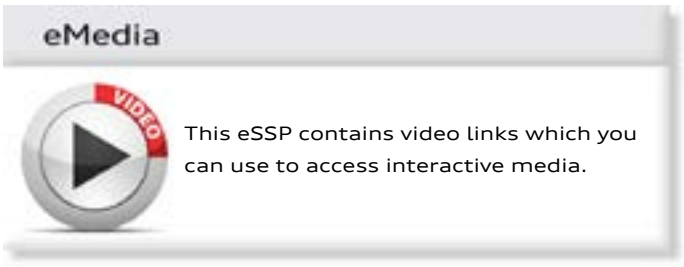
eSelf Study Program 970153

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

Audi Academy

Audi of America, LLC
Service Training
Created in the U.S.A.
Created 05/2015
Course Number 970153

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



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

All versions of the new Audi TT come with a generous range of standard equipment.

On the infotainment front, customers can choose from a wide range of options. The connectivity package features the MMI touch system incorporating a touch-sensitive touch pad. At the top of the modular range is the MMI Navigation plus with its large flash memory, two card readers, DVD drive, Bluetooth interface and voice control system. The T30 chip from the Tegra 3 series by market leader Nvidia, which is installed in the new-generation Modular Infotainment System, controls all in-car navigation and multimedia functions and displays content in the Audi virtual cockpit.

The Audi connect system complements the MMI Navigation plus perfectly – it connects the new Audi TT to the internet using the high-speed LTE transmission standard. The integrated Wi-Fi hotspot means passengers can surf the internet and E-mail as they please, while the driver can rely on the customized Audi connect services.

An optional Bang & Olufsen Sound System features a 14-channel amplifier and 12 loudspeakers; the bass loudspeakers in the doors are illuminated discretely by fiber optics.

Highly intelligent assistance systems make driving the new TT an even more pleasurable experience. As an option, the car can be equipped with Audi side assist, which uses rear-mounted radar sensors to help drivers change lane more safely.

Power supply

Battery

The battery of the Audi TT is housed in the rear of the vehicle. Battery size and type are dependent on engine version, trim and country specification.

Attached to the battery positive terminal is the main fuse box and Battery Interrupt Igniter N253.

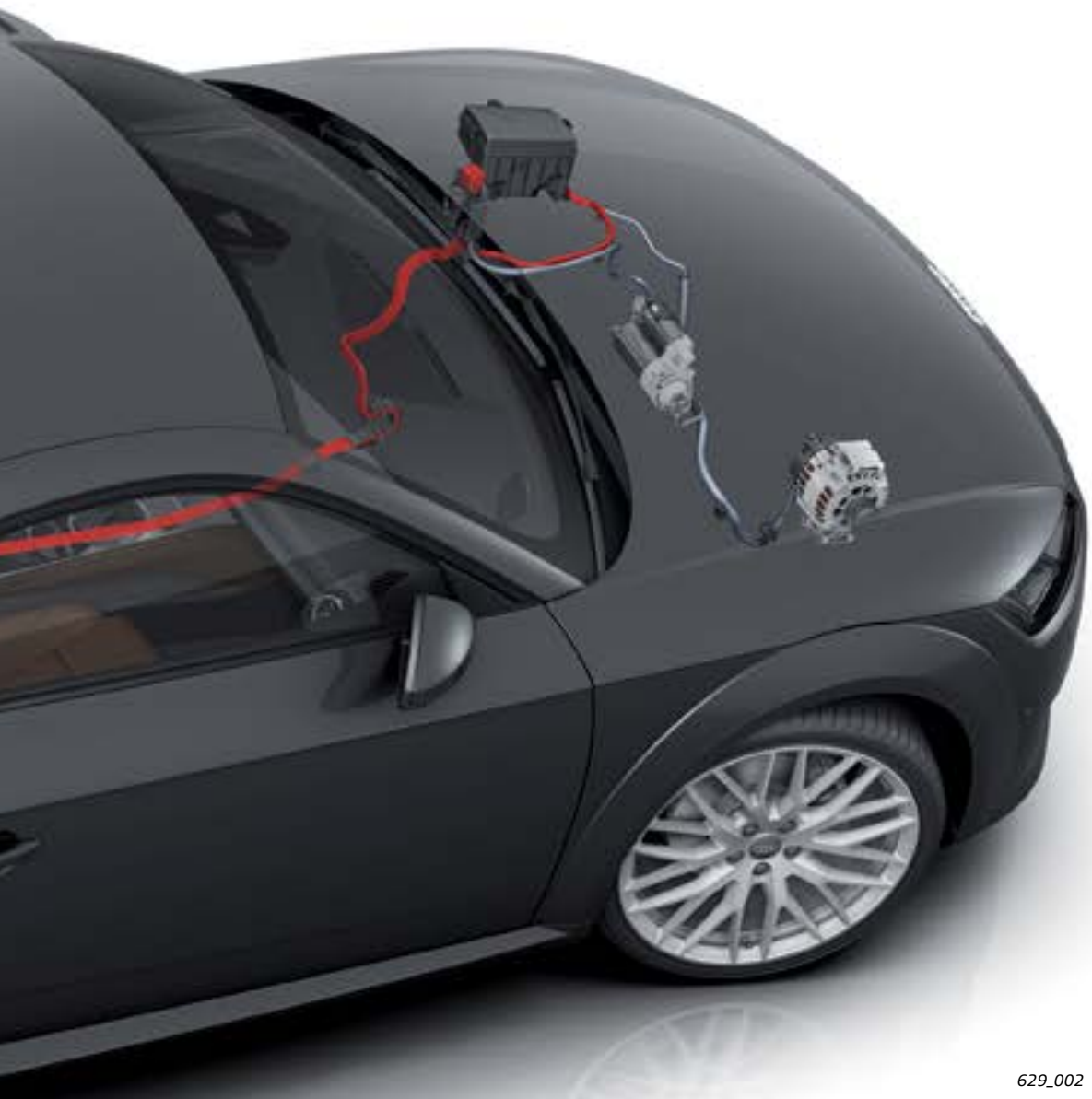
Battery Monitoring Control Module J367 (BDM) is mounted on the negative battery terminal. If the battery is replaced it must be adapted (encoded) to J367 using the VAS Scan Tool.

Positive battery cable

The positive battery cable is an advanced aluminum ribbon cable with high flexural rigidity. It is coated with a red plastic insulating layer.

Apart from its light weight, this type of main battery lead has other advantages as well:

- Because of the shape and rigidity of the rail, there is no need for additional routing devices.
- No cable ducts are required.
- More efficient use is made of available space.



629_002

The positive battery cable leaves the battery positive terminal as a flexible, round-section lead. It is routed out of the vehicle interior through a cable sleeve, becoming a ribbon cable in the rear axle area and ending at the jump start terminal on the left hand side of the engine compartment. From there, wires go to the E-box, starter and alternator.

Fuses, fuse holder and jump start terminal

In addition to standard flat fuses, space saving mini-fuses and circuit breakers (thermal fuses), the TT uses the new J-Case fuse like those of the 2015 Audi A3.

These fuses are, like the standard and mini fuses, identified in different colors.

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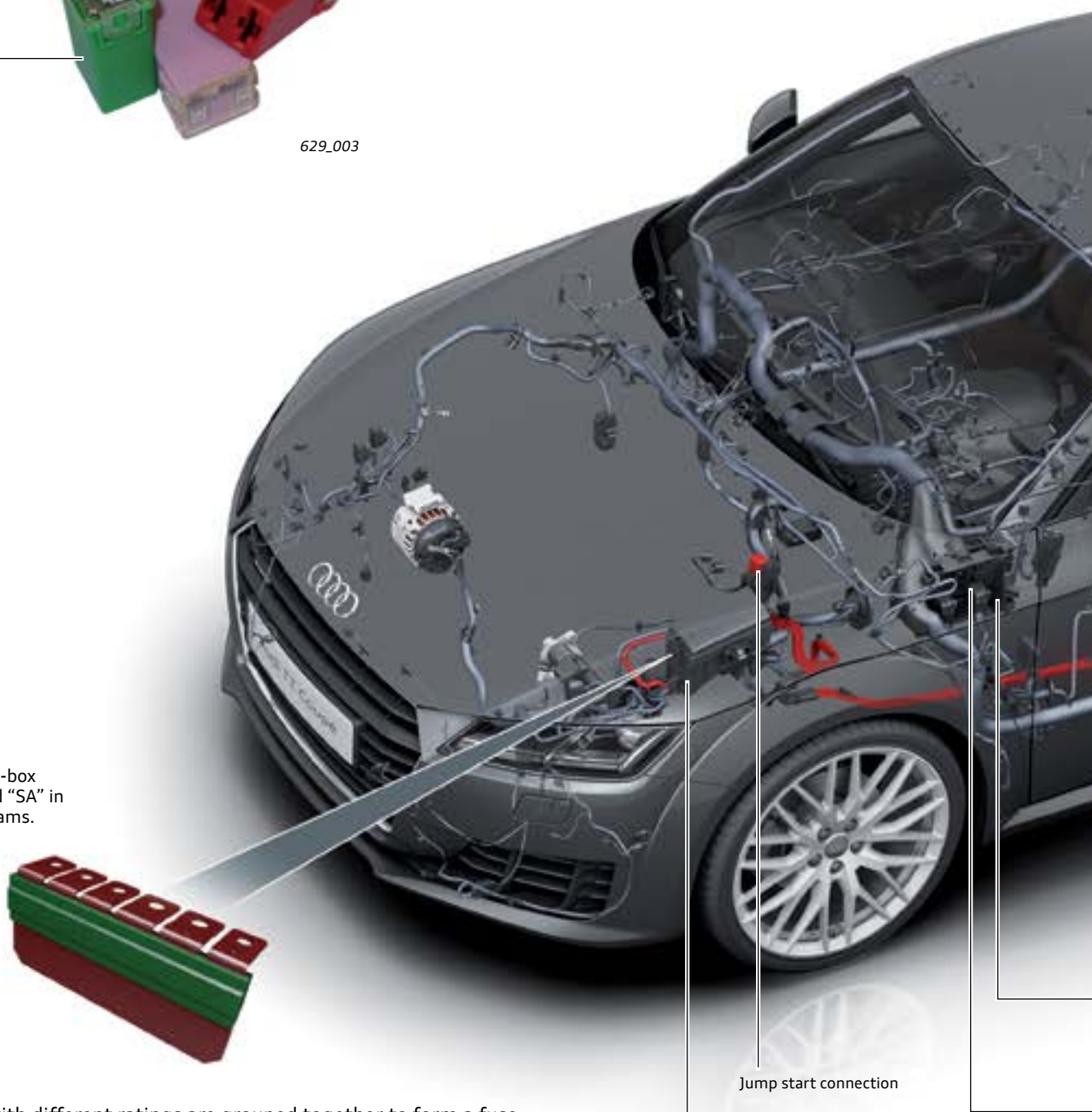
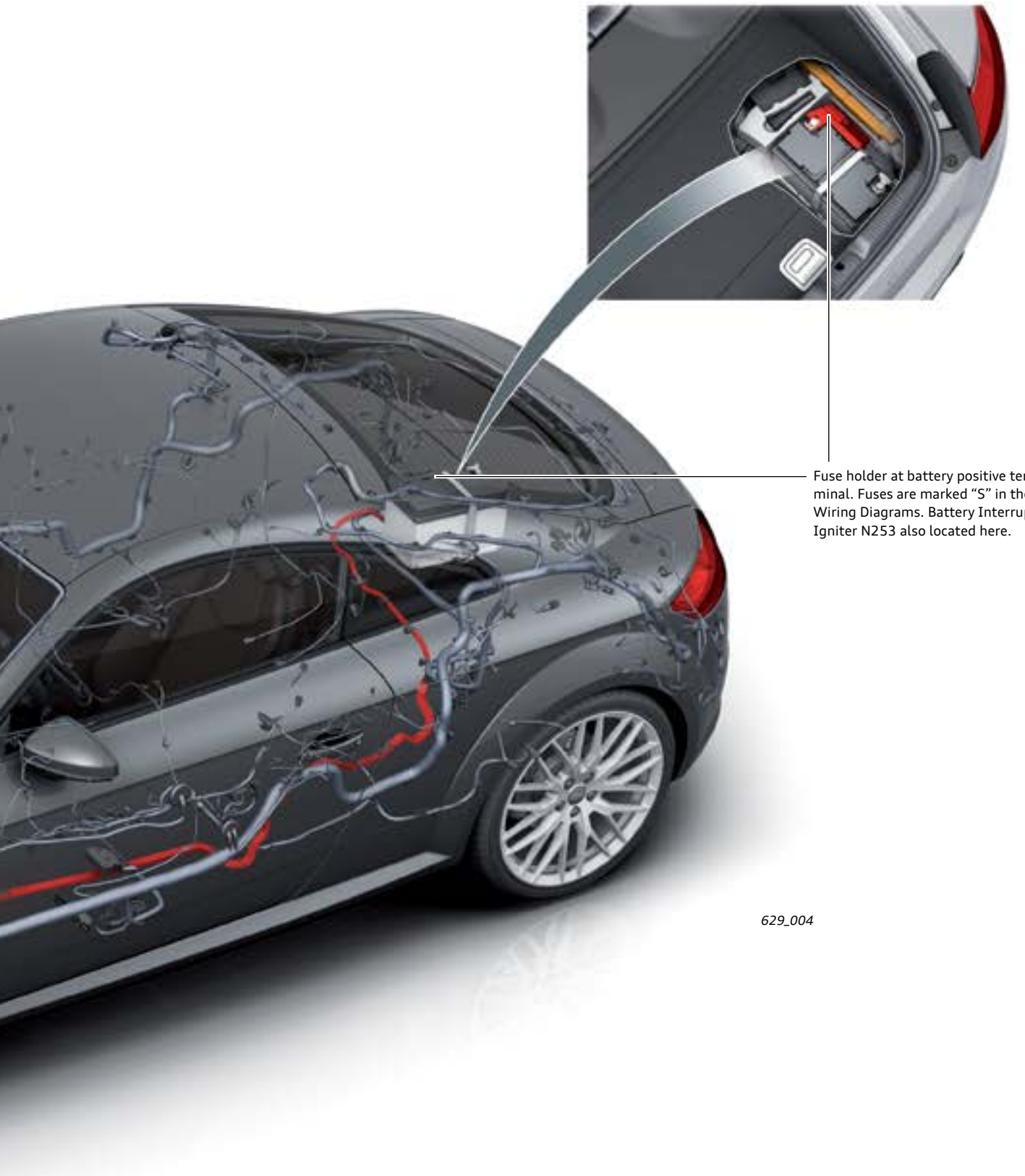


Several fuses with different ratings are grouped together to form a fuse strip or multi-fuse. The fuses protect the alternator, electromechanical power steering and the radiator fans. In the event of a fault, the complete multi-fuse must be replaced.



Fuse holder at battery positive terminal. Fuses are marked “S” in the Wiring Diagrams. Battery Interrupt Igniter N253 also located here.

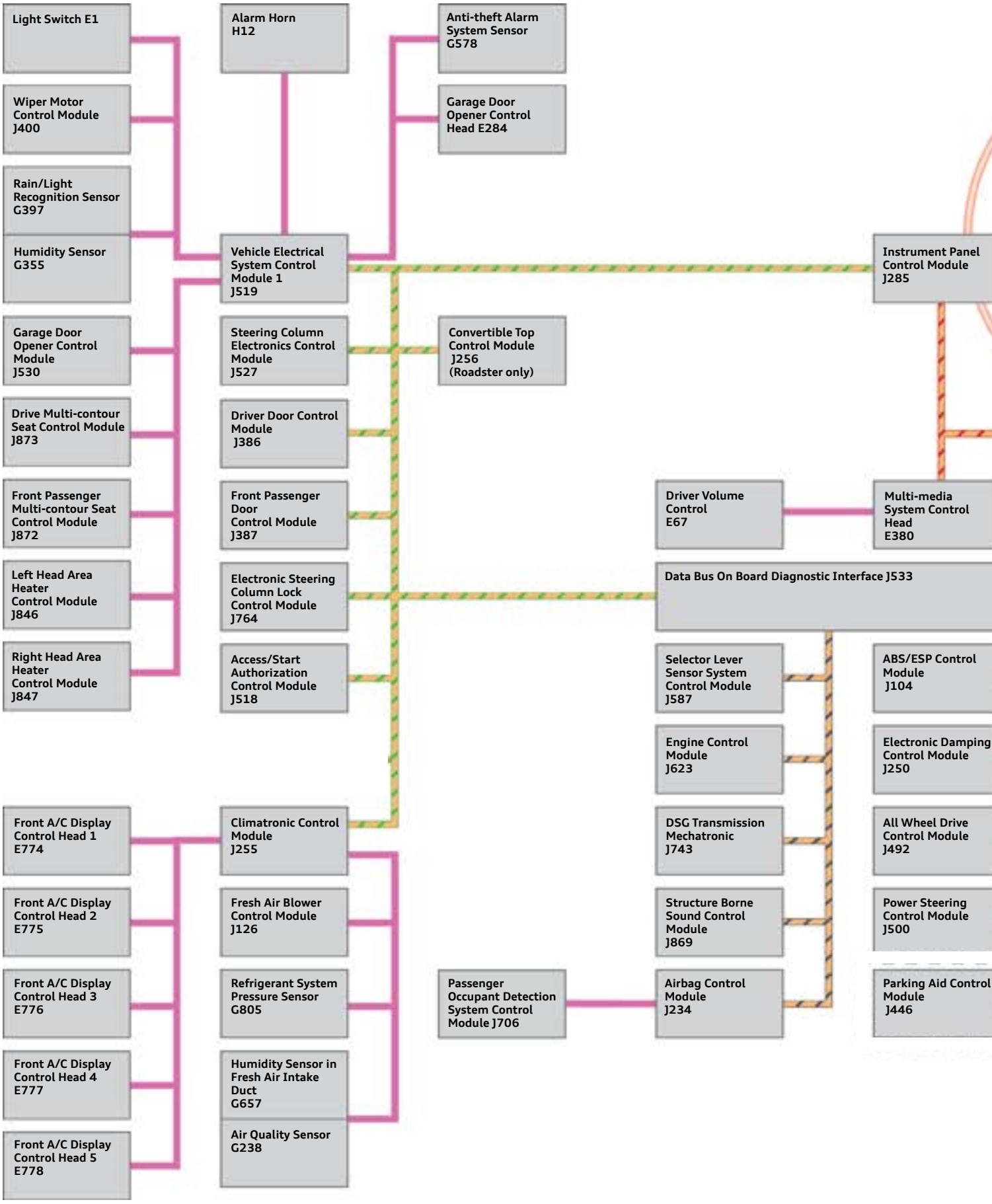
629_004

Fuse holder and relay panel under the instrument panel.
Fuses are marked "SR" in the Wiring Diagrams.

Fuse holder and relay panel under the instrument panel, left.
Fuses are marked “SC” in the Wiring Diagrams.

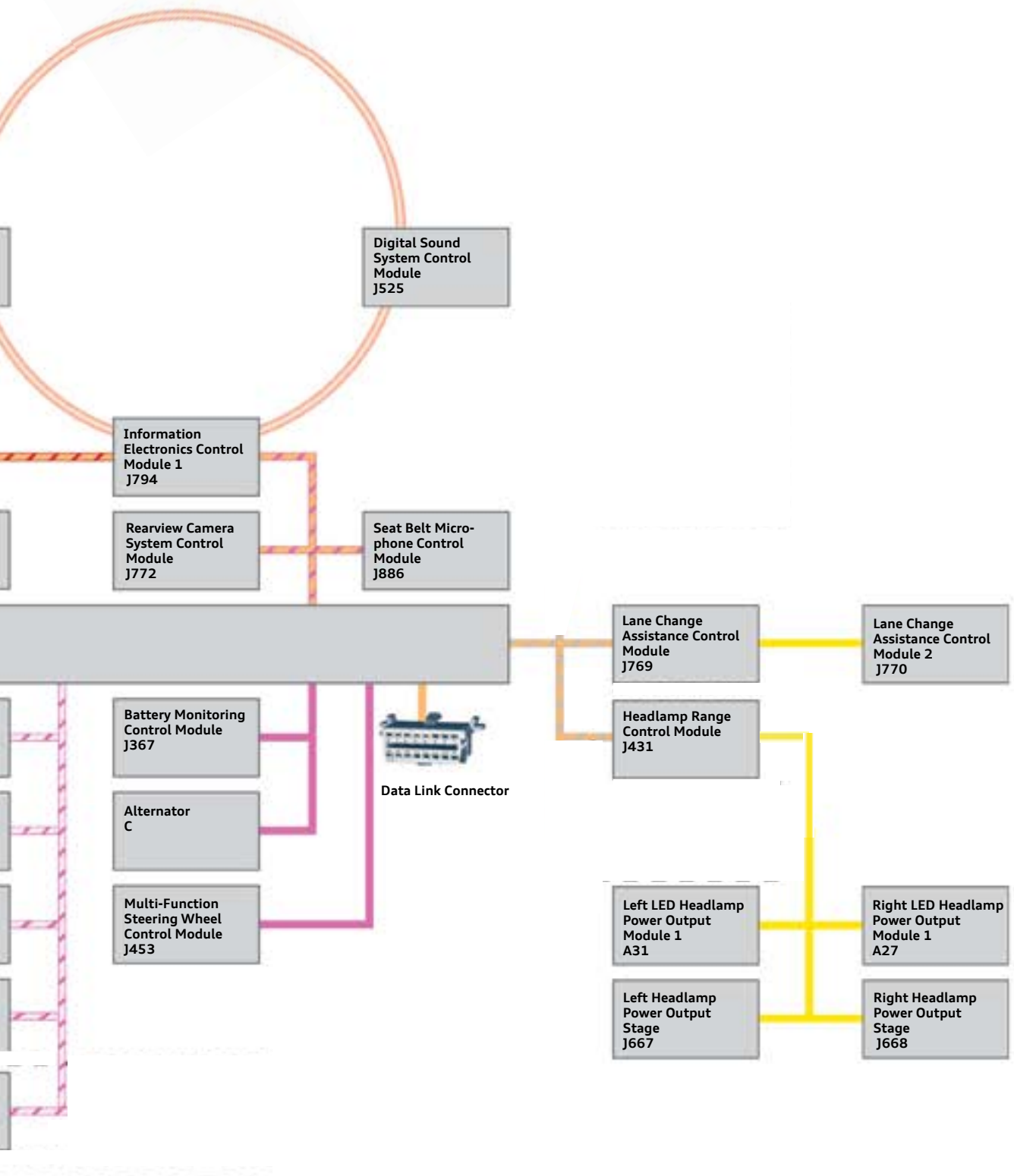
Networking

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 due to be introduced at a later date.



