

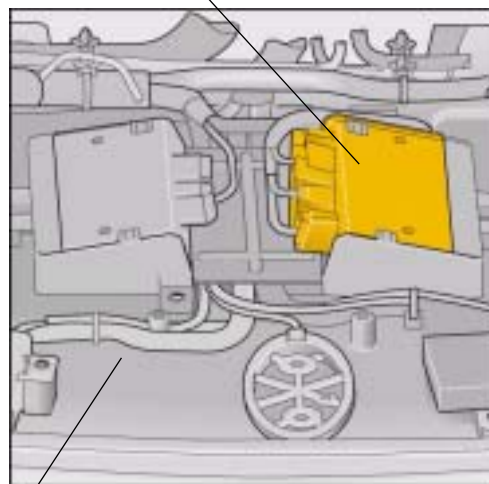
Convenience system central control unit

The convenience system central control unit monitors and controls the following functions:

- central locking
- unlocking the fuel filler flap
- window regulators
- interior monitor
- anti-theft alarm system
- tilt sensor
- rear lighting
- bootlid light
- control unit activation for the bootlid
- rear window heater (refer to Self-Study Programme 272 "The Phaeton Onboard Power Supply")
- bootlid lock control with automatic closing



Convenience system central control unit



Rear shelf

S273_029

Central locking (CL) system

The central logic of the central locking system for the doors and bootlid is stored in the convenience system central control unit. The functions are triggered by the entry information and the commands are transmitted to the door control units and the bootlid control unit.

In the case of vehicles with standard equipment, the central locking is activated as before by using the button on the ignition key with radio-wave remote control. In the event of a fault the vehicle can be locked and unlocked by using a mechanical emergency lock cylinder in the driver's door.

Functional sequence

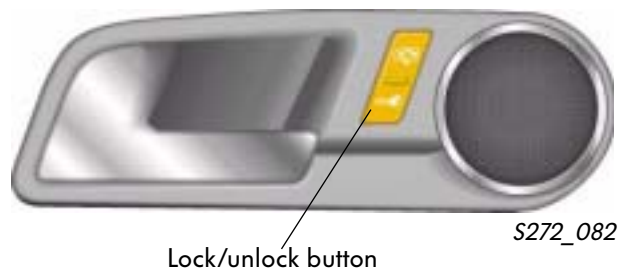
The door control units provide information via the convenience CAN databus.

The convenience system central control unit evaluates this information and controls the central locking functions. The door control units evaluate the messages from the convenience system central control unit and activate the motors for the central locking.

In the convenience equipment of the system for entry and start authorisation, the convenience system central control unit receives the central locking command from the entry and start authorisation relay.

Operating units for the central locking system

- Radio-wave remote control
- Lock/Unlock button in all doors
- Driver's door lock cylinder (emergency locking)
- System for entry and start authorisation (optional)



Emergency functions

Communication between the convenience system central control unit and the door control unit takes place via the CAN databus. If the CAN messages cannot be received by the door control units (for example if the convenience system central control unit is defective), the following emergency functions are initiated:

- After five messages have not been received, all door control units detect that no further messages are being transmitted by the central control unit.
- The driver's door control unit assumes control of central locking.
- All other door control units react to the messages from the driver's door control unit.
- The signals from the driver's door lock cylinder, as well as those from the lock/unlock button become command signals and the operating units of the other doors cease to work.
- When operated, the lock cylinder takes priority over the button.
- If the CAN connection to the driver's door is interrupted, the door can only be activated manually by means of the lock cylinder; the lock/unlock button does not function.

Behaviour in a crash

Information about a crash is transmitted via the CAN databus. A signal is transmitted from the convenience system central control unit to unlock the central locking.



Convenience system central control unit

Unlocking the fuel filler flap

The fuel filler flap is unlocked if:

- there is a request made by means of a CAN message from the driver's side door control unit,
- the vehicle road speed is below the preset speed threshold and
- the vehicle has not been locked from outside.

Remote release switch for the fuel filler flap



S273_067

Power regulators

All window regulators have decentralised electric control and, for safety reasons, have a roll-back function when the window regulator motor has been learned-in. The convenience system central control unit generates the CAN signals for the convenience opening and closing functions.

Interior monitor (IM)

The IM in the roof module is activated and deactivated by means of the convenience system central control unit per CAN databus. Each IM operating state is transmitted back to the convenience system central control unit, including the alarm signal, if the IM has been triggered. The driver can deactivate the IM once for this cycle between switching off the ignition and activating the ATA via the front central display and operating unit (CDC).

Sensors for interior monitor



Front roof module

S273_089

Anti-theft alarm system (ATA)

The anti-theft alarm system function is integrated in the convenience system central control unit. The information necessary for activation and deactivation is provided by the entry and start authorisation relay. Communication takes place via the convenience CAN databus.

Activating the ATA

When the vehicle is locked with the radio-wave remote control, this status is transmitted via the CAN databus and the ATA is activated. The ATA can also be activated by actuating the emergency locking cylinder. In the convenience version of the Entry and Start Authorisation system, when locking the vehicle, the ATA is activated using the locking button in the outer door handles. If Terminal 15 is engaged or the driver's door opened, the ATA is not activated.

Deactivating the ATA

Authorised access is transmitted by a radio-wave remote control key via the CAN databus, causing deactivation. If the vehicle is entered by means of the mechanical emergency lock cylinder (if there is interference to radio communication or the radio-wave remote control key battery has discharged), Terminal 15 must be engaged at the latest after 15 seconds, otherwise the ATA will be deactivated.



