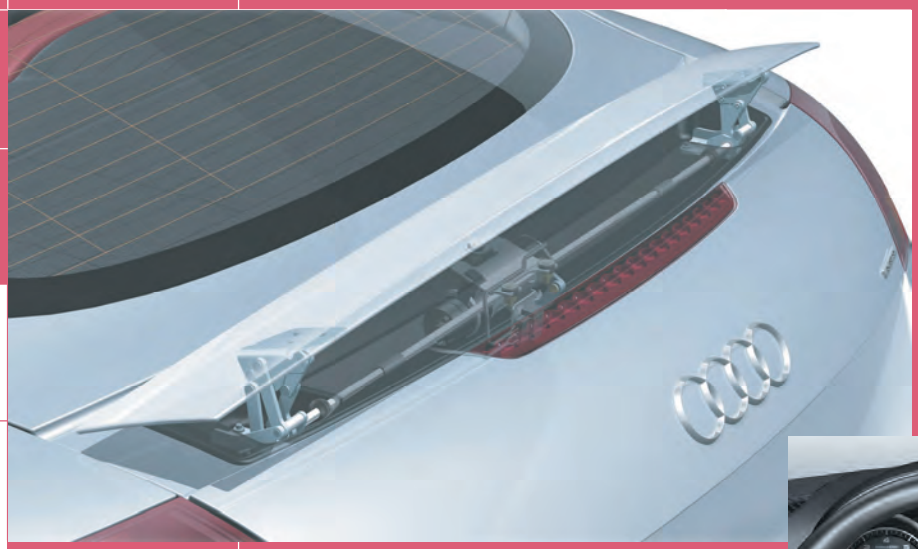
Service Training





The 2008 Audi TT
Electrical and Infotainment Systems

Self-Study Program 992703

Audi of America, Inc.
Service Training
Printed in U.S.A.
Printed 1/2007
Course Number 992703

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The Self-Study Program provides introductory information regarding the design and function of new models, automotive components or technologies.

The Self-Study Program is not a Repair Manual!
All values given are intended as a guideline only.
For maintenance and repair work, always refer to current technical literature.

Reference



Note



Notes

Innovations in the Electronics, Electrical, and Infotainment Systems of the 2008 Audi TT

The proven electronic technology of the Audi A3 Sportback has been adopted for the new TT. The most striking new feature is the automatic, electrically adjustable rear spoiler activated by the Comfort System Central Control Module.

In the TT, the Driver Information System (Onboard Computer) in the center display of the instrument cluster has an extended settings and query menu.

The customer can use the settings menu to configure functions and make adjustments. This was previously possible only in vehicles with MMI.

The Audi TT offers the customer a multitude of functions and equipment options. This has resulted in a dramatic increase in the number of control modules compared to the original TT.

To ensure accurate and efficient communication between control modules, various network buses are used.

The networking structure is similar to the Audi A3 Sportback.

In this Self-Study Program, you will see the network topology, installation location of the control modules, and function descriptions.

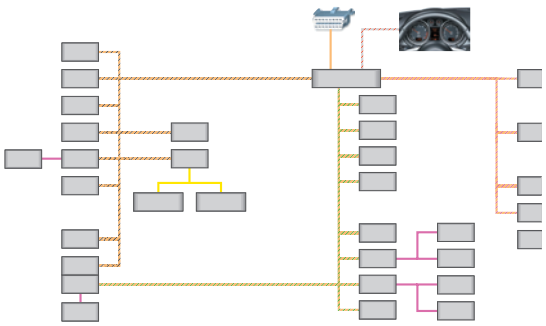
The Audi TT has a new generation of both the Audi concert and Audi symphony II + radios available. The radios also feature a new reception concept as well as MP3 compatible CD drives.

Audi Navigation Plus (RNS-E) (which includes the MMI) is also available in the new TT.

The BOSE Surround Sound system is optional on all three radios. It features 12 loudspeakers driven by a 255 watt amplifier.







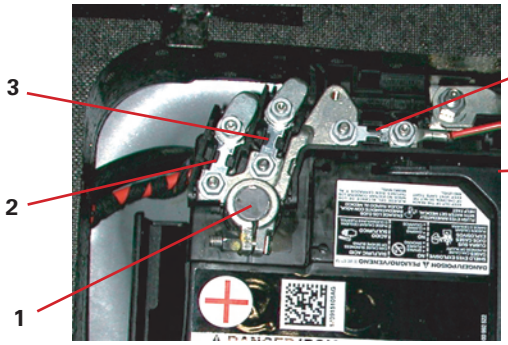


Fuse and Relay Carriers

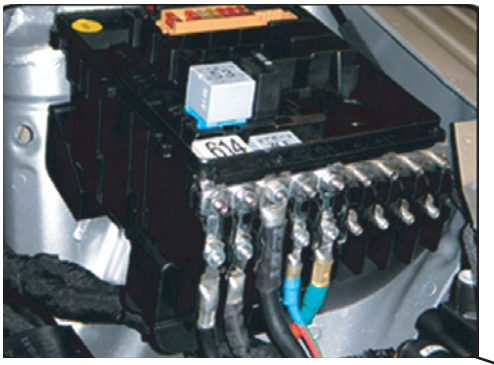
In the 2008 Audi TT, the fuses and relay carriers are located as illustrated.

Legend (for Main Vehicle Fuses, at right)

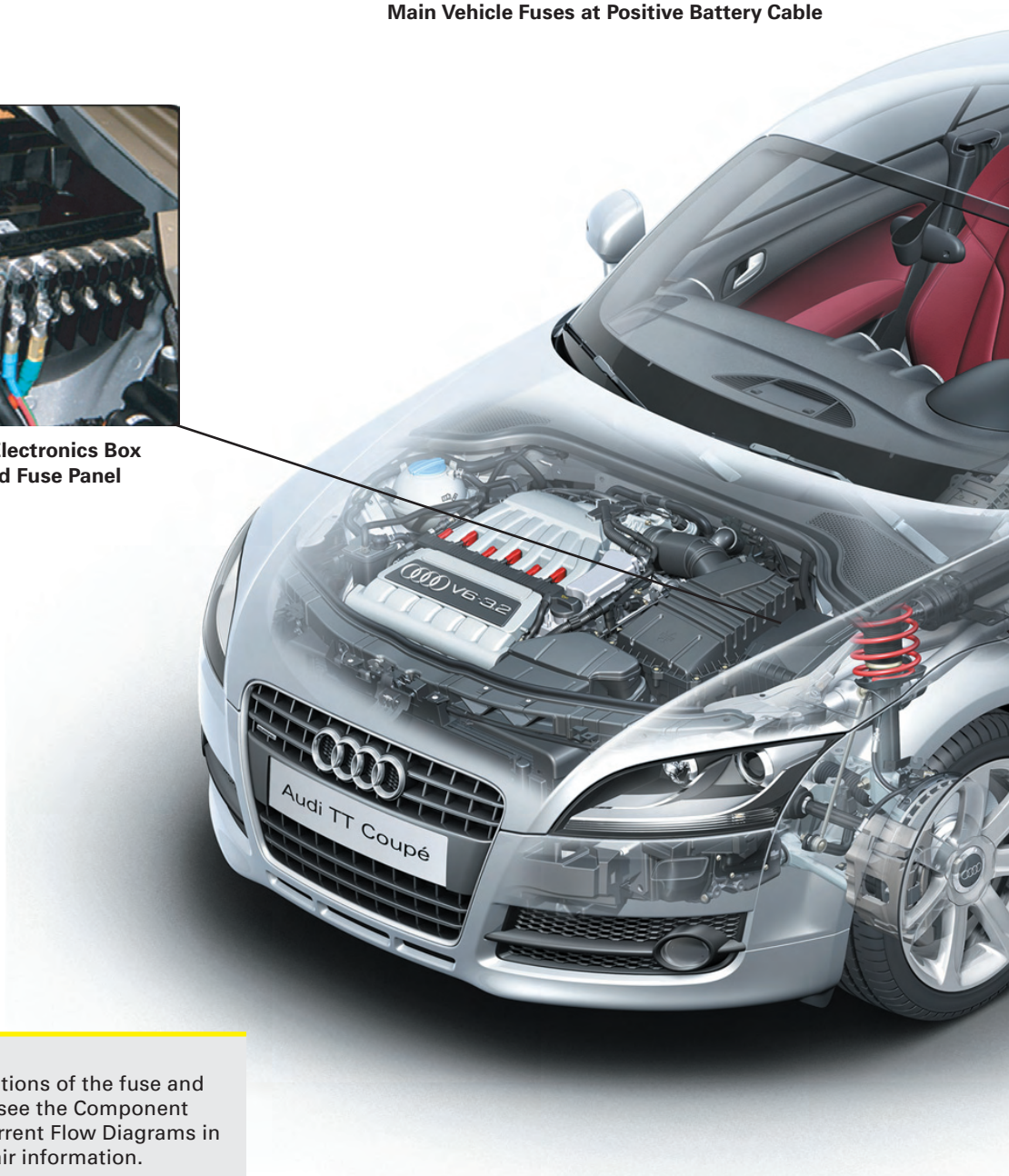
1 Positive Battery Terminal
2 Power Supply Fuse (SD3, 110A) to fuse holder on left side of instrument panel
3 Power Supply Fuse (SD2, 110A) to fuse holder in engine compartment
4 Fuse for ABS Hydraulic Pump V64 (SD1, 40A)



