

Service.



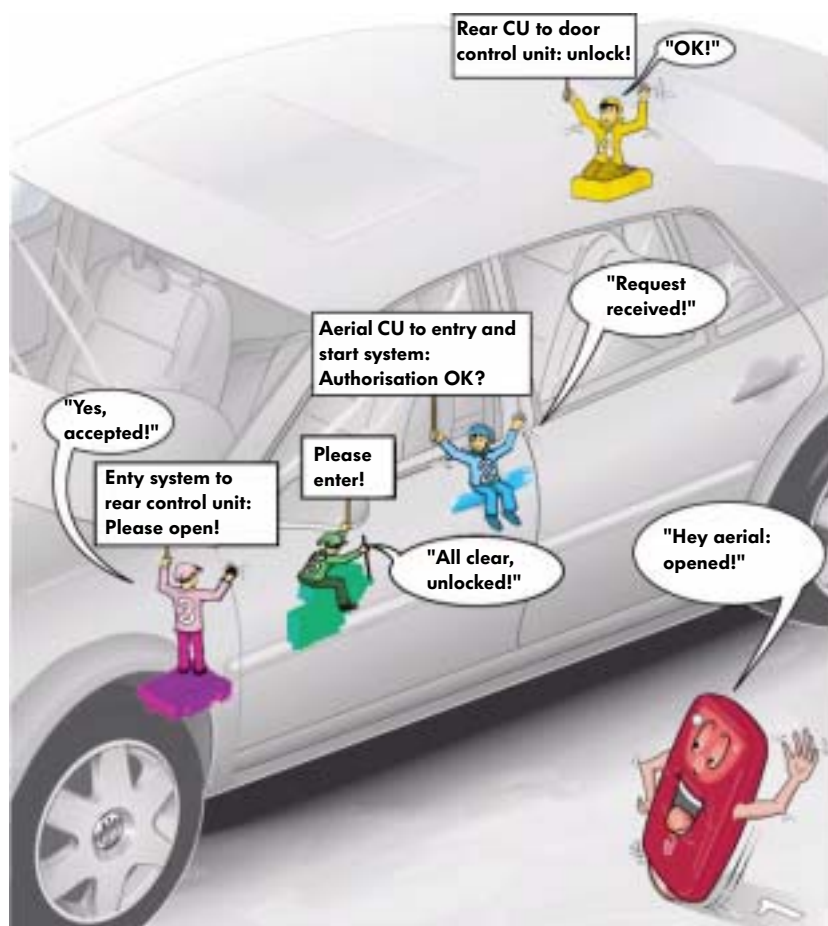
Self-Study Programme 273

Phaeton Convenience and Safety Electronics

Design and Function



Open sesame - thanks to a new system for entry and start authorisation, the Phaeton can be accessed without actively using a key (1). The opening request is detected via an aerial in the outer door handle (2) and authorisation is identified via a control unit (3). The opening request is detected via an aerial in the outer door handle (2) and authorisation is identified via a control unit (3).



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Further information about the Phaeton can be found in the following Self-Study Programmes:

- Self-Study Programme 250: The Phaeton - W12 - Engine Management
- Self-Study Programme 270: The Phaeton
- Self-Study Programme 271: The Phaeton - Heating and Air Conditioning System
- Self-Study Programme 272: The Phaeton - Onboard Power Supply
- Self-Study Programme 274: The Phaeton - Infotainment System
- Self-Study Programme 275: The Phaeton - Air Suspension with Dynamic Damping
- Self-Study Programme 276: The Phaeton - Automatic Proximity Control
- Self-Study Programme 277: The Phaeton - Running Gear

NEW



Important Note

This Self-Study Programme explains the design and function of new developments. The contents are not updated.

Please always refer to the relevant Service Literature for all inspection, adjustment and repair instructions.

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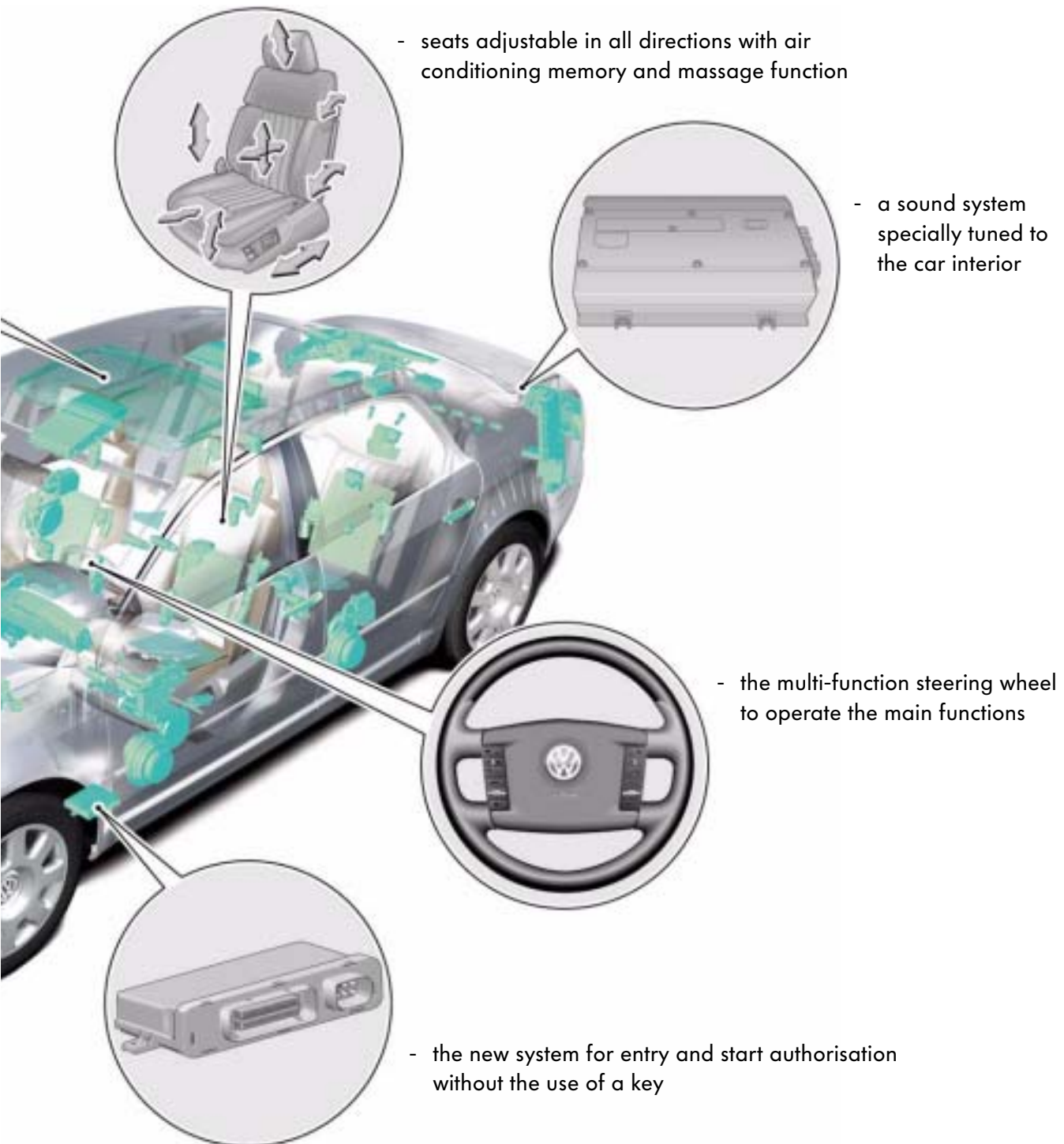
Introduction



