Service

Self-study programme 281

The New Beetle Cabriolet

The New Beetle Cabriolet, quality and safety at the highest level.

A class of its own, open body and perfect compatibility for everyday use.

From 1949 - 1980, the Beetle Cabriolet was built a total of 330,000 times.

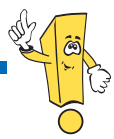
New Beetle Cabriolet - Modern with safety features of the future.

S281_004

The vehicle builds on the successful New Beetle concept and carries off the design as a Cabriolet throughout.

With this self-study programme, we would like to introduce you to the new technical features and innovations of the New Beetle Cabriolet.

NEW



Important Note

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

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

Contents

Brief summary

The New Beetle Cabriolet

Body

The body of the New Beetle Cabriolet features a wide range of welded and bolted reinforcements.

Targeted reinforcements, such as high tensile bars in the A and B pillars, doors and in the floor, provide optional response in crash situations.

Engine

Three petrol engines and a diesel engine have been taken over from the New Beetle range.

Power transmission

5-speed manual gearbox and a newly developed

6-speed automatic gearbox.

S281_047

Electrics and equipment

Overview of special features:

- Buttons in centre tunnel for opening and closing semi-automatic convertible top roof
- Audio system with CD changer in centre armrest
- Indicator lamp for convertible top roof control integrated in ambient temperature display in roof frame
- Front seats with flush seat backrest release
- Cellphone holder on front passenger grab handle
- Interior monitoring, can be switched off
- Lockable through-loading aperture
- 12 volt socket in luggage compartment
- Optional windbreak

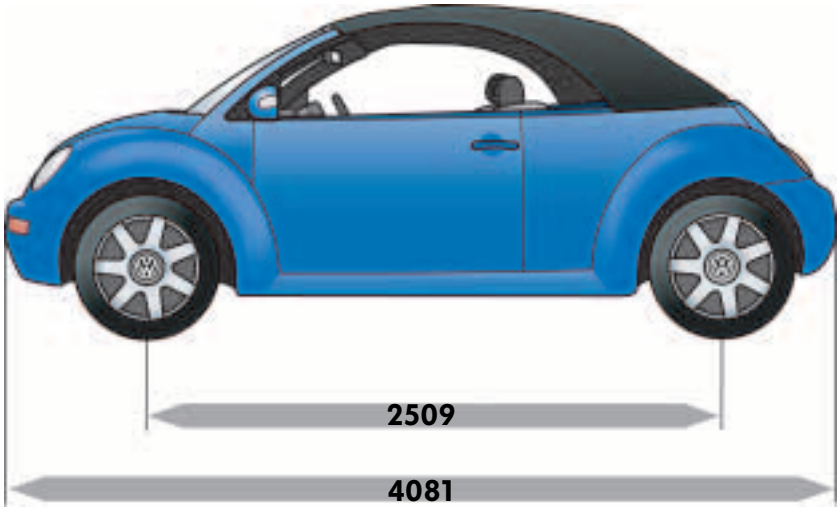
Occupant safety

Airbags for driver and front passenger and front belt tensioners assure passive and active safety.

Roll-over protection opens out and locks in place within 0.25 seconds.

Brief summary

Technical data



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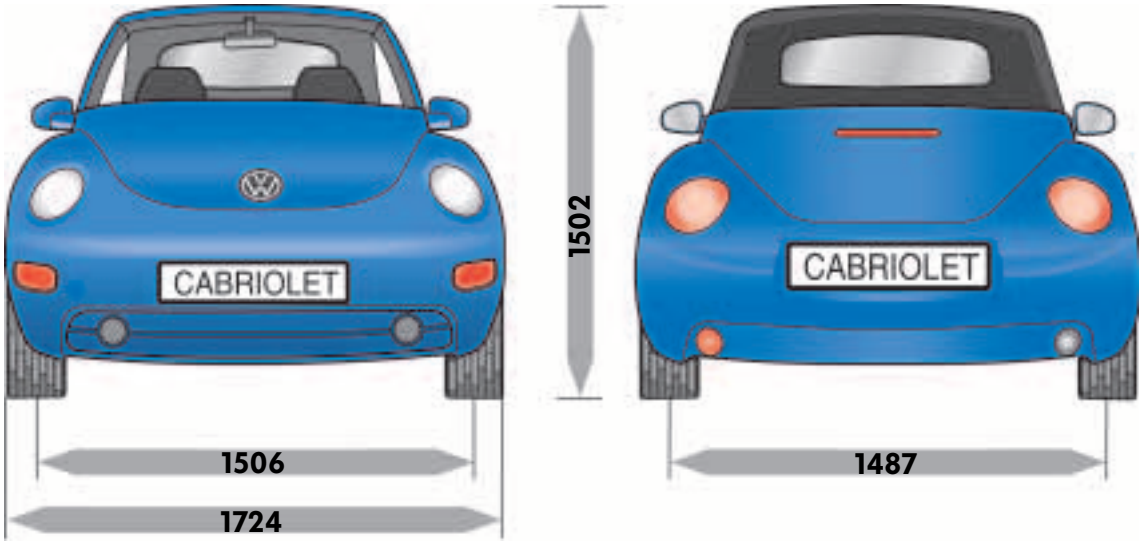

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Dimensions and weights

Length	approx. 4081 mm
Width	approx. 1724 mm
Height	approx. 1502 mm
Tank capacity	55 ltr.
Luggage compartment	201 ltr.
Turning circle	10.9 m

Front track width	1506 mm
Rear track width	1487 mm
Wheelbase	2509 mm
Max. permissible GVW	1770 kg*
Unladen weight	1401 kg*

*Figures are based on a Beetle Cabriolet with 2.0 ltr. / 85 kW engine and manual gearbox

The Volkswagen factory in Puebla, Mexico

The New Beetle Cabriolet is built in Puebla. Way back in 1964, a good hundred kilometres to the south east of the countries capital of Mexico City, the company built one of the most important automobile factories on the American continen.

S281_052

This factory underlines once again the international significance of the Volkswagen Group as a global player.

The high build quality, typical of Volkswagen, is guaranteed at production sites in four of the five continents of the globe.

In the Puebla factory, there are about 14,000 employees. In addition to the New Beetle Cabriolet, the New Beetle, the Golf and the Bora (known in America as the Jetta) are also manufactured here among others. The New Beetle Cabriolet takes the place of the Golf Cabriolet in terms of production.

S281_068

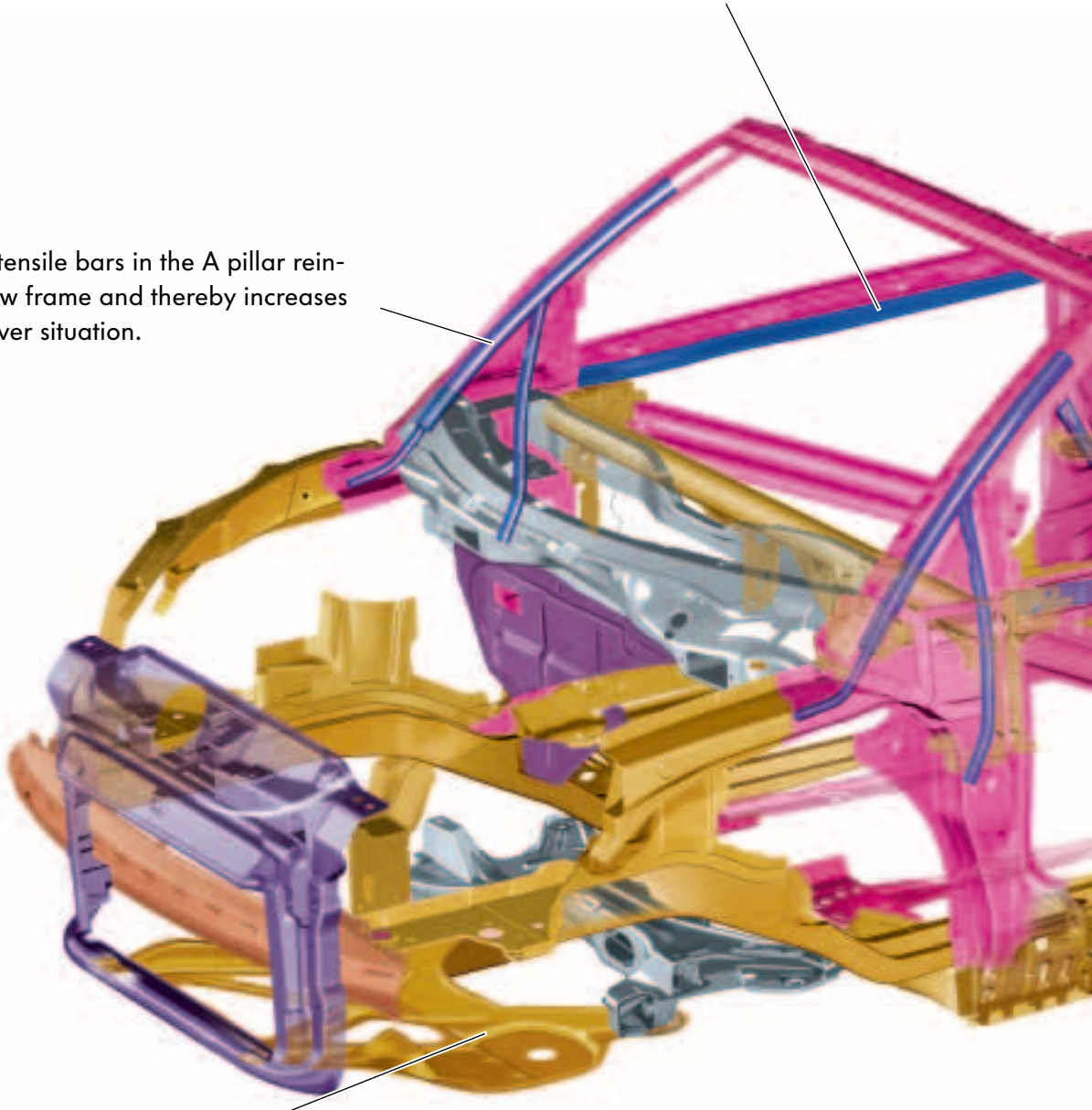
Body

The body

The body is fully galvanised and consists partly of high tensile and reinforced steel panels.

A high tensile bar, situated at the lower edge of the window, keeps the occupant cell intact in a frontal collision by using the A and B-pillars as anchors.