Main Vehicle Fuses at Positive Battery Cable

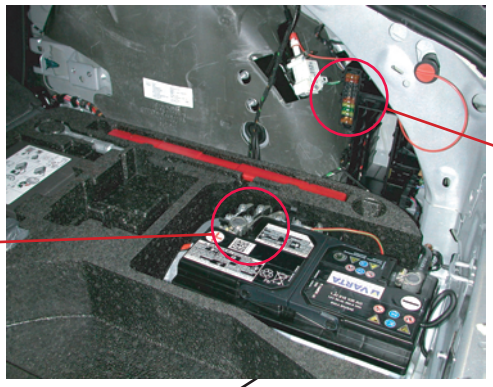


Engine Compartment Electronics Box with Relay Carrier and Fuse Panel

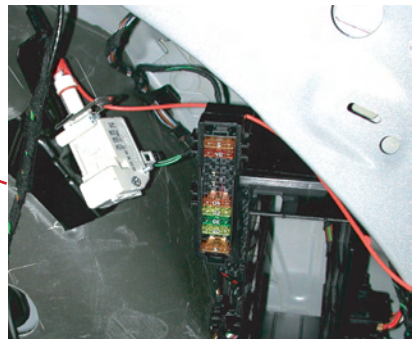


Reference

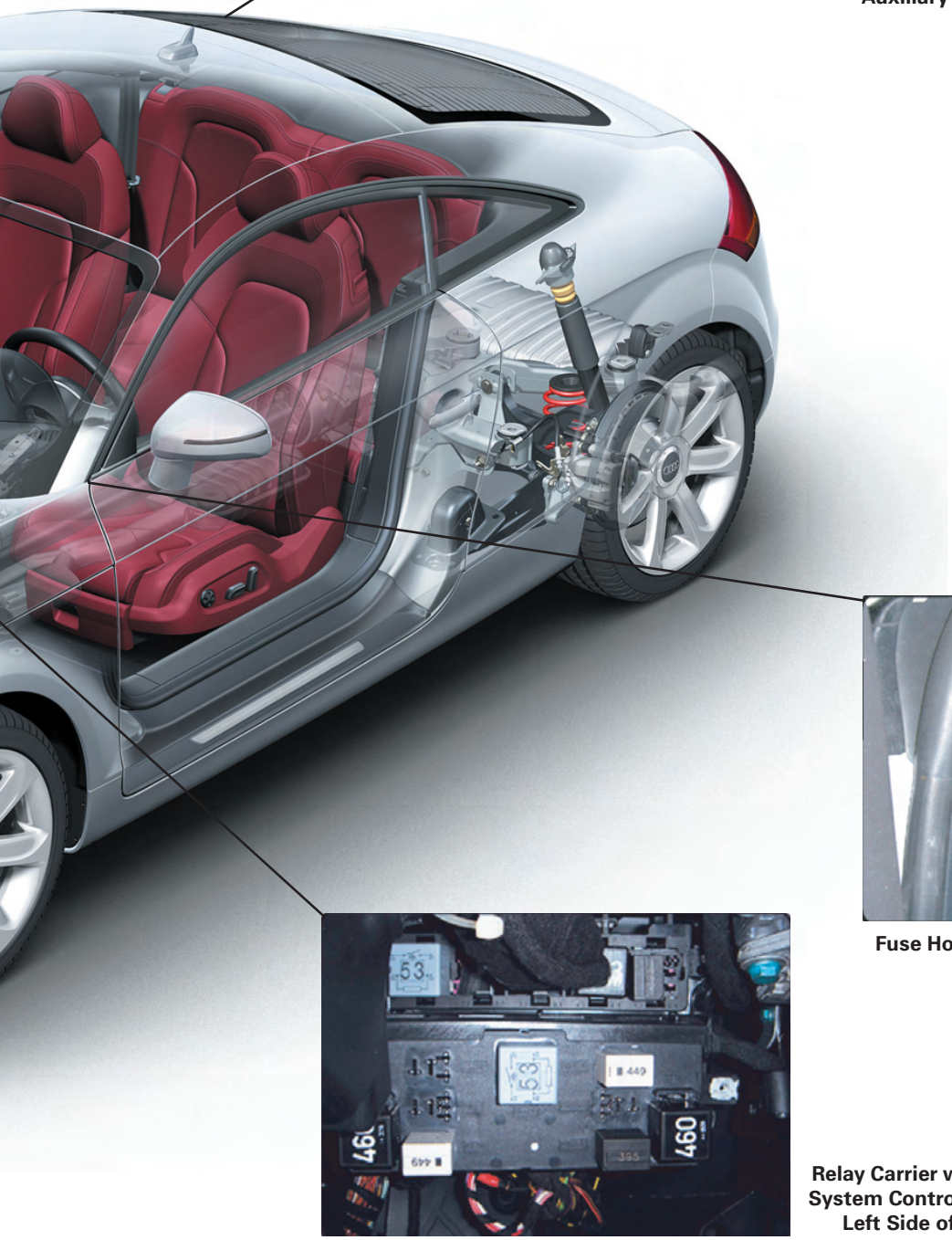
For detailed descriptions of the fuse and relay assignments, see the Component Locations of the Current Flow Diagrams in current service repair information.



Battery Location in Luggage Compartment



Auxiliary Fuse Panel in Luggage Compartment



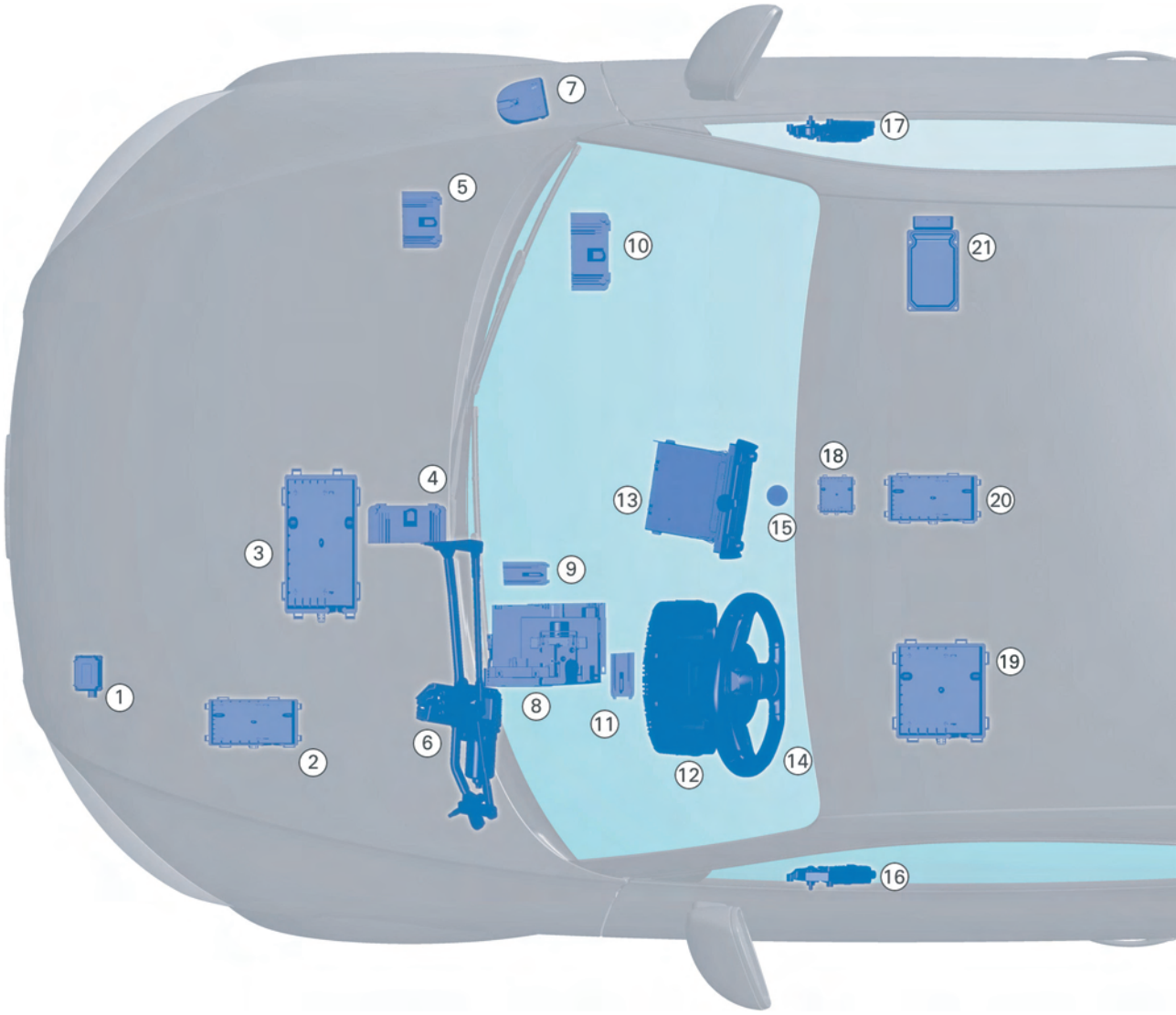


Fuse Holder on Left Side of Instrument Panel

Relay Carrier with Vehicle Electrical System Control Module J519, Under Left Side of Instrument Panel

