eSelf Study Program 970563

The 2017 A4 Electronic and Electrical Systems

Audi Academy

Audi of America, LLC
Service Training
Created in the U.S.A.
Created 12/2015
Course Number 970563

Always check Technical Bulletins and the latest electronic service repair literature for information that may supersede any information included in this booklet.

eMedia

This eSSP contains video links which you can use to access interactive media.

This eSelf Study Program teaches a basic knowledge of the design and functions of new models, new automotive components or technologies.

It is not a Repair Manual! All values given are intended as a guideline only.

For maintenance and repair work, always refer to the current technical literature.

Note

Reference

Introduction

The 2017 Audi A4 is the second Audi vehicle to adapt the MLBevo (Modular Longitudinal Platform evolution). A fully equipped A4 has approximately 90 control modules, many of which exchange information with one another.

The FlexRay bus system is now used on an A4 model for the first time. It helps ensure data is transmitted quickly and securely. The key components on the FlexRay are the engine control module, the transmission control module, a new central suspension control module, the ESC, power steering control module and ACC.

In addition to the FlexRay bus CAN bus systems (CAN = controller area network) integrate the climate control system and several assistance systems such as Audi side assist and the surround cameras.

They also facilitate communication between the comfort/convenience control modules, the infotainment modules and central display and operating components such as the MMI and Audi virtual cockpit. LIN buses (LIN = local interconnect network) complement the CAN buses by serving less complex systems such as the interior lighting.

The Audi A4 now also has aluminum high-current wires with diameters of 16 mm^2, 35 mm^2 and 50 mm^2.

It is also the first Audi to use aluminum wires with diameters of 2.5 mm^2, 4 mm^2 and 6 mm^2. Thanks to these modifications, the weight of the vehicle in this area has been reduced by approximately 13 lb (5 kg) compared with the previous model.

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Learning objectives of this Self-Study Program:

Once you have completed this eSelf-Study Program program you will be able to answer the following questions:

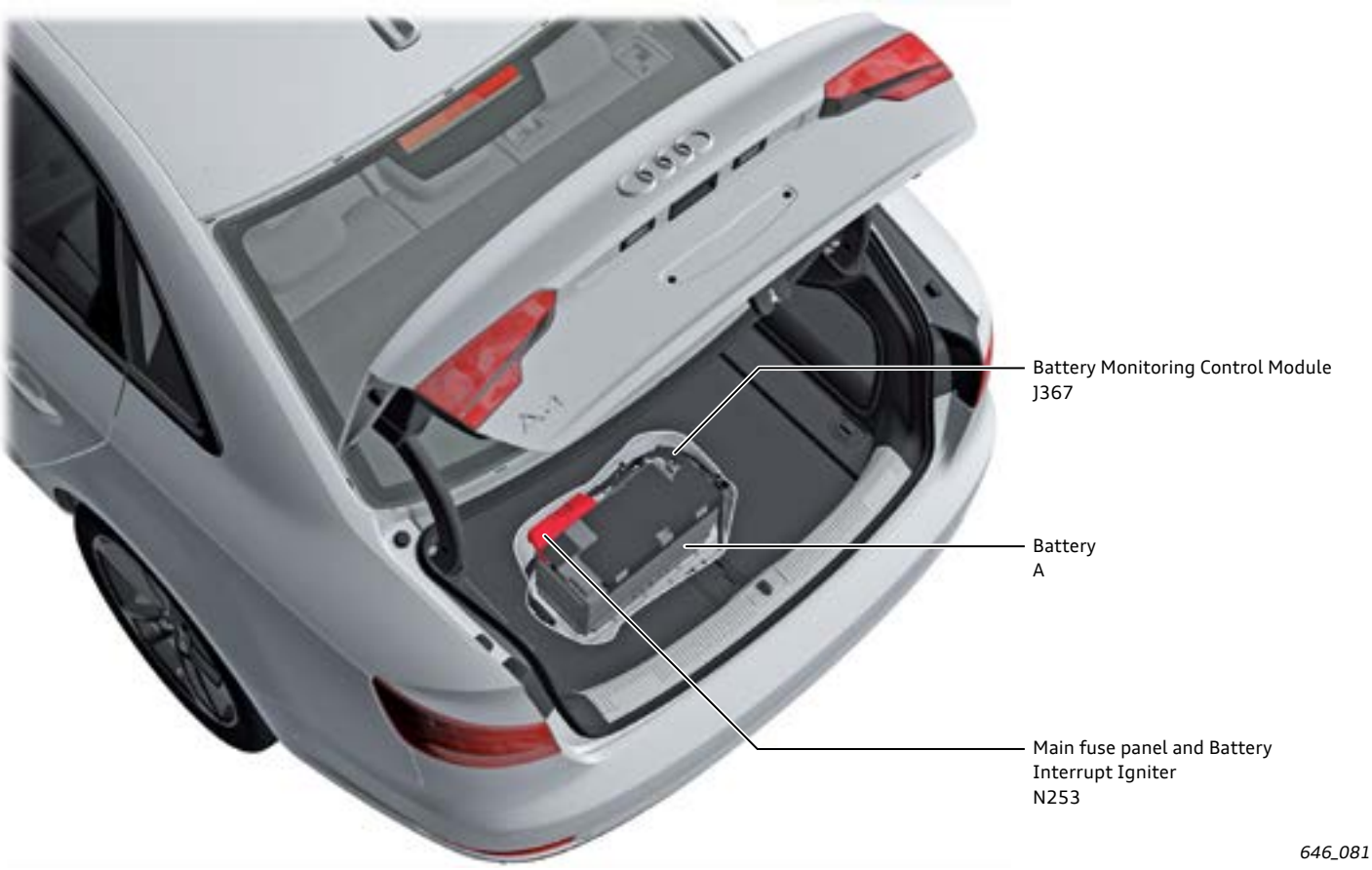
- Where are the fuse and relay panels located in the Audi A4?
- In what locations are electrical components installed on the car?
- Which bus systems are used in the Audi A4?
- What are the tasks of the control modules in the car?
- What are the versions of the exterior lighting, and how are the individual light functions implemented?

Voltage supply

Vehicle battery

The vehicle battery is housed centrally in the spare wheel well. The main fuse panel as well as Battery Interrupt Igniter N253 are mounted on the positive terminal. In the event of a crash, N253 disconnects the main battery lead from the vehicle electrical system.

Battery Monitoring Control Module J367 (BDM) is located at the negative battery terminal.



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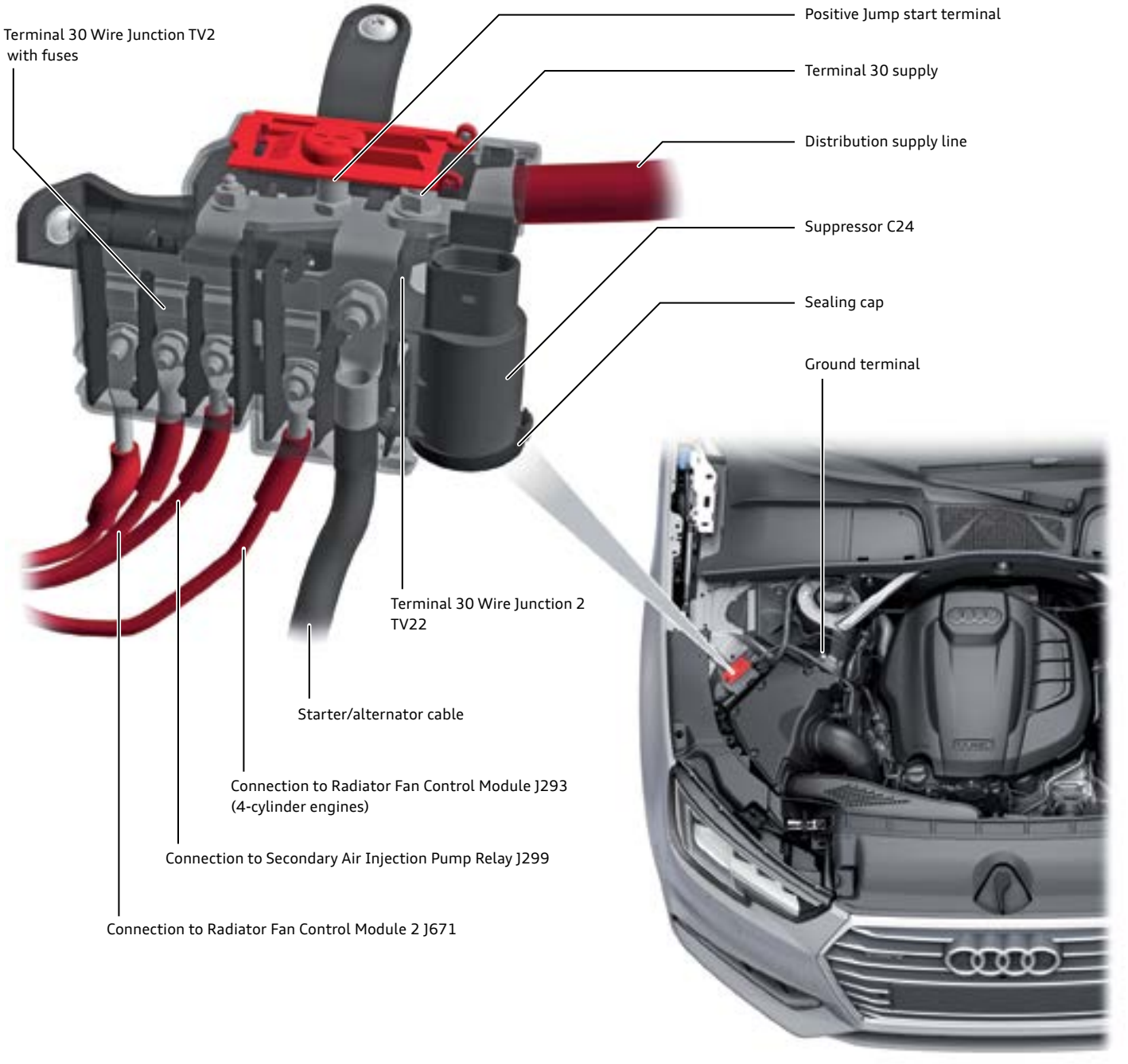
Jump start terminal

The positive jump start terminal is located under a red plastic cover on the right hand side of the engine compartment. A negative terminal is attached directly to the body at the right suspension strut tower.

These terminals should also be used for maintaining the battery in the showroom or when performing diagnostic work.



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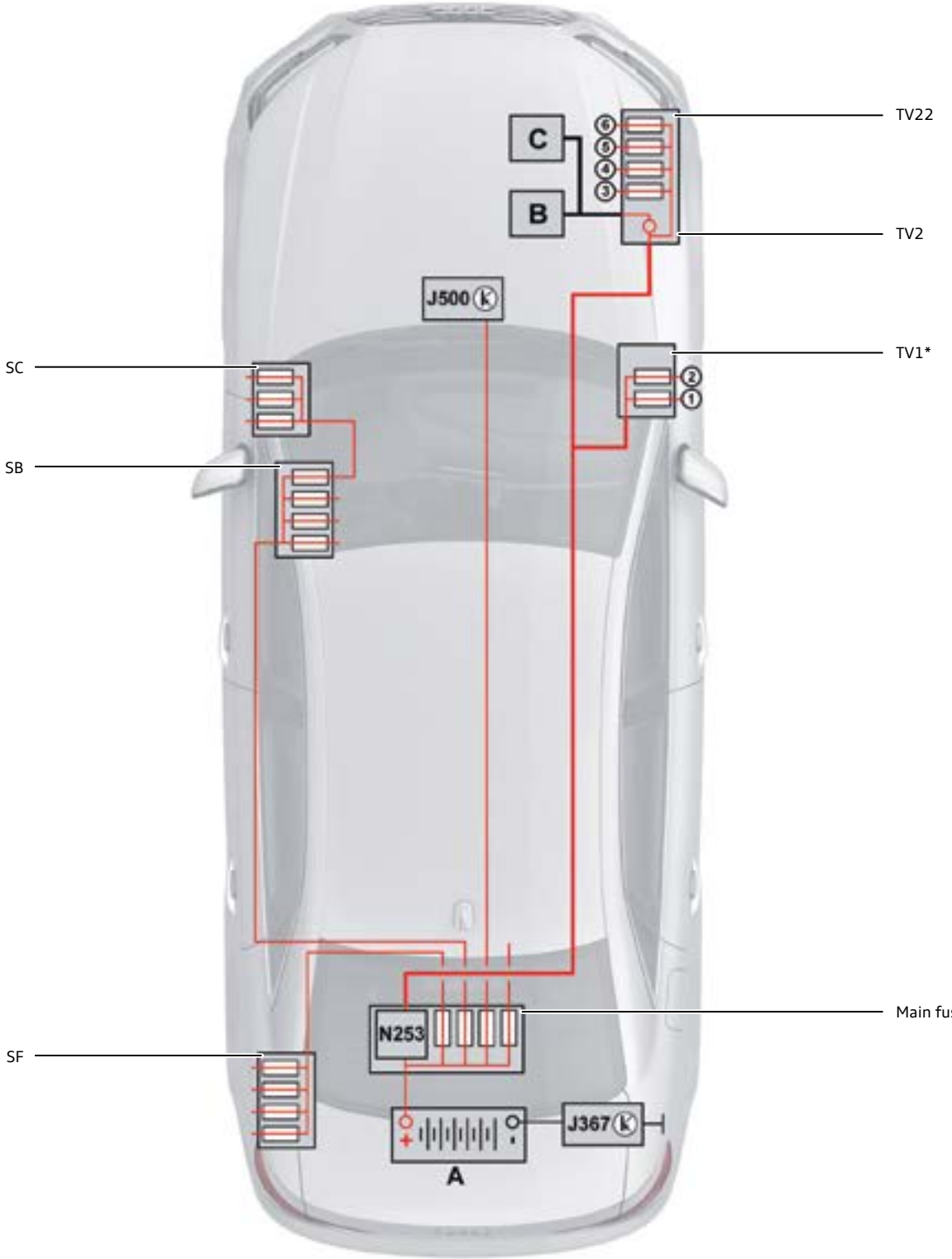
Power distribution

This is a schematic diagram of the A4 power distribution structure.

For exact details of fuse assignment and the cable routing, please refer to the applicable service literature.



646_083

Key:

1 Not used in North American Region
2 Not used in North American Region
3 Connection to Radiator Fan Control Module J293 (4-cylinder engines)
4 Connection to Secondary Air Injection Pump Relay J299
5 Connection to Radiator Fan Control Module 2 J671
6 Connection to Radiator Fan Control Module J293

A Battery
B Starter motor
C Alternator

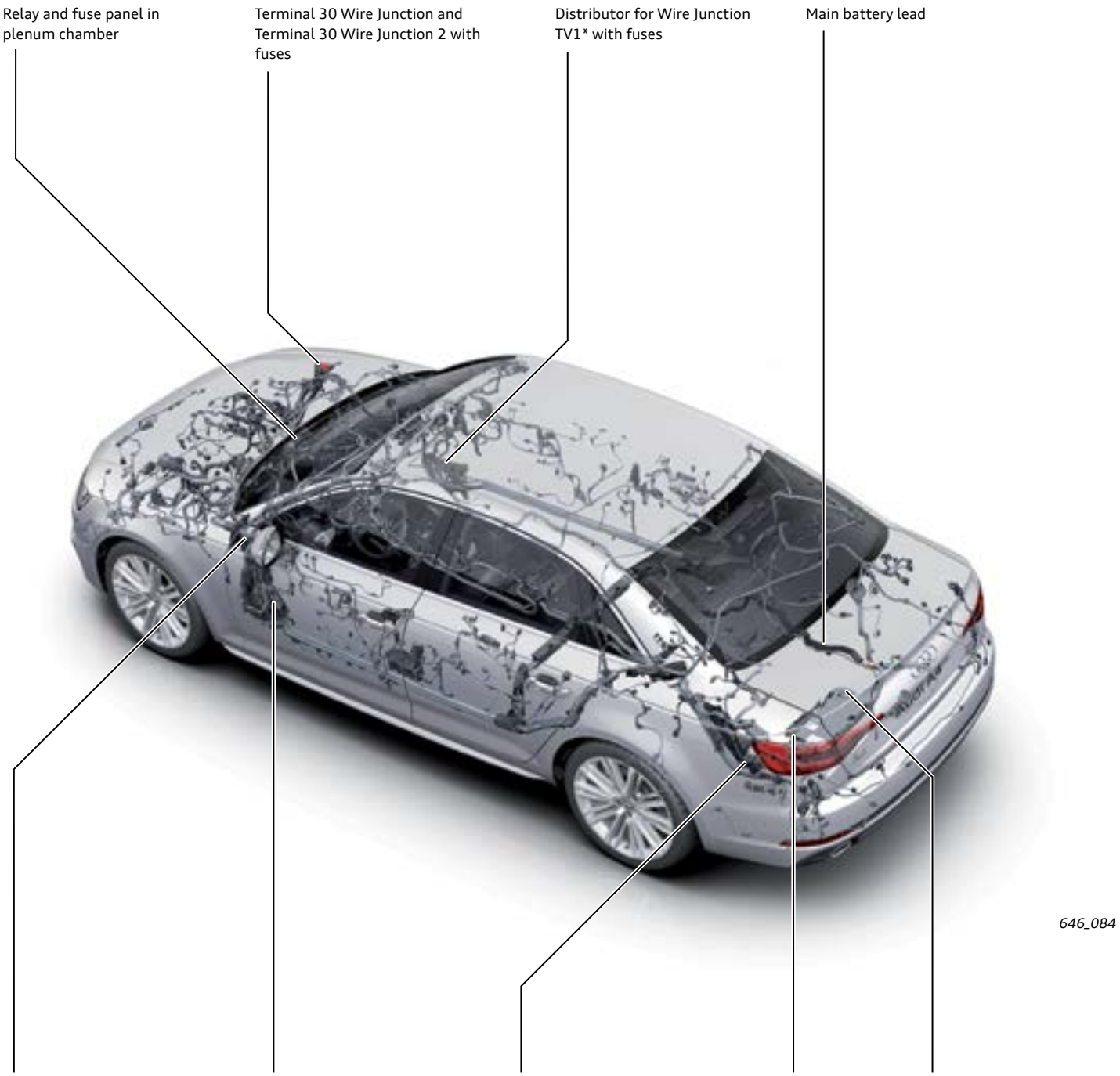
J367 Battery Monitoring Control Module
J500 Power Steering Control Module
N253 Battery Interrupt Igniter
SB Fuse panel B, on the footrest
SC Fuse panel C, under instrument panel, right side
SF Fuse panel F, in luggage compartment on left side
TV1* Wire Junction, base of right 'A' pillar
TV2 Terminal 30 Wire Junction
TV22 Terminal 30 Wire Junction 2

*Not for North American Market

Fuses and relays

The fuses on the main fuse panel as well as distributors TV1* and TV22 are labeled only "S" in the Wiring Diagrams. This also applies to other individual fuses distributed throughout the car.

