

# Onboard power supply management

## The onboard power supply control unit J519

### Functions of onboard power supply control unit

Until now control units and relays functioned at different locations in the vehicle. In the onboard power supply control unit, these functions are now localised.

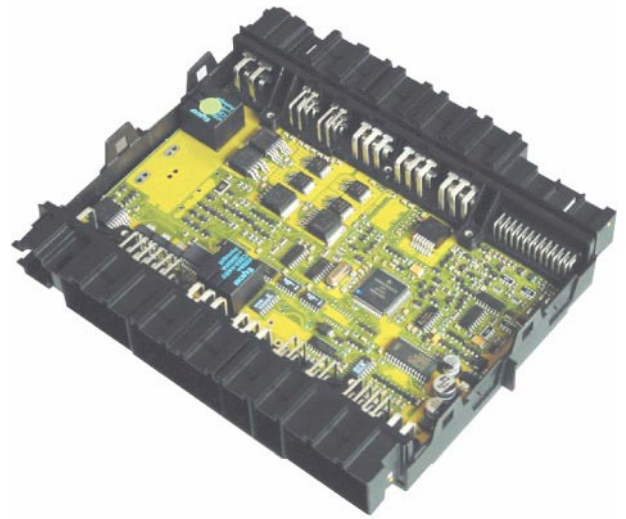
The onboard power supply control unit in the Touareg is responsible for the following functions:

- Load management
- Parking light
- Dipped beam headlights
- Side lights
- Turn signals (not in exterior mirrors)
- Main beam headlights
- Additional main beam headlights
- Fog lights
- Footwell lights
- Terminal 58d
- Indicator lamp for hazard warning lights
- Relay for headlight washer system
- Fuel pump priming action
- Horn
- Twin washer pump
- Interior lights
- Rain and light sensor voltage supply

Furthermore, the following switches and signals are processed and sent via the CAN bus to other control units.

- Bonnet contact switch
- Exterior mirror adjustment switch
- Hazard warning lights button
- Light switch
- Voltage supply at starter and onboard power supply battery

Onboard power supply control unit

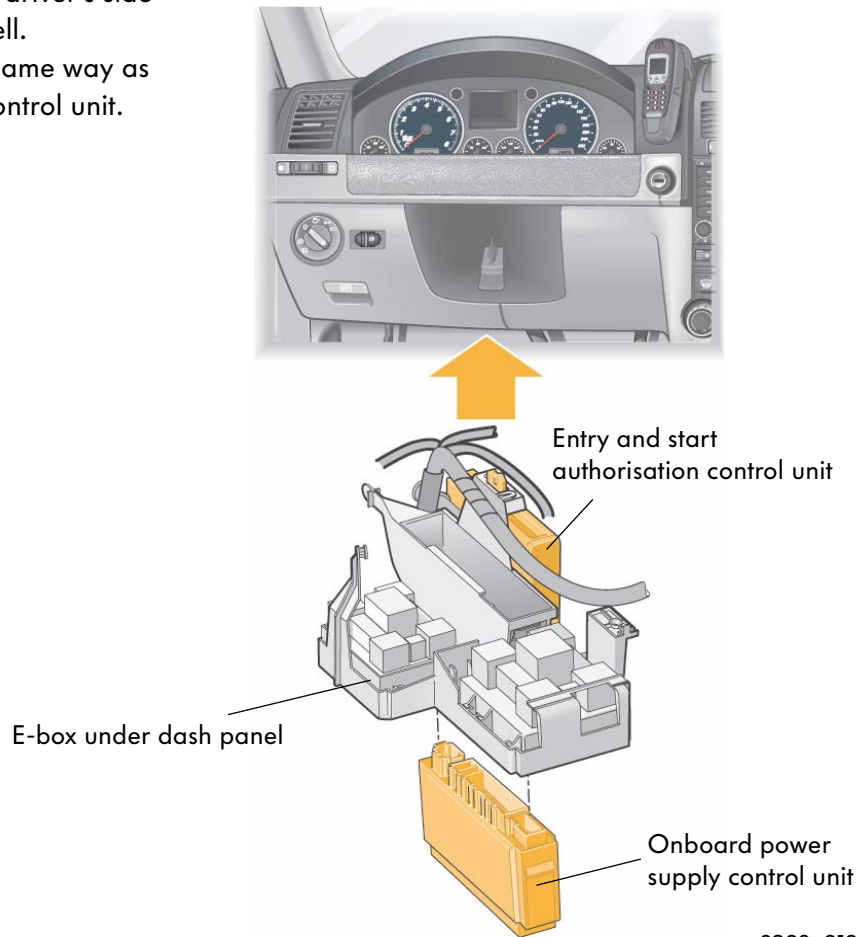


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### Fitting location

The onboard power supply control unit can be found in the vehicle interior on the driver's side under the dash panel in the footwell. It is connected to the E-box in the same way as the entry and start authorisation control unit.

### Fitting location of onboard power supply control unit and entry and start authorisation control unit



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### Load management

Furthermore, the onboard power supply control unit deactivates convenience system consumers and long-term HT consumers e.g. heated rear windscreen, so that heavy discharging of the battery is avoided. If the onboard power supply is placed too much under load, the idling speed is also increased. This ensures that there is always sufficient energy to start the engine. Switching off is inline with the guidelines for the Volkswagen Phaeton and is described in Self-Study Programme 272.

# Onboard power supply management

## Priming function of electrical fuel pump

The petrol engines of the Volkswagen Touareg all feature a priming function of the fuel pump so that enough pressure in the fuel lines can be built up.

### Function:

When the driver's door is opened and terminal 15 is closed, a signal is sent via the CAN bus from the entry and start authorisation control unit J518 (terminal 15 off), a signal is also sent from the driver's door control unit J386 (driver's door opened) and, for reasons of safety, a discreet signal (status of terminal 15) is sent to the onboard power supply control unit J519. This then actuates the relay to prime the fuel pump for approx. 2 seconds. The priming function of the fuel pump is stopped when the ignition is switched on. Continued actuation is done through the engine control unit.

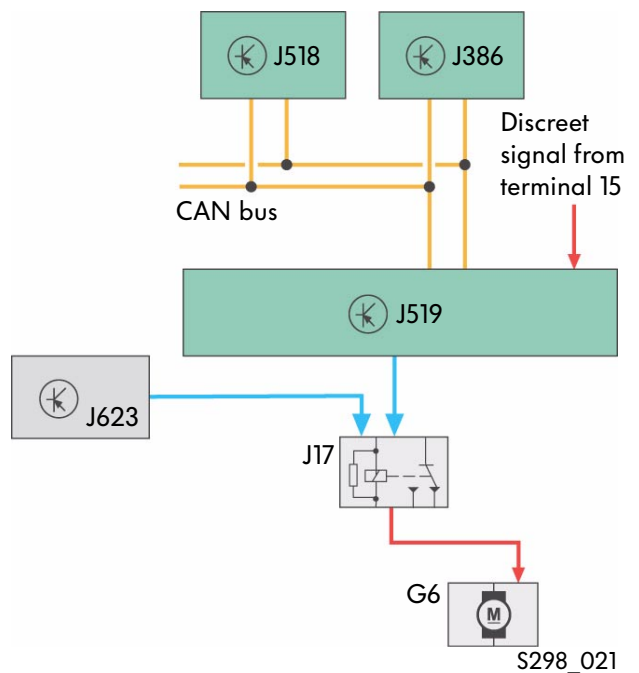
If the driver's door stays open, the actuation is repeated a maximum of three times in intervals.

Timed actuation from the onboard power supply control unit prevents continued actuation of the fuel pump if the driver's door is opened and closed a number of times in short intervals.

## Crash shut-off

If with the ignition switched on a crash is detected, a signal is sent from the airbag control unit J234 via the CAN bus and the fuel pump is switched off immediately. After about 5 seconds it can be activated again by switching the ignition off and on.

### Electric circuit



### Key

- G6 Fuel pump
- J17 Fuel pump relay
- J386 Driver's door control unit
- J518 Entry and start authorisation control unit
- J519 Onboard power supply control unit
- J623 Engine control unit

## Interior light actuation

The interior lighting is actuated by the onboard power supply control unit. The voltage supply comes from terminal 30G.

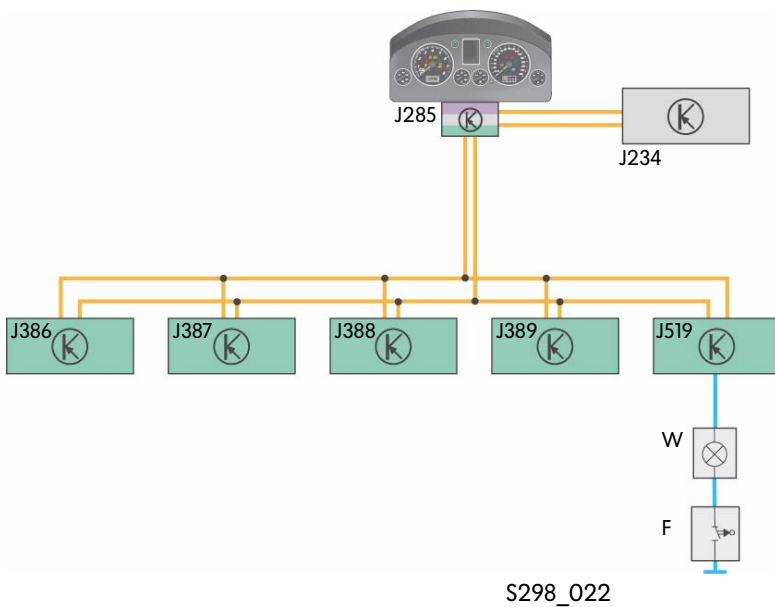
To prevent discharge of the vehicle battery when the interior lights are switched on, power supply from terminal 30G is interrupted in the following circumstances:

- the ignition is switched off,
- the vehicle is locked from the outside and all doors are locked.

Terminal 30G is activated under the following circumstances:

- the interior light switch is actuated,
- the ignition is switched on,
- the vehicle is unlocked, a door, the bonnet or the tailgate is opened,
- the bonnet contact switch.