Control Module Locations

Installation Overview — Control Modules



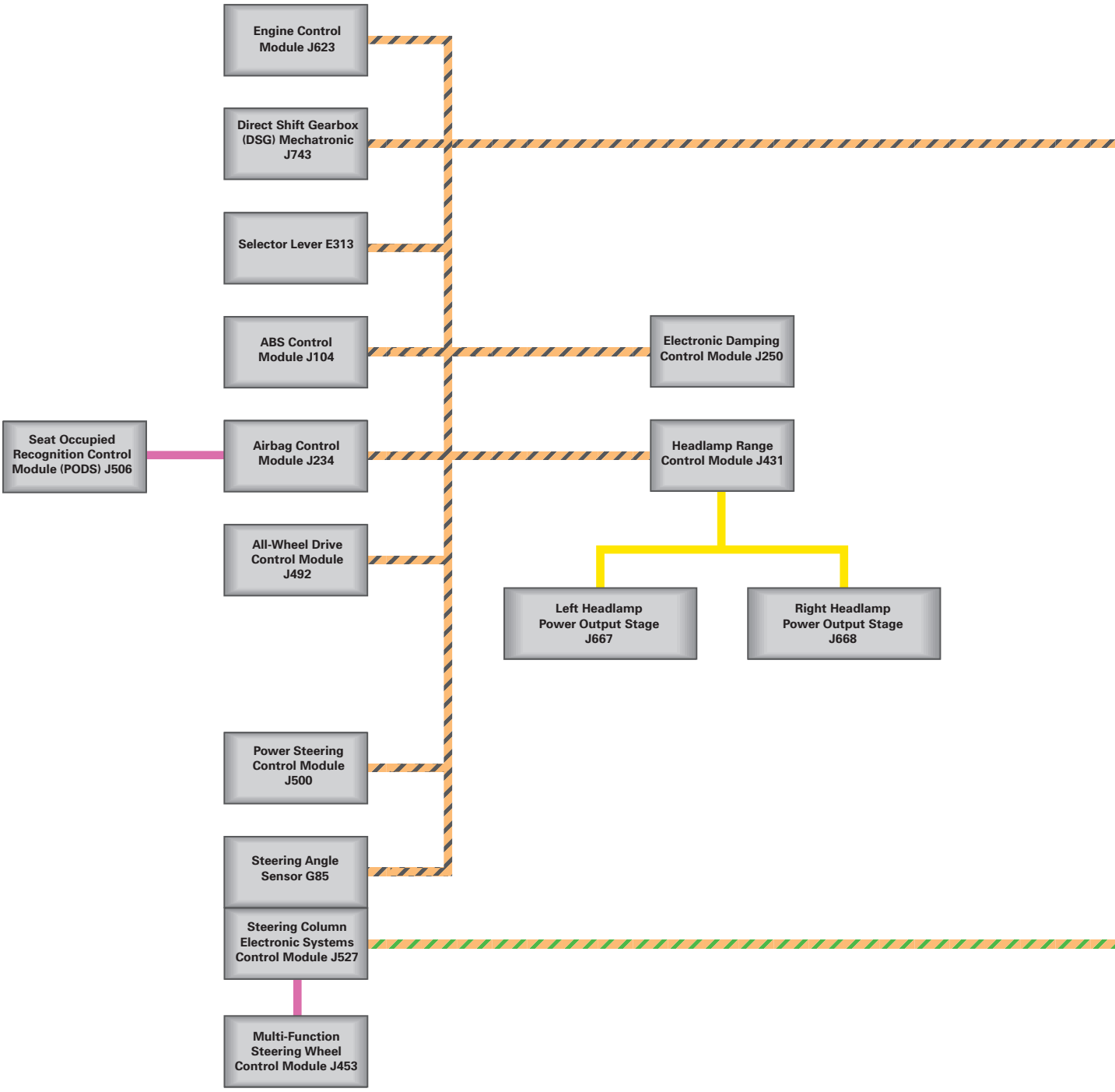
Control Module Locations

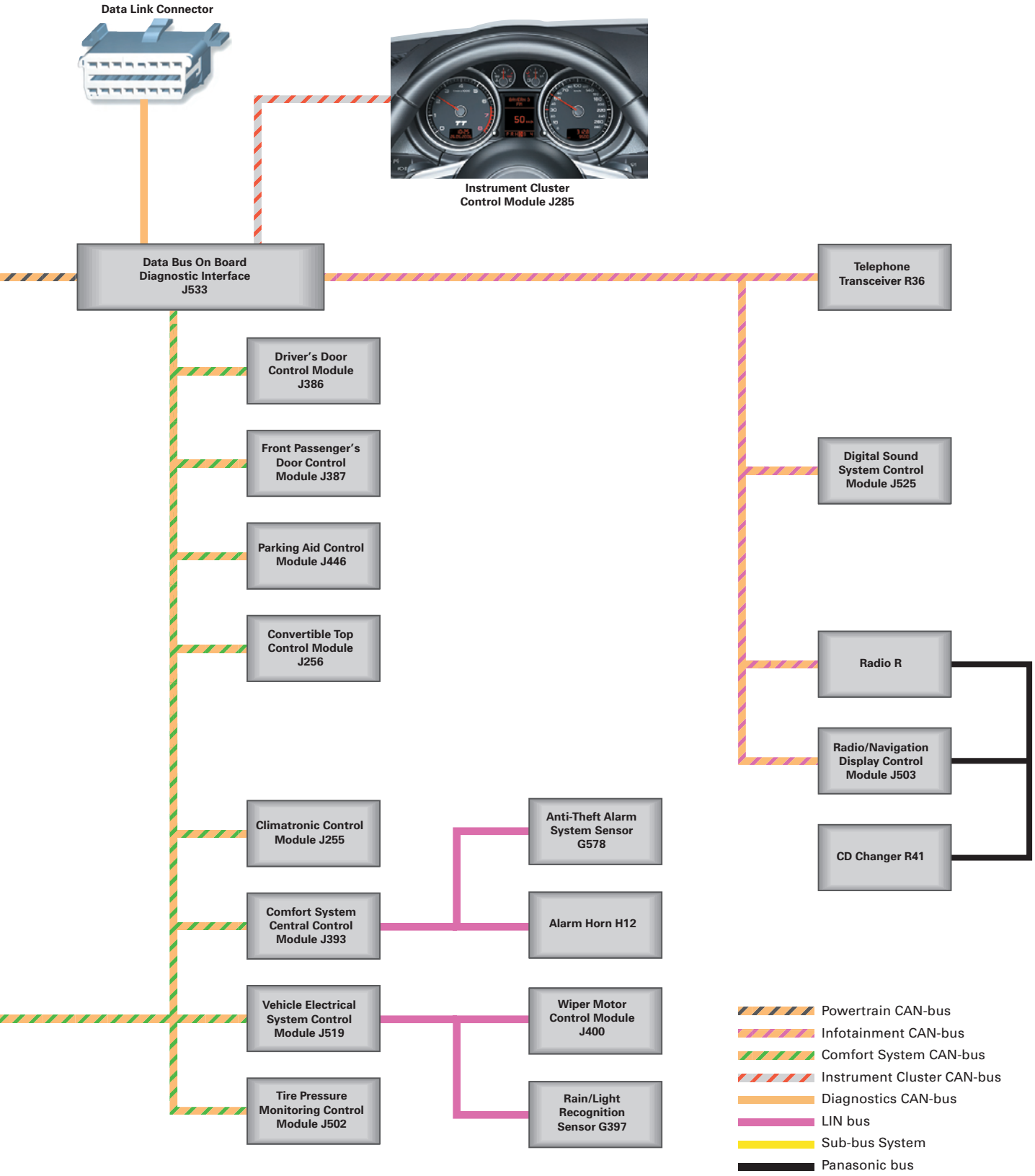


Legend

1 Garage Door Opener Control Module J530
2 Direct Shift Gearbox (DSG) Mechatronic J743
3 Power Steering Control Module J500
4 Engine Control Module J623
5 ABS Control Module J104
6 Wiper Motor Control Module J400
7 Alarm Horn H12
8 Vehicle Electrical System Control Module J519
9 Data Bus On Board Diagnostic Interface J533
10 CD Changer R41
11 Tire Pressure Monitoring Control Module J502
12 Instrument Cluster Control Module J285
13 Radio R
Radio/Navigation Display Control Module J503
Climatronic Control Module J255
14 Steering Column Electronic Systems Control Module J527
Steering Angle Sensor G85
Multi-Function Steering Wheel Control Module J453
15 Rain/Light Recognition Sensor G397
16 Driver's Door Control Module J386
17 Front Passenger's Door Control Module J387
18 Anti-Theft Alarm System Sensor G578
19 Telephone Transceiver R36
20 Airbag Control Module J234
21 Electronic Damping Control Module J250
22 All-Wheel Drive Control Module J492 (quattro models only)
23 Digital Sound System Control Module J525
24 Comfort System Central Control Module J393
25 Parking Aid Control Module J446

Topology and Networking



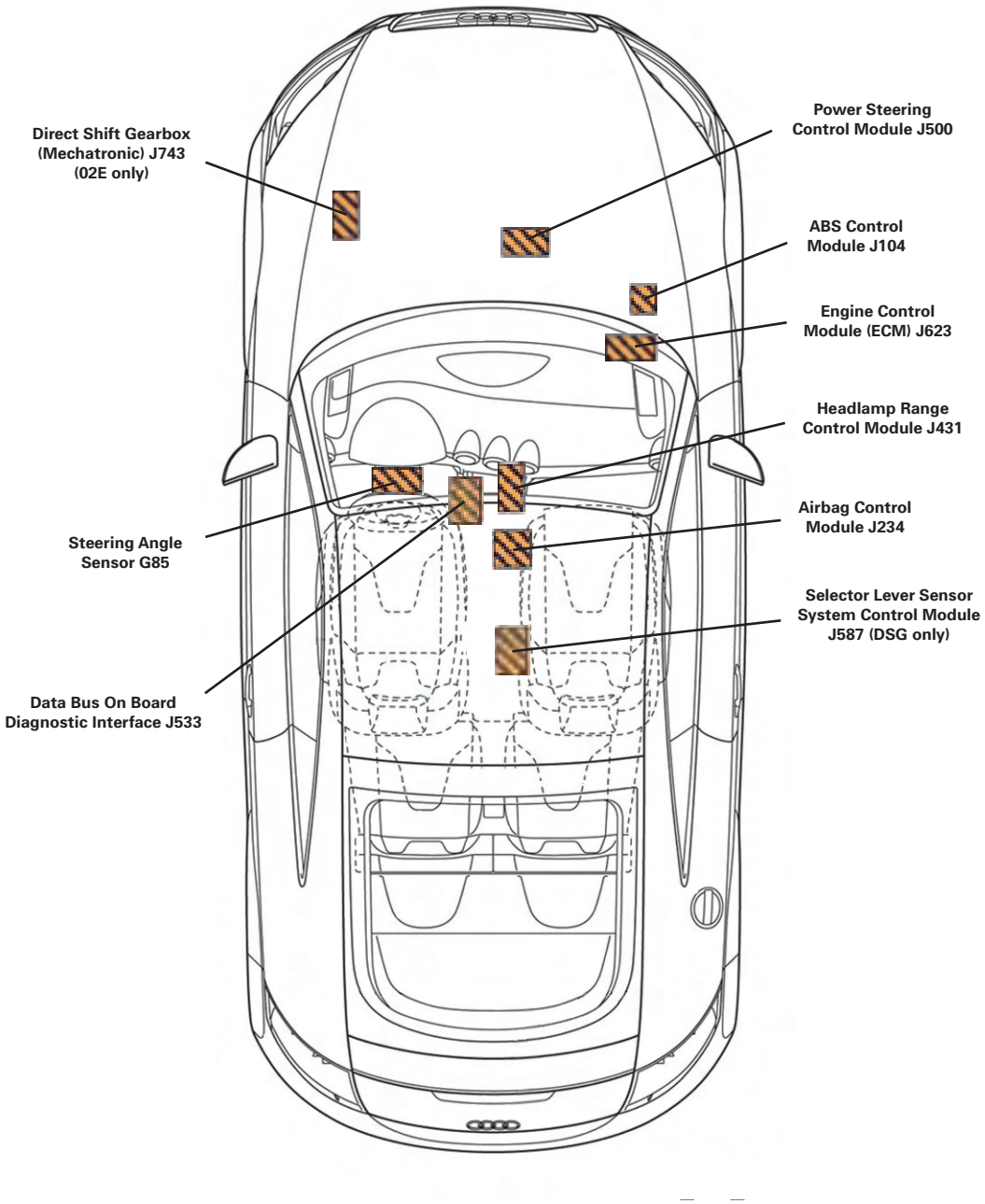

Data Link Connector
Instrument Cluster Control Module J285
Data Bus On Board Diagnostic Interface J533
Telephone Transceiver R36
Driver's Door Control Module J386
Front Passenger's Door Control Module J387
Parking Aid Control Module J446
Convertible Top Control Module J256
Digital Sound System Control Module J525
Radio R
Radio/Navigation Display Control Module J503
CD Changer R41
Climatronic Control Module J255
Anti-Theft Alarm System Sensor G578
Comfort System Central Control Module J393
Alarm Horn H12
Vehicle Electrical System Control Module J519
Wiper Motor Control Module J400
Tire Pressure Monitoring Control Module J502
Rain/Light Recognition Sensor G397
Powertrain CAN-bus
Infotainment CAN-bus
Comfort System CAN-bus
Instrument Cluster CAN-bus
Diagnostics CAN-bus
LIN bus
Sub-bus System
Panasonic bus

Drivetrain CAN-Bus Control Modules

Locations

The illustration below shows the control modules of the Drivetrain CAN and their locations.

The data transfer rate is 500 kbit/s. The data is transferred through the CAN high wire (orange/black) and CAN low wire (orange/brown). To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

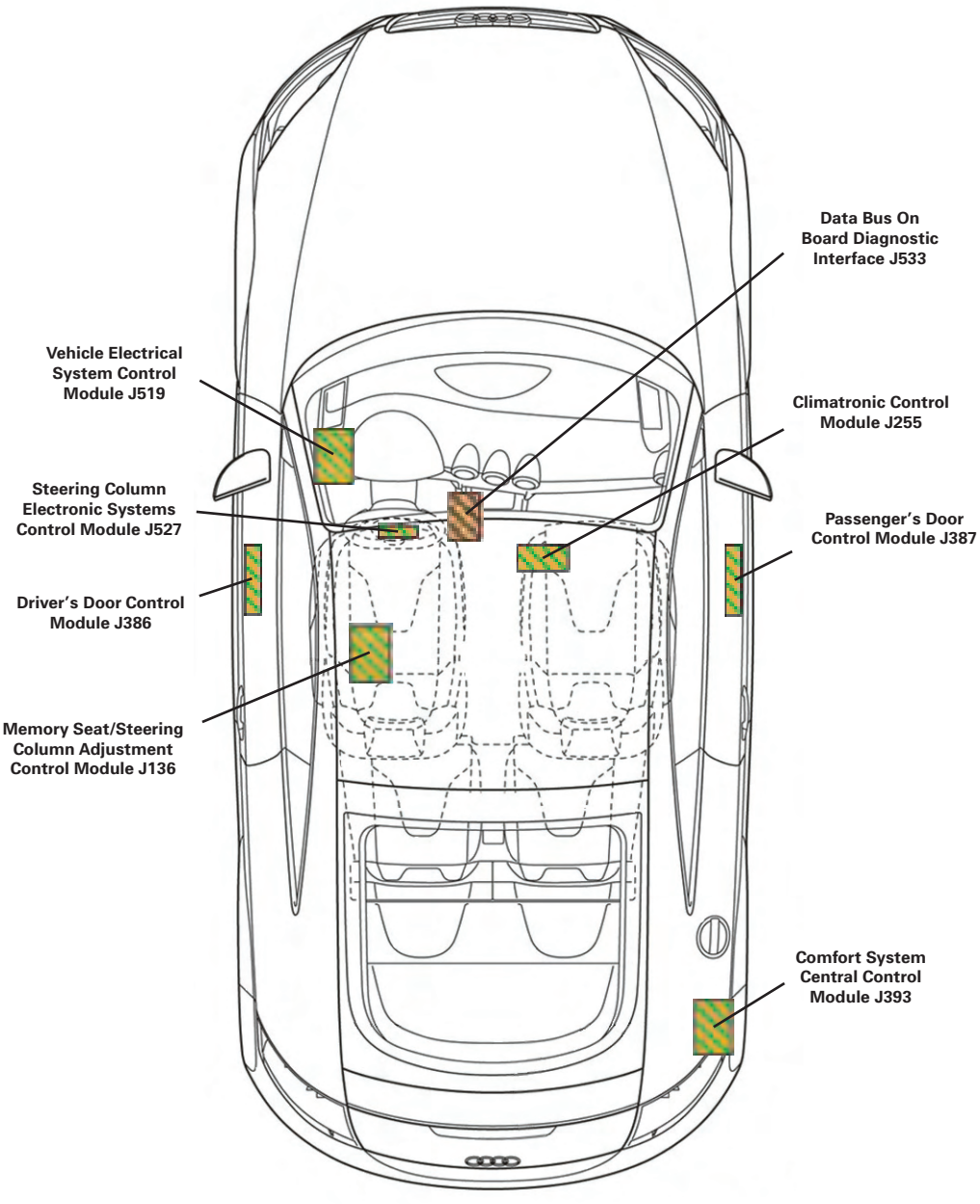


Comfort System CAN-Bus Control Modules

Locations

The illustration below shows the control modules of the Comfort System CAN and their locations.