Fuses "SB", "SC" and "SF" can also be accessed by the driver behind the relevant fuse panels and therefore are also described in the Owner's Manual.



*Not for North American Market

Aluminum wires

Main battery lead

The main positive battery cable in the Audi A4 is made of aluminum like the Audi A8 where this was used for the first time. The cable begins at the main fuse panel as a flexible round cable. On the right hand-side of the luggage compartment, it is welded onto a flexurally rigid aluminum ribbon cable.

This ribbon cable runs along the right-hand side of the vehicle through the rear section of the vehicle and under the rear seat, terminating in the heel panel area. Here it is welded onto a round cable which continues along the inside of the right-hand sill and through the engine bulkhead to the jump start terminal in the engine compartment.

If defective, the battery cable can only be replaced. There is no provision for repairs.

Wiring harness

A new feature is the use of aluminum wires with diameters of 2.5 mm^2, 4 mm^2 and 6 mm^2 in certain areas of the wiring harness.

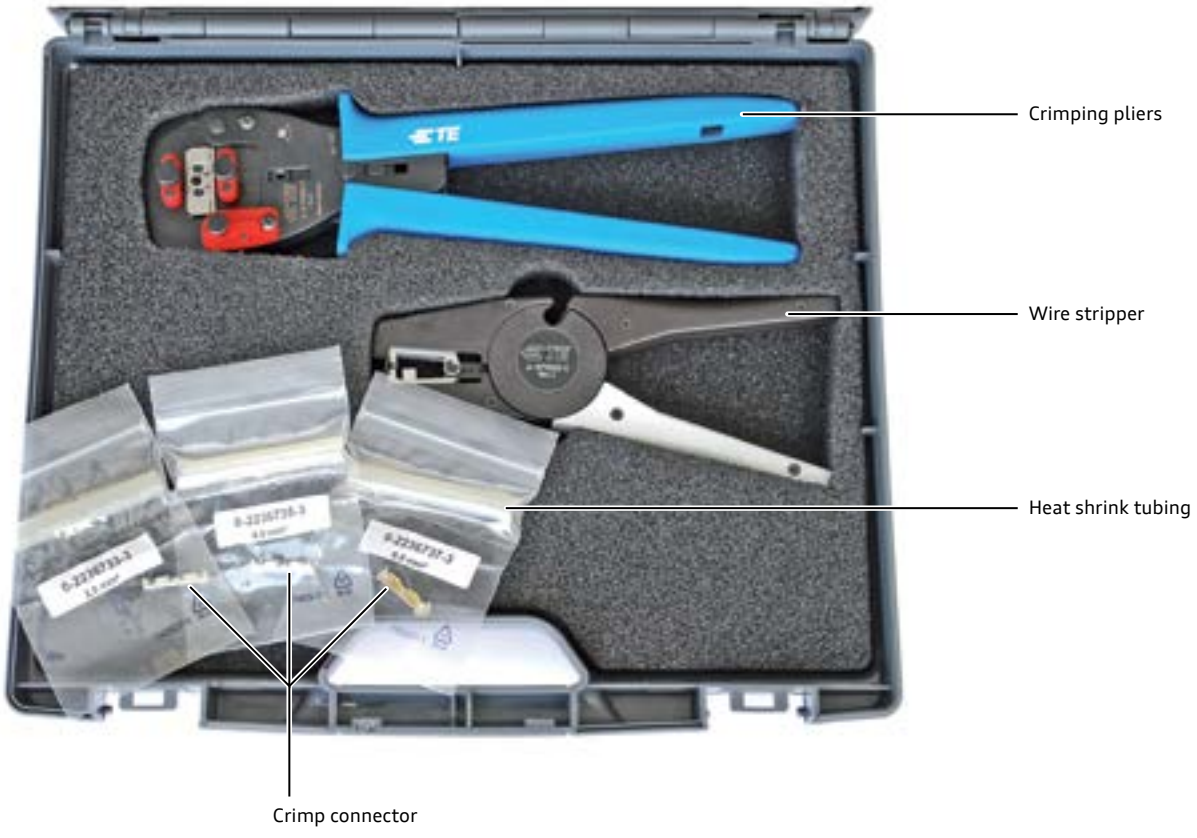
This helps save weight in the electrical system. Copper wires with diameters from 1.5 mm^2 to 6 mm^2 are also used, particularly in areas in which wires are subject to movement, for example, on the hood.

Repairing aluminum wires

A new tool, VAS 631 001 has been developed for repairing aluminum wires.

In addition to a crimping pliers, this repair kit includes a wire stripper and a special crimp connector including heat shrink tubing for wire diameters of 2.5 mm^2, 4 mm^2 and 6 mm^2.

As before, copper wires can be repaired using the wiring harness repair kit VAS 1978B. Cut wires can be reconnected using crimp connectors. Repair wires with industrial manufactured contacts are also available.



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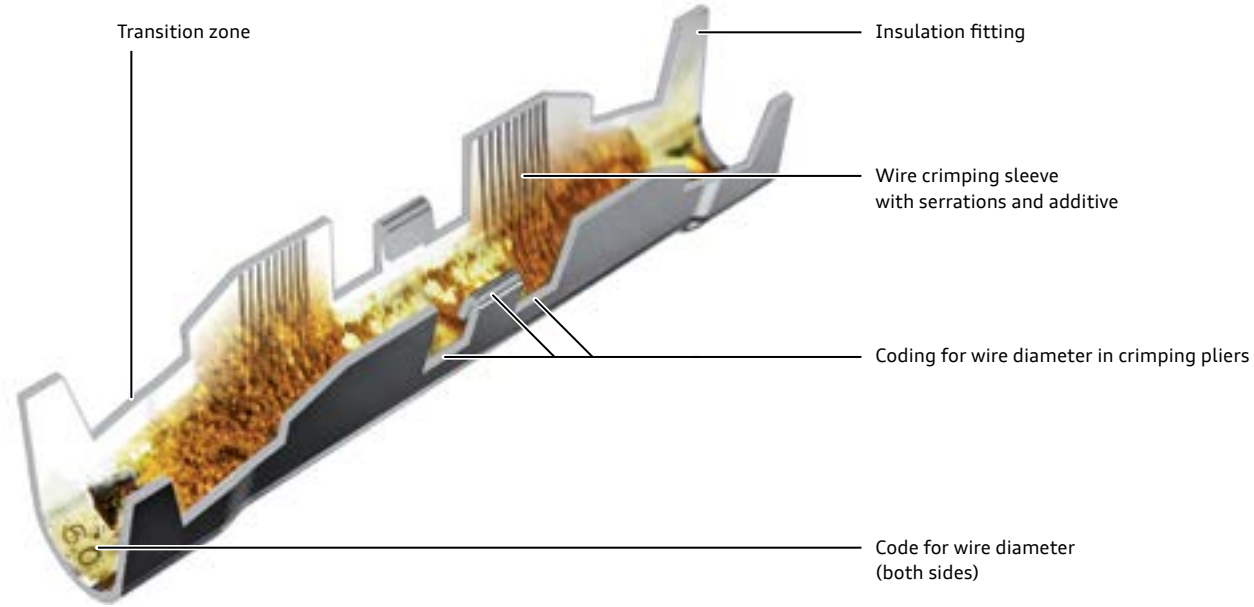
Special crimp connectors are used for the repair of aluminum wires. These connectors ensure strain resistant connection of the aluminum wires. The supplied heat shrink tubing reliably protects the joints against moisture.

A cut aluminum wire can be reconnected using this crimp connector. If it is necessary to attach a new section of wires, the copper repair wires from repair kit VAS 1978A can be used.



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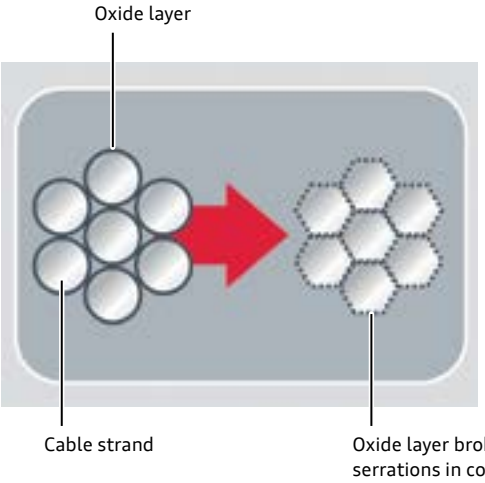
Challenges in repairing aluminum wires:

1. The crimp connector must provide a strain resistant connection.

To achieve a strain resistant connection with the aluminum wires, the oxide layers on the individual strands of the aluminum wires must be broken. This is achieved by the serrations in the crimp connectors. These serrations are also coated with an additive to provide better corrosion protection.

2. The joint must be sealed.

Because copper repair wires are used, there is an aluminum wire on one side of the connector and a copper wire on the other side. To prevent electro-chemical corrosion, the joint must be reliably protected. The heat shrink tubing supplied with the crimp connector is used for this purpose.



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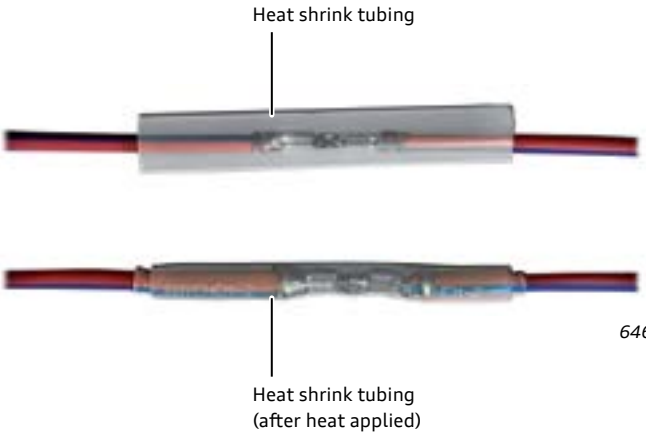

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Reference

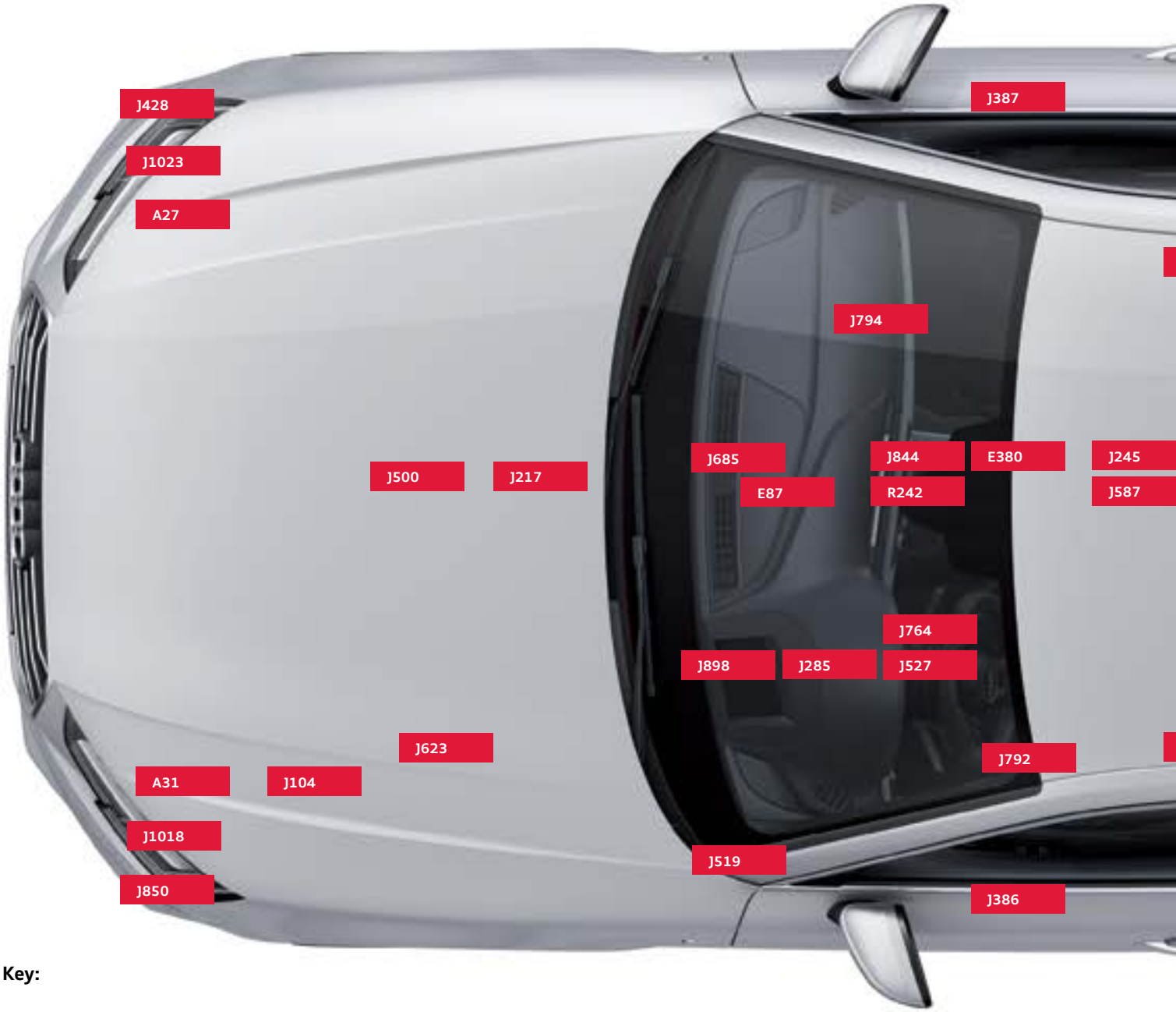
For a detailed description of how to repair aluminum wires, please refer to the Workshop Manual. At the vehicle introduction, the aluminum wire repair tools can be rented from Equipment Solutions.

Networking

Installation locations of control modules

Some of the control modules shown in the overview are optional and/or country-specific equipment.

Refer to the current service literature for details of control module installation positions as well as instructions for installation and removal.

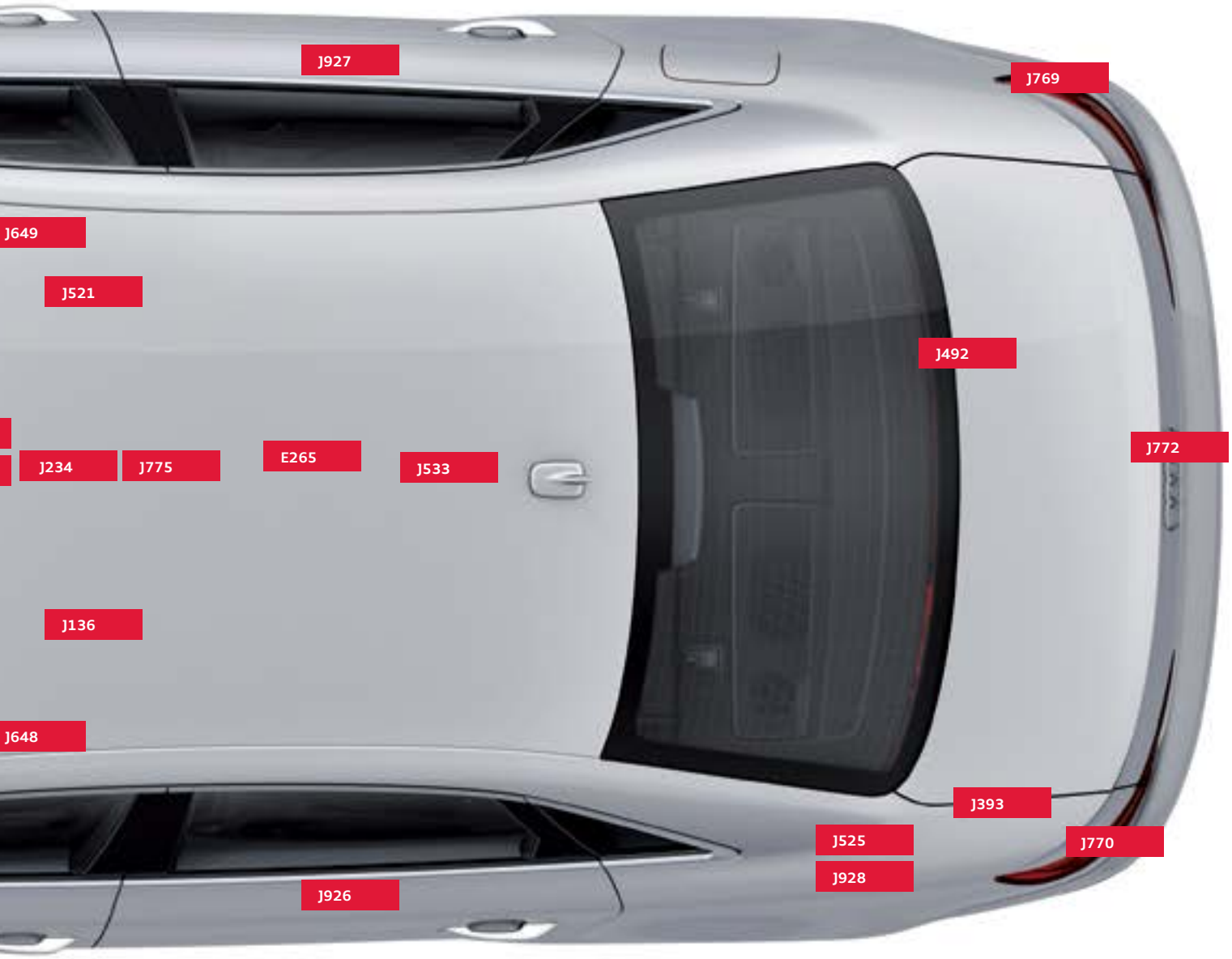


Key:

A27 Right LED Headlamp Power Output Module 1
A31 Left LED Headlamp Power Output Module 1

E87 Front A/C Display Control Head
E265 Rear A/C Display Control Head
E380 Multimedia System Control Head