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Key:

- Powertrain CAN bus
- Convenience CAN bus
- Extended CAN bus
- "OR" configuration
- Infotainment CAN bus
- Diagnostics CAN bus
- Suspension CAN bus
- Modular infotainment system (MIB)
- LIN bus
- Sub-bus systems
- MOST bus

Overview of bus systems

Bus system	Cable color	Configuration	Max. data transfer rate	Property
Powertrain CAN bus		Electrical two-wire bus system	500 kbit/s	Not single wire capable
Convenience CAN bus		Electrical two-wire bus system	500 kbit/s	Not single wire capable
Extended CAN bus		Electrical two-wire bus system	500 kbit/s	Not single wire capable
Infotainment CAN bus		Electrical two-wire bus system	500 kbit/s	Not single wire capable
Suspension CAN bus		Electrical two-wire bus system	500 kbit/s	Not single wire capable
Modular infotainment system CAN		Electrical two-wire bus system	500 kbit/s	Not single wire capable
Diagnostics CAN bus		Electrical two-wire bus system	500 kbit/s	Not single wire capable
MOST bus		Optical bus system	150 Mbit/s	Ring structure: an open circuit leads to total system failure
LIN bus		Electrical single-wire bus system	20 kbit/s	Capable of single-wire operation
Sub-bus system		Electrical two-wire bus system	500 kbit/s	Not single wire capable

New features of the bus systems

- The convenience CAN and the infotainment CAN in the Audi TT are high-speed bus systems.
- New CAN bus: Modular Infotainment System (MIB) CAN.
- New MOST bus: MOST150.
- Instrument Cluster Control Module J285 is a convenience CAN bus user and a MOST150 user, and is connected to Information Electronics Control Module 1 J794 via the Modular Infotainment System CAN.
- The Data Bus On Board Diagnostic Interface J533 is the master of LIN slave Multi-function Steering Wheel Control Module J453.
- J533 interface is not integrated into the MOST bus.
- Information Electronics Control Module 1 J794 is the system and diagnostic manager for the MOST bus.
- Information Electronics Control Module 1 J794 is connected to the Multi-media System Operating Button E380 and Instrument Cluster Control Module J285 via the Modular Infotainment System CAN via the Modular Infotainment System CAN.

The networking diagram on the previous pages provide a schematic overview of the communication paths of the in-car control modules.

Which control modules are installed in the vehicle depends on its optional equipment level.

Here are a two examples:

- Automatic High Beam Assist Control Module J844 is never installed together with Drive Assistance Systems Front Camera R242.
- Passenger Occupant Detection System Control Module J706 is only used in the North American Region.

Optical bus system MOST150

History

The MOST optical data bus was installed first in the 2004 Audi A8.

The data bus system is named after the Media Oriented Systems Transport (MOST) Cooperation. This organization is composed of various automobile manufacturers, their component suppliers and software companies who joined forces to create a standardized high speed data transfer system.

The term "Media Oriented Systems Transport" denotes a network with media-oriented data transport. This means that, unlike in the CAN bus, address-oriented messages are sent to a specific recipient.

This technology is used in Audi vehicles to transfer data within the infotainment system. The data transfer rate on the MOST25 bus is approximately 25 Mbit/s.

MOST150

An advancement of the MOST technology, MOST150, was first introduced in North America in the 2015 Audi A3. MOST150 is six times faster than the MOST25 bus.

The development process necessitated making various modifications to the components of the MOST bus.

For example, the transmitter and receiver units - Fiber Optical Transmitters (FOT) - had to be adapted.

Other components such as optical connectors, the fiber optic cables and the electrical connectors of the control modules are identical to those of the MOST25 system.

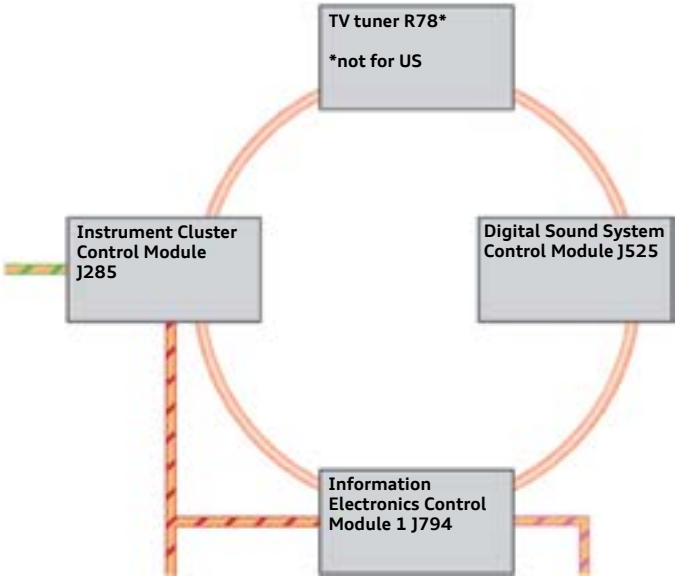
System manager

Up to four control modules are integrated into the MOST bus in the Audi TT:

- Information Electronics Control Module 1 - J794.
- Instrument Cluster Control Module J285.
- TV tuner R78 (not used in the North American market).
- Digital Sound System Control Module J525.

Information Electronics Control Module 1 J794 serves two functions:

- It is the system manager for the MOST bus.
- It is the diagnostic manager replacing Data Bus On Board Diagnostic Interface J533.



629_006

Special tool

Diagnostics

The ring break diagnosis procedure is identical to that of the MOST25 bus system. However, the Test Plans are found under Address Word 5F on the VAS Scan Tool.

Even though the ring break diagnosis procedure remains unchanged, a modified tool – VAS 6778 – must be used in the event of an optical fault in the MOST150 bus because the transmitter and receiver units in the control modules have been modified.

629_007

Control units

Brief descriptions

Onboard power supply control unit

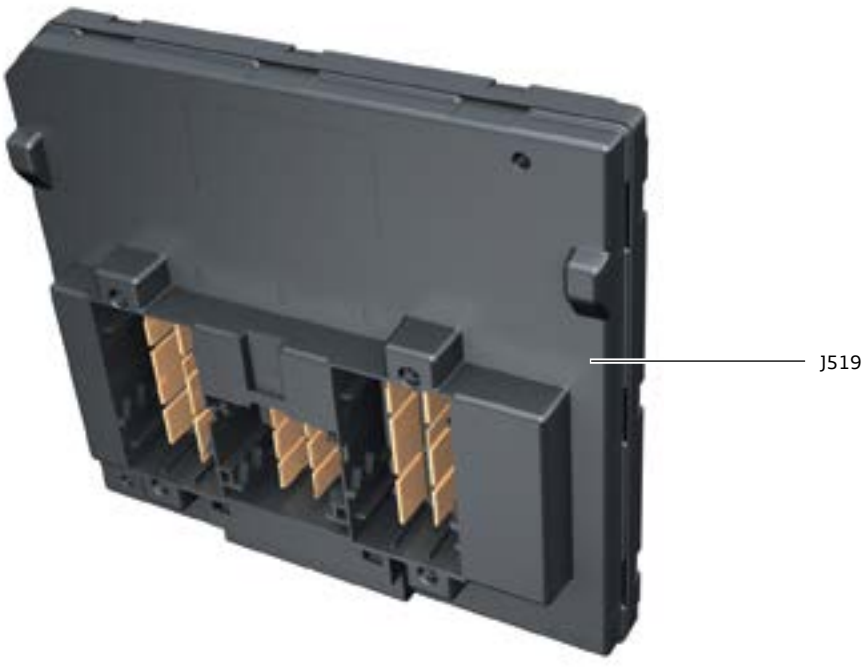
Designation	Vehicle Electrical System Control Module 1 J519
Equipment	Always installed
Installation location	Under the instrument panel, left-hand side

Tasks	▸ Central locking master
	▸ Exterior light master
	▸ Interior light master
	▸ Anti-theft alarm / optional equipment master, PR No.: 7AL
	▸ Activation of various relays
	▸ Activation of various convenience components:
	  ▸ Seat heaters
	  ▸ Heated windshield washer spray jets
	  ▸ Windshield washer pump
	  ▸ Headlight washer system pump
	▸ Monitoring various switches and buttons
	▸ Monitoring various sensors

Address Word	09

Data bus communication	▸ Convenience CAN bus user
	▸ J519 is the LIN master for:
	  ▸ LIN 1 – Rain/light Recognition Sensor G397, Humidity Sensor G355, Wiper Motor Control Module J400 and Light Switch E1
	  ▸ LIN 2 – Alarm Horn H12
	  ▸ LIN 3 – Anti-theft Alarm System Sensor G578 and Garage Door Opener Control Head E284
	  ▸ LIN 4 – Garage Door Opener Control Module J530; Front Driver and Passenger Multi-contour Seat Control Modules J872 and J873

Special feature	Duplicated pins on LIN 1 and on LIN 4 Description on the next page



629_008

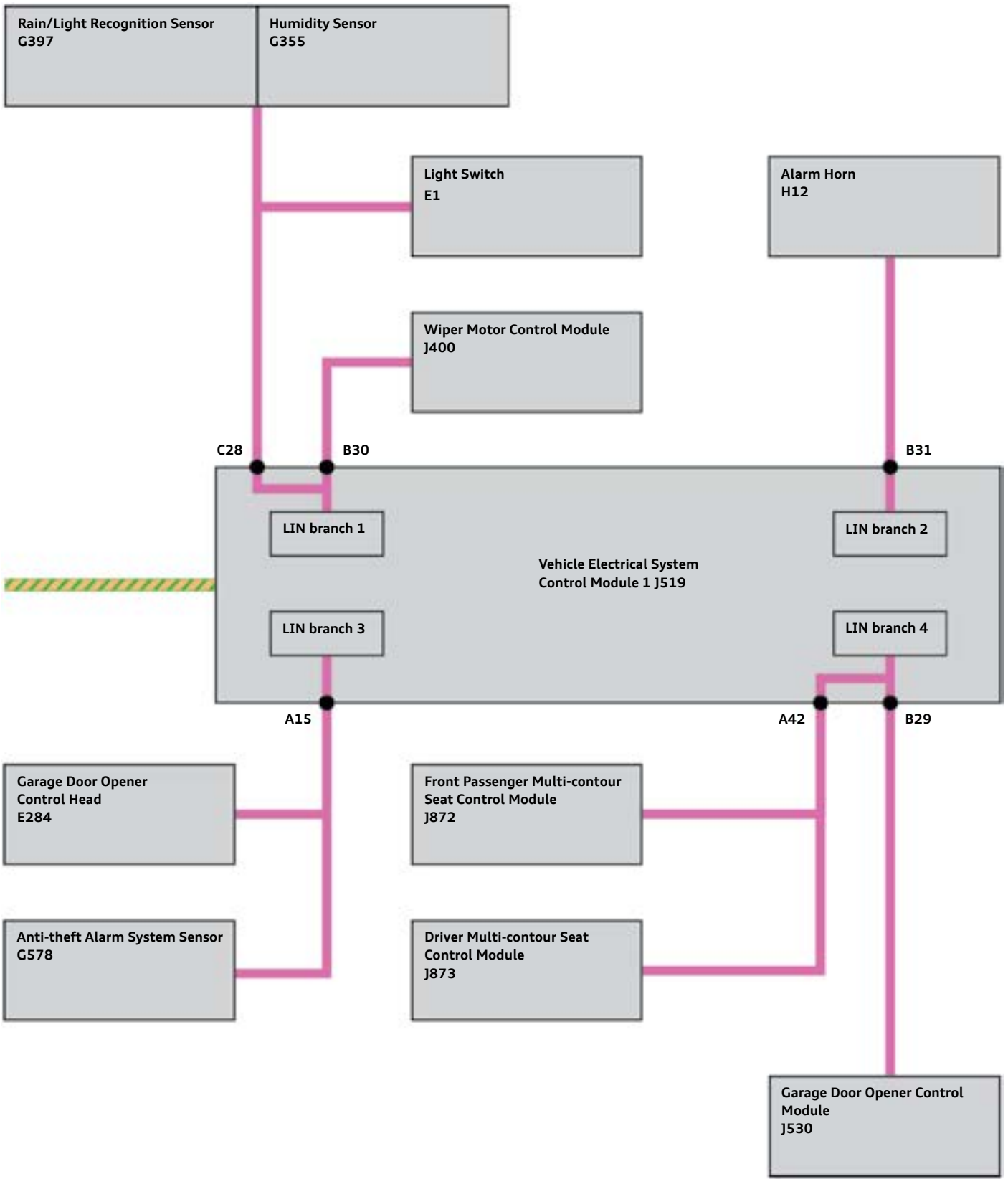
Reference

For a detailed description of Vehicle Electrical System Control Module 1 J519, see eSelf-Study Program 970343, The 2015 Audi A3 Vehicle Electronics and Driver Assistance Systems.

Duplicated pins on J519

LIN 1 is distributed to two pins at J519 (duplicated pin). Wiper Motor Control Module J400 is connected to pin B30. Connected to pin C28 are the Light Switch E1 and the combination sensors Rain/Light Recognition Sensor G397 and Humidity Sensor G355. This means that the control modules connected to pin C28 are also affected in the event of a short circuit to positive or negative at pin B30.

LIN 4 is also distributed to two pins on Vehicle Electrical System Control Module 1 J519. Garage Door Opener Control Module J530 is connected to pin B29. The Multi-Contour Seat Control Modules J872 and J873 are both connected to pin A42. This means that the control modules connected to pin A42 are also affected by a short circuit to positive or negative at pin B29, and vice versa.



629_009

Gateway

Designation	Data Bus On Board Diagnostic Interface J533
Equipment	Always installed
Installation location	Under the instrument panel, left-hand side
Tasks	▸ Network system gateway ▸ Diagnostic master (with the exception of MOST150 bus) ▸ Energy management system control ▸ Multifunction steering wheel master
Address Word	19
Data bus communication	▸ User of all CAN bus systems ▸ LIN master of Battery Monitoring Control Module J367 and the Alternator ▸ LIN master of Multi-function Steering Wheel Control Module J453
Special feature	Not a MOST bus user

629_010

Audi virtual cockpit

Designation	Instrument Cluster Control Module J285
Equipment	Always installed
Installation location	In the instrument panel (not integrated with Audi virtual cockpit)
Tasks	▸ Display of information relevant to the driver ▸ Immobiliser master
Address Word	17
Data bus communication	Convenience CAN bus user and MOST150 user and connected to the Information Electronics Control Module 1 - J794 via the Modular Infotainment System CAN
Special feature	Also displays all content shown on the MMI screen in other vehicles

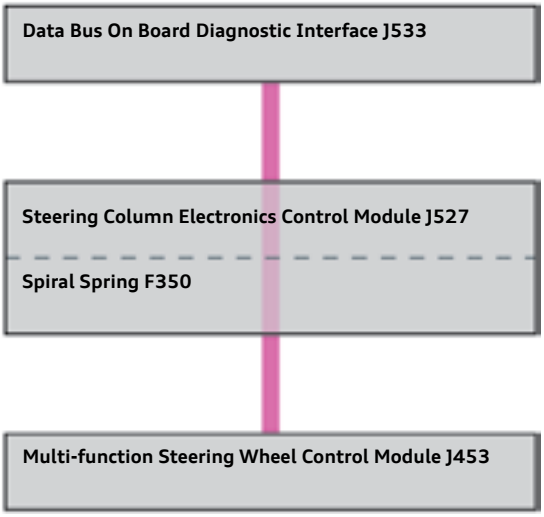
629_011

For a detailed description of the Audi virtual cockpit, please refer to eSelf Study Program 910153 "Audi Virtual Cockpit".

Steering column electronics

Designation	Steering Column Electronics Control Module J527
Equipment	Always installed
Installation location	On the steering column
Task	▸ Connecting the steering column stock and the electrical components in the steering wheel to the vehicle electronics
Address Word	16
Data bus communication	Convenience CAN bus user
Special feature	Transfers the LIN signals from Data Bus On Board Diagnostic Interface J533 (master) to the Multi-function Steering Wheel Control Module J453 (slave)

629_012



629_013

Sound actuator

Designation	Structure Borne Sound Control Module J869
Equipment	Depending on engine version
Installation location	In the plenum chamber, right-hand side, beneath the windshield
Task	Producing a sporty engine sound for the vehicle occupants
Address Word	A9
Data bus communication	Powertrain CAN bus user

629_014

Air conditioning system

Designation	Climatronic Control Module J255
Equipment	Standard equipment: automatic climate control, PR No.: 9AK
Installation location	On the instrument panel cross-member
Tasks	Controlling: ▸ Temperature ▸ Blower ▸ Air flow distribution
Address Word	08

Data bus communication	▸ Convenience CAN bus user
	▸ J255 is the LIN master for:
	  ▸ LIN 1 – Fresh Air Blower Control Module J126, Refrigerant Circuit Pressure Sensor G805, Humidity Sensor in Fresh Air Intake Duct G657 and Air Quality Sensor G238
	  ▸ LIN 2 – Front A/C Display Control Head 1 E774 to Front A/C Display Control Head 5 E778

Special feature	The control module is separate from the operating and display components

629_015

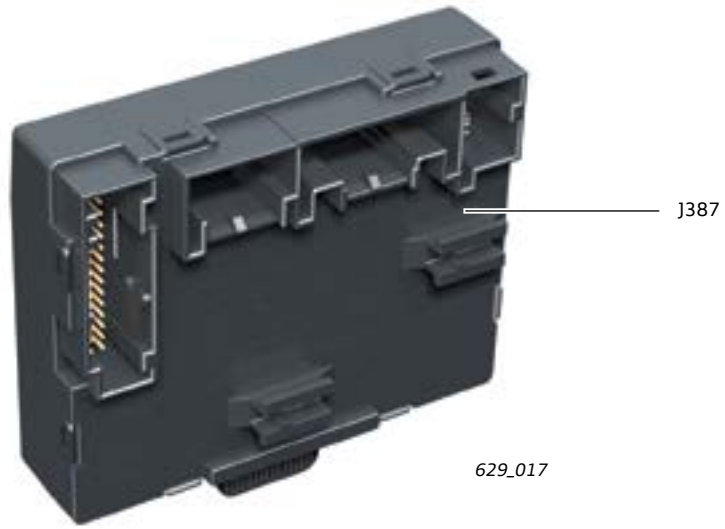
Door electronics, driver side

Designation	Driver Door Control Module J386
Equipment	Always installed
Installation location	In the driver's door
Task	Controlling the electrical and electronic components in and on the driver's door
Address Word	42
Data bus communication	Convenience CAN bus user
Special features	▸ J386 acts as the substitute master for the central locking system in the event of failure of Vehicle Electrical System Control Module 1 J519 ▸ Activates the side turn signal in the driver's door mirror

629_016

Door electronics, passenger side

Designation	Front Passenger Door Control Module J387
Equipment	Always installed
Installation location	In the front passenger's door
Task	Controlling the electrical and electronic components in and on the front passenger's door
Address Word	52
Data bus communication	Convenience CAN bus user
Special feature	Activates the side turn signal in the front passenger door mirror



629_017

Advanced key / keyless entry and start authorization

Designation	Access/Start Authorization Control Module J518
Equipment	Standard equipment: keyless start Optional equipment: keyless entry, PR No.: 4F2
Installation location	Under the instrument panel
Tasks	▸ Monitoring both capacitive sensors ▸ Activation of the entry and start authorization antennas
Address Word	B7
Data bus communication	Convenience CAN bus user
Special feature	Exterior antennas are installed on the vehicle underbody in the B post area

629_018

Electrical steering column lock

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

629_020

Back-up camera

Designation	Rearview Camera System Control Module J772
Equipment	Optional equipment Versions: ▸ Parking aid plus with back-up camera, PR No.: 7X2+KA2 ▸ Parking aid with back-up camera, PR No.: 7X5+KA2
Installation location	In the handle on the trunk lid
Tasks	▸ Rectification and processing of raw images captured by the camera ▸ Transfer of processed images to Information Electronics Control Module 1 J749
Address Word	6C
Data bus communication	Infotainment CAN bus user
Special feature	No need for a separate control module, control module and camera are integrated in a single housing

629_021

Infotainment

Designation	Information Electronics Control Module 1 J794
Equipment	MMI radio as standard equipment, PR No.: I8E+7UH Optional equipment Versions: ▸ MMI touch, PR No.: UJ1 ▸ MMI Navigation plus, PR No.: I8H+7UG
Installation location	In the glove compartment
Task	Controlling the infotainment systems
Address Word	5F
Data bus communication	▸ Infotainment CAN bus user ▸ MOST bus user ▸ J794 is connected to the Multi-media System Operating Button E380 and to Instrument Cluster Control Module J285 via the Modular Infotainment System CAN.
Special features	▸ No need for a separate MMI display, all content is displayed in the Audi virtual cockpit ▸ J794 is the system manager and the ring break diagnostics master for the MOST bus

629_022

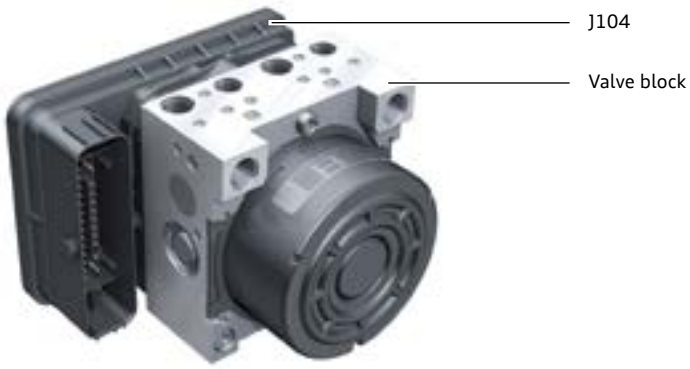
Sound amplifier

Designation	Digital Sound System Control Module J525
Equipment	Optional equipment for models with Bang & Olufsen Sound System, PR No.: 9VS
Installation location	Under the driver's seat
Task	Driving the 12 loudspeakers
Address Word	47
Data bus communication	MOST bus user

629_023

Electronic Stabilization Program (ESP)

Designation	ABS/ESP Control Module J104
Equipment	Always installed
Installation location	▸ In the engine compartment, on right-hand side of engine bulkhead in left-hand-drive models
Tasks	▸ Anti lock braking system (ABS) ▸ Electronic Stabilization Program (ESP) ▸ Traction Control System (TCS) ▸ Electronic Differential Lock (EDL) ▸ Electronic transverse lock ▸ Multicollision brake ▸ Electro-mechanical parking brake (EPB)
Address Word	03
Data bus communication	Suspension CAN user
Special features	▸ The control module can be replaced separately from the valve block using ESD protective mat VAS 6613 ▸ The electro-mechanical parking brake is integrated into the ABS/ESP Control Module. Address Word 53 for electro-mechanical parking brake has been deleted.