The data transfer rate is 100 kbit/s. The data is transferred through the CAN high wire (orange/green) and the CAN low wire (orange/brown). To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

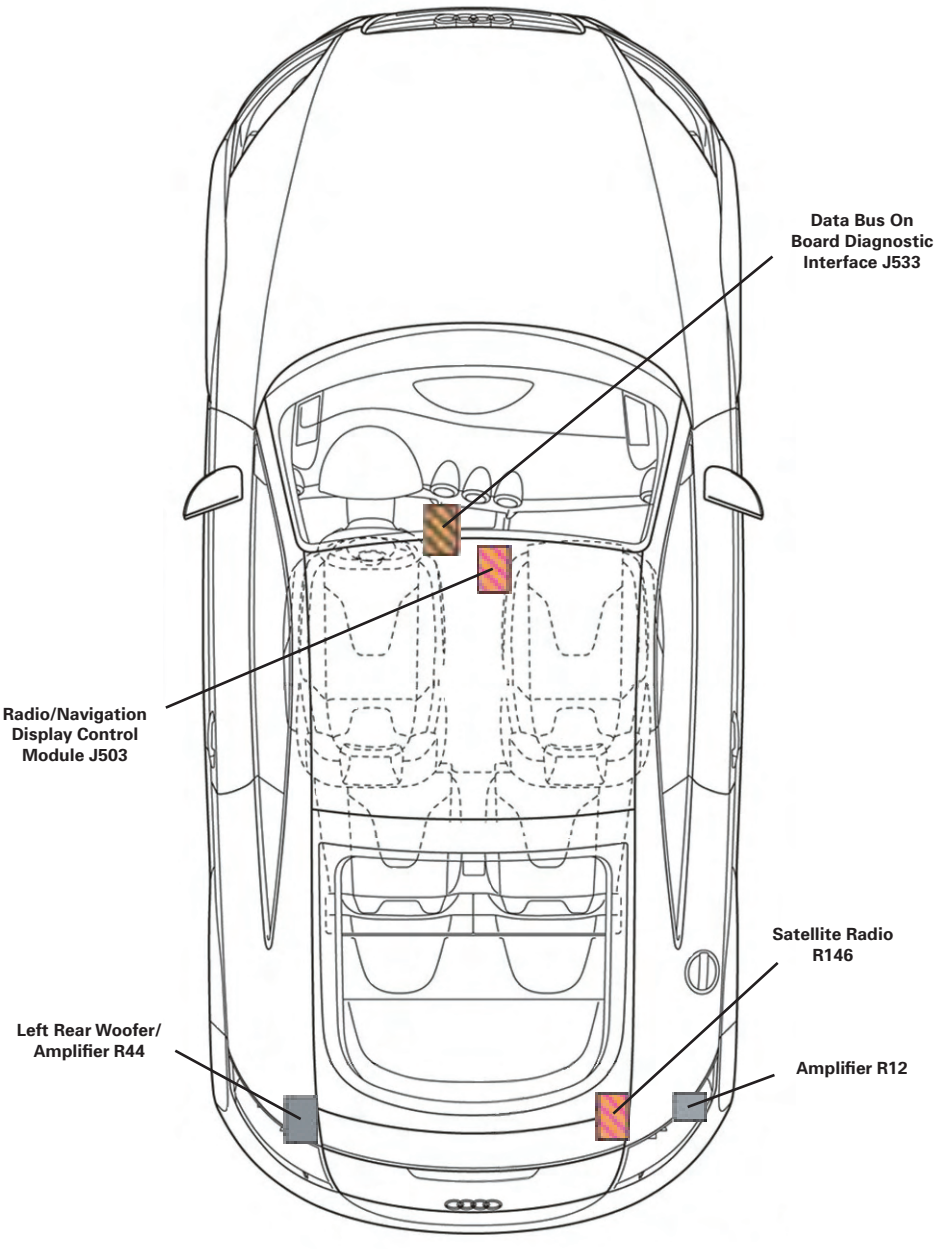


Infotainment CAN-Bus Control Modules

Locations

The illustration below shows the control modules of the Infotainment CAN and their locations.

The Infotainment CAN transfer rate is 100 kbit/s. The data is transferred through the CAN high wire (orange/purple) and the CAN low wire (orange/brown). To ensure reliable communication without conflict or interference, the CAN wires are twisted together.



Instrument Cluster and Diagnosis CAN-Bus Control Modules

Instrument Cluster CAN-Bus

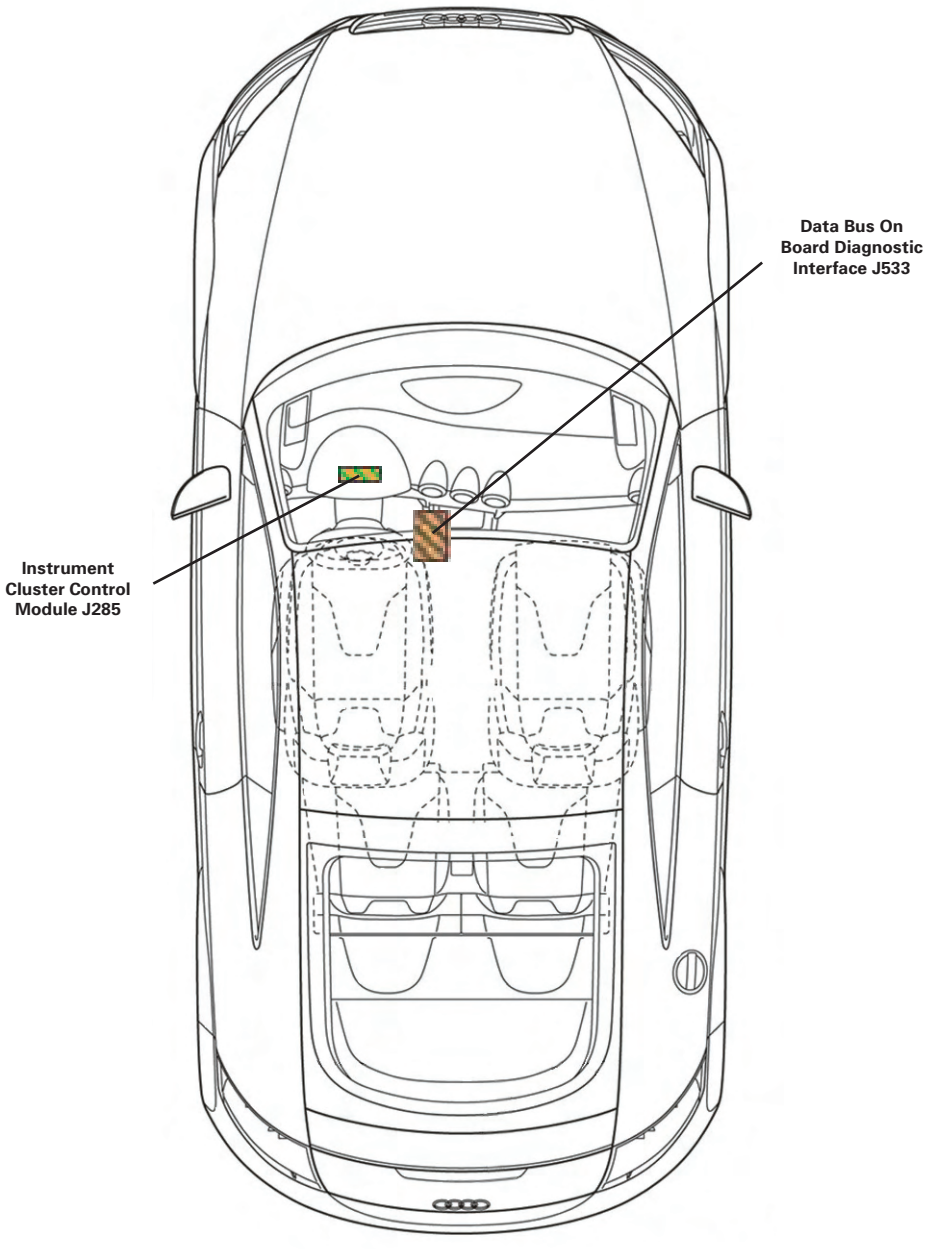
Information is exchanged between Instrument Cluster Control Module J285 and Data Bus On Board Diagnostic Interface J533 through the Instrument Cluster CAN. These are the only control modules in this data bus system.

Diagnosis CAN-Bus

The transfer of data between the VAS scan tool and Data Bus On Board Diagnostic Interface J533 is through the Diagnosis CAN.

Data Transfer Rate

The transfer rate for both CAN-buses is 500 kbit/s.



CAN Node Points

As in the A3 Sportback, the CAN node points are located at the lower “A” pillars.

The Drivetrain CAN node point can be found on the driver’s side A-pillar facing the left door.

The Comfort System CAN and Infotainment CAN node point can be found on the passenger’s side A-pillar facing the right door.



Drivetrain CAN Node Point: Lower Left A-Pillar



Comfort System CAN and Infotainment CAN Node Points: Lower Right A-Pillar

LIN Bus

The Local Interconnect Networks (LIN) are sub-networks within the topology of the TT's electrical system.

LIN bus systems communicate over a single wire which allows bi-directional communication between the master control module and its slave control modules.

Note

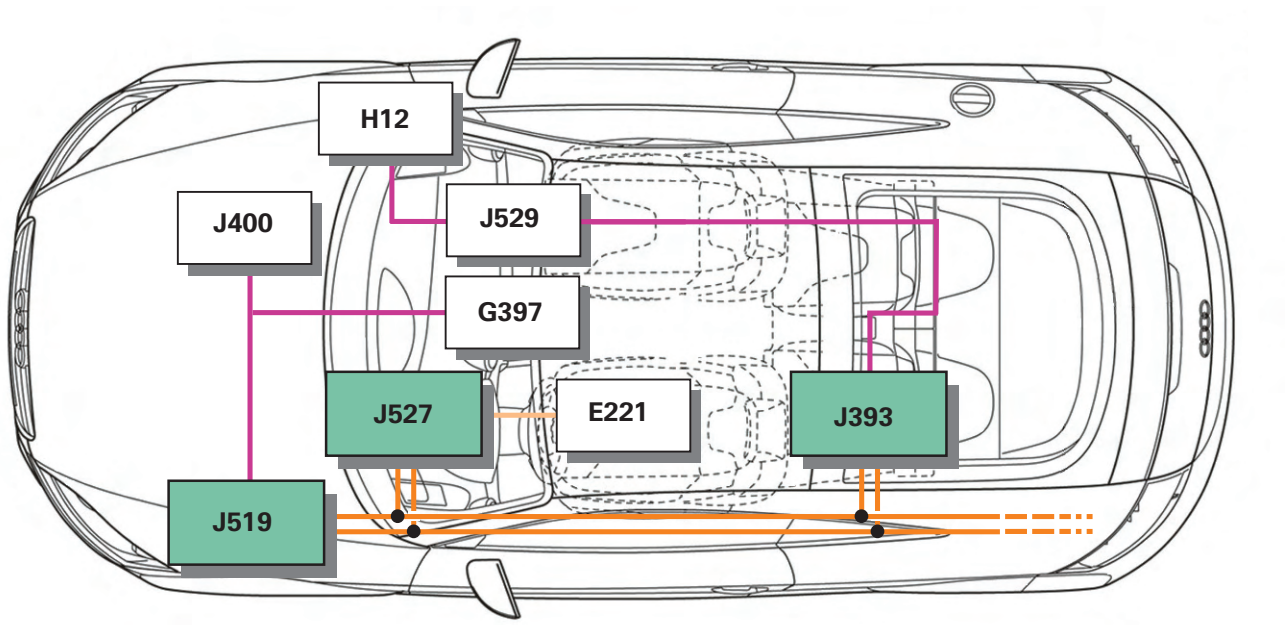
Coding and adaptations of the slave control modules must be done after accessing the respective master control module using the VAS scan tool.