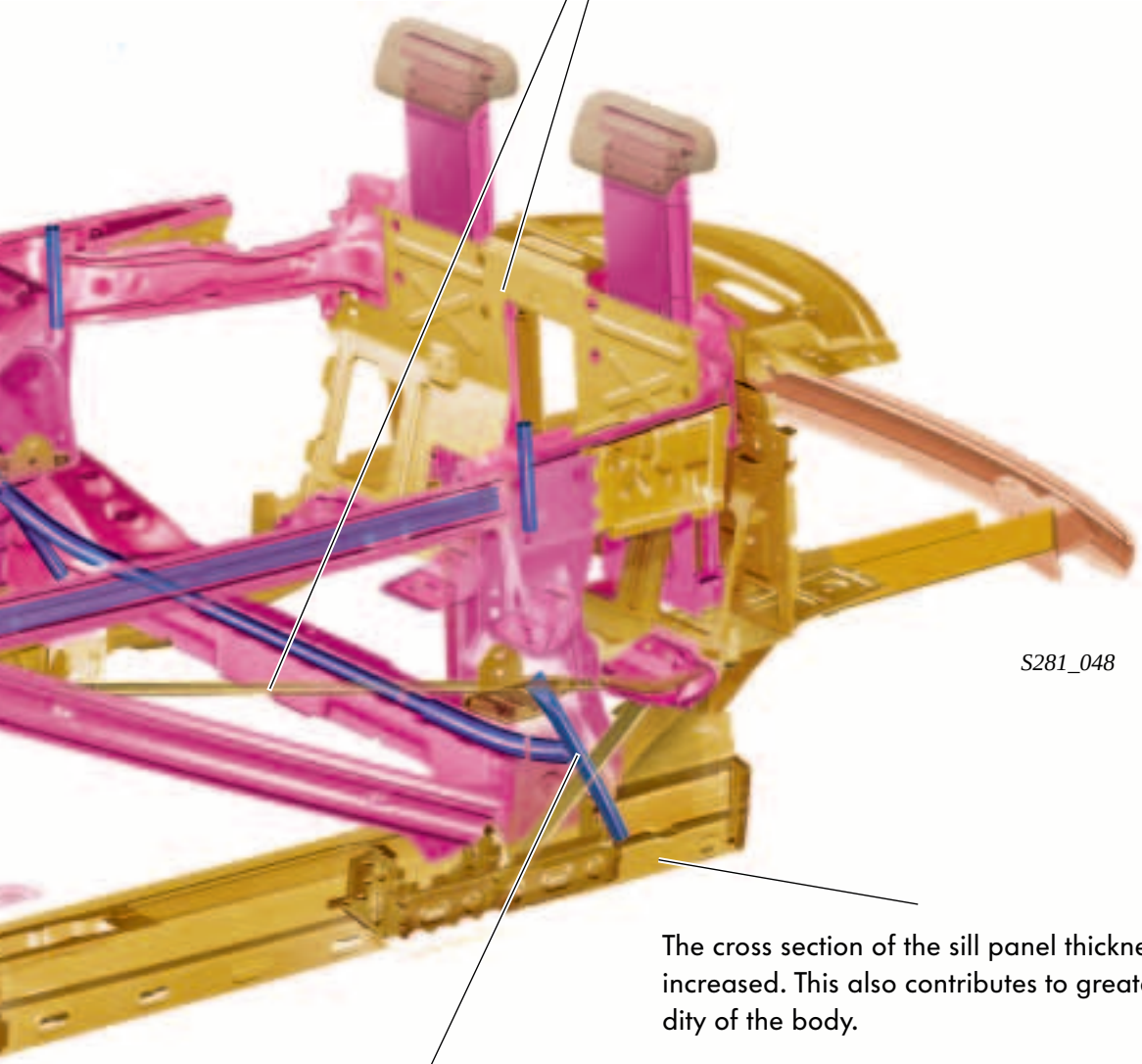
A batch of high tensile bars in the A pillar reinforces the window frame and thereby increases safety in a roll-over situation.



The bolted engine cover is made of sheet aluminium to improve torsional rigidity of the body.

Additional welded joints and reinforcements in the front end structure result in crash optimised response.

The twin wall partition with through-loading aperture (ski sack) and bolted diagonal beams also increases torsional rigidity of the body.



S281_048

The cross section of the sill panel thickness was increased. This also contributes to greater torsional rigidity of the body.

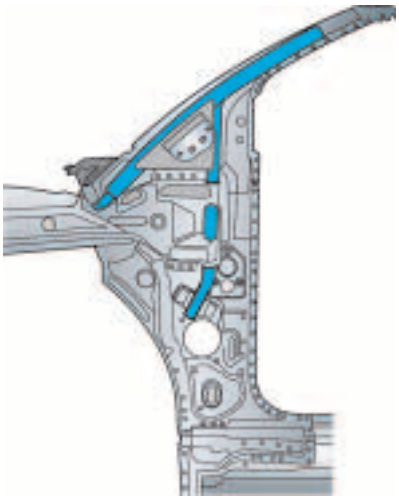
High tensile bars in the B-pillar and seat traverse limit deformation in a side impact situation and thereby offer a high level of protection for the occupants.

Key:

- Plastic
- Safety cell
- Crash relevant parts
- Reinforcement bars
- Bumper carrier

Body

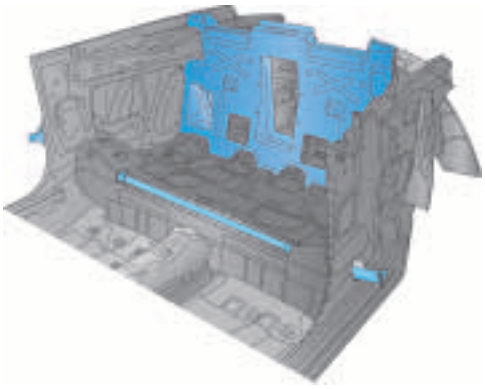
The reinforcements



S281_043

The stability of the A-pillar is of particular importance for the safety of the occupants if the vehicle rolls over.

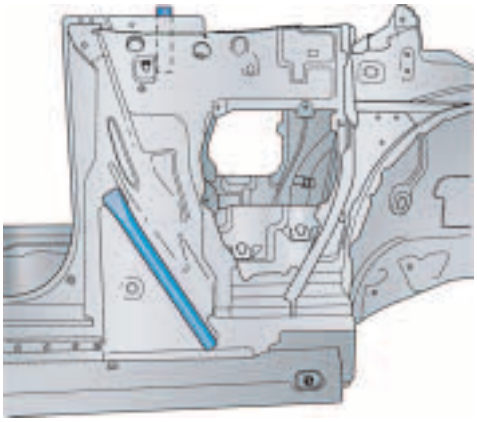
On the New Beetle Cabriolet, these are reinforced by the use of high tensile bars.



S281_046

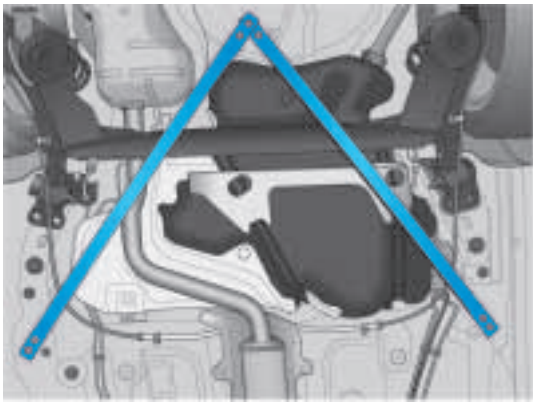
The wall between rear seat and luggage compartment is of the two shell design. It contributes towards greater rigidity of the body and houses the roll-over protection.

The use of an additional reinforcement bar on the rear seat traverse increases transverse rigidity of the vehicle in a side impact collision.



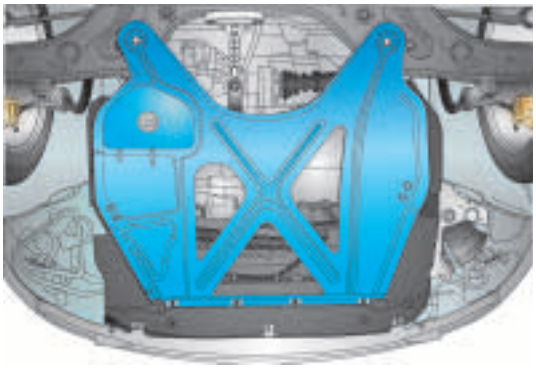
S281_044

The reinforcement bar on the B-pillar joined with the reinforcement bar on the seat traverse increases stability in a side crash.



S281_055

Diagonal beams in the rear area of the body structure contribute towards increased rigidity.



S281_067

The engine cover is made of sheet aluminium.

It increases the rigidity of the front end and improves the response to vibrations.

The equipment

S281_049

If the battery is discharged, the luggage compartment can be opened via the rear lid lock (emergency opening).

The lock cylinder of the rear lid lock can be found in the Volkswagen emblem.

It can be accessed by moving the Volkswagen emblem cover in the direction of the arrow.

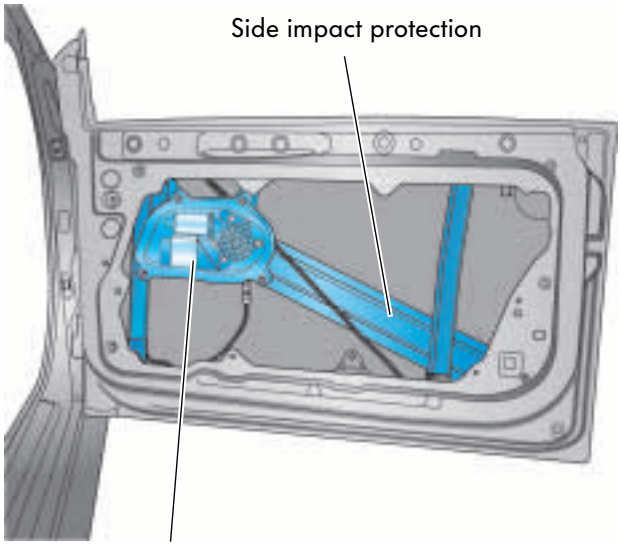
S281_006

Since the side panel trim on the Cabriolet reaches further inwards, the backrest release was made flush with the seat.

S281_045

The door window is lowered automatically by approx. 3 cm to allow the door to be opened.

When the door is closed, the window rises automatically to seal against wind and water.

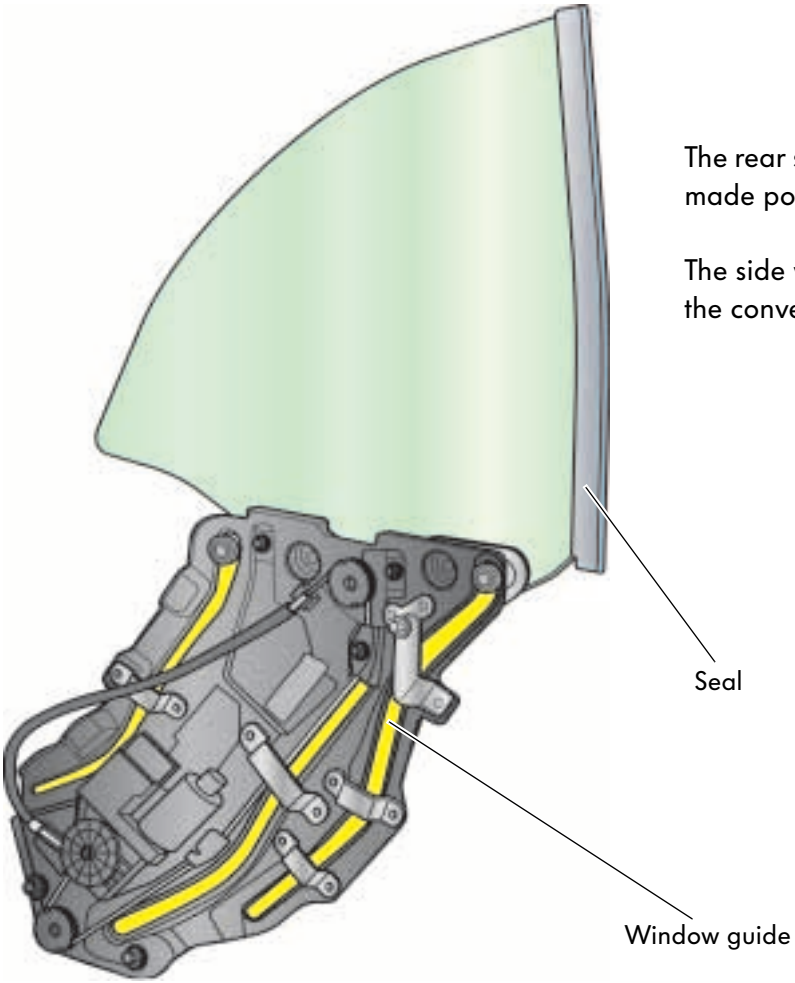


S281_030

The front window regulator motor is attached to the window regulator.