629_025

Power steering

Designation	Power Steering Control Module J500
Equipment	Always installed
Installation location	Connected to the steering gear
Tasks	▸ Power steering ▸ Servotronic speed-responsive power steering ▸ Corrective steering intervention, with Audi active lane assist and park assist ▸ Corrective steering intervention, with ESP
Address Word	44
Data bus communication	Suspension CAN user
Special features	▸ The control module with power steering motor as well as Steering Angle Sensor G85 can only be replaced together with the steering gear ▸ G85 has no separate data bus connections; data is transferred through Power Steering Control Module J500

629_026

All-wheel drive

Designation	All Wheel Drive Control Module J492
Equipment	Standard equipment with quattro powertrain
Installation location	Connected to the rear axle gear
Task	Controlling the Haldex coupling depending on the driving situation
Address Word	22
Data bus communication	Suspension CAN user
Special features	▸ The control module can be replaced separately and without removing the rear axle gear ▸ The Haldex coupling setup can be selected via Audi drive select

629_027

Parking aid/ park assist

Designation	Parking Aid Control Module J446 Parallel Parking Assistance Control Module J791
Equipment	Optional equipment Versions: ▸ Rear parking aid, PR No.: 7X1 ▸ Parking aid plus, PR No.: 7X2
Installation location	Behind the instrument panel, left-hand side
Tasks	▸ Monitoring the ultrasound sensors and, depending on version, audible or visual obstacle warnings
Address Word	76
Data bus communication	Suspension CAN user
Special feature	The diagnostic address is now 76, instead of Address Word 10 on previous Audi models

629_028

Audi magnetic ride (TTS)

Designation	Electronic Damping Control Module J250
Equipment	Optional equipment, PR No.: 1BL
Installation location	Under the right-hand front seat
Task	Adaptation of the damping characteristic
Address Word	14
Data bus communication	Suspension CAN user

629_029

Engine Control Module

Designation	Engine Control Module J623
Equipment	Always installed
Installation location	In the engine compartment next to the E-box
Task	Controlling the engine characteristic
Address Word	01
Data bus communication	Powertrain CAN bus user
Special features	▸ Control modules (gas engine/diesel engine) have different plug connections ▸ Immobilizer user ▸ Vehicles with an anti-theft alarm have an anti-theft device (sheet metal cover with shear bolts) over the Engine Control Module

629_030

Airbag

Designation	Airbag Control Module J234
Equipment	Always installed
Installation location	On the center tunnel in front of the center console
Tasks	▸ Deployment of the airbags
Address Word	15
Data bus communication	▸ Powertrain CAN bus user ▸ LIN master for Passenger Occupant Detection System Control Module J706 in vehicles for the North American Region
Special feature	

629_031

DSG transmission

Designation	DSG Transmission Mechatronic J743
Equipment	Optional equipment for vehicles with double-clutch transmission:
Installation location	On the transmission
Task	Controlling the double-clutch transmission
Address Word	02
Data bus communication	Powertrain CAN bus user

629_032

Selector lever sensors

Designation	Selector Lever Sensor System Control Module J587
Equipment	For vehicles with DSG transmission:
Installation location	On the selector lever housing
Tasks	▸ Indication of the selector lever position ▸ Indication of tiptronic commands
Address Word	81
Data bus communication	Powertrain CAN bus user
Special feature	The control module can only be replaced together with the selector lever

629_033

Headlight range adjustment

Designation	Cornering Lamp and Headlamp Range Control Module J745
Equipment	Always installed, different versions depending on type of headlights installed
Installation location	Behind the instrument panel, left-hand side
Tasks	▸ Dynamic headlight range adjustment ▸ Controlling the light profiles
Address Word	55
Data bus communication	CAN-Extended bus user
Special feature	Connected to the power modules for the left and right headlights via a sub-bus system

629_034

Audi side assist (lane change warning system)

Designation	Lane Change Assistance Control Module J769 Lane Change Assistance Control Module 2 J770
Equipment	Optional equipment, PR No.: 7Y1
Installation location	▸ In the bumper, rear right (J769) ▸ In the bumper, rear left (J770)
Tasks	▸ Monitoring the area behind and to the side of the vehicle ▸ Activation of the warning lights in the door mirrors
Address Word	3C
Data bus communication	▸ J769 (master) CAN-Extended bus user ▸ J770 (slave) connected to J769 via a sub-bus system
Special feature	The control modules are mounted in the bumper cover. The system has to be calibrated after removal and installation.

629_035

Notes

Exterior lights

Headlights

Full LED headlights are now standard equipment for the 2016 TT. All functions, including low beam, high beam, daytime running lights, side lights, and turn signal indicator use LED technology.

629_040

LED headlight

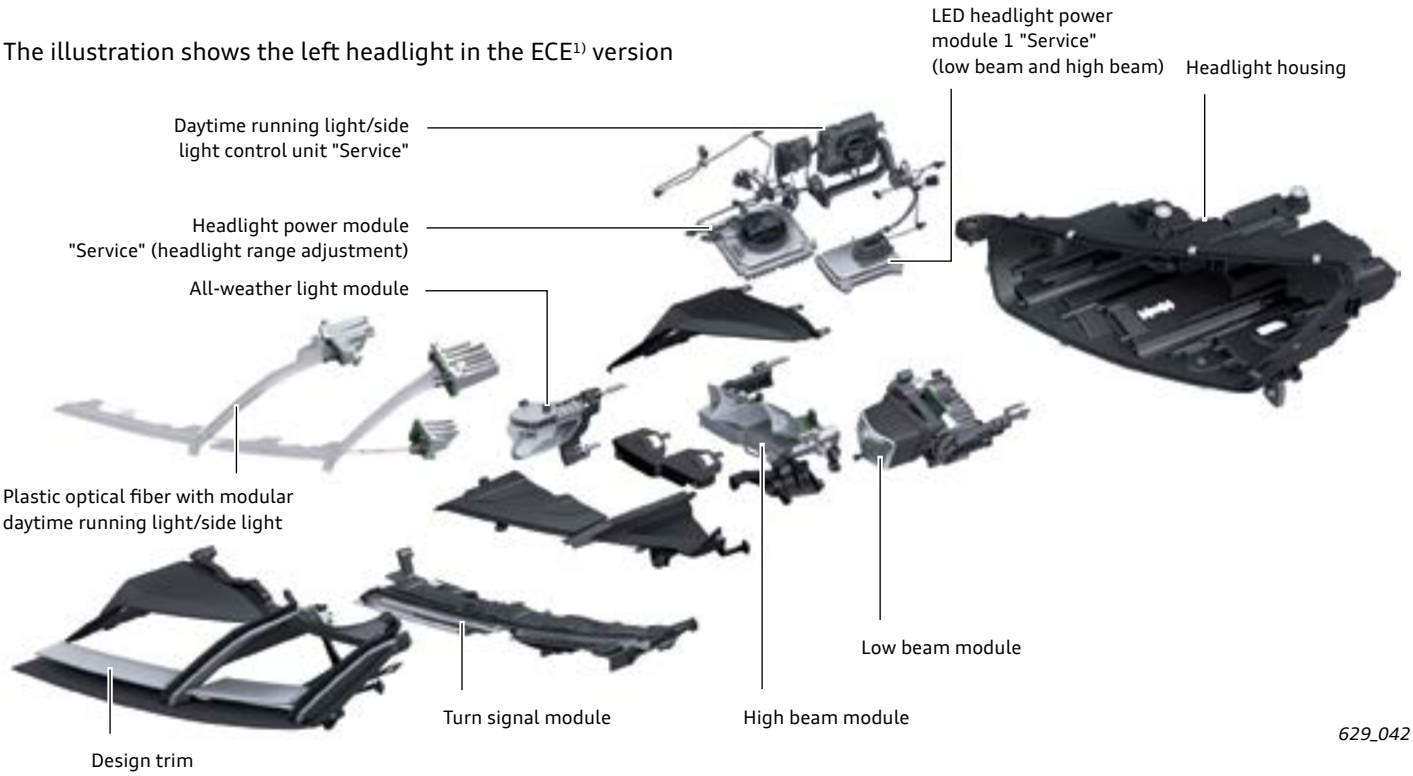
The bumper cover must first be removed when removing the headlights. They are connected to the body by adjusting elements which provide a means of adjustment to the other body parts. It is possible to adjust the headlights exactly with other body parts.

The parts marked “Service” in the detailed description of the headlights on the following pages can be replaced individually in the event of damage.

In the event of damage to the upper and inner headlight mounts, repair tabs can be attached to the headlight housing. Always refer to ElsaPro and ETKA for the proper workshop procedures and part numbers.

LED headlight, PR No.: 8IT

The illustration shows the left headlight in the ECE[1)] version



629_042

Light functions	Bulb used	Power
Daytime running light	10 LEDs with plastic optical fibers dimmed to approximately 10% when the side light function is active	17 watts
Side light		
Low beam	11 LEDs	30 watts
High beam	8 LEDs	28 watts
All-weather light	3 LEDs	10 watts
Turn signal light	10 LEDs	16 watts
Sidemarker (not shown)	2 LEDs	1 watt

Activation mechanism

The day time running light/side light control module is activated directly by Vehicle Electrical System Control Module 1 J519. The control modules for the headlight power module and LED headlight power module 1 are connected to Cornering Lamp and Headlamp Range Control Module J745 via a CAN bus. J745 in turn receives its commands from the J519.

The day time running light is switched off for the duration of a turn signaling cycle. The side light LEDs are used for the Coming Home/Leaving Home function.

Service

With this headlight version, only the three outer control modules can be replaced. The headlight range adjustment servomotor (not shown) cannot be replaced individually.

Adaptation for driving on the opposite side of the road

It is not necessary to adapt the headlights. No further action is needed in order to meet the statutory requirements.

Equipment

The headlight washer system is integrated as standard into the LED headlight.

Headlight range adjustment

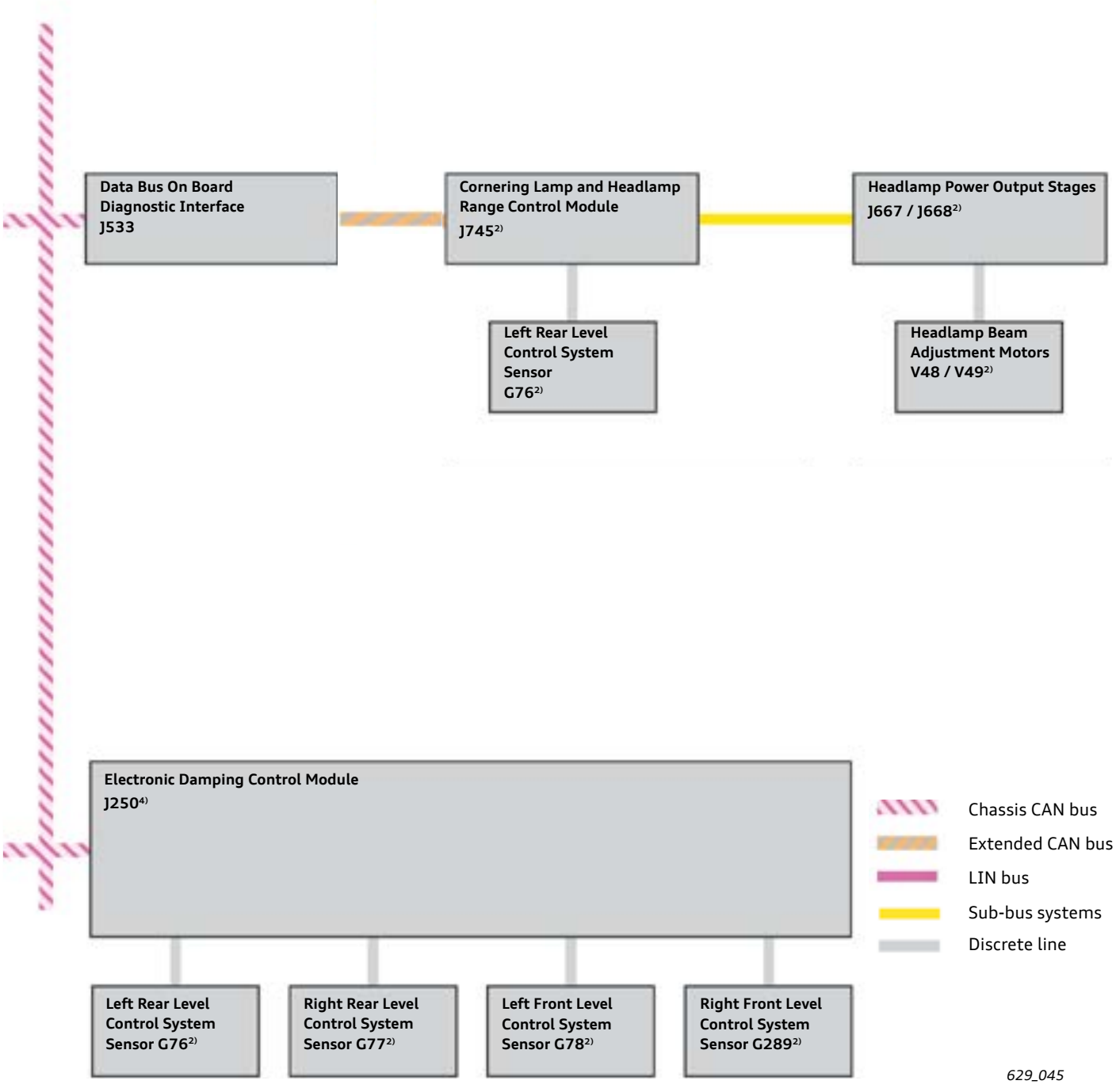
The Audi TT always comes equipped with a dynamic headlight range adjustment system. Depending on the attitude and movement of the vehicle, Headlamp Beam Adjustment Motors (V48, V49) correct the headlight range of the headlights.

However, the designation of the headlight range adjustment control unit, the number of ride height sensors as well as the transmission rate for activation of the headlight range adjustment servomotors differ according to headlight version.

The Audi TT can be optionally equipped with Audi magnetic ride. These vehicles have four sensors for detecting the vehicle ride height. The signals from these senders are are sent to Electronic Damping Control Module J250 via discrete lines. J250 is a powertrain CAN bus user and relays information on vehicle ride height via CAN bus to the headlight range adjustment control unit (depends on headlight version installed).

Schematic diagram of the headlight range adjustment system

1) in conjunction with LED headlights
2) in vehicles with Audi magnetic ride

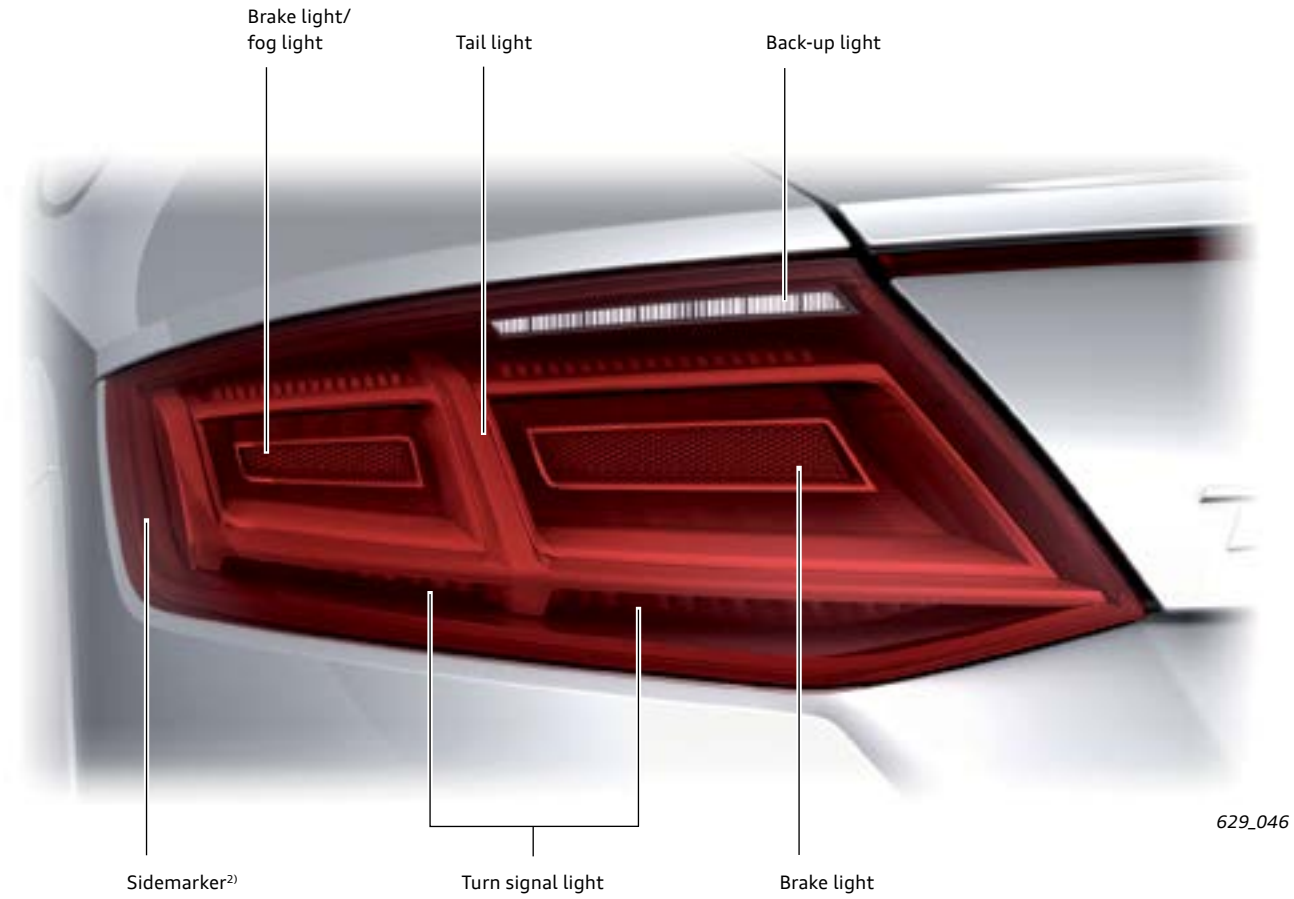


Tail lights

The tail lights of the Audi TT use only LEDs. Two versions of tail lights are available:

- Low version (used with Xenon headlights) (not available for the North American market)
- High version (used with LED headlights)

The tail light versions are geometrically identical. The only functional difference is the additional side marker for the SAE version.



Activation mechanism

The tail lights are activated by Vehicle Electrical System Control Module 1 J519. The tail light LEDs are used for the Coming Home/Leaving Home function.

Service

There are no serviceable parts for the tail lights. In the event of damage, the entire tail light unit must be replaced.

[2)] SAE = for North American Region

High-level brake light / license plate light

High-level brake light

The high level brake light is integrated into the trunk lid below the rear spoiler. It has a total of 18 LEDs.

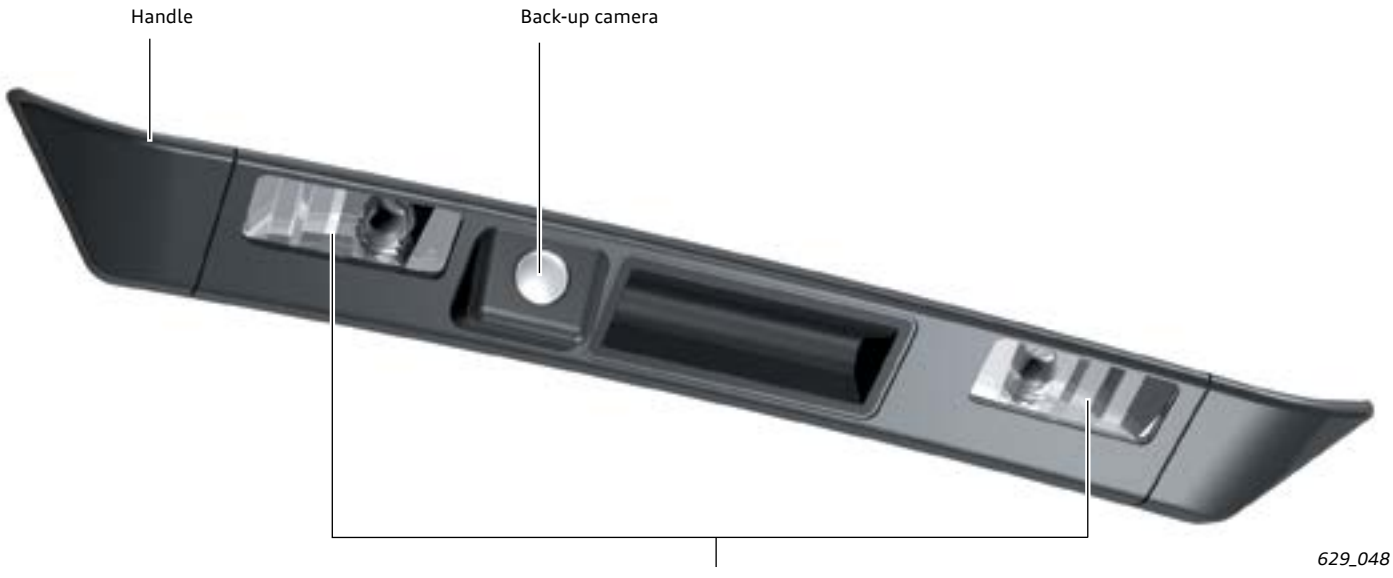
The individual component parts of the high-level brake light cannot be replaced. If defective, the complete component must be replaced. The high-level brake light can be replaced after raising the rear spoiler.