The LIN master control module can be one of several in use on the TT (J519, J527, and J393). These master control modules interface through the CAN-bus, communicating with and sometimes controlling up to 16 slave control modules through a single wire LIN bus.

Slave control modules supply information to or act on commands from the LIN master control module.

All OBD functions of the slave modules (coding, adaptation, Measuring Value Blocks, and output tests) are also carried out through the master control module.

LIN Bus System (control module locations are approximate)



Key

E221 Control Module in Steering Wheel

G397 Rain/Light Recognition Sensor

H12 Alarm Horn

J393 Comfort System Central Control Module

J400 Wiper Motor Control Module

J519 Vehicle Electrical System Control Module

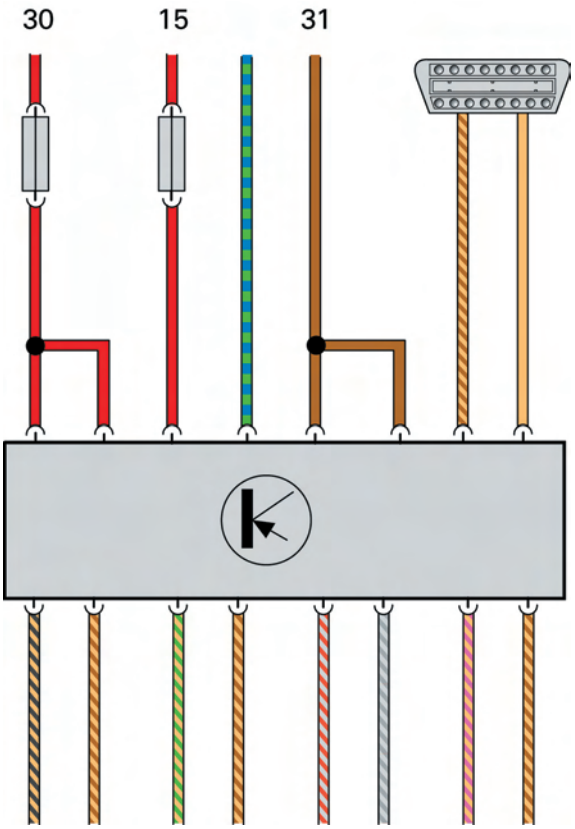
J527 Steering Column Electronic Systems Control Module

J529 Inclination/Anti-Theft Control Module

Data Bus On Board Diagnostic Interface (Gateway) J533

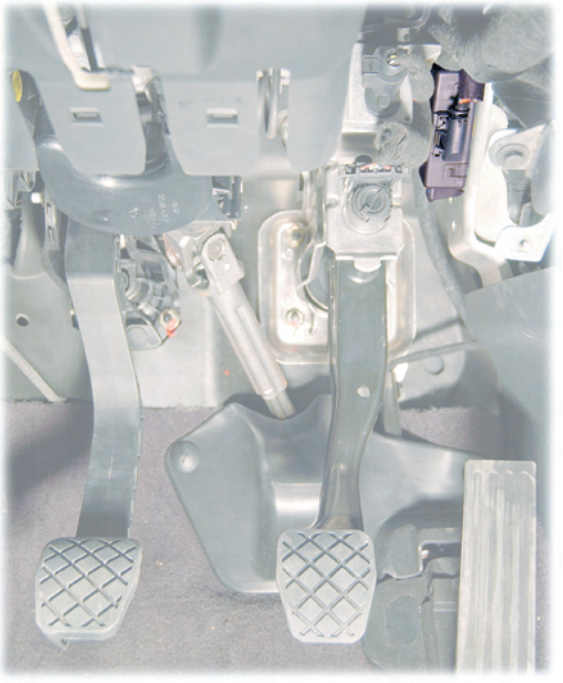
Due to the complexity of vehicle functions, large amounts of data must be exchanged between the different CAN-bus networks.

For example, A/C compressor load information on the Comfort System CAN at 100 kbs needs to be supplied to the engine control module on the Drivetrain CAN which operates at 500 kbs. J533 enables this interface, acting as a translator to allow communication between the two CANs.



Location

The Gateway is located under the lower instrument cluster, next to the pedal bracket. It is accessible from the driver's footwell.



J533 Functions

- Acts as an interface between the different CAN-bus systems
- Acts as the interface between the VAS scan tool and the vehicle
- Stores vehicle information (VIN, country code, and engine configuration) which can be referenced by the control modules
- Controls the terminal 15 run-on function
- Allows monitoring of CAN communication through Measuring Value Blocks
- Controls transport mode

Data Bus Sleep and Wake-Up Modes

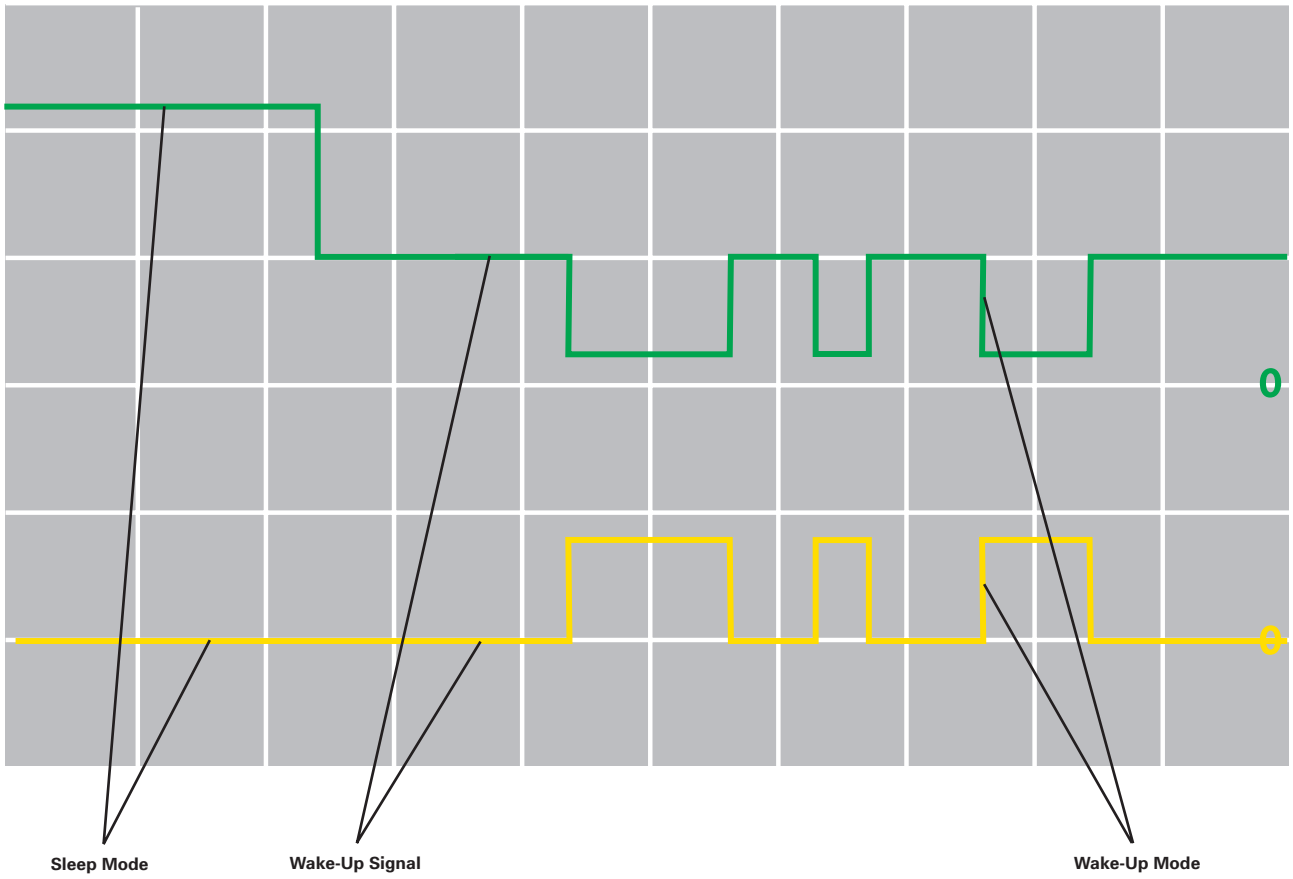
When all of the control modules on the Comfort System CAN and Infotainment CAN indicate that they are ready for stand-by, the Gateway control module gives the signal to “sleep.” The voltage level of the low signal is 12 volts and 1 volt for the high signal.

A control module also gives the wake-up signal when the data bus requires activation, such as when the doors are unlocked.

Data Bus On Board Diagnostic Interface J533 monitors the sleep function.

If the Drivetrain CAN does not go into sleep mode, the Comfort System CAN and Infotainment CAN will not go into sleep mode.

If the Comfort System CAN does not go into sleep mode, the Infotainment CAN will also not go into sleep mode.



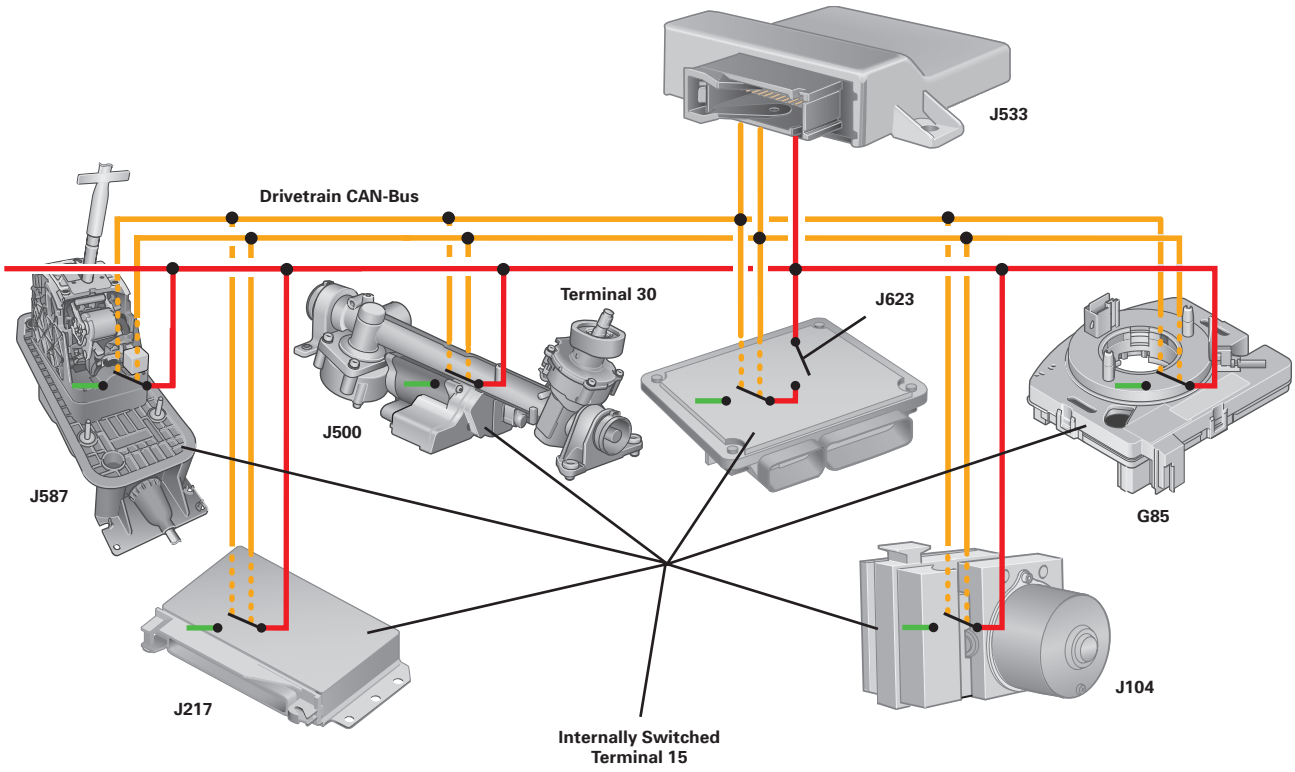
Terminal 15 Run-On

Some control modules on the CAN-bus must exchange information when terminal 15 is OFF. When necessary, a message is sent to the CAN-bus to enable the run-on mode. The control modules involved make a connection internally from terminal 30 to terminal 15, allowing them to communicate.