## Data transfer



### Key

- F Interior light switch
- J234 Airbag control unit
- J285 Dash panel insert (Gateway)
- J386 Driver door control unit
- J387 Front passenger door control unit
- J388 Rear left door control unit
- J389 Rear right door control unit
- J519 Onboard power supply control unit
- W Interior lights



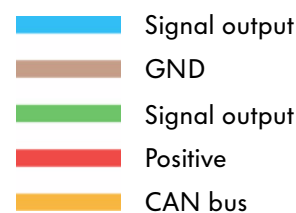
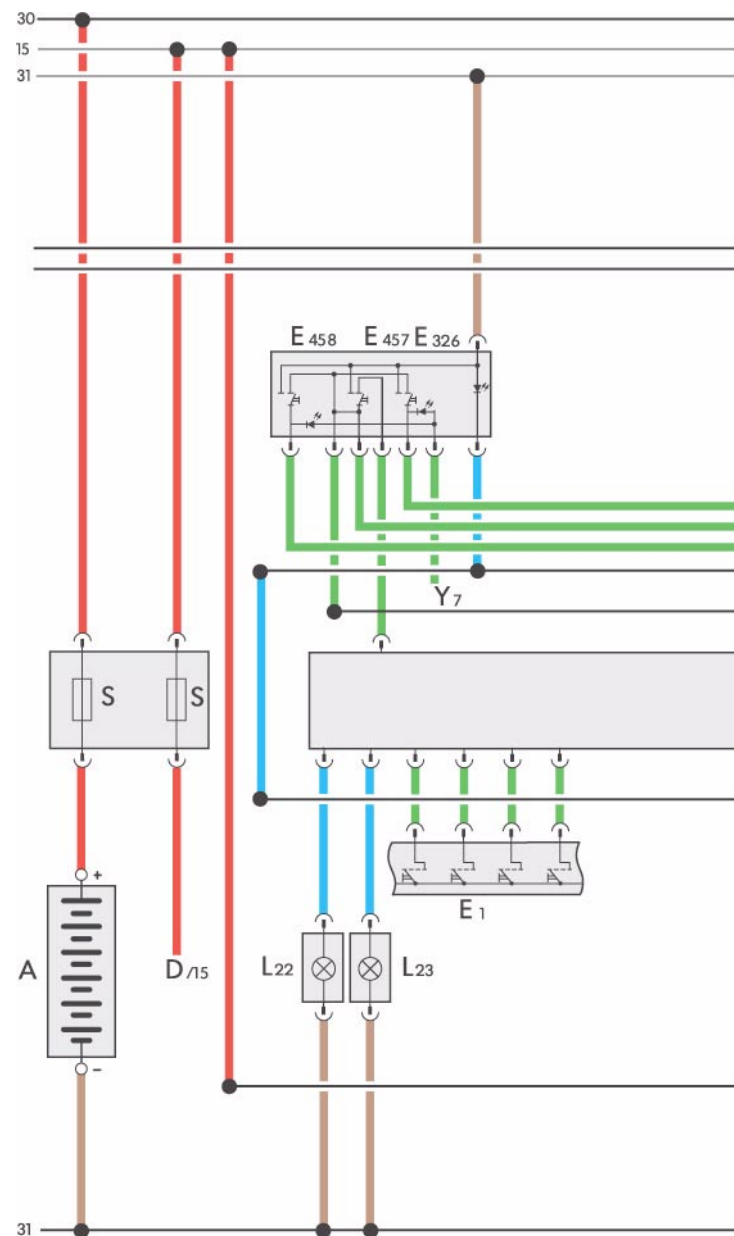
If a crash is detected, the interior light is switched on immediately. After the ignition is switched on and off and after it has been switched on again, the cut-off function from terminal 30G is reactivated.

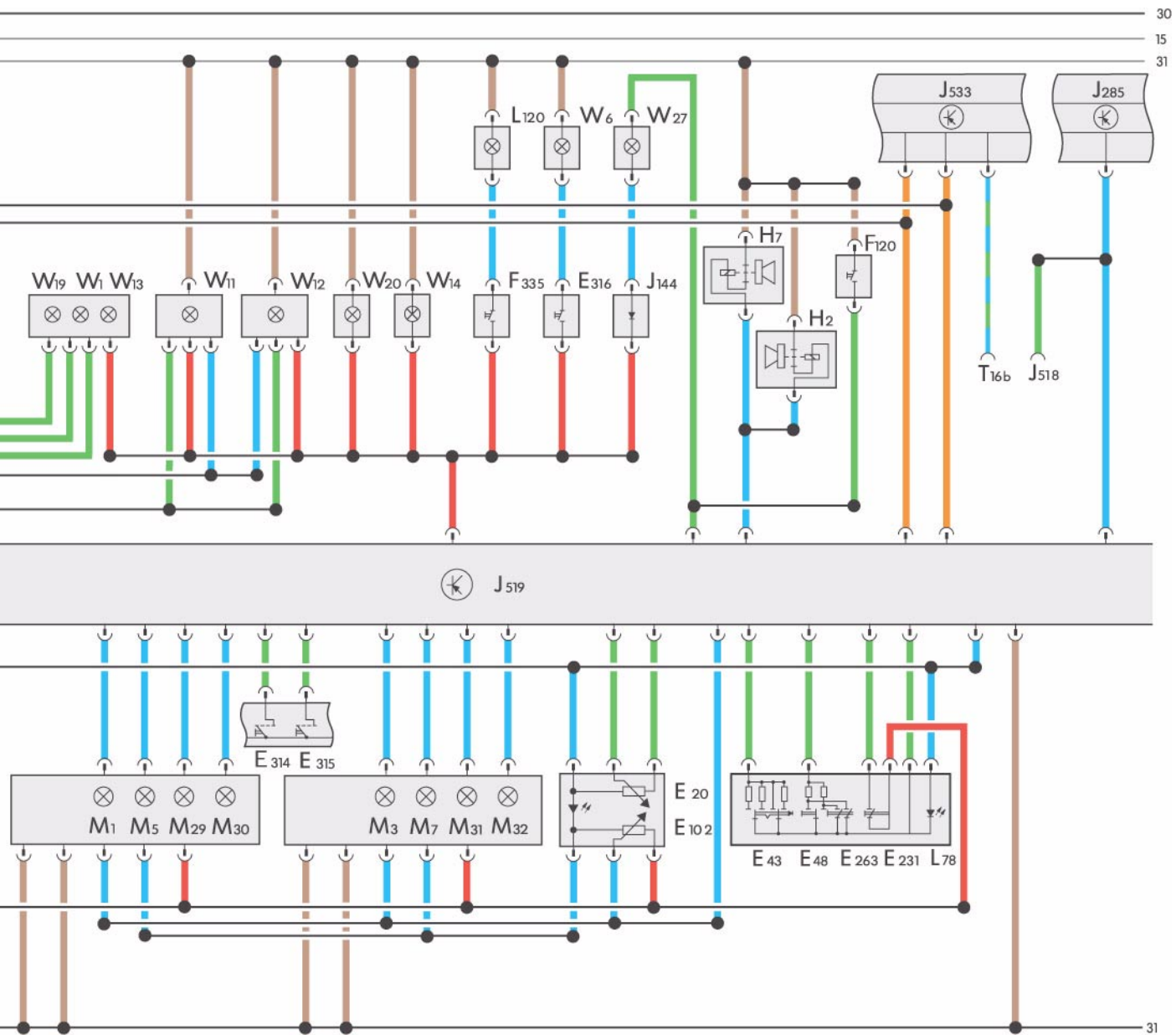
# Onboard power supply management

## The function layout

### Key

A	Battery
D	Ignition switch
E1	Light switch
E3	Hazard warning light switch
E20	Light regulator for lighting switches and instruments
E43	Exterior mirror adjustment switch
E48	Mirror adjustment change-over switch
E102	Headlight range control adjuster
E231	Exterior mirror heating button
E263	Mirror fold system switch
E314	Rear fog light button
E315	Fog light button
E316	Glove box button
E326	Interior light button, front
E457	Driver reading light button
E458	Front passenger reading light button
F120	Anti-theft alarm/ vermin repellent system contact switch
F335	Stowage compartment illumination switch
G213	Rain sensor
H2	High tone horn
H7	Low tone horn
J39	Relay for headlight washer system
J144	Interior light switch-off delay blocking diode Interior lighting
M1	Side light bulb, left
M3	Side light bulb, right
M5	Turn signal bulb, front left
M7	Turn signal bulb, front right
M29	Dipped beam bulb, left
M30	Main beam bulb, left
M31	Dipped beam bulb, right
M32	Main beam bulb, right
U1	Cigarette lighter
U9	Cigarette lighter, rear





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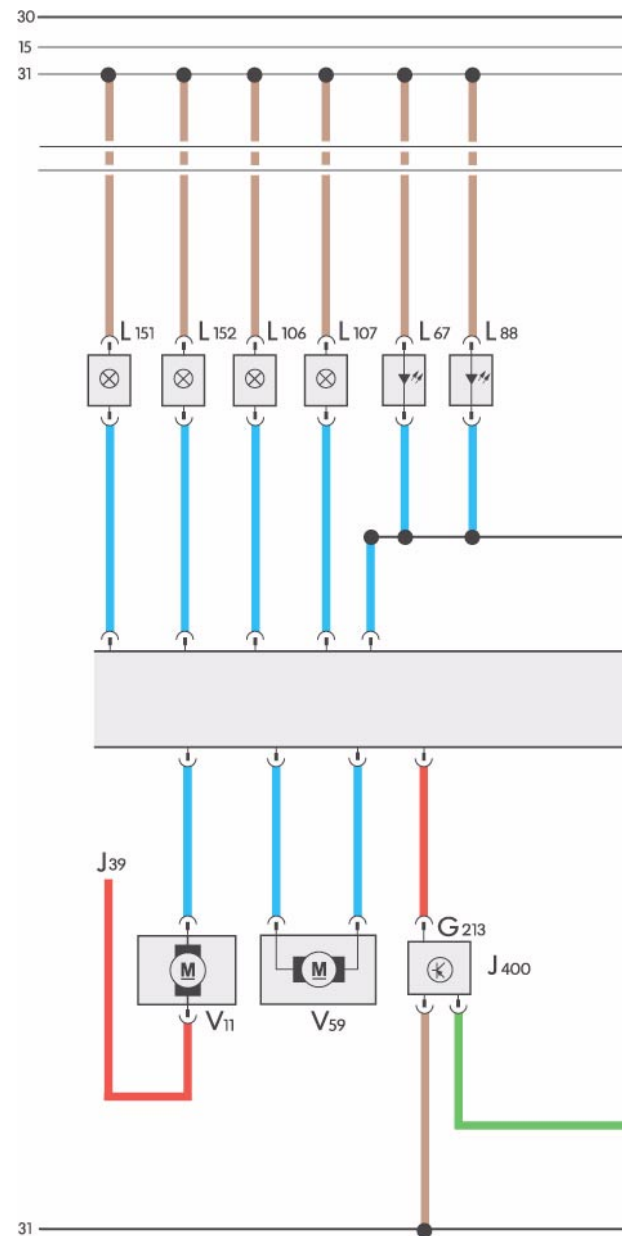