Convenience system central control unit

Tilt sensor

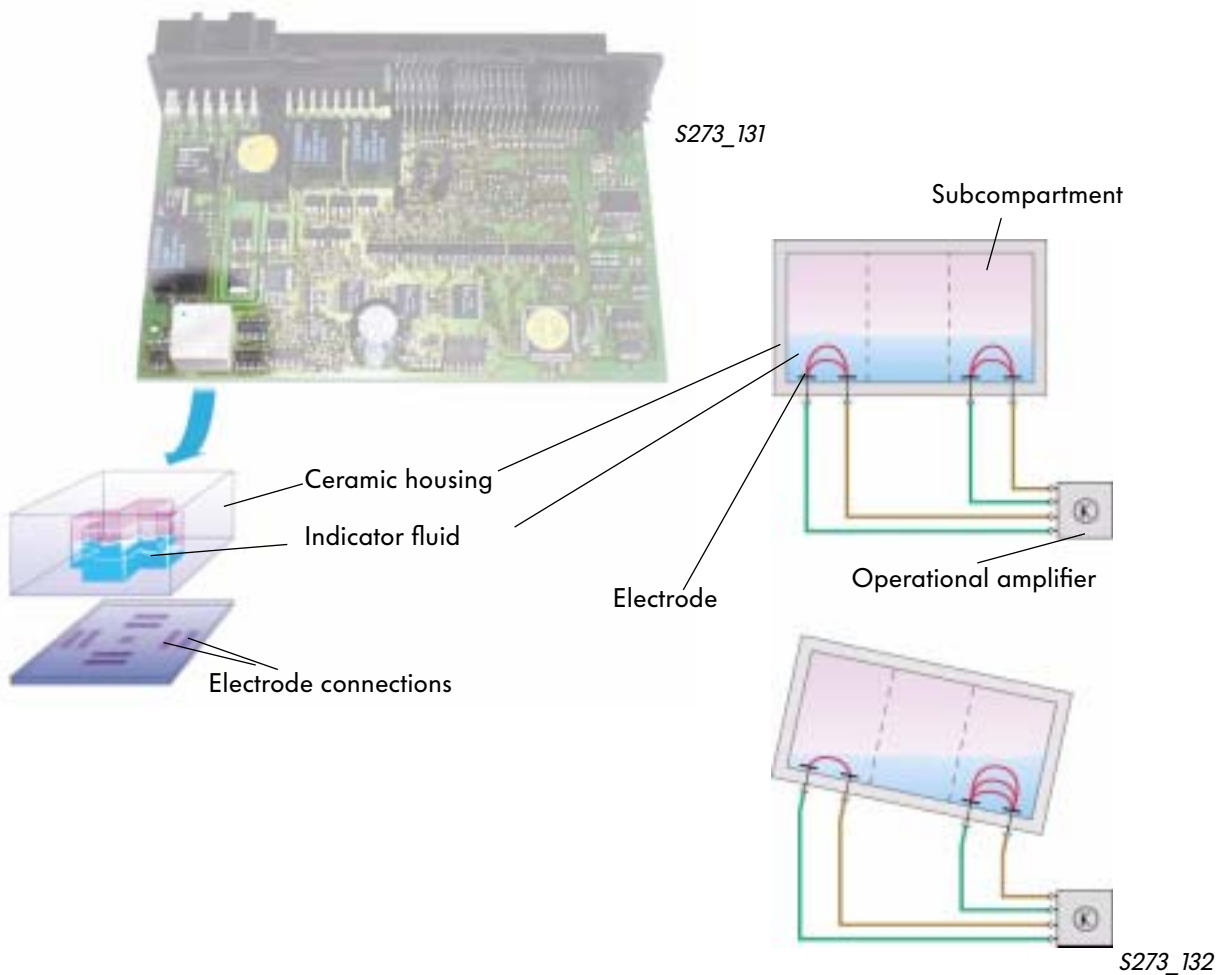
The tilt sensor ensures that the vehicle cannot be towed away without authorisation.

The tilt sensor mechanism is based on what is known as the conductometric technique. It determines the change in resistance if there is a change in the volume of a viscous, electrically conductive liquid.

Electrodes arranged at different positions project out of this liquid. Electrodes arranged at different positions project out of this liquid.

If the position of the sensor changes (if the vehicle is raised on one side), then the distribution of the fluid in the chambers also changes. When the level of the fluid in the compartments changes, the resistance determined across the electrodes in the chambers also changes.

The change in the position of the tilt sensor caused by inclining the vehicle to one side changes the resistance. This is stored and activates the anti-theft alarm system. This is stored and activates the anti-theft alarm system.



Rear lighting

The convenience system central control unit controls the following lighting functions:

- Right/left rear and marker light
- Left/right brake light
- 3rd brake light
- Left/right reversing light
- Rear fog light
- Number plate light
- Rear courtesy light or self-illuminating number plate
- Boot light



Number plate lighting



S273_129

Automatic closing

The automatic closing motor ensures that the bootlid is securely closed as soon as a rotary latching contact is energised.

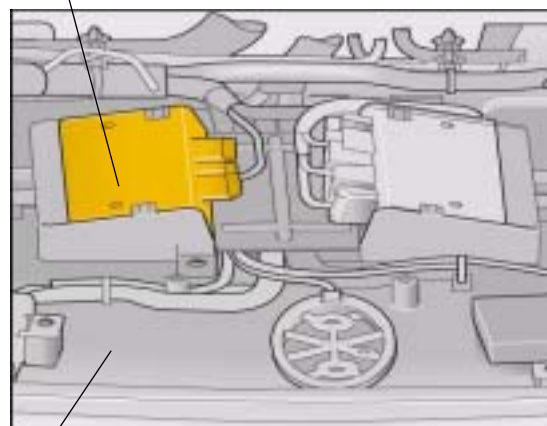
Convenience system central control unit

Bootlid control unit

The bootlid control unit controls the complete bootlid opening and closing procedure and is assigned as a slave to the convenience system central control unit. It receives its information via a serial interface from the convenience system control unit and transmits its status and diagnostic messages back via the same interface.



Bootlid control unit



Rear shelf

S273_060

Exterior button

With basic equipment:

- The central locking is unlocked = press the button to open
- The central locking is locked = button activation is ignored

With convenience equipment:

- The central locking is unlocked = press the button to open
- The central locking is locked = pressing the button triggers authorisation; in the event of a positive result the bootlid is opened.

For both types of equipment the exterior button for the bootlid is deactivated if the speed threshold is exceeded. It is enabled when a vehicle door is opened.



Emergency lock cylinder

Bootlid exterior button

S273_064



The convenience system central control unit and bootlid have self-diagnostic capability using the VAS 5051 Diagnostic Testing and Information System via address word 46.

The bootlid is opened

either by means of

- the bootlid switch on the inner side of the driver's door under the speed threshold of 6 km/h,
- or the bootlid radio-wave remote control button (RLR),
- or the exterior bootlid button (concealed in the VW emblem).

Switch for bootlid, driver's door



S273_065



The bootlid is closed

manually in the basic version,

- manually

and with convenience equipment (with hydraulics) by using

- the button in the bootlid,
- the radio-wave remote control or
- the switch on the inner side of the driver's door,
- and the exterior switch in the VW emblem.

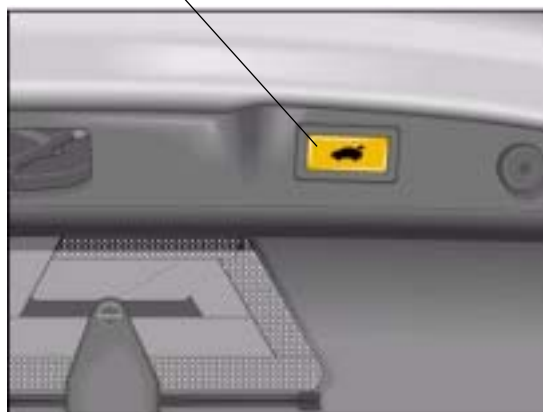
The bootlid can only be shut if the bootlid has been learned-in (end position learned-in). Refer to the current Service Literature for information on how to carry out the learn-in process.

