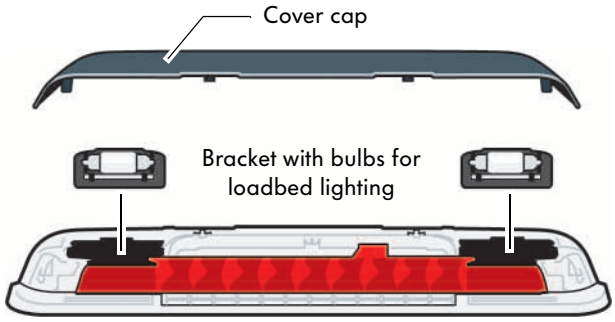
s463_102

s463_195

Button for loadbed lighting

Structure of the loadspace lighting



s463_188

The controls

The dash panel insert

s463_158

Light/dark red display
in the bottom area with gauge display for coolant temperature and tank fill level

s463_159

s463_160

Black/white display
in the bottom area with gauge display for the tank fill level

s463_161

Two basic variants of instrument clusters with multi-function indicator are installed for specific countries:

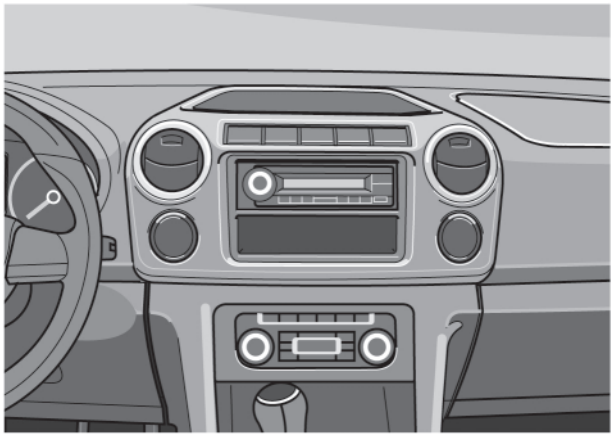
- One version with light/dark red display in the dash panel insert. (Display of coolant temperature and tank fill level)
- One version with black/white display in the dash panel insert (display of tank fill level)

The fuel gauge is always a component of the multifunction indicator. If the multifunction display does not contain a coolant temperature gauge then overheating of the coolant is indicated by flashing of the shared warning lamp for low coolant level and coolant overheating.

The radio and radio/navigation devices

Depending on the market, a wide variety of different radios and navigation devices are available.
At present, the full range of devices includes:

- Plus radio
- MID radio
- RCD 210 radio
- RCD 310 radio
- RCD 510 radio
- Radio and navigation unit RNS 315



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Note that radio and navigation devices for the Amarok are used very differently from region to region, with units for specific markets.

Plus radio

Technical features

- FM+TP+RDS reception via single tuner
- AM
- 2/4 loudspeaker outputs
- Speed-dependent volume adjustment
- CD, MP3, WMA
- AUX-IN interface
- Diagnosis via K-wire
- Online radio code request
  (no convenience coding)

s463_095

MID radio

s463_096

Technical features

Additional features in addition to Plus radio:

- USB connection in front panel
- SD memory card reader
- Recording of voice memos on SD card
- Microphone integrated in front panel
- Bluetooth hands-free protocol (HFP)
- Bluetooth audio streaming (A2DP)

The RCD 210 radio

s463_097

For more information, refer to self-study programme 404 "The Tiguan 2008".

Radio and navigation

The RCD 310 radio

Technical features

Additional features in addition to RCD 210 radio:

- FM+RDS+TP via twin tuner
- CD, MP3, WMA
- Display of climate information
- Optical Park System (OPS) display

s463_098

For more information, refer to self-study programme no. 417 "The Passat CC 2009".