The side impact protection carrier is attached diagonally in the door.

The diagonal layout of the side impact protection means that the area covered is greater, i.e. in a side crash, the side impact protection will always be hit.



S281_031

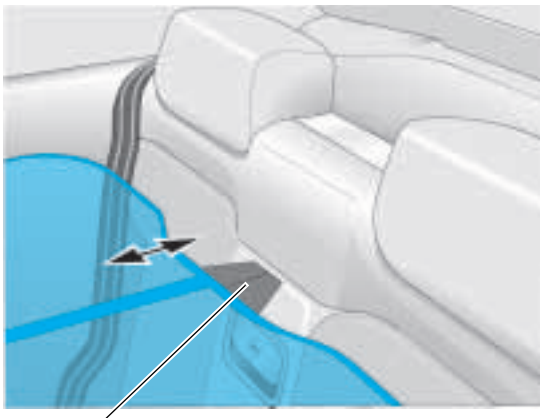
The rear side window can be lowered fully. This is made possible by a sophisticated window guide.

The side window with seal is driven up flush with the convertible top seal and front door window.

The windbreak

The windbreak considerably reduces air swirl in the interior at high speeds. It can be folded in four places and requires little space for storage in the luggage compartment.

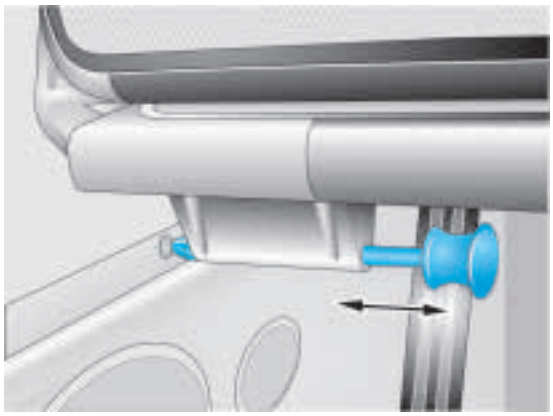
S281_065



S281_071

Guide lug

The guide lug of the windbreak is inserted in the upholstery slot above the through-loading aperture.



S281_072

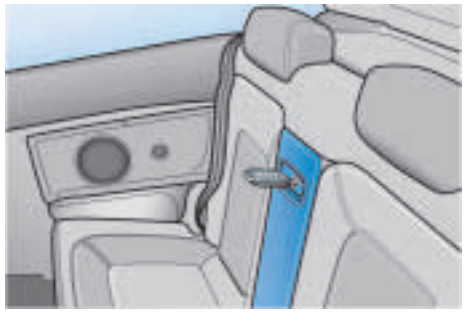
To lock the windbreak, locking pins are inserted on the left and right in holes prepared for this purpose in the side panel trim.

The through-loading aperture

With the aid of the through-loading aperture ski sack, skis or other long objects can be transported without dirtying or damaging the interior.

S281_059

The flap of the through-loading aperture can be locked using the ignition key.

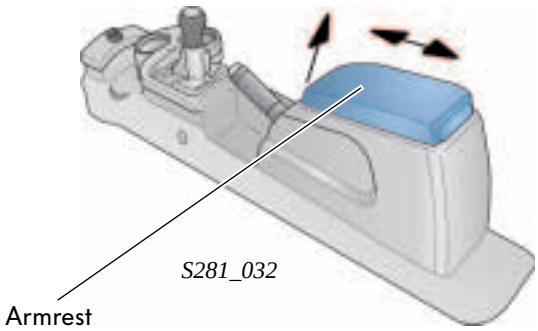


S281_082

The centre console

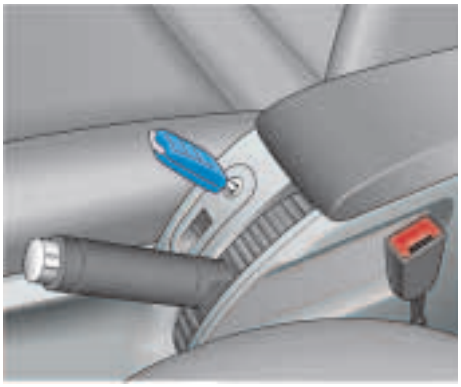
The centre console is equipped with a opening armrest. Beneath the integrated armrest there is a stowage compartment. If fitted, the optional CD changer can be found in this stowage compartment.

The armrest for the driver and front passenger can be adjusted in length and 3 positions in height.



S281_032

The stowage compartment can be locked using the ignition key.



S281_033

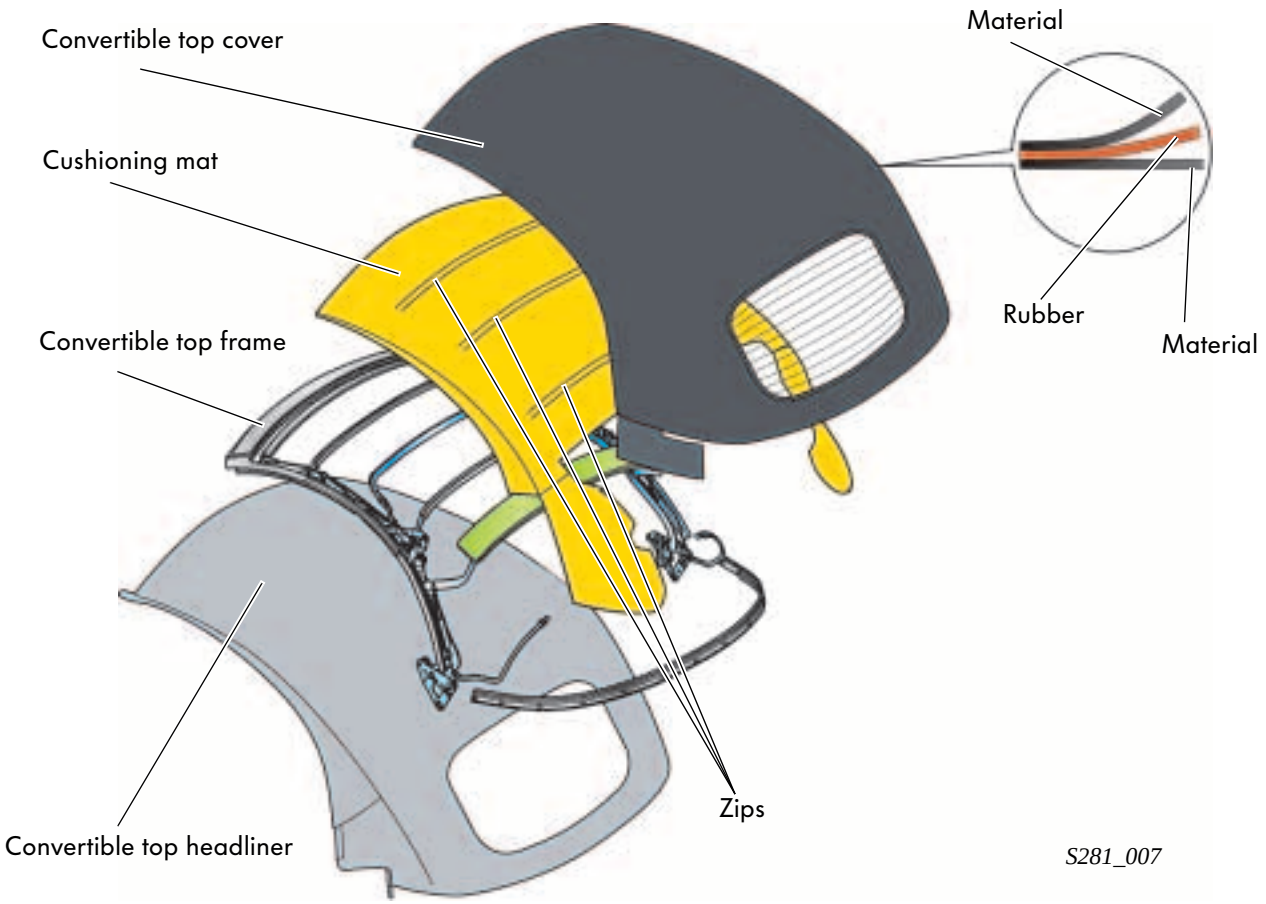
The convertible top

The design of the convertible top shows, at a glance, that it is well capable of the demands from everyday and even winter use.

The convertible top cover

The convertible top cover consists of three-fold laminate. The rubber layer means that there is no need to impregnate the material with weatherproof protection.

It is held in place by a bead and profile design on the convertible roof frame.



The cushioning mat

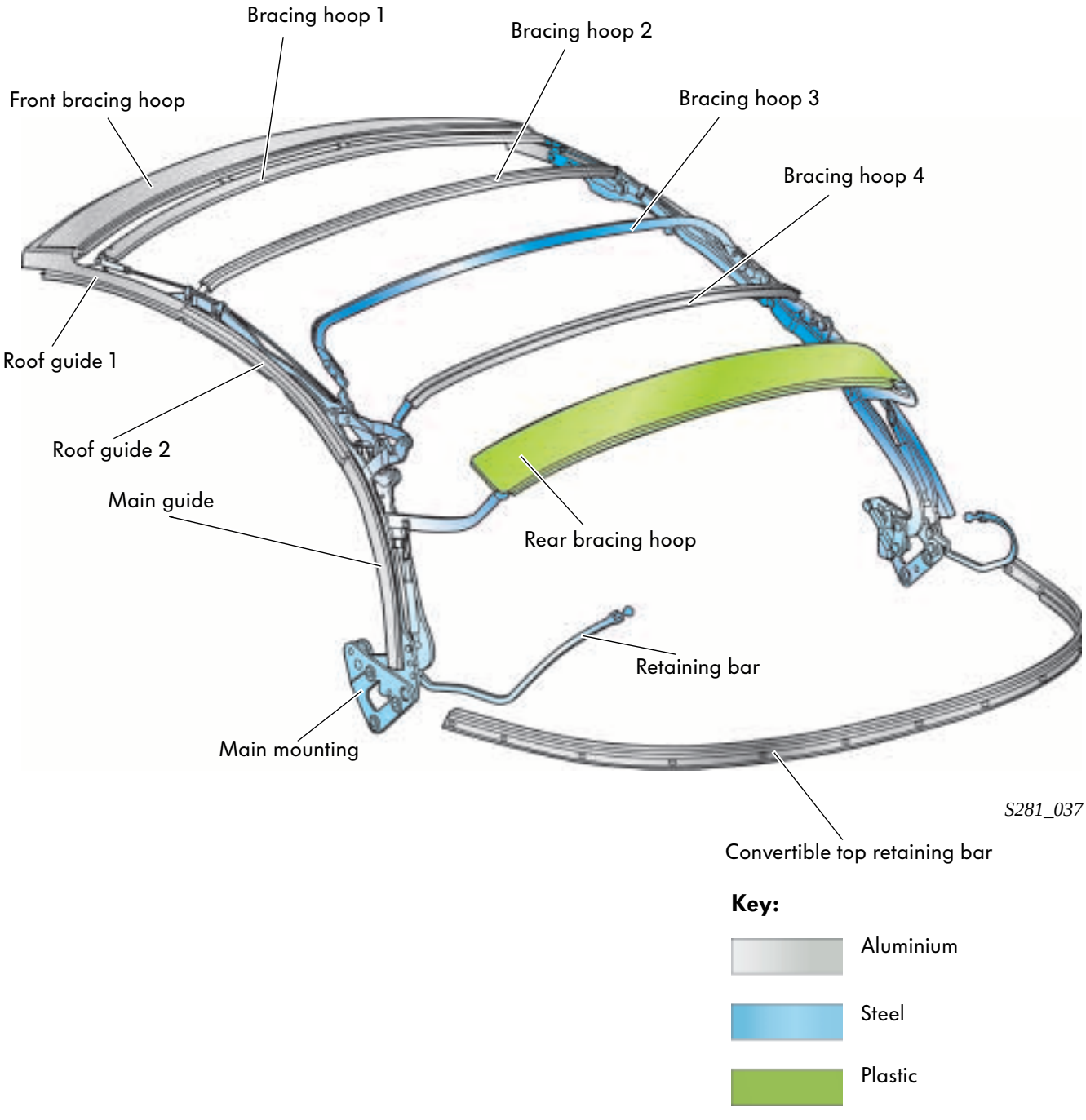
The cushioning mat is attached to the convertible roof frame and bracing hoops. It consists of a 20 mm thick fabric fleece material.

