

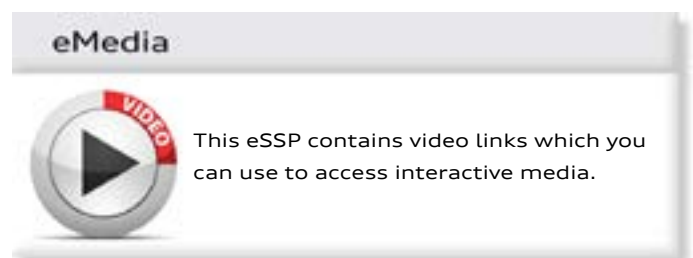


The 2017 Audi R8 Electrics, Electronics, and Infotainment Systems

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



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Electrical system

Introduction

The 420 A/75 Ah AGM battery of the R8 is located in the luggage compartment. The jump start terminals are located under a service flap adjacent to the battery's negative and positive terminals.

Battery Monitoring Control Module J367 is integrated into the negative battery cable, similar to other current Audi vehicles.

The main fuse panel is located on the left hand side of the battery. It includes Battery Interrupt Igniter N253. If N253 deploys, power to the alternator and starter will be de-energized.

In addition to other fuses, the main fuse panel contains the high amperage fuses for the electro-mechanical steering and ABS systems.

Fuse panel
in footwell on right

Battery

Main fuse panel
adjacent to battery



Fuse and relay panel
below parcel shelf

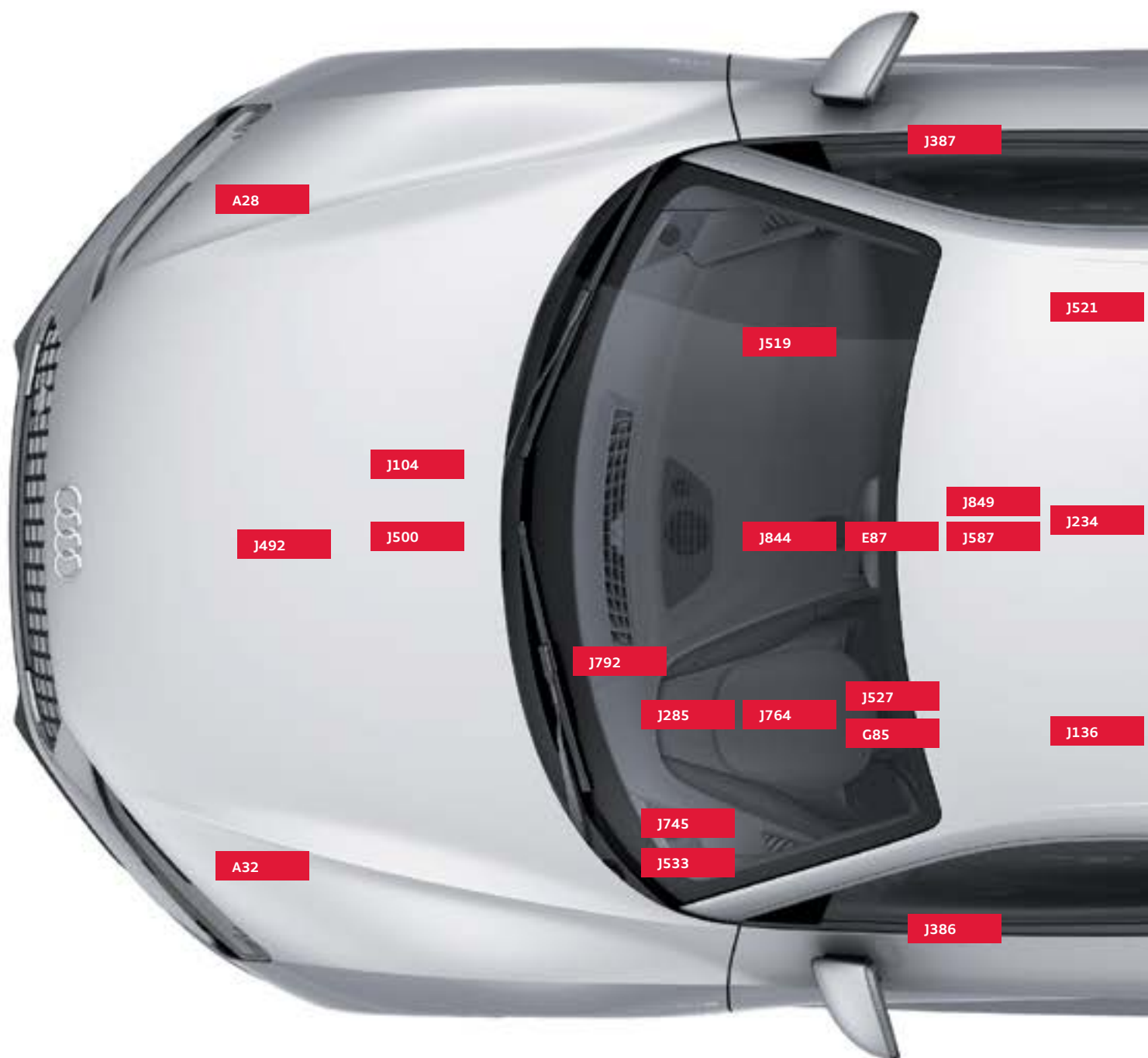
Fuse and relay panel
in E-box on right



Fuse and relay panel
in E-box on left

Installation locations of control modules

Descriptions for the precise locations of the control modules and instructions for installation and removal can be found in ElsaPro. Some of the control modules shown in this overview are optional equipment and may not be installed in the vehicle.



Key:

A28 Right Led Headlamp Power Output Module 2

A32 Left Led Headlamp Power Output Module 2

E87 Front A/C Display Control Head

G85 Steering Angle Sensor

J104 ABS Control Module

J136 Memory Seat/Steering Column Adjustment Control Module

J217 Transmission Control Module

J234 Airbag Control Module

J250 Electronic Damping Control Module

J285 Instrument Cluster Control Module

J386 Driver Door Control Module

J387 Front Passenger Door Control Module

J393 Comfort System Central Control Module

J492 All Wheel Drive Control Module

J500 Power Steering Control Module

J502 Tire Pressure Monitoring Control Module

J519 Vehicle Electrical System Control Module 1

J521 Front Passenger Memory Seat Control Module



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J525 Digital Sound System Control Module
J527 Steering Column Electronics Control Module
J533 Data Bus On Board Diagnostic Interface
J540 Electromechanical Parking Brake Control Module
J587 Selector Lever Sensor System Control Module

J623 Engine Control Module
J624 Engine Control Module 2

J745 Cornering Lamp And Headlamp Range Control Module
J764 Electronic Steering Column Lock Control Module
J772 Rearview Camera System Control Module
J792 Active Steering Control Module

J794 Information Electronics Control Module 1

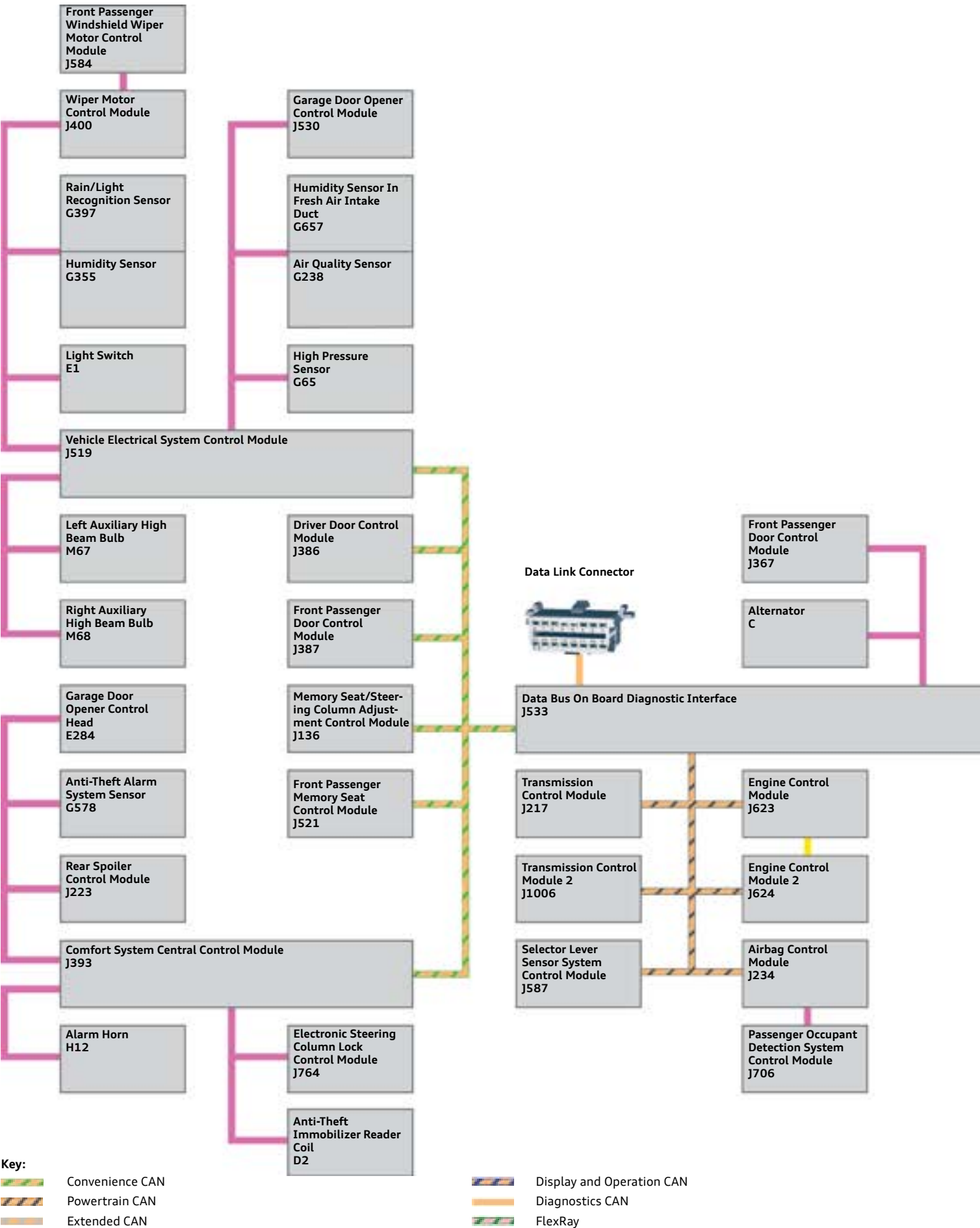
J844 Automatic High Beam Assist Control Module
J849 Sensor Electronics Control Module
J886 Seat Belt Microphone Control Module

J1006 Transmission Control Module 2

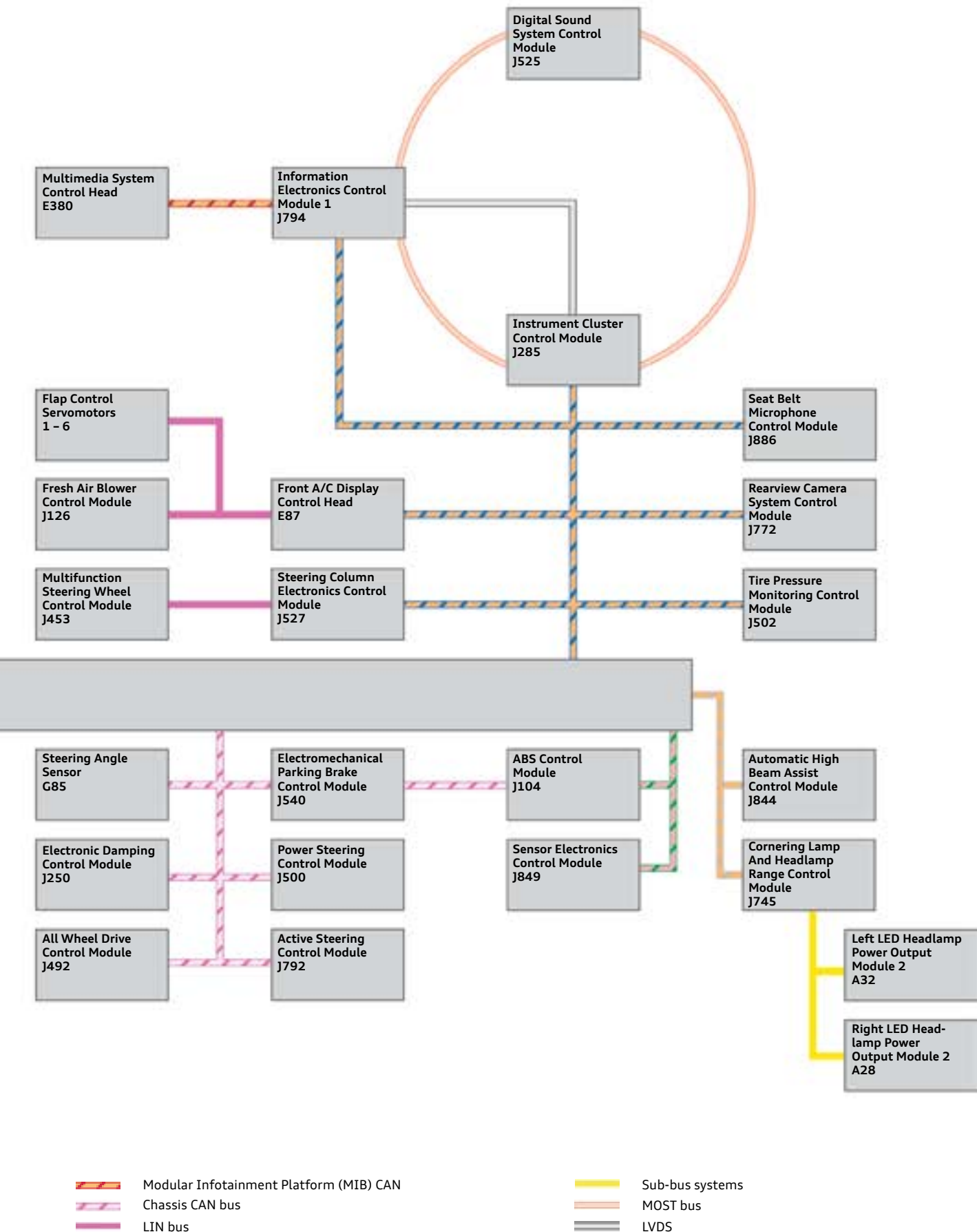
Topology

The topology shows all control modules with connectivity to the bus systems.