Bootlid radio-wave remote control button (RLR)



S273_083

Bootlid interior button



S273_063

Pinch protection function

A force limitation mechanism for the hydraulic pump clearly identifies any likelihood of anyone trapping a hand etc. when opening and closing the bootlid.



Danger: During self-diagnosis "basic setting", there is no pinch protection function!

Roof module

Various electrical components are integrated in the roof module which are not all part of the same function system. Various electrical components are integrated in the roof module which are not all part of the same function system. For this reason not all components are controlled by the roof electronics control unit; some are controlled via separate control lines.

Components activated directly by the roof module:

- Interior lighting
- Interior lighting control
- Control for Terminal 30G
- Garage door opener
- Interior monitor (IM)
- Electronically controlled interior rear-view mirror with memory function (optional)
- Rain sensor
- Light sensor (optional)
- Humidity sensor and windscreen temperature sensor
- Control for sliding/tilting roof (refer to chapter entitled "Sliding/tilting roof").

Not directly activated by the roof module:

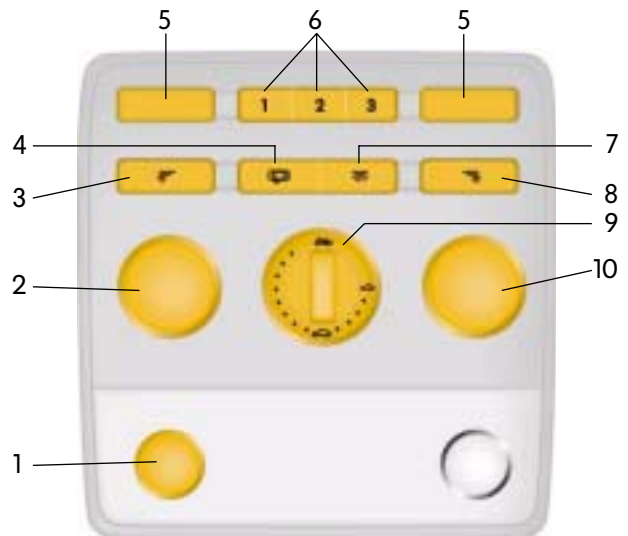
- Indirect dash panel lighting - via the onboard power supply control unit
- Instrument lighting - via the onboard power supply control unit
- Hands-free microphone - via the car phone/telematics control unit



The humidity sensor and windscreen temperature sensor are assigned to the climate control system and are described in Self-Study Programme 271.

Front roof module

- 1 Hands-free microphone driver's side
- 2 Driver's side reading light
- 3 Driver's side reading light On/Off
- 4 Interior light automatic function On/Off
- 5 Sensors for interior monitor (optional)
- 6 Actuation of garage door opener (optional)
- 7 Actuation of interior light On/Off
- 8 Actuation of reading light front passenger On/Off
- 9 Rotary switch sliding/tilting roof (optional)
- 10 Front passenger reading light

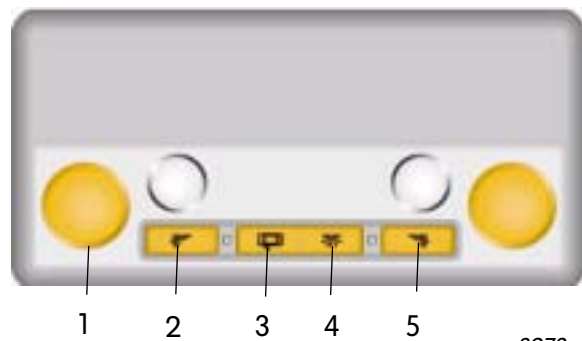


S273_015



Rear roof module

- 1 Rear left reading light
- 2 Rear left reading light On/Off
- 3 Interior light automatic function On/Off
- 4 Actuation of interior light On/Off
- 5 Rear right reading light



S273_074

Roof module

Interior lighting

The interior light plus the driver's and front passenger reading lights and their switches are integrated in the roof module.

The roof module assumes control of the interior lights in the vehicle. The necessary information is transmitted via the convenience CAN databus as shown in the following example:

- Rotary latch contact (door open)
- NO contact (ignition key inserted)
- Terminal 15 (ignition "on")
- Anti-theft alarm system (ATA) triggered
- Crash signal (crash intensity).



Interior lighting control

Switching the voltage supply for the interior lights, the reading lights and the vanity mirror lights is part of the interior lighting control.

To control the following lighting, the necessary information for the control units concerned is also provided by the roof module via the convenience CAN databus.

- The footwell lighting is dimmed and switched on and off by means of the seat control units as soon as the interior light in the roof module is switched on or off manually or automatically.
- The door exit warning lights are switched on undimmed by means of the door control units when doors are open.
- The door courtesy lights are switched on if a door is opened, an unlocking command exists, the ATA alarm is active or the automatic driving light control* has been activated.
- The inner door handle lighting is switched on if a command is sent to the roof module via the convenience system central control unit to lock the vehicle. The interior door handle lights are activated via the door control units. The intensity of the inner door handle lighting is controlled via Terminal 58d. If Terminal 15 is on, it is activated at full brightness.

* For more detailed information on the automatic driving light control system please refer to the chapter entitled "Automatic driving light control" in this Self-Study Programme.

Control for Terminal 30G

Terminal 30G is switched via the roof module and supplies the voltage for the glove box and vanity mirror lights. A pulse width modulated signal (PWM signal) is generated in the roof module.

Terminal 30G switches on under the following conditions:

- Terminal 15 is switched on and
- the run-on period for the supply switched on has not expired.

Terminal 30G switches off under the following conditions:

- after Terminal 15 has been switched off, if no interior light or reading light has been switched on for 30 seconds,
- an hour after Terminal 15 has been switched off and the interior light or reading light has been switched on,
- after an hour if Terminal 15 has been switched off and an interior light or reading light is switched on,
- immediately after all the conditions for switching off the dimmed front interior light have been met.

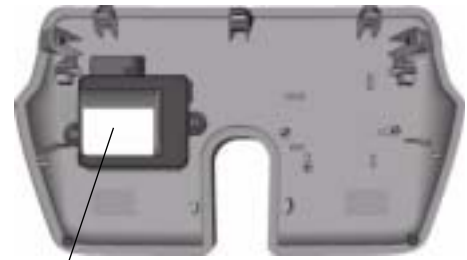


Roof module

Garage door opener

The garage door opener is supplied as an option. Up to three different garage door openers can be activated by means of the roof module. The driver must be responsible for learning-in the function of the garage door opener, as the function can vary depending on the manufacturer.

The garage door opener is only active if Terminal 15 is switched on. After Terminal 15 is switched off it remains active for a run-on period of 10 minutes. The run-on period is interrupted if a door is opened.