This Self-Study Programme provides you with an overview of the complex convenience and safety electronics in the Phaeton. It provides information, for instance, about:

- the new solar sliding/tilting roof with road speed-dependent wind deflector
- the new windscreen wiper system with two separate, electronically controlled motors
- the new orientation light for safe entering and exiting in the dark
- a parking aid that warns against obstacles not only visually, but also acoustically



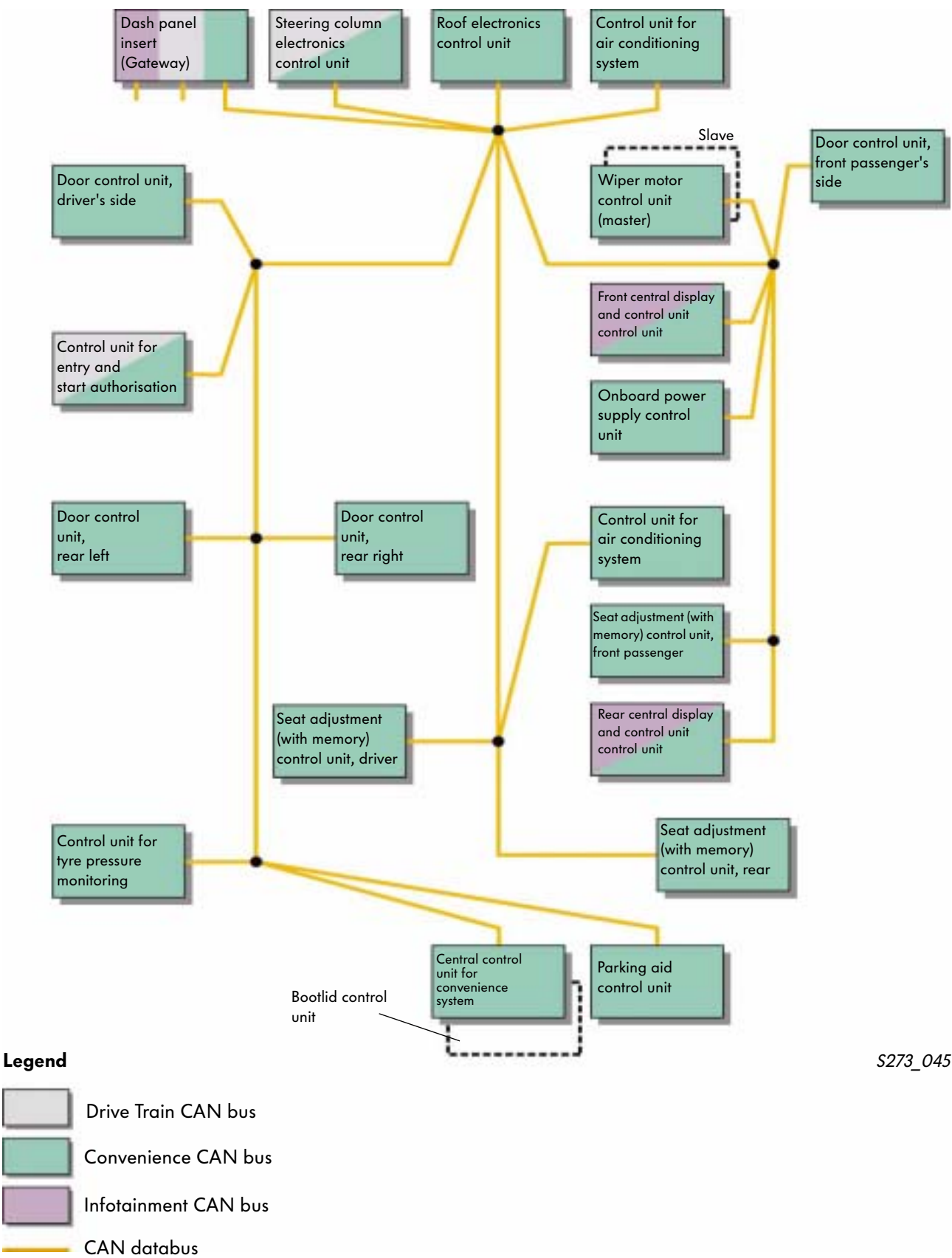


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Introduction



System overview of convenience and safety electronics



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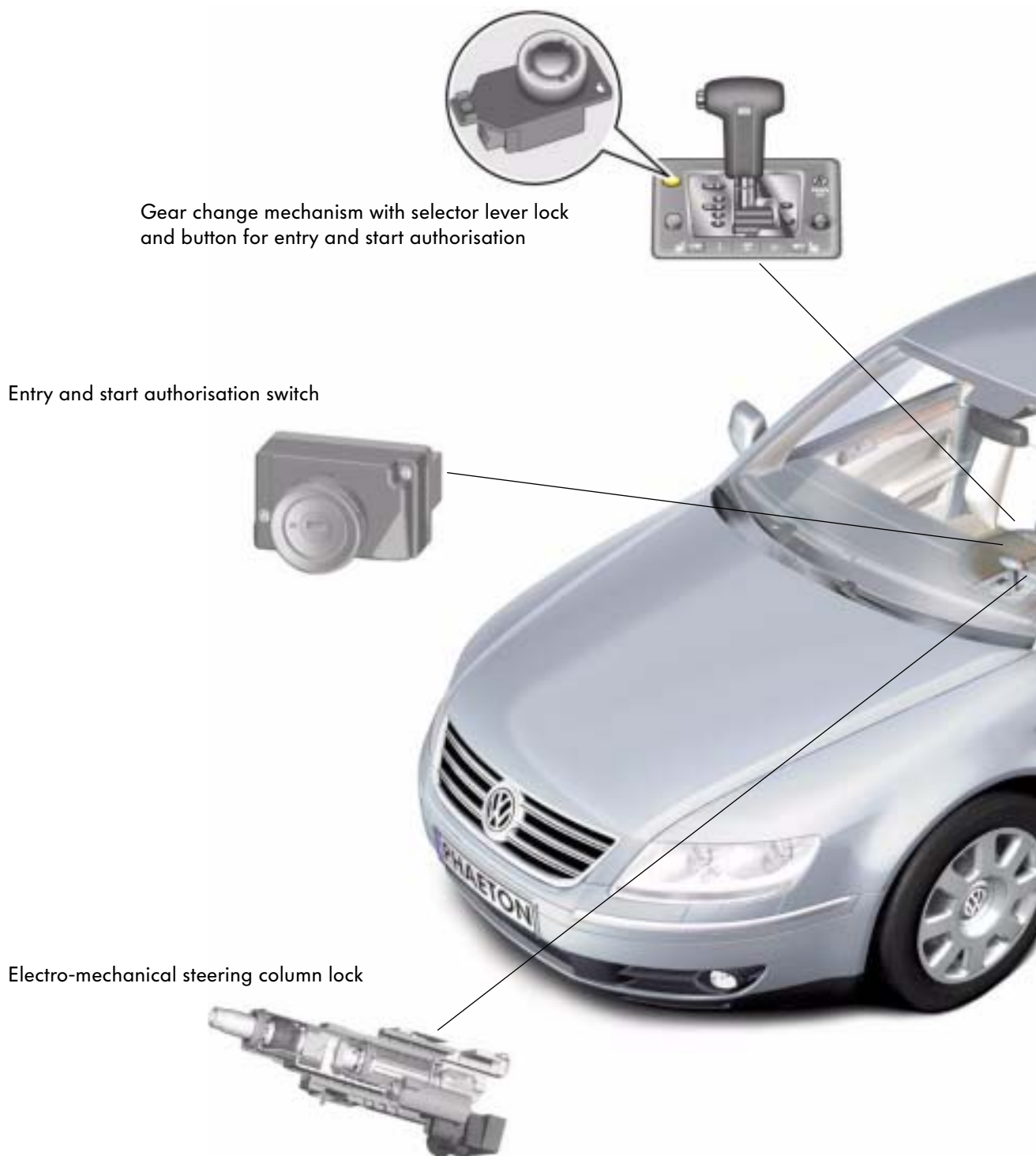