Some of the control modules shown here are optional or country-specific equipment or are scheduled for introduction at a later date.



The FlexRay topology does not represent the actual configuration of the control modules. This also applies to the control modules on the MOST bus.



Overview of the bus systems

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

MOST 150

The MOST 150 bus was first used in the 2015 Audi A3 and subsequently in the 2016 Audi TT and 2017 Audi Q7 models. In the Audi R8 up to 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.

J794 acts both as the diagnosis manager and as the system manager for the MOST bus. As always with the MOST bus in Audi vehicles, the control modules are interconnected by an electronic ring break diagnostics wire. This line is only required for electronic ring break diagnostics in the event of a fault.

FlexRay

ABS Control Module J104 and Sensor Electronics Control Module J849 are the only two modules transferring data over the FlexRay data bus.

The FlexRay wires are twisted in the same way as the CAN wires. They are additionally sheathed. However, the sheathing does not provide shielding against electromagnetic interference; it only minimizes effects of external influences, such as dampness and temperature on the core's characteristic impedance. In principle, sections of FlexRay lines can be replaced. Always follow the instructions in ElsaPro regarding replacement of FlexRay wires.

LVDS

LVDS (Low Voltage Differential Signal) is used for image transfer between Information Electronics Control Module 1 J794 and Instrument Cluster Control Module J285.

Unlike with the FlexRay, the sheathing of the LVDS wires not only protects against mechanical stresses and moisture, but also shields against electromagnetic interference. In the event of a fault, LVDS lines must always be completely replaced.



Reference

For further information about the FlexRay bus, refer to eSelf Study Program [970103, The 2011 Audi A8 Convenience Electronics and Networking Systems](#). For information about the LVDS and MOST 150 buses, refer to eSelf Study Program [970153, The 2016 Audi TT Vehicle Electrics, Electronics and Infotainment Systems](#), and eSelf-Study Program [970163, The 2017 Audi Q7 Onboard Power Supply and Networking System](#).

Special features of the control modules used

The control modules used in the R8 are adopted from various other Audi models. Because of this, there are differences in enabling, encoding and the Test Plans that can be performed during control module replacement.

Some control modules use an old procedure that is based on a comparison of target and actual values.

Other control modules use a new procedure. The new procedure adopts, where possible, custom adjustments and activations in addition to the coding of the control module.

The following table identifies the old and new modules of the 2017 R8.

Old procedure modules

Control module designation	Address Word
Engine Control Module J623	01
Engine Control Module 2 J624	11
Transmission Control Module J217	02
All Wheel Drive Control Module J492	22
Driver Door Control Module J386	42
Front Passenger Door Control Module J387	52
ABS Control Module J104	03
Power Steering Control Module J500	44
Cornering Lamp And Headlamp Range Control Module J745	55
Tire Pressure Monitoring Control Module J502	65
Steering Column Electronics Control Module J527	16
Data Bus On Board Diagnostic Interface J533	19
Active Steering Control Module J792	18
Sensor Electronics Control Module J849	3B
Electromechanical Parking Brake Control Module J540	53
Transmission Control Module 2 J1006	C2
Memory Seat/Steering Column Adjustment Control Module J136	06
Front Passenger Memory Seat Control Module J521	36
Comfort System Central Control Module J393	46
Vehicle Electrical System Control Module J519	09

New procedure modules

Control module designation	Address Word
Automatic High Beam Assist Control Module J844	20
Electronic Damping Control Module J250	14
Airbag Control Module J234	15
Seat Belt Microphone Control Module J886	A6
Instrument Cluster Control Module J285	17
Digital Sound System Control Module J525	47
Front A/C Display Control Head E87	08
Rearview Camera System Control Module J772	6C
Information Electronics Control Module 1 J794	5F
Selector Lever Sensor System Control Module J587	81

Control module profiles

Gateway

Designation	Data Bus On Board Diagnostic Interface J533
Equipment	Always installed
Installation location	On the bulkhead at the top left
Task	› Network system gateway › Controller for FlexRay bus › Diagnostic master › Energy management control
Address Word	19
Data bus communication	› User of Convenience CAN, Powertrain CAN, Chassis CAN, Display and Operation CAN, Extended CAN, Diagnostic CAN and FlexRay buses. › LIN master of Battery Monitoring Control Module J367 and Alternator C
Special features	› Not a participant of the Modular Infotainment Platform (MIB) CAN › Not a participant of the MOST bus



Data Bus On Board Diagnostic Interface J533

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Connection

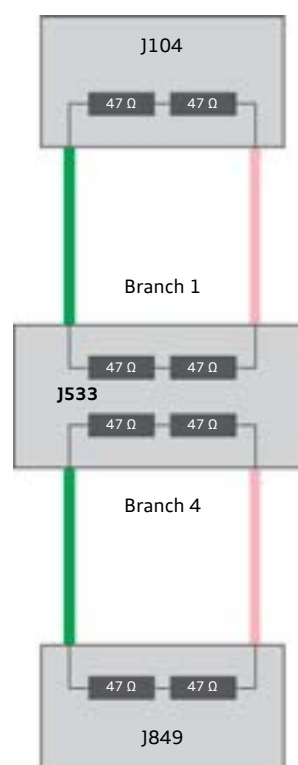
J533 is the controller for the FlexRay bus. All FlexRay control modules are connected to J533 within various branches. In this configuration J533 is referred to as the "active hub" or "active node". If only one control module is connected to a branch, this is referred to as a "point to point" connection.

Only two FlexRay users are connected to J533 in the Audi R8.

- › ABS Control Module J104 is connected to branch 1.
- › Sensor Electronics Control Module J849 connected to Branch 4.

This illustration differentiates between the bus positive cable (pink) and the bus negative cable (green) regarding the configuration of the control modules and thus reflects the actual situation.

Two resistors each having a resistance of 47 Ω (94 Ω in total) are connected to the end of each branch in the control module. After disconnecting the control module connector, the resistance value of 94 Ω can be measured by connecting a multimeter between the connecting pins of the bus positive and the bus negative at the relevant control module.



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Onboard power supply

Designation	Vehicle Electrical System Control Module J519 / also referred to as BCM1 (Body Control Module 1)
Equipment	Always installed
Installation location	In the footwell on the right above the fuse box
Task	Exterior lights master and activation of the front lights Limp-home turn signal master in case of failure of J393 Interior lighting master A/C functions › Activation of front seat heating › Activation of A/C Compressor Regulator Valve N280 and A/C Clutch N25 Integration functions › Parking › Park assist › Activation of front and rear acoustic signal generators Other functions › Reading input from the following senders/sensors/switches: › Ambient temperature › New engine coolant, windshield washer fluid, brake fluid › Brake pad wear › Hood contact › Temperature sensor for seats › Start-stop button, rear spoiler, park assist, ESP, hazard warning flashers › Activating the following actuators/control elements: › Signal horn › Windshield washer pump › Heating the windshield washer jets › Seat heater, front › Engine bay lights › Interior lights, glove box light
Address Word	09
Data bus communication	› Convenience CAN user › J519 is the LIN master for: › LIN 1: Light Switch E1, Rain/Light Recognition Sensor G397, Humidity Sensor G355 and Wiper Motor Control Module J400 › LIN 2: High Pressure Sensor G65, Humidity Sensor In Fresh Air Intake Duct G657, Air Quality Sensor G238, and Garage Door Opener Control Module J530 › LIN 3: Left and Right Auxiliary High Beam Bulbs M67 and M68
Special feature	Fault finding notes: Regarding the LIN slave configuration, J519 has a duplicated pin. For example, LIN 1 is distributed to 2 pins (A18, C2) which are, however, connected internally within the control module. This means that the control modules connected to pin C2 are also affected in the event of a short circuit to positive or negative at pin A18.



Vehicle Electrical System Control Module
J519

Comfort/convenience system

Designation	Comfort System Central Control Module J393 / also referred to as BCM2 (Body Control Module 2)
Equipment	Always installed
Installation location	Below the parcel shelf on the left
Task	Central locking system master Turn signal master Integration functions › Terminal management system › Entry and start authorization › Immobilizer (master) › Anti-theft alarm system Other functions › Reading input from the following senders/sensors/switches: › Brake light switch › Ignition starter button › P signal › Central locking antenna › Capacitive sensors of door handles › Entry and start authorization antennas › Activating the following actuators/control elements: › Rear lights › Signal for dynamic turn signal operation › Rear hatch motor › Luggage compartment release › Fuel tank flap lock › Relay for external sockets › Terminal 15 relay › Luggage compartment lights › Rear lighting
Address Word	46
Data bus communication	› Convenience CAN participant › J393 is the LIN master for: › LIN 1: Garage Door Opener Control Head E284, Anti-Theft Alarm System Sensor G578 and Rear Spoiler Control Module J223 › LIN 2: Alarm Horn H12 › LIN 3: Electronic Steering Column Lock Control Module J764 and Anti-Theft Immobilizer Reader Coil D2
Special features	› J393 is the immobilizer system master › The central locking antenna is integrated with the control module printed circuit board



Comfort System Central Control Module
J393

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Driver control modules

Designation	Driver Door Control Module J386
Equipment	Always installed
Installation location	In driver's door
Task	Controlling the electrical and electronic components in and on the driver's door › Reading input from the following senders/sensors/switches: › Switches/buttons on the door panel, for example: window lifters, rear hatch release, electric door mirrors, central locking › Activating the following actuators/control elements: › Lights and components in and on the door trim, turn signals in door mirror
Address Word	42
Data bus communication	Convenience CAN participant
Special feature	J386 reads input from the rear hatch release switch. However, the release motor is activated by Comfort System Central Control Module J393



Designation	Front Passenger Door Control Module J387
Equipment	Always installed
Installation location	In front passenger's door
Task	Controlling the electrical and electronic components in and on the front passenger's door › Reading input from the following senders/sensors/switches: › Switches/buttons on the door panel, for example: window lifters, central locking › Activating the following actuators/control elements: › Lights and components in and on the door trim, turn signals in door mirror
Address Word	52
Data bus communication	Convenience CAN participant

Seat adjustment

Designation	Memory Seat/Steering Column Adjustment Control Module J136
Equipment	Optional equipment
Installation location	Below the driver's seat
Task	Controlling the driver seat adjustment functions › Reading input (senders/sensors): › Seat adjustment sender › Pressure sensors › Activating the following actuators/control elements: › Seat adjustment motors › Compressor for multi-contour seat
Address Word	36
Data bus communication	Convenience CAN participant
Special features	Regarding the position and pressure state of the seat pneumatics, the seat settings are assigned to the car key. A seat memory, in which various positions are stored using a switch on the door panel, is not available for the Audi R8.