629_047

License plate lights

The license plate lights use LED technology irrespective of tail light version. Both lights are integrated into the trunk lid handle. Each has two LEDs.

The license plate lights are activated by J519 and can be replaced individually.



629_048

Vehicle electronics

Car key

The keys of the 2016 TT have been redesigned. The shape of the key and design of the buttons makes tactile identification and operation easier.

Each new vehicle is supplied with three car keys. Two of these keys are fully functional remote control keys, while the third key is a wallet key. Each of the remote control keys houses a key to enable the valet functions.

The wallet key can be used to open and close the mechanical locks on the vehicle. It is also possible to switch on the ignition and start the engine with this key. Because the wallet key does not have a battery, the emergency transponder coil must be used to turn on the ignition and start the engine.

If the Audi TT is equipped with the optional advanced key (keyless entry system), the back of the remote control key is chrome-plated. The second remote control key is supplied in the standard design.

629_049

Audi TT car key in standard design

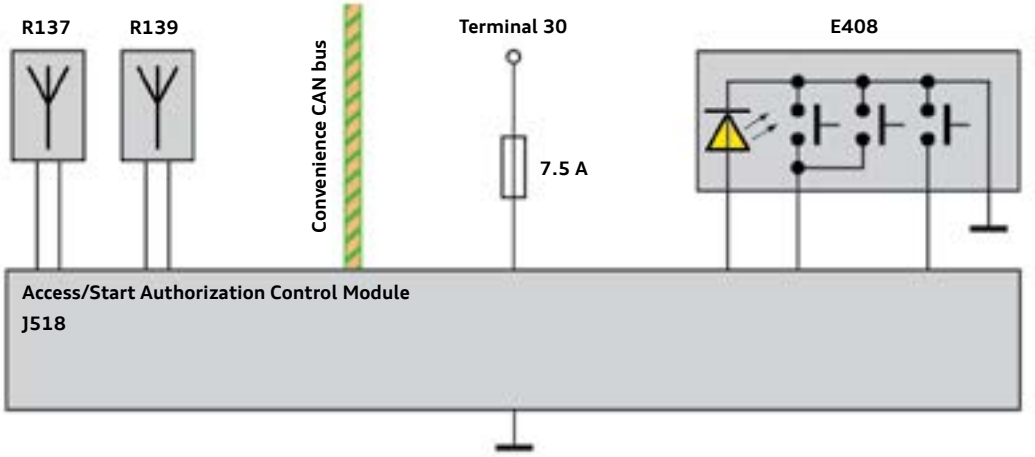
Keyless starting system

The keyless starting system is standard on the Audi TT. After pressing the Start button in the center console, the vehicle electronics check whether an authorized key is in the vehicle.

If a key is in the vehicle, the ignition is switched on and the engine is started (the brake pedal must be pressed). A mechanical ignition lock is not required nor installed.

To implement the keyless starting system, the following components are required in the vehicle:

- **J518** Access/Start Authorization Control Module.
- **E408** Access/Start Authorization Button.
- **R137** Access/Start Authorization Antenna in Luggage Compartment.
- **R139** Access/Start Authorization Antenna 2 in Vehicle Interior.



629_050

Terminal 15 power supply

Access/Start Authorization Control Module J518 is the master controller for activation of Terminal 15. Access/ Start Authorization Button E408 provides the central signal input.

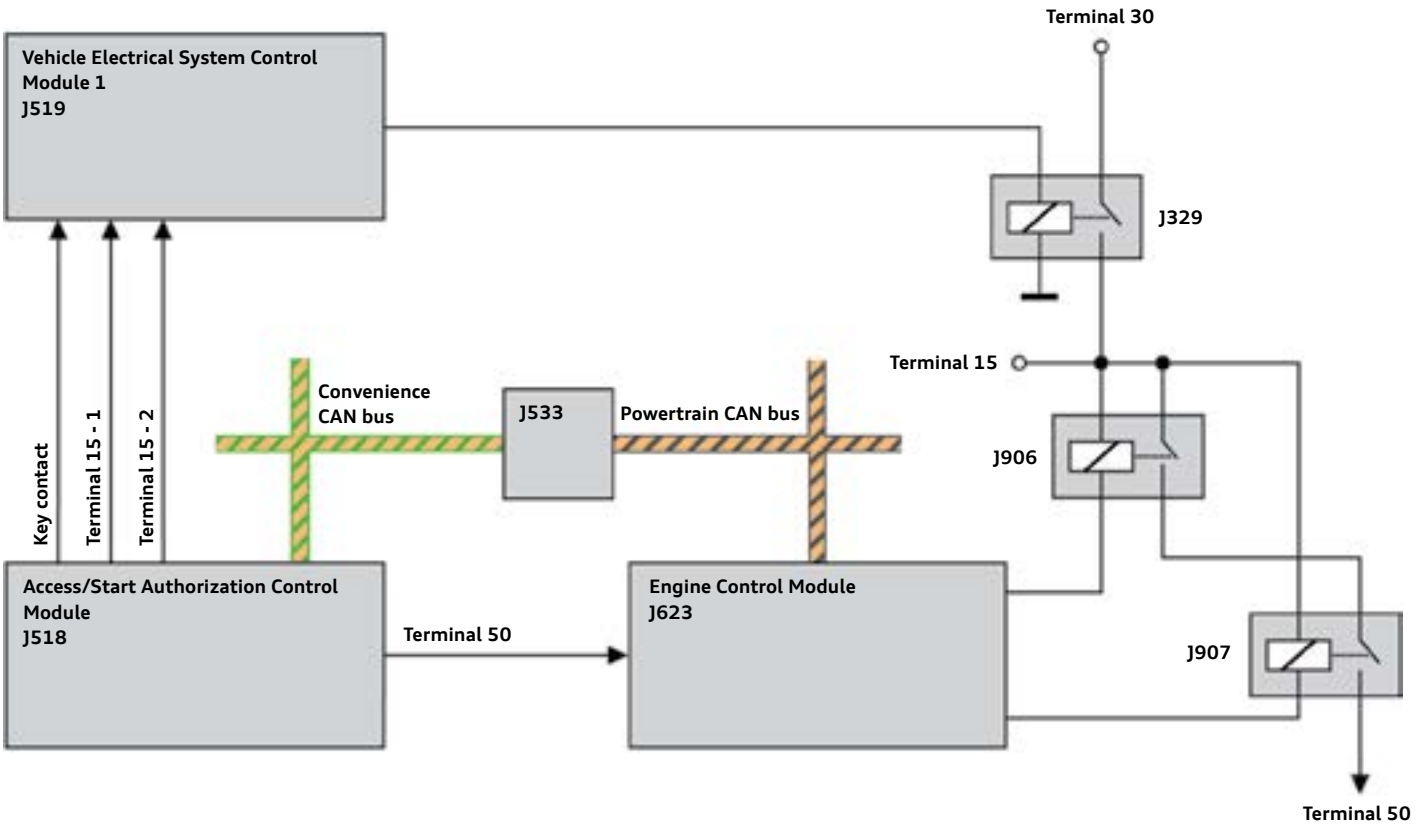
J518 determines the current status of key contact and Terminals 15 and 50. The terminal states are indicated to all control modules via the various bus systems. Terminals 15 and 50 also exist as separate supply wires and are switched by relays.

Terminal 15 Power Supply Relay J329 connects Terminal 30 power to the Terminal 15 supply wire when the ignition is switched on and disconnects them when the ignition is switched off. J329 is controlled by J519.

To start the engine, a Terminal 15 supply wire (via J329) activates Starter Relays 1 and 2. This in turn connects a Terminal 50 line to the starter solenoid.

For safety reasons, two series-connected starter relays are always installed. If one starter relay can no longer open its closed terminals after the engine starts, the second starter relay will open to break the starter motor circuit. The starter relays are activated and monitored for DTCs by Engine Control Module J623.

The following pages discuss this process in detail.



629_051

J329 Terminal 15 Power Supply Relay

J533 Data Bus On Board Diagnostic Interface

J906 Starter Relay 1

J907 Starter Relay 2

Switching Terminal 15 Power Supply Relay J329

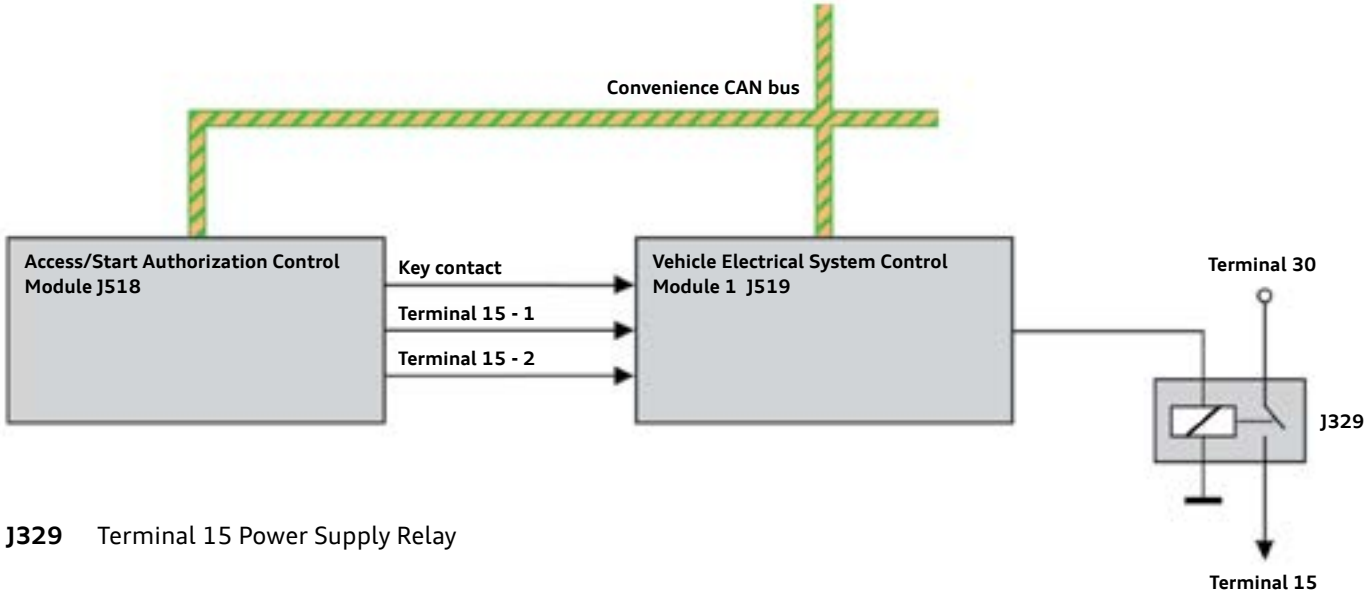
There are three signal wires from J518 to J519:

- Key contact.
- Terminal 15 – 1.
- Terminal 15 – 2.

A signal voltage is applied to these three wires by J518 if J519 is required to activate Terminal 15 Power Supply Relay J329.

J519 activates Terminal 15 Power Supply Relay J329 if at least two of the three signal wires is carrying a signal voltage. This configuration ensures that the vehicle can be started in the event of an open circuit in one of the three signal wires.

Access/Start Authorization Control Module J518 also sends a terminal 15 request to J519 via the CAN bus but this has no effect on the actual switching of terminal 15; the signal wires are exclusively responsible for this.



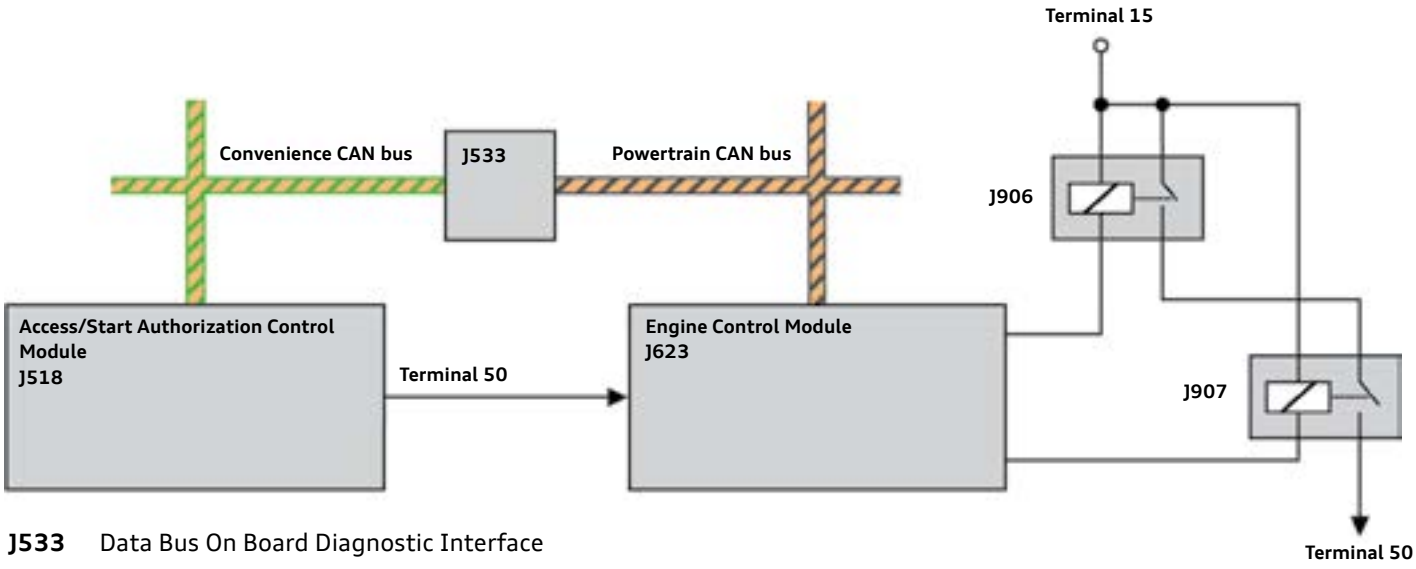
J329 Terminal 15 Power Supply Relay

629_053

Switching Starter Relays J906 and J907

A terminal 50 signal wire leads directly to Engine Control Module J623 from J518. J518 applies a signal voltage to this wire if the engine is to be started. The ECM switches its two Starter Relays if this signal wire is live and all other requirements for starting the engine have been met.

J518 also sends a terminal 50 request to J519 via the CAN bus. The ECM uses this information to validate the plausibility of the signal from J518.



J533 Data Bus On Board Diagnostic Interface

J906 Starter Relay 1

J907 Starter Relay 2

629_054

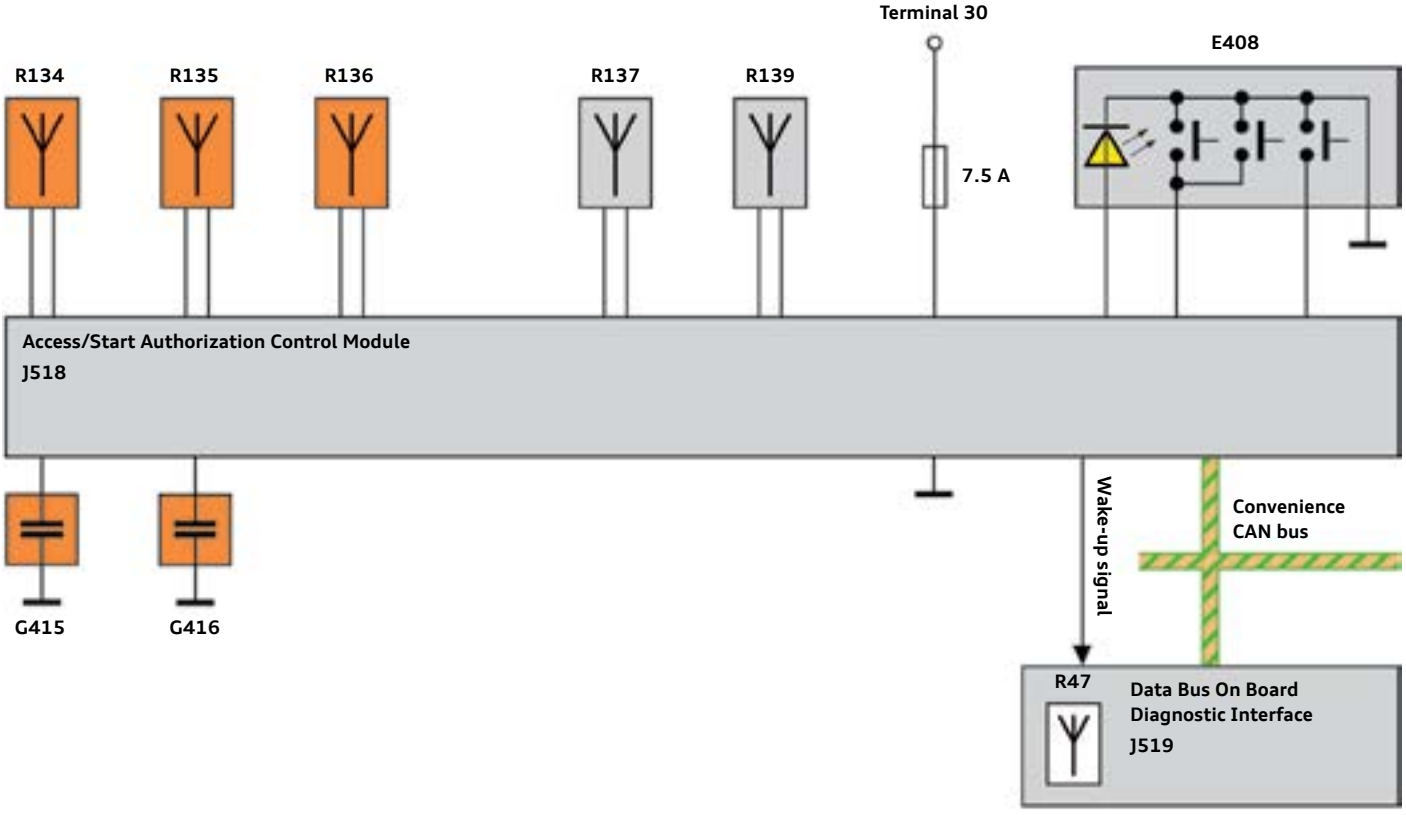
Advanced Key

The Advanced key option is being offered on the Audi TT for the first time.

The car key no longer has to be taken out of the driver's pocket in order to open both vehicle doors and the trunk lid. When the driver moves his hand into the door handle or the trunk lid handle, the advanced key uses radio signals to search for an authorized key. If the search is successful, the vehicle or trunk lid is unlocked. Keyless entry is possible on both the driver and front passenger doors.

The following additional components are integrated into the advanced key for the keyless entry system:

- G415 Driver Exterior Door Handle Touch Sensor.
- G416 Front Passenger Exterior Door Handle Touch Sensor.
- R134 Driver Access/Start System Antenna.
- R135 Front Passenger Access/Start System Antenna.
- R136 Access/Start System Antenna in Bumper.



629_055

Implementation of keyless entry and start systems at Audi

There are two different versions of the keyless entry system for Audi models. The systems differ from one another in regard to system supplier and the internal system processes, however not from the customer's point of view.

The systems in the 'B' series vehicles onwards are suppied by Marquardt, while the systems in the Audi A3 and Audi TT are suppied by Hella. The keyless entry and start system was first introduced in the Audi A8 (D3) in 2003. The system was subsequently described in several Self-Study Programs. All previous system descriptions refer to the Marquardt system because this was the only system in the Audi model range until now.

This eSelf-Study program gives a detailed description of the Hella system offered in the 2016 Audi TT.

The following system processes are described:

- Turning on the ignition with the start button.
- Turning on the ignition with the emergency transponder coil.
- Starting the engine with the start button.
- Unlocking the vehicle via the sensor in the driver's door handle.
- Unlocking the trunk lid using the Softtouch function.