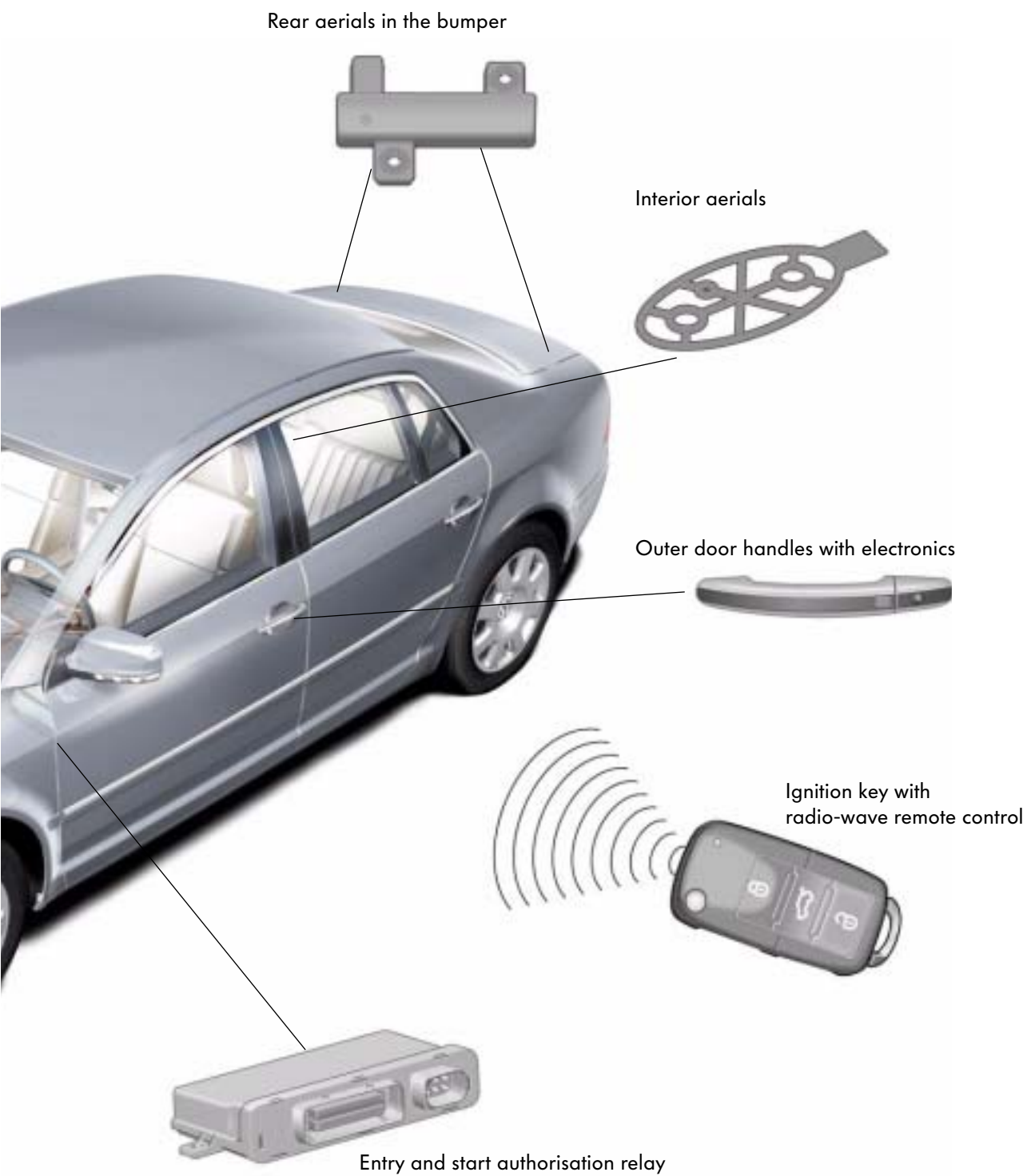
Component	Designation in current flow diagram	Address word for self-diagnosis	Other information
Onboard power supply control unit	J 519	09	SSP 272
Roof electronics control unit	J 528	38	SSP 273
Gateway in dash panel insert	J 533/J 285	19/17	SSP 273
Bootlid control unit	J 605	via 46	SSP 273
Convenience system central control unit	J 393	46	SSP 273
Entry and start authorisation relay	J 518	05	SSP 273
Climatronic control unit	J 255	08	SSP 271
Steering column electronics control unit	J 527	16	SSP 273
Parking aid control unit	J 446	76	SSP 273
Tyre pressure monitor control unit	J 502	65	SSP 270
Seat adjustment (with memory) control unit, driver	J 136	36	SSP 273
Seat adjustment (with memory) control unit, front passenger	J 521	06	SSP 273
Seat adjustment (with memory) control unit, rear	J 522	66	SSP 273
Door control unit, driver's side	J 386	via 46	SSP 273
Door control unit, front passenger's side	J 387	via 46	SSP 273
Door control unit, rear left	J 388	via 46	SSP 273
Door control unit, rear right	J 389	via 46	SSP 273
Wiper motor control unit (master)	J 400	68	SSP 273
Windscreen wiper control unit, front passenger's side (slave)	J 584	via 68	SSP 273
Control unit, front information display and operating unit	J 523	07	SSP 274
Rear information display and operating unit control unit	J 524	27	SSP 274

Entry and start authorisation

Complete overview

The adjacent diagram provides an overview of the components involved in the system for entry and start authorisation.





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Entry and start authorisation

When suitable equipment is available, the convenience functions for the entry and start authorisation system (**KeylessStart** Exit and **Security System**) make it possible to lock and unlock the vehicle and to switch the engine on and off by radio-wave remote control without actively using the ignition key.