Memory Seat/Steering Column Adjustment Control Module J136

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Designation	Front Passenger Memory Seat Control Module J521
Equipment	Optional equipment
Installation location	Below the front passenger seat (not shown)
Task	Control of front passenger seat adjustment functions › Reading input (senders/sensors): › Seat adjustment sender › Pressure sensors › Activating the following actuators/control elements: › Seat adjustment motors › Compressor for multi-contour seat
Address Word	06
Data bus communication	Convenience CAN participant
Special features	As regards the position and pressure state of the seat pneumatics, the seat settings are assigned to the car key. A seat memory, in which various positions are stored using a switch on the door panel is not available for the Audi R8.

Selector lever

Designation	Selector Lever Sensor System Control Module J587
Equipment	Always installed
Installation location	On selector lever
Task	› Indication of selector lever position › Transfer of tiptronic commands
Address Word	81
Data bus communication	Powertrain CAN participant
Special features	› Can only be replaced together with the selector lever housing. › Selector lever is not mechanically connected to automatic transmission.



Selector Lever Sensor System Control Module J587

641_136

Transmission control modules

Designation	Transmission Control Module J217
Equipment	Always installed
Installation location	In DSG Transmission Mechatronic J743
Task	Monitoring and controlling the automatic transmission shift operations
Address Word	02
Data bus communication	Powertrain CAN participant
Special feature	Immobilizer user



Transmission Control Module
J217 in DSG Transmission Mechatronic J743

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Designation	Transmission Control Module 2 J1006
Equipment	Always installed
Installation location	In the engine bay on the left under the engine trim
Task	Controlling the auxiliary hydraulics and the parking lock function
Address Word	C2
Data bus communication	Powertrain CAN participant

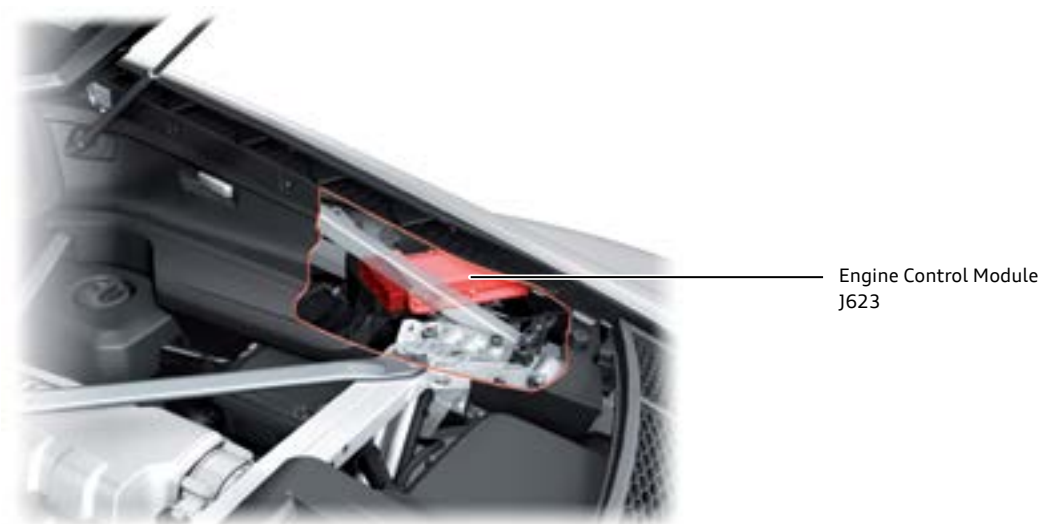


Automatic Transmission Control Module 2
J1006

641_138

Engine control modules

Designation	Engine Control Module J623
Equipment	Always installed
Installation location	In the engine bay on the right below the engine bay trim
Task	› Controlling the engine electronic functions for cylinders 1 – 5 › Master control unit for engine management › Activation of starter relays J906 and J907
Address Word	01
Data bus communication	› Powertrain CAN participant › J623 is connected via a sub-bus system J624
Special feature	Immobilizer user



641_139

Designation	Engine Control Module 2 J624
Equipment	Always installed
Installation location	In the engine bay on the left under the engine trim
Task	Controlling the engine electronic functions for cylinders 6 – 10
Address Word	11
Data bus communication	› Powertrain CAN participant › J624 is connected via a sub-bus system J623
Special feature	Immobilizer user



641_140

Airbag

Designation	Airbag Control Module J234
Equipment	Always installed
Installation location	On the center tunnel below the center console
Task	Deployment of airbags, safety belt pretensioners and battery interrupt igniter
Address Word	15
Data bus communication	› Powertrain CAN participant › LIN master for Passenger Occupant Detection System Control Module J706
Special feature	J234 sends the safety belt recognition signals to Seat Belt Microphone Control Module J886.



Airbag Control Module
J234

641_141

Sensor electronics control

Designation	Sensor Electronics Control Module J849
Equipment	Always installed
Installation location	On the center tunnel below the center console
Task	The control module contains sensors for measuring vehicle acceleration in x, y and z directions, as well as vehicle rotation about the x, y and z axes.
Address Word	3B
Data bus communication	FlexRay participant
Special feature	It serves as a functional replacement for ESP Sensor Unit G419.



Sensor Electronics Control Module
J849

641_142

Electronic Stability Control (ESC)

Designation	ABS Control Module J104
Equipment	Always installed
Installation location	In the vehicle front end behind the luggage compartment trim
Task	› Anti lock braking system (ABS) › Electronic Stability Control (ESC) › Traction Control System (TCS) › Electronic Differential Lock (EDL) › Torque vectoring › Multi-collision brake
Address Word	03
Data bus communication	FlexRay participant
Special feature	The control unit can be replaced separately from the valve block using ESD protective mat VAS 6613.



ABS Control Module J104

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Parking brake

Designation	Electromechanical Parking Brake Control Module J540
Equipment	Always installed
Installation location	Below the parcel shelf on the left
Task	Controlling the parking brake function
Address Word	53
Data bus communication	› Chassis CAN participant › J540 is also connected to ABS Control Module J104 via a sub-bus system



Electromechanical Parking Brake Control Module J540

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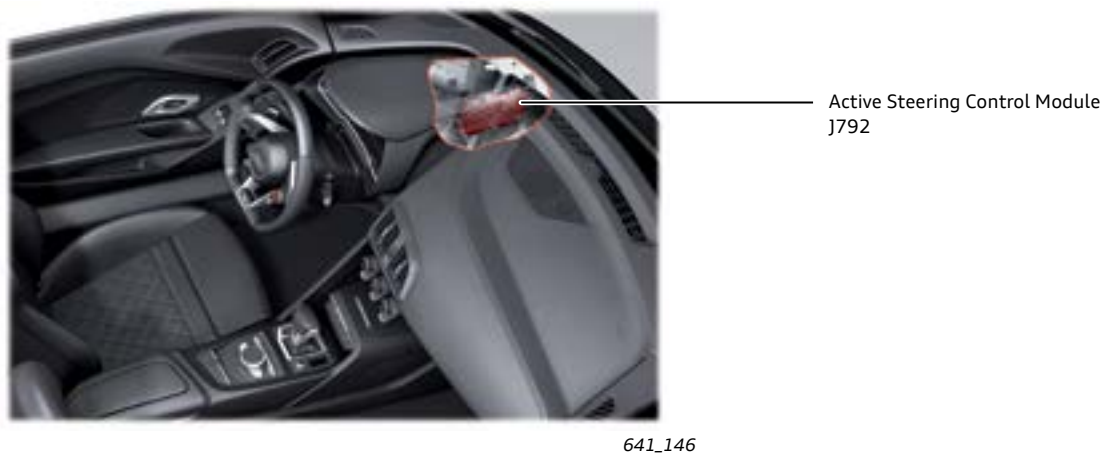
Power steering

Designation	Power Steering Control Module J500
Equipment	Always installed
Installation location	Connected to steering gear
Task	› Power steering › Servotronic speed-responsive power steering › Corrective steering intervention with ESP
Address Word	44
Data bus communication	Chassis CAN participant
Special features	› The control module with power steering motor can only be replaced together with the steering gear.



Dynamic steering

Designation	Active Steering Control Module J792
Equipment	Optional equipment
Installation location	On the left hand module cross-member
Task	The control module calculates the super-imposition angle required to implement the variable steering ratio.
Address Word	2B
Data bus communication	Chassis CAN participant



Audi magnetic ride

Designation	Electronic Damping Control Module J250
Equipment	Optional equipment
Installation location	Below the parcel shelf on the right at the heel plate
Task	Adaptation of the damping characteristic
Address Word	14
Data bus communication	Chassis CAN participant



Electronic Damping Control Module J250

641_147

All-wheel drive

Designation	All Wheel Drive Control Module J492
Equipment	Always installed
Installation location	On the cover of the main fuse panel adjacent to the battery
Task	J492 calculates the clutch pressure required for the all-wheel drive clutch
Address Word	22
Data bus communication	Chassis CAN participant
Special features	Unlike the previous all-wheel drive clutch systems (Haldex systems), the all-wheel drive clutch system in the Audi R8 uses oil pressure and temperature sensors.



All Wheel Drive Control Module J492

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High beam assist

Designation	Automatic High Beam Assist Control Module J844
Equipment	Always installed
Installation location	In rear view mirror
Task	Automatic activation and deactivation of high beam in response to oncoming traffic
Address Word	20
Data bus communication	Extended CAN participant
Special feature	J844 can only change over the low beam/high beam headlights.



Light control

Designation	Cornering Lamp And Headlamp Range Control Module J745
Equipment	Always installed
Installation location	On the bulkhead at the bottom right
Task	J745 is responsible for calculating auxiliary light functions such as the all-weather light, turning light and static cornering light, as well as for diagnosis of the power modules.
Address Word	55
Data bus communication	› Extended CAN participant. › J745 is connected to the power modules for the LED headlights via a sub-bus system.



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 electronic components.
Address Word	16
Data bus communication	› Display and operation CAN bus participant › J527 is the LIN master for: › Multifunction Steering Wheel Control Module J453
Special features	J527 transfers the signals from the Access/Start Authorization Button E408 to Comfort Systems Central Control Module J393. The steering angle sensor is integrated in J527, but is connected to the Chassis CAN by its own bus connection.



Steering Column Electronics Control Module J527

641_151

Climate control

Designation	Front A/C Display Control Head E87
Equipment	Always installed
Installation location	In instrument panel, center
Task	Controlling: › Temperature › Blower speed › Air flow distribution
Address Word	08
Data bus communication	› Display and Operation CAN bus participant › E87 is the LIN master for: › Control motors for flap activation 1 – 6 › Fresh Air Blower Control Module J126
Special features	The seat heater and rear window heater switches are located in E87 where their input is read. However, Vehicle Electrical System Control Module J519 is responsible for activating the seat heaters while Comfort System Central Control Module J393 is responsible for activating the rear window heater relay.



Front A/C Display Control Head E87

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Rear-view camera

Designation	Rearview Camera System Control Module J772
Equipment	Always installed
Installation location	Below the parcel shelf on the right at the heel plate
Task	› Reading input from Rearview Camera R189 › Processing and sending image data to Information Electronics Control Module 1 J794.
Address Word	6C
Data bus communication	Display and Operation CAN participant
Special features	› Control module and camera are two separate components.



Rearview Camera System Control Module J772

641_153

Safety belt microphone

Designation	Seat Belt Microphone Control Module J886
Equipment	Always installed
Installation location	Below the parcel shelf on the left at the heel plate
Task	› Reading input data from the safety belt microphones in the driver's and front passenger's safety belts and from the microphone in the overhead module. › Sending data to Information Electronics Control Module 1 J794
Address Word	A6
Data bus communication	Display and Operation CAN participant
Special features	› If Seat Belt Microphone Control Module J886 is de-energized or defective, an internal relay establishes a direct connection between the roof microphone and Information Electronics Control Module 1 J794. › J886 was only installed in the Spyder version of the previous R8.



Seat Belt Microphone Control Module J886

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Tire pressure monitoring

Designation	Tire Pressure Monitoring Control Module J502
Equipment	Always installed
Installation location	Below a flap in the underbody on the left
Task	› Pick-up and evaluation of signals from Tire Pressure Sensors G222, G223, G224 und G225 › Indication of tire pressures or issuance of warnings to Information Electronics Control Module 1 J794
Address Word	65
Data bus communication	Display and Operation CAN participant
Special features	› The control module sends a PWM signal by cable to the trigger senders in the wheel arches with the command to query the pressure and temperature sensors in the wheel rims. › The sensors in the tire valves send the data wirelessly to the control module.



Tire Pressure Monitoring Control Module J502

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Instrument cluster

Designation	Instrument Cluster Control Module J285
Equipment	Always installed / Audi virtual cockpit
Installation location	In instrument panel
Task	Display of information relevant to the driver
Address Word	17
Data bus communication	› Display and Operation CAN participant › MOST participant
Special features	› J285 is connected the Information Electronics Control Module 1 J794 with an LVDS line. › The instrument cluster is not integrated with the immobilizer in the Audi R8.