# Onboard power supply management

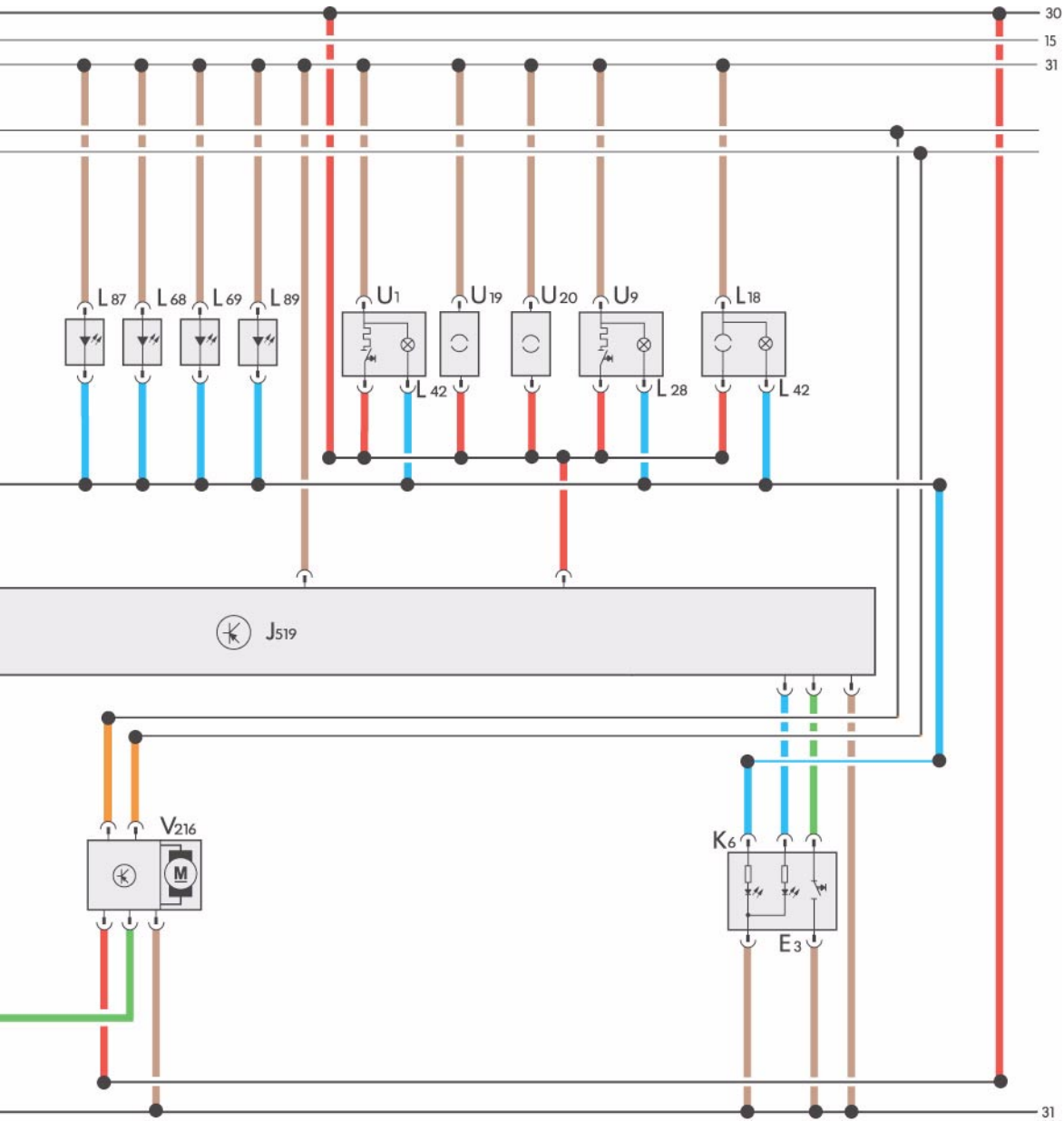
## The function layout

### Key

- J285 Control unit with display in dash panel insert
- J400 Wiper motor control unit
- J518 Entry and start authorisation control unit  
Start authorisation
- J519 Control unit for onboard power supply
- J533 Diagnosis interface for data bus
- K6 Hazard warning light system warning lamp
- L22 Foglight bulb, left
- L23 Foglight bulb, right
- L28 Cigarette lighter light bulb
- L42 Socket light bulb
- L67 Dash panel left vent illumination
- L68 Dash panel central vent illumination
- L69 Dash panel right vent illumination
- L78 Mirror adjustment switch illumination
- L87 Central rear vent illumination
- L88 Rear left vent illumination
- L89 Rear right vent illumination
- L106 Footwell illumination, rear left
- L107 Footwell illumination, rear right
- L120 Shelf illumination
- L151 Front left footwell illumination
- L152 Front right footwell illumination
- U19 12 V socket -3-
- U20 12 V socket -4-
- V11 Headlight washer system pump
- V59 Windscreen and rear window washer pump
- V Windscreen washer motor
- W1 Front interior light
- W11 Reading lamp, rear left
- W12 Reading lamp, rear right
- W13 Front passenger reading light
- W14 Illuminated vanity mirror (front passenger side)
- W19 Reading lamp, driver side
- W20 Illuminated vanity mirror (driver side)
- Y7 Automatic anti-dazzle interior mirror



- Signal output
- GND
- Signal output
- Positive
- CAN bus



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# Lighting

## The headlights

### Main headlights

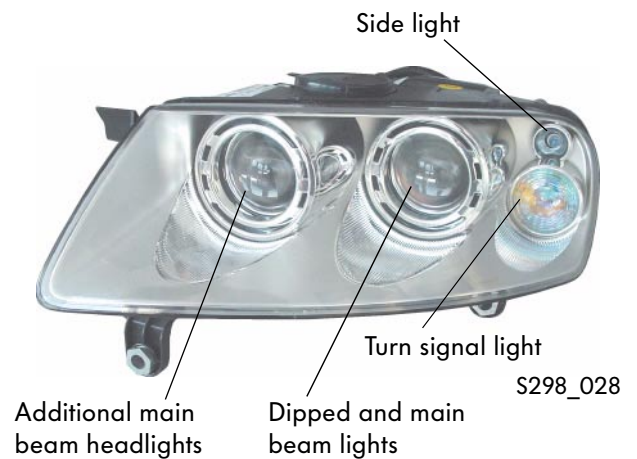
The basic equipment comprises a DE headlight with H7 halogen bulb and a H9 halogen bulb for main beam.

### Headlights without additional main beam



The "M" equipment level features bi-xenon headlights for main and dipped beam and additional DE headlights with H7 bulbs for main beam. On this version, only the headlights for additional main beam flash when the flasher unit is actuated and the dipped beam is not switched on. A brief actuation of the xenon lamps, e.g. when flashing lights as a signal, shortens their useful life. The turn signals are cool blue in appearance but flash yellow when they are switched on.

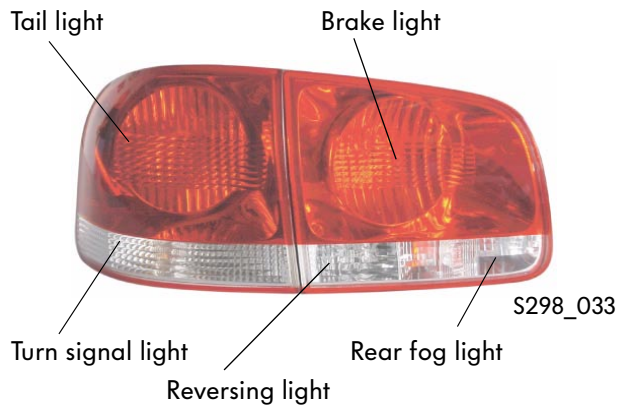
### Headlight with additional main beam



## The rear light

For the rear lighting of the vehicle, rear light clusters with bulbs are used. The rear light clusters are split into two parts. One part is fixed to the sidewall and the second part can be found on the tailgate.

### Rear light cluster



### Vehicle at normal level



### Vehicle raised



### Rear fog light

Due to the Touareg's off-road capability, the adaptive suspension of the vehicle allows greater changes in vehicle height than on normal automobiles. Government regulations require, in Japan for example, that the rear fog light is switched off when the vehicle is in the highest position.

This function is available for other countries as a code in the onboard power supply control unit.



# Lighting

## Surround lighting

The lights integrated in the exterior mirrors illuminate the area around the vehicle.

### Conditions for activation:

The lights are actuated simultaneously with:

- the interior lights,
- the coming home/leaving home lighting function.

The surround lights are controlled by the onboard power supply control unit via the CAN bus and actuated by the driver's and front passenger's door control units.

To prevent the surround lights from becoming damaged by long periods of activation, a protection feature is integrated in the onboard power supply control unit which switches off the lights after a prescribed duration to allow them to cool down.

## Surround lights



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## The convenience lighting

### Lighting settings

In the set-up menu of the dash panel insert, various adjustments can be made to the lighting:

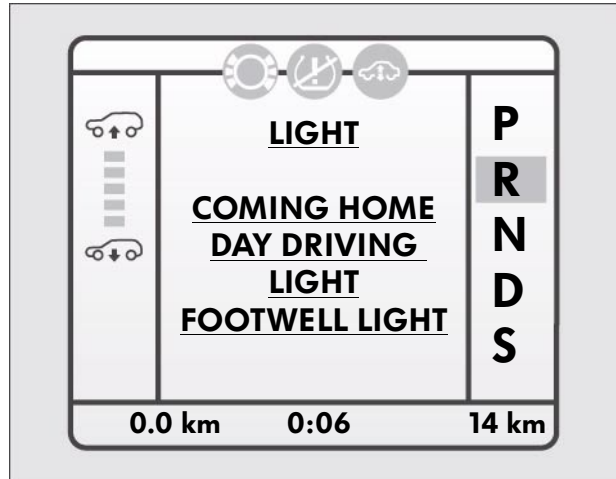
- Duration of coming-home lighting,
- Day driving light,
- Brightness of footwell lighting.

The duration of the coming-home lighting can be set between 0-90 seconds. After 90 seconds, the lights are switched off automatically to avoid discharging of the battery.

In the set-up menu, the day driving light function can be switched on or off. This option is only available in countries where day driving lights are not a legal requirement.

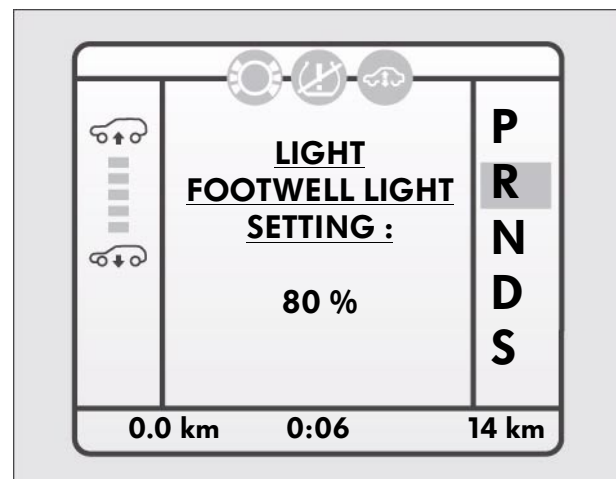
The footwell lighting can be adjusted from 0 %-100 %.

### Display in instrument panel insert



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### Display in instrument panel insert



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# Networked functions

## The lighting

### Functions:

#### Turn signals

The main function of the turn signals is set in the onboard power supply control unit.