The system is offered in two equipment variants:

- Basic equipment (standard equipment)
- Convenience equipment (optional)



Overview of equipment variants

Components	Basic equipment	Convenience equipment
Entry and start authorisation switch	X	X
Terminal control (Terminal 15SV, 15, 75, 50)*	X	X
Immobiliser (Immobiliser III)	X	X
Radio-wave remote control (RRC) for central locking	X	X
Electro-mechanical steering column lock activation (ESL)	X	X
Button for entry and start authorisation		X
Interior and exterior aerials		X
Central locking button in the outer door handles		X
Proximity sensors		X
Transponder for Immobiliser III and entry and start authorisation	X	X
Anti-theft alarm system		X
Interior monitor		X

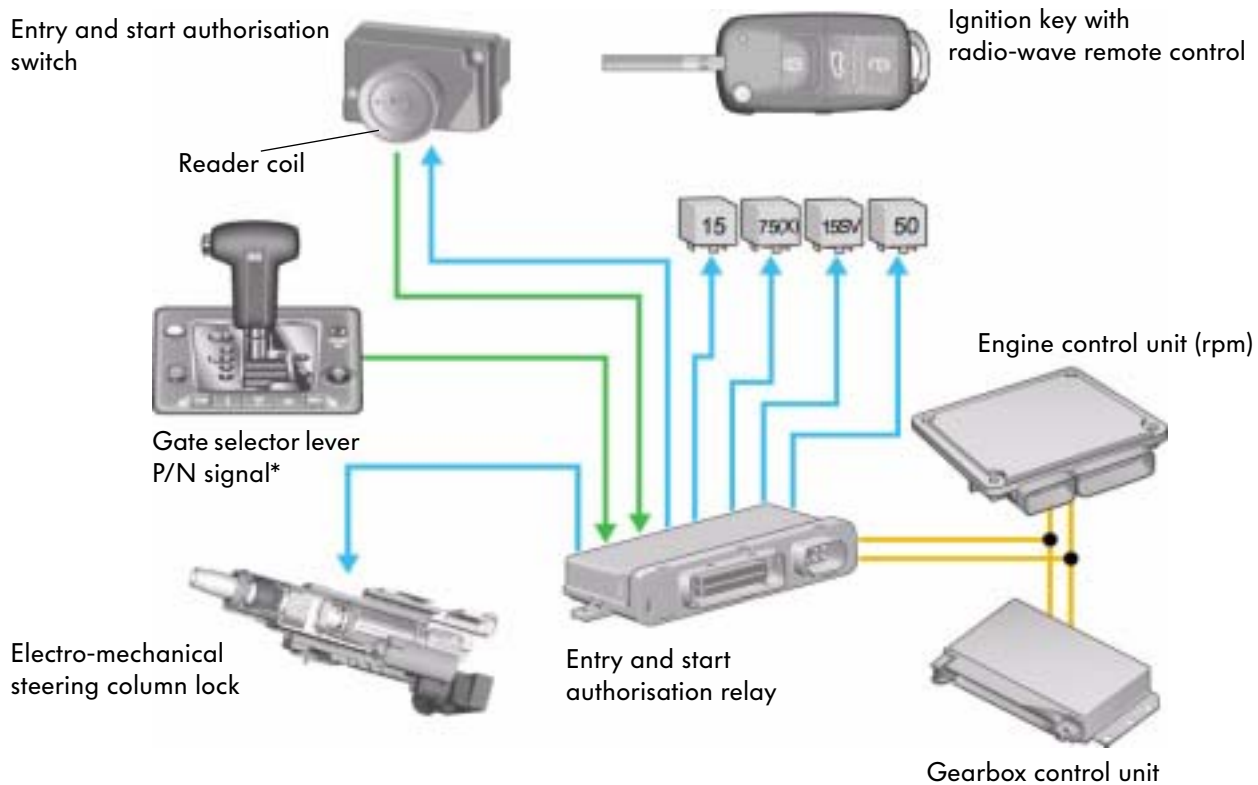
*Terminal 15SV: Power supply of electrical equipment required for start

Terminal 15: Power supply ignition "on"

Terminal 75x: Power supply/relief relay

Terminal 50: Power supply starter/solenoid

Basic equipment components



* Clutch pedal switch for manual gearbox

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Basic equipment for vehicle entry and starting the engine

The vehicle is unlocked using the unlocking button on the ignition key with radio-wave remote control (RRC). To unlock the steering column, the ignition key must be inserted into the entry and start authorisation switch. By means of the immobiliser (coil) in the entry and start authorisation switch, a request is sent to the entry and start authorisation relay for ignition key authorisation. If the control unit makes a positive identification, the steering column is unlocked.

Turning the ignition key in the entry and start authorisation switch switches Terminals 15, 75(X) and 15SV. Further turning (Terminal 50 on) starts the engine, providing the following conditions are met:

- P/N signal (automatic gearbox)
- Clutch applied (manual gearbox).

If there is radio interference, or the vehicle or ignition key battery has discharged, the vehicle may be entered using the mechanical emergency lock cylinder in the driver's door or in the bootlid.



Entry and start authorisation



Ignition key with radio-wave remote control

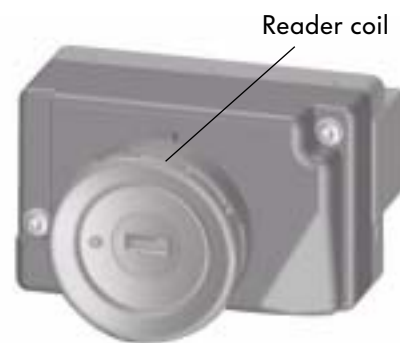
The radio-wave remote control functions in the usual way: to unlock the vehicle door, the unlock button must be pressed on the radio-wave remote control. The control unit for entry and start authorisation evaluates the radio signals. The convenience system central control unit activates the standard functions for the central locking system.



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Immobiliser (Immobiliser III)

The immobiliser also functions as before together with the entry and start authorisation switch, which carries the reader coil, and the engine control unit.