Instrument Cluster Control Module J285

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Information electronics

Designation	Information Electronics Control Module 1 J794
Equipment	Always installed
Installation location	In the parcel shelf at the center
Task	Controlling the Infotainment systems
Address Word	5F
Data bus communication	> Display and Operation CAN participant > MOST participant > J794 is connected to Multimedia System Control Head E380 via the Modular Infotainment Platform (MIB) CAN bus.
Special features	> J794 is the system manager and the ring break diagnostics master for the MOST bus. > Connected to the Instrument Cluster Control Module J285 by a LVDS line (image transfer to instrument cluster).



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Information Electronics Control Module 1
J794

Sound amplification

Designation	Digital Sound System Control Module J525
Equipment	Installed only with B&O sound system
Installation location	Below the parcel shelf on the left
Task	Activating the 13 speakers
Address Word	47
Data bus communication	MOST participant
Special feature	The subwoofer is housed in the passenger side wheel arch and its membrane faces outwards.



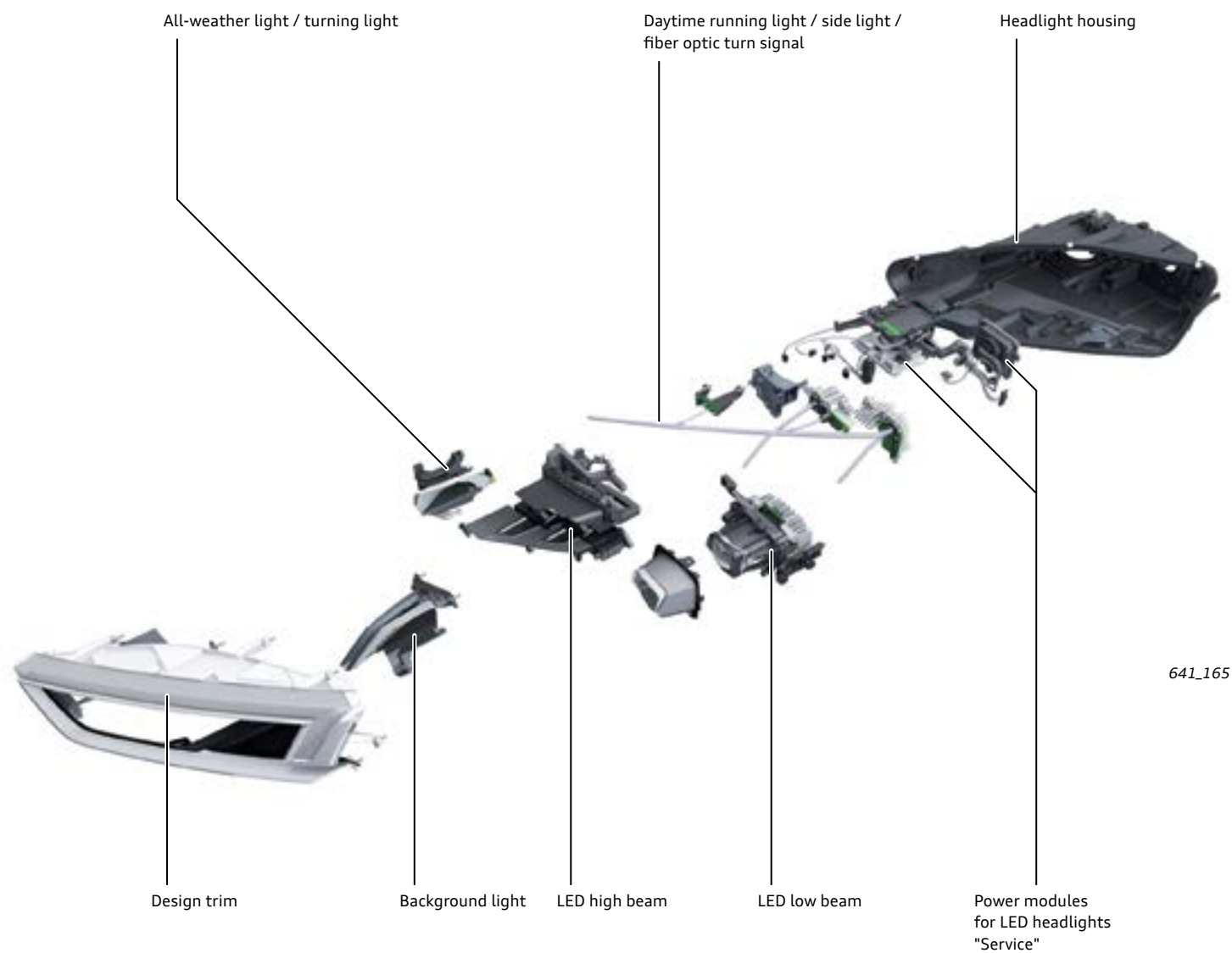
Digital Sound System Control Module J525

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Exterior lights

LED headlights

LED headlights are standard equipment on the R8 V10 and R8 V10 plus.

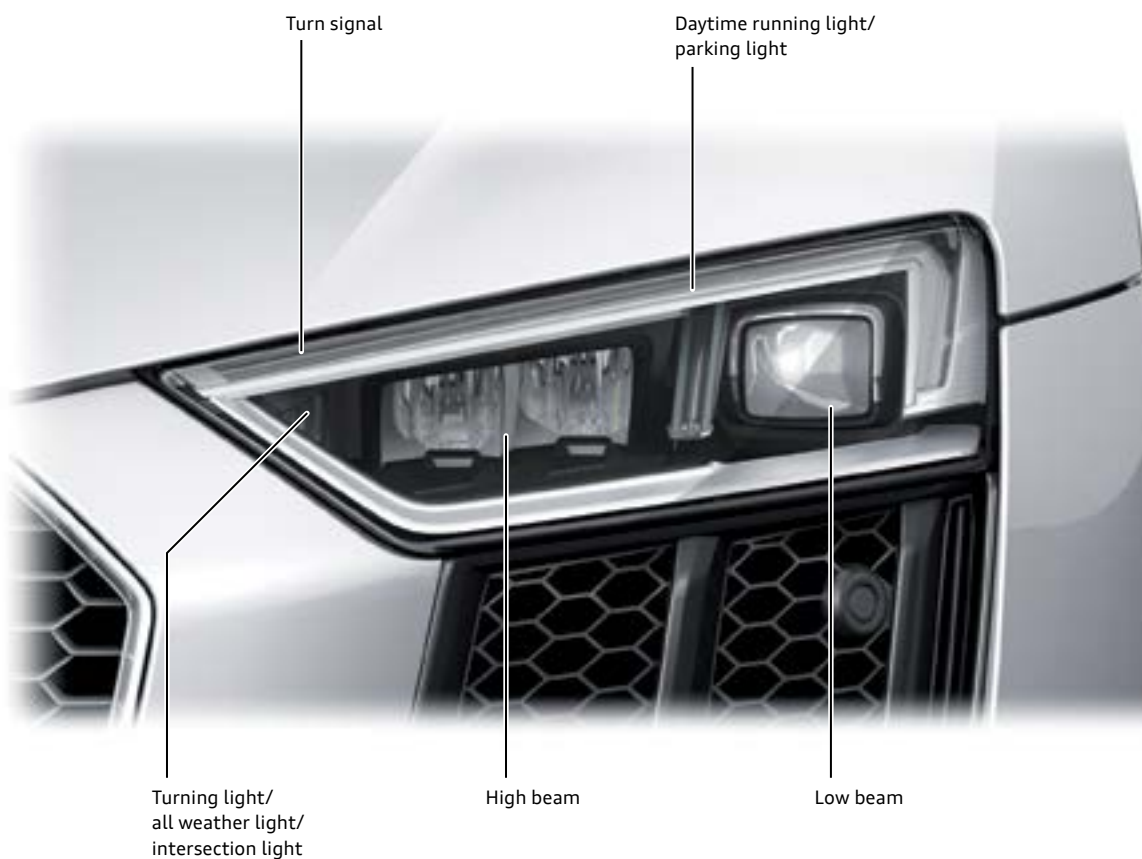


641_165

Special features of the light functions

The daytime running light is dimmed for the duration of the turn signaling cycle.

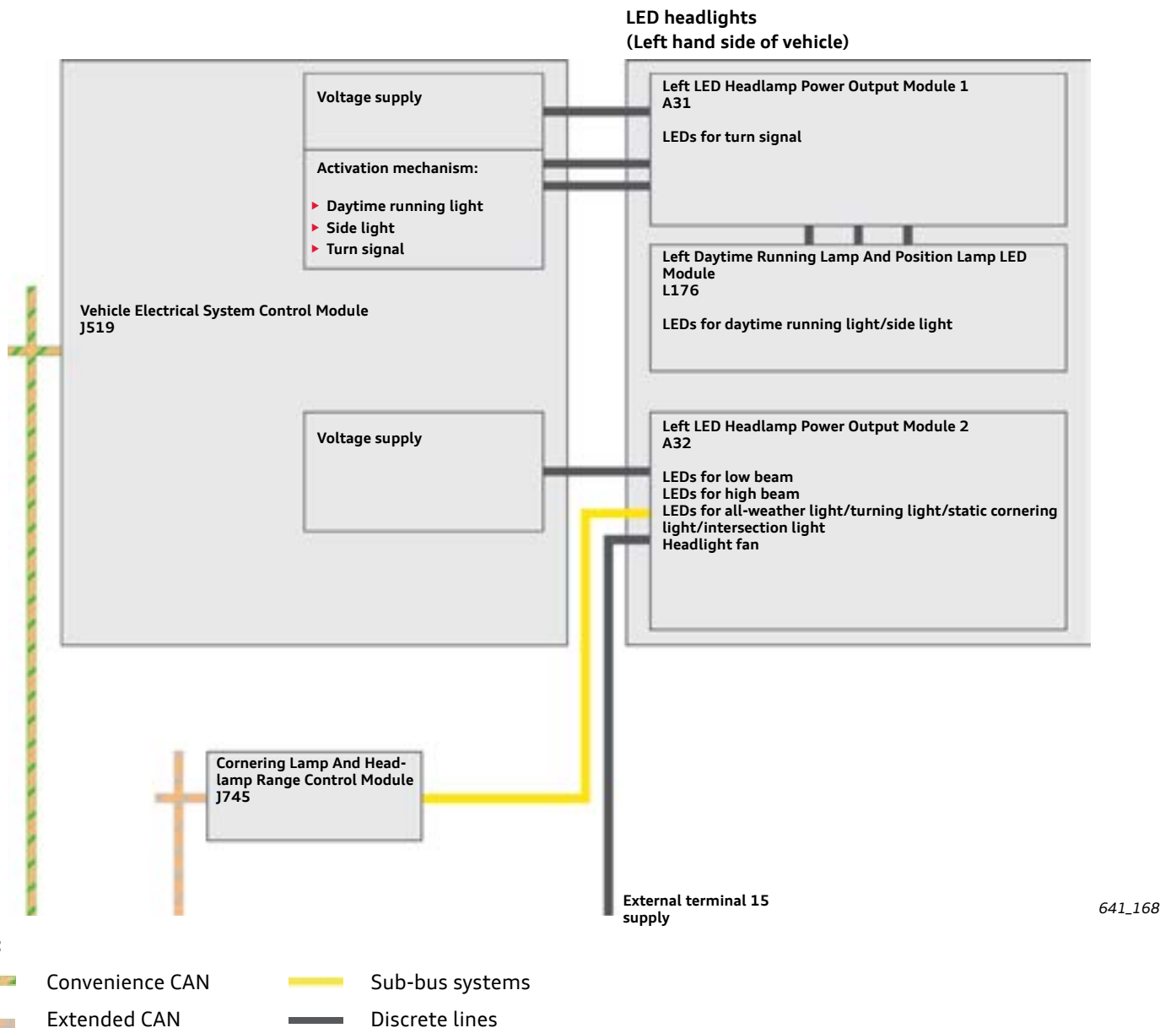
The low beam and the parking light are used for the Coming Home/Leaving Home function.



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Light functions	Type of bulb used	Power
Daytime running light	6 LEDs with plastic optical fibers	18 watts
Side light	Parking light is dimmed if light function is active	1.8 watts
Low beam	11 LEDs	22 watts
High beam	6 LEDs	22 watts
Turning light / static cornering light	2 LEDs at 100% and low beam	7 watts
All-weather light	Turning light dimmed to 50% and low beam dimmed to 50%	
Intersection light	Turning light on both sides and low beam	
Turn signal	9 LEDs	18 watts

Schematic diagram of the activation mechanism



Activation

Vehicle Electrical System Control Module J519 supplies voltage to Left and Right LED Headlamp Power Output Modules 1, A31 and A27 as well as for Left and Right LED Headlamp Power Output Modules 2, A28 and A32.