#### Signal sequence:

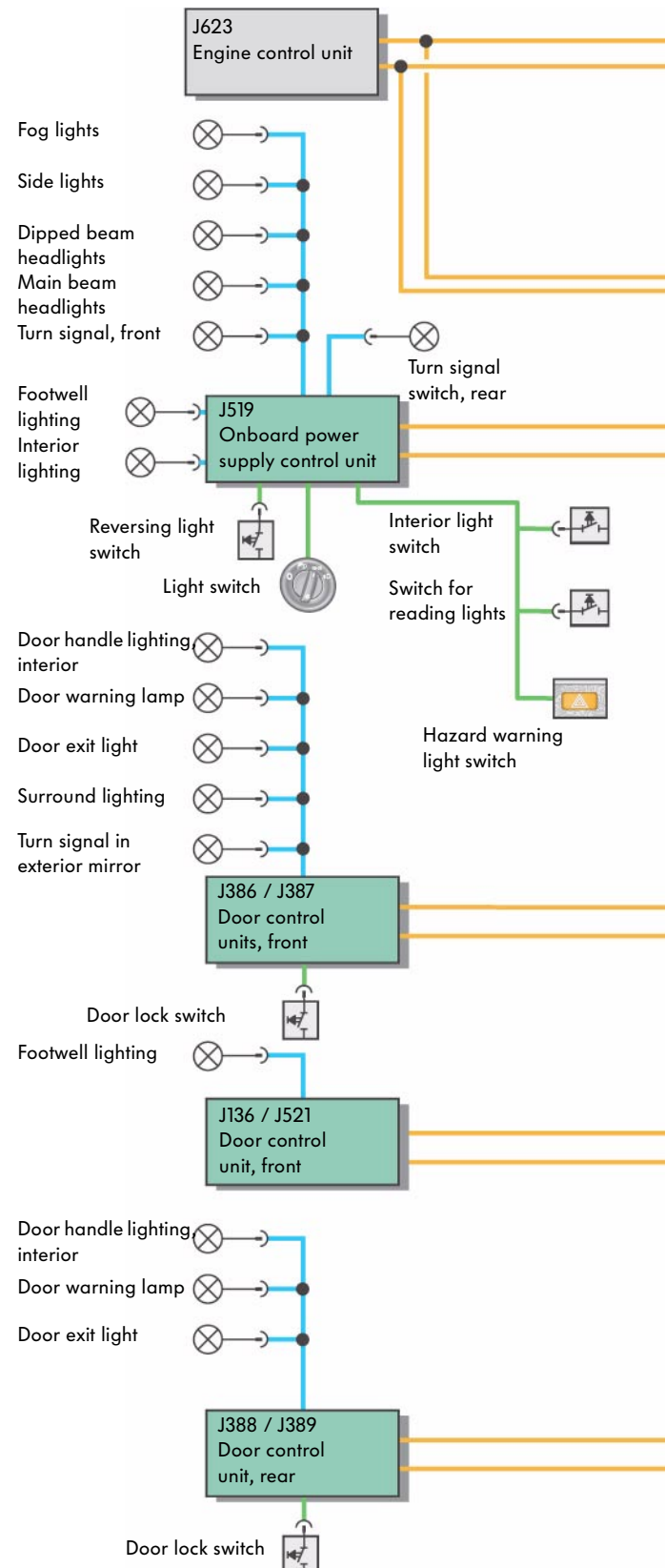
- Turn signal switch
- Steering column electronics control unit
- Onboard power supply control unit (actuation of turn signals)
- Trailer detection control unit (actuation of turn signals on trailer)
- Driver and front passenger door control units (actuation of turn signals in exterior mirrors)
- Dash panel insert (actuation of warning lights and display of warning messages)

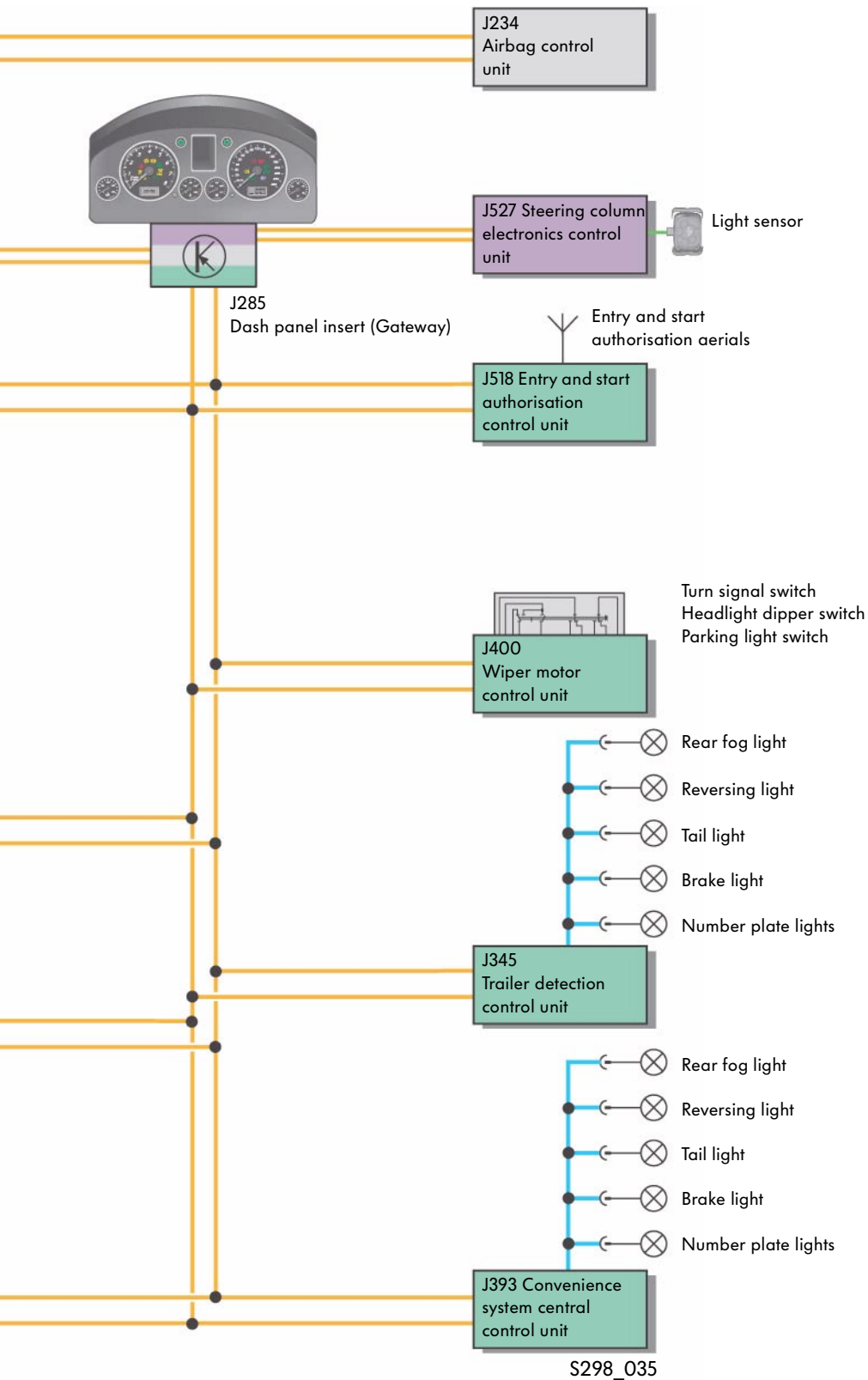
#### Side lights

The main function of the side lights is also set in the onboard power supply control unit.

#### Signal sequence:

- Light switch
- Onboard power supply control unit (actuation of front lights)
- Convenience system central control unit (actuation of rear lights)
- Trailer detection control unit (actuation of turn signals on trailer)
- Dash panel insert (actuation of warning lights and display of warning messages)