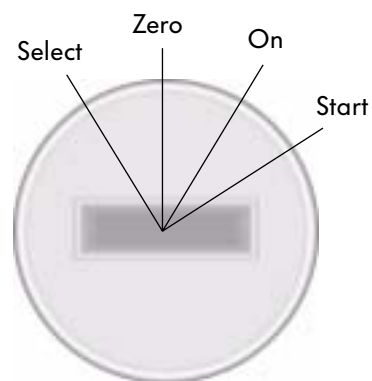
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Entry and start authorisation switch

Entry and start authorisation switch

The operating concept for the entry and start authorisation switch has been very slightly changed. The positions are:

- Off = ignition/engine off
- Zero = Automatic reset of the ignition key after switching on the engine
- On = ignition on
- Start = engine on



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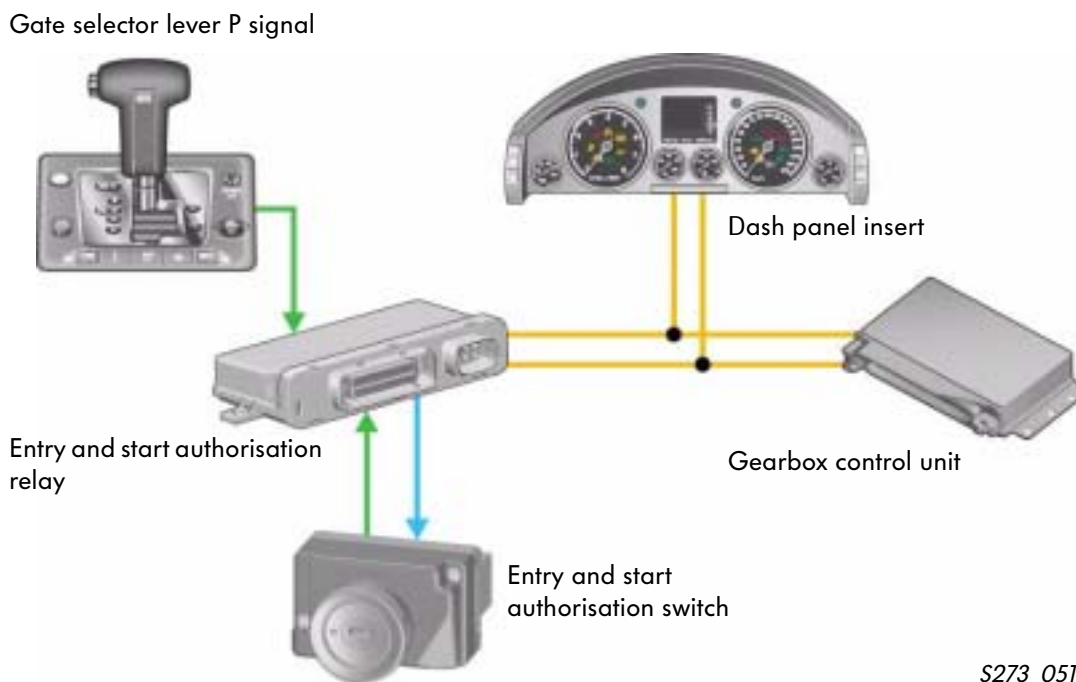
Switch positions for entry and start authorisation

Electrical release disable control unit

The electrical release disable control unit ensures that the ignition key cannot be inadvertently removed from the entry and start authorisation switch.

The ignition key cannot be removed while

- the ignition is on (Terminal 15 on) and
- if the gate selector lever for the automatic gearbox is not in P position.



S273_051



Each key fits mechanically into the entry and start authorisation switch and can be turned.

Once the ignition key has been authorised (transponder), it is enabled by the immobiliser (IM III).

Entry and start authorisation

Electro-mechanical steering column lock (ESL)

This is an electro-mechanical version of the conventional mechanical steering column lock, which means that it has an electrical interface to the entry and start authorisation relay and a mechanical interface to the steering column.

The ESL is encoded and activated by means of the entry and start authorisation relay. When the key is inserted or withdrawn, the steering column is locked or unlocked by means of the entry and start authorisation relay. The steering column is supplied with voltage for this procedure only, otherwise the ESL has no voltage (deenergised). The ignition can only be activated when the steering column is unlocked.



Entry and start authorisation relay



Electro-mechanical steering column lock



Entry and start authorisation switch



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Soft start

The soft start is initiated via the drive train CAN databus between the entry and start authorisation relay and the engine control unit.

If the start position (Terminal 50 on) in the entry and start authorisation switch is flicked, the starter stays in the ON position until the engine is running. To protect the starter and avoid unnecessary noise, the start position of the starter is only activated until the engine has reached idling speed even if the starter is activated for a longer period of time.

The engine control unit receives this message from the engine speed sender and transmits the information to the entry and start authorisation relay, giving the command to shift the starter out of position (Terminal 50 off).

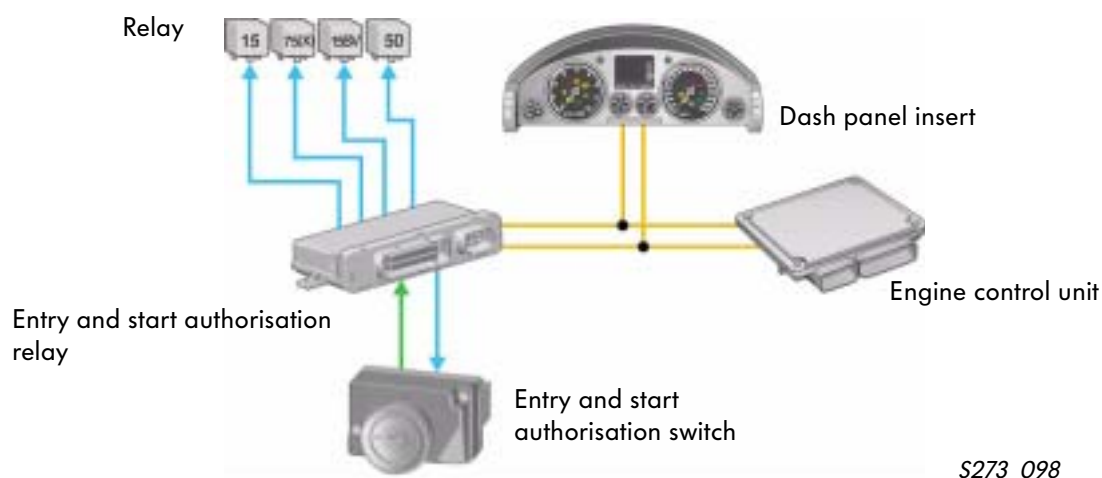
The entry and start authorisation relay switches the following relays:

- Relay Terminal 15: voltage supply
- Relay Terminal 15 SV: voltage supply
- Relay Terminal 75X: voltage supply
- Relay Terminal 50: voltage supply



Emergency start

If the onboard power supply battery has discharged, an emergency start is possible when the engine is not running by means of the battery management control unit and the entry and start authorisation relay.



Please refer to Self-Study Programme 272 of "The Phaeton - Onboard Power Supply" for more detailed information about battery management.