The power modules A31/A27 are responsible for the daytime running light/side light and turn signal functions.

Power modules 2 A32/A28 are responsible for activating the LEDs for low beam, high beam, all-weather light, turning light, static cornering light as well as the headlight fan.

Service

Headlight range adjustment is not implemented for the headlights on the Audi R8. Cornering Lamp and Headlamp Range Control Module J745 is only used to operate the cornering lights. The LED headlight bulbs cannot be replaced. Only the outer control units can be replaced separately.

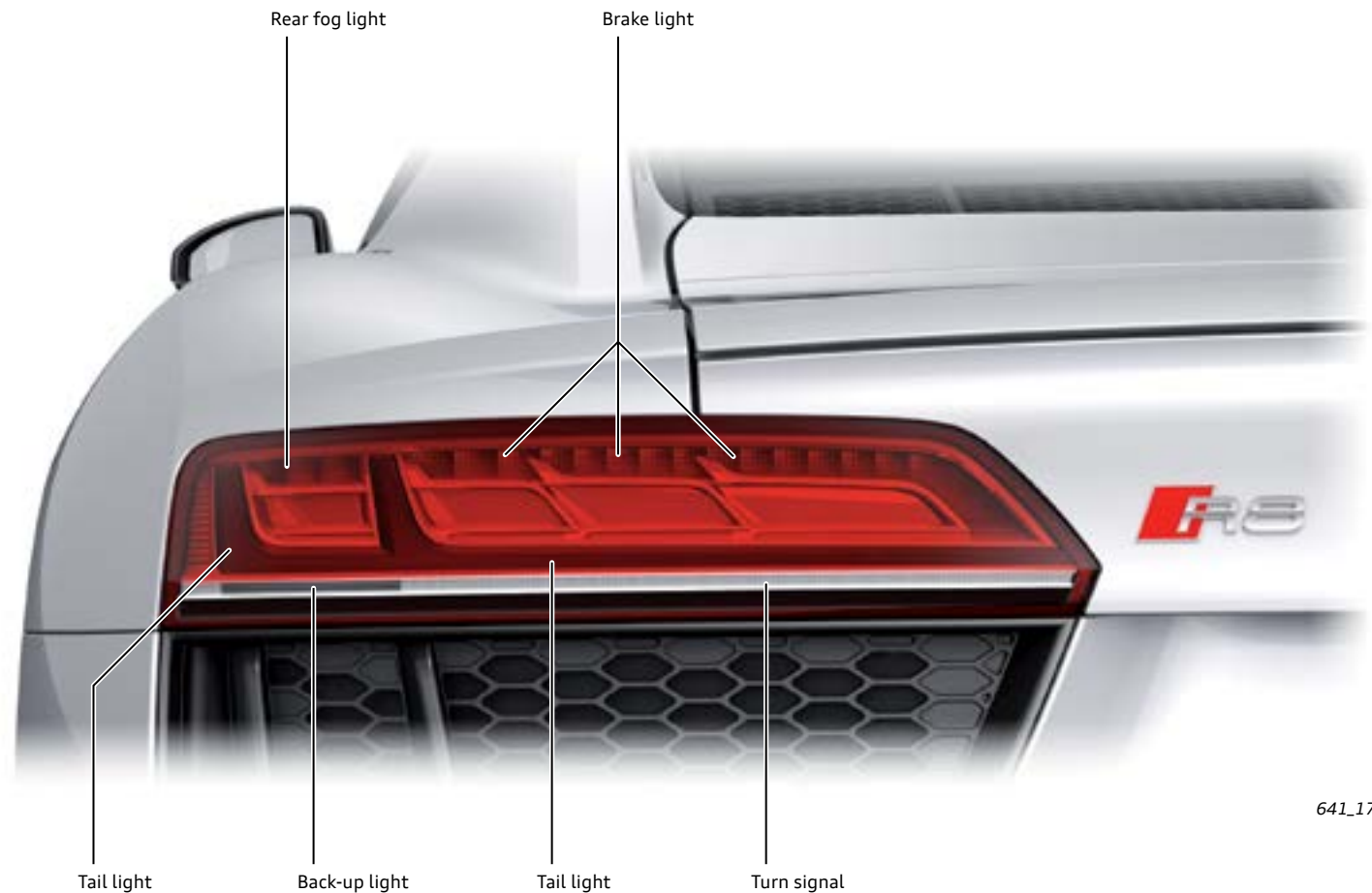
Optional equipment

The LED headlights are combined with High beam assist.

Tail lights

The tail lights of the Audi R8 are integrated in the rear body side sections and border the bumper cover or the ventilation grilles at the bottom. Only LEDs are used for lighting.

The sequential turn signal function has an additional electronic module in the tail light. The sidemarkers for the North American Region are not integrated in the tail lights, but rather have been transferred to the body side sections of the vehicle as separate lights.



641_173

Activation

The tail lights are activated by Comfort System Central Control Module J393. J393 also determines whether sequential or conventional turn signaling is required.

The tail light LEDs are used for the Coming Home/Leaving Home function.

Service

Neither individual LEDs nor the electronic components for "dynamic turn signal operation" can be replaced on the tail lights. In case of damage, the entire tail light must be replaced.

Audi drive select

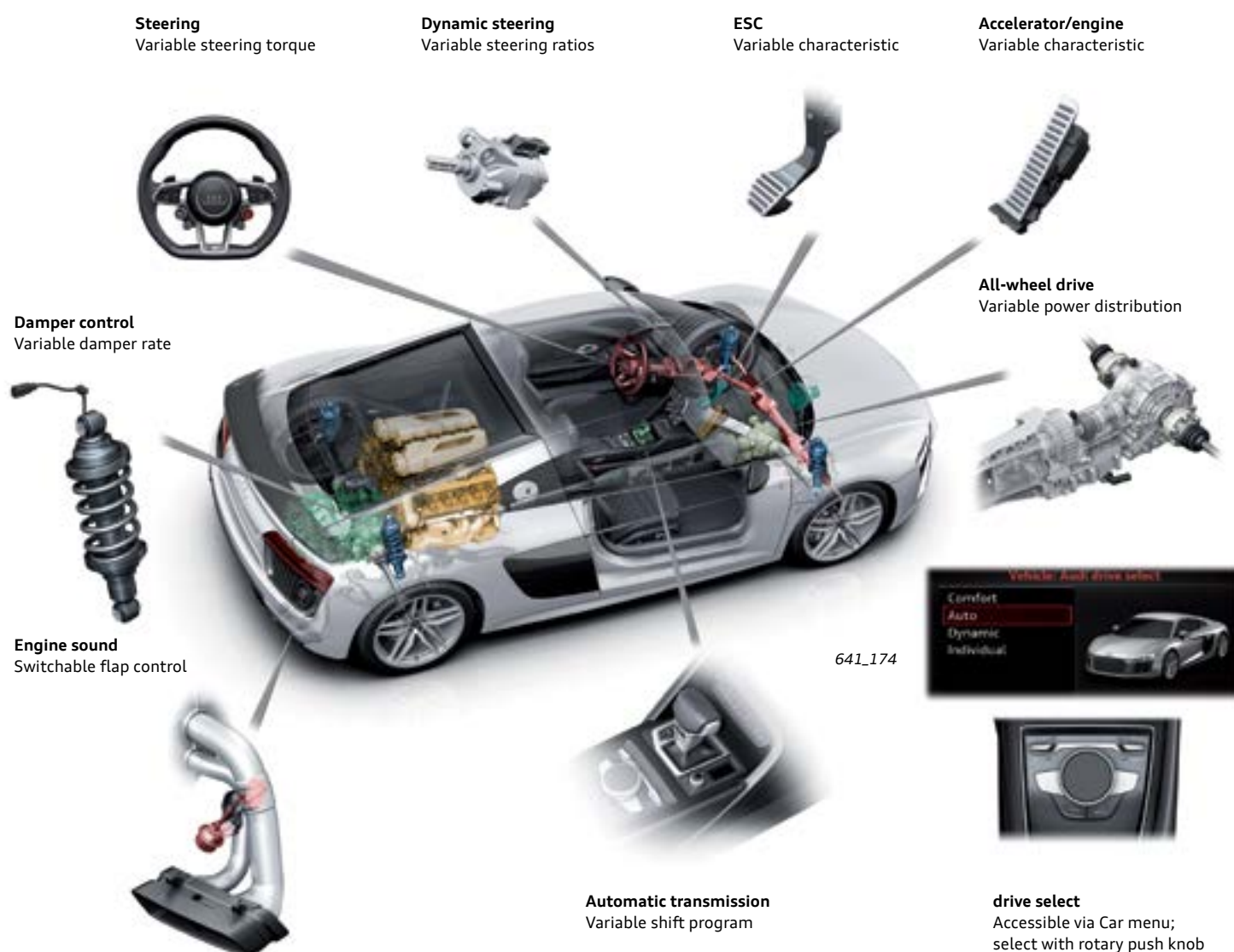
Functional characteristics

The Audi R8 is equipped with the Audi drive select system. With Audi drive select, it is possible to modify the vehicle characteristic. The mode can be changed when the car is stationary or while driving.

The systems shown in the illustration below can be controlled via the Audi drive select system.

In the Audi R8 the driver can select between the following drive modes: Comfort, Auto, Dynamic, Individual and Performance.

The Audi drive select system can be set using the Audi drive select button in the steering wheel or using the Car menu via Multimedia System Control Head E380. The selected mode is always displayed in the Audi virtual cockpit.



Audi drive select function

The tables below show the functional characteristics of all systems which form the Audi drive select handling system.

Standard equipment

	comfort	auto	dynamic	individual
Accelerator/engine	balanced	balanced	sporty	comfort, auto, dynamic
Automatic transmission	balanced	balanced	sporty	
Steering	comfortable	balanced	sporty	
All-wheel drive	stable	stable	sporty	
ESC	full system	full system	full system	
Engine sound ²⁾	balanced	balanced/sporty ³⁾	sporty	
Dynamic steering ²⁾	balanced and indirect	balanced and indirect	sporty and direct	
Damper control ²⁾	comfortable	balanced	sporty	

Optional equipment¹⁾

	Performance - dry	Performance - wet	Performance - snow
Accelerator/engine	performance ⁴⁾	performance ⁴⁾	performance ⁴⁾
Automatic transmission	performance ⁵⁾	performance ⁵⁾	performance ⁵⁾
Steering	sporty	sporty	sporty
All-wheel drive	performance (neutral in dry conditions)	performance (neutral in wet conditions)	performance (neutral in snow)
ESC	performance	performance	performance
Engine sound ²⁾	sporty	sporty	sporty
Dynamic steering ²⁾	sporty and direct	sporty and direct	sporty and direct
Damper control ²⁾	balanced	balanced	comfortable

¹⁾ Standard with V10 plus

²⁾ Optional equipment

³⁾ Depending on selector lever position

⁴⁾ Accelerator map, load shock absorption, idling speed boost, engine sound during acceleration

⁵⁾ Shift point adjustment, torque increase during upshifting, no automatic upshifting in **M** mode

Multifunction steering wheel

Two steering wheels are available for the Audi R8. A new multifunction steering wheel, the R8 sport leather steering wheel (PR 2ZC), is standard. The "drive select" and "START ENGINE STOP" buttons are integrated. The individual drive select modes can be selected using the "drive select" button. Because the Audi R8 has a keyless start system, the "START ENGINE STOP" button is used to switch the ignition on and off as well as to start and stop the engine.

The optional R8 performance leather steering wheel (PR 2FJ) has 2 additional buttons.

- › The engine sound button adjusts the engine sound directly by opening or closing the exhaust flap.
- › The "wet" performance mode is activated by pressing the Performance button. If performance mode is active, the adjusting ring can be used to select from the following modes:
 - › "snow".
 - › "wet".
 - › "dry".

If performance mode is selected, the vehicle switches to an even more sporty setup.

The driver can exit performance mode in the following ways:

- › Pressing the Performance button the vehicle now switches back to the previous Audi drive select setting.
- › Pressing the "drive select" button: the vehicle now switches back to the previous Audi drive select setting.
- › Pressing the rotary push knob on the MMI when the Car menu is open: the vehicle now switches back to the previous Audi drive select setting.
- › Switching the ignition off and on again: the vehicle now switches back to the Audi drive select setting "dynamic".