Zips join the convertible roof cover directly with the cushioning mat and thereby indirectly with the bracing hoops.

In this way, the so-called ballooning effect (inflation of convertible top at high speeds) is kept to a minimum.

The convertible top frame

The design of the convertible top frame is an optimal balance between high rigidity and low weight thanks to an aluminium/steel construction (approx. 26 kg).



The convertible top headliner

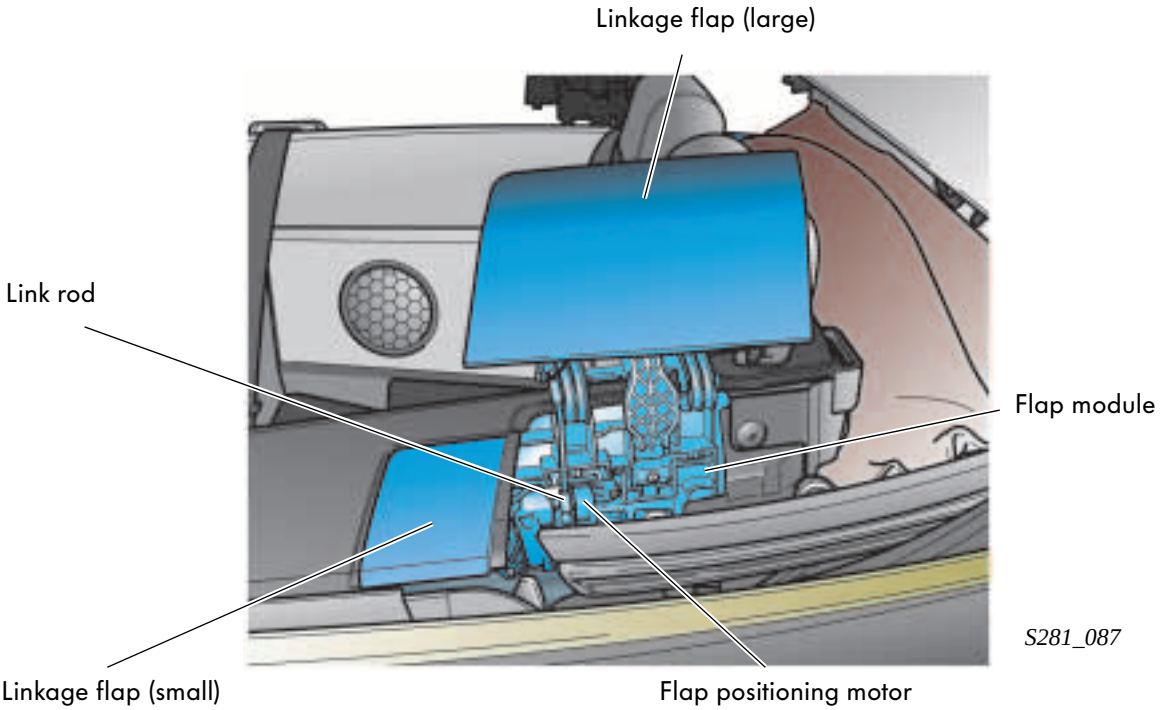
The convertible top headliner is hooked into the convertible top frame and is made of fabric.

The linkage flaps

The linkage flaps are required to allow unrestricted opening and closing of the convertible top. At the same time, they protect the mechanics of the convertible top frame housed below.

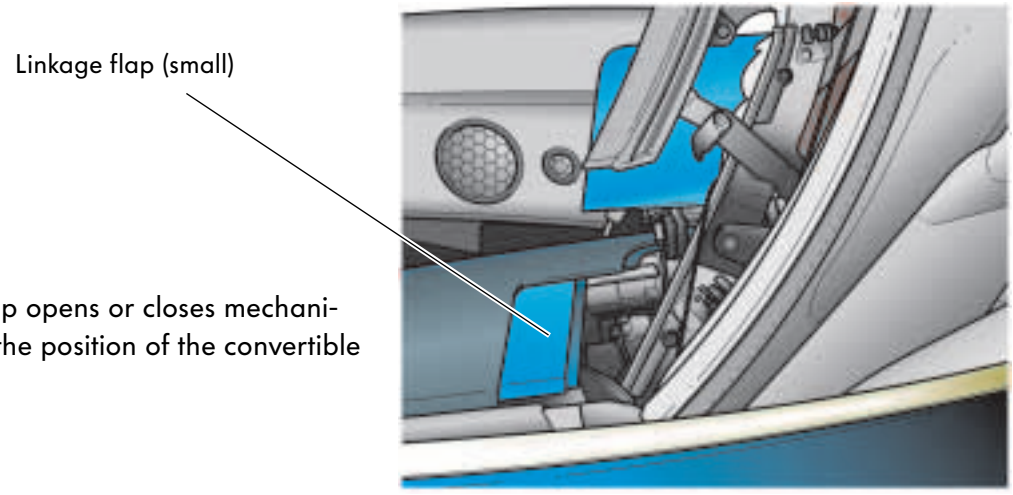
The large linkage flap is opened electrically once the opening or closing procedure is initiated.

It is connected to the flap positioning motor by means of a link rod.



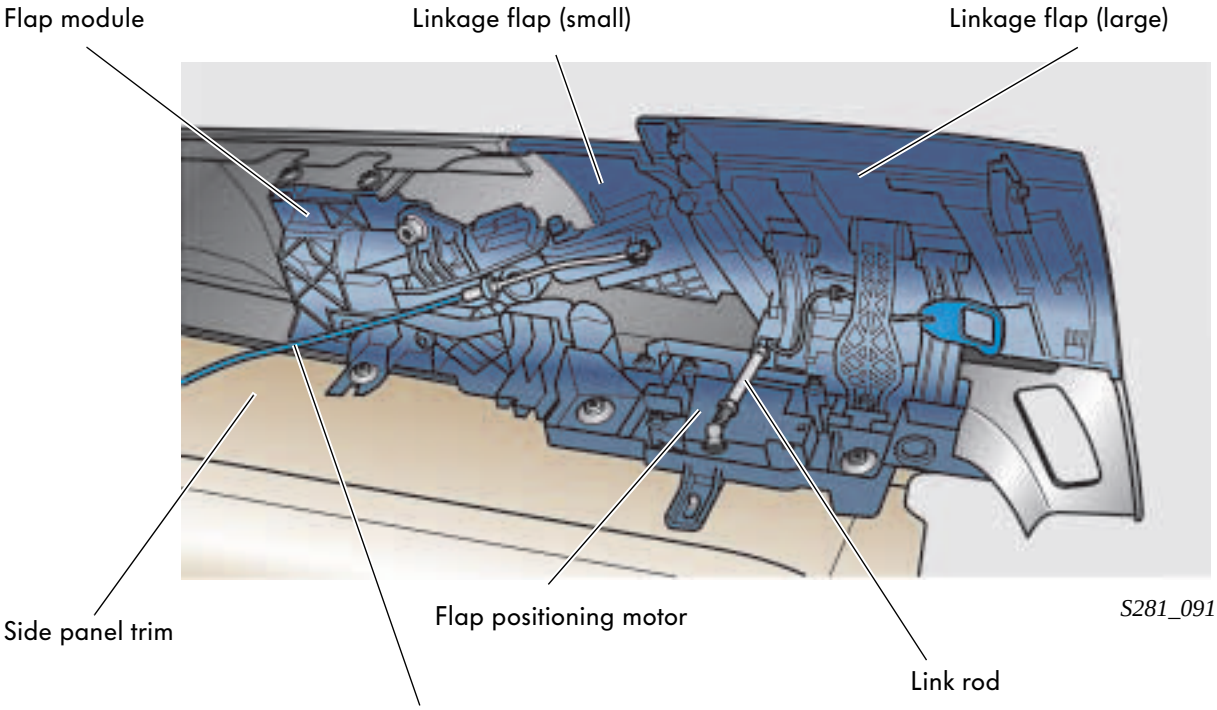
S281_087

The small linkage flap opens or closes mechanically depending on the position of the convertible top.



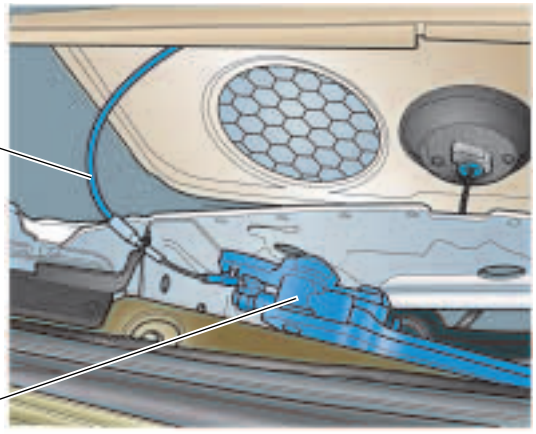
S281_088

The flap module is attached to the side panel trim.



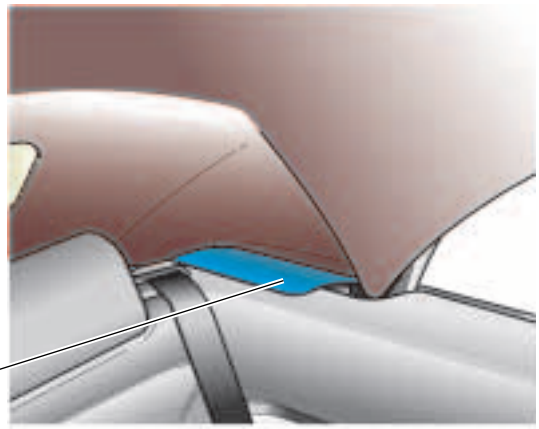
S281_091

The small linkage flap is connected to the convertible top frame by means of a cable.



S281_092

When the convertible top is closed, the small linkage flap remains open and the large linkage flap closes automatically.



S281_089

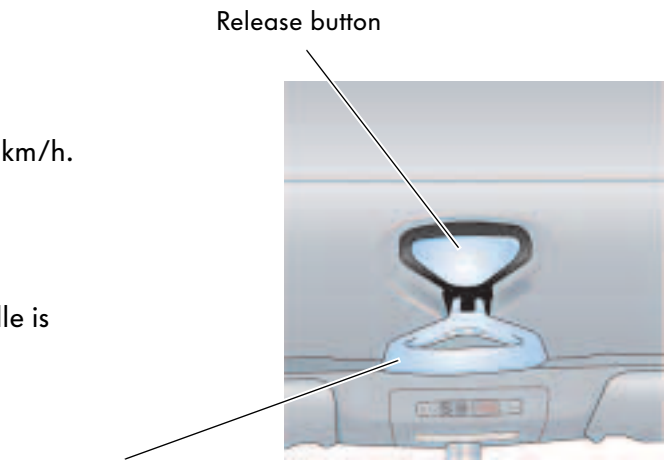
The semi-automatic convertible top

Roof open function

Prerequisites:

- The speed of the vehicle must be less than 6 km/h.
- The ignition must be switched on.