S273_115

Garage door opener in the front roof module



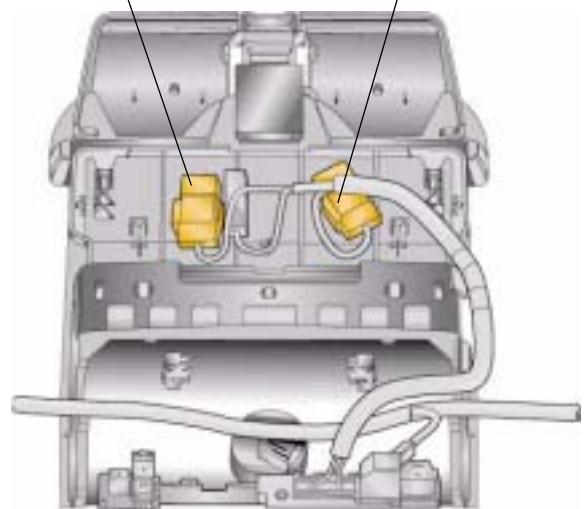
Interior monitor (IM)

The interior monitor (IM) is controlled via the roof electronics control unit. The sensor technology is integrated in the roof module. The information necessary for control is transmitted by the convenience CAN databus.

The roof electronics control unit detects any tripping via the IM sensors and transmits this by means of the convenience CAN databus. The convenience system central control unit receives this information and triggers the functions of the anti-theft alarm system (ATA).

Connector for the garage door opener

Connector for the interior monitor (IM)



S273_080

Activating the IM

The IM is activated via the convenience system central control unit (anti-theft alarm system master).

Deactivating the IM

Deactivating the IM depends on deactivating the anti-theft alarm system (ATA) by unlocking the central locking system.

It is possible to switch off just once and bring about subsequent locking via the front central display and control unit (CDC).

Sensors for interior monitor (IM)



Front roof module

S273_089



For more detailed information about the anti-theft alarm system (ATA) please refer to the chapter entitled "Convenience system central control unit".

Roof module

Electronically controlled interior rear-view mirror with memory function

The use of **Electronic PhotoChromic (EPC)** gel inside the automatic anti-dazzle interior mirror (**electronically controlled** interior rear-view mirror) allows it to automatically change the reflection when the light sensor detects an impinging bright light. By

- engaging reverse gear,
- switching on the interior light and
- deactivating the electronically controlled function through the button on the bottom of the mirror,

the roof electronics control unit adjusts the interior rear-view mirror for maximum brightness. Information about the selected reverse gear is received via the CAN databus.

Interior rear-view mirror memory function

Basic adjustment for the interior rear-view mirror is carried out manually. The position of the interior rear-view mirror is recorded by two feedback potentiometers (x, y axis) and stored in the roof module. This stored information is transmitted via the convenience CAN databus to the seat control unit on the driver's side.

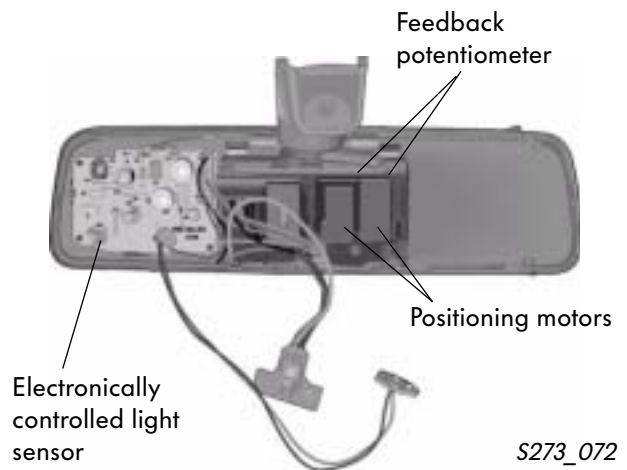
Where there is appropriate equipment, in order to adjust the stored interior rear-view mirror position assigned to a memory button, the roof module receives the command from the driver's side seat control unit via the convenience CAN databus. This position is adjusted by means of two positioning motors in the mirror housing.

Front roof module



Electronically controlled light sensor

S273_075



Electronically controlled light sensor

S273_072



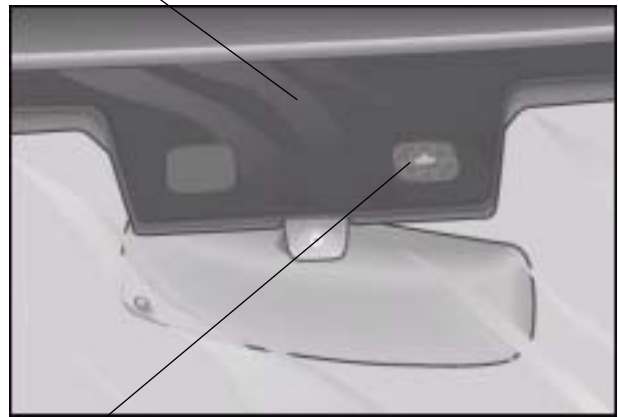
For further information on the electronically controlled interior rear-view mirror please refer to Self-Study Programme 200 "The Golf '98".

Rain sensor

The rain sensor is supplied with voltage by the roof electronics control unit. Signals output by the rain sensor are sent in the form of commands to the wiper motor control unit via the convenience CAN databus.

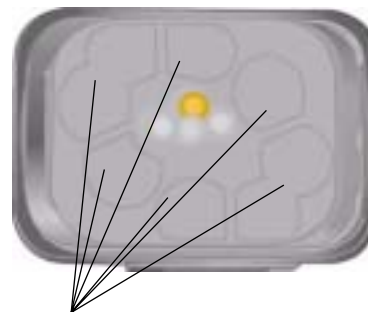
The rain sensor is activated by means of the "Intermittent" and "Automatic" positions on the steering column switch (also refer to the chapter entitled "Wiper module").

Front roof module



Rain sensor

S273_075



Sensitive surfaces of the rain sensor

S273_071



The roof module is capable of self-diagnosis through the VAS 5051 Diagnostic Testing and Information System using address word 38 ("Roof electronics").

Roof module

Sliding/tilting roof (STR)

The sliding/tilting roof (STR) is supplied with dimensions of 520 x 900 mm and with two equipment variants:

- solar roof
- glass roof

Solar roof version

The solar cell power output of 24 watts is used by activating the ventilator fan for the interior ventilation even if the ignition is not switched on.