Multifunction Steering Wheel Control Module J453 records all button movements and relays the signals to Steering Column Electronics Control Module J527. J527 transfers this information via CAN to the relevant control modules. To ensure a rapid transfer of shift commands, all movements of the steering wheel shift paddles are transmitted by discrete wires to Transmission Control Module 2 J1006. The Start Engine Stop button is also connected directly to Comfort System Central Control Module J393.

Multifunction Steering Wheel Control Module J453 is diagnosed using Address Word 16.



Display in Engine sound "Sport" mode

641_079



Display in Performance mode "snow" setting

641_080



Display in Performance mode "wet" setting

641_081



Display in Performance mode "dry" setting

641_082



641_083

Audi drive select button

START ENGINE STOP button

Audi R8 standard leather steering wheel



641_084

Audi drive select button

Performance button with
adjusting ring for selecting the
snow, wet and dry modes

Engine sound button

START ENGINE STOP button

Audi R8 performance leather steering wheel

Infotainment

As in the 2016 Audi TT, the second generation of the Modular Infotainment Platform (MIB 2) is installed in the Audi R8.

Because the layout of the controls as well as all displays is focused entirely on the driver, the Audi R8 does not have a separate MMI display. All MMI displays are rendered in the Audi virtual cockpit.

The operating concept of the Audi TT has also been adopted for the Audi R8. The standard multifunction steering wheel enables the driver to control virtually all functions without looking away from the road.

MMI Navigation plus (i8H) with Audi connect (EL3)

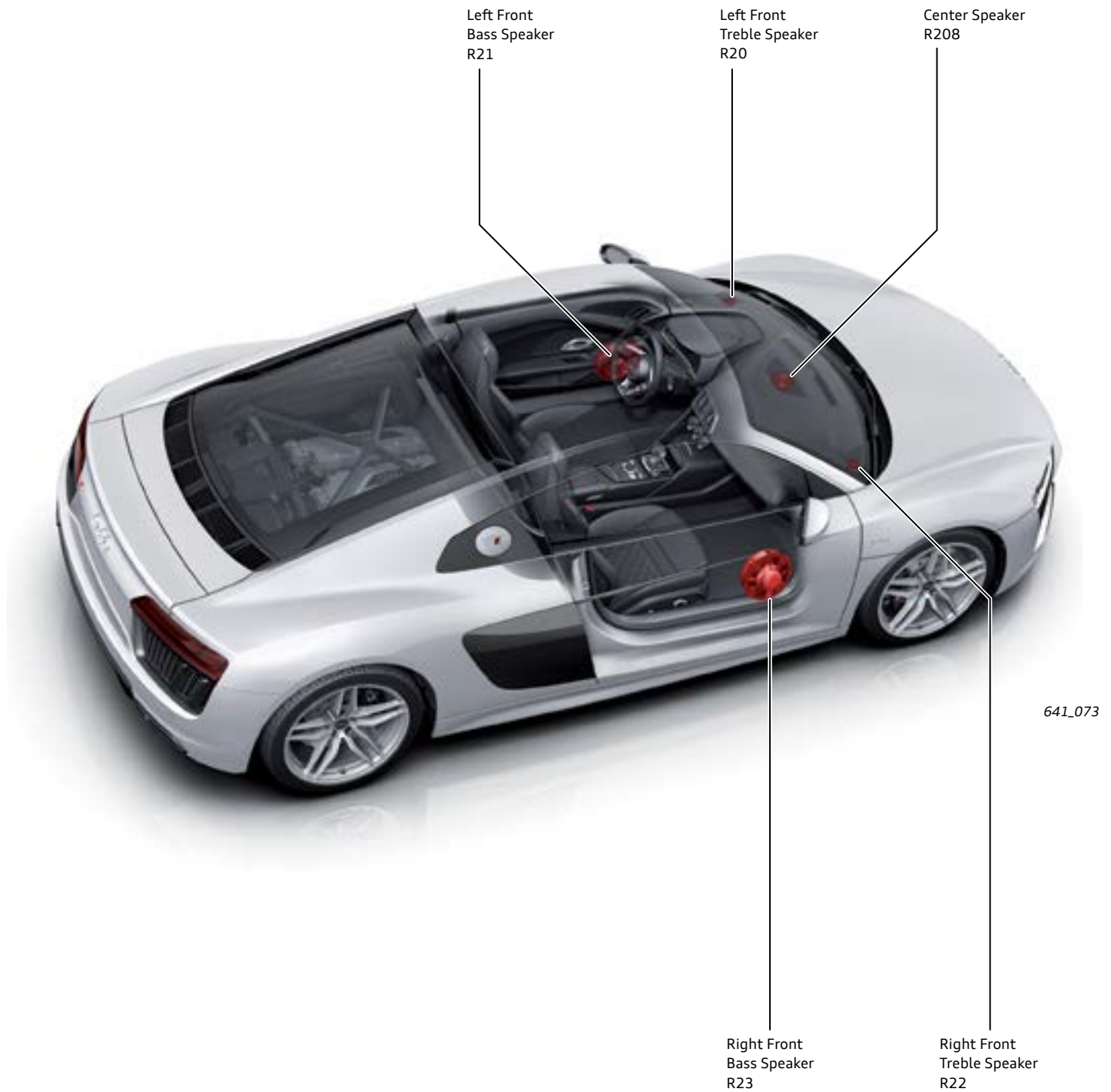


Audi virtual cockpit (9S8)
3D SSD navigation system (7UG) ¹⁾
MMI touch (UJ1)
Multifunction steering wheel, high version (2PF)
AM/FM radio with phase diversity and background tuner
Jukebox (approx. 11 GB)
DVD drive (audio/video)
2 SDXC card readers
Audi music interface with two USB ports and AUX-IN jack (UE7)
Audi sound system (9VD)
Bluetooth interface for HFP and A2DP (9ZX)
SiriusXM® Satellite Radio with 90-day trial subscription
Bang & Olufsen Sound System (9VS) (standard on R8 V10, optional on R8 V10 plus)
HD radio technology
Audi connect
INRIX XD® Traffic (req. Audi connect® subscription) Audi music interface with two USB ports BLUETOOTH® streaming audio for compatible devices BLUETOOTH® wireless technology preparation for compatible mobile phones

Sound systems

Audi sound system

The Audi sound system is standard equipment on the R8 V10 plus. It has five speakers and delivers a total of 140 watts power. The speakers are powered through Information Electronics Control Module 1 J794 and can be diagnosed individually.

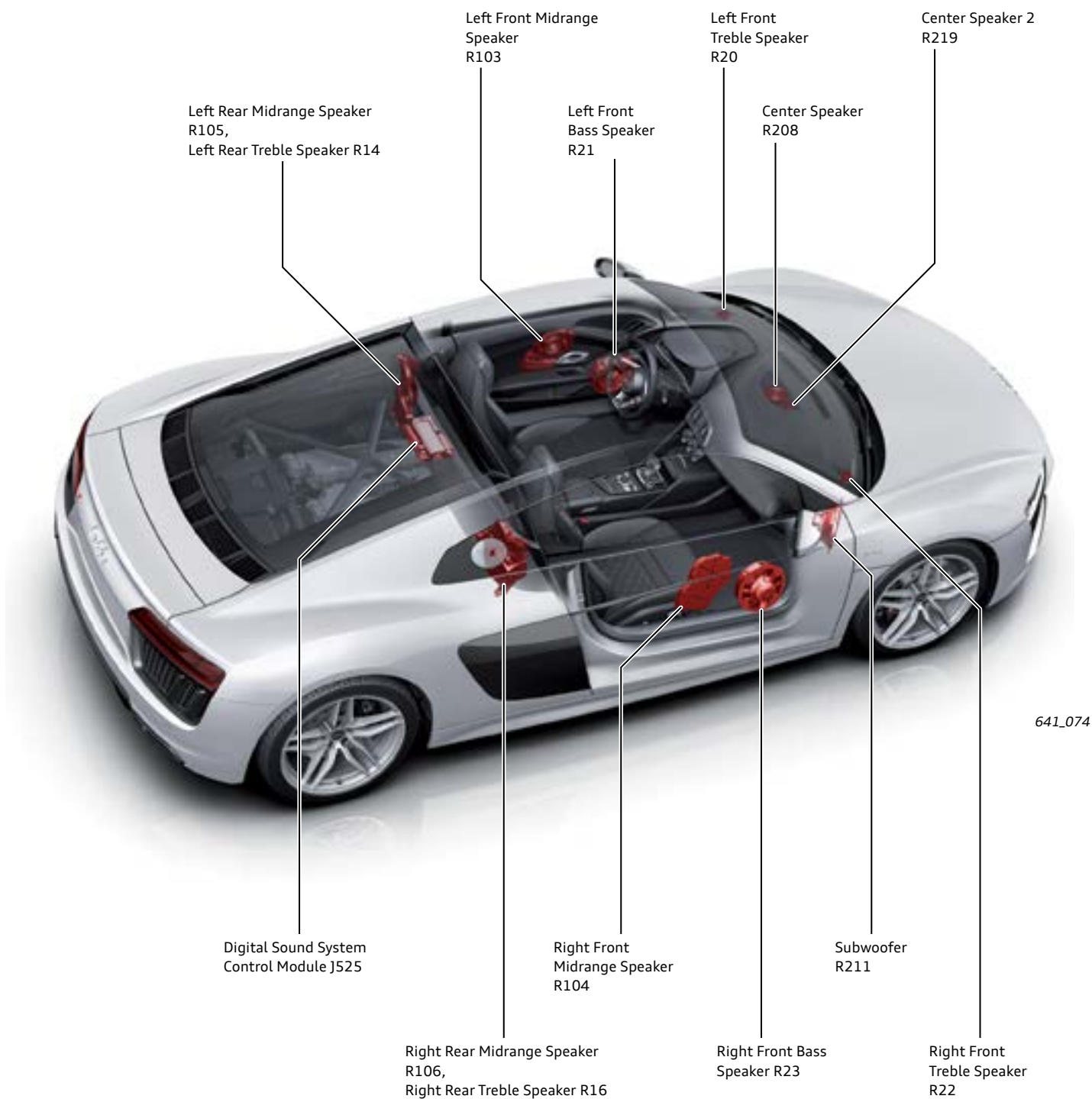


Bang & Olufsen Sound System

The Bang & Olufsen sound system is standard equipment for the R8 V10 and optional for the R8 V10 plus model. It has 13 speakers with a total power output of 550 watts.

The speakers are amplified by Digital Sound System Control Module J525 which is located behind the left seat. It is connected to Information Electronics Control Module 1 J794 via the MOST bus.

To ensure there is enough bass volume, a subwoofer is installed in the front passenger footwell in addition to the two woofers in the front doors. The subwoofer membrane is installed facing outwards towards the wheel arch. It can be removed and installed via the footwell after taking out the glove box.



Safety belt microphone

Safety belt microphones are integrated in both safety belts. An additional conventional microphone is installed in the overhead module. Seat Belt Microphone Control Module J886 monitors and controls which microphone is used.

The safety belt microphones are only used if the driver's safety belt is fastened. Otherwise, the microphone in the overhead module is used. The signals from the safety belt microphones are sent first to Airbag Control Module J234 via the Infotainment CAN and then to J886. J886 also receives information about the status of the front passenger - activated or not activated.

If the driver's safety belt is not fastened, nor the passenger side airbag activated, the passenger side microphone is not used.

The safety belt microphone consists of three microphone capsules. The wires for the individual capsules are woven into the safety belt. When the safety belt microphone is active, J886 continuously monitors which of the three capsules is delivering the best signal and sends that signal to Information Electronics Control Module 1 J794.