J104 ABS Control Module
J136 Memory Seat/Steering Column Adjustment Control Module
J217 Transmission Control Module
J234 Airbag Control Module
J245 Power Sunroof Control Module
J285 Instrument Cluster Control Module
J386 Driver Door Control Module
J387 Front Passenger Door Control Module
J393 Comfort System Central Control Module
J428 Distance Regulation Control Module
J492 All Wheel Drive Control Module
J500 Power Steering Control Module
J519 Vehicle Electrical System Control Module 1
J521 Front Passenger Memory Seat Control Module
J525 Digital Sound System Control Module
J527 Steering Column Electronics Control Module
J533 Data Bus On Board Diagnostic Interface



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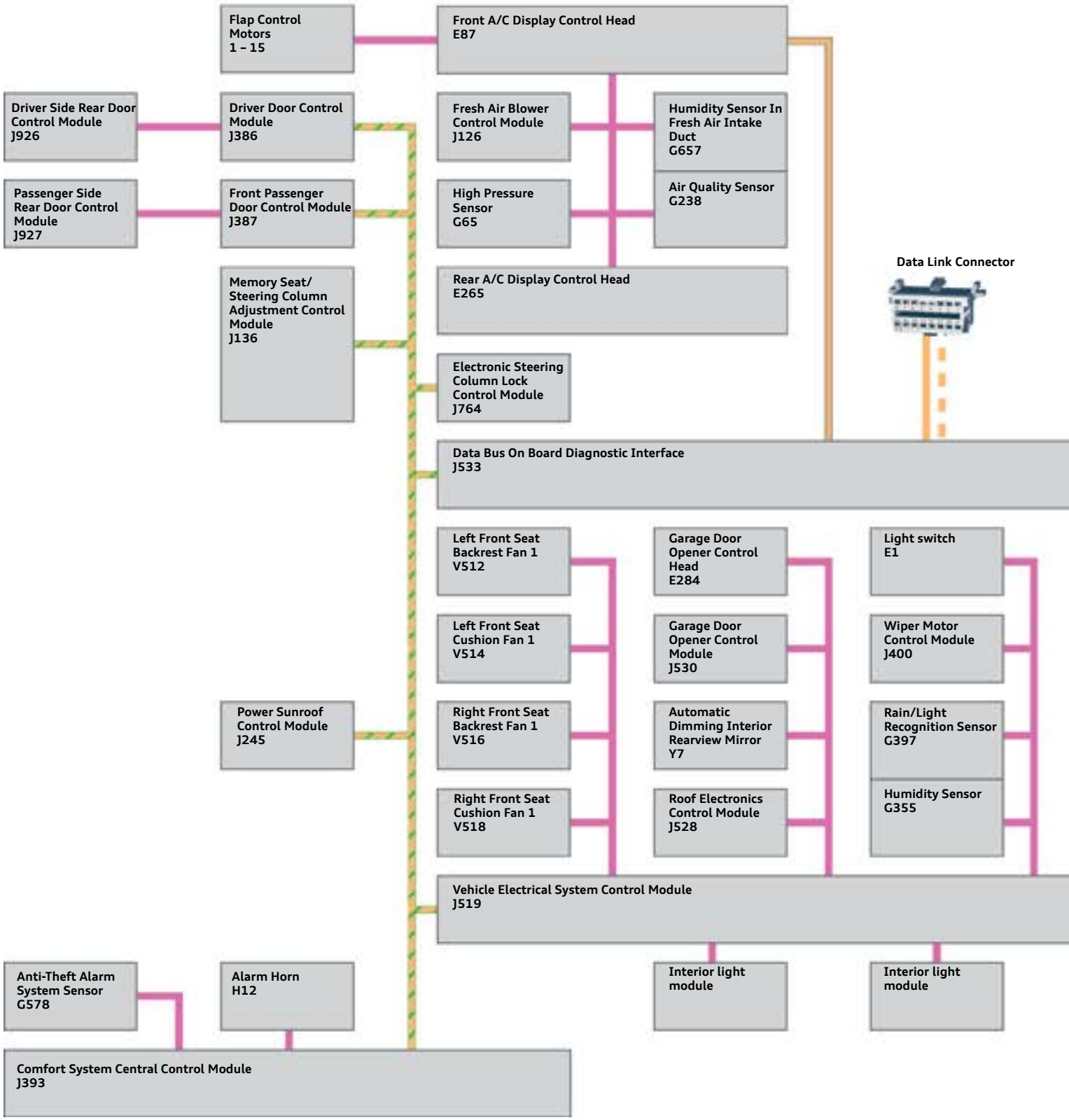
J587 Selector Lever Sensor System Control Module
J623 Engine Control Module
J648 Left Rear Information Display Control Head Control Module
J649 Right Rear Information Display Control Head Control Module
J685 Front Information Display Control Head
J764 Electronic Steering Column Lock Control Module
J769 Lane Change Assistance Control Module
J770 Lane Change Assistance Control Module 2
J772 Rearview Camera System Control Module
J775 Drivetrain Control Module

J792 Active Steering Control Module
J794 Information Electronics Control Module 1
J844 Automatic High Beam Assist Control Module
J850 Distance Regulation Control Module 2
J898 Windshield Projection Head Up Display Control Module
J926 Driver Side Rear Door Control Module
J927 Passenger Side Rear Door Control Module
J928 Peripheral Camera Control Module
J1018 Left Light Control Module
J1023 Right Light Control Module

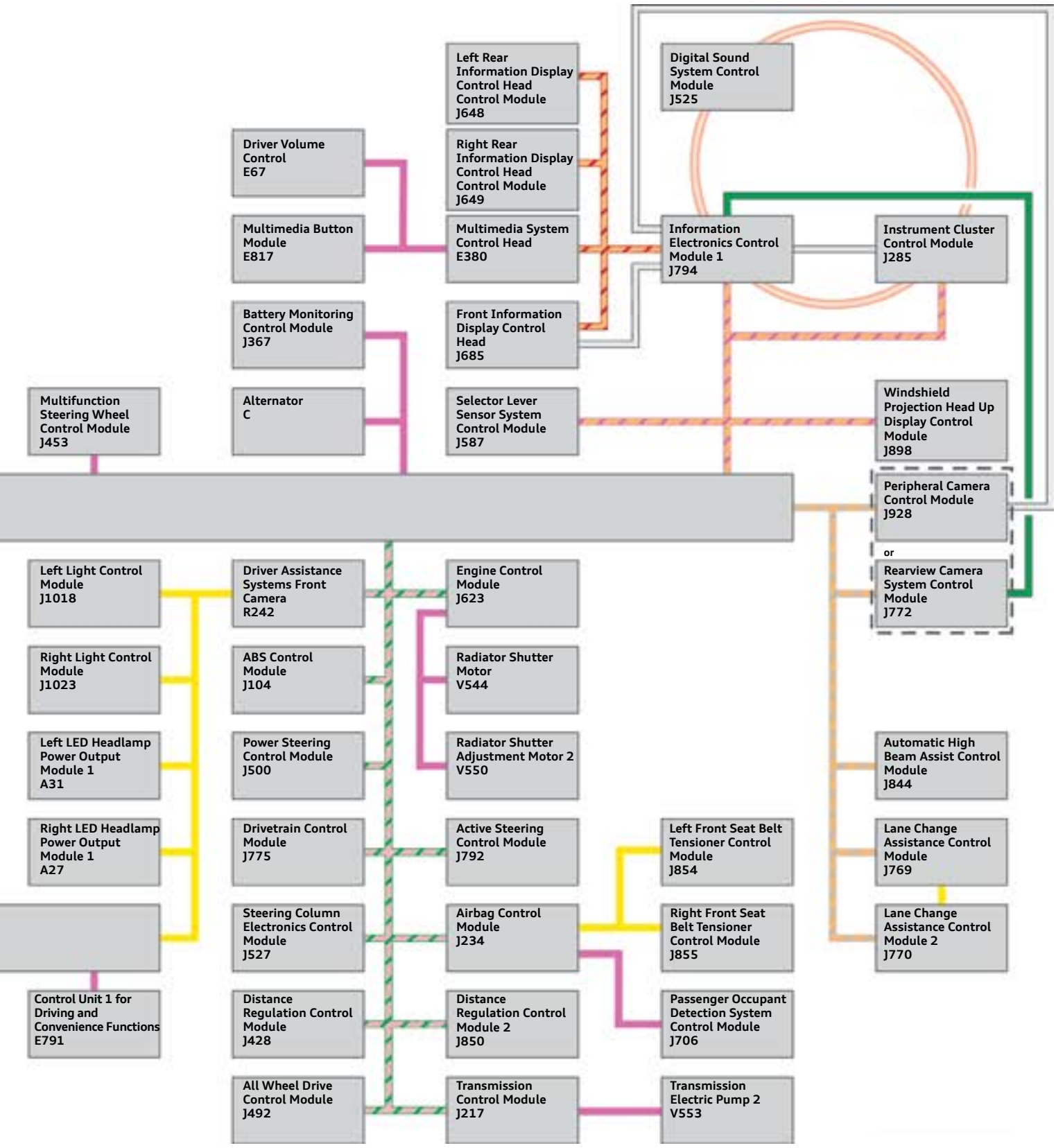
R242 Driver Assistance Systems Front Camera

Topology



Key:

- Convenience CAN
- Hybrid CAN
- Extended CAN
- Infotainment CAN
- Diagnostics CAN
- FlexRay
- Modular Infotainment Platform (MIB) CAN
- LIN bus



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Sub-bus systems
MOST bus
LVDS
FBAS
"OR" configuration
Ethernet port for diagnose interface VAS 6154

Bus systems used on the Audi A4

Bus system	Cable color	Configuration	Max. data transfer rate	Property
Hybrid CAN		Electrical two-wire bus system	500 kbit/s	not single wire capable
Convenience CAN		Electrical two-wire bus system	500 kbit/s	not single wire capable
Extended CAN		Electrical two-wire bus system	500 kbit/s	not single wire capable
Infotainment CAN		Electrical two-wire bus system	500 kbit/s	not single wire capable
Modular Infotainment Platform (MIB) CAN		Electrical two-wire bus system	500 kbit/s	not single wire capable
Diagnostics CAN		Electrical two-wire bus system	500 kbit/s	not single wire capable
FlexRay		Electrical two-wire bus system	10 Mbit/s	not single wire capable
MOST bus		Fiber-optic bus system	150 Mbit/s	Ring structure: an open circuit will result in total system failure
LIN bus		Electrical single-wire bus system	20 kbit/s	single wire capable
Sub-bus system		Electrical two-wire bus system	500 kbit/s	not single wire capable
LVDS		Electrical two-wire bus system	approx. 200 Mbit/s	not single wire capable
FBAS		Electrical single-wire bus system	approx. 80 Mbit/s	single wire capable

The network diagram on page 10 provides a schematic overview of the communication paths between the control modules in the Audi A4. The bus systems used in the Audi A4 are identical to those of the Audi Q7.

If we compare the 2017 Audi A4 with the predecessor model), new features in the area of data transmission are the FlexRay, MOST150 and LVDS buses.

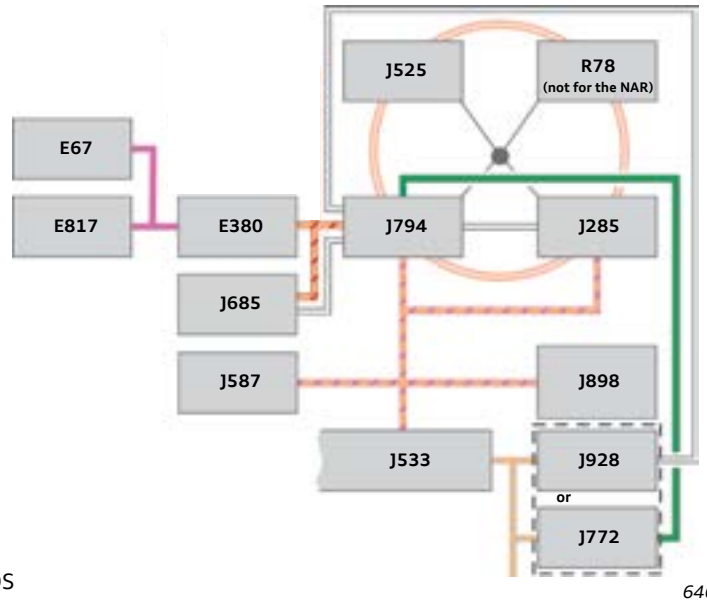
In spite of the many similarities with the 2017 Audi Q7, there are a few differences that are not exclusively equipment-specific. For this reason, the topologies in the areas of infotainment and FlexRay are described below.

Infotainment topology

In the Audi A4 three control modules are integrated in the MOST ring in the following order:

- Information Electronics Control Module 1 J794.
- Instrument Cluster Control Module J285.
- Digital Sound System Control Module J525.

When compared to the 2017 Q7, the difference is that the DVD Changer is not on the MOST ring in the 2017 A4. Driver Volume Control E67 is configured as the LIN slave of Multimedia System Control Head E380.



646_051

Key:

- Infotainment CAN
- Modular Infotainment Platform (MIB) CAN
- LIN bus
- MOST bus
- LVDS
- FBAS
- Ring break diagnostics line
- "OR" configuration

Reference

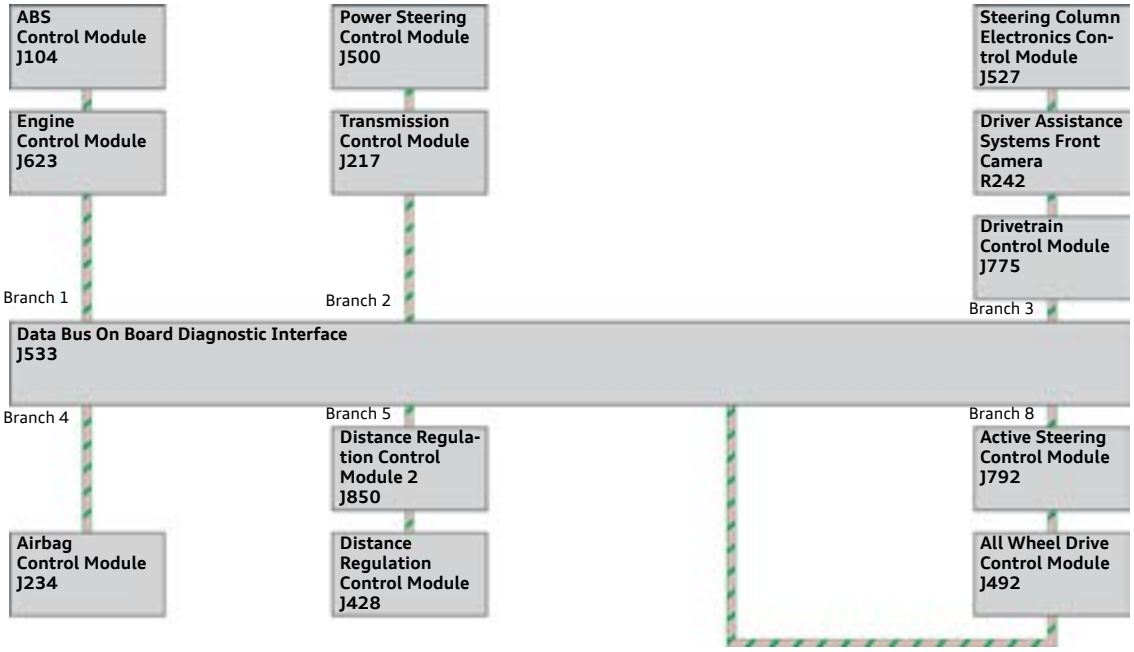
For further information and general descriptions of the MOST150 and FlexRay buses, refer to Self-Study Program 970163, The 2017 Audi Q7 On-board Power Supply and Networking System.

FlexRay topology

Data Bus On Board Diagnostic Interface J533 is the controller for the FlexRay bus. All FlexRay control modules are connected to J533 via various branches. In this configuration J533 is referred to as the "active hub" or "active node". If only one control module is connected to a branch, this is referred to as a "point to point" connection.

A configuration in which more than one control module is connected to a branch is known as a "daisy chain connection".

In the Audi A4, six branches are used: branches 1 – 5 and branch 8. The pins of branches 6 and 7 are reserved in the current version of J533, but are still not assigned.

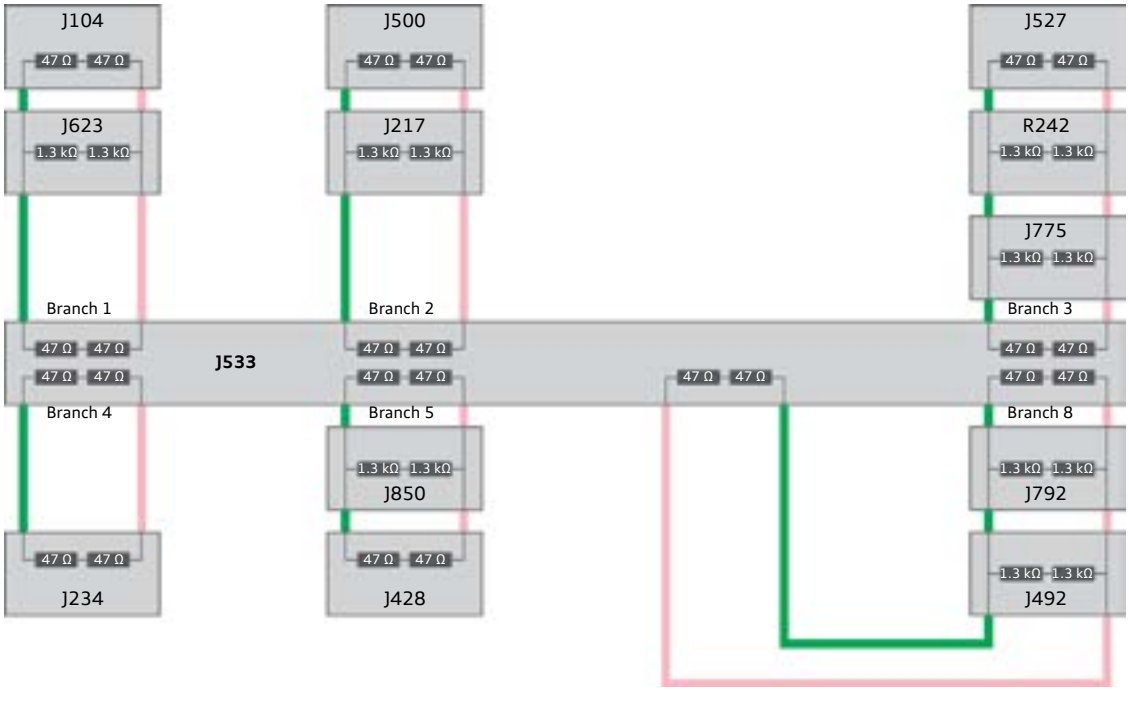


646_052

In configuring of the control modules, a distinction is made between the bus positive cable (pink) and the bus negative cable (green).