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# Networked functions

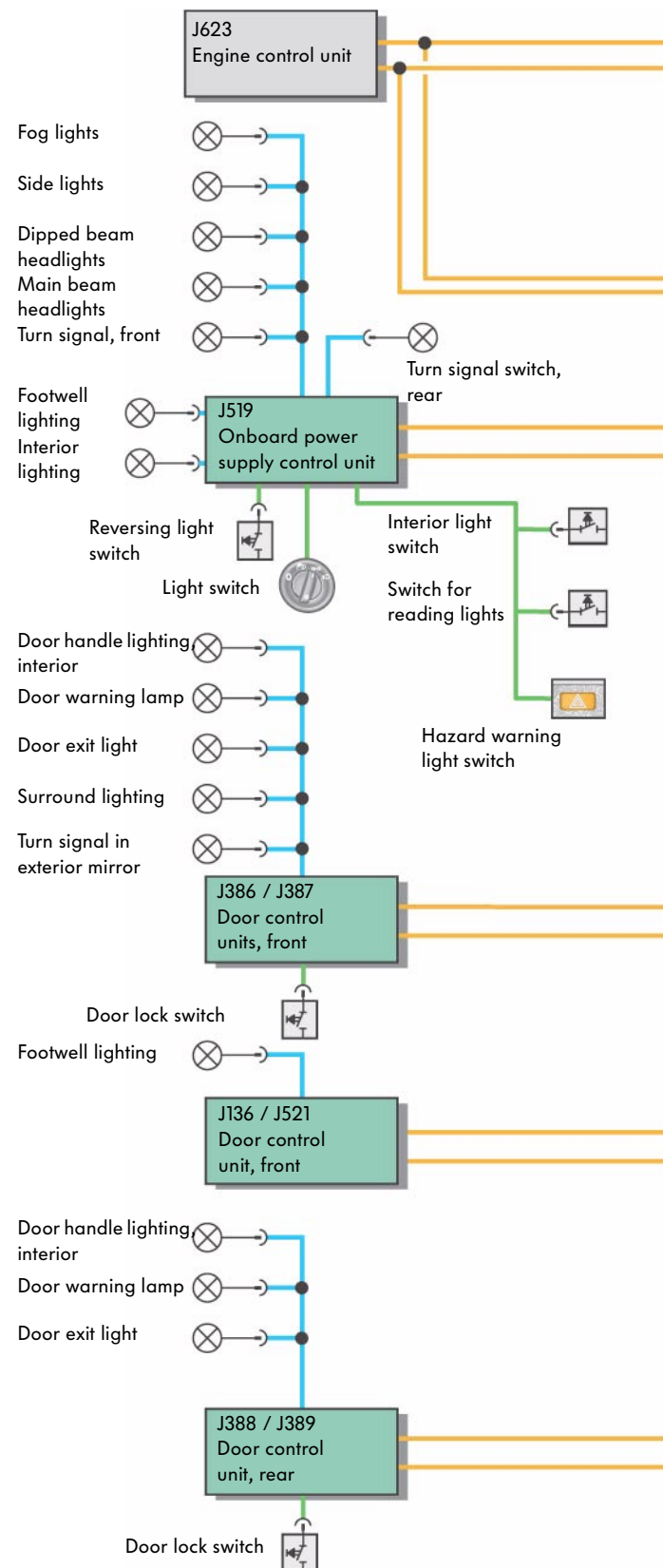
## Driving lights

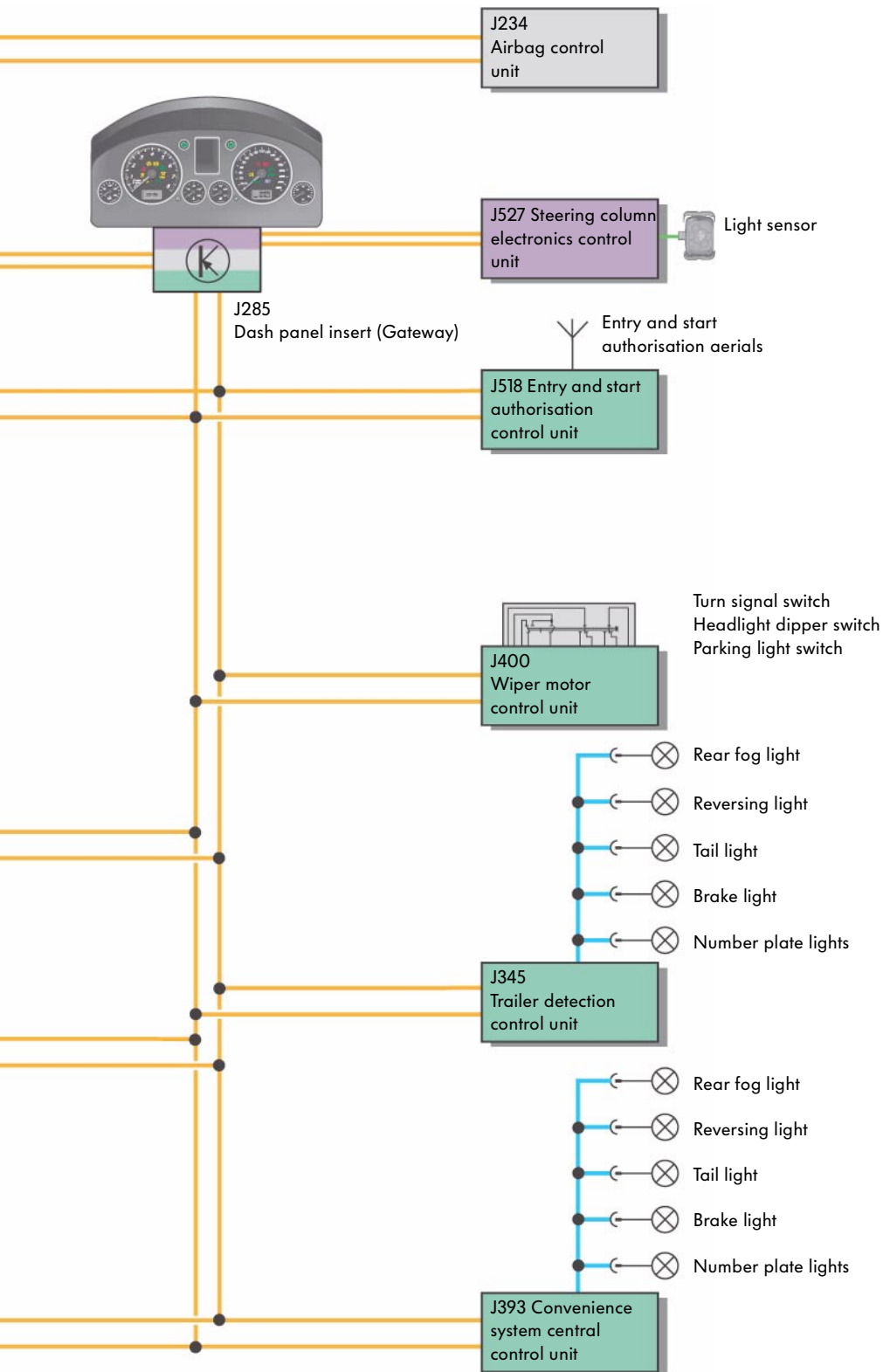
The main function of the driving lights is also set in the onboard power supply control unit.

### Signal sequence:

- Light switch
- Onboard power supply control unit (actuation of headlights)
- Dash panel insert (actuation of warning lights and display of warning messages)

An additional switching option in the onboard power supply control unit permits activation of the headlights if the onboard power supply control unit should fail or the side light and dipped beam light switches should cease to function.





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# Networked functions

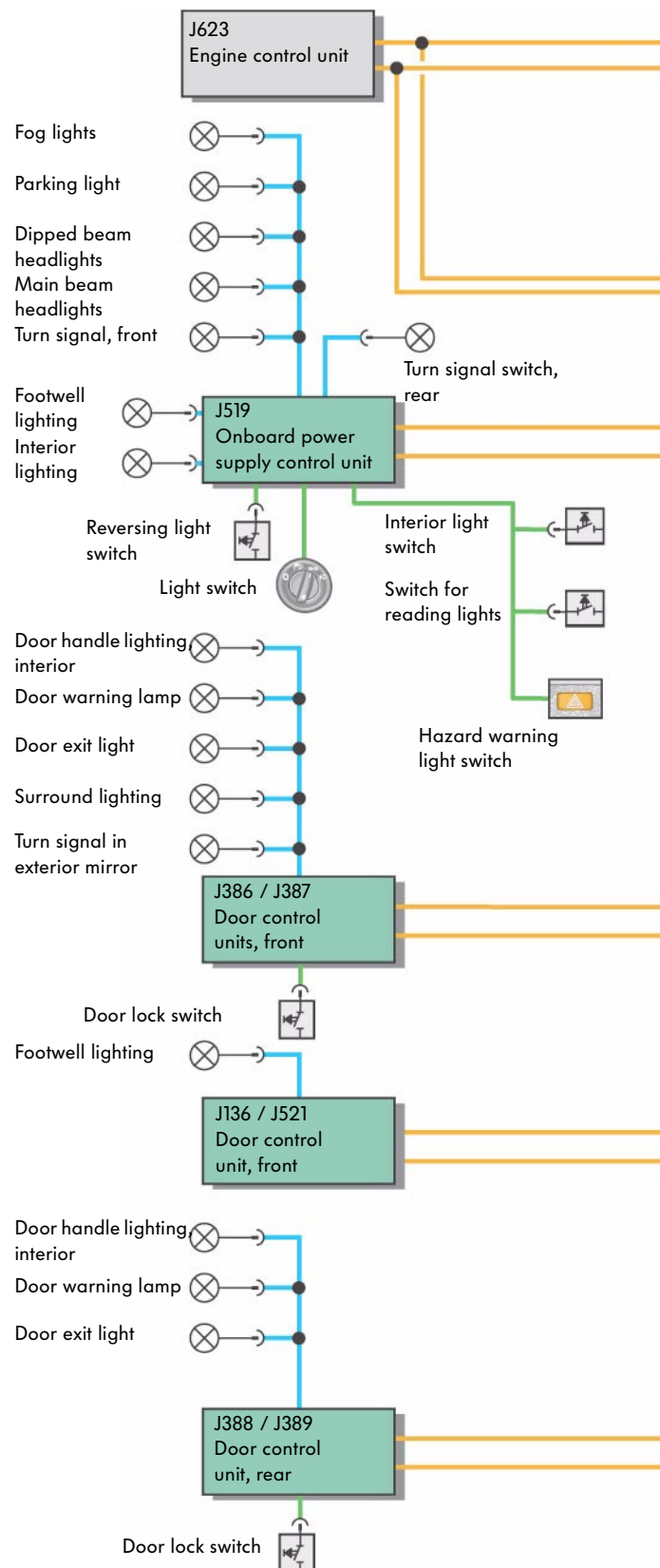
## Automatic driving light control

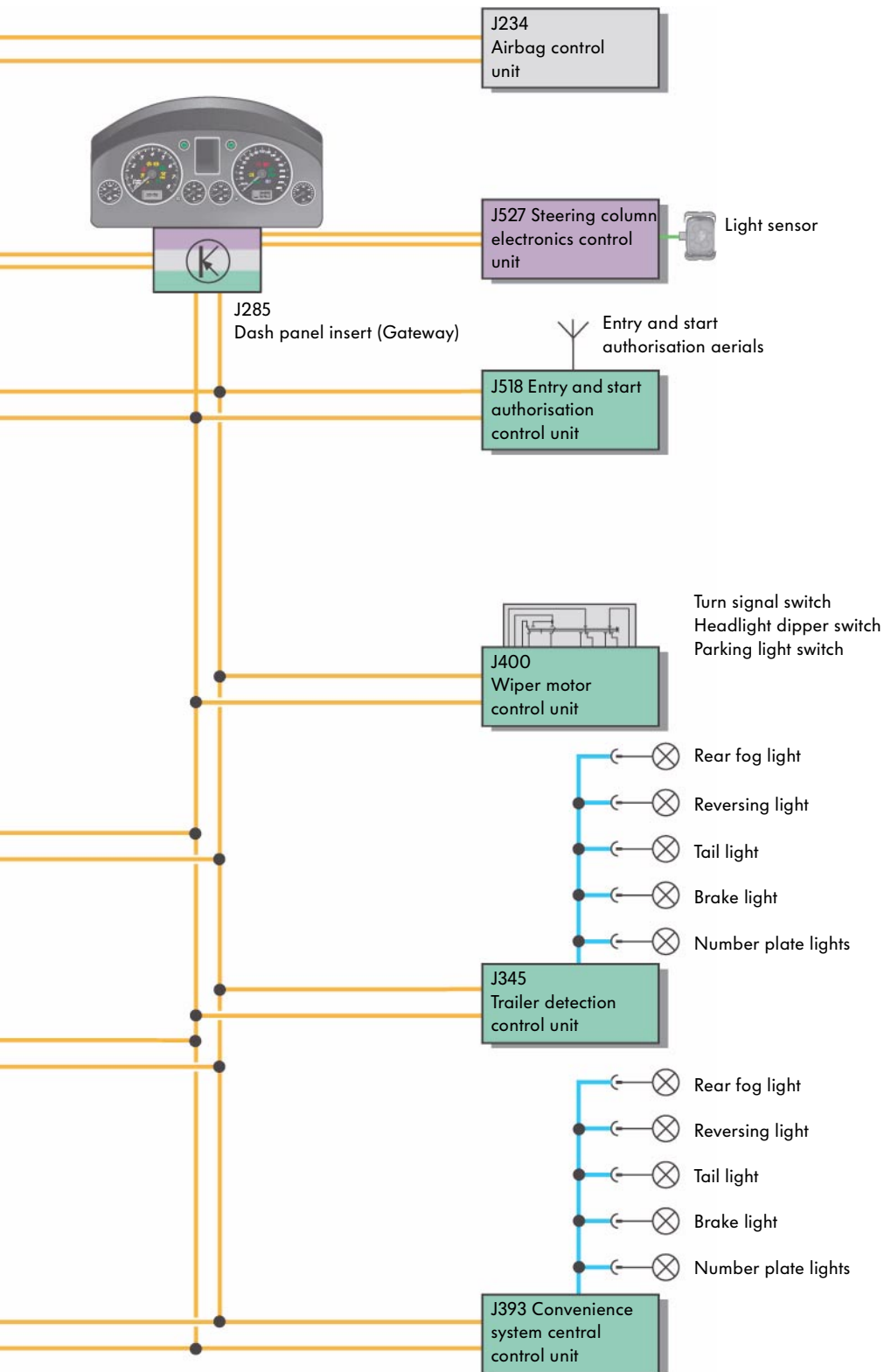
The automatic driving light control is set in the onboard power supply control unit as normal.