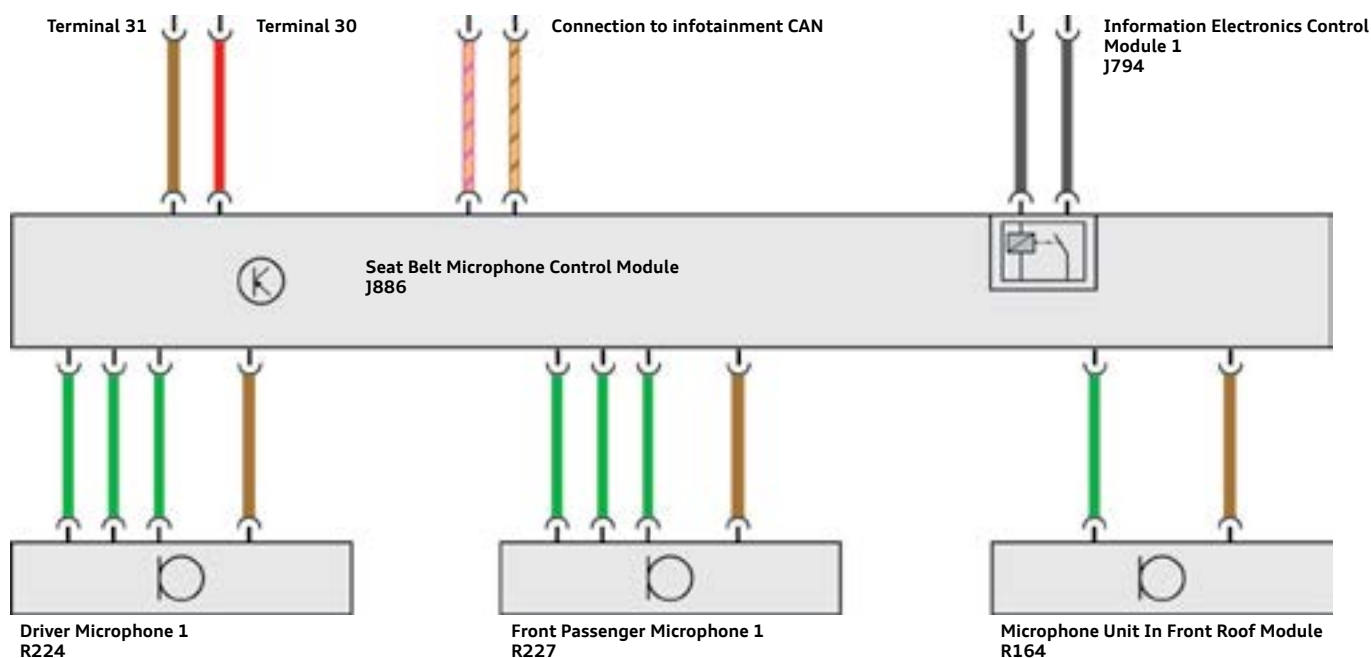
Seat Belt Microphone Control Module J886 is not active until it receives a voltage signal from J794 indicating there is a phantom feed through "micro 1" wire. When activated, J886 has self-diagnostic capability and can be accessed through Address Word A6.

If J886 loses voltage or is defective, an internal relay establishes a direct connection between the roof microphone and Information Electronics Control Module 1 J794.



641_077

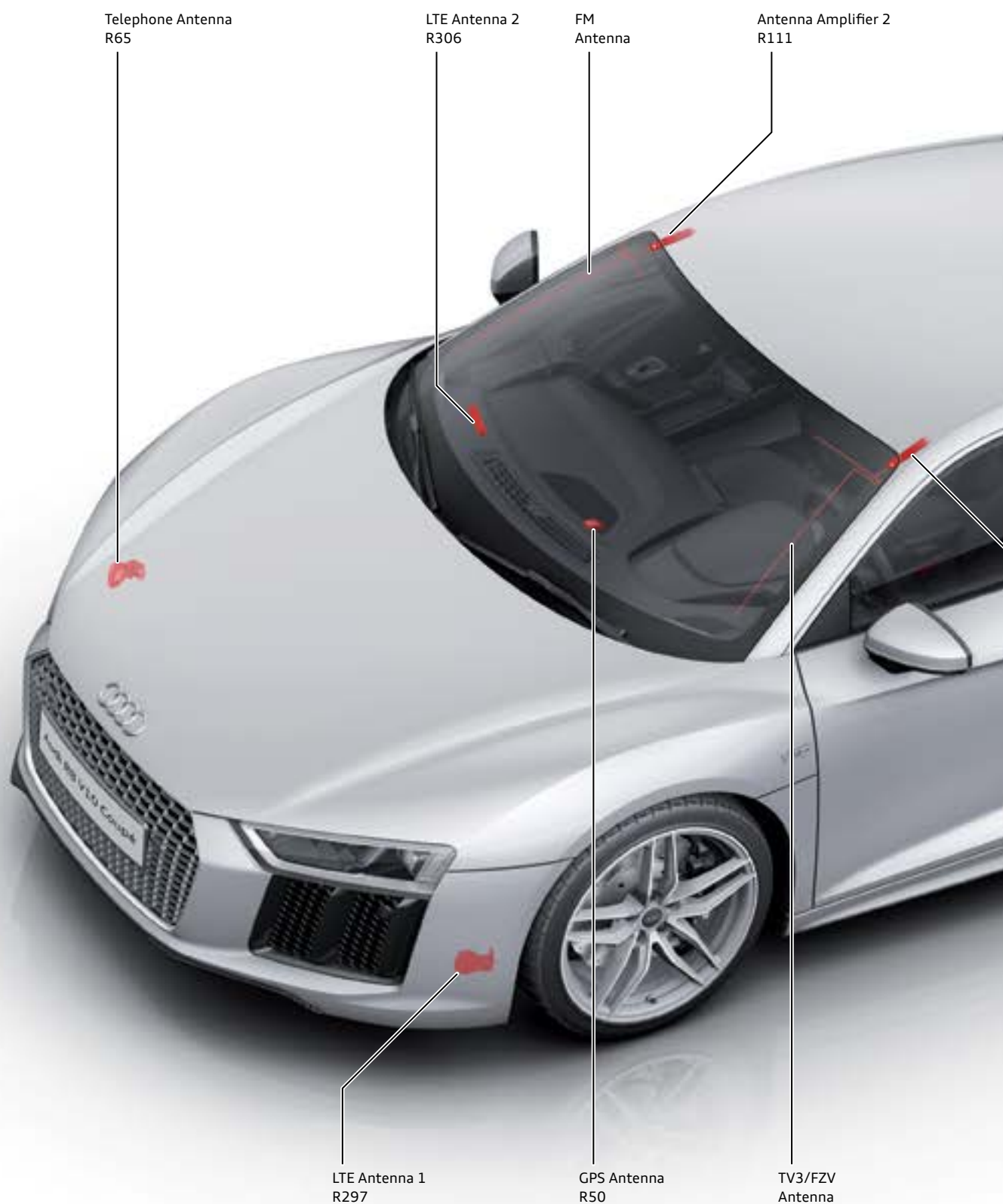
Microphone capsules



641_078

Antenna overview

The antennas of the R8 are located throughout the vehicle. Installation is dependent on vehicle specification. Only the antennas needed for a particular feature are installed.



AM/FM1
Antenna

641_076



Antenna Amplifier 3
R112

Satellite Antenna
R170

Antenna Amplifier
R24

641_075

Climate control

Introduction

The 2017 Audi R8 is equipped with a single zone automatic climate control system.

Six servomotors are used to control air flow and temperature. They are all identical in design and connected in series to Front A/C Display Control Head E87. The servomotors must be programmed via the Basic settings/auto-addressing procedure using the VAS Scan Tool if replaced.

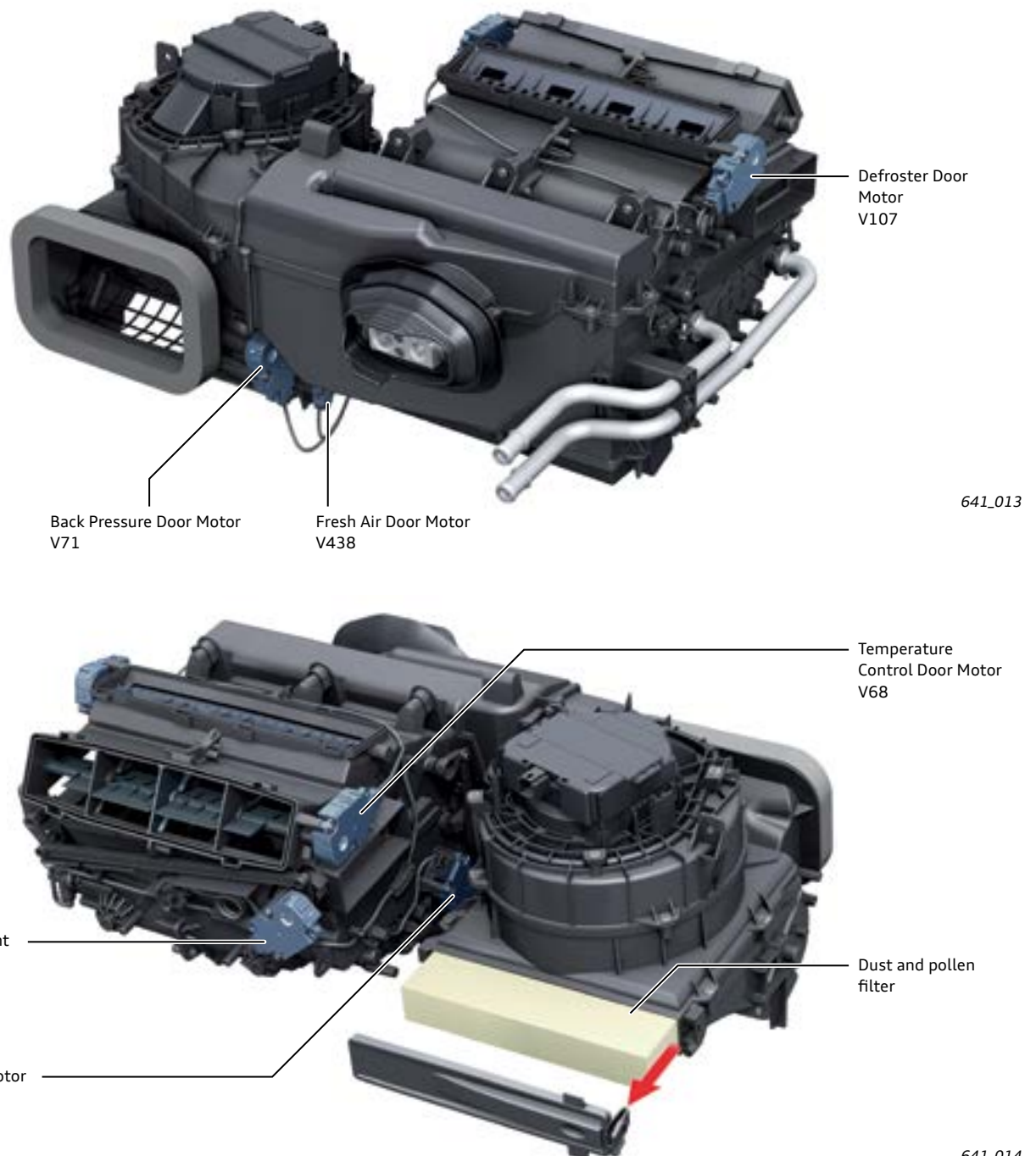
E87 is connected to the display and operation CAN bus and can be accessed using the VAS Scan Tool under Address Word 08.

Climate control operation is supported by:

- › Sunlight Photo Sensor G107 (discrete wiring to E87).
- › Combined Air Quality Sensor G238 and Humidity Sensor In Fresh Air Intake Duct G657.
- › High Pressure Sensor G65.
- › Humidity Sensor G355.

G238/G657, G65 and G355 are LIN bus participants connected to Vehicle Electrical System Control Module J519. Their data is provided to A/C Display Control Head E87 via Data Bus On Board Diagnostic Interface J533.

Servomotors



Front A/C Display Control Head E87

E87 has three turn-and-push knobs. The center turn-and-push knob has a display which can be used to set the cabin temperature.

The seat heater buttons are located in a row of buttons above the turn-and-push knob.

E87 has two cabin temperature sensors. Depending on software version of control unit E87, either one of or both of the sensors may be active. If both the temperature sensors are active, the hardware computes a valid value from the data provided.