For example, Power Steering Control Module J500 can continue to communicate with other control modules.

The run-on mode can last between 10 seconds and 15 minutes. The run-on length of time depends on the data being transferred. The run-on period ends when J533 sends the sleep command.

Terminal 15 Run-On Control Modules



Key

G85 Steering Angle Sensor

J104 ABS Control Module

J217 Transmission Control Module (TCM)

J623 Engine Control Module (ECM)

J500 Power Steering Control Module

J533 Data Bus On Board Diagnostic Interface

J587 Selector Lever Sensor System Control Module

Data Bus Sleep and Wake-Up Modes

For continued operation of terminal 15, Drivetrain CAN control modules form three groups of CAN users.

Active control modules are able to keep the Drivetrain CAN awake:

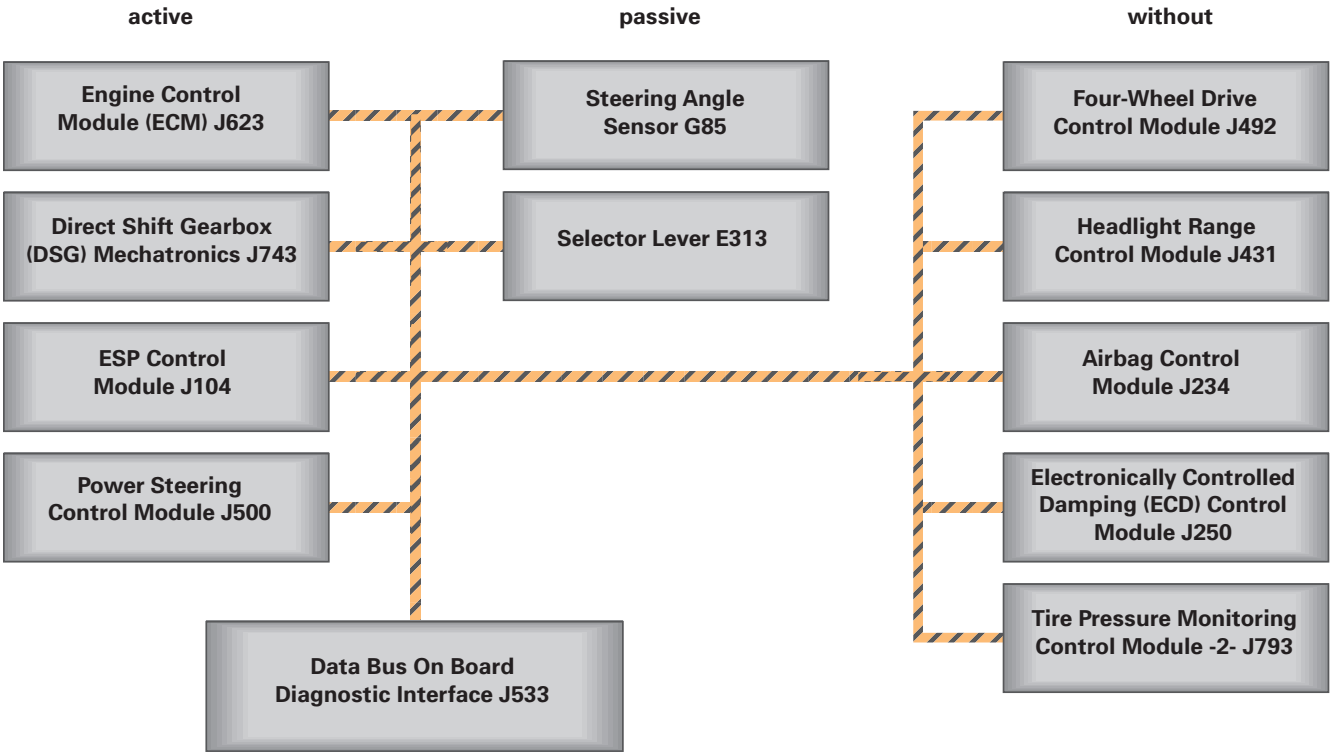
- ABS Control Module J104
- Direct Shift Gearbox (DSG) Mechatronics J743
- Power Steering Control Module J500
- Data Bus On Board Diagnostic Interface J533
- Engine Control Module (ECM) J623

Passive control modules remain awake until J533 signals readiness for sleep mode, but are not able to keep the Drivetrain CAN awake themselves:

- Steering Angle Sensor G85
- Selector Lever Sensor System Control Module J587

Control Modules with no continued operation function. These are deactivated as soon as the ignition is switched OFF:

- Airbag Control Module J234
- Headlamp Range Control Module J431
- All-Wheel Drive Control Module J492

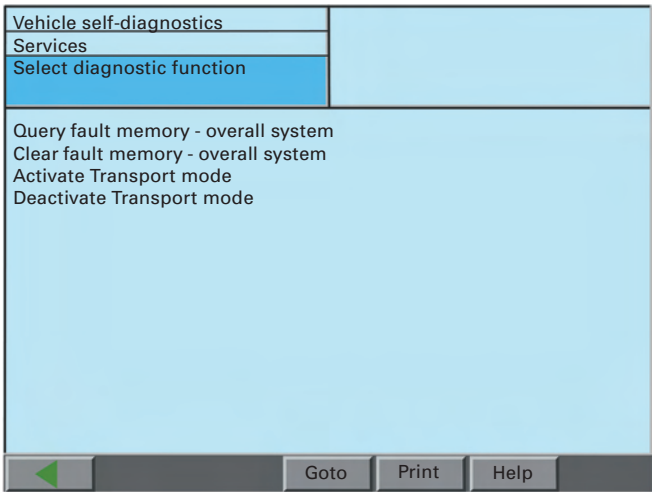


Transport Mode

Transport Mode for the Audi TT is implemented by the Gateway. It is activated and deactivated using the VAS scan tool.

The transport mode is only available during the vehicle's first 93 miles (150 km). After reaching this mileage, the J533 automatically switches transport mode OFF.

"TrA" shows in the odometer display of the instrument cluster when transport mode is active.





Instrument Cluster and Instrument Cluster Control Module J285

Three instrument cluster variations are available for the new Audi TT in the worldwide market. In North America, only the High Line version will be used.

The center display has a resolution of 64 x 88 pixels. Warning and fault conditions are indicated by yellow and red icons rather than warning lamps.

Immobilizer IV

The Immobilizer is integrated into Instrument Cluster Control Module J285. Immobilizer data is stored in the FAZIT database of Audi AG.

Immobilizer IV can be adapted using VAS scan tools in the “Guided Fault Finding” and “Guided Functions” modes. The diagnostic tester must be online in order to make a connection to the FAZIT database.

The instrument cluster is addressed through Address Word 17 and the immobilizer is addressed through Address Word 25. This means that data blocks, adaptation channels, and fault memories are handled separately.

Expanded Features of the Driver Information System (Onboard Computer)

The Driver Information System has the following new features:

- Mileage since the last reset of the onboard computer is indicated on onboard computer modes 1 and 2. Maximum range of the mileage indicator is 6213.65 miles (9999.9 km) and resolution is 0.06 miles (100 m).
- The driving time display range was extended from 99:59 h to 999:59 h on both onboard computer modes
- Each individual display variable of the onboard computer can be deactivated separately in the convenience menu under “SET.” This applies to both onboard computer modes.
- All display variables of the onboard computer can be reset in the convenience menu under “SET”

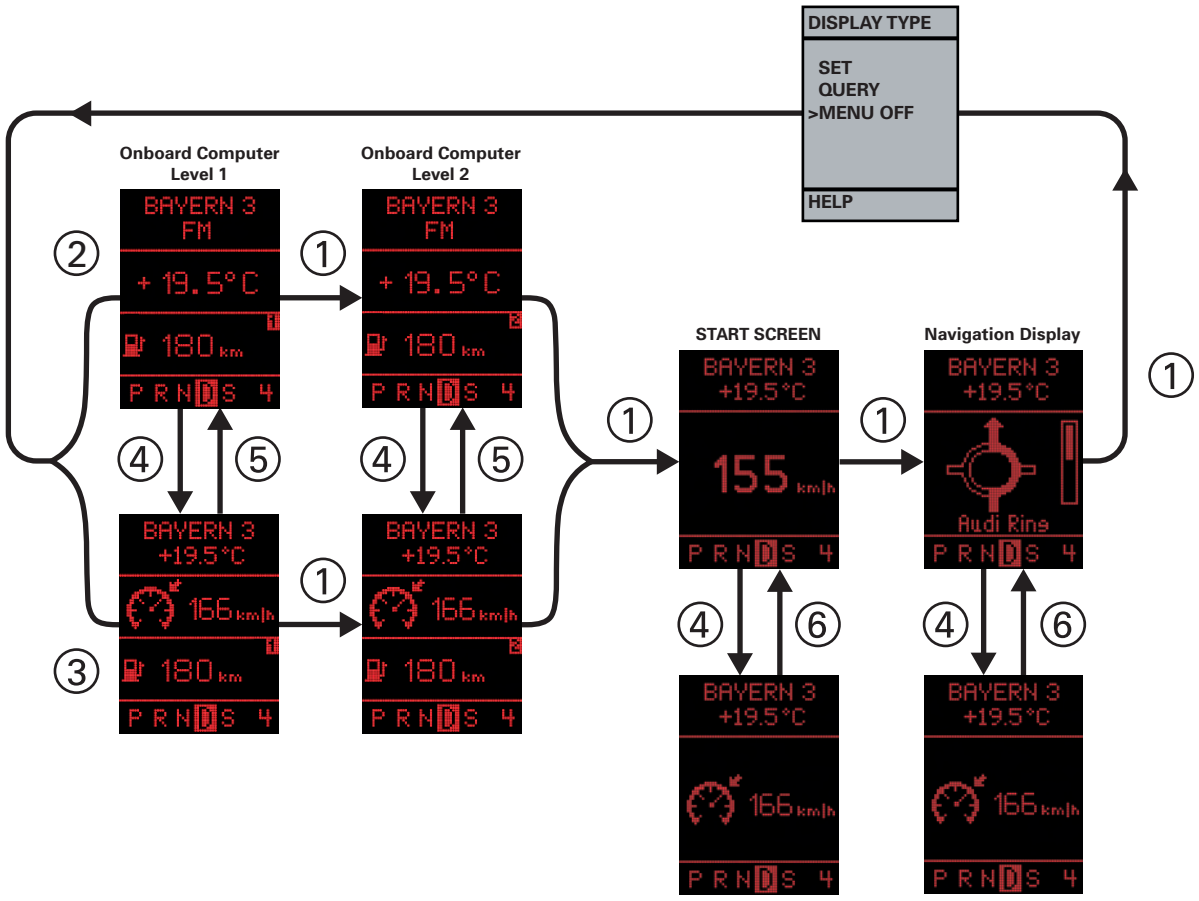


Display of Cruise Control System Speed Setting

When the cruise control system is active, the current speed setting is indicated in the instrument cluster. The set speed is indicated continuously. The speed is normally displayed in the position where the ambient temperature is indicated.