Two resistors each having a resistance of 47 Ω (94 Ω in total) are always connected at the beginning and end of a branch. Each of the center control modules has two resistors with a resistance of 1.3 Ω, i.e. 2.6 Ω in total.

A control module from the vehicle's standard specification is always connected at the end of a branch. This ensures that there is a resistance of 94 Ω at the end of each branch. Two optional control modules, which are integrated in other models as center control modules, are connected to branch 8 in the Audi A4. The FlexRay line is routed back to J533. The resistance here is 94 Ω - the value required for the termination of branch 8.



646_053

Control units

Brief descriptions

Vehicle Electrical System Control Module J519

646_012

Connector C (54-pin)
to cockpit wiring harness

Connectors A and B (each 73-pin)
to vehicle / engine compartment

Designation	Vehicle Electrical System Control Module J519 / also referred to as BCM1 (Body Control Module 1)
Equipment	Always installed
Installation location	On left 'A' pillar above the hood release lever
Tasks	Exterior lighting master
	Interior lighting master
	Diagnostic gateway for the light control modules
	A/C functions ▸ Activation of seat heater and front seat ventilation ▸ Activation of A/C Compressor Regulating Valve N280

	Integration functions
	▸ Parking
	  ▸ Parking aid
	▸ Ambient lighting
	  ▸ Activation and supply of LIN interior light modules
	▸ Headlight range adjustment
	  ▸ Calculation of headlight range adjustment
	  ▸ Activation of headlight range adjustment via the left and right control modules for light control J1018 and J1023.
	  ▸ Reading input of the signals from the inclination sensor via the CAN line

	Other functions
	▸ Reading input from (senders/sensors/switches)
	  ▸ Ambient temperature
	  ▸ Engine coolant, windshield washer fluid, brake fluid
	  ▸ Brake pad wear
	  ▸ Hood contact
	  ▸ Seater heater temperature
	▸ Activation (actuators/control elements)
	  ▸ Relay for sockets
	  ▸ Signal horn
	  ▸ Headlight washer system
	  ▸ Windshield washer pump (dual pump)
	  ▸ Heating the windshield washer jets
	  ▸ Seat heater, front

Address Word	09

Data bus communication	▸ Convenience CAN participant
	▸ J519 is the LIN master for
	  ▸ LIN 1: Light Switch E1, Wiper Motor Control Module J400, Rain/Light Recognition Sensor G397, and Humidity Sensor G355
	  ▸ LIN 2: Garage Door Opener Control Head E284, Garage Door Opener Control Module J530, Automatic Dimming Interior Rearview Mirror Y7, Roof Electronics Control Module J528
	  ▸ LIN 3: Left Front Seat Backrest Fan 1 V512, Left Front Seat Cushion Fan 1 V514, Right Front Seat Backrest Fan 1 V516, Right Front Seat Cushion Fan 1 V518
	  ▸ LIN 4: Control Unit 1 for Driving And Convenience Functions E791
	  ▸ LIN 5: Interior light module
	  ▸ LIN 6: Interior light module
	▸ Communicates via a sub-bus system with Left and Right Light Control Modules J1018 and J1023, and Left and Right LED Headlamp Power Output Modules A31 and A27 and left and right LED headlight power modules 1 A31 and A27

Special feature	Fault finding notes: J519 has duplicated pins at the LIN slave connection. For example, LIN 1 is distributed to 3 pins (A22, A23,C50), which, however, are connected internally within the control module. This means that the control modules connected to pin A23 and C50 are also affected in the event of a short circuit to positive or negative at pin A22 and vice versa.

Gateway

Designation	Data Bus On Board Diagnostic Interface J533
Equipment	Always installed
Installation location	Under the rear seat, on the floor pan
Tasks	▸ Network system Gateway ▸ Controller for FlexRay bus ▸ Diagnostic master ▸ Energy management control ▸ Interface for various connect services
Address Word	19
Data bus communication	▸ Hybrid CAN, Convenience CAN, Infotainment CAN, CAN-Extended and FlexRay user ▸ LIN master of Battery Monitoring Control Module J367 and alternator C ▸ LIN master for Multifunction Steering Wheel Control Module J453
Special features	▸ Not a user of the Modular Infotainment Platform (MIB) CAN ▸ Not a user of the MOST bus ▸ Additional variant as "Connected Gateway"

646_011

Data Bus On Board Diagnostic Interface J533

Comfort System Central Control Module

Designation	Comfort System Central Control Module J393 / also referred to as BCM2 (Body Control Module 2)
Equipment	Always installed
Installation location	In luggage compartment on left hand side, behind luggage compartment side trim, under fuse and relay panel
Tasks	Central locking system master
	Integration functions ▸ Terminal management system ▸ Entry and start authorization ▸ Immobilizer (master) ▸ Anti-theft alarm system

	Other functions
	▸ Reading input (senders/sensors/switches)
	  ▸ Brake light switch
	  ▸ Ignition starter button
	  ▸ P signal
	  ▸ Soft touch button on rear hatch
	  ▸ Rear hatch contacts (pre-lock and full lock)
	  ▸ Capacitive sensors of door handles
	  ▸ Entry and start authorization aerials
	  ▸ Fuel tank sender
	  ▸ Inclination sensors for headlight range adjustment
	▸ Activation (actuators/control elements)
	  ▸ Rear hatch lock motor
	  ▸ Luggage compartment release
	  ▸ Fuel tank flap lock
	  ▸ Terminal 15 relay
	  ▸ Heated rear window relay
	  ▸ Luggage compartment lights
	  ▸ Rear lighting

Address Word	46

Data bus communication	▸ Convenience CAN participant
	▸ J393 is the LIN master for:
	  ▸ LIN 1: Anti-Theft Alarm System Sensor G578
	  ▸ LIN 2: Alarm Horn H12
	  ▸ LIN 3:

Special features	▸ J393 is the immobilizer system master in the Audi A4 ▸ Central locking antenna is integrated in control module

Comfort System Central Control Module J393

Door control modules

Designation	Driver Door Control Module J386
Equipment	Always installed
Installation location	In driver's door
Tasks	Controlling the electrical and electronic components in and on the driver's door ▸ Reading input (senders/sensors/switches) ▹ Switches/buttons, for example, power windows, rear hatch release, child lock button, door mirror, central locking, seat memory etc. ▸ Activation (actuators/control elements) ▹ Lights and components in and on the door trim, locking motor, turn signals in door mirror
Address Word	42
Data bus communication	▸ Convenience CAN participant ▸ LIN master for Driver Side Rear Door Control Module J926
Special feature	J926 has its own Address Word "BB" although it is a LIN slave of J386.

646_014

Designation	Front Passenger Door Control Module J387
Equipment	Always installed
Installation location	In front passenger's door
Tasks	Controlling the electrical and electronic components in and on the front passenger's door ▸ Reading input (senders/sensors/switches) ▹ Switches/buttons, for example, power windows, rear hatch release, child lock button, electrical door mirror, central locking, seat memory etc. ▸ Activation (actuators/control elements) ▹ Lights and components in and on the door trim, locking motor, turn signals in door mirror
Address Word	52
Data bus communication	▸ Convenience CAN participant ▸ LIN master for Passenger Side Rear Door Control Module J927
Special feature	J927 has its own Address Word "BC" although it is a LIN slave of J386.

Seat adjustment

Designation	Memory Seat/Steering Column Adjustment Control Module J136
Equipment	Optional equipment (PR no.: PV3)
Installation location	Below the driver's seat
Tasks	Activation (actuators/control elements) ▸ Seat adjustment (memory function)
Address Word	36
Data bus communication	Convenience CAN participant

646_015

Steering column lock control

Designation	Electronic Steering Column Lock Control Module J764
Equipment	▸ Always installed
Installation location	On steering column
Task	Locking and unlocking the steering column
Address Word	2B
Data bus communication	Convenience CAN participant
Special features	▸ Immobilizer user ▸ Can be replaced separately from the steering column

Electronic Steering Column Lock Control Module J764

646_017

Power sunroof control

Designation	Power Sunroof Control Module J245
Equipment	Always installed
Installation location	On sliding sunroof frame at front
Tasks	Controlling the functions of the glass sunroof ▸ Reading input (senders/sensors/switches) ▸ Controller for sliding sunroof adjustment ▸ Activation (actuators/control elements) ▸ Motors for Sunroof Motor V1
Address Word	CA
Data bus communication	Convenience CAN participant

Power Sunroof Control Module J245

646_018

Instrument cluster

Designation	Instrument Cluster Control Module J285
Equipment	▸ Always installed ▸ Optional Audi virtual cockpit (PR no.: 9S8)
Installation location	In instrument panel
Task	Display of information relevant to the driver
Address Word	17
Data bus communication	▸ Infotainment CAN participant ▸ MOST participant ▸ Connected by LVDS bus to Information Electronics Control Module 1 J794 (image transfer for navigation display in instrument cluster).
Special feature	The instrument cluster in the Audi A4 is not integrated with the immobilizer.

646_020

Instrument Cluster Control Module
J285

646_086

Instrument Cluster Control Module
J285
(Audi vitual cockpit)

ACC adaptive cruise control

Designation	Distance Regulation Control Module J428
Equipment	Optional equipment: ▸ ACC with Stop&Go including traffic jam assist (PR no.: 8T8) ▸ ACC distance indicator (PR no.: 8T3)
Installation location	On lock carrier, front right, behind front bumper cover
Tasks	▸ Radar scanning of traffic (distance and speed) ▸ Controlling speed and distance ▸ Distance display and distance warnings (only if ACC is deactivated)
Address Word	13
Data bus communication	FlexRay participant
Special features	▸ ACC Stop&Go with integrated traffic jam assistant ▸ Distance display and distance warning – display of distance in instrument cluster in seconds ▸ Function master for Distance Regulation Control Module 2 J850

646_021

Distance Regulation Control Module J428

Distance Regulation Control Module 2 J850

Designation	Distance Regulation Control Module 2 J850
Equipment	Optional equipment
Installation location	On lock carrier, front left, behind front bumper cover
Task	Radar scanning of traffic (distance and speed)
Address Word	8B
Data bus communication	FlexRay participant
Special feature	J850 is a slave of J428 and, based on its function, could also be referred to as a sensor.

Front camera

Designation	Driver Assistance Systems Front Camera R242
Equipment	Optional equipment
Installation location	On windshield above base of interior rear view mirror
Tasks	Imaging of traffic, traffic signs and lane markers for ▸ Audi active lane assist (lane departure warning system) ▸ High beam assist ▸ Road sign recognition ▸ ACC Stop&Go ▸ Audi pre sense ▸ Collision avoidance assist
Address Word	A5
Data bus communication	▸ FlexRay participant ▸ R242 is connected to the light control modules via a sub-bus system.
Special features	▸ Forms a functional unit in combination with image processing control module

Driver Assistance Systems Front Camera R242

646_023

Automatic transmission

Designation	Transmission Control Module J217
Equipment	Installed in combination with: ▸ 7-speed dual clutch gearbox 0CK/0CL – S tronic (PR no.: G1C/G1D)
Installation location	Component part of DSG Transmission Mechatronic J743
Task	Controlling and monitoring the engagement and disengagement operations of the automatic transmission
Address Word	02
Data bus communication	▸ FlexRay participant ▸ LIN master for Transmission Electric Pump 2 V553
Special feature	Immobilizer user

Transmission Control Module
J217
(7-speed dual clutch gearbox 0CK/0CL)

646_047

Reference

For further information about the automatic transmission, refer to Self-Study Program 990263, The 2017 Audi A4 Introduction.

Selector mechanism

Designation	Selector Lever Sensor System Control Module J587
Equipment	Installed in combination with: ▸ 7-speed S tronic transmission 0CK/0CL – S tronic (PR no.: G1C/G1D) ▸ 8-speed automaic gearbox 0D5 – tiptronic (PR no.: G1G)
Installation location	Within the selector mechanism at center console
Tasks	Operating the transmission. For example, transmitting drive positions, controlling the mechanical selector lever locks, transmitting selector lever tiptronic commands and resetting the selector lever in the automatic gate.
Address Word	81
Data bus communication	Infotainment CAN bus participant
Special features	▸ J587 can only be replaced together with the selector mechanism. ▸ The selector mechanism is not mechanically connected to the transmission.

646_025

Reference
For further information about the selector mechanism, refer to eSelf-Study Program 990263, The 2017 Audi A4 Introduction

Steering column electronics

Designation	Steering Column Electronics Control Module J527
Equipment	Always installed
Installation location	On steering column
Task	Connects the steering column stalk and the electrical components in the steering wheel to the vehicle's electrical system
Address Word	16
Data bus communication	FlexRay participant
Special feature	In conjunction with the multifunction steering wheel, it transfers the LIN signals from J533 (master) to Multifunction Steering Wheel Control Module J453 (slave).

Steering Column Electronics Control Module J527

646_027

Airbag

Designation	Airbag Control Module J234
Equipment	Always installed
Installation location	Under front center console storage bin
Tasks	▸ Deployment of airbags, seat belt pretensioners and battery interrupt igniter ▸ Audi pre sense
Address Word	15
Data bus communication	▸ FlexRay participant ▸ Is connected to Left and Right Front Seat Belt Tensioner Control Modules J854 and J855 via a sub-bus system. ▸ LIN master for Passenger Occupant Detection System Control Module J706
Special feature	Inertial sensors for ESC (ABS Control Module J104).

Airbag Control Module J234

646_028

Engine control

Designation	Engine Control Module J623
Equipment	Always installed
Installation location	In left hand side of engine compartment in front of air plenum chamber
Tasks	▸ Controlling the engine characteristic ▸ Activation of Start Relays J906 and J907 ▸ Function master for start-stop system
Address Word	01
Data bus communication	▸ FlexRay participant ▸ LIN master for Radiator Shutter Motors V544 and V550.
Special features	▸ Immobilizer user ▸ Control module with new plug-in connections. Has a total of 315 pins. New test adapter VAS 6606/23 for Test Box VAS 6606

646_030

Start-stop system

The Audi A4 is equipped with start-stop system Version 2.0, which was first used in the 2017 Audi Q7.

For a history of the start-stop system and a detailed description of Version 2.0, refer to 970163 The 2017 Audi Q7 Onboard Power Supply and Networking System.

Control Unit 1 For Driving And Convenience Functions E791

646_080a

Front climate control panel

Designation	Front A/C Display Control Head E87
Equipment	Always installed ▸ Automatic air conditioning (PR no.: 9AQ)
Installation location	In center of instrument panel
Tasks	Controlling: ▸ Temperature ▸ Fan speed ▸ Air flow distribution
Address Word	08

Data bus communication	▸ Hybrid CAN participant
	▸ E87 is the LIN master for
	  ▸ LIN 1: Control motors for flap activation 1 – 15
	  ▸ LIN 2: Rear A/C Display Control Head E265, Fresh Air Blower Control Module J126, Humidity Sensor In Fresh Air Intake Duct G657, Air Quality Sensor G238, High Pressure Sensor G65

Special feature	Although the seat seating and seat ventilation switches are integrated in and monitored by Front A/C Display Control Head E87, the Vehicle Electrical System Control Module J519 is responsible for their activation.

Front A/C Display Control Head E87

[1] Optional equipment

646_029

Head-up display

Designation	Windshield Projection Head Up Display Control Module J898
Equipment	Optional equipment (PR no.: KS1) for Prestige models
Installation location	In instrument panel directly behind the instrument cluster
Task	Controlling all optical, mechanical and electrical components of the head-up display
Address Word	82
Data bus communication	Infotainment CAN bus participant
Special features	▸ The control module can only be replaced complete with the other components of the head-up display. ▸ To replace the head-up display, the windshield must be removed. ▸ The head-up display requires a special windshield (with wedge-shaped foil).

646_032

Windshield Projection Head Up Display Control Module J898

Rear-view camera

Designation	Rearview Camera System Control Module J772
Equipment	Standard equipment on all models (PR no.: KA2)
Installation location	In handle (soft touch) on rear hatch
Task	Processing and transfer of images from the area behind the vehicle to the Information Electronics Control Module 1 J794
Address Word	6C
Data bus communication	Extended CAN participant
Special feature	Control module, camera and wiring harness form a unit (as shown)

Rearview Camera System Control Module J772
(with built-in camera)

646_033

Surround cameras

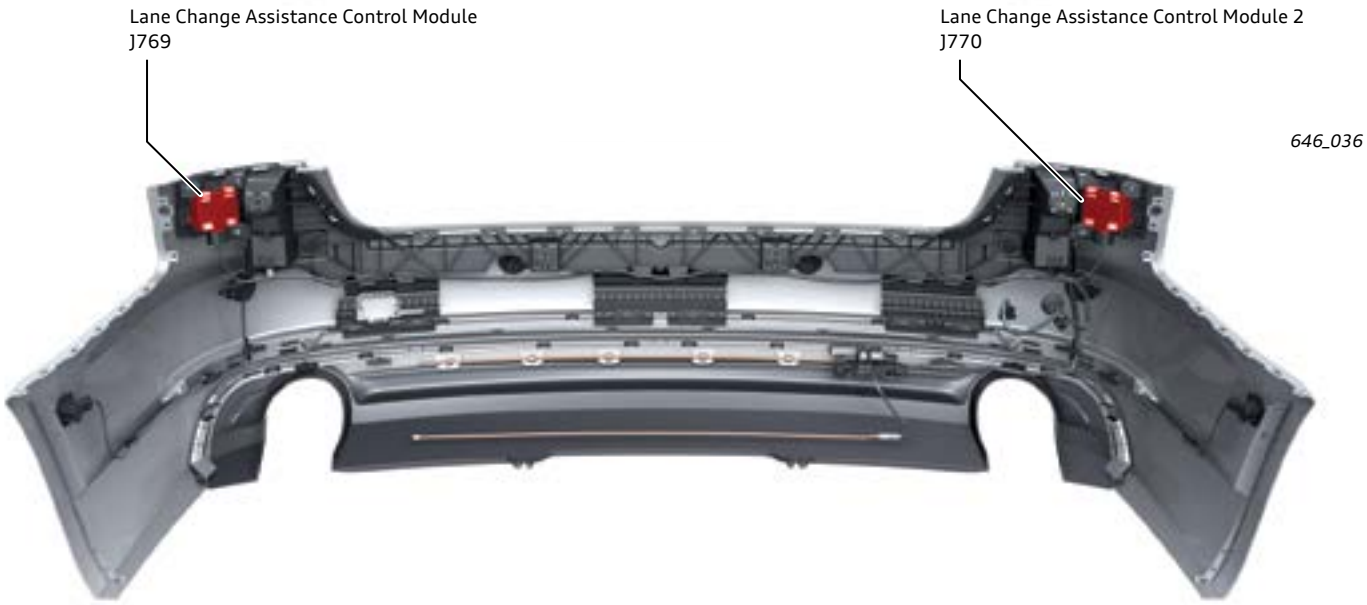
Designation	Peripheral Camera Control Module J928
Equipment	Standard equipment on Prestige model,
Installation location	In luggage compartment, L/H side, behind luggage compartment side trim
Task	The control module reads the data from the four surround-view cameras and generates images mapping the area around the vehicle.
Address Word	6C
Data bus communication	▸ Extended CAN participant ▸ Image transfer to instrument cluster by LVDS

Peripheral Camera Control Module J928

646_034

Audi side assist

Designation	Lane Change Assistance Control Module J769 (master) Lane Change Assistance Control Module 2 J770 (slave)
Equipment	Optional equipment (PR no.: 7Y1) on Premium plus, standard on Prestige
Installation location	In rear bumper cover
Tasks	Radar monitoring system for the detection of vehicles in the area to the rear and side of the vehicle for: ▸ Audi pre sense rear including Audi side assist ▸ Rear cross traffic assist ▸ Exit warning
Address Words	▸ 3C – J769 (master) ▸ CF – J770 (slave)
Data bus communication	▸ Extended CAN participant ▸ Both control modules inter-connected by a sub-bus system.
Special feature	The control module is integrated in the bumper cover. The system has to be calibrated after removal and installation.