By pressing the release button, the locking handle is released.

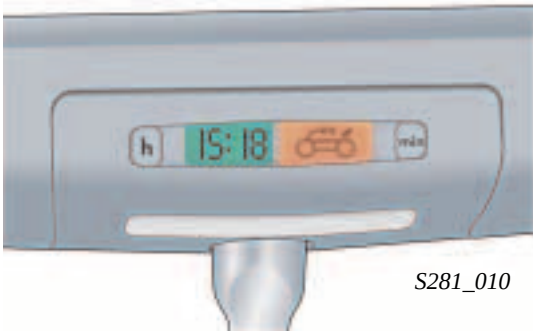


S281_008

Turning the locking handle to the left unlocks the convertible top.

S281_009

The convertible top indicator lamp is located in the display unit. When the convertible top is opened, the ambient temperature display will change to the roof control symbol for the duration of the opening procedure.

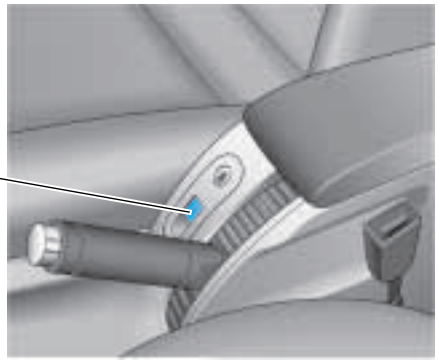


S281_010

Closed door and side windows are opened automatically to a predefined position as soon as the convertible top is unlocked. At the same time, the linkage flaps open on the side panel trim.

S281_012

By actuating the convertible top operating switch E137, the opening procedure is initiated.



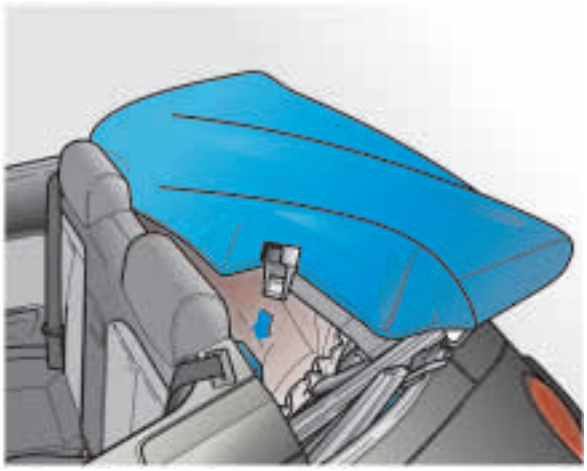
S281_014

The convertible top is opened. It features three fold points. It is folded in the form of a "Z" on the rear shelf and secured automatically by hooks to prevent unintended closing.

S281_013

The tonneau cover is secured by means of two clips in the mountings.

The opened convertible top should always be covered by the tonneau cover before driving off to protect against dirt and damage.



S281_086

Roof close function

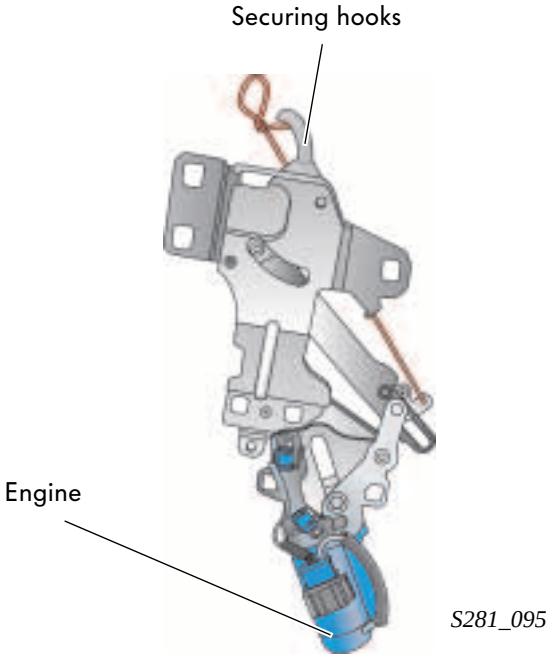
Prerequisites:

- The speed of the vehicle must be less than 6 km/h.
- The ignition must be switched on.
- The tonneau cover must be removed.

By actuating the convertible top operating switch E137, the closing procedure is initiated.

The left and right convertible top locking motors release the securing hooks for locking.

The locking procedure takes approx. 13 seconds.



S281_095

Closed door and side windows are opened automatically to a predefined position.

S281_015

For reasons of safety, the door and side windows are not closed automatically after the closing procedure.

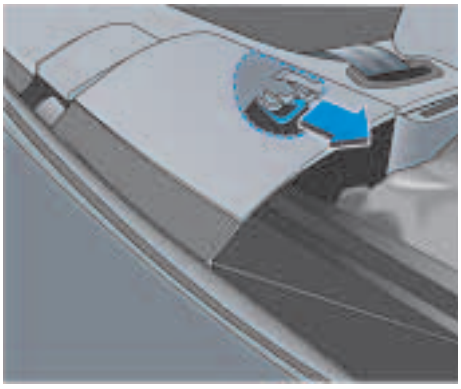
Convertible top emergency operation

The semi-automatic convertible top can also be closed by hand should the system fail in its function.

To carry out emergency operation, the following requirements are necessary:

- The vehicle is stationary.
- The ignition must be switched off.

The emergency release mechanism can be found beneath the linkage flap for the convertible top frame. By pulling the plastic ring, disconnects the connection between linkage flap and linkage flap motor. The flap can then be opened and the convertible top frame will be visible.



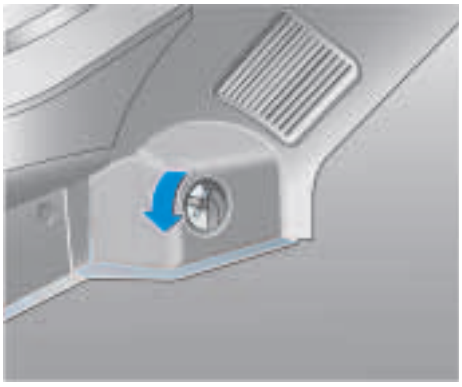
S281_034

By pulling the red loop, the securing hooks are released to unlock the convertible top.

S281_035

By turning the bolt on the hydraulic pump in the direction of the arrow, the oil circuit is opened and the convertible top can be closed manually.

The hydraulic pump for convertible top operation can be found on the rear left of the luggage compartment.



S281_036

Occupant safety

The airbag system

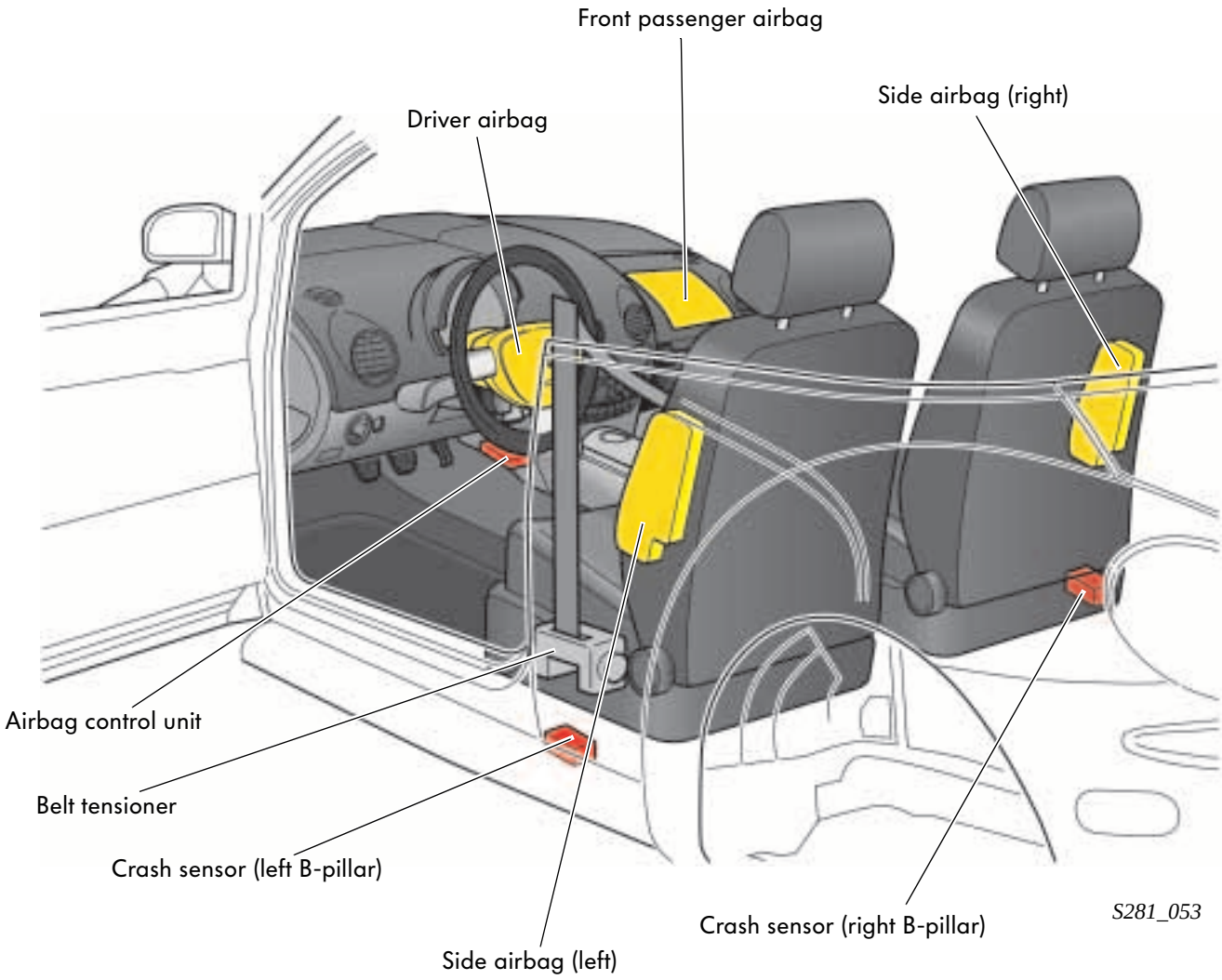
Included as standard on the New Beetle Cabriolet are:

- Full size airbags for driver and front passenger
- Side airbags for driver and front passenger
- Belt tensioners with belt tension limiter for driver and front passenger
- Roll-over protection

Additional early crash sensors in the front longitudinal member react very quickly in accidents by igniting the airbags. In this way, crash related ignition is assured in heavy impact collisions. All airbags are triggered by the airbag control unit.