RCD 510 radio*

Technical features

Additional features in addition to RCD 310 radio:

- 6.5-inch colour display (touchscreen)
- Integrated SD card reader
- Integrated 6-way CD changer
- TIM (Traffic Information Memory)

s463_099

*
This radio is a special variant of the RCD 510 to facilitate use in areas with restricted RDS coverage:
- Simple deactivation of alternative frequencies (AF)
- Simple RDS deactivation
- Rapid change between AM and FM possible by separate buttons

For more information about the RCD 510, please refer to self-study programme 423, "The Golf 2009".

s463_100

The radio and navigation unit RNS 315

Technical features

- 5.5“ TFT colour display (touchscreen)
- FM+RDS+TP via twin tuner
- AM
- Integrated CD player (MP3/WMA)
- SD navigation
- Navigation data on internal hard disk (6 GB)
- SD card slot for navigation and MP3
- TMC function & TMC background reception
- Display of climate information
- AUX-In interface on the front panel
- Optical Park System (OPS) display

Additional items depending on equipment:

- Bluetooth hands-free function (HFP) with telephone book download and 10-digit numeric keypad on the touchscreen
- Bluetooth audio streaming (A2DP)

For more information, refer to self-study programme 445 "The Sharan 2011".

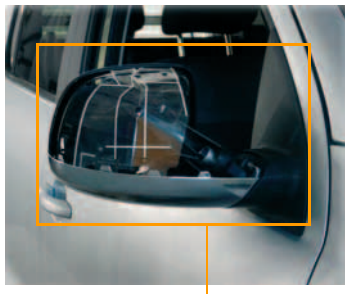
The aerial concept of the Amarok 2010

The aerial foil, impedance converter and aerial cable are combined in one component and can only be renewed together.

The aerial foil for AM/FM reception is located in the left exterior mirror. Depending on the equipment, there may be a second FM aerial foil in the right exterior mirror. AM/FM and FM2 aerials have phantom supply. The phantom supply (approx. 12V) is used to power the impedance converter and the diagnostic function.

If a GPS aerial is installed then it is attached in the right exterior mirror using an adhesive pad. The internal electronics are powered with a 5V supply.

The aerials can be renewed separately.
All connectors are mechanical and colour-coded.



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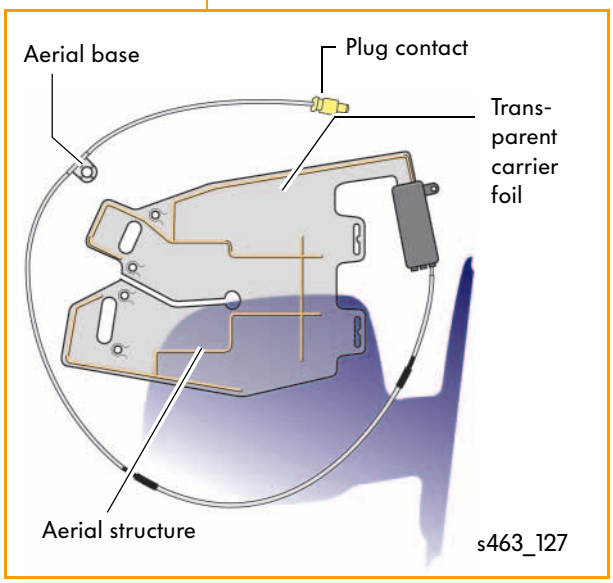
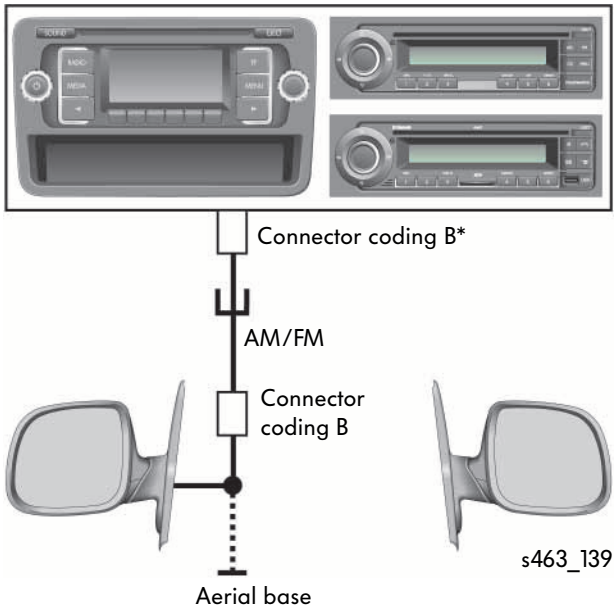