Electronic Stability Control (ESC)

Designation	ABS Control Module J104
Equipment	Always installed
Installation location	On left hand side of engine compartment
Tasks	Controlling: ▸ Anti lock braking system (ABS) ▸ Electronic Stability Control (ESC) ▸ Traction Control System (TCS) ▸ Electronic Differential Lock (EDL) ▸ Torque vectoring ▸ Multi-collision braking ▸ Electro-mechanical parking brake (EPB)
Address Word	03
Data bus communication	FlexRay participant
Special features	▸ The control module can be replaced separately from the valve block. ESD protective mat VAS 6613 must be used. ▸ The electro-mechanical parking brake softward is integrated in the ABS control module. Address word 53 is no longer used for electro-mechanical parking brake.

646_037

ABS Control Module J104

Information electronics

Designation	Information Electronics Control Module 1 J794
Equipment	Always installed
Installation location	In glove compartment
Task	Controlling the infotainment systems
Address Word	5F
Data bus communication	▸ Infotainment CAN bus user ▸ MOST participant ▸ J794 is connected to the Front Information Display Control Head J685 and the Multimedia System Control Head E380 via the Modular Infotainment System (MIB) CAN.
Special features	▸ J794 is the system manager and the ring break diagnostics master for the MOST bus. ▸ J794 is connected to the Instrument Cluster Control Module J285 and the Front Information Display Control Head J685 via LVDS bus (image transfer for navigation display in instrument cluster or MMI display).

Information Electronics Control Module 1
J794

646_038

Sound amplification

Designation	Digital Sound System Control Module J525
Equipment	Optional equipment (PR no.: 9VS)
Installation location	In left hand side of luggage compartment, behind luggage compartment side trim
Task	Activation of up to 19 speakers
Address Word	47
Data bus communication	MOST participant

646_040

Digital Sound System Control Module J525

Suspension control

Designation	Drivetrain Control Module J775
Equipment	Standard equipment with optional Audi adaptive suspension system
Installation location	Under center console storage bin
Tasks	Wheel damping control ▸ Reading input (senders/sensors/switches) ▸ Level control system sensors ▸ Activation (actuators/control elements) ▸ Damper adjustment valves
Address Word	74
Data bus communication	FlexRay participant
Special feature	J775 is responsible for driving dynamics control.

Drivetrain Control Module J775

646_042

Power steering

Designation	Power Steering Control Module J500
Equipment	Always installed
Installation location	Connected to the steering gear.
Tasks	Controlling: ▸ Power steering ▸ Servotronic speed-responsive power steering ▸ Corrective steering inputs in conjunction with Audi active lane assist, park assist, evasion assist and trailer assist ▸ Corrective steering inputs in conjunction with ESC
Address Word	44
Data bus communication	FlexRay participant
Special feature	The control module and power steering motor can only be replaced together with the steering gear.

Power Steering Control Module J500

646_043

Dynamic steering (not available at model introduction)

Designation	Active Steering Control Module J792
Equipment	Optional equipment (PR no.: 1N8)
Installation location	In driver's side footwell, under the floor covering

Tasks	▸ Calculating the super-imposition angle required to implement the variable steering ratio.
	▸ Correcting the calculated super-imposition angle of the stabilizing function through ESC intervention.
	▸ Reading input (senders/sensors/switches)
	  ▸ Index sensor
	  ▸ Motor position sensor
	▸ Activation (actuators/control elements)
	  ▸ Dynamic steering actuator
	  ▸ Dynamic steering lock

Address Word	1B
Data bus communication	FlexRay participant
Special features	Basic setting is necessary after: ▸ replacement by a new or different Active Steering Control Module J792 ▸ replacement by a new or different steering column ▸ replacement by a new or different Steering Angle Sensor G85 or recalibration ▸ Changing the wheel alignment values ▸ Disconnecting the actuator from the steering column or the actuator from the steering gear

646_044

Active Steering Control Module J792

Exterior lighting

Headlight variants

Two headlight variants are available for the 2017 Audi A4:

- Xenon headlight (ECE[1)] and SAE[2)]) standard equipment on Premium models
- LED headlight (ECE[1)] and SAE[2)]) standard equipment for Premium plus and Prestige models

The headlights are connected to the vehicle body by adjusting elements. This makes it possible to align them precisely with the other body components. Before the headlights can be removed, the bumper cover must be removed and the headlight washer nozzle unclipped from the headlight.

In the event of damage to the upper and inner headlight attachments, repair tabs can be attached to the headlight housing. The parts marked "Service" in the exploded-view illustrations of the headlights on the following pages can be replaced individually in the event of damage.

For information as well as the corresponding spare part numbers, please refer to the repair literature and ETKA.

Xenon headlight

The illustration shows the left headlight in the ECE[1)] version. The SAE version is similar.

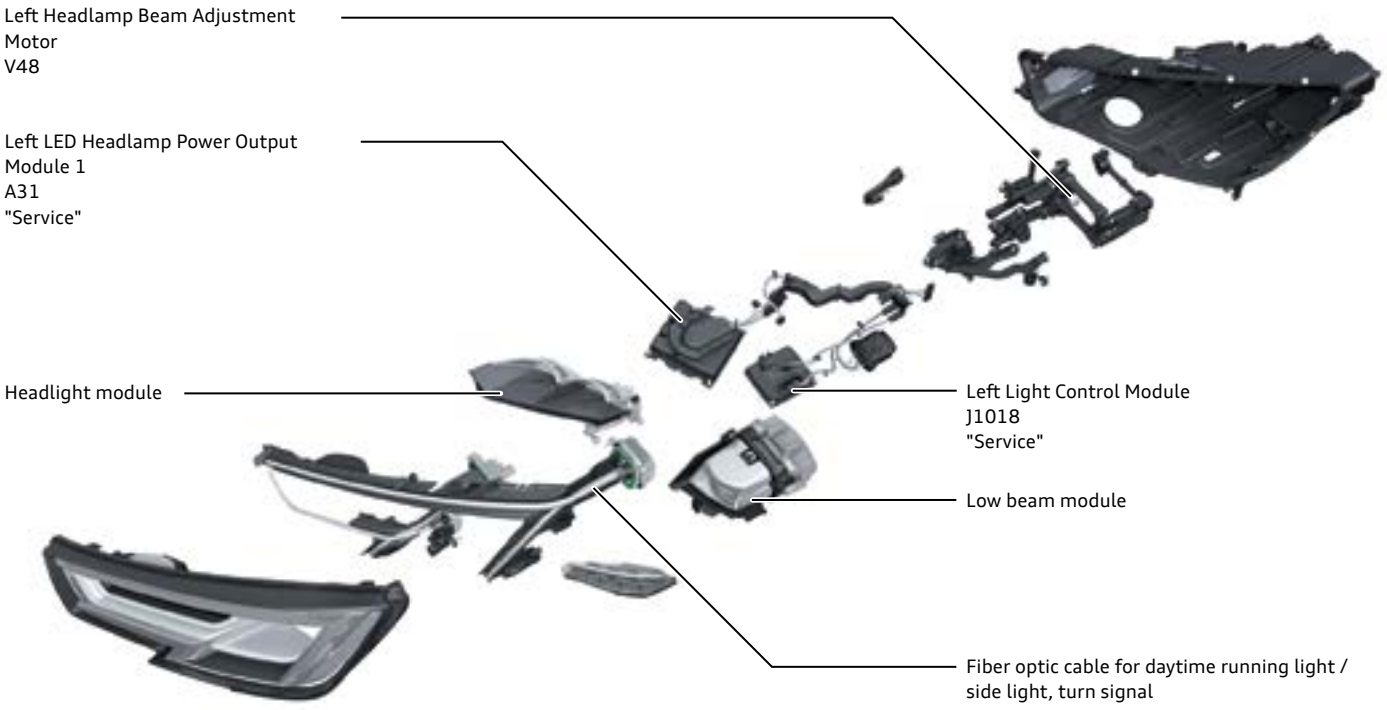
646_054

[1)] ECE = for European market

[2)] SAE = for North American Region

Note
Left Front Fog Lamp Bulb L22 (for the all-weather light function) can be accessed via a cover on the back of the headlight housing and can be replaced after the headlight has been installed.

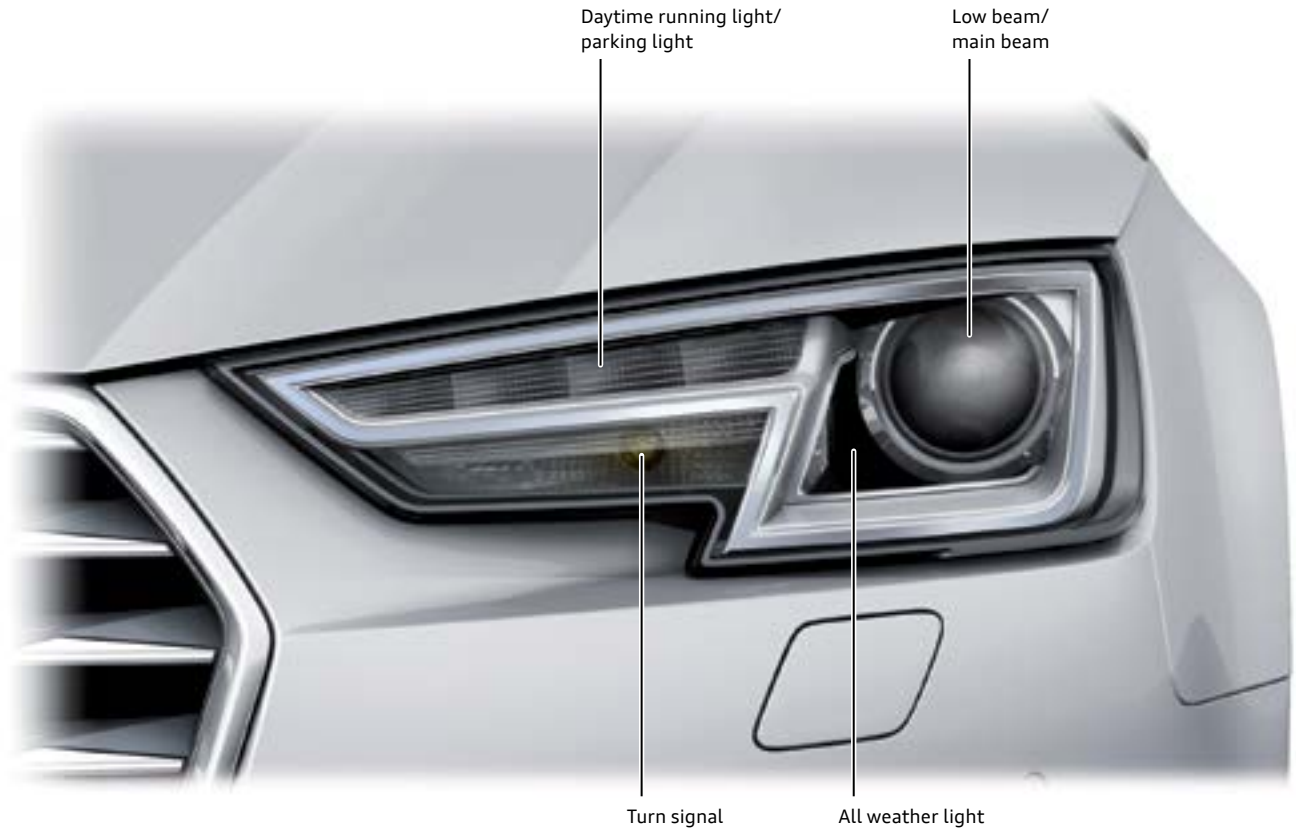
LED headlights



646_055

Xenon headlight

The illustration shows the left hand headlight in the ECE[1] version. The SAE version is similar.



646_057

Light functions	Type of bulb used	Power
Daytime running light	4 LEDs	5 watts
Side light	Parking light is dimmed if light function is active	
Low beam	Gas discharge lamp D5S	25 watts
High beam	Changes over from low beam using shutter	
All weather light	Bulb H8	35 watts
Turn signal	Bulb PSY24W	24 watts
Sidemarker (SAE only[2])	1 LED	0.5 watts

Special features of the light functions

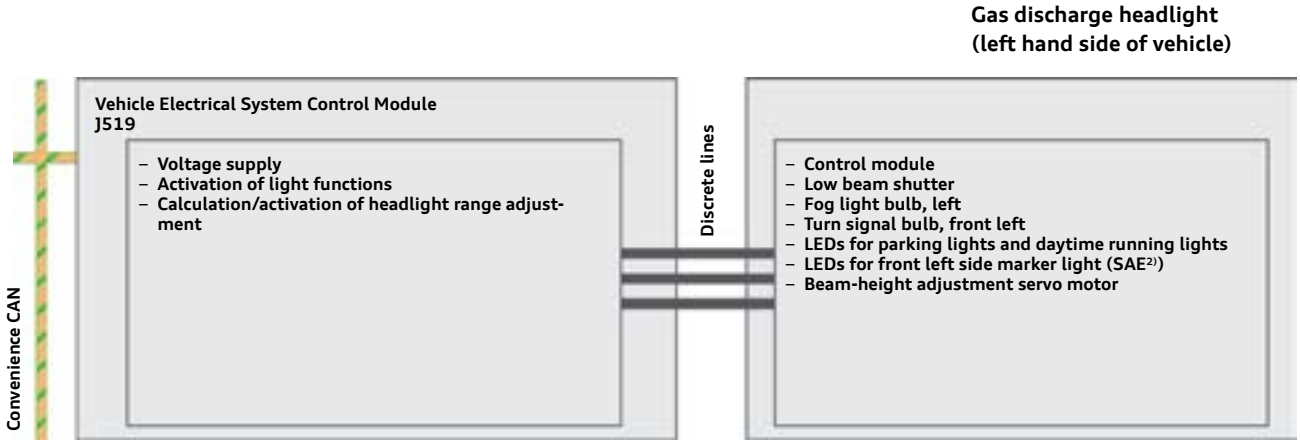
The daytime running lights are switched off for the duration of a turning cycle. The all-weather light is switched off during the turning signal cycle as soon as the vehicle exceeds a speed of 25 mph (40 km/h). The all-weather light in both versions is deactivated during the turn signaling cycle as soon as the vehicle exceeds a speed of 40 kph.

Left and Right Low Beam Headlamp Reflector Motors V294 and V295 are used for switching between low and high beams. The LEDs for the side light function and the low beams of the gas discharge lamps are used for the Coming Home/Leaving Home function.

[1] ECE = for European market

[2] SAE = for North American Region

Schematic diagram of the activation mechanism



646_058

Activation

Vehicle Electrical System Control Module J519 is responsible for power supply as well as for activating all bulbs in the headlight. J519 also activates the low beam shutter and the headlight range adjustment control motors.

Headlight range adjustment

The gas discharge headlight has automatic static headlight range adjustment. This means that changes in headlight range are compensated for when the vehicle is loaded differently. However, changes caused by rolling movements of the vehicle under acceleration and braking are not compensated.

J519 receives information about ride height from either Comfort System Central Control Module J393 or, if installed, Drivetrain Control Module J775.

Service

The basic setting of the headlight range adjustment function is configured by J519. The foglamp bulb can be replaced with the headlights installed. This bulb can be accessed via a cover on the back of the headlight housing. The headlight must be removed in order to replace the gas discharge lamp or the turn signal lamp.