Entry and start authorisation

Additional convenience equipment functions

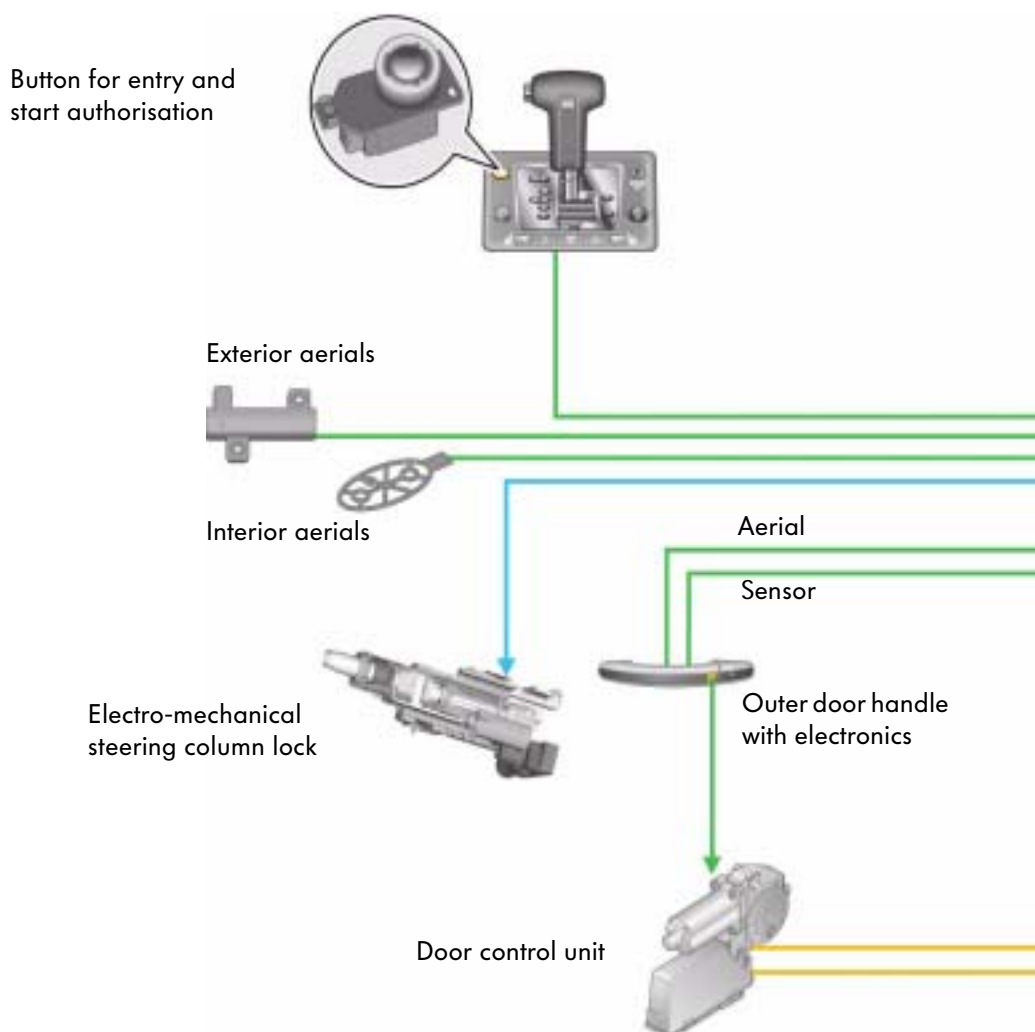
Thanks to the additional convenience equipment functions, the ignition key with radio-wave remote control (RRC) is required to open and lock the vehicle, but it no longer needs to be activated. The engine can also be started and switched off without actively operating the ignition key using the authorised transponder.



The additional functions of the convenience equipment are as follows:

- Opening the vehicle without actively operating the ignition key with the authorised transponder
- Starting the engine by means of a button for entry and start authorisation without actively operating the ignition key with the authorised transponder
- Locking the vehicle without actively operating the ignition key with the authorised transponder

Convenience equipment components



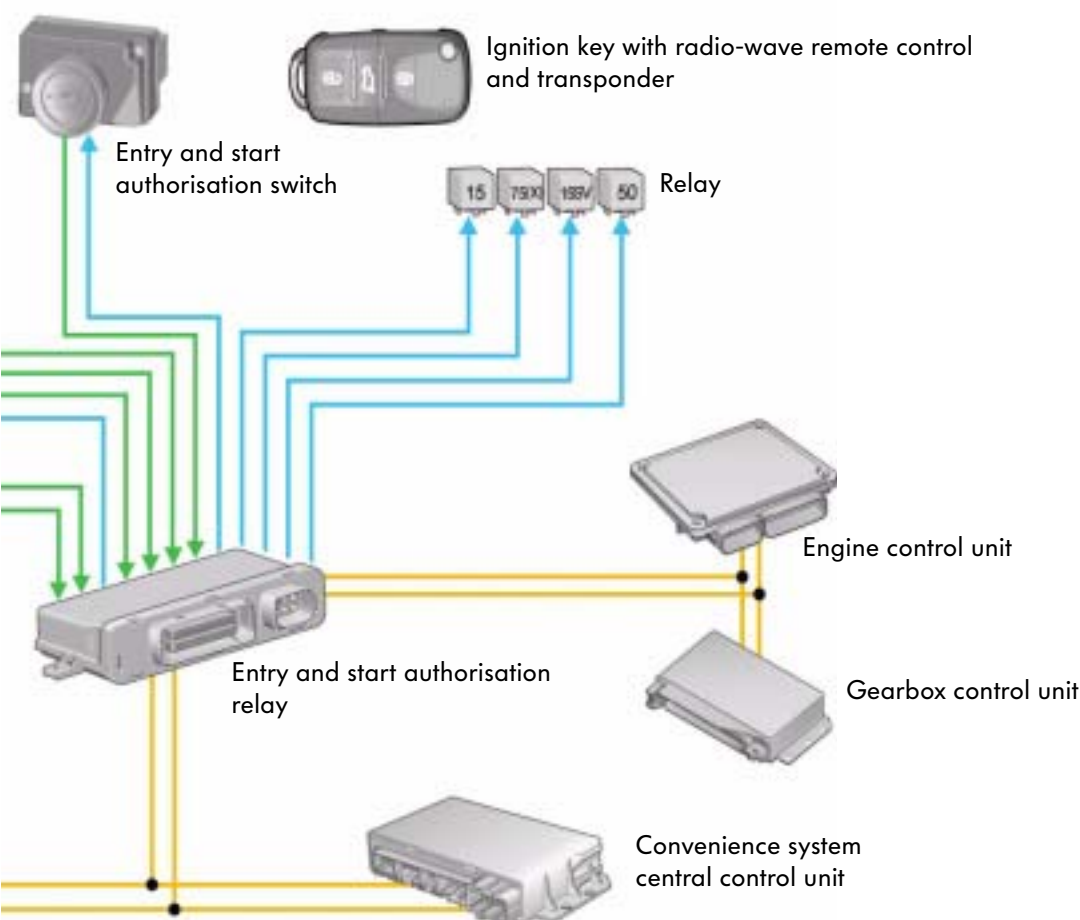
Entering the vehicle using the convenience equipment

If the user approaches the vehicle with an authorised ignition key, touching the outer door handle with the entry and start authorisation relay transmits an inductive request to the transponder in the ignition key via the exterior aerial in the door handle. If the control unit recognises the ignition key as authorised for entry, it transmits this information to the convenience system central control unit. The convenience system central control unit gives the door control unit the command to unlock the requested vehicle door. The door control unit unlocks the vehicle door.



It is possible to enter the car using any door, opening either a single door or all of the doors, depending on the coding.