S281_040

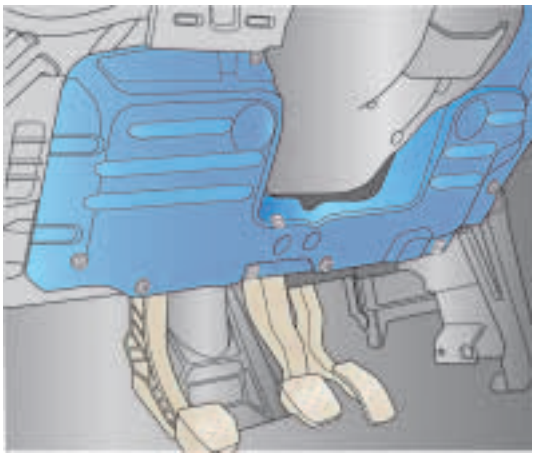
Early crash sensors in longitudinal member



S281_053

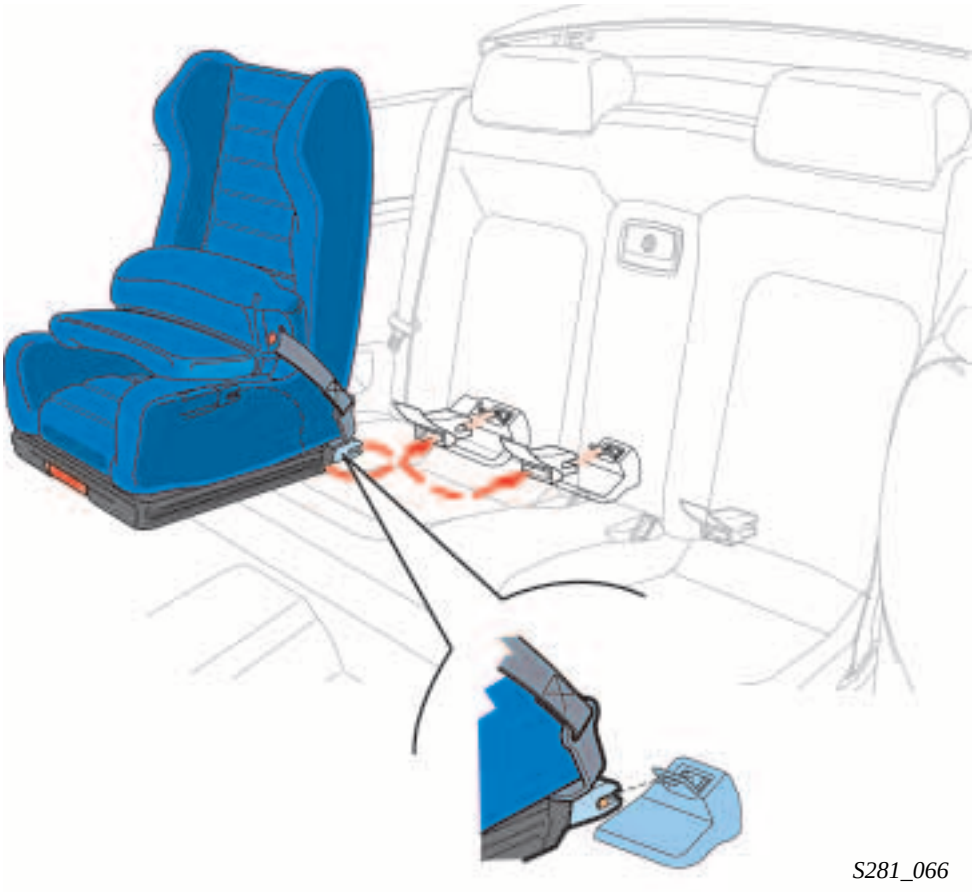
The impact plate

To protect the driver's knees in a crash, a deformable impact plate has been fitted below the steering column.



S281_028

Isofix child restraint system



S281_066

There are four retaining eyes under the rear bench seat that allow installation of two child seats with the Isofix restraint system. The retaining eyes are welded to the floor panel and offer secure mounting points for the child seat for crash situations.

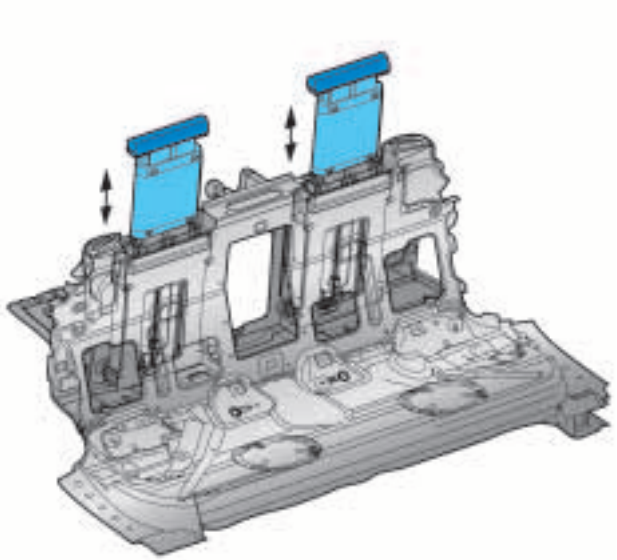
The roll-over protection

The roll-over protection is activated in serious accidents (roll-over, but also front, side and rear collisions) or at extreme side tilt angles.

In this way, an occupant safety zone is created in conjunction with the A-pillars.

The airbag control unit is fitted with a yaw rate sensor for detection of potential roll-over incidents. The risk is evaluated, in combination with four sensors within the control unit, and the roll-over protection is triggered. The roll-over protection is always activated when an airbag has been triggered.

Exception: In a rear collision or roll-over without airbag release, only the roll-over protection and belt tensioners are triggered.



S281_029

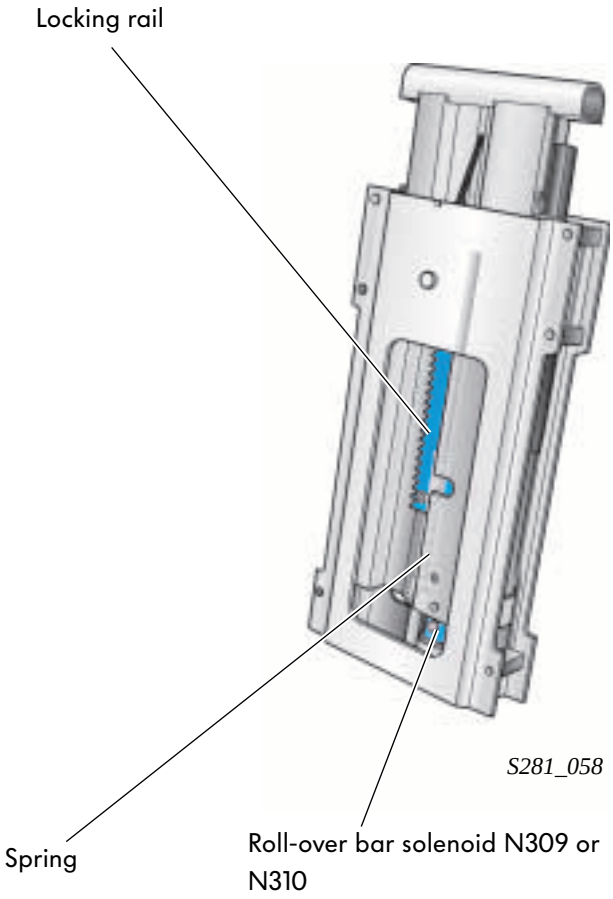
Function

When no voltage is applied to the roll-over protection, a hook on the roll-over bar solenoid N309 and N310 holds it in the lower position.

If the airbag control unit J234 detects a crash or potential roll-over situation, the roll-over bar solenoid triggers the roll-over protection.

Spring tension releases the roll-over protection within 0.25 seconds and locks it in the locking rail.

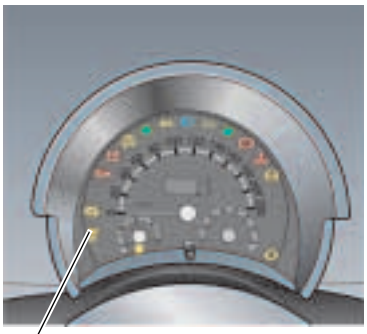
The roll-over protection cannot be pushed back after it has raised at least 80 mm due to the lokking rail.



S281_058

The roll-over protection is monitored together with the air-bag system.

A fault is indicated by the airbag warning lamp K145 in the instrument panel insert.



S281_011

Warning lamp K145

The roll-over protection can be released by final control diagnosis (take note of safety precautions). Unnecessary release of the roll-over protection should be avoided.

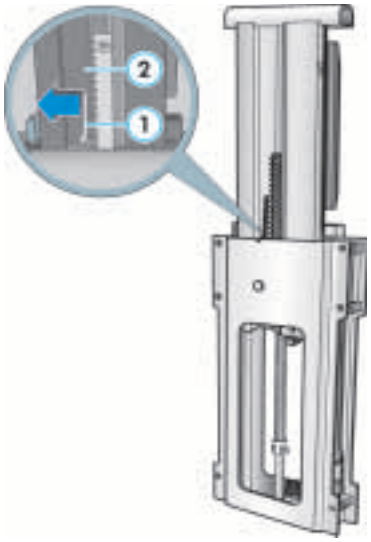
Inserting roll-over protection

The closed convertible top must be opened until the roll-over protection is free to move.

When doing this, the convertible top should not be opened fully as otherwise the convertible top cover and the bracing hoops could become damaged.

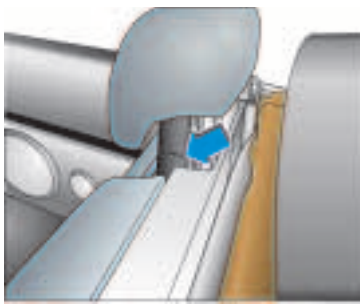
S281_016

Push release lever (1) in direction of arrow and slide roll-over protection (2) downwards onto stop until it can be heard to engage.



S281_073

From the visible marking (arrow) at cover height, the release lever should no longer be held.



S281_069

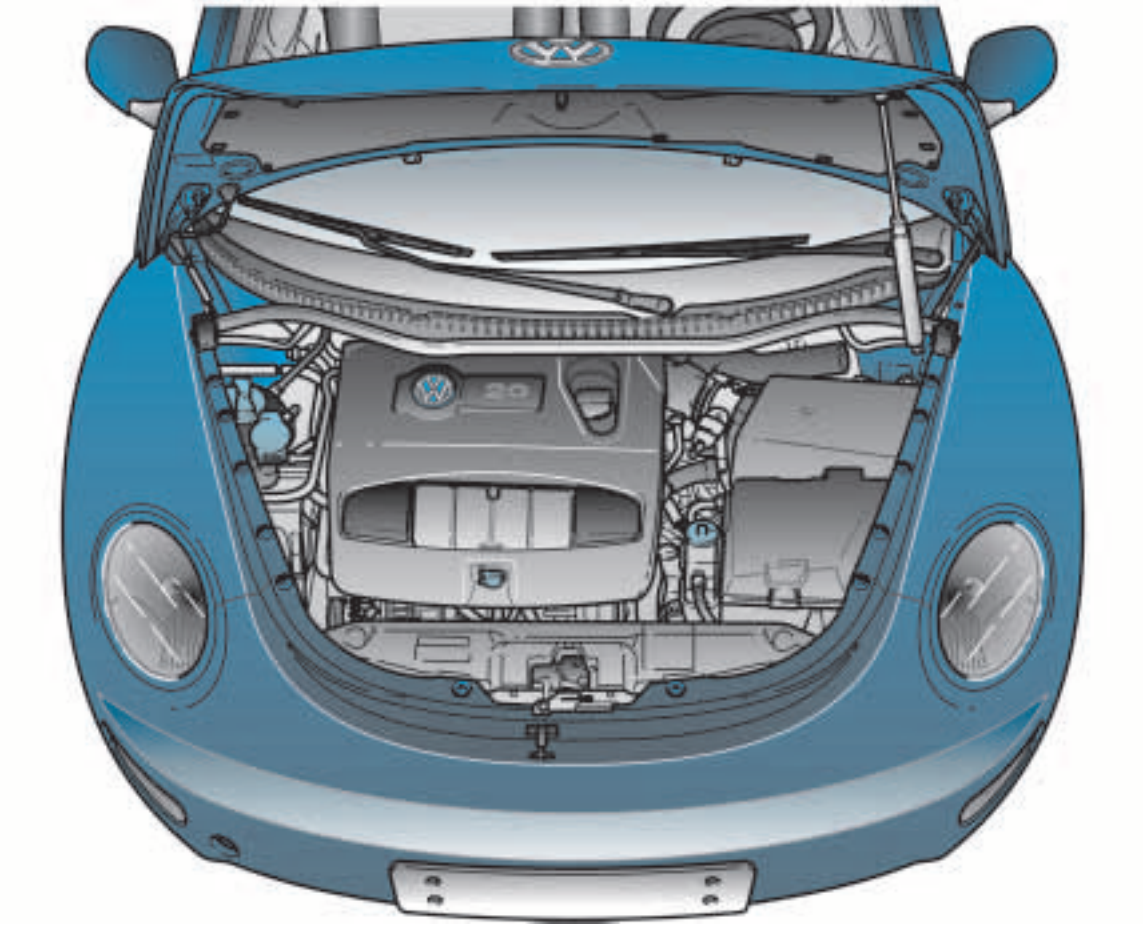
Power units

The engine and gearbox combinations

All engines were taken over from the New Beetle. There is a new combination in the form of a 6-speed automatic gearbox with 2.0 ltr. 4-cylinder petrol engine (85 kW).