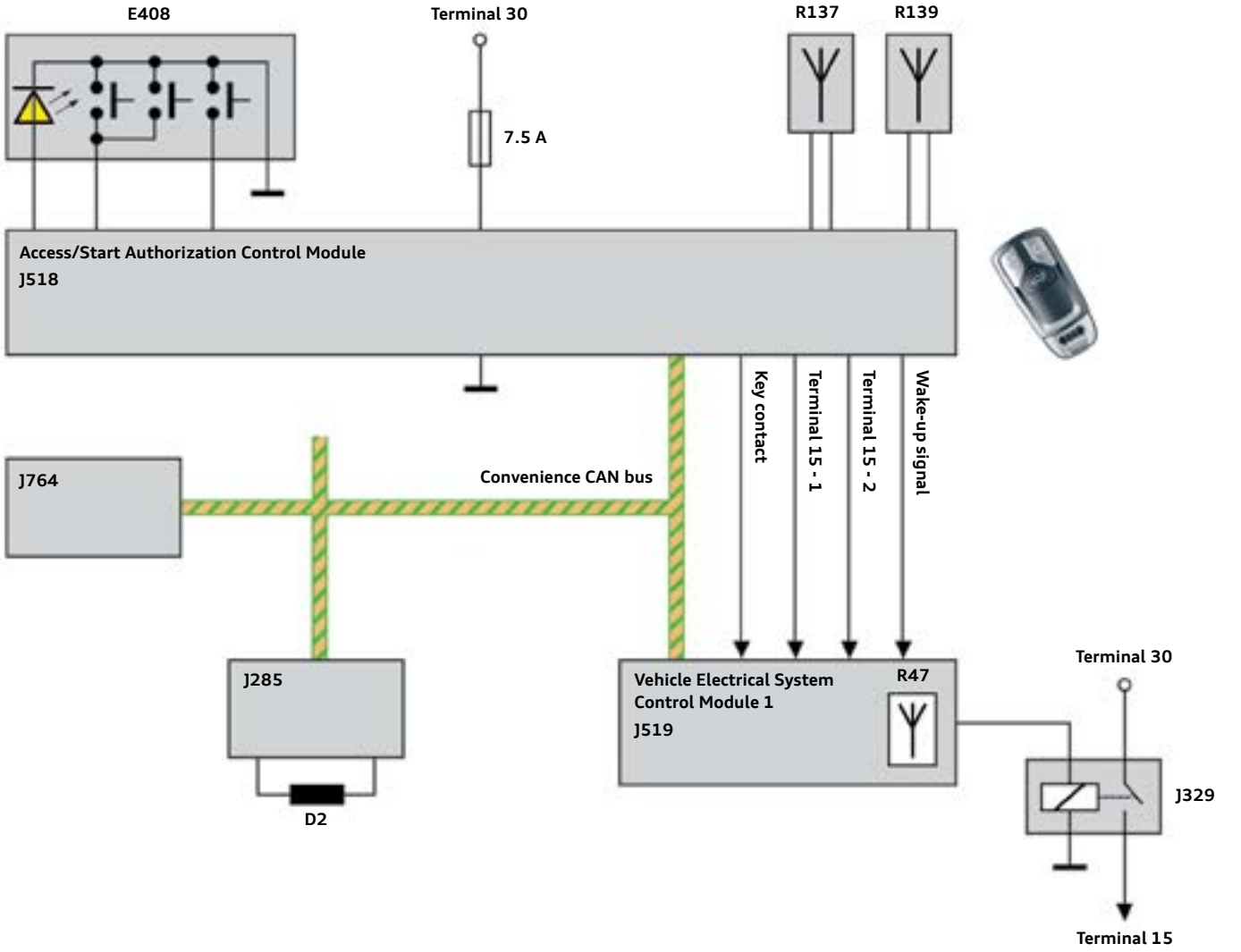
Notes

System processes in the keyless start system

Turning on the ignition
(not starting the engine)

Initial situation:

- The vehicle is equipped with an automatic transmission.
- An authorized key is located inside the vehicle.
- The CAN bus and Vehicle Electrical System Control Module 1 are active.
- The brake pedal is not pressed when the start button is pressed.



629_056

D2 Anti-theft Immobilizer Reader Module

E408 Access/Start Authorization Button

J285 Instrument Cluster Control Module

J329 Terminal 15 Power Supply Relay

J764 Electronic Steering Column Lock Control Module

R47 Central Locking and Anti-theft Alarm System Antenna

R137 Access/Start System Antenna in Luggage Compartment

R139 Access/Start System Antenna 2 in Vehicle Interior

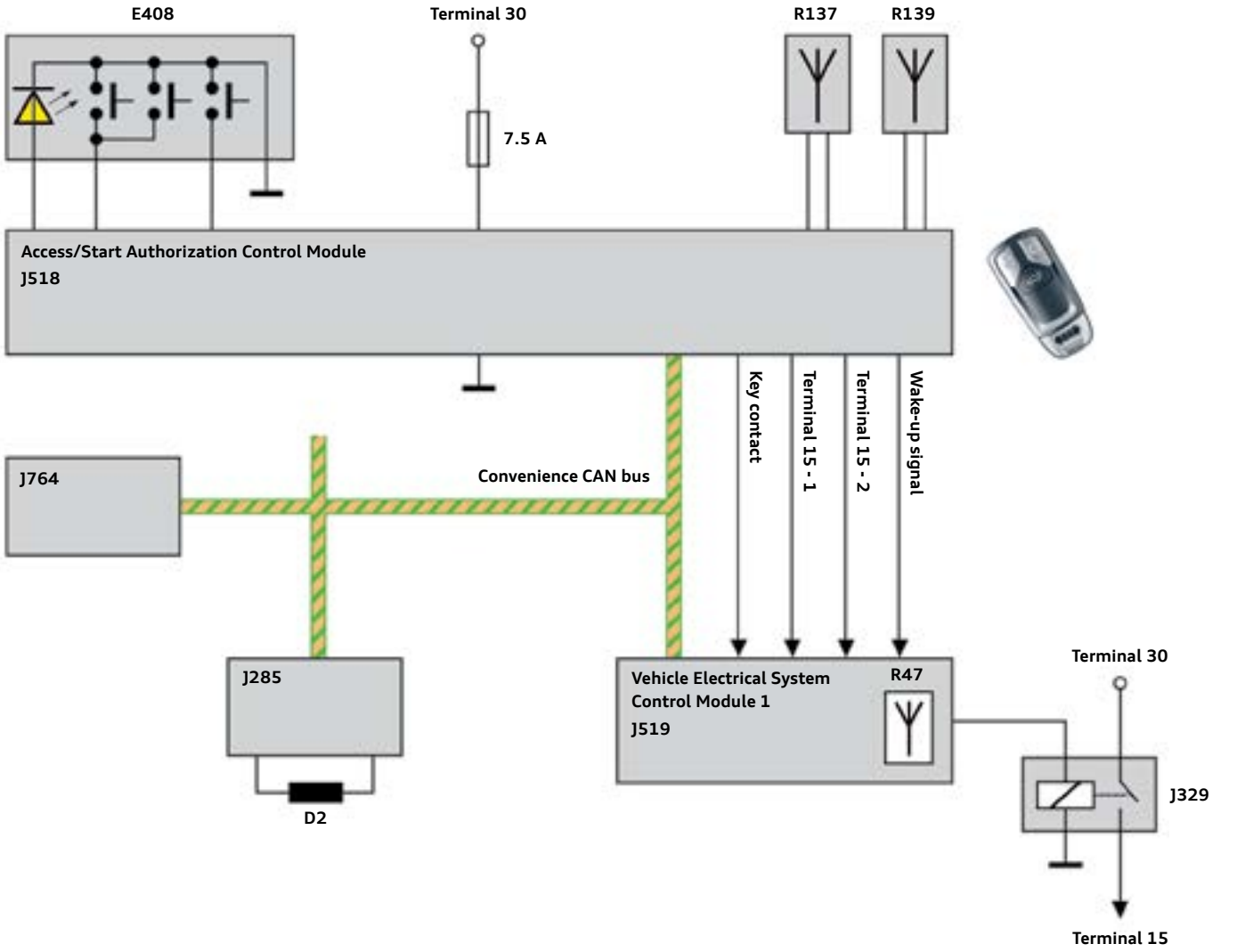
The system process step by step:

1. Access/Start Authorization Button E408 is pressed.
2. This is detected by J518.
3. J518 instructs J764 to unlock the steering column via the Convenience CAN bus.
4. J518 instructs Instrument Cluster Control Module J285 via the Convenience CAN bus to enable the terminals.
5. J285, in turn, instructs J518 to search for an authorized key.
6. J518 initiates a key search by activating antennas R137 and R139.
7. An authorized key receives the signals sent by both interior antennas and responds by giving its key identification number.
8. J519 receives the response from the key via Central Locking and Anti-theft Alarm System Antenna R47.
9. J519 indicates the reception of a key response to J285 via the Convenience CAN bus.
10. J285 sends key authentication data to J518 via the Convenience CAN bus.
11. J518 activates interior antennas R137 and R139 once again to transfer authentication data and measurement signals.
12. The key measures the field strengths of the measurement signals. Taking the measured field strengths as a basis, the key determines whether it is located inside the vehicle or not. In addition, the key calculates an appropriate key response based on the authentication data received.
13. The key sends a radio response if located inside the vehicle, and no response if not located inside the vehicle.
14. After receiving a key response, J519 transmits the response to J285.
15. Taking the key response as a basis, J285 checks whether the response originates from an authorized key.
16. If the check is successful, J285 notifies J764 via the Convenience CAN bus.
17. If all the requirements for unlocking the steering column are met, J764 unlocks the steering column.
18. The successful unlocking of the steering column is indicated to J518 and J285 via the Convenience CAN bus.
19. J285 sends an enabling signal for the terminals to J518.
20. J518 receives this information and checks whether all the requirements for switching on terminal 15 have been met.
21. If all the requirements have been met, the three signal lines (key contact, terminal 15-1 and terminal 15-2) are switched by J518.
22. If J519 measures a high enough voltage level in at least two of the three signal lines, it switches relay J329. The terminal 15 supply voltage will then be available to the connected electrical loads.
23. After switching the relay, J519 changes the status of terminal 15 from "off" to "on" and places this information on the CAN bus.

Turning on the ignition via the emergency transponder coil (not engine starting)

Initial situation:

- The vehicle is equipped with an automatic transmission.
- The batteries in the remote control key are so weak, it is not possible to communicate with the vehicle.
- The CAN bus and Vehicle Electrical System Control Module 1 are active.
- The brake pedal is not pressed when the driver presses the start button.



629_056

D2 Anti-theft Immobilizer Reader Module

E408 Access/Start Authorization Button

J285 Instrument Cluster Control Module

J329 Terminal 15 Power Supply Relay

J764 Electronic Steering Column Lock Control Module

R47 Central Locking and Anti-theft Alarm System Antenna

R137 Access/Start System Antenna in Luggage Compartment

R139 Access/Start System Antenna 2 in Vehicle Interior

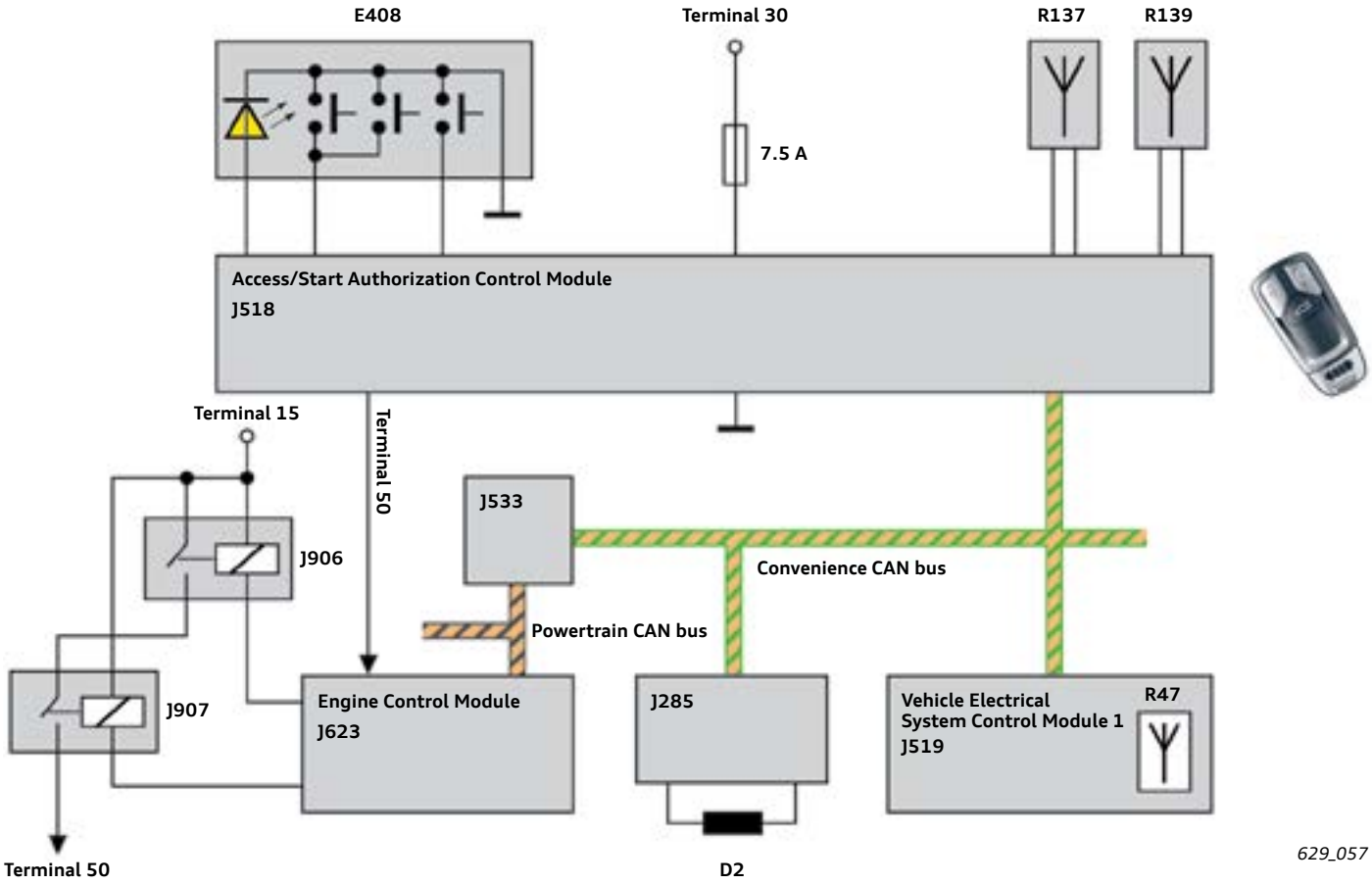
The system process step by step:

1. Access/Start Authorization Button E408 is pressed.
2. This detected by Access/Start Authorization Control Module J518.
3. J518 instructs J764 to unlock the steering column via the Convenience CAN bus.
4. J518 then instructs Instrument Cluster Control Module J285 to enable the terminals via the Convenience CAN bus.
5. J285, in turn, instructs J518 to search for an authorized key.
6. J518 then initiates a key search by activating interior antennas R137 and R139.
7. Because the battery of the authorized key is too weak, this key can neither receive the message nor send a radio response.
8. J285 does not receive a key response from J519 via the Convenience CAN bus within the given time period.
9. After this, J285 again instructs J518 to search for an authorized key.
10. J518 again activates its two interior antennas, R137 and R139.
11. J285 again does not receive a key response from J519 via the convenience CAN within the given time period.
12. J285 then displays a message to prompt the driver to hold the key in the position indicated inside the vehicle.
13. J285 energizes Anti-theft Immobilizer Reader Coil D2 for a defined period of time.
14. The driver holds the car key in the position indicated.
15. The coil supplies the key with sufficient power and exchanges data with it.
16. J285 receives this data and verifies it.
17. If the check is successful, J285 notifies J764 via the Convenience CAN bus.
18. If all other requirements have been met, J764 unlocks the steering column.
19. The successful unlocking of the steering column is indicated to J518 and J285 via the Convenience CAN bus.
20. J285 sends an enabling signal for the terminals to J518.
21. J518 receives this information and checks whether all the requirements for switching on terminal 15 have been met.
22. If all the requirements have been met, the three signal lines (key contact, terminal 15-1 and terminal 15-2) are switched by J518.
23. If J519 measures a high enough voltage level in at least two of the three discrete terminal lines, it switches Terminal 15 Power Supply Relay J329. The terminal 15 supply voltage will then be available to the connected electrical loads.
24. After switching the relay, J519 changes the status of terminal 15 from "off" to "on" and places this information on the CAN bus.

Starting the engine with the ignition on

Initial situation:

- The vehicle's ignition is on.
- The vehicle has an automatic transmission.
- The brake pedal is pressed.
- An authorized key is located inside the vehicle.



D2 Anti-theft Immobilizer Reader Coil

E408 Access/Start Authorization Button

J285 Instrument Cluster Control Module

J533 Data Bus On Board Diagnostic Interface

J906 Starter Relay 1

J907 Starter Relay 2

R47 Central Locking and Anti-theft Alarm System Antenna

R137 Access/Start System Antenna in Luggage Compartment

R139 Access/Start System Antenna 2 in Vehicle Interior

The system process step by step:

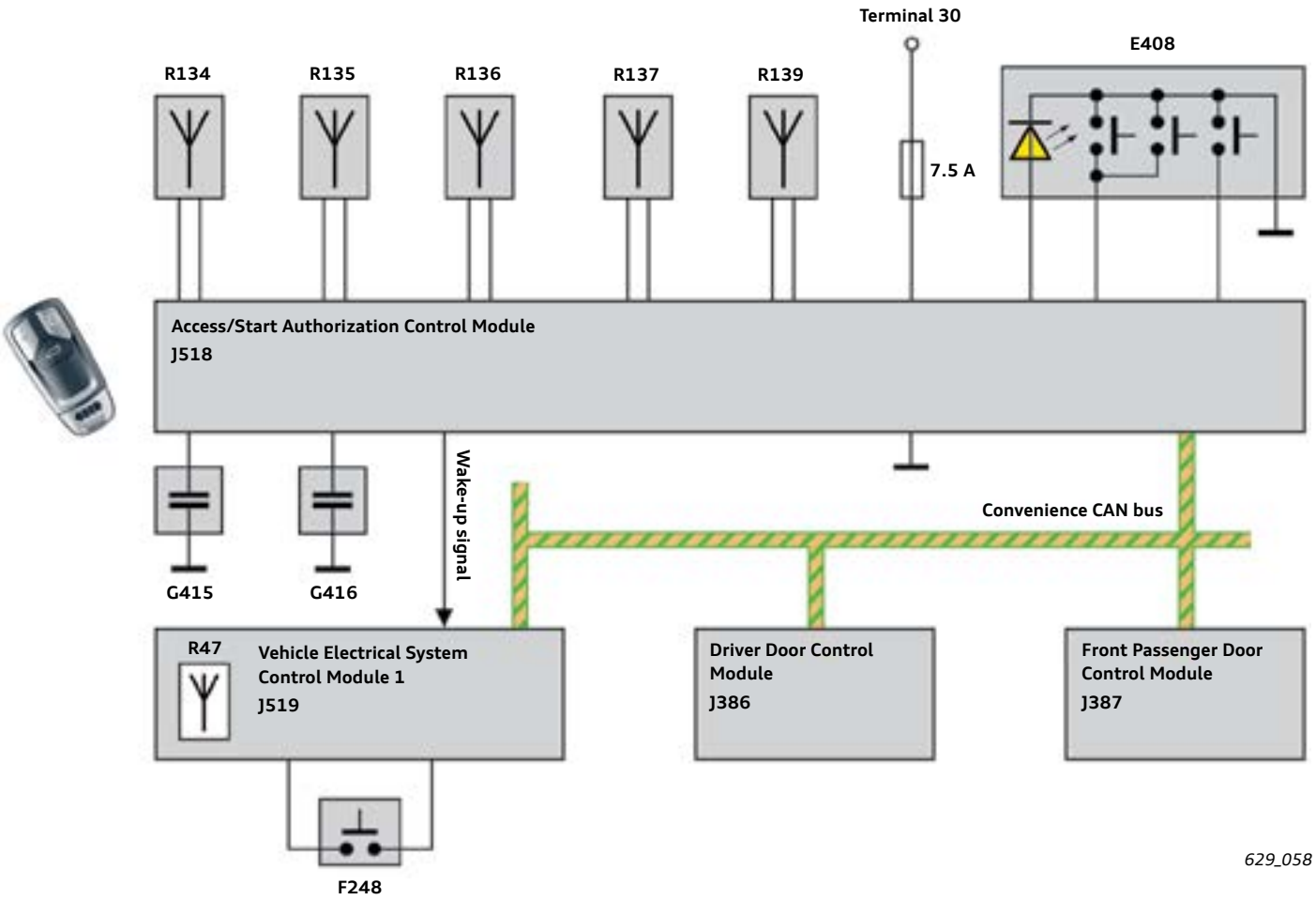
1. Access/Start Authorization Button E408 is pressed.
2. This is detected by Access/Start Authorization Control Module J518. The module knows the driver wants to start the engine because the brake pedal is depressed.
3. J518 applies a voltage to the “terminal 50” signal line leading to Engine Control Module J623.
4. It also changes the "terminal 50" bit request of the corresponding CAN bus message from 0 to 1.
5. J518 requests the enabling signal for the terminals from Instrument Cluster Control Module J285.
6. J285, in turn, instructs J518 to search for an authorized key.
7. J518 then initiates a key search by activating two interior antennas R137 and R139.
8. An authorized vehicle key in side the vehicle receives the signals sent by both interior antennas and responds by giving its key identification number.
9. J519 receives the response from the key through antenna R147.
10. J519 indicates the reception of a key response to J285 via the Convenience CAN bus.
11. J285 sends key authentication data to J518 via the Convenience CAN bus.
12. J518 activates interior antennas R137 and R139 once again in order to transfer authentication data and measurement signals.
13. The key measures the field strengths of the measurement signals. Taking the measured field strengths as a basis, the key determines whether it is located inside the vehicle or not.
14. In addition, the key calculates an appropriate key response based on the authentication data received.
15. If the key is located inside the vehicle, its sends a key response.
16. J519 indicates the reception of a key response J285 via the Convenience CAN bus.
17. J285 evaluates the key response with regard to the immobilizer. If this evaluation and all other checks are successful, J285 issues an engine enabling signal via the CAN bus.
18. J623 receives the engine start enabling signal. Voltage is already present in the terminal 50 signal line from J518. The ECM then switches its two terminal 50 relays.
19. The starter is subsequently energized and the engine starting cycle is initiated.

System processes in the keyless entry system (Advanced key)

Keyless unlocking of the vehicle at the driver's door

Initial situation:

- There is an authorized car key outside the vehicle within a radius of 5.0 ft (1.5 m) of the driver's side door handle.
- The vehicle is parked and locked.