If the digital speedometer is shown on the center display or if it is currently being used by the navigation system, the set speed is displayed after activating the cruise control system for three seconds, after which the display returns automatically to the original screen.

When terminal 15 is switched ON, the display shown will be what was displayed when the ignition was switched OFF.



Description of the Various Options

① Press Reset key on onboard computer

② Press Reset key on onboard computer when cruise control system is inactive

③ Press Reset key on onboard computer when cruise control system is active

④ Set a speed when the cruise control system is active

⑤ Cancel set speed when the cruise control system is active

⑥ Display changes automatically after three seconds

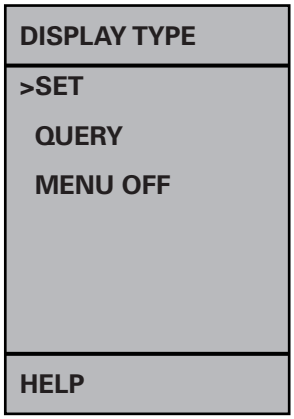
Extended Comfort Menu — "SET" Option

The Driver Information System (Onboard Computer) is controlled with the switches located on the Windshield wiper switch stalk.

Switching between Onboard Computer modes 1 and 2 is done by pressing the Reset Key.

In the menu option "SET," the driver can change the settings of the instrument cluster and Onboard Computer, and also change the settings of other control modules. For example, it is possible to change the settings of the central locking system or acoustic parking system. The windshield wipers can also be placed in service mode in this way.

All setting options are shown below in the associated menu structure:



SET

Clock
- Current time
- 12th or 24th mode
- Current date
- Date display mode

Computer

Computer 1
- Reset all values in onboard computer 1
- Display range on / off
- Display driving time on / off
- Display mileage on / off
- Display average fuel consumption on / off
- Display average speed on / off
- Display current fuel consumption on / off

Computer 2
- Reset all values in onboard computer 2
- Display range on / off
- Display driving time on / off
- Display mileage on / off
- Display average fuel consumption on / off
- Display average speed on / off
- Display current fuel consumption on / off

Speed alarm
- Switch speed alarm on or off
- Set speed alarm threshold (increments of 10 kph)

Language
- German
- English
- Francais
- Italiano
- Espanol
- Portugues

Units
- Display distances in kilometers or miles
- Fuel consumption display in 1/100 km or in km/1
- Temperature display in °C or °F

Lights

Indicating
- Convenience indicator (= motorway indicator function) on or off

Wiper

Front
- Service position on or off

Window
- Convenience opening on or off

Doors

Unlocking
- Unlock driver's door or all doors
- Horn mode on or off

Lock
- Switch Autolock on or off
- Horn mode on or off

Control Unit

Rear
- Volume: Levels 1, 2, 3, 4 or 5
- Pitch: Levels 1, 2, 3, 4 or 5

Extended Comfort Menu — "QUERY"

All querying options are shown below in the associated menu structure:

QUERY

Service

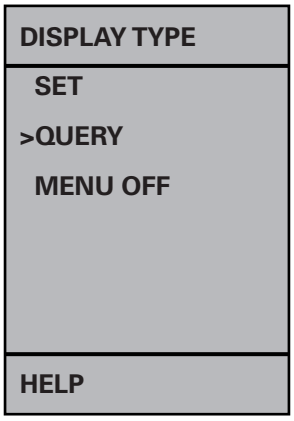
Service in: x miles (kilometers)
y days

Vehicle ID

VIN

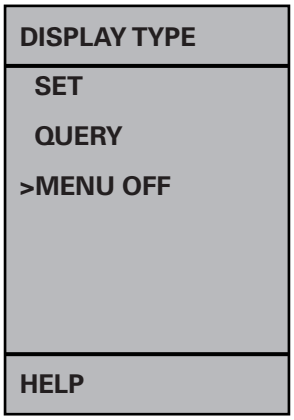
Engine oil temperature

Engine oil temperature: x degrees



Extended Comfort Menu — "MENU OFF"

To return to the display of onboard computer variables, select the menu option "MENU OFF," press the Reset key on the onboard computer and return to onboard computer mode 1.



Reference

For details about the Driver Information System, refer to the Owner's Manual.

Vehicle Electrical System Control Module J519

Function

J519 controls:

- Exterior lighting
- Charge warning lamp
- Terminal 58s
- Load management
- Terminals 15, 75x, 50 and 30
- Fuel Pump (FP) Relay J17
- Windshield wipers
- Heated rear window
- Horn
- Interior lighting
- Footwell lights (optional)

Exterior Lighting Control

In addition to full software control, J519 is responsible for all exterior lights, such as headlights, back-up lights, license plate lights and turn signal indicators.

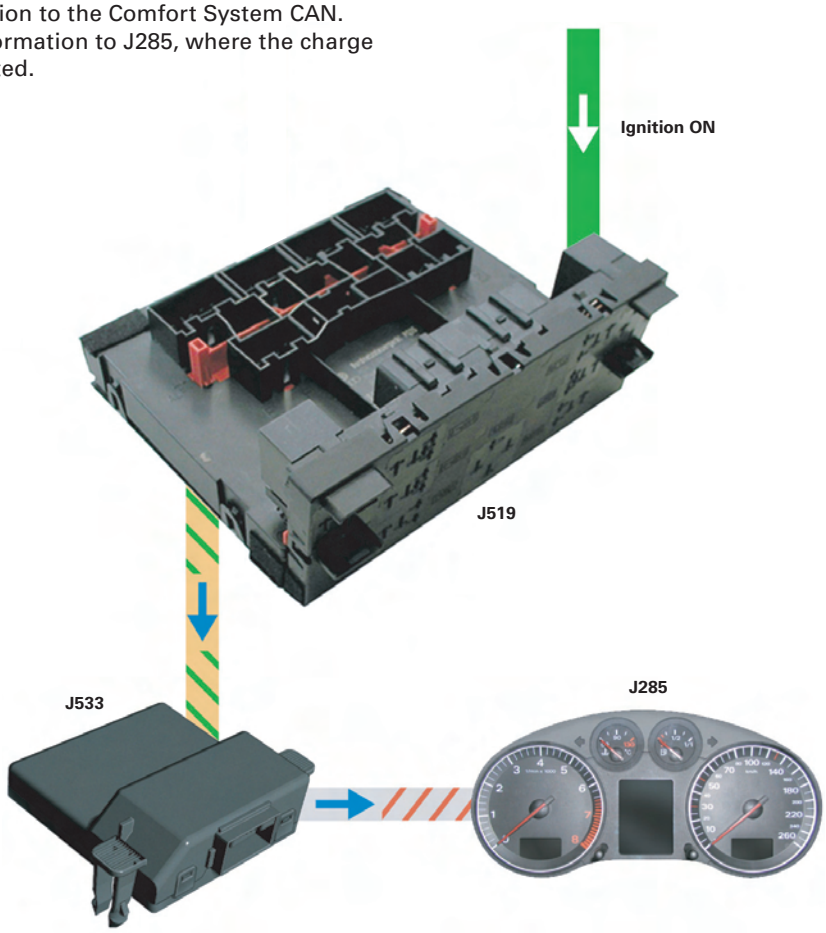
The output voltage to the exterior light bulbs is restricted to 13.2 V through pulse-width modulation to prevent bulb damage in the event of electrical system over-voltage.

Fuse protection for exterior lighting is provided by just one fuse each for the bulbs on the left and right sides, with the side light bulbs and the side-mounted turn signal indicators being connected to the fuse on the opposite side.

Failure of the “Right side electrical system” fuse thus leads to failure of the left side light and side-mounted turn signal indicator. In the event of a blown fuse, the vehicle will still have limited lighting on the opposite side.

Activation of Charge Warning Lamp

Terminal L of the alternator is evaluated by J519, which transmits this information to the Comfort System CAN. J533 transmits this information to J285, where the charge warning lamp is activated.



Brightness Control (Terminals 58s and 58d)

In conjunction with J285, J519 regulates the brightness of the display illumination (terminal 58d) and the switch illumination (terminal 58s).

Terminals 58s and 58d have different brightness values.

While values of 6-100% are possible for the switch illumination, only 80-100% can be set for the display illumination.

1 Instrument Panel Illumination Dimmer Switch E20 transmits the potentiometer value to J519

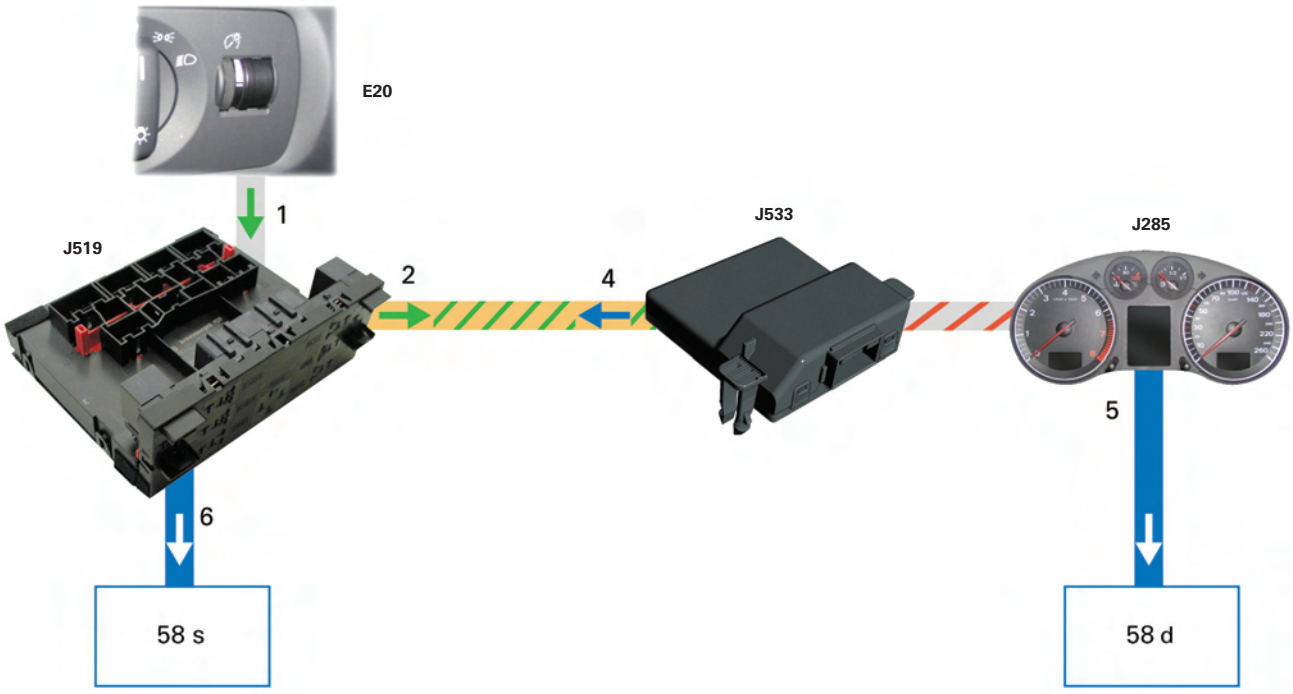
2 J519 transmits the information through the Comfort System CAN to J533, then J285

3 J285 uses the potentiometer value and the signal of the internal phototransistor to generate values for terminals 58d and 58s

4 J285 transmits the information on terminals 58d and 58s back to J519 through J533

5 J519 uses the values for 58d and 58s to illuminate various switches and controls

6 J533 also supplies this information to the Comfort System CAN for use by other control modules, such as Climatronic Control Module J255



Load Management

The wide range of electrical equipment may cause the battery and alternator voltage to drop below a permissible level and thus jeopardize proper functioning of vital systems such as ABS or electro-mechanical steering.