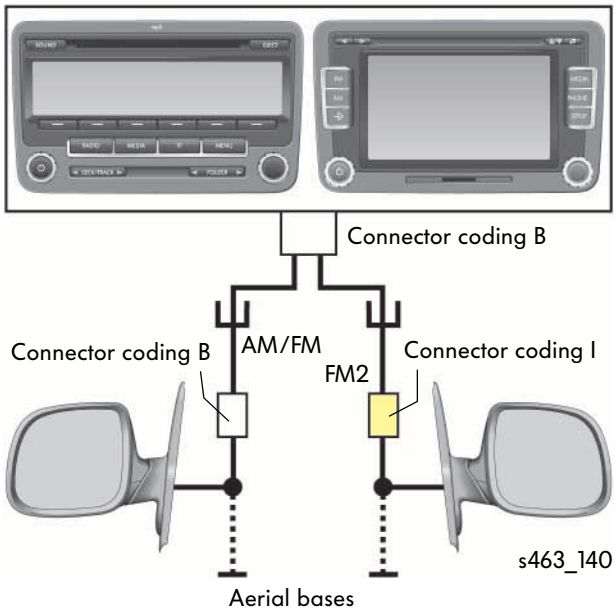
For more detailed information, please refer to self-study programme 453, "The T5 2010".



* A conventional aerial plug is used in the PLUS radio and MID radio.

The aerial system in the RCD 210, PLUS, MID

This shows the aerial concept of the radios with single tuner or radio preparation.
The left-hand exterior mirror contains the AM/FM aerial. The right-hand exterior mirror does not contain any aerials.

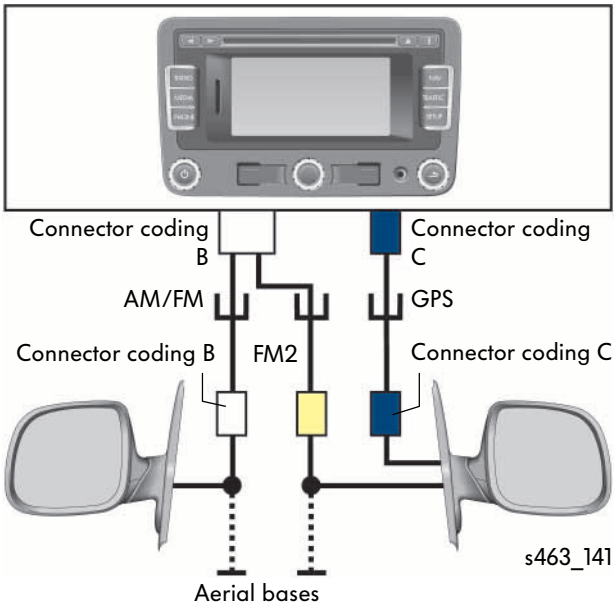


The aerial system in the RCD 310 and RCD 510

This shows the aerial concept for radios with twin tuner.
The AM/FM aerial is located in the left-hand exterior mirror and the FM2 aerial in the right-hand exterior mirror.

The aerial system in the RNS 315

As in the previous configurations, the FM/AM aerial for the RNS 315 radio and navigation system is located in the left-hand exterior mirror. The FM2 and GPS aerials are located in the right-hand exterior mirror.



Notes

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❀ This paper was manufactured using pulp bleached without the use of chlorine.