E408 Access/Start Authorization Button

F248 Rear Lid Lock Cylinder Unlock Button

G415 Driver Exterior Door Handle Touch Sensor

G416 Front Passenger Exterior Door Handle Touch Sensor

R47 Central Locking and Anti-theft Alarm system Antenna

R134 Driver Access/Start System Antenna

R135 Front Passenger Access/Start System Antenna

R136 Access/Start System Antenna in Rear Bumper

R137 Access/Start System Antenna in Luggage Compartment

R139 Access/Start System Antenna 2 in Vehicle Interior

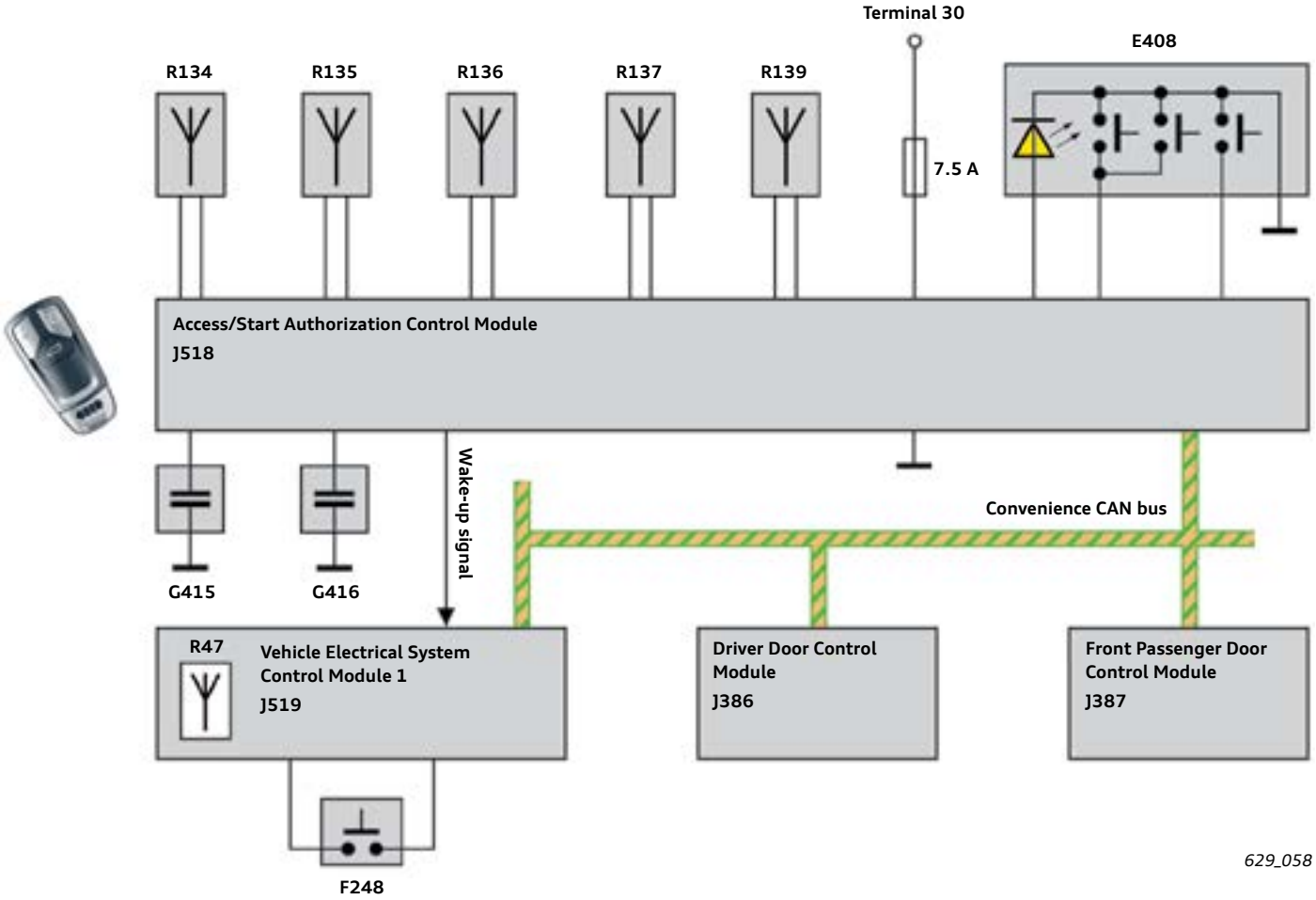
The system process step by step:

1. The customer grips the door handle of the driver's door.
2. The request to open is detected by J518 through Driver Exterior Door Handle Touch Sensor.
3. J518 then activates antenna R134 on the driver's side, and a key search begins.
4. J518 wakes up Vehicle Electrical System Control Module 1 J519 via a signal line.
5. An authorized car key which receives this antenna signal then responds by giving its key identification number as feedback.
6. J519 receives a key response through the antenna R47. It subsequently wakes up the convenience CAN bus.
7. J519 informs that it has received a key response.
8. J518 re-activates antenna R134, followed by interior antennas R137 and R139.
9. The key receives the antenna signals and measures their field strengths.
10. Based on the measured field strengths, the key can decide whether it is in a position which allows the vehicle to be unlocked.
11. If the key arrives at a positive result, it sends a key response to J519. In the event of a negative result, no response is sent.
12. J519 receives the response from the key through the central locking antenna R47.
13. If more than one authorized key provides feedback, J519 assigns a higher priority to one of the keys and proceeds with this key only.
14. The key response contains additional information based on which J519 can verify whether the response actually originates from an authorized car key.
15. If this is the case and if all other requirements for unlocking have been met, the unlocking command is placed on the CAN bus.
16. The door control modules unlock the vehicle doors, and the handle in the trunk lid F248 (Softtouch) is enabled.

Keyless trunk lid opening

Initial situation:

- There is an authorized car key outside the vehicle within a radius of 5.0 ft (1.5 m) of the trunk lid handle.
- The vehicle is parked and locked.

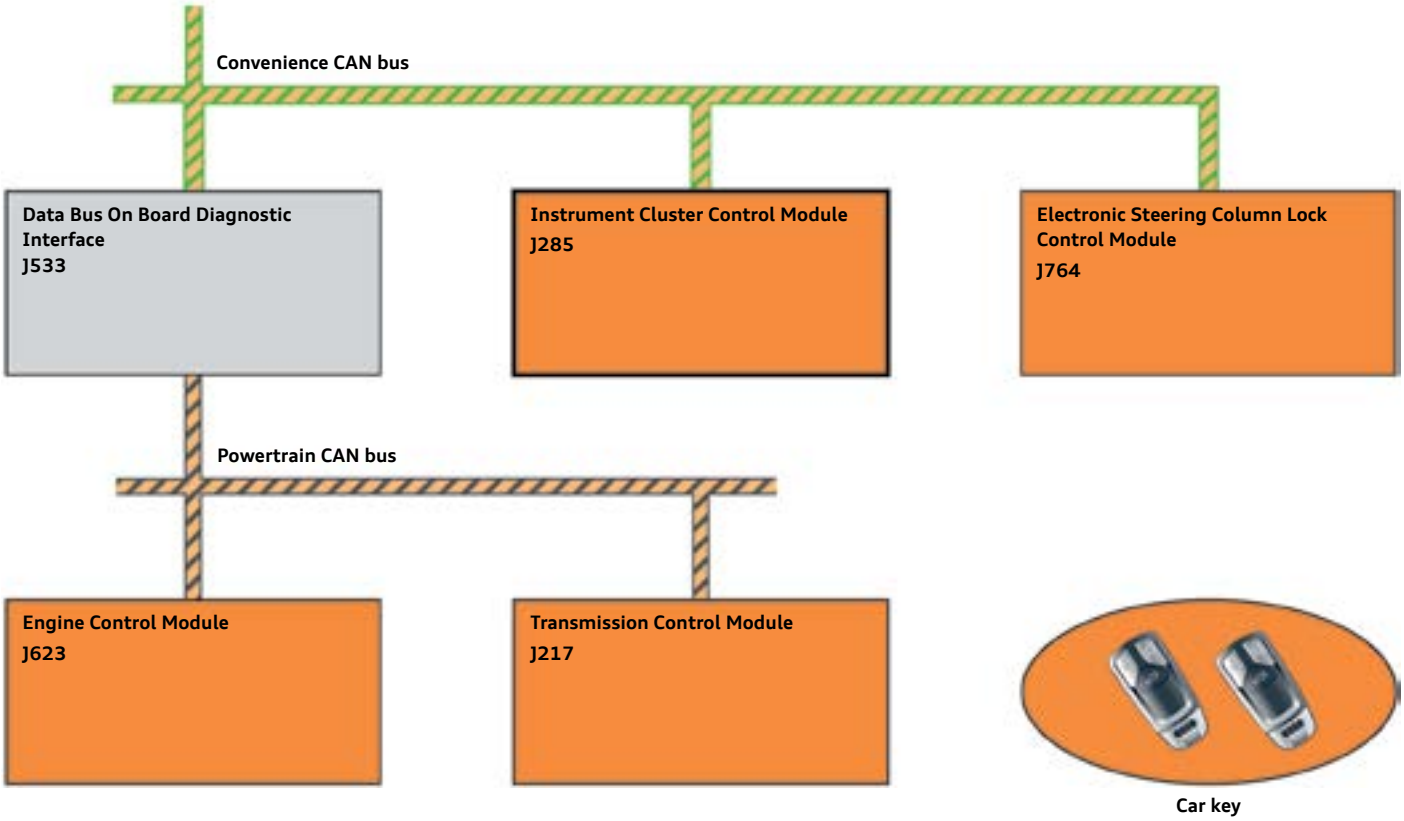


The system process step by step:

1. The customer reaches into the handle in the trunk lid.
2. The actuation of Rear Lid Lock Cylinder Unlock Button F248 (Softtouch) is detected by J519.
3. Vehicle Electrical System Control Module 1 J519 wakes up the Convenience CAN bus.
4. J519 instructs Access/Start Authorization Control Module J518 via the Convenience CAN bus to search for a key at the rear of the vehicle.
5. J518 subsequently activates Access/Start System Antenna in Rear Bumper R136.
6. An authorized car key which receives this signal then responds by giving its key identification number as feedback.
7. J519 receives the response from the key through the Central Locking and Anti-theft Alarm System Antenna R47.
8. J519 indicates to J518 via the Convenience CAN bus that an authorized key has responded.
9. J518 re-activates antenna R136, followed by interior antennas R137 and R139.
10. The key receives the antenna signals and measures their field strengths.
11. Based on the measured field strengths, the key can decide whether it is in a position which allows the trunk lid to be unlocked.
12. If the key arrives at a positive result, it sends a key response. In the event of a negative result, no response is sent.
13. J519 receives and evaluates this information.
14. This key response contains additional information based on which J519 can verify whether the response actually originates from an authorized car key.
15. If all the requirements for unlocking the trunk lid have been met, J519 activates the trunk lid lock, and the trunk lid open.

Immobilizer

A fifth generation immobilizer system is used on the 2016 TT. It is the same as the system used on the 2015 A3 and is diagnosed in the same manner.



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Immobilizer master control module:

- Instrument Cluster Control Module J285.

Other immobilizer system participants:

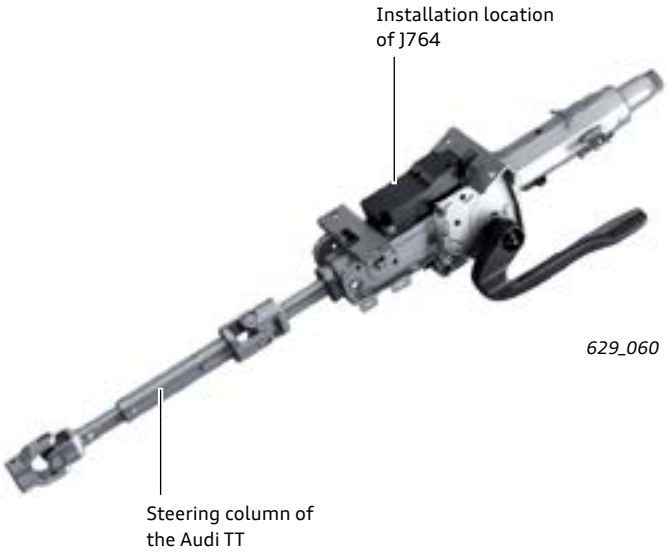
- All car keys.
- Engine Control Module J623.
- Electronic Steering Column Lock Control Module J764.
- Transmission Control Module J217.

Note
Please note the information on installation of Electronic Steering Column Lock Control Module J764 on the following page.

Electronic Steering Column Lock Control Module J764

At launch, all TT models will come equipped with Electronic Steering Column Lock Control Module J764. It is planned to eliminate this control module in models with automatic transmissions in some markets.

Always consult ElsaPro and ETKA for the latest information when working on this system.



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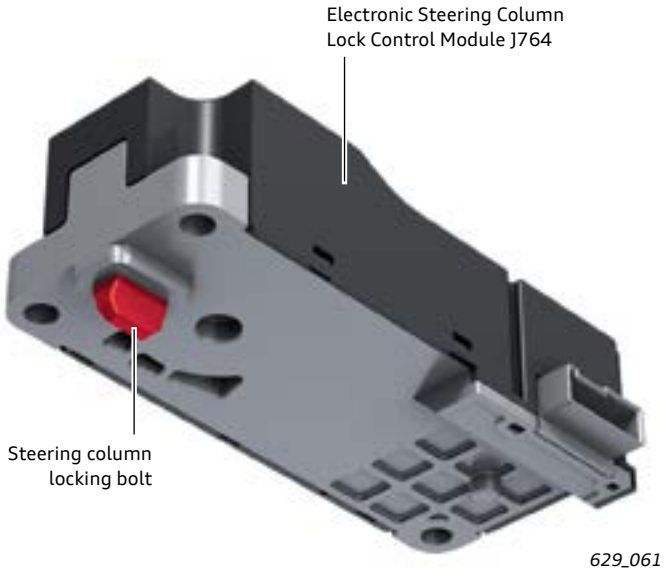


629_061

Comparing the steering column locking systems of the 2016 TT and the 2015 Audi A3 reveals the following commonalities and differences:

Commonalities:

- J764 is integrated with the immoblizer system.
- J764 locks and unlocks the steering column.
- J764 is connected to the convenience CAN bus.

Differences:

- On the Audi A3, installation of the electronic steering column lock is coupled to the optional advanced key. It comes installed in 100% of Audi TT models.
- On the A3, J764 reads the signal from Access/Start Authorization Button E408. On the 2016 TT this task is performed by Access/Start Authorization Control Module J518.
- On the A3, J764 assumes the master function for terminal control. On the 2016 TT, this task is performed by Access/Start Authorization Control Module J518.
- On the A3, five additional signal lines lead to J764. On the 2016 TT, no signal lines lead to J764.

Electrical rear spoiler

The 2016 TT has an electrically operated rear spoiler as standard equipment.

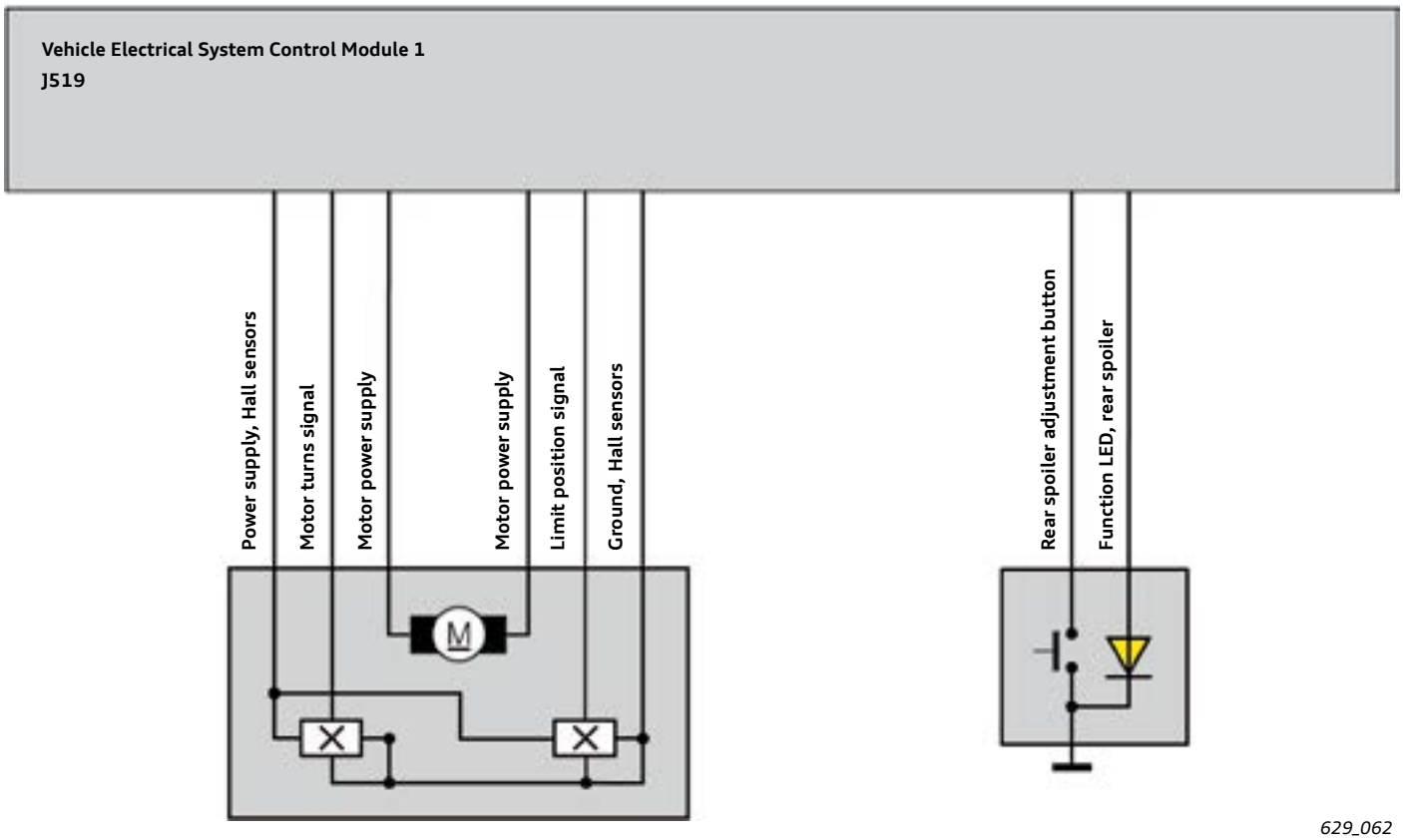
There are two differences between the way in which the rear spoiler operates in the 2016 Audi TT and in the predecessor model.

1. The task of controlling the rear spoiler has been transferred to Vehicle Electrical System Control Module 1 J519. It was controlled by Comfort System Central Control Module J393 on the predecessor model.

2. Two Hall sensors are used to detect the position of the rear spoiler in the Audi TT. Two micro-switches were used for this purpose in the predecessor model.

   The two micro-switches only indicated when a limit position had been reached. An issue with the micro-switch based solution of the predecessor model was that it was not possible to determine the position of the rear spoiler between the two limit positions.

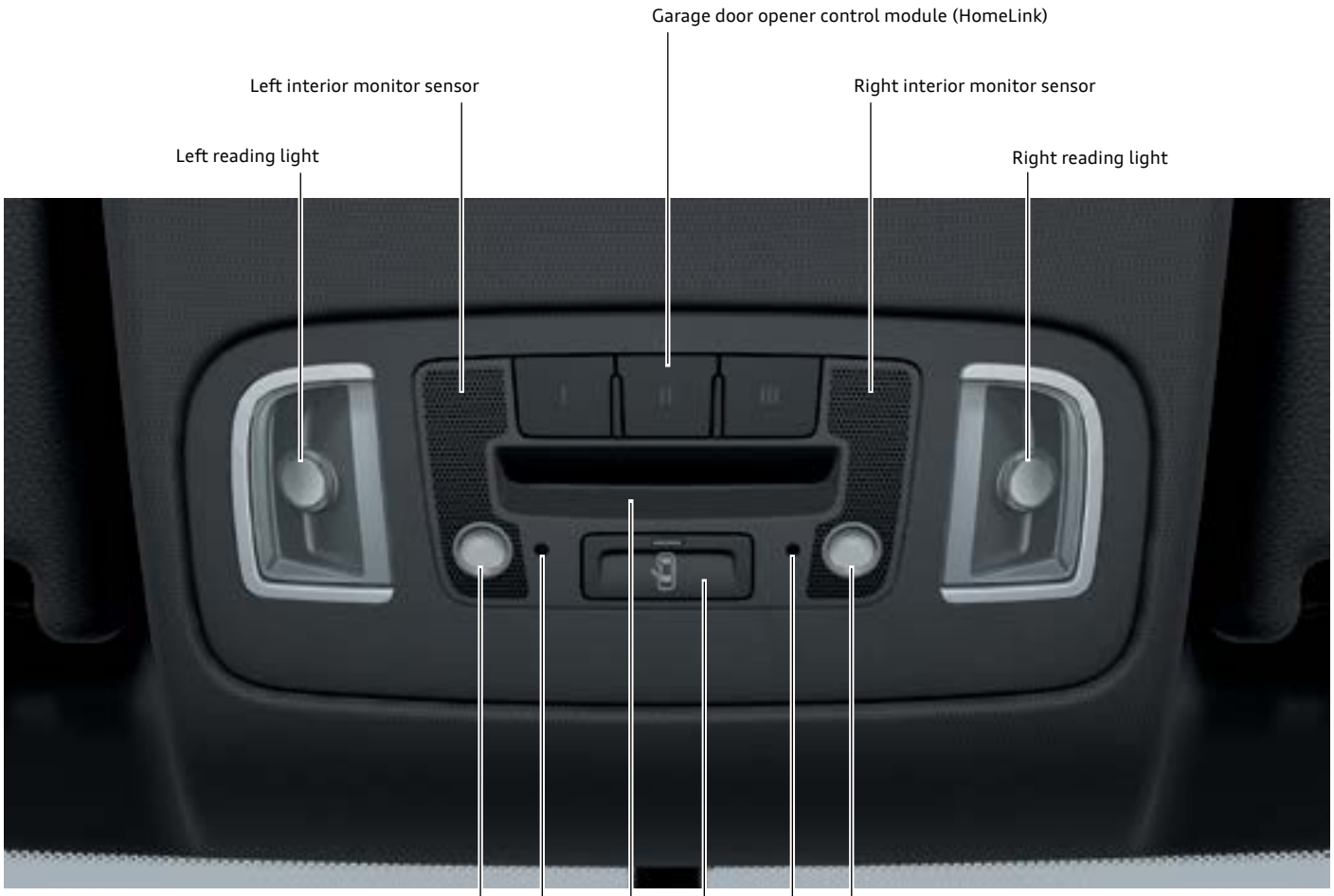
   On the 2016 TT, one Hall sensor serves to detect the “Rear spoiler extended” limit position, while the second Hall sensor counts the number of the turns of the adjustment motor. The exact position of the rear spoiler can be determined from the information provided by both sensors.