### Signal sequence:

- Light switch in automatic driving light position
- Input signal from light sensor via wiper motor control unit, Infotainment and Gateway CAN bus
- Onboard power supply control unit (actuation of front lights)
- Convenience system central control unit (actuation of rear lights)
- Trailer detection control unit (actuation of turn signals on trailer)
- Dash panel insert (actuation of warning lights and display of warning messages)

The automatic driving light control is only active when the light switch is in the relevant position.





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# Networked functions

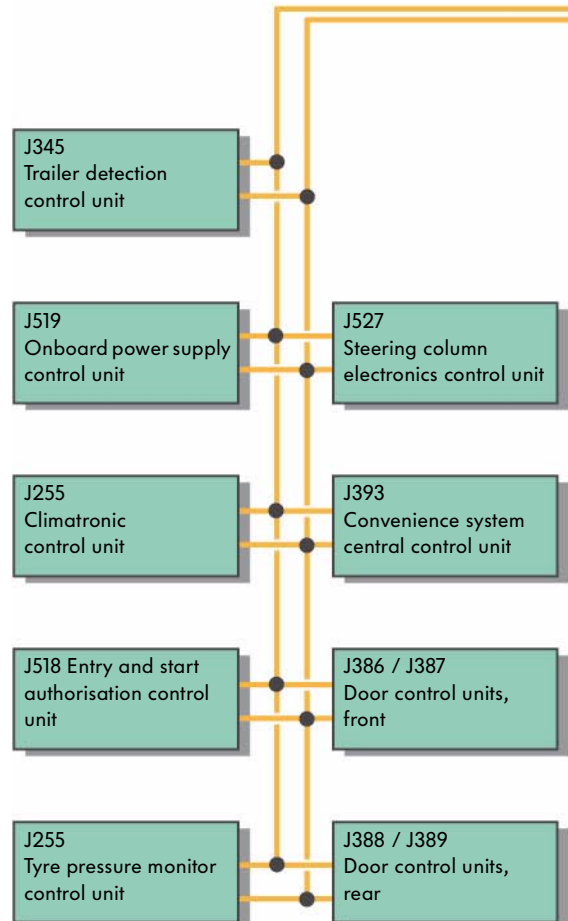
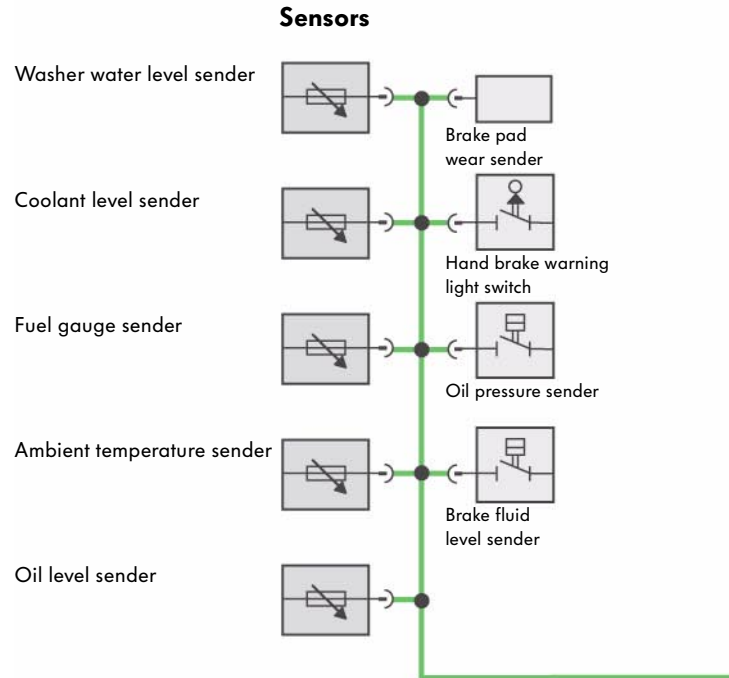
## Driver information

### Function:

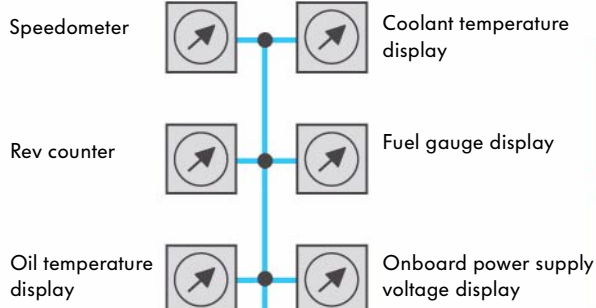
The warning lights and instruments in the dash panel insert receive their information from the control units via the CAN bus or discreet wiring from their own sensors.

Signals that are sent via the CAN bus from the control units make their way to the processor in the dash panel insert via the Gateway.

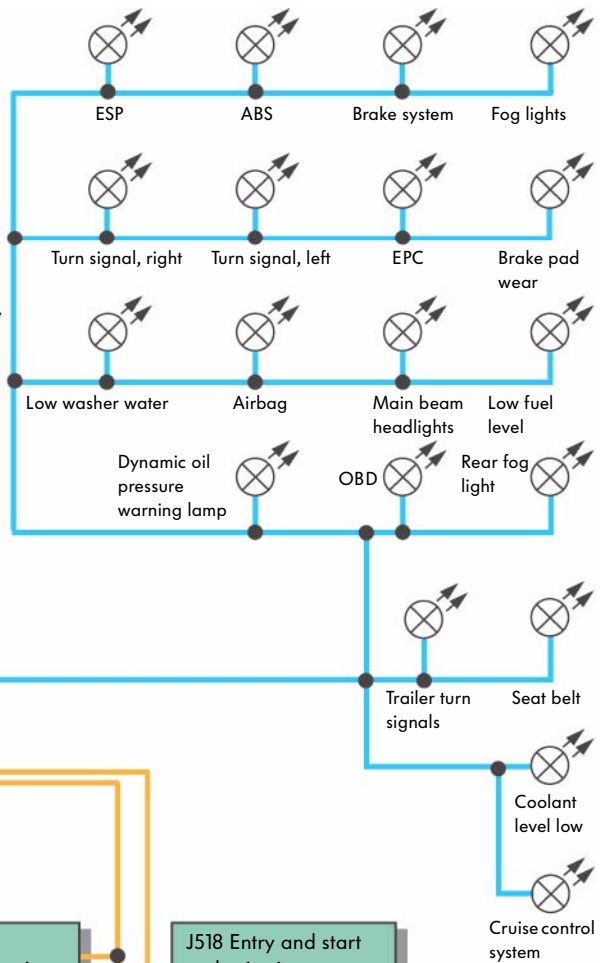
The control units can be adapted in the Gateway using the vehicle diagnosis system VAS 5051. If the control units are not adapted, the warning lights and instruments cannot be actuated.



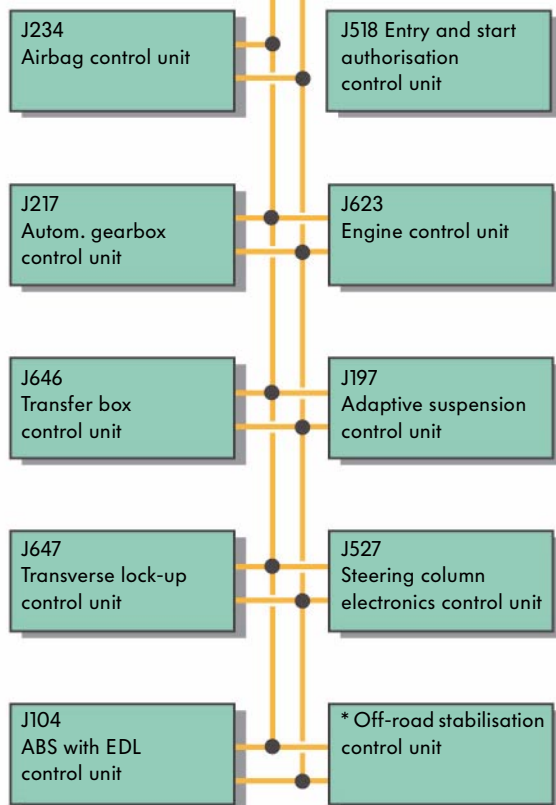
### Display instruments



### Warning lamps



J285 Dash panel insert (Gateway)



\*Reserved

S298\_036



# Networked functions

## Entry and start authorisation

### Function:

### Central locking in general

The central locking of the vehicle is controlled by the convenience system central control unit. The doors and the tailgate are locked. The lock positions of the doors are unlocked, locked and secured or not secured. In the tailgate the lock positions are locked and unlocked.