Optional equipment

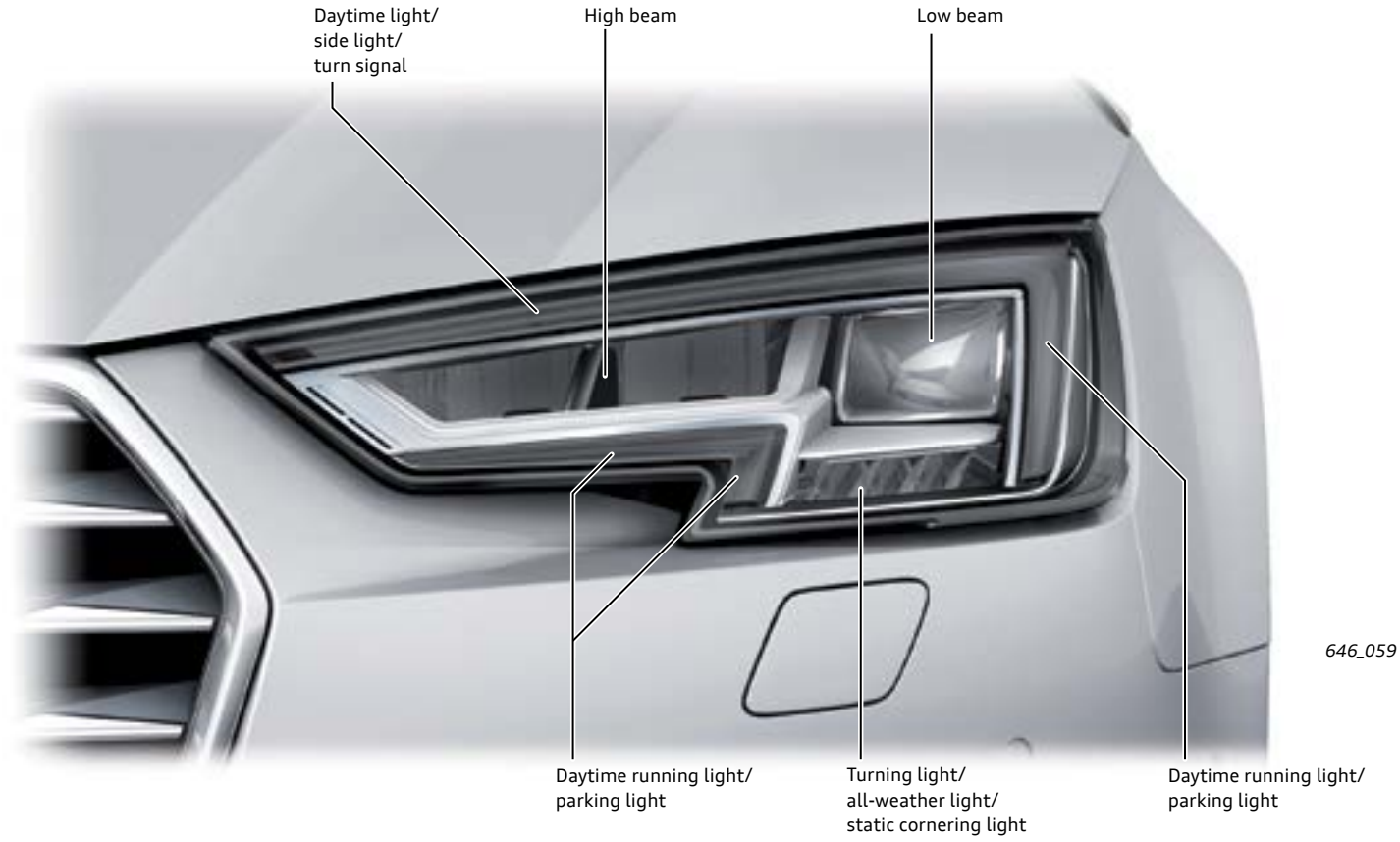
The xenon headlight can be combined with main beam assist (PR no.: 8G1).

[1)] ECE = for European market

[2)] SAE = for North American Region

LED headlight

The figure shows the left hand headlight in the ECE[1] version.



Light functions	Type of bulb used	Power
Daytime running light	7 LEDs with plastic optical fibers	18 watts
Side light	Parking light is dimmed if light function is active	
Low beam	11 LEDs	20 watts
High beam	6 LEDs	20 watts
All weather light	3 LEDs	10 watts
Turning light	0 - 25 mph (0 - 40 km/h), turn signal responsive	
Static cornering light	0 - 43 mph (0 - 70 km/h), steering angle responsive	
Turn signal	8 LEDs	18 watts
Sidemarker (SAE only[2])	1 LED	0.5 watts

Special features of the light functions

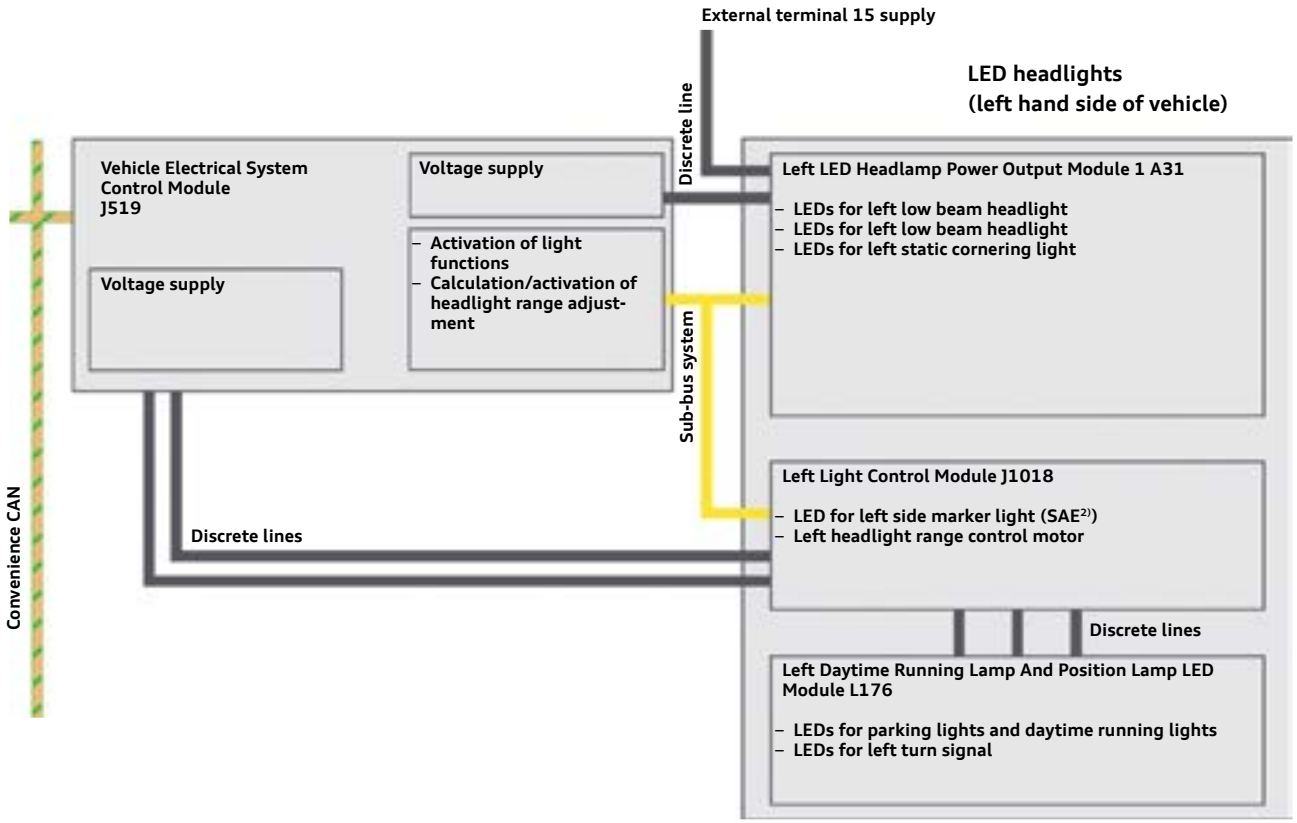
The "upper" daytime running light is dimmed for the duration of the turn signaling cycle. The "lower" daytime running light is dimmed to side light level. The all-weather light is not affected by turn signal operation.

The LEDs for the side light function and the low beam function are used for the Coming Home / Leaving Home function.

[1] ECE = for European market

[2] SAE = for North American Region

Schematic diagram of the activation mechanism



646_060

Activation

Vehicle Electrical System Control Module J519 supplies voltage to Left and Right Led Headlamp Power Output Modules 1 A31/A27 and to Left and Right Light Control Module Control Modules J1018 and J1023. J519 communicates with these modules over a sub bus system.

A31 and A27 are responsible for activating the LEDs for low beams, high beams and the static cornering light (turning light). These modules have diagnostic capability and can be accessed through Address Words D6 and D7.

J1018 and J1023 are responsible for the parking lights/ DRLs, turn signals, side marker lights and the headlight range adjustment servo-motors. They have diagnostic capability and can be accessed through Address Words 29 and 39.

Headlight range adjustment

The LED headlight has automatic dynamic headlight range adjustment. Changes in the range of the headlight beam due to loading of the vehicle as well as braking and accelerating are compensated.

J519 receives information on ride height from either Comfort System Central Control Module J393 or Drivetrain Control Module J775 if installed.

Service

The basic setting of the headlight range adjustment function is configured in Vehicle Electrical System Control Module J519. LED headlight bulbs cannot be replaced. Only the outer units can be replaced individually after removing the headlights.

Optional equipment

The LED headlight can be combined with main beam assist (PR no.: 8G1).

[1)] ECE = for European market

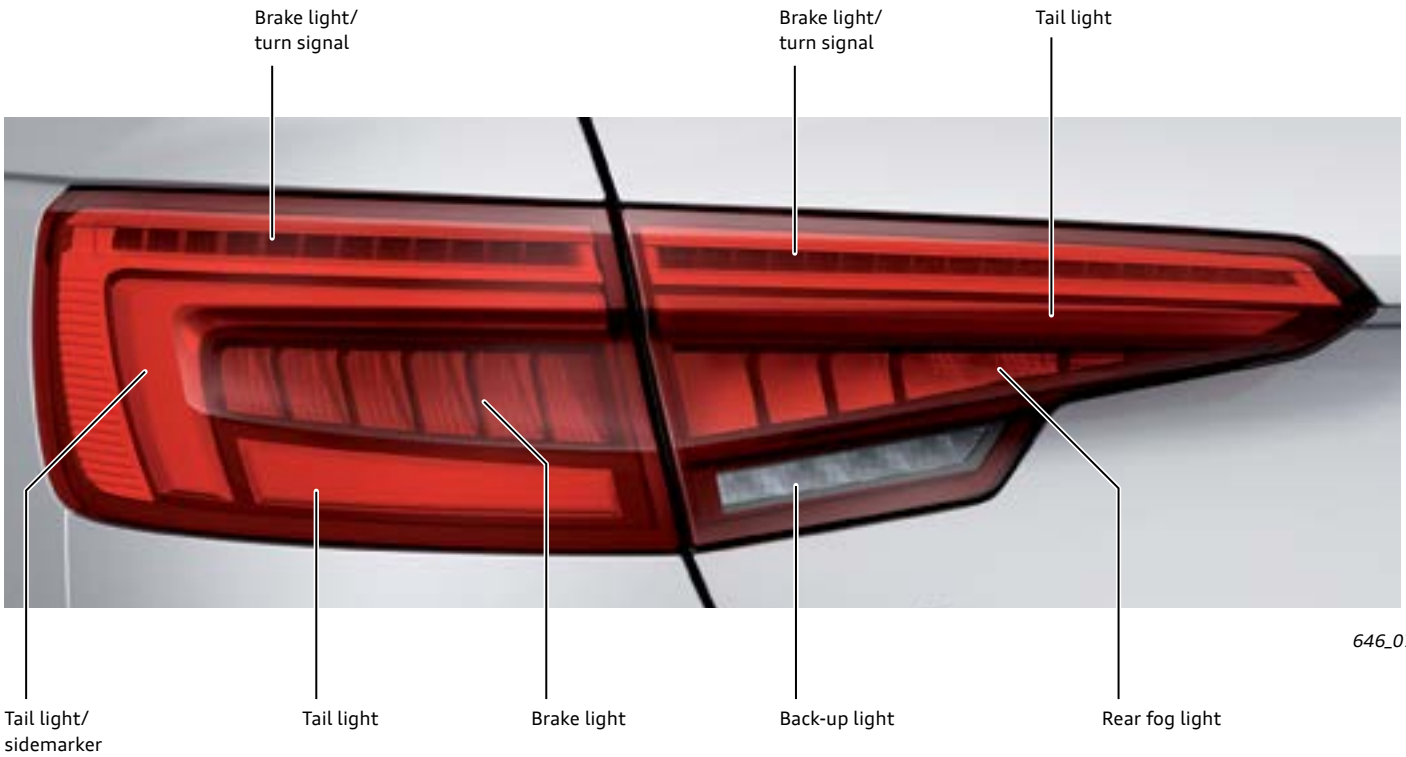
[2)] SAE = for North American Region

Tail lights

The A4 tail lights are mounted in both the fender and the rear trunk lid. They are activated by Comfort System Central Control Module J393.

LED tail light (PR no.: 8SP)

The figure shows the left hand tail light for the A4 sedan model in the SAE[2)] version.



Light functions	Sedan[2)]	
	Bulb/lamp	Power
Brake light/turn signal (dynamic)[3)]	12 LEDs	10 watts
Tail light[3)]	33 LEDs	10 watts
Brake light[3)]	6 LEDs	6 watts
Turn signal (dynamic)[4)]	18 LEDs	8 watts
Back-up light[4)]	4 LEDs	6 watts
Tail light[4)]	15 LEDs	4 watts
Rear fog light[4), 5)]	2 LEDs	4 watts

Special features of the light functions

The tail lights are also activated if the vehicle is equipped with a Coming Home / Leaving Home function. Light functions are not deactivated when the rear trunk lid is open. If the tail light is activated and the brake light is simultaneously active, the LEDs for the brake light/turn signal in the rear trunk lid are deactivated. If the tail light is activated and the turn signal is simultaneously active, the LEDs for the brake light/turn signal in the rear trunk lid are also active. Amber-colored LEDs are used for the turn signal.

With the dynamic turn signal function, the LEDs for the turn signal/brake light are briefly activated in a dimmed manner when the turn signals are activated. After that, the LEDs for the turn signal function are dynamically activated in an alternating sequence to produce the dynamic effect.

Service

No bulbs/lamps can be replaced in the LED tail lights. In the event of a fault, the complete assembly must be replaced.

[2)] SAE = for North American Region
[3)] Lights in the body side panels
[4)] Lights in the rear lid
[5)] One side only

High-mounted brake light / license plate lights

Activation

Both the high-mounted brake light and license plate lights are activated by Comfort System Central Control Module J393.

They remain active even when the rear trunk lid is open.

High-mounted brake light

The high-mounted brake light is installed inside the vehicle behind the rear window. It has 18 LEDs with a power output of 4 watts.

In the event of failure, the entire assembly must be replaced.

646_075

License plate lights

The license plate lights on the Audi A4 use LED technology. Each of the license plate lights is clipped into the luggage compartment lid and has two LEDs.

646_077

Interior lighting

Two levels of interior lighting are used on the 2017 Audi A4.

- QQ1 lighting package - standard equipment on Premium and Premium plus models.
- QQ2 background lighting - standard equipment on Prestige models

QQ1
Vanity lights, footwell lights, cupholder light, center console background lighting, entry light, door panel lighting in the door trims and door inner handle lighting.

White light and LED technology are exclusively used as light sources.

QQ2
Contour lighting in the door trim, door pocket lighting. The LEDs are colored. 30 light colors are available. The door pocket lighting in the Audi A4 (type 8W) is non-capacitive. An exception is the LED in the door inner handle which lights up in white only.

The list of interior lighting features with the various production numbers always includes the equipment with lower production numbers.

The background lighting QQ2 is controlled by a background lighting module. The background lighting module is a software function and is integrated in Vehicle Electrical System Control Module J519.

J519 is the RGB master. RGB denotes the colors red, green and blue. The color profiles are produced by additive mixing of these colors. In the case of additive color mixing, the human eye is able to discern multiple wavelengths simultaneously and in quick succession, but the different colors cannot be resolved and appear as a single color to the eye.

Apron lighting

The apron lighting is provided by 2 LEDs per door. These LEDs also function as door handle lights.

646_004

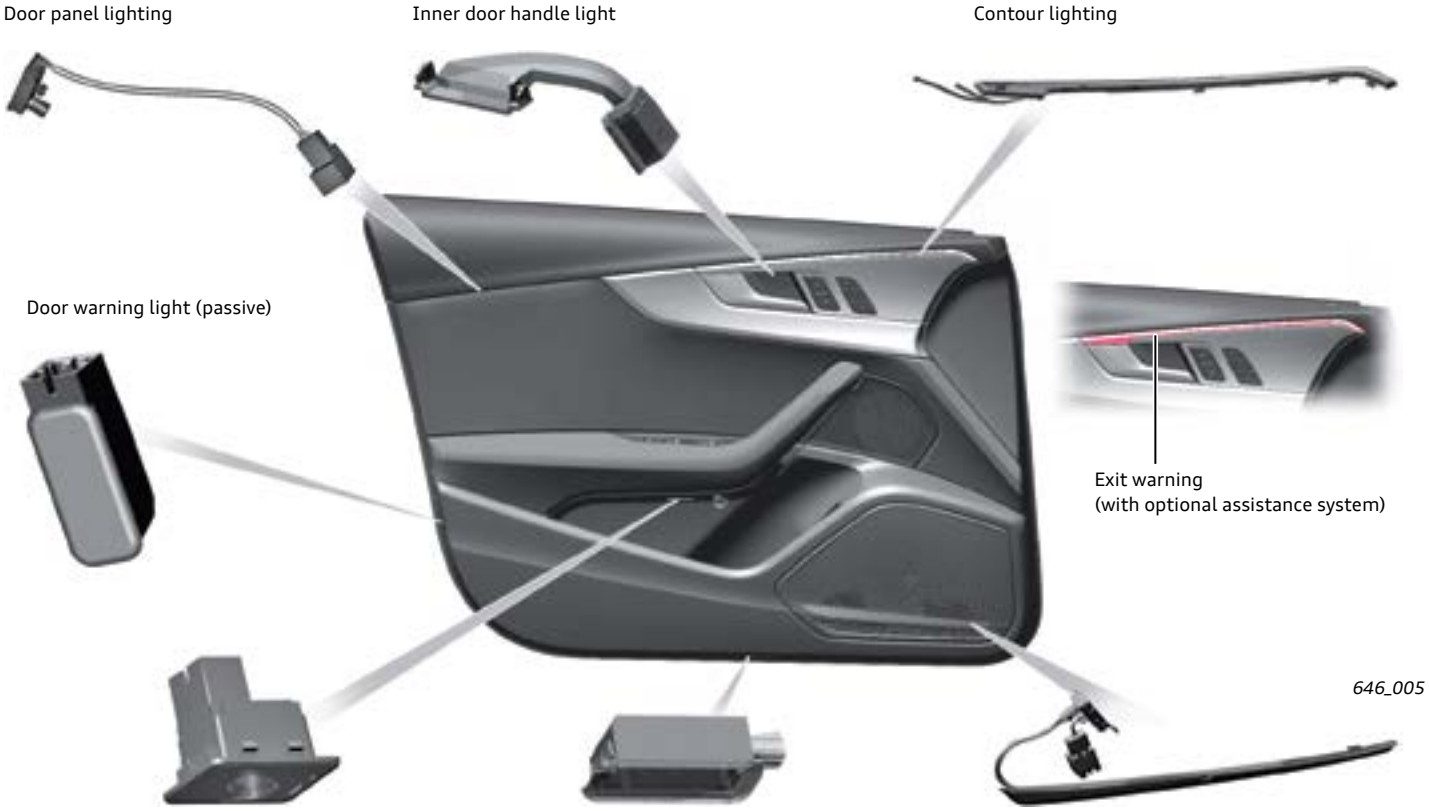
Interior door trim lighting

Background lighting as shown using the door trims as an example – the door warning light may use a conventional bulb/lamp depending on country.