629_062

Overhead module

The overhead module for the TT contains the “PASSENGER AIRBAG OFF / ON” display, the garage door opener and interior lighting controls.



Notes

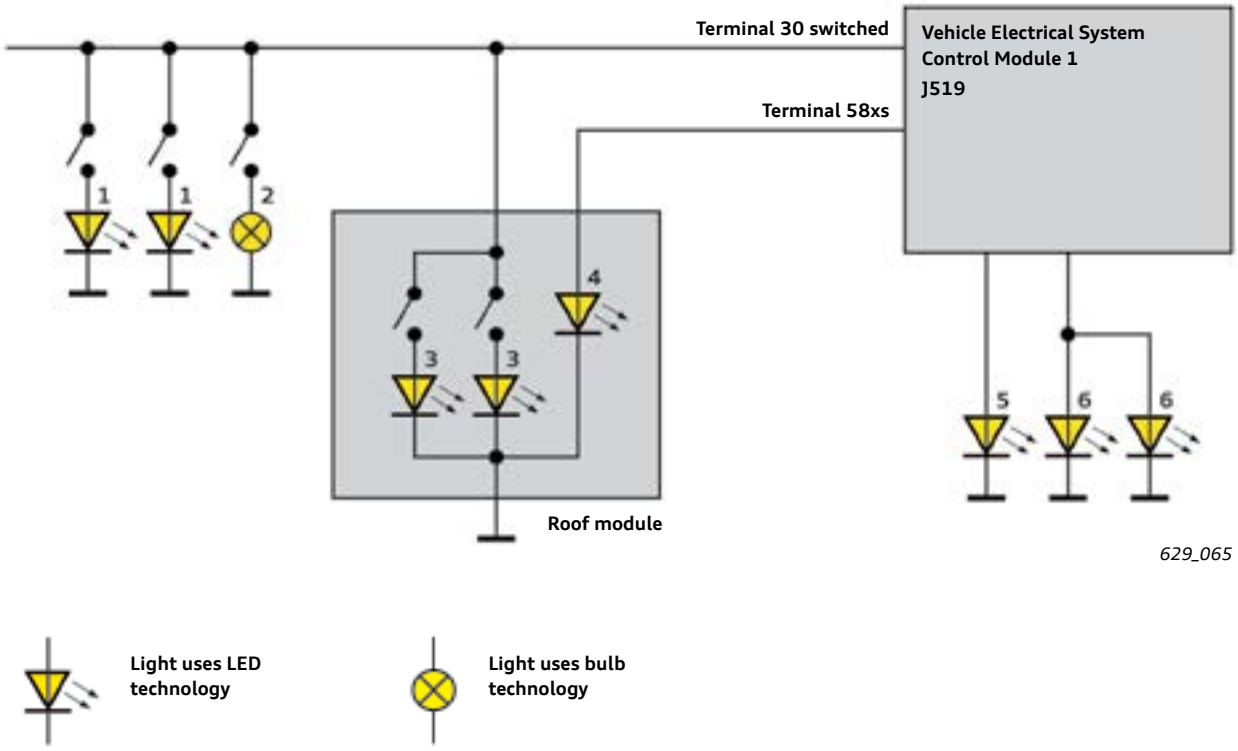
Interior light

Standard lighting in the Audi TT

In the Audi TT, both the vanity lights in the two sun visors and the footwell lighting are standard and use LED technology. The luggage compartment light also uses LED technology.

The bulbs in the overhead module are also LEDs. The two reading lights are no longer switched on and off using conventional mechanical buttons, but rather are switched on and off contactlessly via remote switches. Moving a finger into the vicinity of a reading light is sufficient to change its status from on to off, and vice versa.

The customer can set the brightness of the footwell lights via the MMI control panel. To do this, the customer can find the option "Background lighting" under the menu item "Vehicle settings" in the main function "Car".



Light uses LED technology

Light uses bulb technology

1. Vanity lights
2. Light in glove compartment
3. Reading light in overhead module
4. Background spotlight in overhead module
5. Right luggage compartment light
6. Footwell lights

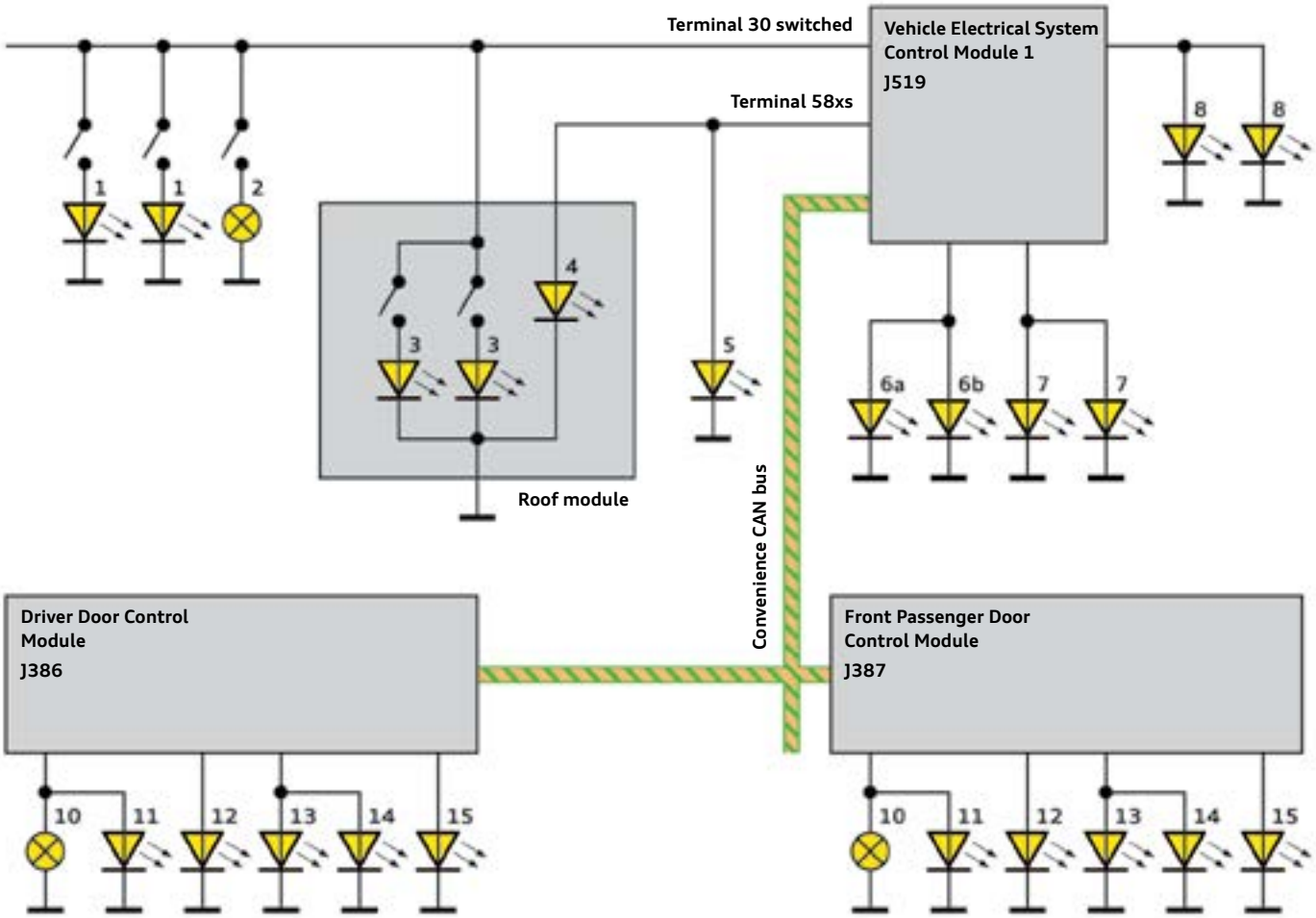
Optional interior lighting package

If an Audi TT has the interior lighting package, it has additional lights in the doors, in the center console and in the luggage compartment. All additional lights in the interior lighting package incorporate LED technology with the exception of the two active door reflectors which still use conventional bulbs.

The entire vehicle is subdivided into three interior lighting zones:

- Front
- Footwell
- Door

The customer can set a different brightness level for each zone via the MMI control panel.



629_067

1. Vanity lights
2. Light in glove compartment
3. Reading light in overhead module
4. Background spotlight in overhead module
5. Media box light

6a. Left luggage compartment light

6b. Right luggage compartment light

7. Light strips in center console
8. Lights in driver and front passengr footwells

10. Active door warning light
11. Door entry light
12. Inner door handle light
13. Optical fiber of ambient light in door
14. Door storage compartment light
15. Premium Sound speaker lighting

The two lights for illuminating the Premium Sound speakers are only installed in the vehicle if it has the optional Bang & Olufsen Sound System.

These lights are not a component part of the optional interior lighting package. Regarding brightness adjustment in the Audi virtual cockpit, they are assigned to the "door" zone.

Infotainment

The Audi TT introduces the next generation of Audi infotainment systems. The Audi TT is the first vehicle to be equipped with the second-generation Modular Infotainment System (MIB) in its full specification.

The Audi TT features the new Audi operating concept which allows even more intuitive operation. Due to the complete restructuring of the menu, each function can be accessed with no more than three clicks. The high version of the multifunction steering wheel enables the driver to control virtually all functions without looking away from the road.

Overview of versions

Two versions of the MMI are available in the Audi TT:

- MMI radio.

and

- MMI Navigation plus.

From a technical point of view, the MMI radio and MMI Navigation plus correspond to the second-generation MIB High.

The customer can order the optional connectivity package for the MMI radio. The package also includes pre-wiring for a navigation unit.

MMI radio (i8E)	MMI Navigation plus (i8H)
with connectivity package (7UH)	**with Audi connect (EL3)**
	
	
Standard equipment	**Standard equipment**
Audi virtual cockpit (9S8)	Audi virtual cockpit (9S8)
Pre-wiring for navigation unit (7UH)	3D SSD navigation system (7UG)[1)]
MMI touch (UJ1)	MMI touch (UJ1)
Multifunction steering wheel, high version (2PF)	Multifunction steering wheel, high version (2PF)
AM/FM radio with phase diversity and background tuner	AM/FM radio with phase diversity and background tuner
	Jukebox (approx. 11 GB)
CD drive (MP3, WMA, AAC)	DVD drive (audio/video)
Two SDXC card readers	Two SDXC card readers
Audi music interface with two USB ports and AUX-in jack (UE7)	Audi music interface with two USB ports and AUX-in jack (UE7)
Audi sound system (9VD)	Audi sound system (9VD)
Bluetooth interface for HFP and A2DP (9ZX)	Bluetooth interface for HFP and A2DP (9ZX)
Audi sound system (9VD)	Audi connect (EL3)
Digital radio (SDARS) (QV3)[3)]	Digital radio (SDARS) (QV3)[3)]
Optional equipment	**Optional equipment**
Bang & Olufsen Sound System (9VS)	Bang & Olufsen Sound System (9VS)

1) For countries without navigation map data, the PRNR is 7UH.
2) Also available with Basic Plus sound system (8RM) depending on country.
3) If digital radio (QV3) and TV tuner (QV1) are ordered together, the PRNR is QU1.

Second-generation MIB High

(Modular Infotainment System)

The second-generation MIB High is the current high-end version of the Modular Infotainment System.

Compared to the first generation MIB introduced in the 2015 A3, the second generation MIB High in the 2016 TT has the following technical modifications:

- Double processing power (8000 MIPS[1)]).
- Double RAM (2 GB).
- High-speed Wi-Fi (up to 150 Mbit/s).
- Screen formats of 1440 x 540 pixels and 1024 x 480 pixels are also possible.
- New operating concept.

Technically speaking, an MIB High control unit is always installed in the Audi TT. Depending on the customer's specifications, the installed system can have the following designations:

- MMI radio.
- MMI Navigation plus.

Information Electronics Control Module 1 J794 is installed in the glove compartment in the TT. It is always equipped with a MOST bus connection regardless if the equipment level requires it or not.

The key features of both versions of the Audi TT infotainment system are shown on the following pages.

629_068

Front panel of J794 for MIB High

629_069

Rear panel of J794 for MIB High

629_070

Front panel of J794 for MIB High with Audi connect

629_071

Rear panel of J794 for MIB High with Audi connect

[1)] Million Instructions per Second

MMI radio

Features of the MMI radio include:

- Radio with phase diversity, FM dual tuner (very high frequency) and AM tuner (medium wave).
- Single CD drive for audio playback (MP3, WMA, AAC).
- Two SDXC card readers for audio playback (MP3, WMA, AAC).
- Car menu.
- 1440 x 540 pixel video output.
- AUX-in connection (UE3) and one 5V charging port in USB format.
- Multifunction steering wheel.
- Internal audio amplifier for Audi sound system rated at 155 watts (8VD).
- Audi music interface for audio files (UE7).
- SDARS tuner (NAR-spec digital radio) (QV3).

The following optional equipment can be ordered for the MMI radio:

- External audio amplifier with Bang & Olufsen sound system rated at 680 watts (9VS).

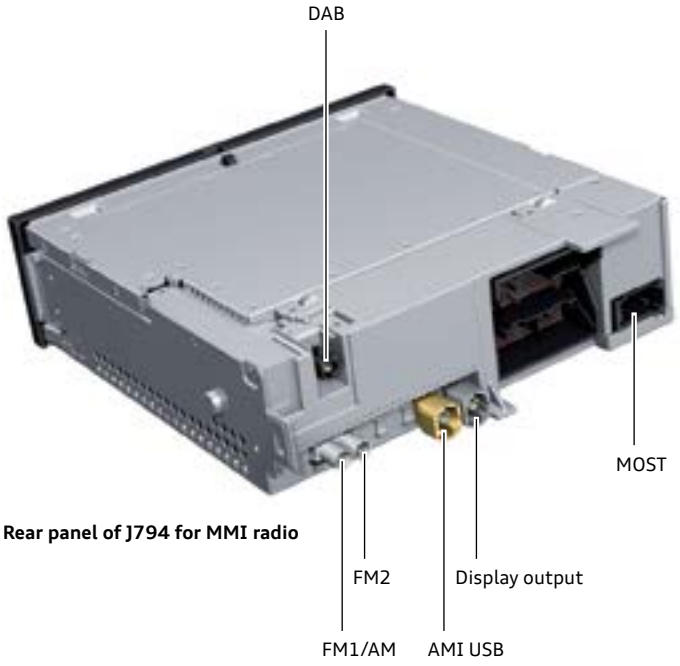
If the vehicle has the PR numbers "i8E" plus "7Q0", this means that it is installed with the MMI radio.

629_072

Display for MMI radio

629_068

Front panel of J794 for MMI radio



Rear panel of J794 for MMI radio

629_073

MMI radio with connectivity package

Compared to the MMI radio without connectivity package, the MMI radio with connectivity package has the following additional features:

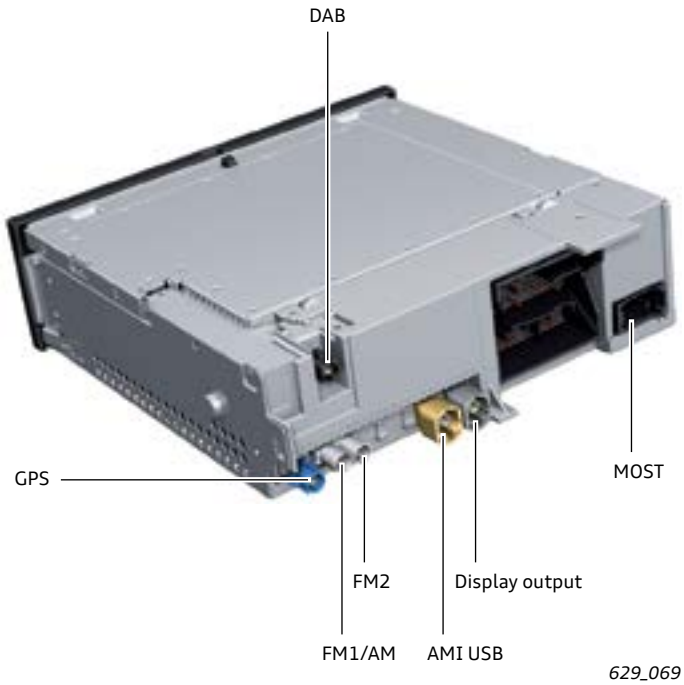
- Pre-wiring for navigation unit with installed navigation antenna.
- Bluetooth interface for HFP and A2DP with Premium voice dialogue system.
- Audi music interface with two fully functional USB data connections (UE7).
- MMI touch.
- Multifunction steering wheel, version (2PF).

629_074

Display when the navigation function is activated

629_068

Front panel of J794 for MMI radio



629_069

Rear panel of J794 for MMI radio with connectivity package

MMI Navigation plus

Features of the MMI Navigation plus include:

- Radio with phase diversity, FM dual tuner (very high frequency) and AM tuner (medium wave).
- Single DVD drive for audio and video files.
- Two SDXC card readers for audio and video files.
- SSD drive (approximately 64 GB).
- One SIM card reader.
- Jukebox (approximately 11 GB).
- 3D navigation system with navigation data on solid state drive.
- Integrated audio amplifier rated at 4 x 25 watts (8RM).
- Audi music interface with two fully functional USB data connections (UE7).
- AUX-in connection (UE3).
- Car menu.
- Bluetooth interface for HFP and A2DP.
- Premium voice dialog system.
- Provision of predictive route data.
- 1440 x 540 pixel video output.
- MMI touch.
- High-speed Wi-Fi module (up to 150 Mbit/s).
- SDARS tuner (NAR-spec digital radio) (QV3).
- Internal audio amplifier for Audi sound system rated at 155 watts (8VD).

The following optional equipment can be ordered for the MMI High:

- Audi connect (EL3).
- External audio amplifier with Bang & Olufsen sound system rated at 680 watts (9VS).

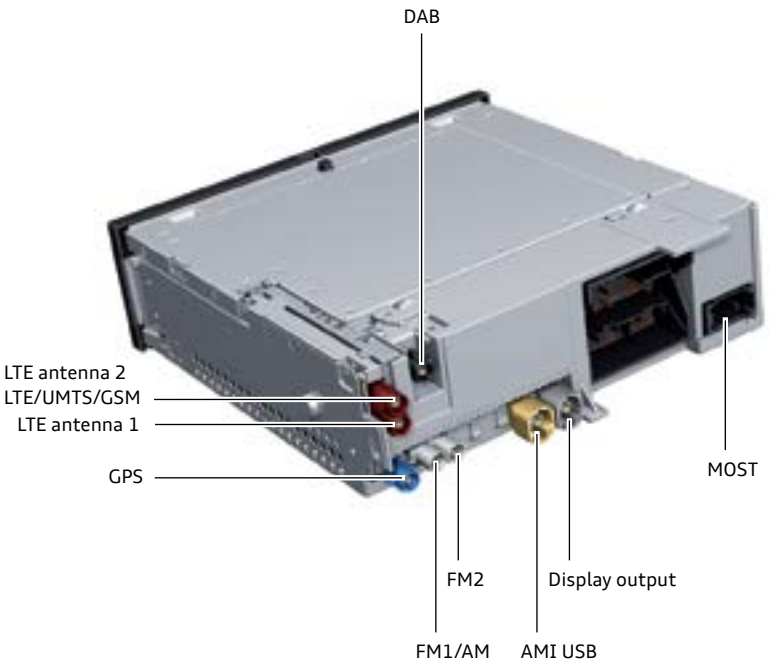
If the vehicle has the PR numbers "i8H" plus "7UG", it means that it has MMI Navigation plus.

629_075

MMI Navigation plus display

629_070

Front panel of J794 for MIB navigation plus with Audi connect



629_071

Back panel of J794 for MMI Navigation plus

Audi connect

Various Audi connect services can be ordered for the Audi TT. The availability of these services is market dependent.

The term Audi connect stands for networked mobility. It combines applications and developments which allow media to be used in the vehicle and to be connected to the outside world.

For example, the following Audi connect services are available for the Audi TT:

- Traffic information online.
- Google Earth map.
- Wi-Fi hotspot.
- Facebook*.
- Twitter.
- Plane / rail information.
- Picture destinations.

*Note - As of June 1st, 2015, Facebook will no longer be available in the Audi connect portfolio in any Audi vehicles.

Several services, such as "Google Earth", are pre-activated and ready for use on delivery of the vehicle. Other services, such as "Facebook", can only be used after they have been activated via the "myAudi" website or the "myAudi APP" after "personalizing" the settings. To do this, the customer must register online at "myAudi" (www.audi.com/myaudi). Customers can then configure their vehicle. If the configured vehicle meets the requirements for Audi connect, the additional services available for this vehicle can also be used.

In the Audi TT, news and weather are displayed above the services list on the Audi connect start page for the first time. Here, the customer can create a preview of Audi connect services. This preview is created in the vehicle by the customer and can also be deleted. Basically, it is possible to create a preview for all Audi connect services.

In the screenshot shown here, the weather and a news preview are displayed for the actual location. It is also possible to save a weather forecast for any selectable location.

629_075

Audi connect start page

629_076

Audi connect menu

629_077

Traffic information online

629_078

Audi connect preview menu

Reference
For further information about Audi connect, please refer to the Audi Video Portal. Several videos are available that explain this topic.

Networking

In models with MMI radio and MMI Navigation plus, Information Electronics Control Module 1 J794 is connected to Data Bus On Board Diagnostic Interface J533 via the Infotainment CAN bus. The Infotainment CAN bus is a high speed bus with a maximum data transfer rate of 500 kbit/s.

The Audi virtual cockpit (J285) and Multi-media System Control Head E380 are connected to Information Electronics Control Module 1 J794 via a new Modular Infotainment System CAN (MIB CAN) for the first time. This bus is also a high speed bus with 500 kbit/s capability.