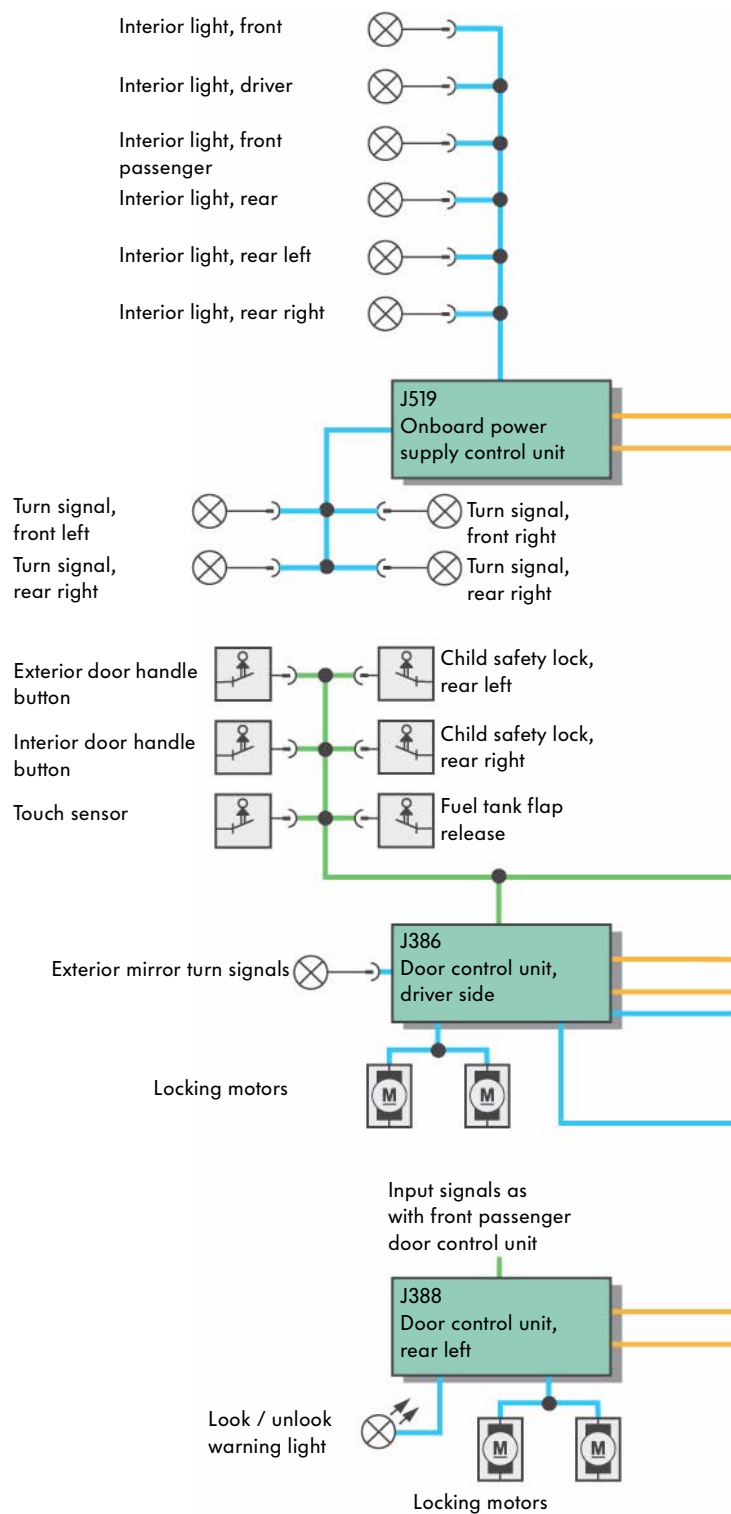
If the vehicle is locked and secured, the LEDs in the driver and front passenger doors will be actuated. Actuation lasts for about 5 seconds and is controlled by the convenience system central control unit. Thereafter it is controlled by the door control units.

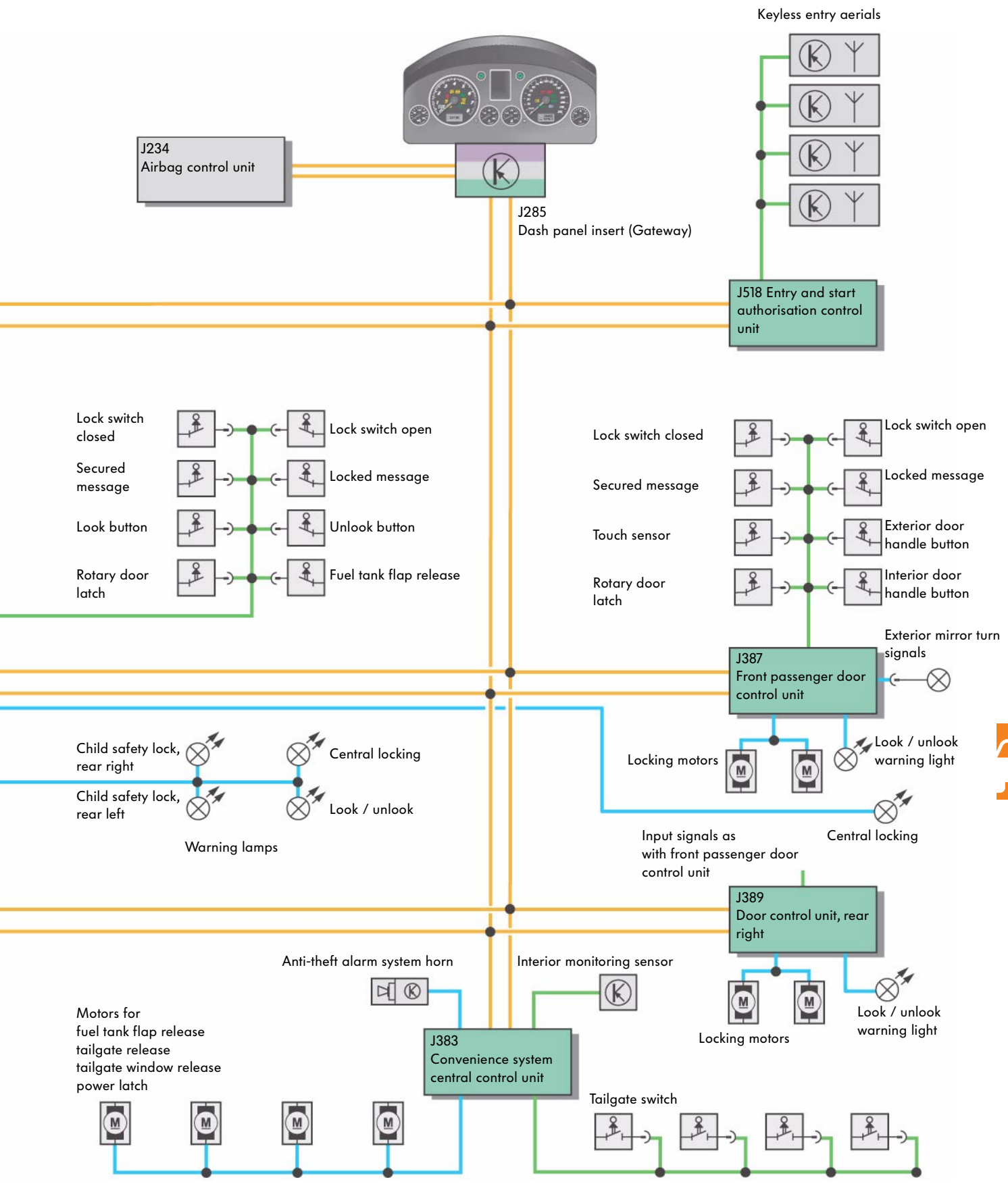
If the convenience system central control unit should fail, the driver's door control unit will take over in emergency operation mode. A difference in operation cannot be detected.

### Operation via radio remote control

The information from the radio remote control is received by the aerial of the entry and start authorisation control unit.

The entry and start authorisation control unit passes the information on via the convenience CAN bus to the convenience system central control unit. This in turn actuates the door control units.





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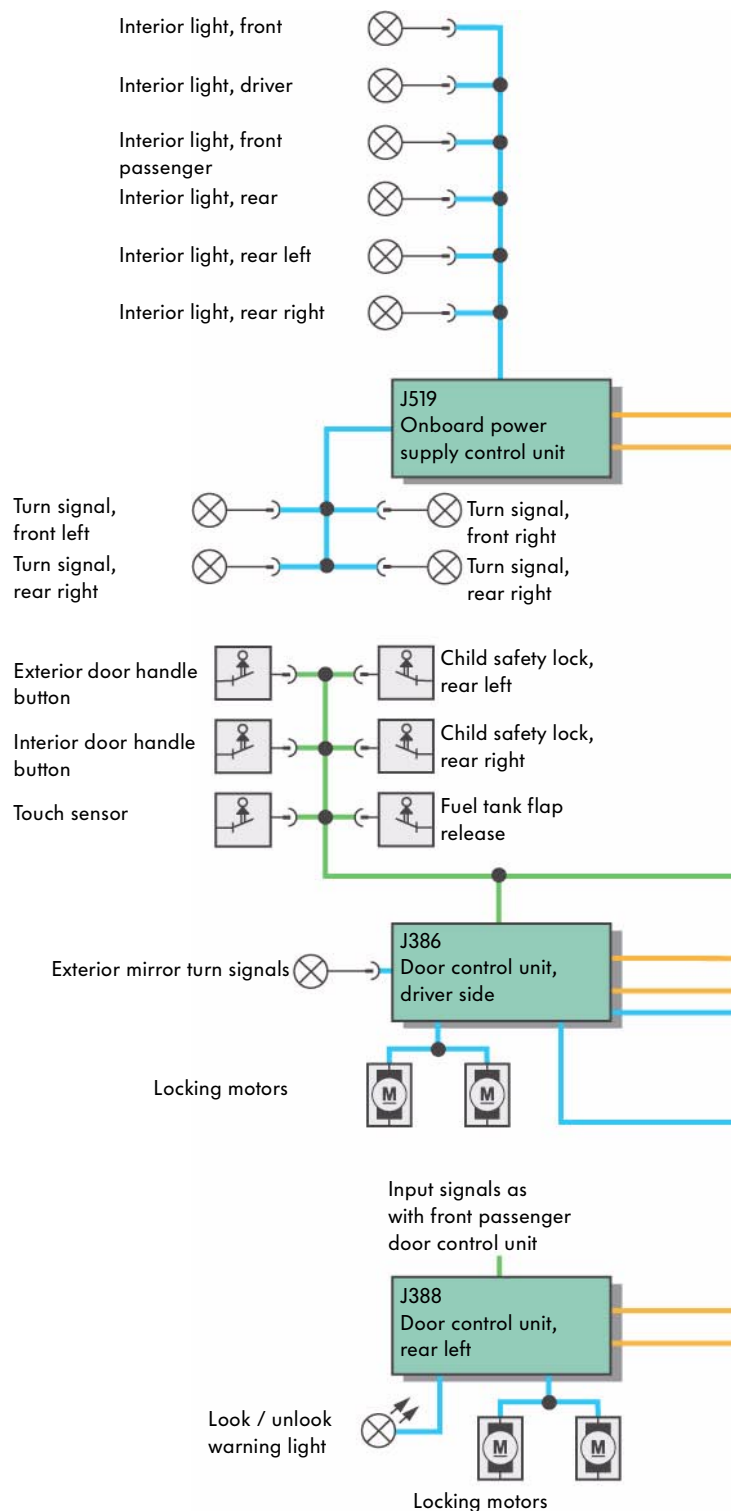
# Networked functions