The apron lighting is integrated in all four door handles in conjunction with PR nos. QQ1 and QQ2.

Unlike the Audi Q7, the door pocket lighting is not capacitively controlled.

Front door trim



Rear door trim

Function and control

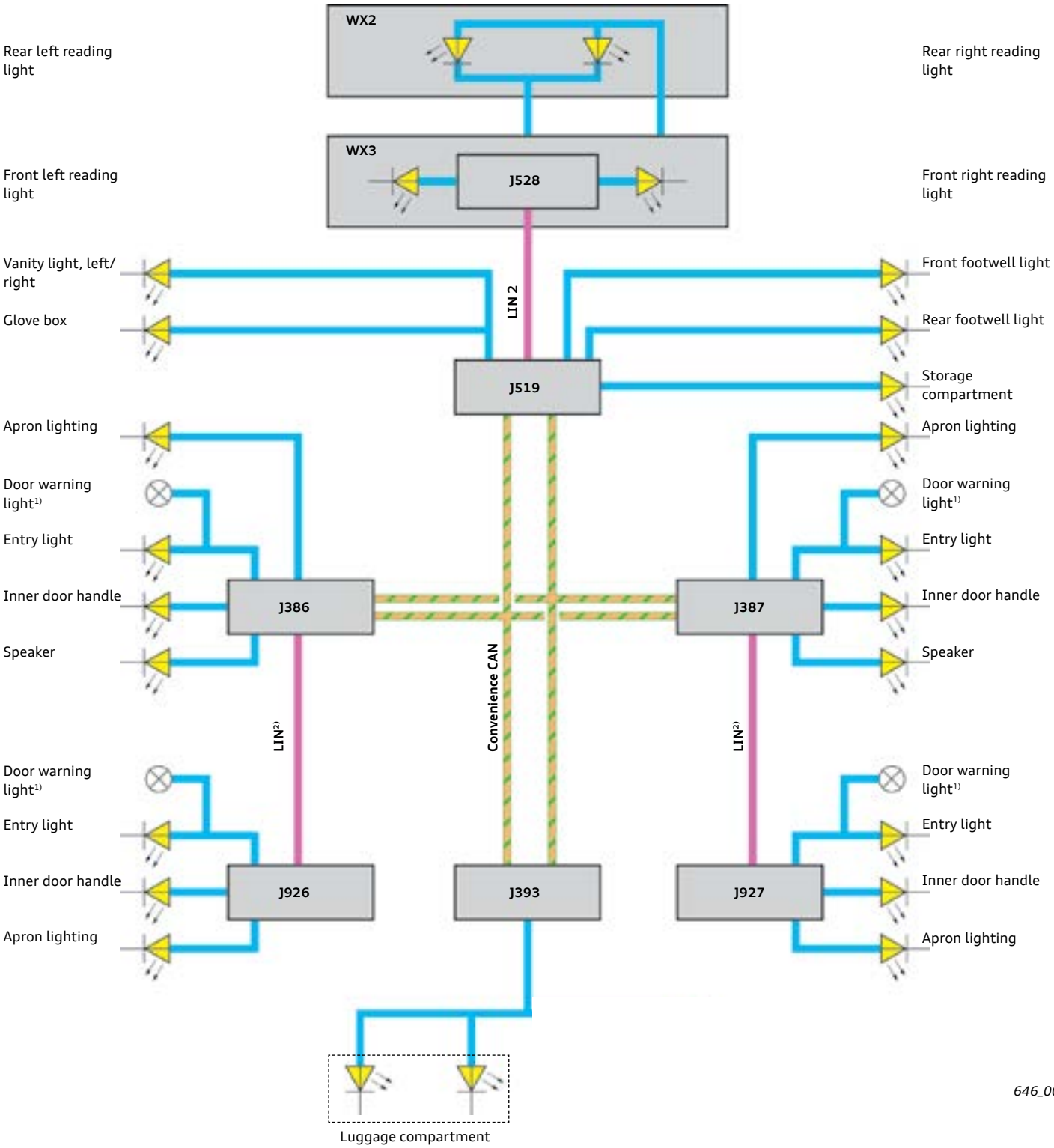
Interior and background lighting

The LEDs of the interior and background lighting are controlled by various control modules and are networked with one another via the Convenience CAN. These are:

- Vehicle Electrical System Control Module J519.
- Comfort System Central Control Module J393.
- Driver Door Control Module J386.
- Front Passenger Door Control Module J387.

The following control modules connected by LIN bus are also used:

- Driver Side Rear Door Control Module J926.
- Passenger Side Rear Door Control Module J927.
- Roof Electronics Control Module J528.
  - Front Roof Module WX3.
  - Rear Interior LampWX2.



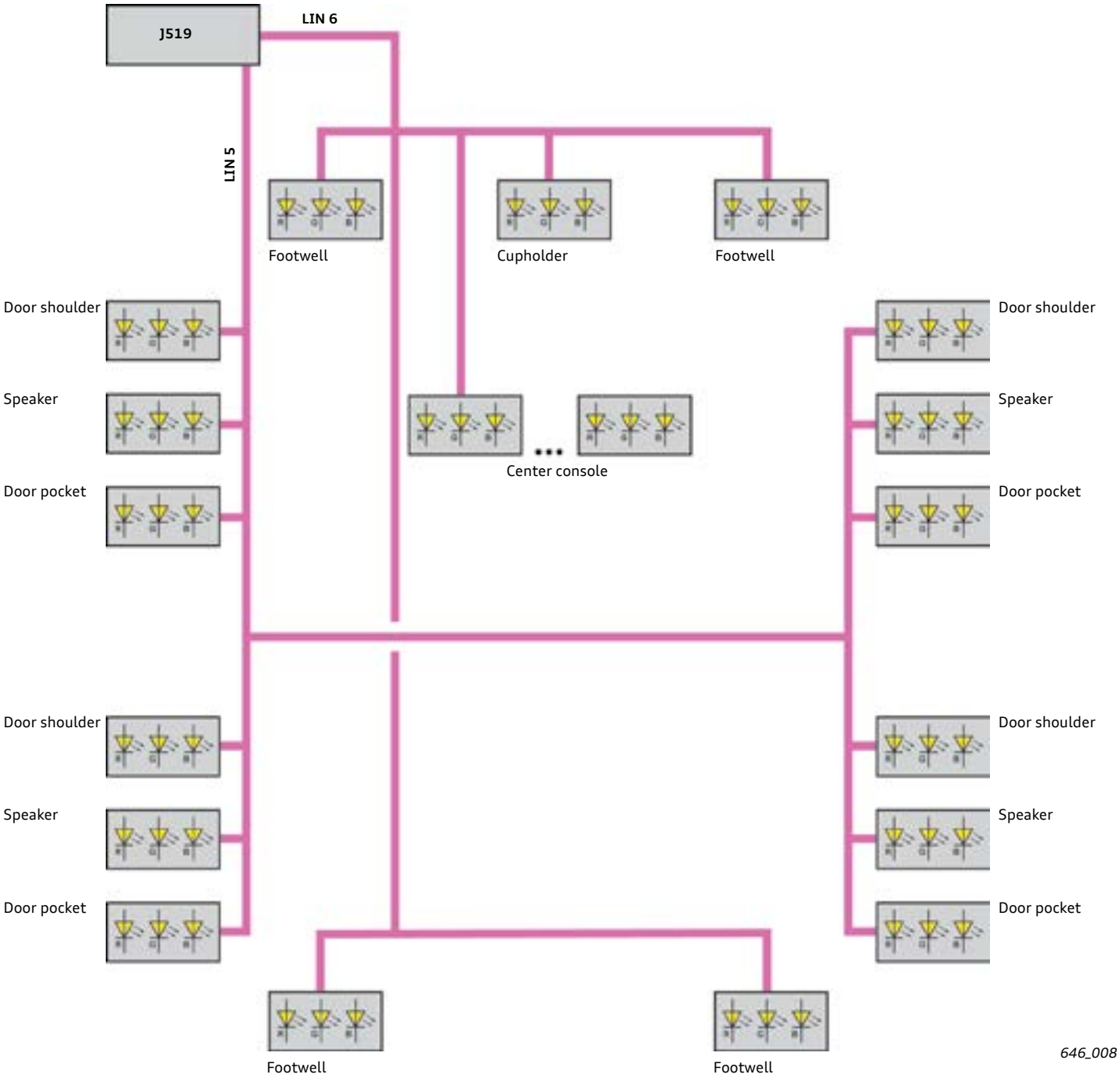
646_007

1) Country-dependent

2) Door control module LIN bus

RGB components

The RGB components of the background lighting are controlled by Vehicle Electrical System Control Module J519. The individual LEDs or optical fibers are supplied via 2 LIN bus lines.



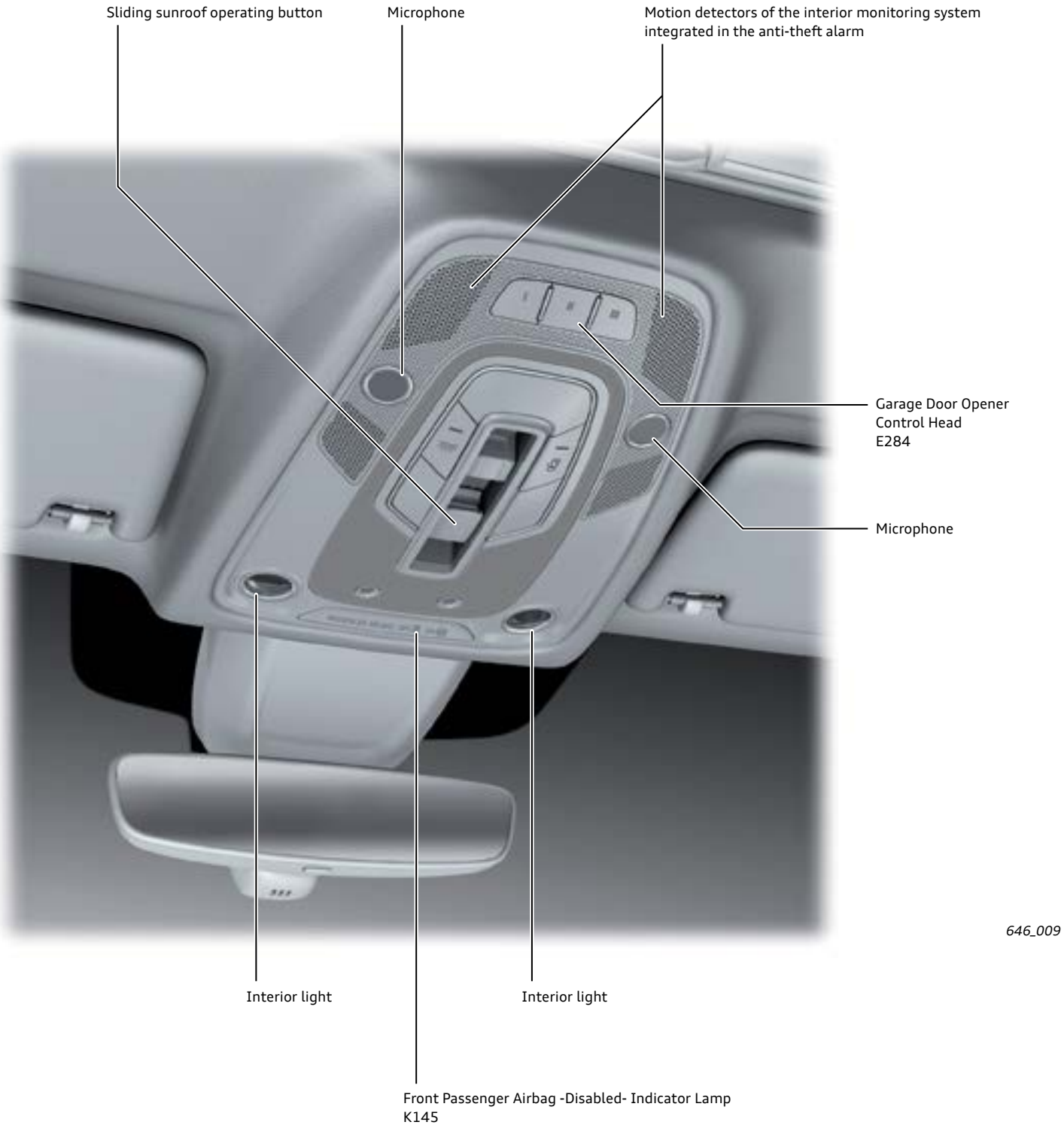
Overhead module

The overhead module is used to activate and read in the following components:

- Roof Electronics Control ModuleJ528.
- Sliding sunroof operating button.
- Garage Door Opener Control Head E284.
- Front interior lights.
- Hands-free telephone microphone.
- Front Passenger Airbag -Disabled- Indicator Lamp K145.

The interior lights are capacitive. The interior lights use LED technology.

J528 is a LIN participant of J519.



646_009

Audi drive select

Functional characteristics

The Audi A4 is equipped with Audi drive select.
With Audi drive select, it is possible to modify the vehicle characteristic. The mode can be changed when the car is stationary with the ignition switched on or while driving.

In the Audi A4, the driver can select between the following drive modes:

- comfort.
- auto.
- dynamic.
- individual.

Audi drive select affects the following equipment:

- Automatic transmission.
- Sport differential (not available at vehicle introduction).
- Climate control system.
- Cornering light.
- Ambient lighting.
- Dynamic steering (not available at vehicle introduction).
- Damper control.
- Cruise control system.
- Distance regulation.
- Audi pre sense basic / pre sense city.
- Start-stop system.

Displays and operation

Audi drive select can be configured using Control Unit 1 for Driving And Convenience Functions E791 or Multimedia System Control Head E380.

Depending on the vehicle equipment specification, the drive mode can also be selected on the multifunction steering wheel. When using the multi-function steering wheel, the options menu is displayed on the MMI screen or in the instrument cluster.

646_078

Control Unit 1 for Driving And Convenience Functions E791

Multimedia System Control Head E380

646_079

Audi drive select function

The following systems are influenced by Audi drive select:

System	Vehicle characteristic
Engine and automatic transmission	Depending on mode, the engine and automatic transmission react to accelerator inputs in a more spontaneous or more balanced way. In the sporty **dynamic** mode, the gear shift points are adjusted to higher in the RPM band.
Steering	The steering can be adapted with the regard to steering assistance. A distinction is made here between three characteristics ranging from comfortable (**comfort**) and balanced (**auto**) to sporty (**dynamic**).
Dynamic steering (not available at vehicle introduction)	The following applies to models with dynamic steering: To minimize steering effort for the driver, the steering ratio is adjusted to the speed at which the vehicle is traveling. At higher speeds, the steering is configured for less sensitivity in order to improve handling. At lower speeds, the steering is more direct in order to minimize steering effort for the driver during maneuvering, for example. In addition, the dynamic steering system provides a more agile steering response at low and medium speeds.
Damper control	Audi drive select allows the damper control system to be configured for sporty (**dynamic**), comfort-oriented (**comfort**) or balanced (**auto**) response.
Adaptive cruise control (ACC)	Depending on drive select mode, the acceleration response options range from comfortable (**comfort**) to sporty (**dynamic**). Accordingly, the adaptive cruise control also reacts to the driving style of the driver in front in a more balanced or more spontaneous way.
Sport differential (not available at vehicle introduction)	In **comfort** mode, activation of the sport differential is kept at a minimum. Primarily, load-change reactions are effectively damped so that the car has a very balanced response. In **auto** mode, the sport differential is configured for optimal handling dynamics. The car steers very responsively through corners. In **dynamic** mode, the sport differential is at its most noticeable. The dynamic handling has distinctly sporty feel.

Functional features

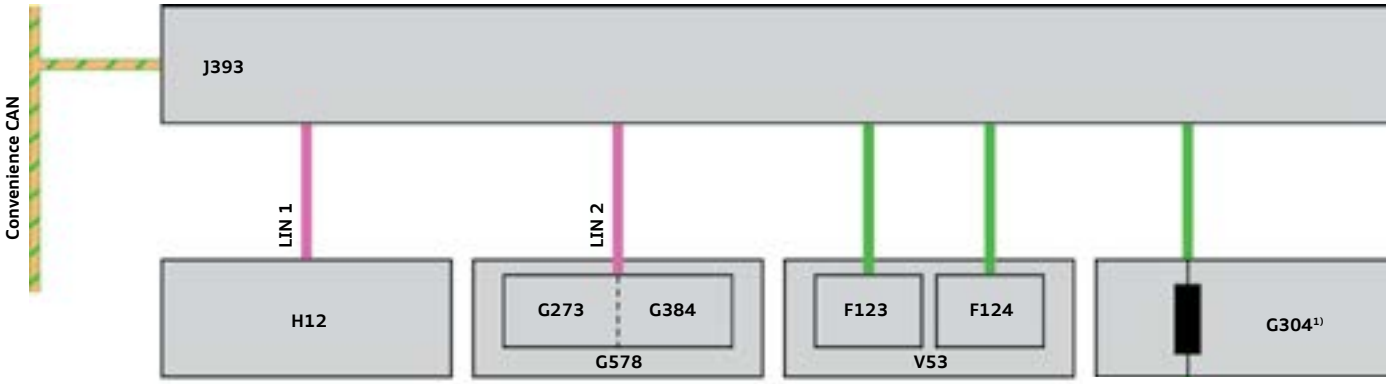
- The vehicle remembers the last selected mode and the **individual** mode configuration when it is re-started.
- To activate a newly selected mode for the engine, too, the accelerator must be briefly released (idle position) or briefly pushed down into the full throttle position.
- To activate the newly selected mode for the steering, the steering wheel must also be moved into the straight-ahead position (zero position).
- On some models, maximum speed is only achieved in **auto** and **dynamic** modes.
- The following applies to models with an automatic transmission: In **dynamic** mode, position **S** is automatically selected.