The 1.4 ltr. 4-cylinder petrol engine with 4 valve technology (55 kW) is installed together with a 5-speed manual gearbox (02T).

The 1.6 ltr. 4-cylinder petrol engine (75 kW) is installed together with a 5-speed manual gearbox (02J).



S281_085

The 2.0 ltr. 4-cylinder petrol engine (85 kW) is installed together with a 5-speed manual gearbox (02J) or the newly developed 6-speed automatic gearbox (09G).

The 1.9 ltr. 4-cylinder TDI engine with unit injector system (74 kW) is installed together with a 5-speed manual gearbox (02J).

6-speed automatic gearbox 09G

The 6-speed automatic gearbox 09G is a compact, lightweight, electronically controlled gearbox designed for transverse installation.

Features of the gearbox are:

- Max. torque 310 Nm
- Weight 84 kg
- Installation length approx. 350 mm
- Torque converter with converter lock-up clutch
- Automatic and Tiptronic operation

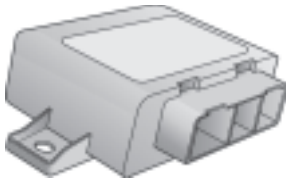
S281_096

The six forward gears and the reverse gear are realised by a simple planetary gear set with post actuated double planetary gear set (Ravigneaux planetary gear set). This configuration is also known as a Lepelletier planetary gear set.

The automatic gearbox control unit controls the build-up of pressure in the multi-plate clutch and brakes via modulation valves.
The modulation valves allow delayed pressure build-up. This allows light response and jolt free gear selection.

Convertible top operation

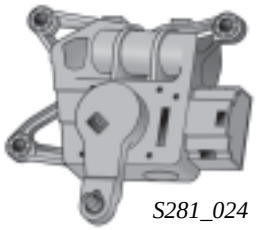
Convertible top operation control unit J256



S281_019

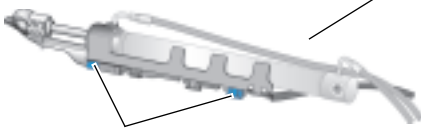
Right tonneau cover switch F328

S281_021



S281_024

Right linkage flap motor V290



Convertible top stowage switch F171

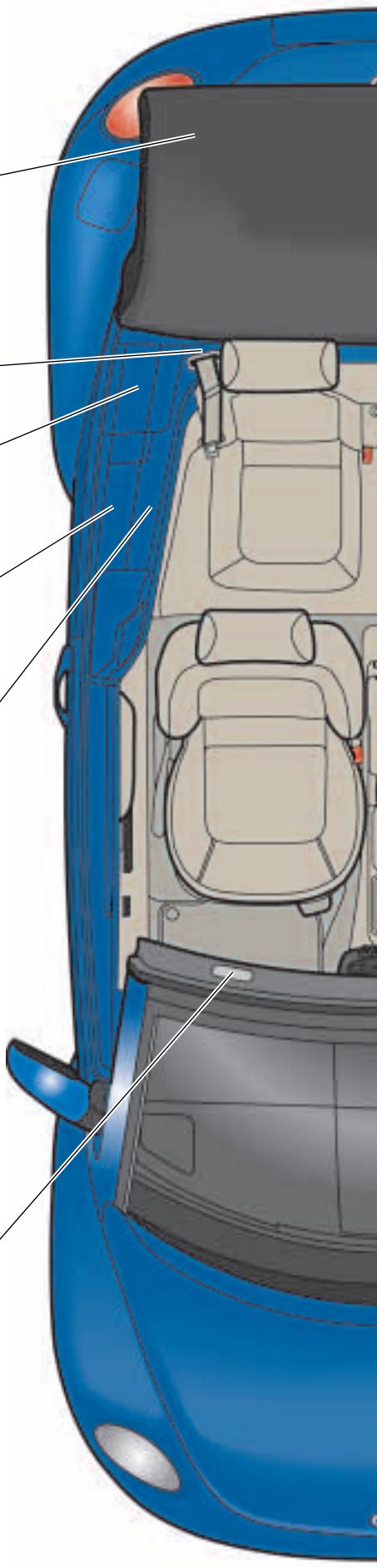
S281_025

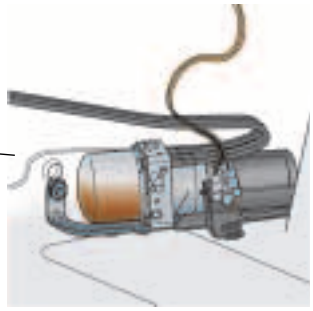
Switch to open convertible right lock F325, F326 and convertible top right lock motor V292

S281_023

Convertible top front switch F202

S281_026



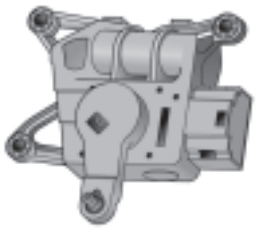


Convertible top operation hydraulic pump V118

S281_018

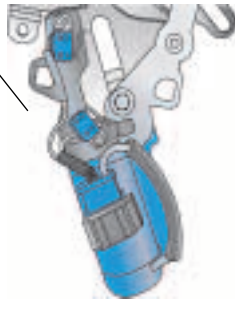
Left tonneau cover switch F348

S281_020



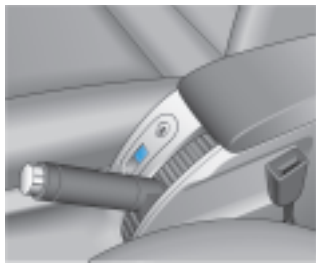
S281_024

Left linkage flap motor V289



Switch to open convertible left lock F323, F324 and convertible top left lock motor V291

S281_022



Convertible top operation switch E137

S281_005

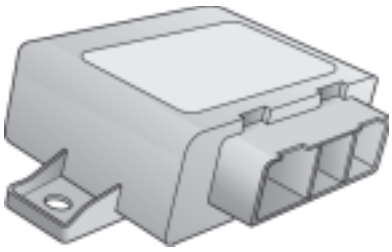
S281_014

Electrical system

Convertible top operation control unit J256

Convertible top operation is via control unit J256.

The convertible top control unit J256 can be found on the rear right of the luggage compartment behind the side panel trim.



S281_019

Convertible top front switch F202

The right hook on the convertible top actuates the integrated microswitch in the lock. This signal is used for:

- Actuation of the convertible top warning lamp on opening and closing of convertible top.
- Lowering of door and side windows on opening and closing of convertible top.
- Opening of linkage flaps for convertible top frame on side panel trim.

S281_026

Convertible top operation switch E137

By operating the switch, the opening or closing procedure is initiated.

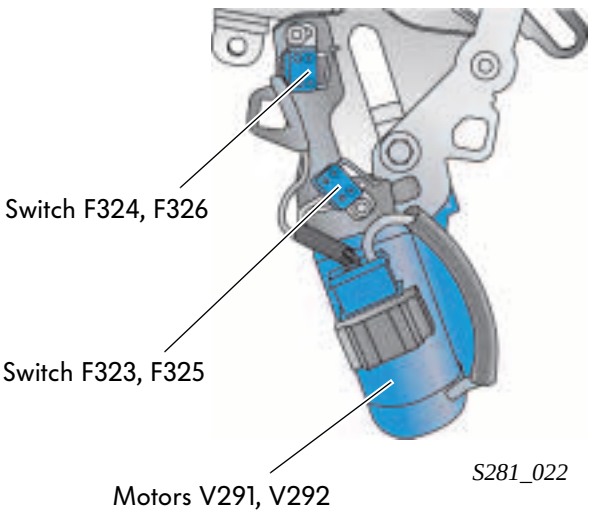
S281_014

Switch to open convertible top left/right lock F323, F324, F325, F326 and convertible top left/right lock motor V291, V292

Switches F324, F326 supply convertible top control unit with information "convertible lock closed".

Switches F323, F325 supply convertible top control unit with information "convertible lock open".

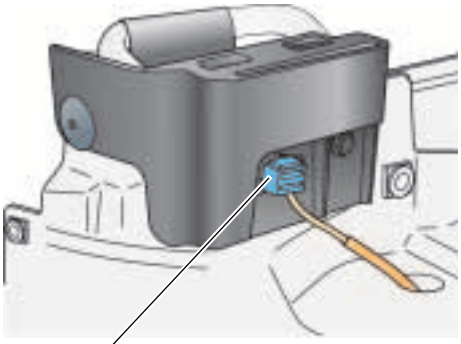
The convertible top lock motors V291, V292 actuate lokking.



S281_022

Tonneau cover switch left/right F348, F328

If the tonneau cover is installed correctly, the micro-switches are closed. This signal is used by the control unit to suppress the function of the convertible top operating switch. This means that closing of the convertible top is prevented.

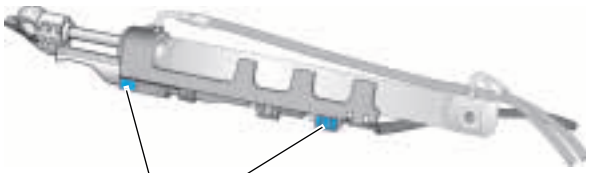


Switches F328, F348

S281_020

Convertible top stowed switch F171 on right hydraulic cylinder

The switches send a signal to the convertible top control unit as soon as the piston of the hydraulic cylinder reaches the upper and lower stops. The input signal is used to switch off the hydraulic pump.



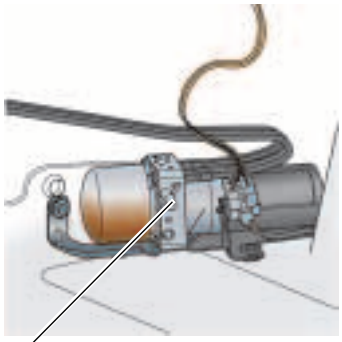
Switch F171

S281_025

Convertible top operation hydraulic pump V118

Depending on the rotation of the electric motor, oil is pumped through the respective pressure line to the hydraulic cylinder.