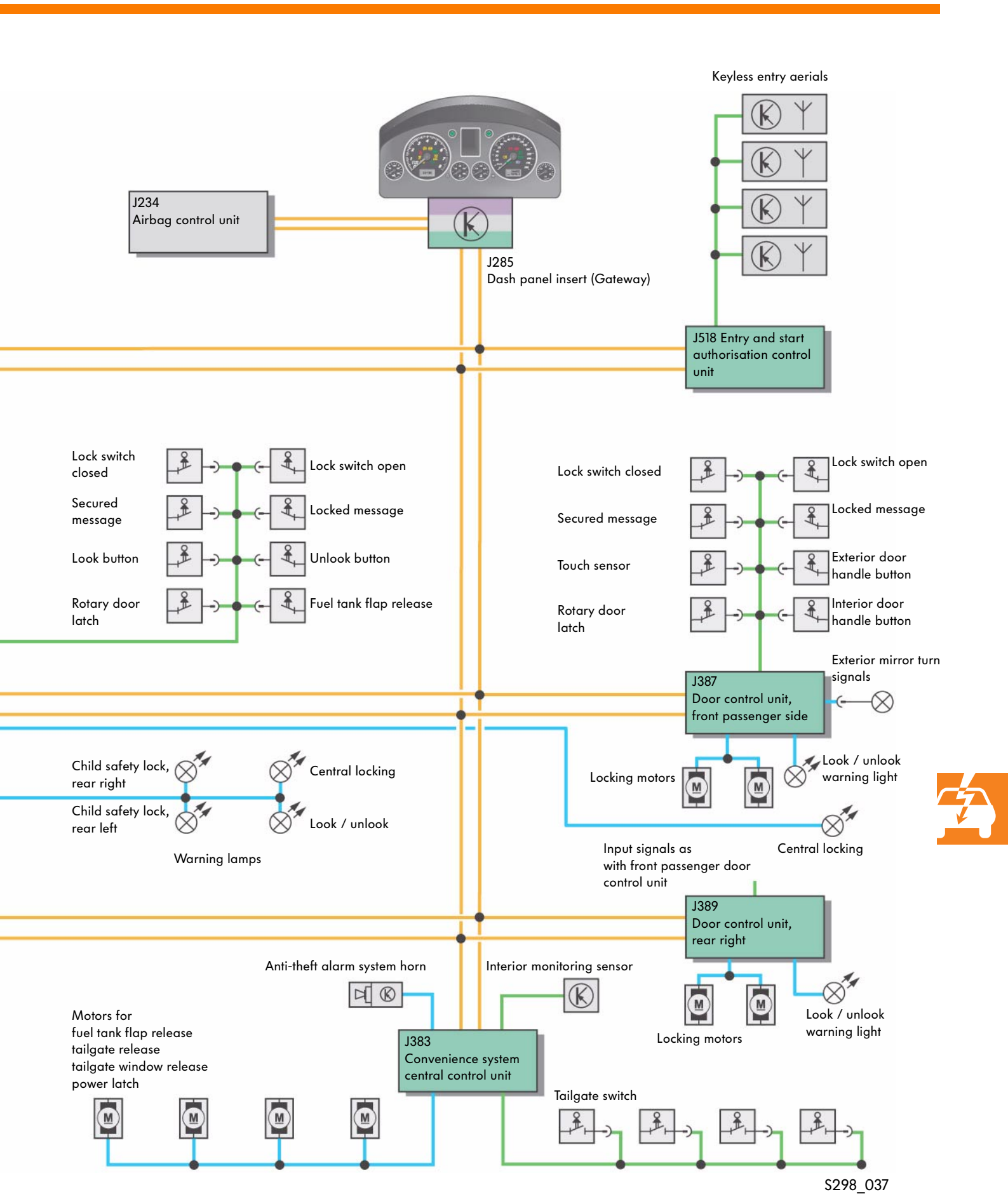
## Operation via proximity sensors

Apart from opening the door, no other action is necessary. The entry and start authorisation control unit detects the transponder in the ignition key. When the door handle is actuated, the action is detected by the entry and start authorisation control unit by means of a signal. A signal is then also sent via the convenience CAN bus to the convenience system central control unit. This actuates the relevant door control unit.

## Activating and deactivating the anti-theft alarm system

The anti-theft alarm system is activated in positions locked or secured. If the ignition is switched on, the anti-theft alarm system cannot be activated. An active anti-theft alarm system is displayed by the central locking warning lights in the front doors for a maximum of 28 days.





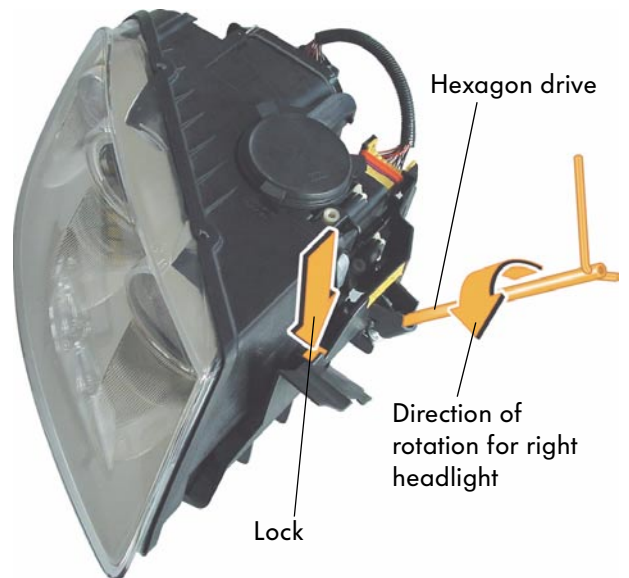
## The lighting

### Removing headlights

The headlights are designed based on the principle of sliding drawers. They can be pulled out. To do this, a socket must be used on a hexagon drive to unscrew the headlights. This releases the lock and the headlight can be removed.

The direction of rotation differs on the left and right.

### Headlights with safety locks



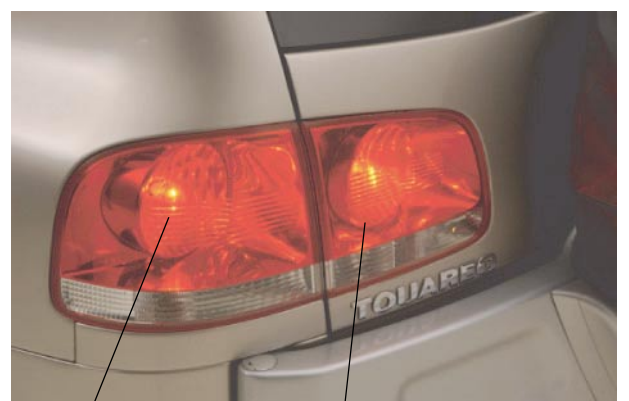
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### Rear lights

On the fixed part of the rear light cluster, the lamp must be removed to replace the bulb.

The bulbs of the rear light in the tailgate can be replaced by changing the lamp holder.

### Rear lights



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Fixed part

Lamp holder in tailgate



## Diagnosis

### Guided fault finding

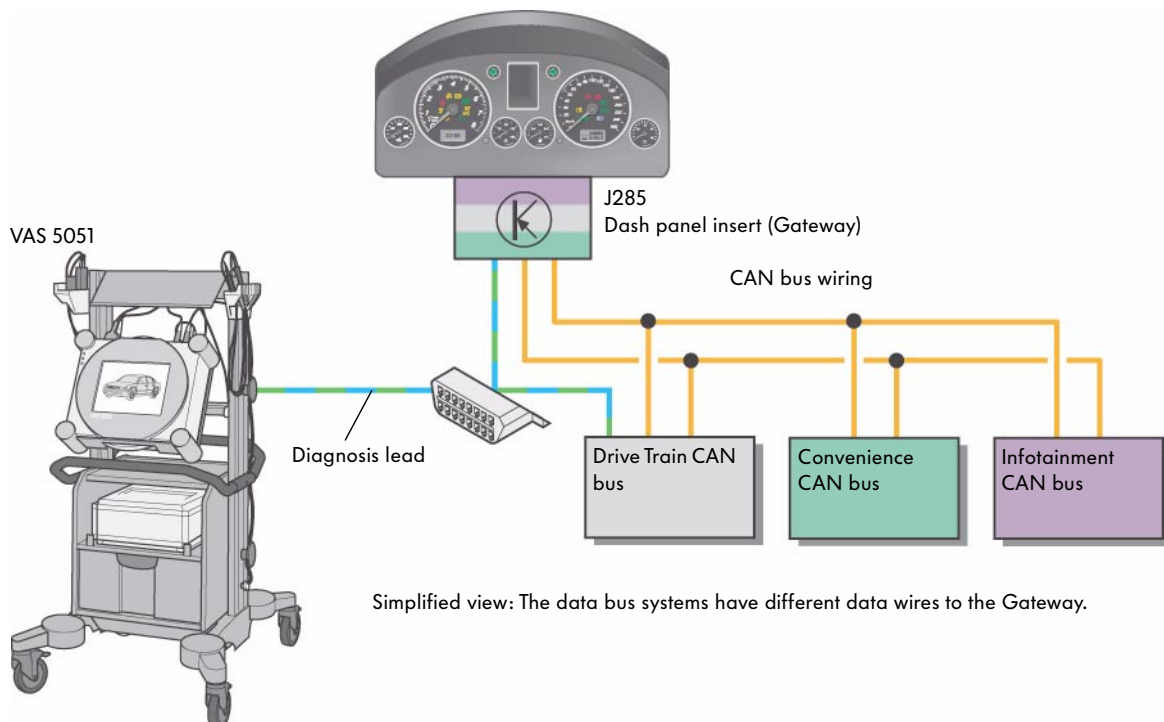
The data from the guided fault finding function is interrogated by the vehicle diagnosis, testing and information system VAS 5051.

To do this, the guided fault finding function must be selected. All the necessary information can be found there.

The data is interrogated via a diagnosis interface for the data bus in the dash panel insert.

A wired communication connection is only necessary to some control units in the drive train CAN bus, to control units for gas discharge lamps and to the convenience system central control unit.

### Signal sequence



S298\_047



# Glossary

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## **CAN bus**

Bi-directional data wire between control units. The data can be sent in both directions (bi-directional). Data buses work at different rates of data transfer. 500 kBit/s means that 500 000 binary figures, that is 0 or 1, can be sent per second.

## **Discreet signal**

This is a voltage signal which is sent via a normal cable.

## **Gateway**

This is a data interface (connection), which allows different data signals to be sent from one CAN bus to another.





# Test yourself

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## 1. Which control units belong to the Drive Train CAN bus?

- a) The airbag control unit, the convenience system central control unit, the tyre pressure monitor control unit.
- b) The steering column electronics control unit, the entry and start authorisation control unit, the engine control unit, the airbag control unit.
- c) The wiper motor control unit, the door control units, the rear blind control unit, the airbag control unit.

## 2. Where can the battery main / isolation switch E 74 be found?

- a) In the luggage compartment, next to the starter battery.
- b) In the engine compartment, near the alternator.
- c) In the back-up fuse box, under the driver's seat.

## 3. If the voltage of the onboard power supply battery is below 11.2 Volt,

- a) it is discharged.
- b) it is weak, but not discharged.
- c) the alternator is defective and must be replaced.



#### 4. Which functions are controlled by the onboard power supply?

- a) The parking light, fog lamps, twin washer pump.
- b) The brake lights, the rear turn signals, the power latch function in the tailgate.
- c) The wiper motor, the central locking, the sliding/tilting sunroof.

#### 5. Which lighting settings can be carried out in the set-up menu of the dash panel insert?

- a) Change in the flash frequency of the turn signals.
- b) Day driving light in countries where there is no legal requirement for them to be on permanently.
- c) The brightness of the footwell lighting.

#### 6. Which control units play a role in the "Automatic driving light" function?

- a) The onboard power supply control unit, the wiper motor control unit, the convenience system central control unit.
- b) The steering column electronics control unit, the onboard power supply control unit, the trailer detection control unit.
- c) The entry and start authorisation control unit, the onboard power supply control unit, the convenience lighting control unit.





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