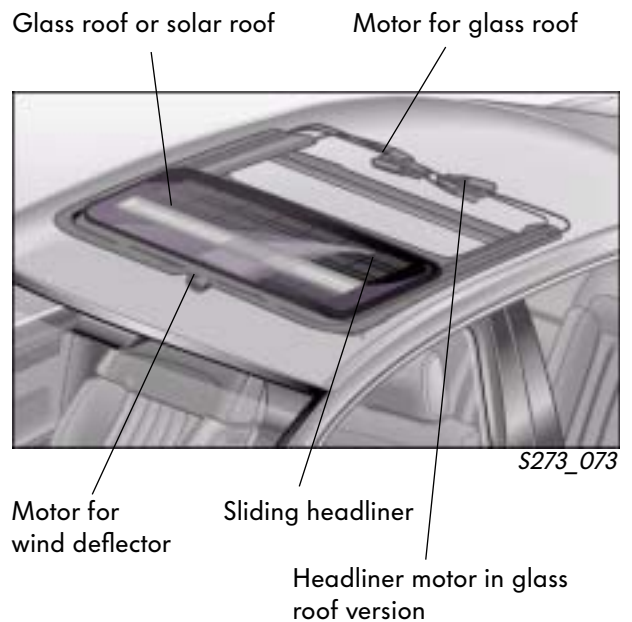


Operating the sliding/tilting roof (STR)

The sliding/tilting roof (STR) is operated by means of the rotary switch on the roof module after it is by the convenience system central control unit. The roof electronics control unit outputs the signals to the sliding/tilting roof to enable the sliding/tilting roof and convenience opening and closing. Evaluation of the STR switch also takes place in the sliding/tilting roof.



For further information about the sliding/tilting roof please refer to Self-Study Programme 270 "The Phaeton".



The STR function is enabled:

- when the ignition is switched on (Terminal 15 on),
- for a run-on period of 10 minutes after the ignition is switched off (Terminal 15 off),
- as long as no door is opened. If the driver's door is opened within the run-on period, the sliding/tilting roof enable function is cancelled.

Glass roof version

For the glass roof version, the roof module has two additional buttons at the front on the rotary switch to operate the roller blind.

In the glass roof version the sliding headliner is activated electrically by a separate motor.



S273_086

Rotary switch in the front roof module with E 437 button for roller blind/sunroof

Convenience opening and closing function

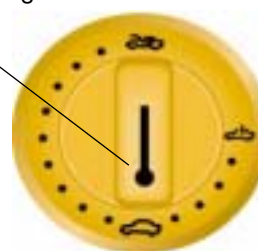
Convenience operation allows the electric windows and a fitted sliding/tilting roof (STR) to be fully opened and closed. The function is configured via the front central display and control unit (CDC). The STR is not enabled by the convenience system central control unit until after the window regulators have reached the end position (if this convenience function is configured). The function is only active while it is being activated.

Emergency closing function

The "emergency closing" function is triggered by pressing the dot in the middle of the rotary switch. The sliding/tilting roof immediately travels to zero position with increased holding power.



Emergency closing



S273_088



The sliding/tilting roof is capable of self-diagnosis through the VAS 5051 Diagnostic Testing and Information System using address word 38 (roof electronics).

Roof module

Automatic driving light control

The automatic driving light control extends the previous number of functions on the rotary light switch.

Firstly, the automatic driving light control (ALC) has a safety function. If the rotary light switch is positioned on the "automatic driving light control" function (tunnel light symbol), the entire vehicle lighting is switched on automatically at a brightness relative to the ambient light levels as detected by light sensors. The light sensors are read by the roof module.

The automatic driving light control switches the following lighting on:

- dipped beam
- tail light
- courtesy lights
- number plate lights

The tunnel light symbol is visible on the speedometer for a few seconds when the automatic driving light control is switched on.



For simple faults such as processor failure, a defective sensor or an open circuit, the entire vehicle lighting is always switched on.

Symbol for tunnel light



S273_004

Rotary light switch with "automatic driving light control" function

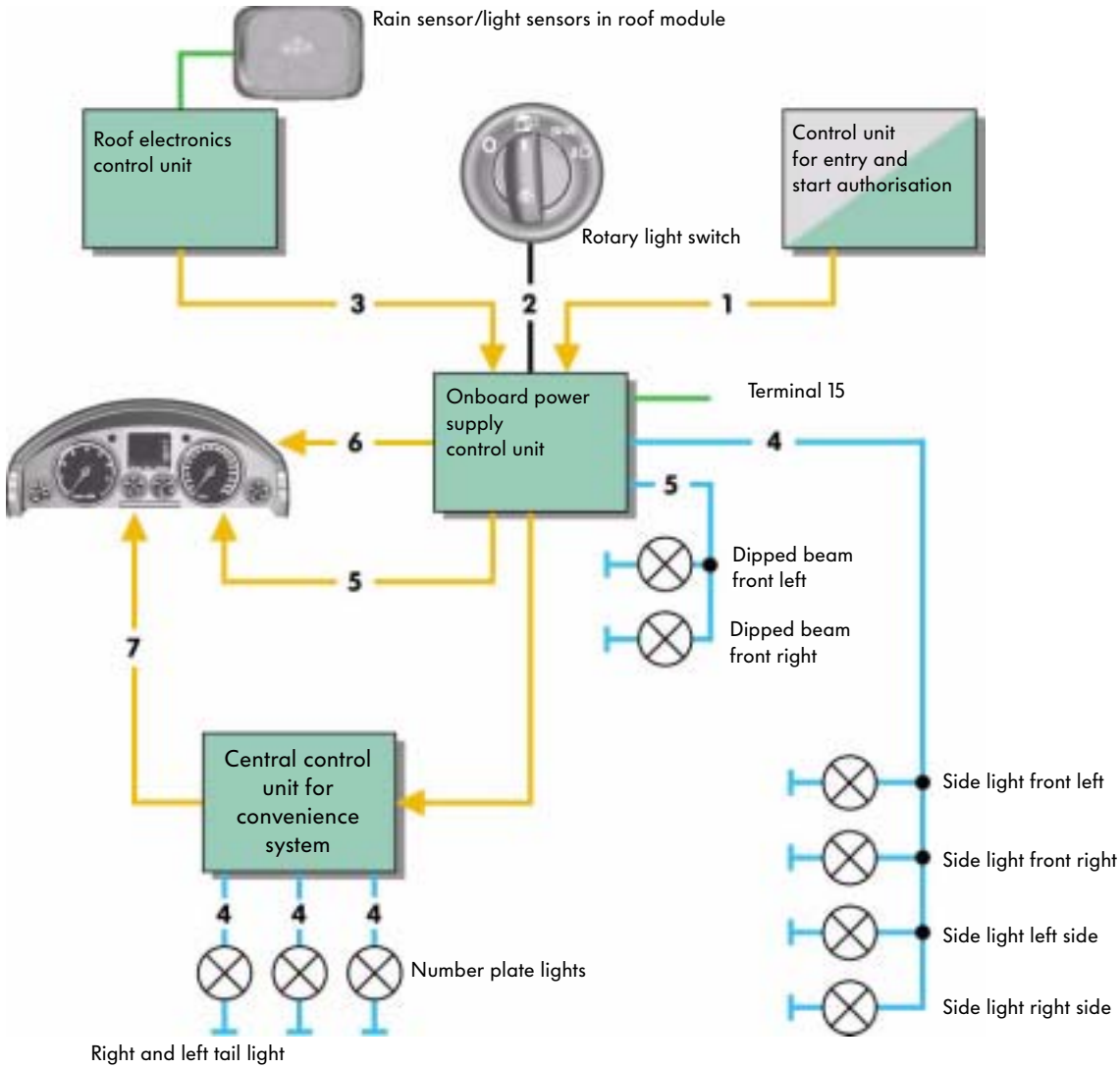


The lighting function that is activated by means of the rotary light switch always takes priority over the light function automatically selected by the automatic driving light control!