The emergency operation screw is located on the hydraulic pump.



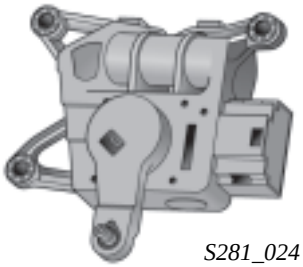
Screw

S281_018

Left/right linkage flap motor V289, V290 with left/right linkage flap sender G442, G443

Opens and closes flap on side panel trim.

The position of the convertible top frame flaps is detected by senders G442, G443.



S281_024

Electrical system

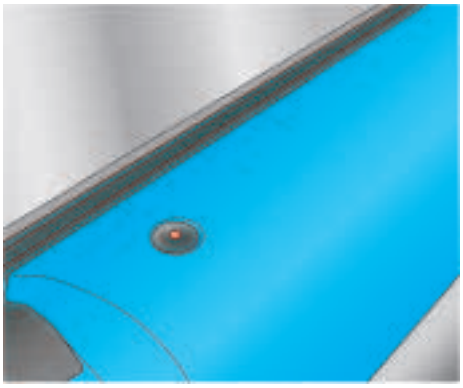
Door warning lamps

In place of lock buttons in the driver and front passenger door panel trim, there are indicator lamps that show the lock status of the front doors.

A flashing indicator lamp shows that the vehicle is locked. The safe function and, if necessary, the anti-theft warning system are activated.

A permanently lit indicator lamp shows that the vehicle is locked. The safe function and, if necessary, the anti-theft warning system are not activated.

When the vehicle is unlocked or opened, the indicator lamps go out.



S281_038

Turn signals

The side turn signals are integrated in the exterior mirror housings. Long lasting light emitting diodes (LED) replace standard bulbs.

S281_039

Rear window

The rear window is heated and made of mineral glass. It can only be replaced together with the convertible top.

S281_056

Switches

The switches for remotely unlocking the tank flap E204 and remotely unlocking the rear lid E188 can be found in the left side panel trim.

The rear lid remote release switch E188 can be deactivated using the ignition key.

The switch is deactivated when the key slot points to the "lock symbol".

S281_062

Convenience and safety electronics

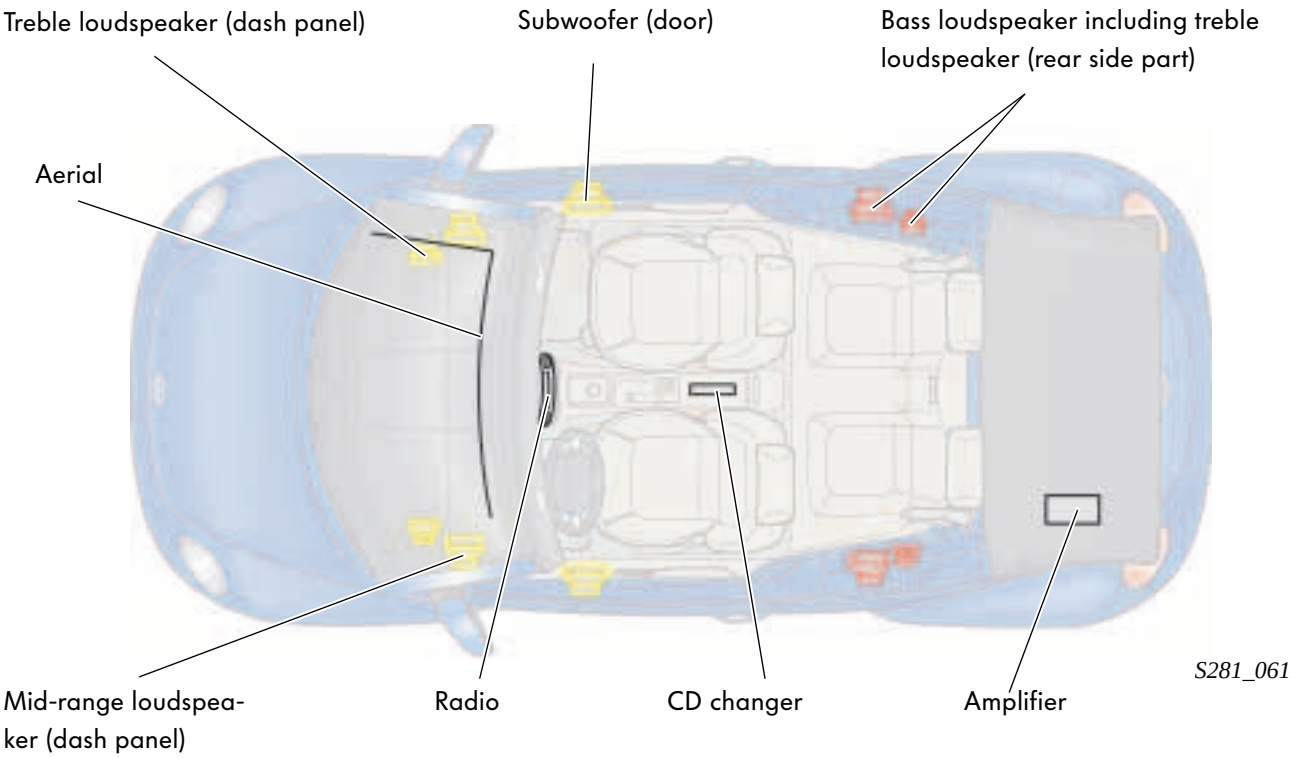
The audio systems

Audio systems "alpha" with 6 loudspeakers or "gamma" with 10 loudspeakers can be installed in the New Beetle Cabriolet.

They were optimised compared to the systems installed in the New Beetle due to high acoustic demands in the Cabriolet.

An additional amplifier can be found in the luggage compartment.

The aerial is integrated in the windscreen.



S281_061

Key:

= “alpha“

= “gamma“

CD player

The optional 6 x CD changer is installed in the stowage compartment of the centre console.

S281_060

The interior monitoring

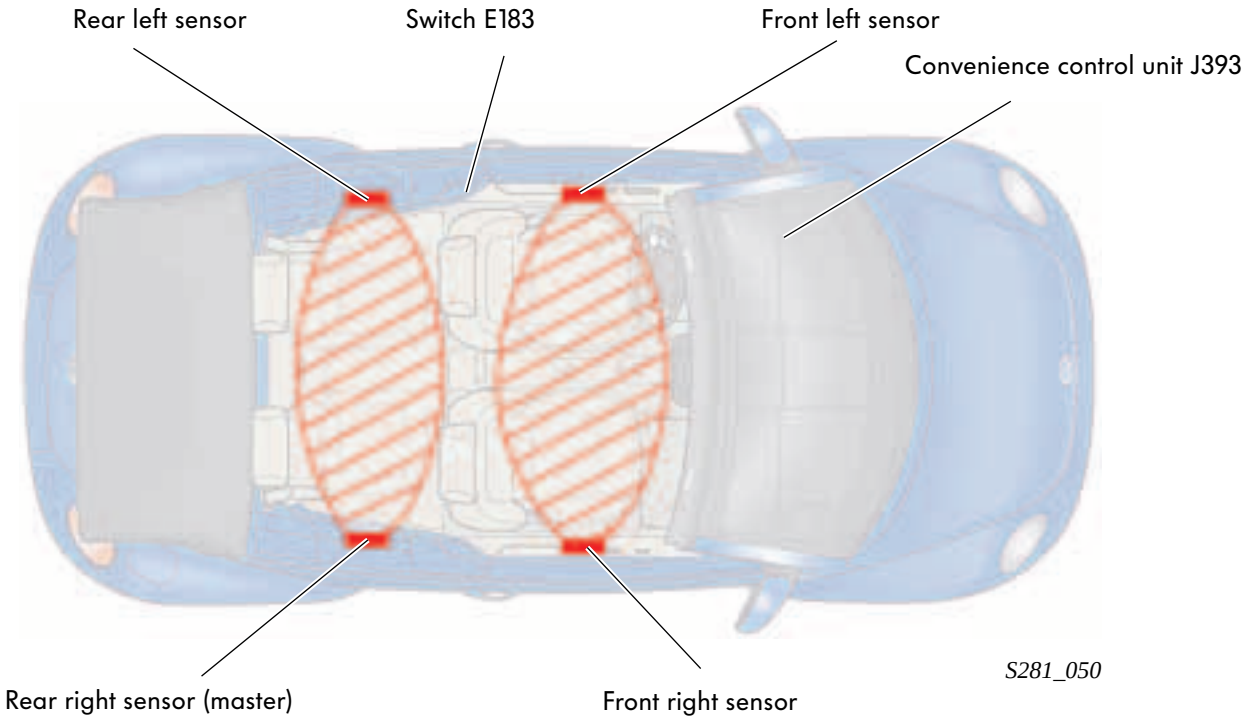
The interior is split into two monitoring areas, front and rear.

When activated, sensors emit radar impulses in a cycle at low output.

These impulses are reflected partly by the interior and stored as a representation of the area to be monitored.

Evaluation is by means of impulse echo via changes in reflection.

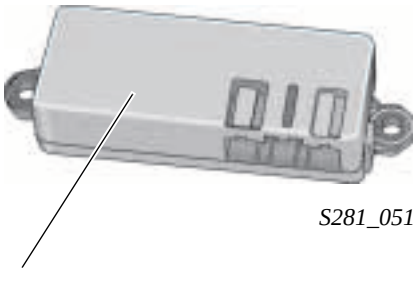
The system can be deactivated via the interior monitoring switch E183 in the B-pillar before exiting the Cabriolet.



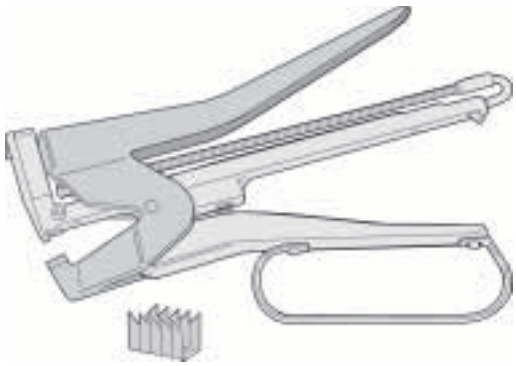
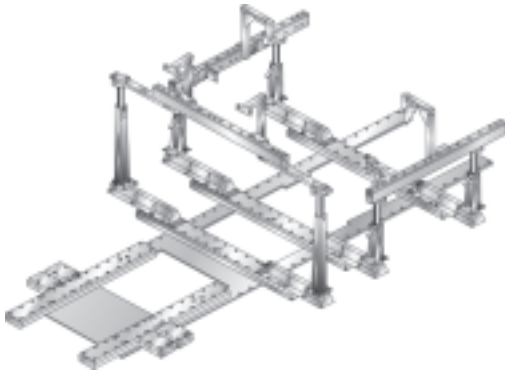
One of the four sensors works as a so-called master, three as slaves.

The master is connected via a bi-directional interface to the convenience control unit J393. The slaves are actuated by the master.

The convenience control unit activates an acoustic and optical alarm when the interior is penetrated.



Special tools

Designation	Tool	Application
VAS 6138 Locking pliers		Pliers for closing zip between convertible top cover and cushioning mat.
VAS 6148 Industrial stapler		Stapler for securing zip between convertible top cover and cushioning mat.
V.A.G 1887 Fitting brackets		Fitting brackets for supporting convertible top retaining bar.
VAS 5007 / 7A Portal gauge		For checking mounting points of convertible top frame on body.

Notes

281

000.2811.01.20 Technical status 03/03