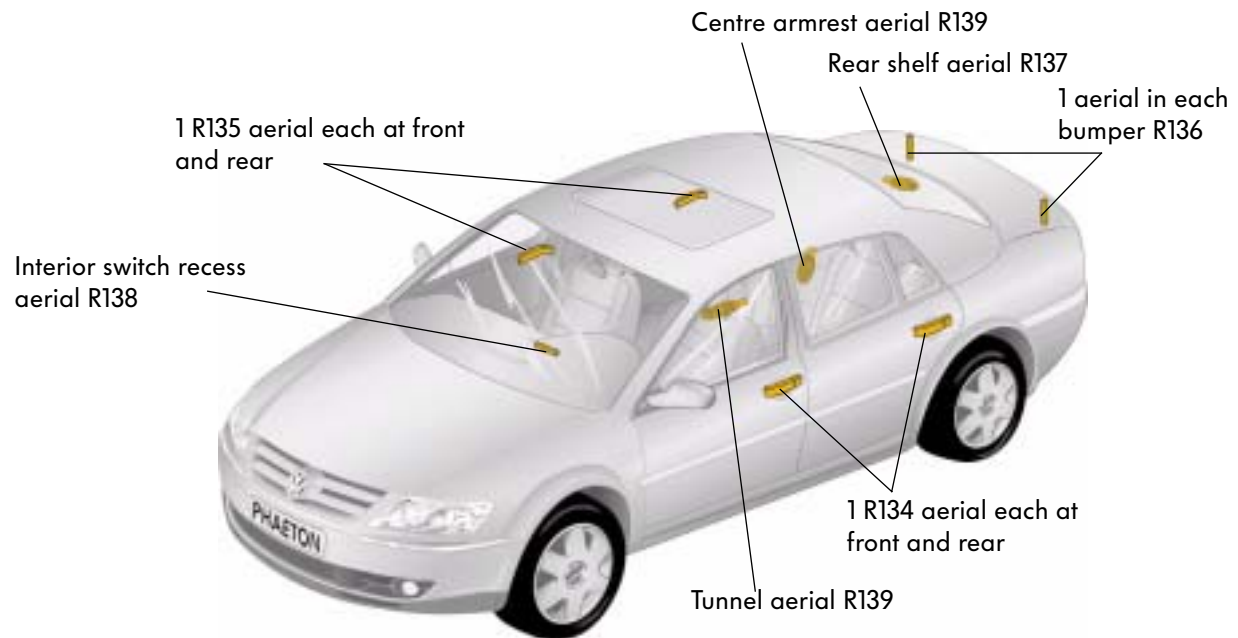
If the control unit for entry and start authorisation fails to function, the vehicle door can be unlocked via the emergency lock cylinder in the door lock on the driver's side. The bootlid can be unlocked by means of the emergency lock cylinder in the bootlid (concealed in the VW emblem).



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Entry and start authorisation

Aerials



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Interior aerials

The interior aerials detect an ignition key with authorised transponder in the vehicle interior for the starting cycle, vehicle operation and locking procedure.

The interior aerial range extends without interruption throughout the entire vehicle interior.

The detection range for the interior aerials does not overlap with the detection range for the exterior aerials.

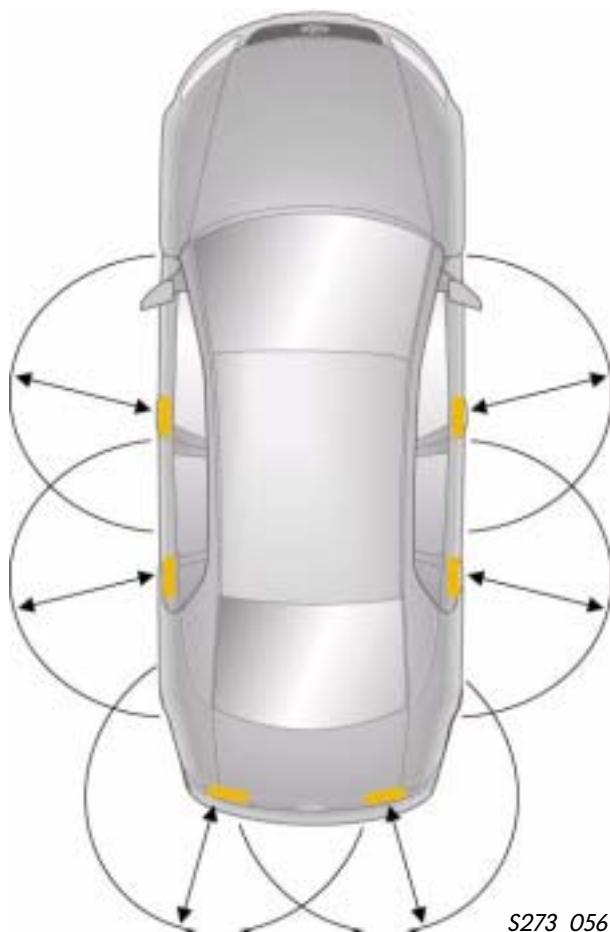
Exterior aerals

The exterior aerals detect an ignition key with authorised transponder for the locking and unlocking procedure. The position of the ignition key with authorised transponder can be allocated specifically to the driver's side, front passenger's side or to the bootlid.

The exterior aerals have a range of approximately 1.50 m radiating from the place at which they each operate - vehicle doors and bootlid - at a height of 0.1 m to 1.8 m.



Exterior aerial detection range



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Entry and start authorisation

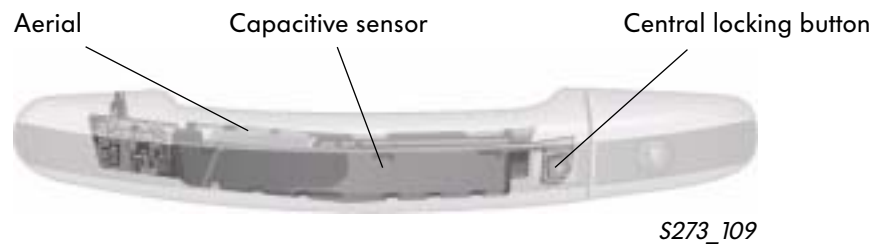
Outer door handles with electronics

If convenience equipment is fitted, the aerials, sensors and central locking buttons are located in all outer door handles and may be used to open and close the vehicle doors without actively using the ignition key with radio-wave remote control:



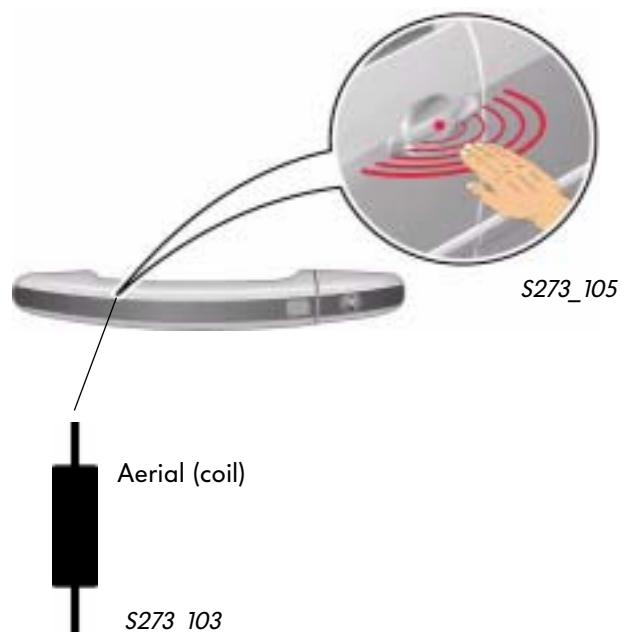
- one aerial on each of the driver's side and front passenger's side for entry and start authorisation R134, R135*
- one sensor on each vehicle door for contact on the driver's side G415, G417 and front passenger's side G416, G418
- one button on each vehicle door for central locking on the driver's side E369, E371 and front passenger's side E370, E372.