S273_005

System overview



S273_007

- | | |
|-----------------------------------|---|
| 1 Terminal 15 on | 6 Front right or left dipped beam defective |
| 2 Automatic driving light control | 7 Rear left and right parking light and number plate lighting defective |
| 3 Light (dipped beam) on | |
| 4 Tail light (parking light) on | |
| 5 Dipped beam on | |



An additional circuit in the onboard power supply control unit ensures that the side lights and dipped beams can be switched on and off even if the μC fails!

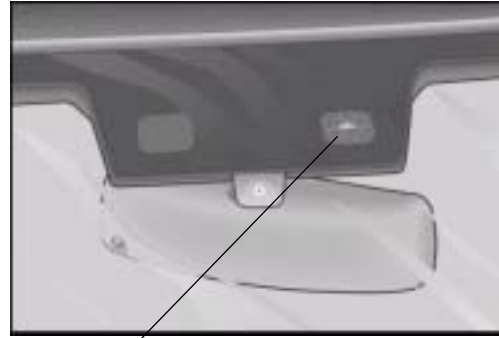
Roof module

Sensor

The sensor comprises the following functions:

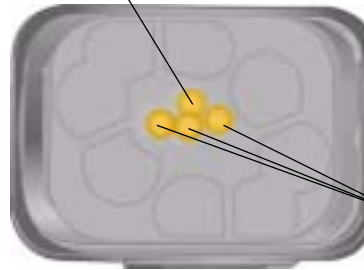
- rain sensors and
- light sensors (optional)

The sensor is mounted on the windscreen (top centre) and linked electrically to the roof module.



S273_075

Ambient light sensor/rain sensor



Directional sensors

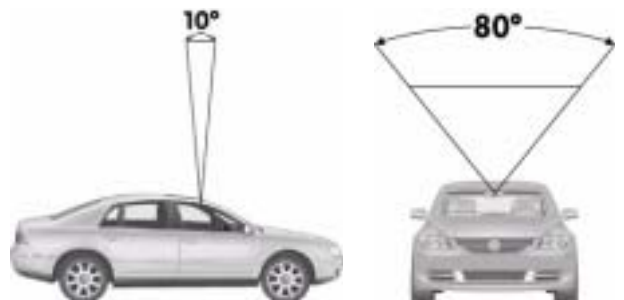
S273_111

The light sensor technology consists of the following components:

- Three directional sensors with a viewing direction horizontal to the vehicle with a beam width of 10° for each sensor
- An ambient light sensor with viewing direction vertical to the vehicle and with a beam width of 10° and 80° to the side.



S273_006



S273_113

S273_112



The ambient light sensor also works as a rain sensor.

Conditions for switching on

When the vehicle enters a tunnel, the vehicle lighting is immediately switched on. It is switched off again with a time delay of 5 seconds after leaving the tunnel (this avoids flashing the lights by constantly switching on and off).

By contrast, the vehicle lighting is not activated when passing bridges and travelling through short underpasses or in fog, as the horizontally arranged light sensor - in contrast to the vertically arranged light sensor - is able to detect light. In such cases the vehicle lighting must always be adjusted manually as required.

Rain sensor function

If it rains, the vehicle lighting is activated after 10 seconds by a rain sensor using infrared detection. It is deactivated again if no further rain is detected for 200 seconds.

The rain sensor also detects how severe the rain is and automatically activates the windscreen wipers and regulates the rate at which they wipe (refer also to the chapter entitled "Windscreen wiper module").



Roof module

Orientation lighting

The convenience functions of orientation lighting assist the vehicle occupants by automatically switching on the vehicle lighting when they enter and leave the vehicle.

The entire interior lighting is switched on via the radio-wave remote control for up to four minutes after the vehicle doors are unlocked. This function is cancelled again when:

- the maximum time for this function has expired
- the orientation lighting is switched off via the CDC "Settings" menu
- the ignition is switched on.



S273_013



S273_019

The orientation lighting switches the entire interior lighting off with a delay after occupants leave the vehicle when:

- the ignition is switched off,
- the vehicle lighting was switched on beforehand for at least three seconds,
- after opening a vehicle door, the system detects that all vehicle doors have been closed again,
- the vehicle doors are opened and closed again, as long as the orientation lighting is still activated and the battery protection time of 180 seconds has not yet elapsed.