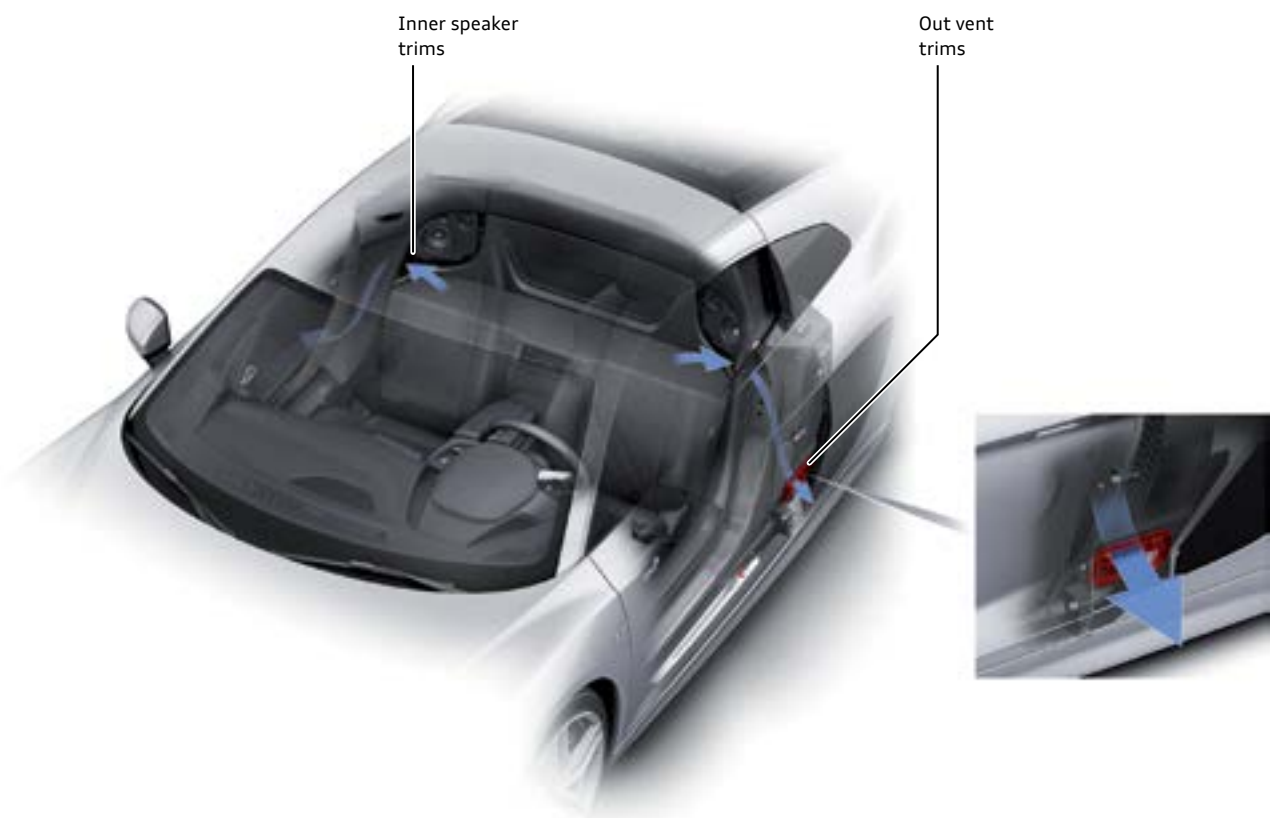
641_015

Passenger compartment ventilation

As with all Audi models, the R8 has a forced air ventilation system. This prevents the build-up of over-pressure when closing a door.

Air flows from behind the parcel shelf towards the 'B' pillars and then through the speaker trims towards the Audi Space Frame body.

The air flows through body intakes to both vent trims located behind the doors on the exterior of the lower 'B' pillars.



641_018

Refrigerant circuit

The refrigerant circuit has two condensers. They are identical in design and like the two outer engine coolant radiators, are installed at a rotation angle of 180 degrees. The refrigerant tube to and from the expansion valve is the familiar internal heat exchanger design (coaxial refrigerant line).

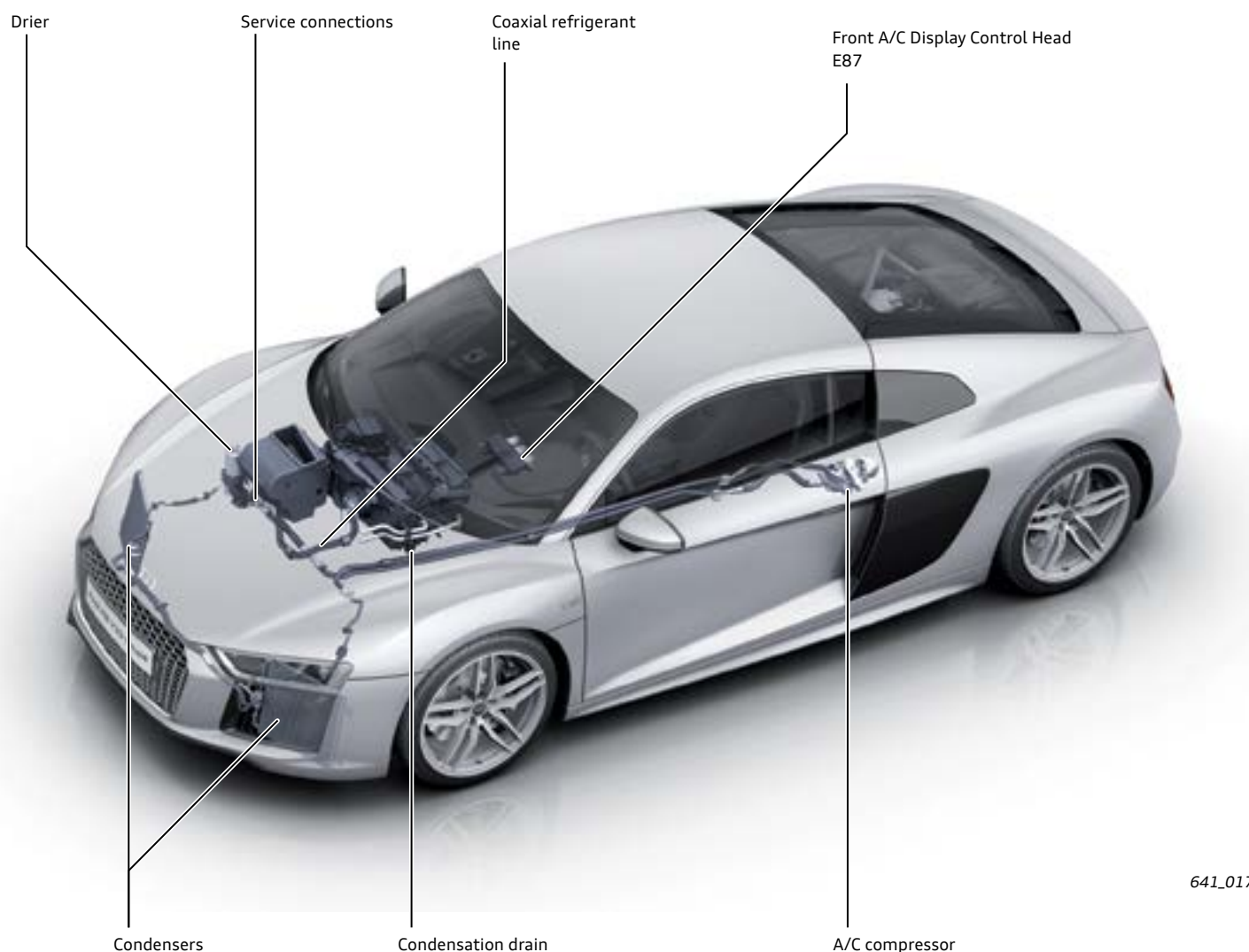
Service operations

The high and low pressure service connections for refilling refrigerant are located near the receiver/drier and can be accessed through a flap in the luggage compartment.

The A/C compressor has a direct clutch and is driven by the engine through a drive shaft. An overload cut-out that can interrupt power flow between the engine and compressor in case of compressor failure is integrated in the A/C clutch. R134 refrigerant is used in this vehicle.

After replacing the components of the refrigerant circuit, care must be taken to ensure that the system is filled with the correct level of refrigerant oil. The following quantities of refrigerant oil must be added to the refrigerant circuit after replacing the following components:

- › Replacing a single condenser: + 0.33 oz (10 ccm).
- › Replacing both condensers: + 0.66 oz (20 ccm).
- › Replacing the evaporator: + 0.66 oz (20 ccm).



641_017

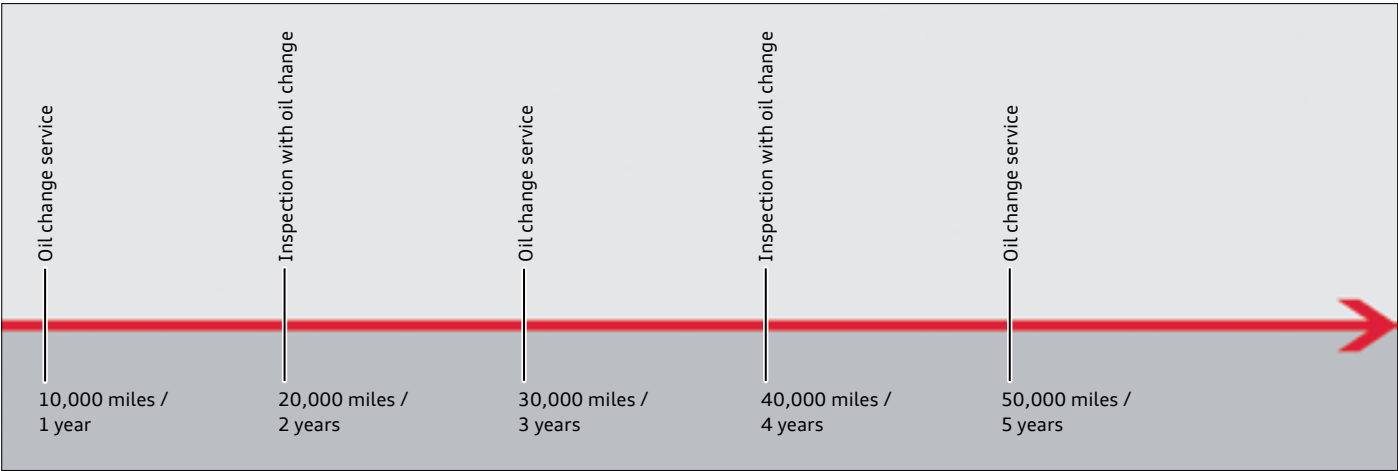
Service

Inspection and maintenance

Overview of maintenance intervals for vehicles in the USA

The Audi R8 is subject to fixed inspection and maintenance intervals in the USA and Canada.

The value for the next oil change is 10,000 miles / 365 days for new vehicles.



641_125



Note

The specifications in the current service literature generally apply.
It is important to comply with the approved oil standard when changing the oil.

Self-study programs

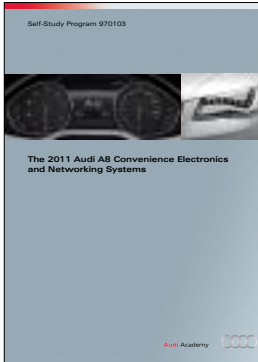
For more information about the technology of the Audi R8, please refer to the following self study programs.



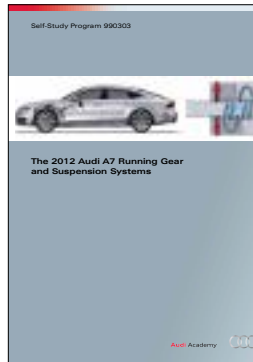
SSP 923603
The 5.2L V10 FSI Engine Design and Function



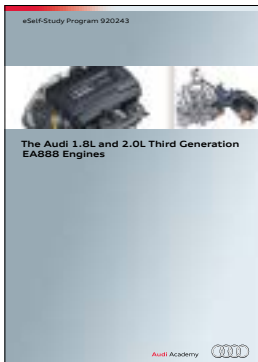
SSP 992803
Audi Dynamic Steering



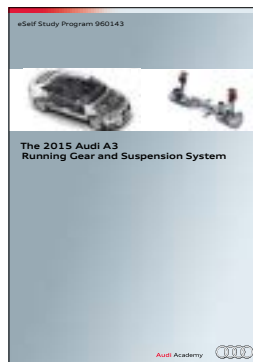
SSP 970103
The 2011 Audi A8 Convenience Electronics and Networking Systems



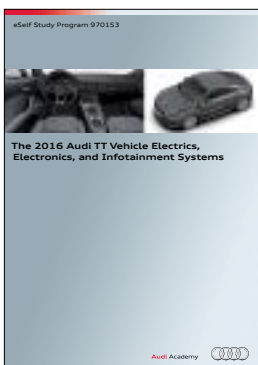
SSP 990303
The 2012 Audi A7 Running Gear and Suspension Systems



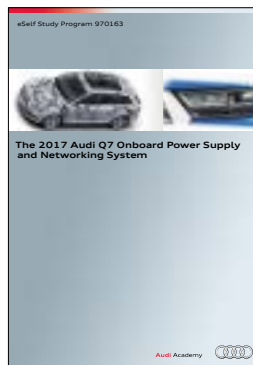
SSP 920243
The Audi 1.8L and 2.0L Third Generation EA888 Engines



SSP 960143
The 2015 Audi A3 Running Gear and Suspension System



SSP 970153
The 2016 Audi TT Vehicle Electrics, Electronics, and Infotainment Systems



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



SSP 990363
The 2017 Audi R8 Introduction



SSP 950163
Front final drive OD4

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

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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 “970173 - The 2017 Audi R8 Electrics, Electronics, and Infotainment Systems”

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Audi of America, LLC
2200 Ferdinand Porsche Drive
Herndon, VA 20171