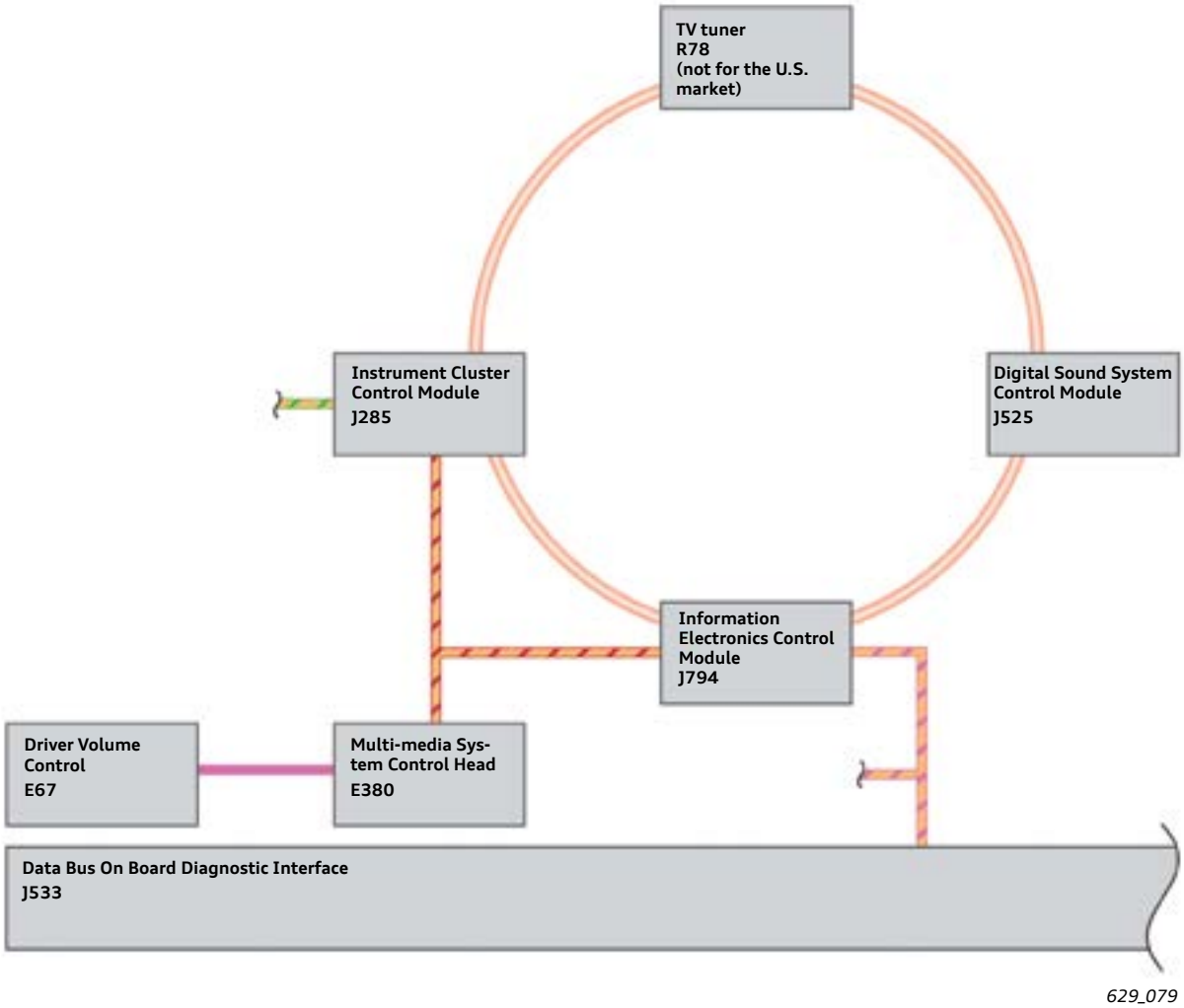
Driver Volume Control E67 is connected to E380 via a LIN Bus.

If an additional infotainment control module, such as the Bang & Olufsen audio amplifier is installed, the infotainment system also has an operational MOST bus.

This vehicle therefore has both the infotainment CAN bus and the MOST bus. The MOST bus is a MOST150 with a data transfer rate of 150 Mbit/s. J794 acts both as the system master and diagnostics master for the MOST bus.

Due to the combination of infotainment CAN bus and MOST bus, an open circuit in the MOST bus will not result in total failure of the MMI. This means that all functions executed directly in J794 are still available. However, audio output via an external amplifier would no longer be possible.

Rearview Camera System Control Module J772 is also connected to the Infotainment CAN.



629_079

Key:

- Convenience CAN bus
- Infotainment CAN bus
- Modular infotainment system CAN
- LIN bus
- MOST bus

Display and operating concept

Display of MMI content

The Audi TT does not have a separate MMI display. All displays appear in the Audi virtual cockpit.

Example of a selection menu *629_080*

Example of an options menu *629_081*

Operating concept

The Audi TT features a new operating philosophy. Due to the complete restructuring of the menu, each function can be accessed with no more than three clicks. The menu guidance system used since the launch of the MMI, with four submenus over each of the four corners of the MMI screen, has been revised. Depending on menu, there are now one or two "side menus". They can be accessed by buttons on the left and right of the rotary pushbutton.

The selection menu (left side menu) can be opened with the left button. The selection menu contains the submenus of a main group.

Example: Media and Radio contain the sources.

The options menu (right side menu) can be opened with the right button. The options menu contains content-dependent and general options.

- Content-dependent options are dependent on the cursor position.
  Example: "Add to favorites"
- General options are cursor dependent.
  Example: "Sound"

In the case of the MMi radio with connectivity package or higher, the functions of both buttons in E380 can selected via the multifunction steering wheel. To do this, there is a toggle button at the bottom of the left control panel on the multifunction steering wheel.

Almost any function of the infotainment system can be operated with the multifunction steering wheel. This is why there is a toggle button with arrow keys in the right control panel. This button can be used, for example, to select the previous or next radio station or track.

629_082

Toggle button for operating the left and right side menus

629_083

Toggle button for selecting forwards and back

Reference

For further information about the operating concept, please refer to eSelf Study Program 910153 "Audi Virtual Cockpit".

Control panel

Multi-media System Control Head E380

With the new operating logic, the controls now have fewer buttons. There are two toggle switches which can be used to select between two menus.

The volume control also tilts to the left and right. This function can be used, for example, to select the previous or next radio station or track. The volume control has the designation Driver Volume Control E67.

With the new operating logic, there are now only two Softkeys in addition to the rotary pushbutton. The predecessor system had a total of four buttons (softkeys).

The left toggle button can be used to activate the following menus:

- NAV/MAP.
- TEL.

The right toggle button can be used to activate the following menus:

- RADIO.
- MEDIA.

629_084

MMI control panel in center console

The following operations can be performed with MMI touch:

- Input of letters, numbers and characters by automatic signature recognition.
- Scrolling through album covers.
- Operating DVD main menu.
- Moving the navigation map.
- Zooming in and out of the navigation map (using a two-finger pinch gesture as used on smartphones).
- Scrolling through various lists.

629_086

Operating unit with MMI touch

Button combinations for service

System reset

To restart (reset), the following buttons must be briefly pressed simultaneously:

- NAV/MAP.
- Rotary pushbutton.
- RADIO.

629_087

Button combination for system reset

Screenshot

When a screenshot is taken, only the image transmitted by the MMI is saved. Instrument cluster displays are not shown on this screen. The image is saved to the internal memory of the Information Electronics Control Module 1 J794. To save a screenshot, the following buttons must be pressed in succession and held down:

- NAV/MAP.
- Rotary pushbutton.

The display in the instrument cluster flashes briefly to indicate that the screenshot has been saved. In total, up to 50 screenshots can be stored in J794. When the 51st screenshot is saved, the first screenshot is overwritten.

The saved screenshots can then be copied from J794 to an SD card using the VAS Scan Tool. The procedure is as follows:

1. Insert blank SD card into the left SD card reader (SD1).
2. Select "5F-Basic setting" in Guided Functions.
3. Start the "Write analysis data to SD card" Test Plan.

The analysis data including the screenshots are now copied to the SD card

629_088

Button combination for screenshot

Engineering menu

The Engineering menu can be used, for example, for diagnosing difficult issues. To access the menu, the following buttons must be pressed in succession and held down:

- NAV/MAP.
- MEDIA.

629_089

Button combination for the Engineering menu

Sound systems

The Audi TT comes standard with the Audi sound system. This system has nine speakers including a center speaker in the center console. To provide more powerful bass, two special mid-range/bass speakers are installed in the doors.

The audio amplifier is integrated with Information Electronics Control Module 1 J794 and delivers a total output of 155 watts. The speakers are supplied with the following power outputs through six channels:

- Mid-range/bass speakers in the doors with parallel-connected treble speakers in the instrument panel, 40 watts each side
- Rear mid-range/bass loud with parallel-connected rear treble speakers, 25 watts each side
- Center speaker rated at 25 watts

Audi TT with Audi sound system

Audi TT with Bang & Olufsen Sound System

The Bang & Olufsen Sound System delivers a total power output of 680 watts through its 12 speakers. The external B&O audio amplifier (Digital Sound System Control Module J525) is located under the left front seat and is connected to Information Electronics Control Module 1 J794 via the MOST bus.

The audio amplifier supplies the 12 speakers with a total of 14 channels.

- One 25 watt channel per center speaker and treble center speaker.
- One 25 watt channel per front left and right treble speaker.
- One 40 watt channel per front left and right mid-range speaker.
- Two 100 watt channels per front left and right bass speaker.
- One 25 watt channel per rear left and right treble speaker.
- One 25 watt channel per rear left and right mid-range/bass speaker.

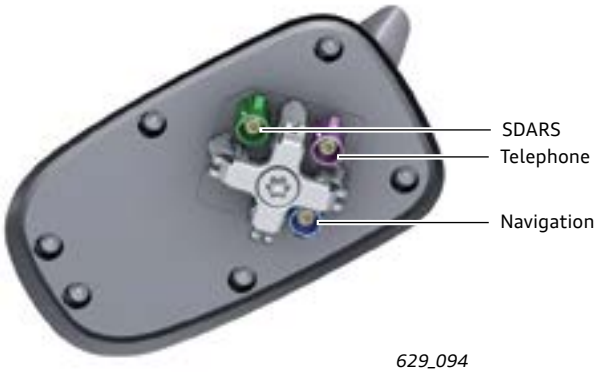

Right Front
Treble Speaker
R22
Right Front
Bass Speaker
R23
Right Front
Mid-range Speaker
R104
Right Rear
Treble Speaker
R16
Right Rear
Bass Speaker
R17
Digital Sound System
Control Module
J525
Left Rear
Treble Speaker
R14
Left Rear
Bass Speaker
R15
Audi TT Coupé
TT

629_092

Antenna overview

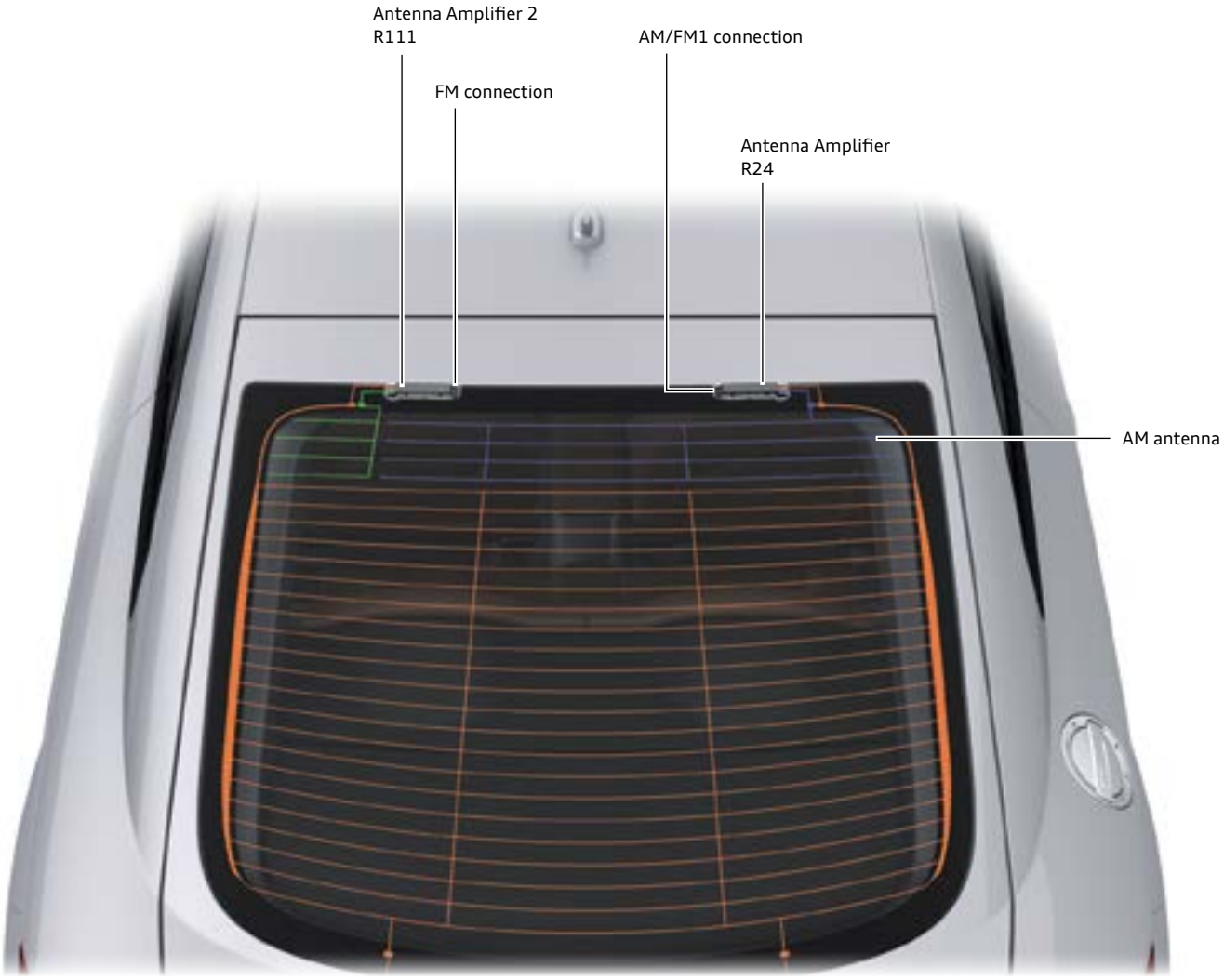
There are antennas on the rear window, under the rear bumper and on the roof of the Audi TT. The antenna amplifiers are housed in the trunk lid.

Only the antennas actually needed are installed on the vehicle.



629_094

Roof Antenna R216 (North America)

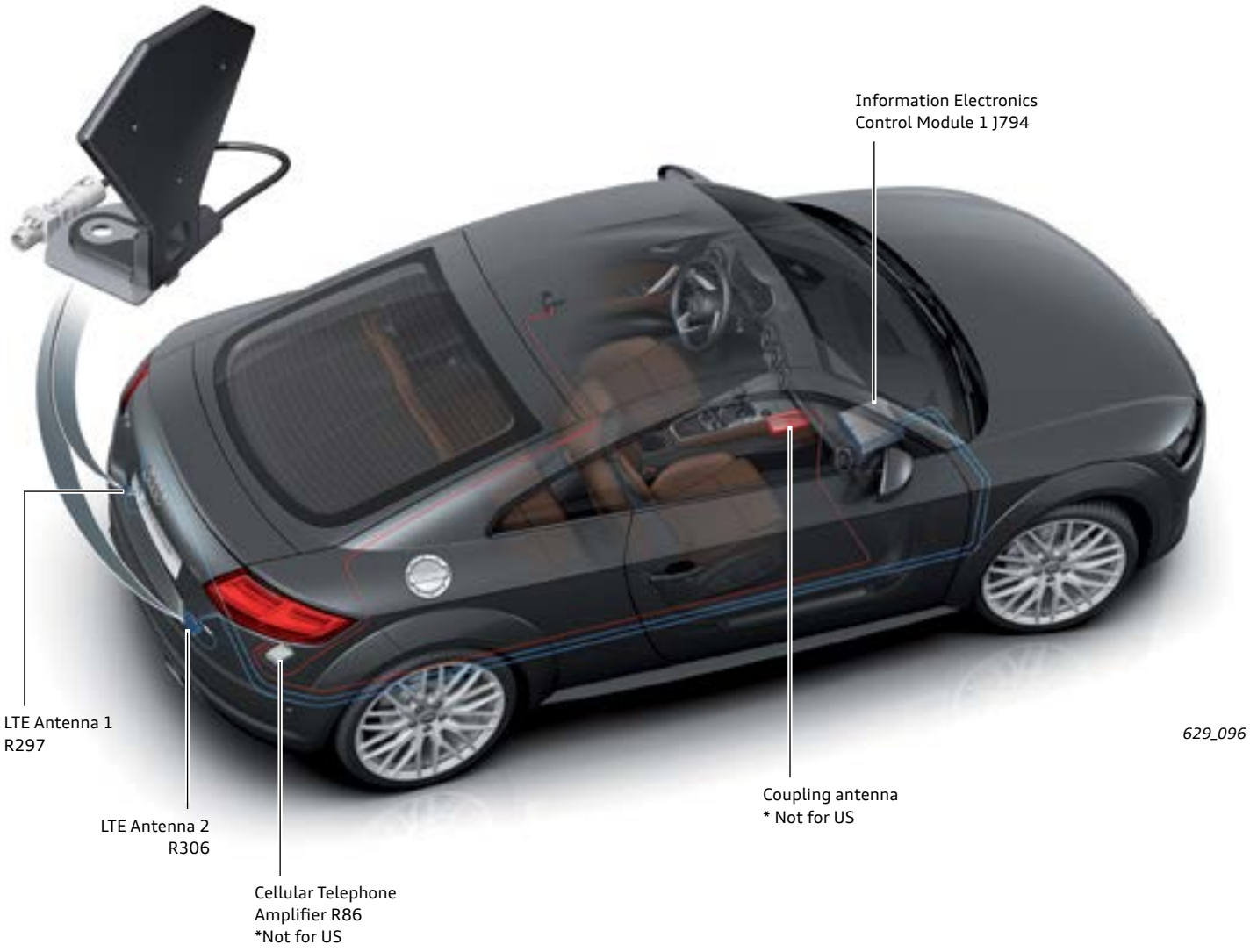


629_095

Telephone antennas

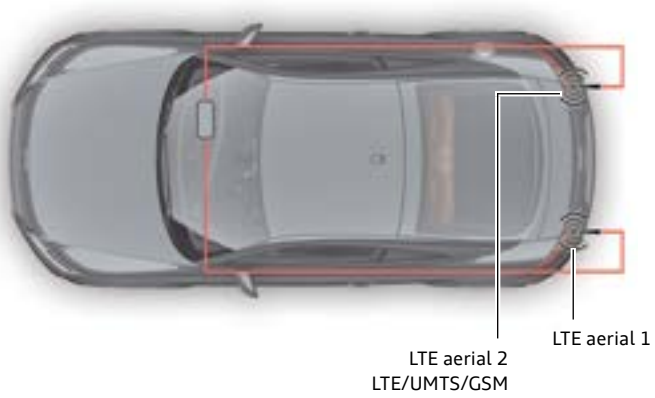
Depending on the equipment level, the TT can come with up to three telephone antennas. Depending on version, the roof antenna can be configured for LTE, UMTS, and GSM reception or for UMTS and GSM reception only.

Two antennas are installed under the rear bumper of models that have Audi connect and LTE reception. The left antenna is configured to receive LTE signals and transmit them to Information Electronics Control Module 1 J794. The right antenna is the North American Region specification and is configured to transmit and receive LTE/UTMS/GSM signals and relay these signals to J794.



Overview of aerial uses

North American Region with Audi connect



Audi music interface (AMI)

The Audi music interface has two fully functional USB data connections in the infotainment box. Here, two different media, such as an USB stick containing audio files and an iPhone, can be connected at the same time.

If both USB connections are in use, music, for example, can be output directly to the speakers through one of these connections. In parallel to this, audio files can be imported into the Jukebox through the second connection.

5 V and up to 500 mA are available at one of the USB connections. If an iPod or iPad is detected, a current of up to 1.6 A is allowed.

On vehicles equipped with MMI radio, only audio files can be transmitted through the two connections.

On vehicles equipped with MMI Navigation plus, video files can be transmitted via the two connections in addition to audio.

The Audi music interface in the Audi TT also allows mobile devices to be connected via Wi-Fi. This connection can be used for audio streaming. Ideally, the customer would use the Audi music stream app or the Audi connect app for this purpose.

629_099

Audi music interface connection

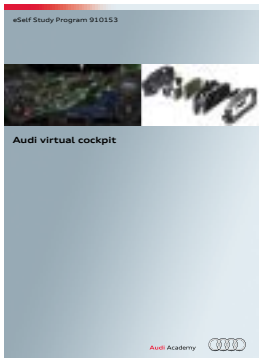
Notes

Self study programs

For further or supplementary information on this eSelf Study program, please refer to the following self study programs:

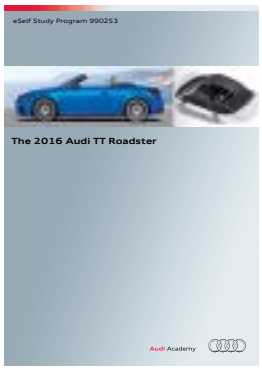
SSP 970243
Audi A3 2015 Onboard Power Supply and Networking

SSP 970343
Audi A3 2015 Vehicle Electronics and Driver Assist Systems



SSP 910153
Audi Virtual Cockpit

SSP 990153
The 2016 Audi TT Introduction



SSP 990253
The 2016 Audi TT Roadster

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:
www.accessaudi.com

From the accessaudi.com Homepage:

- Click on the "ACADEMY" tab
- Click on the "Academy site" link
- Click on the Course Catalog Search and select "970153 - 2015 Audi TT Electric, Electronics and Infotainment 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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Truth in Engineering

970153

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