Anti-theft alarm

The anti-theft alarm of the Audi A4 is similar to the systems used in current Audi models.

Interior Monitoring Sensor G273 and Vehicle Inclination Sensor G384 are integrated with Anti-Theft Alarm System Sensor G578. G578 communicates with Comfort System Central Control Module J393 over LIN 2.

The alarm system will be triggered (if active) when a Scan Tool is connected to the Data Link Connector.



646_045

Key:

F123 Rear Lid Alarm Switch
F124 Rear Lid Lock/Alarm/Central Locking Switch
G273 Interior Monitoring Sensor
G384 Vehicle Inclination Sensor
G578 Anti-Theft Alarm System Sensor
H12 Alarm Horn
J393 Comfort System Central Control Module
V53 Rear Lid Central Locking System Motor

Notes

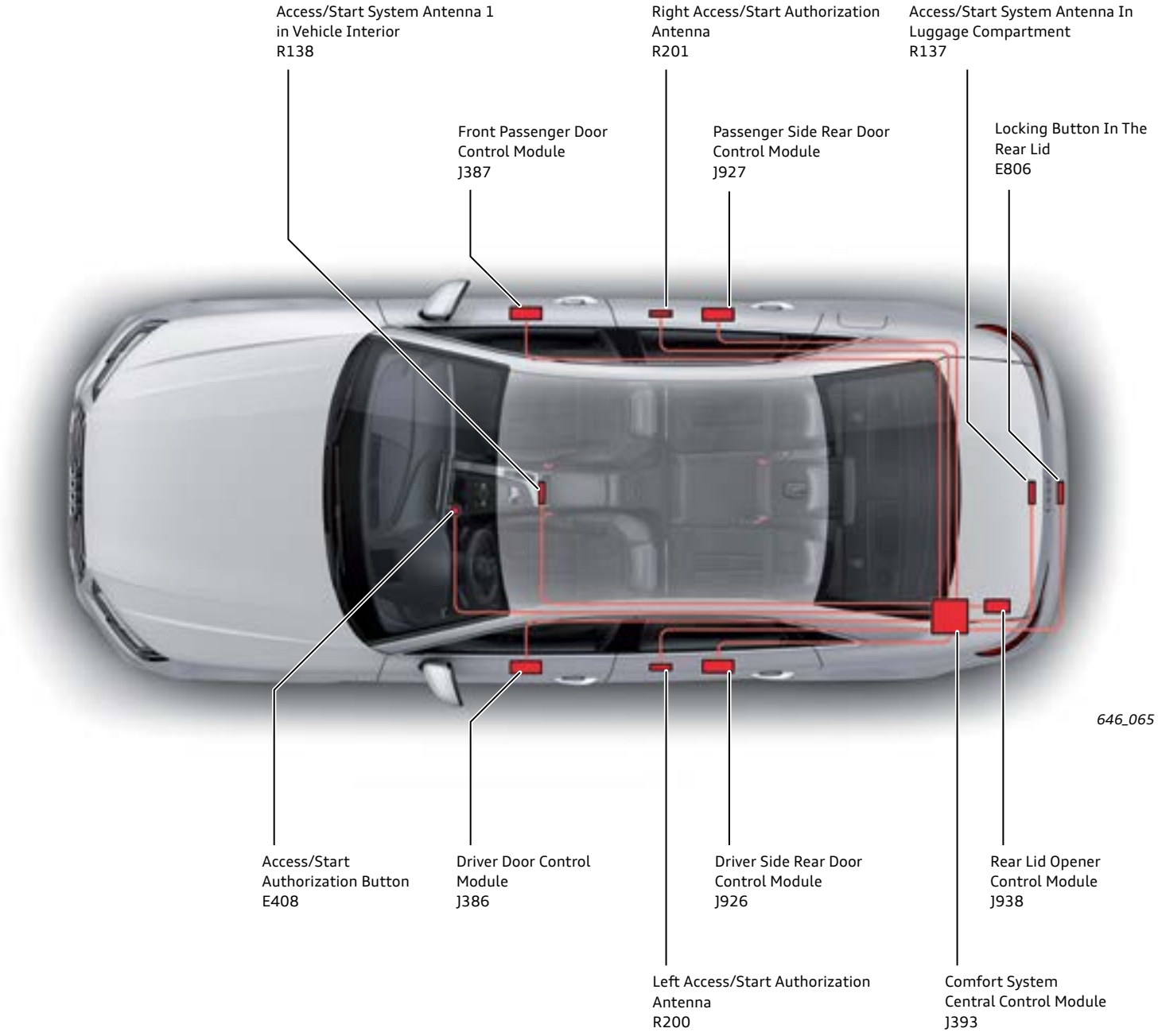
Central locking

The vehicle can be centrally locked and unlocked in various ways:

- Using the radio remote key.
- Via the sensors in the door handles (Advanced key).
- Manually via the locking cylinder in the driver's door.
- Using the inner central locking switch (door trim).

The door handle sensors are used for locking and unlocking with the Advanced key. The door handle sensors are no longer deactivated after 72 hours. This is not necessary due to the very low static current.

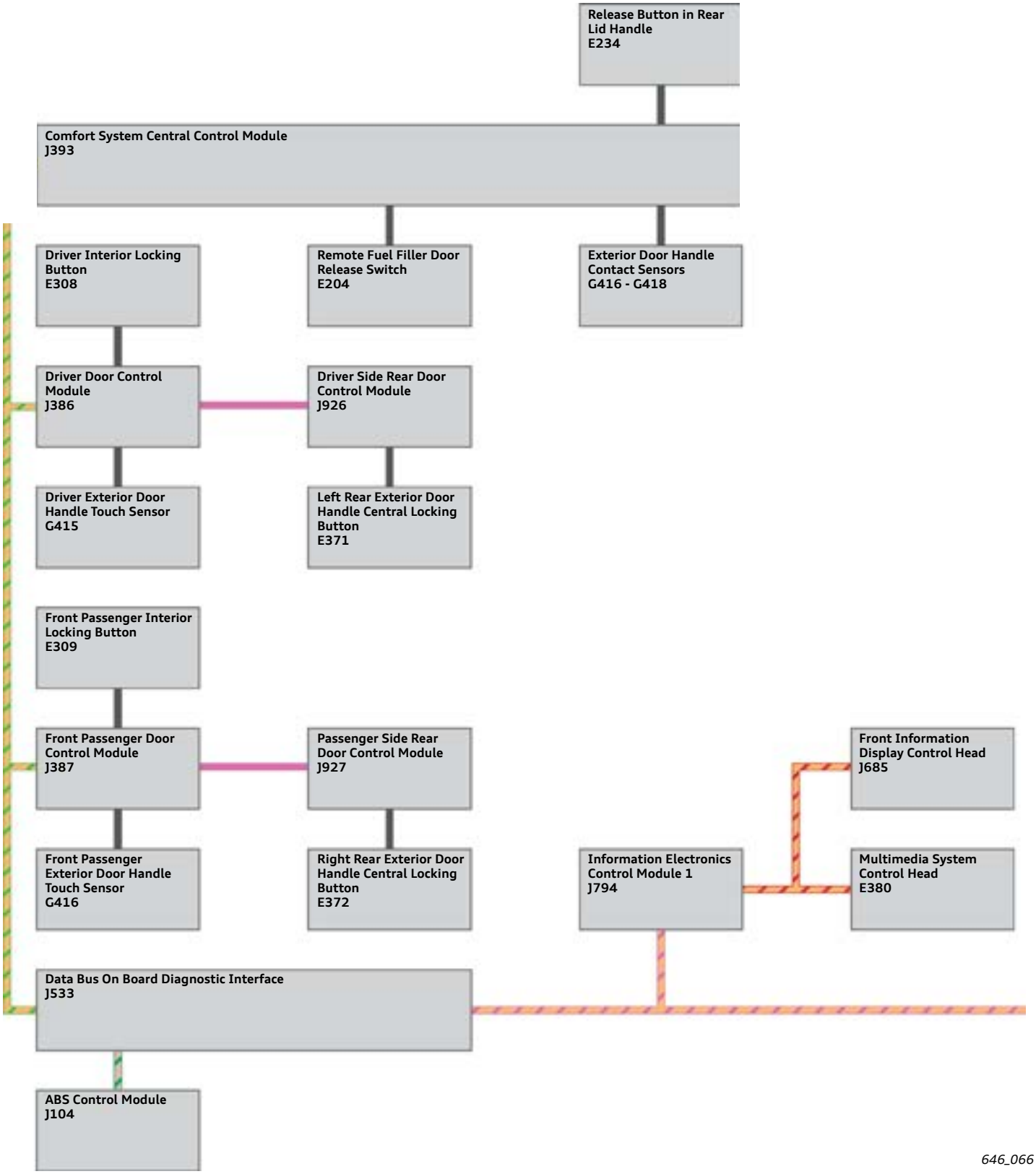
Components



System overview

The system overview shows the theoretical maximum specification. ABS Control Module J104 provides the vehicle speed signal required for the Autolock function via Comfort System Central Control Module J393.

All settings can be viewed on Front Information Display Control Head J685. The exterior door handle contact sensors of all four doors are connected directly to J393.



Key:

- Convenience CAN
- Infotainment CAN
- Modular Infotainment Platform (MIB) CAN
- FlexRay
- LIN bus
- Discrete cable

Garage door opener (HomeLink)

Installation locations

Garage Door Opener Control Module J530 is attached to the vehicle body on a special bracket behind the left side of the rear bumper cover.

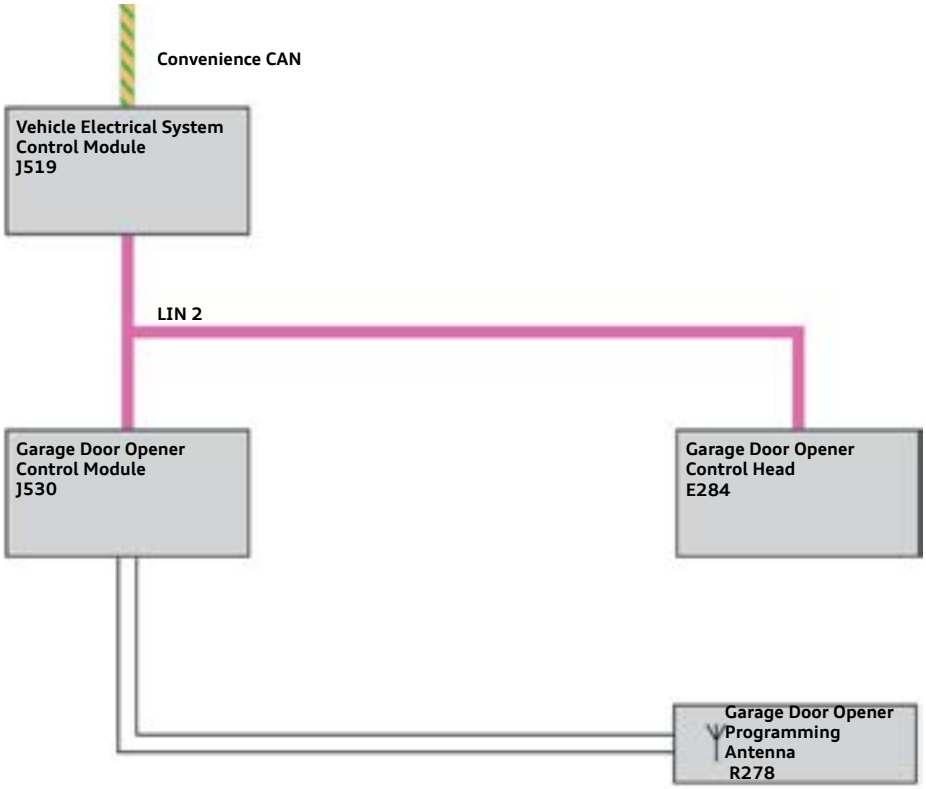
Garage Door Opener Programming Antenna R278 is routed from J530 through a cable duct that ends in the right rear heel panel area under the rear seat cushion.

646_046

System architecture

Vehicle Electrical System Control Module J519 is the master controller for Garage Door Opener Control Module J530. Both J530 and Garage Door Opener Control Head E284 communicate with J519 over LIN 2.

Garage Door Opener Programming Antenna R278 is connected directly to J530.



646_048

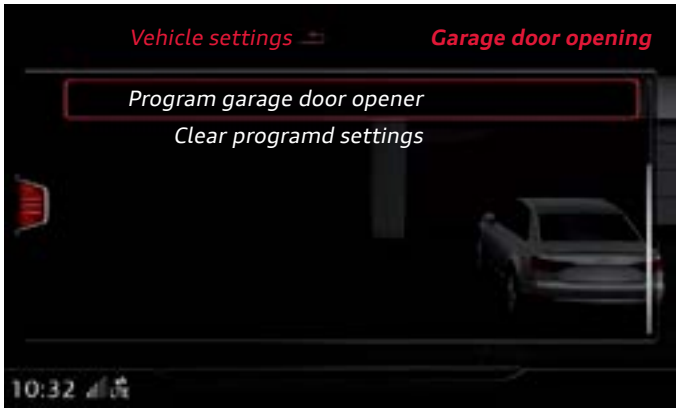
Programming

There are two processes for programming the HomeLink System depending on the type of garage door opener used in the home. A home system may use:

- a fixed code system.
- a rolling code system.

Both programing processes are MMI-controlled. The individual steps are displayed on the MMI screen.

The two code systems are handled differently. A programmed fixed code system is ready for use directly after programming. In the case of a rolling code system, on the other hand, the garage door and the in-car HomeLink system must be synchronized.



646_049

Available Scan Tool information

The last three programming cycles of the system can be viewed through the Measuring values. The following information can be seen:

- Frequency.
- Manufacturer.
- Fault status and modulation.
- Programming timeout.
- User abort.
- Speed information.
- Antenna.
- Status.
- Channel.

Other Measuring values provide information about the current country code and the system supply voltage.

Note
It is recommended that two persons perform the adaption process, to synchronize the garage door drive with the HomeLink system, because there is usually only a very small window available for synchronization.

Note
Individual buttons can be reprogrammed using the menu navigation. This overwrites the previously stored value. All programmed channels can be deleted with menu assistance. Programming can be aborted at any time using the BACK button.

Head-up display

Warnings, selected information from assistance systems and navigation instructions can be projected onto the windshield via Windshield Projection Head Up Display Control Module J898.

The head-up display is attached to a cross-member behind the instrument cluster on an adjustable bracket.

This information is displayed within the driver's field of vision. The virtual image is only visible to the driver within a limited area of the windshield. The driver is able to see a virtual image at a distance of approximately 7 ft (2.1 m) (image viewing distance).

J898 communicates over the Infotainment CAN. It can be accessed with the Scan Tool using Address Word 82.

Windshield Projection Head Up Display Button E736

646_063

Example of a display on the head-up display 646_064

Example of MMI setting options 646_064a

Operating and setting options for customers

- Switching the head-up display on/off.
- Individual height adjustment of the projected image (Windshield Projection Head Up Display Button E736, in the rotary light switch module).
- Selection of information to be displayed (via MMI menu).
- Adjustment of display brightness level (via MMI menu).
- Image rotation to align the display with the horizontal (via MMI menu).

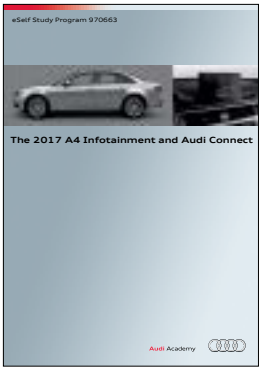
Setting options for service:

Windshield Projection Head Up Display Control Module J898 must be calibrated under the following conditions:

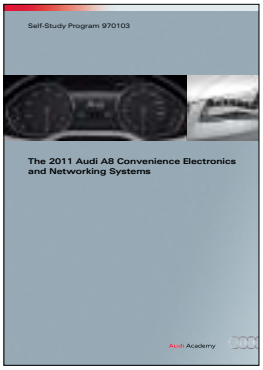
- The control module has been replaced.
- The windshield has been removed and installed or replaced.
- The fault memory has the DTC entry NO or INCORRECT BASIC SETTING / ADAPTION.

Self-study programs

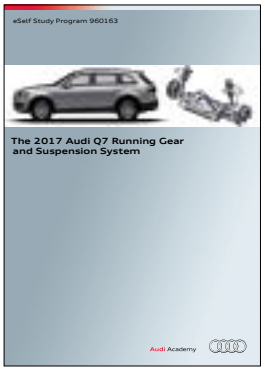
For more information about the technology of the Audi A4, please refer to the following Self study programs.



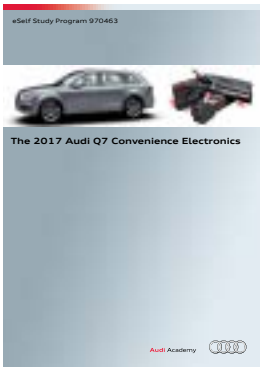
SSP 970663
The 2017 A4 Infotainment and Audi Connect



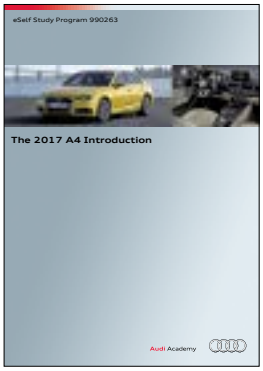
SSP 970103
2011 Audi A8 Convenience Networking



SSP 970163
The 2017 Audi Q7 Onboard power Supply and Networking System



SSP 970463
The 2017 Audi Q7 Convenience Electronics



SSP 990263
The 2017 A4 Introduction

Knowledge assessment

An On-Line Knowledge Assessment (exam) is Available for this eSelf-Study Program.

The Knowledge Assessment is required for Certification credit.

You can find this Knowledge Assessment at:
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From the accessaudi.com Homepage:

- Click on the "ACADEMY" tab
- Click on the "Academy site" link
- Click on the Course Catalog Search and select "970563 - The 2017 A4 Electronic and Electrical Systems"

Please submit any questions or inquiries via the Academy CRC Online Support Form which is located under the "Support" tab or the "Contact Us" tab of the Academy CRC.

Thank you for reading this eSelf-Study Program and taking the assessment.

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