*The aerials in the outer door handles should be regarded as a single aerial per vehicle side (front and rear).



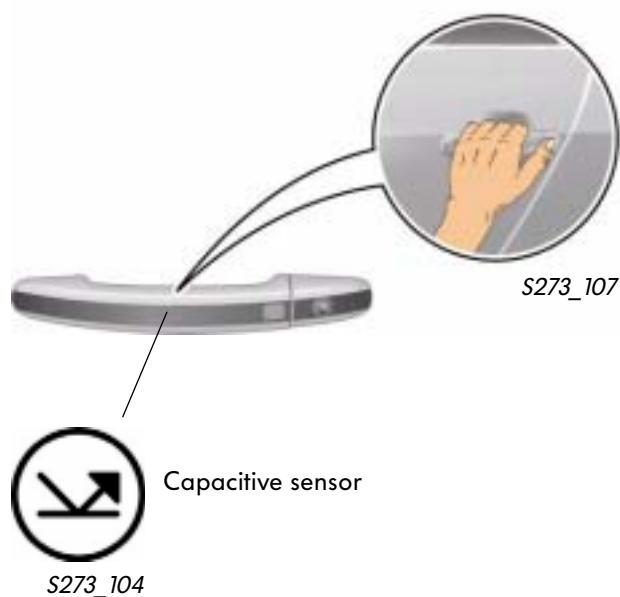
Driver's side and front passenger's side aerials for entry and start authorisation

By means of the aerial in the ignition key with radio-wave remote control and authorised transponder, an encoded signal is transmitted to the aerial in the outer door handle, thus inducing voltage in the aerial. This message is transmitted to the entry and start authorisation relay, which in turn evaluates the signal.



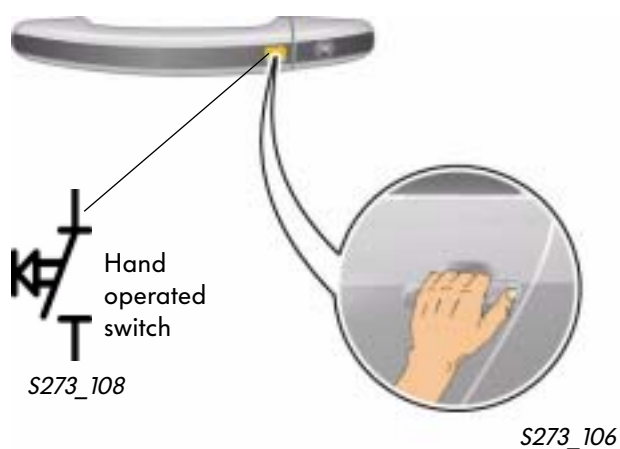
Sensors for contact on the driver's side and front passenger's side

If a hand approaches the outer door handle, the capacitance of the sensor in the outer door handle changes. The entry and start authorisation relay recognises the change in the capacitance of the sensor as proximity to the outer door handle or as a request to enter the vehicle.



Buttons for central locking on the driver's side and front passenger's side

Pressure on the central locking button initiates an inductive request through the entry and start authorisation relay to the ignition key with radio-wave remote control and transponder. If the ignition key is recognised as authorised and outside the vehicle but within the range of the vehicle, the command is enabled to lock the vehicle.



Entry and start authorisation

Starting the engine without an ignition key

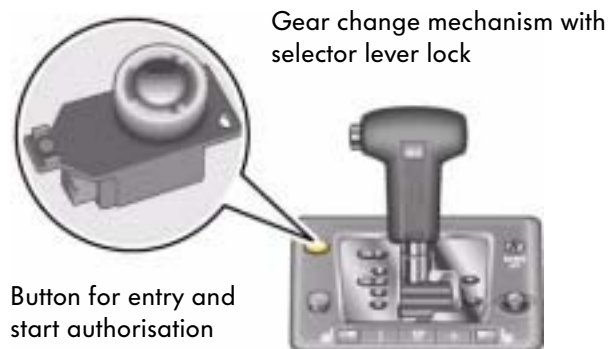


For this function the ignition key with authorised transponder need not be inserted into the entry and start authorisation switch. It must, however, be located inside the vehicle interior in order to initiate an inductive request via the interior aerials when the button for entry and start authorisation is moved to the first engaging position.

The ignition key gives an encoded response to the entry and start authorisation relay. If the ignition key is identified as authorised, the electro-mechanical steering column lock (ESL) is unlocked and the NO contact activated when the first stage of the button for entry and start authorisation is activated. If the button is then moved to the first engaging position, the ignition is switched on.

Switching off the engine without an ignition key

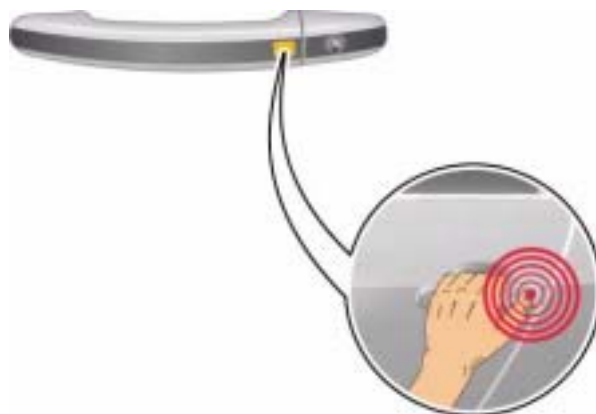
The engine can also be turned off with the button for entry and start authorisation. To do this, move the button for entry and start authorisation to the second engaging position by pressing it once.



S273_099

Locking the vehicle without an ignition key

Activating a central locking button (fitted to all outer door handles) initiates a request for a valid ignition key with authorised transponder in the exterior of the vehicle. The ignition key transmits a response to the entry and start authorisation relay. Once the ignition key has been positively identified, the vehicle door is locked via the convenience system central control unit.



S273_100



If the vehicle is locked and a second ignition key with authorised transponder is still located in the vehicle interior, the latter is disabled for start authorisation and the vehicle is locked!



Learning-in the system for entry and start authorisation

As the system contains the immobiliser,

- the entry and start authorisation relay,
- electro-mechanical steering column lock (ESL)
- the ignition key with radio-wave remote control and
- the engine control unit

have to match one another. This is carried out at the end of the production line or during servicing using the VAS 5051 Diagnostic Testing and Information System.



In order to provide better anti-theft protection it is only possible to change just one of the four components; otherwise the system must be subjected to a learn-in process if new components are fitted.



The system for entry and start authorisation has self-diagnostic capability via the addresses

- 05 Control unit for entry and start authorisation and
- 25 Immobiliser III (diverted to 05).