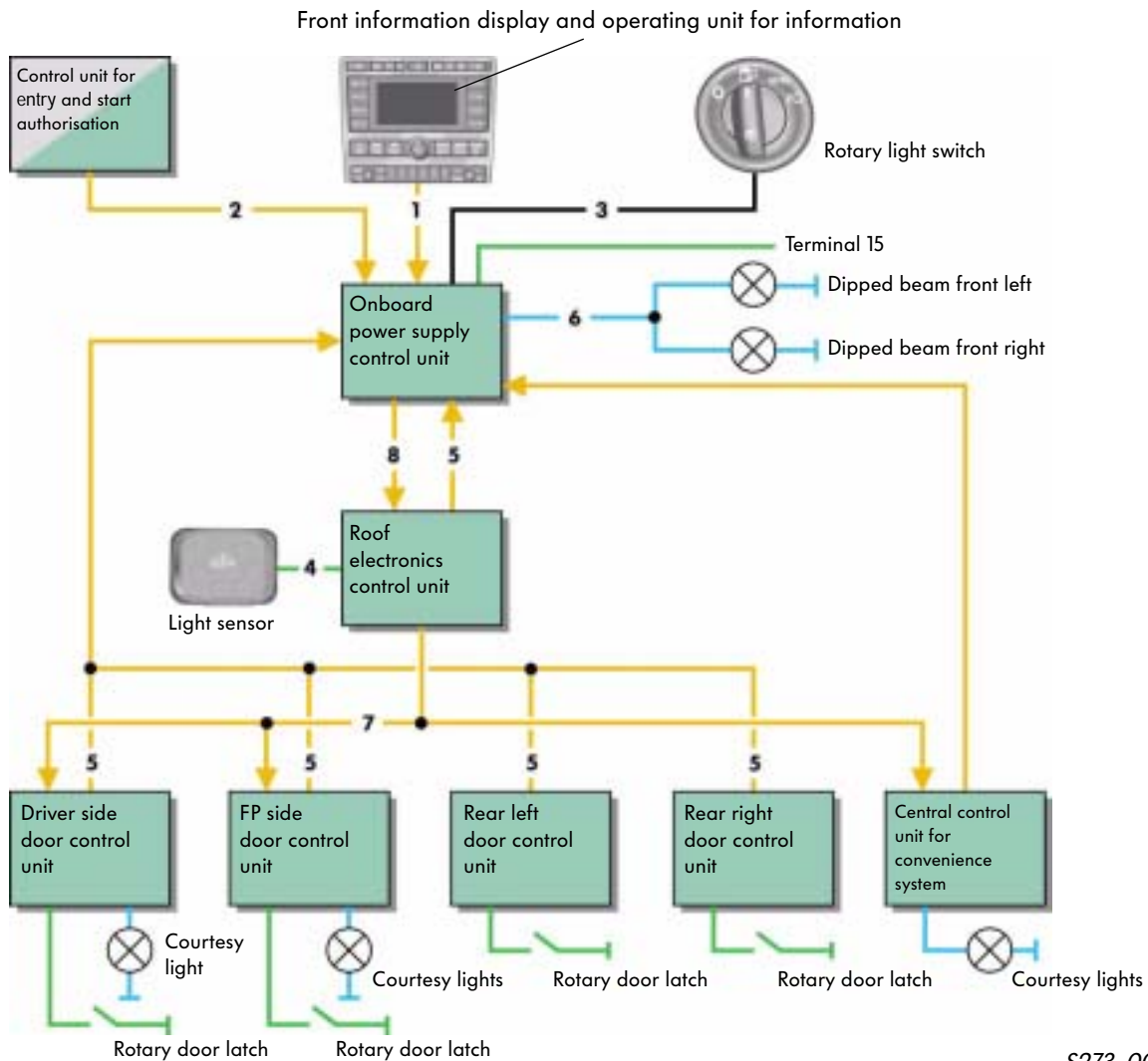
The status of the interior lighting is not affected by the function of the orientation lighting.

The last value for the orientation lighting in each case is stored in the onboard power supply control unit and used if the CAN signals fail.



If there is no light sensor fitted, the lights will also be switched on during the day!

System overview of orientation lighting



S273_008

- | | |
|--|---|
| 1 Orientation lighting activated | 7 Courtesy lighting for outer door handle |
| 2 Terminal 15 off | 8 Orientation lighting active |
| 3 Rotary light switch was switched on beforehand (dipped beam) | |
| 4 Light sensor reports darkness, rotary light switch is set to automatic driving light control | |
| 5 Door open, rotary latch contact | |
| 6 Automatic driving light control active, switch on dipped beam | |



Automatic driving light control is capable of self-diagnosis through the VAS 5051 Diagnostic Testing and Information System using address word 49.



Roof module

Windscreen wiper module

The windscreen wiper module is a new development. It offers:

- a dual motor wiper system without wiper linkage (small crankshaft drive)
- minimum noise from the wiper blades at turning points due to reduced wiper motor speed
- uniform wiping quality depending on road speed and wind pressure
- intermittent wipe controlled according to vehicle road speed
- wiper blade protected by alternating park position in the up or down direction
- lowered wiper arm park position outside range of vision (heated).



V217
Front passenger's side wiper motor (slave)



V216
Driver's side wiper motor (master)

S273_125

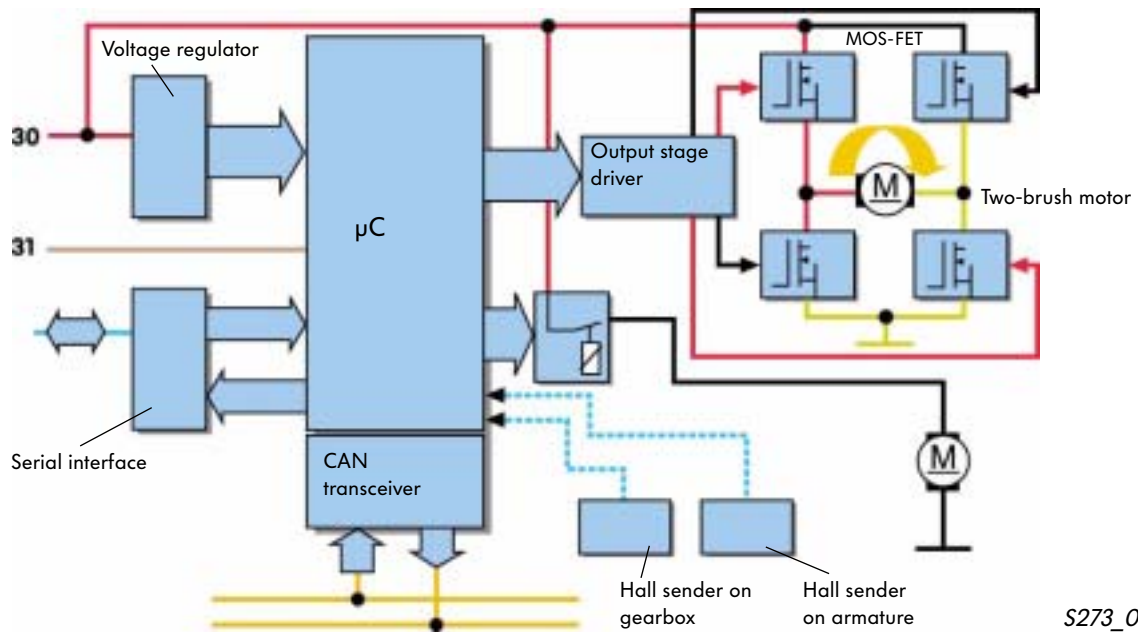
Activating the wiper module

The control electronics for the speed-regulated two-brush wiper motor is integrated in the gearbox cover and activates the wiper motor. The wiper motor on the driver's side (master) receives the wiping requests via a CAN interface.

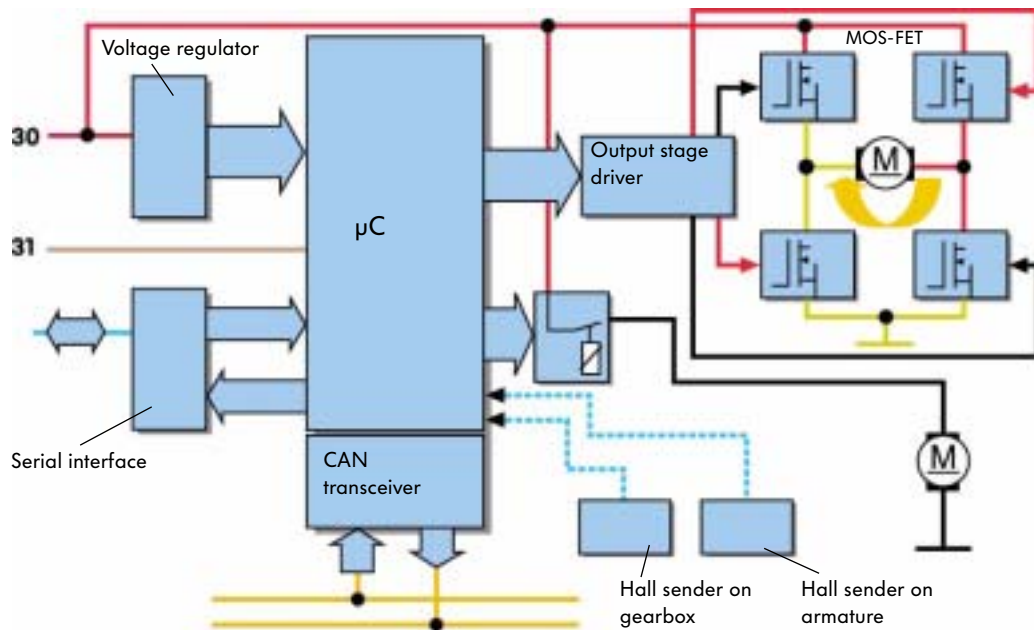
The wiper motor on the driver's side (master) receives the wiping requests via a CAN interface. The driver's side wiper module (master) on the other hand activates the windscreen washer pump directly.

Wiper motor (master)

The wiper arm is moved up and down by reversing the wiper motor (master). To achieve this, the motor terminal voltage changes poles in the reverse positions. To regulate the wiper speed, the motor speed and position of the wiper arm are measured by Hall senders on the armature and gearwheel.



S273_069



S273_070



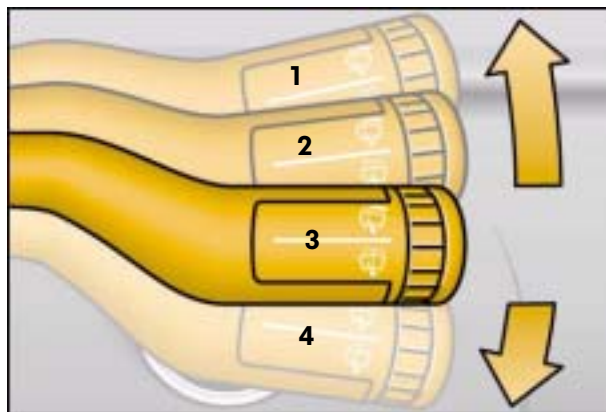
Roof module

Switch positions and intervals

The Phaeton has the following switch positions:

- 1 Continuous wipe Stage 2
- 2 Intermittent wipe Stage 1 (rain sensor active)
- 3 Wipe function off
- 4 Flick wipe

In the intermittent position it is possible to activate the wipers at three different speeds, depending on the level of wetness on the windscreen.

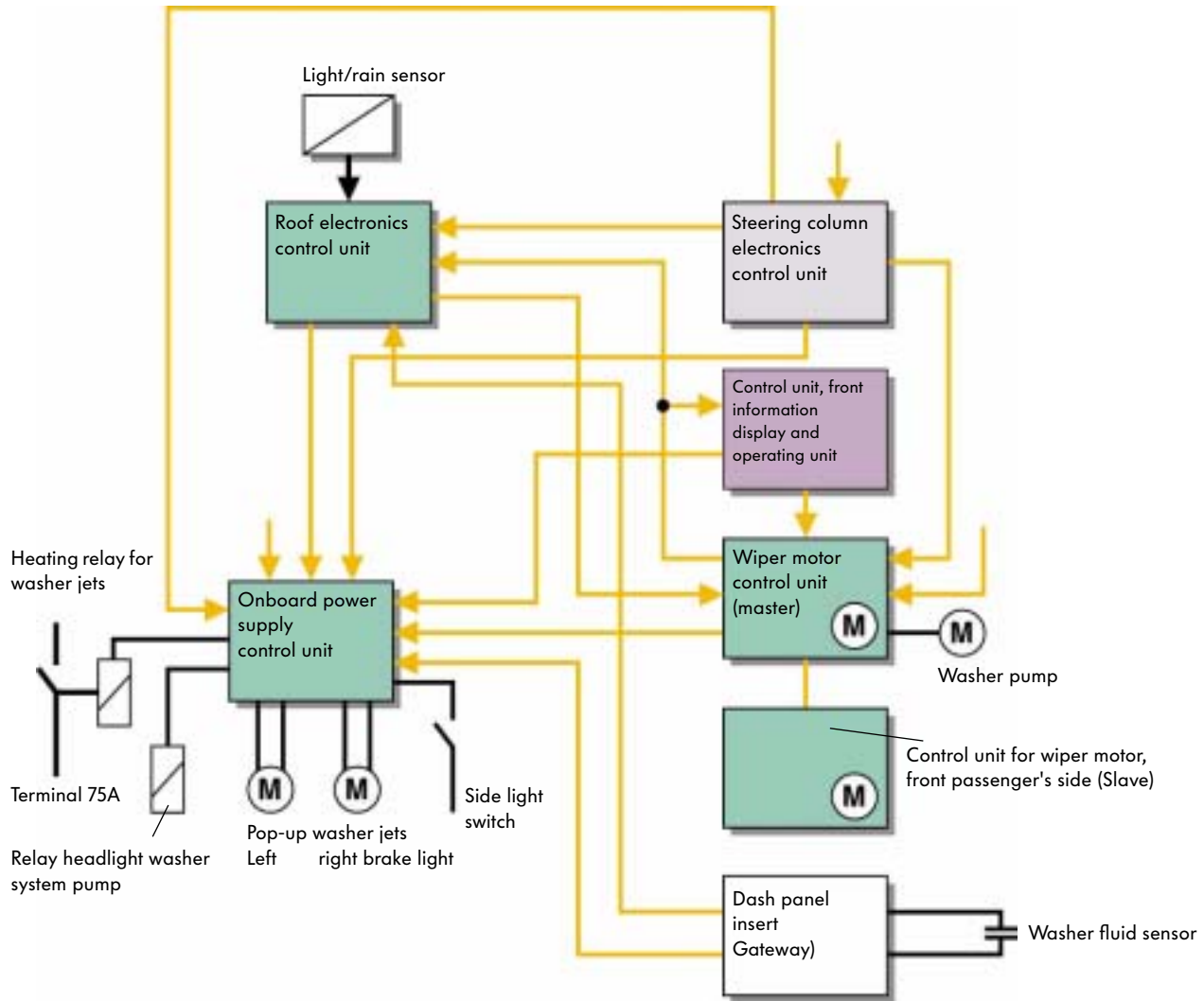


S273_091



To renew the wipers, the wiper arms must be moved to a vertical position via the front central display and control unit (CDC)! Please do not remove the wipers independently!

Wiper park position, heated



S273_009