J519 is able to boost the electrical system voltage to the necessary extent by increasing idle speed and deactivating heavy-duty loads.

Load Regulation Measures

When the engine is running, idle speed increase (two-stage) may be implemented with a request from J519 to the engine control module through the CAN-bus.

If this fails to achieve an adequate electrical system status, electrical equipment is then deactivated.

Determination of Load Status

The electrical system situation is established by comparing the electrical system voltage determined to a permissible lower voltage limit.

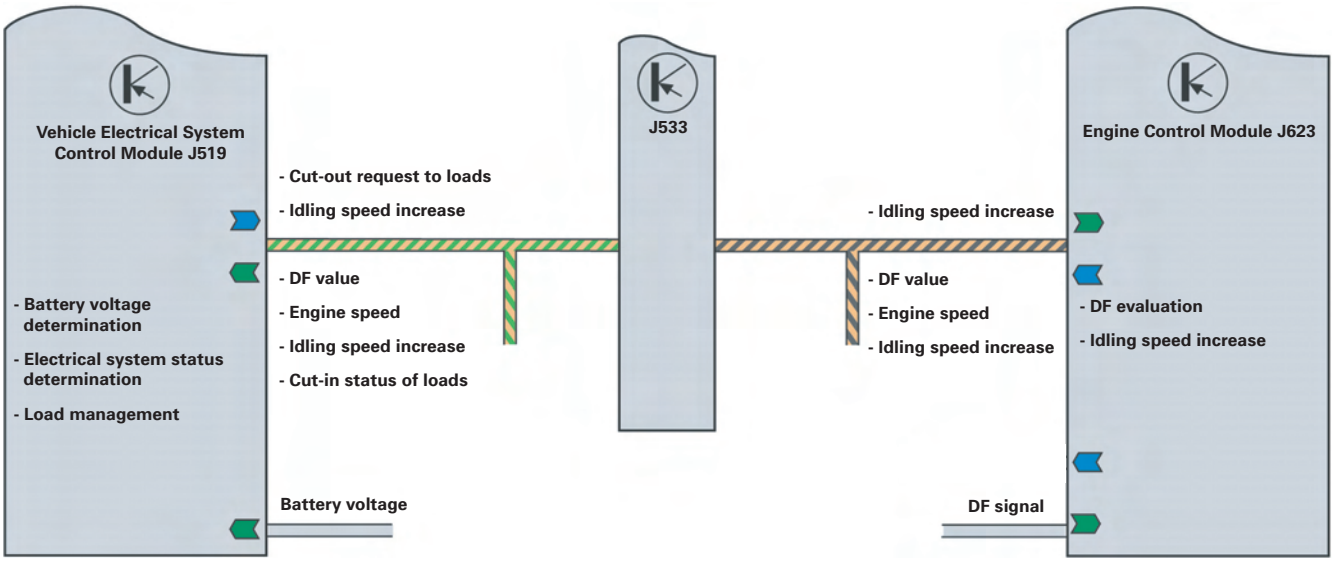
The electrical system condition is established from the following:

– Battery voltage

– DF signal (alternator capacity utilization)

– Information on activated heavy-duty loads with short cut-in time

In addition, the loads activated by the driver are determined in J519 and the load status then calculated from all these quantities.



Deactivation of Comfort System Equipment

In a situation where system voltage is insufficient, J519 can deactivate systems. With ignition ON (with and without engine running), loads are deactivated in the following sequence:

1 Heated Rear Window Z1

2 Heated seats

3 Heated exterior mirrors

4 Footwell illumination, interior door release handle illumination, exit lights, ambient lighting

5 Climatronic Control Module J255

Deactivation is maintained until an adequate electrical system status has been achieved. If the situation improves, equipment is reactivated in reverse order.

In addition, the following are briefly deactivated during ABS braking, or in the case of high electro-mechanical steering current input:

– Heated Rear Window Z1

– Heated seats

With ignition OFF, the following are deactivated.

– Footwell illumination

– Interior door release handle illumination

– Exit lights

– Interior lighting

– Leaving Home function

In the event of a crash (signal from Airbag Control Module J234 through CAN to J519), the following loads are deactivated by J519:

– Heated Rear Window Z1

– Heated seats

– Heated exterior mirrors

– Climatronic Control Module J255

D Ignition/Starter Switch

J59 Load Reduction Relay

J329 Power Supply Relay (terminal 15)

J519 Vehicle Electrical System Control Module

J527 Steering Column Electronic Systems Control Module

J681 Power Supply Relay 2

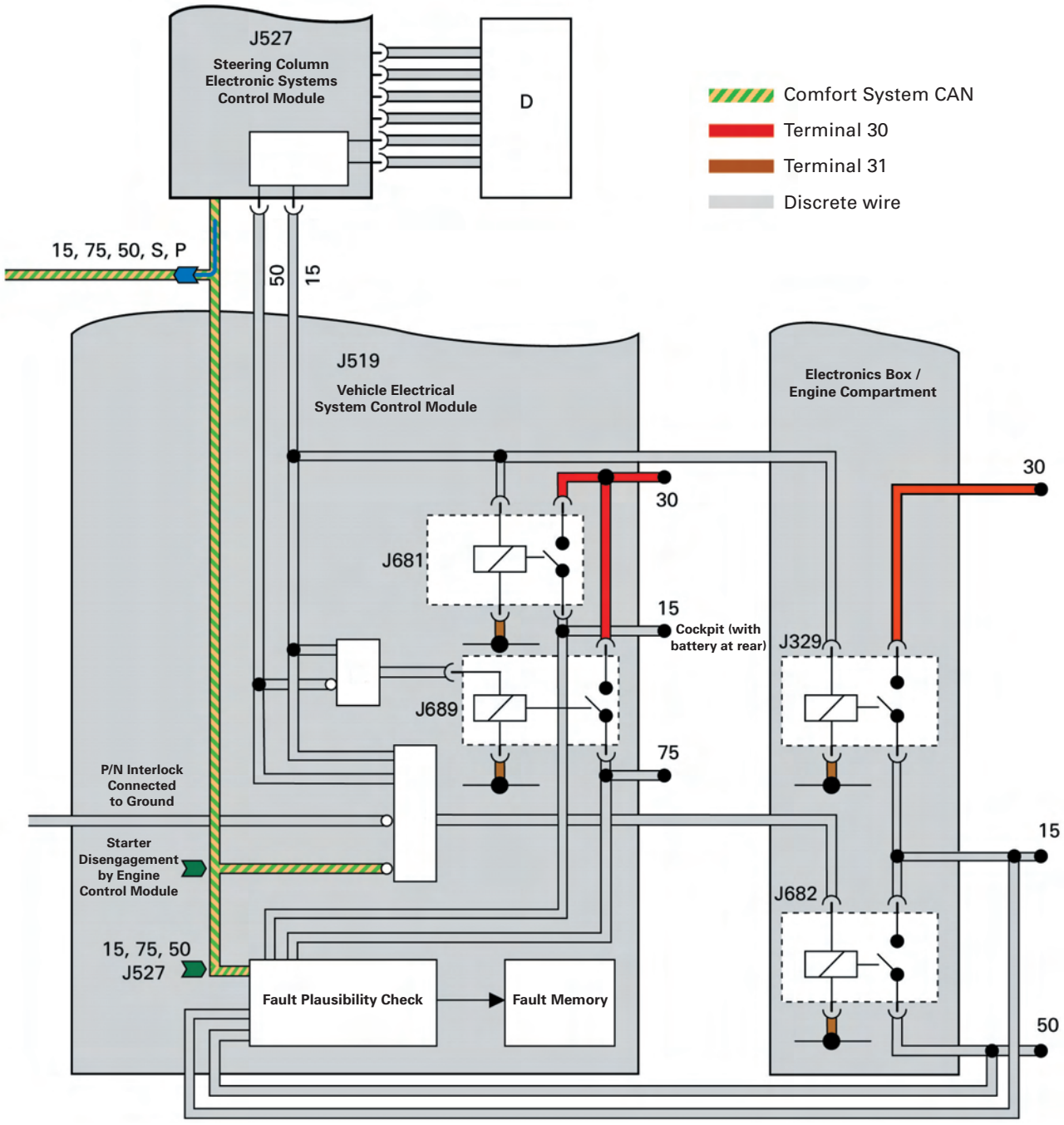
J682 Power Supply (starter) Relay

Terminal Control

Steering Column Electronic Systems Control Module J527 passes all terminal signals of the ignition and starter switch to J519 through the Comfort System CAN.

Additional wires from J527 supply back-up signals to J519 about terminals 15 and 50.

This information is used to activate the relays for terminal 15 engine compartment, terminal 15 cockpit, terminal 75, and terminal 50.



Starter Operation

In addition to the ignition and starter switch signals, the following are required for activation of Power Supply (starter) Relay (terminal 50) J682 in the engine compartment:

– Automatic transmission P/N signal

– Clutch pedal signal (manual transmission only)

– CAN information from Engine Control Module J623

J519 initiates the starter. Once Engine Speed Sensor G28 recognizes sufficient engine speed, the request for starter disengagement is sent to J519. The same signal prevents the starter from being engaged once the engine is running.

Terminal 30 (switched)

Terminal 30 supplies the vehicle interior lights with power.

To avoid battery discharge caused by permanent activation of interior lights, terminal 30 is deactivated approximately 30 minutes after terminal 15 OFF in any of the following conditions:

– Interior light is switched ON

– Door is opened

– Trunk lid is opened

– Hood is opened

Battery

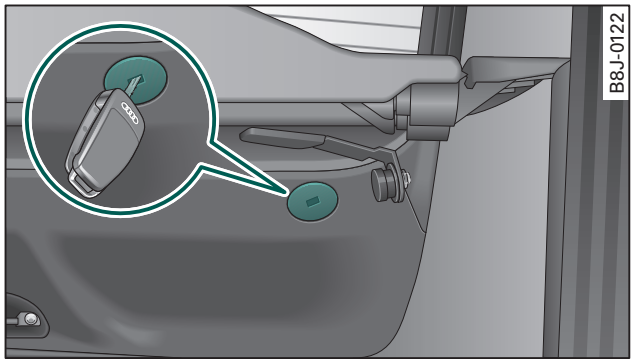
The battery is installed in the trunk on the right and can be accessed by removing the cargo-area floor. The Audi TT does not have a jump start connector because the battery is directly accessible. Therefore, battery charging and auxiliary power supply are through the battery terminals.

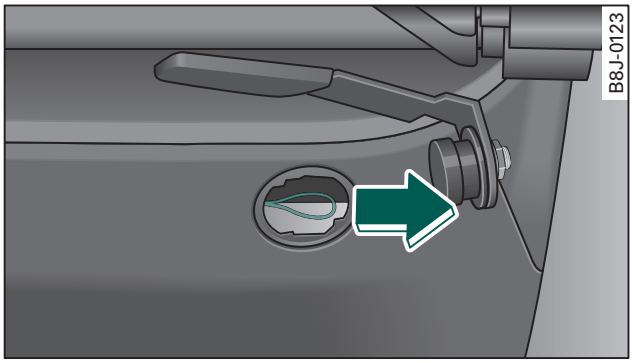
For trickle charging of showroom vehicles, a Midtronics battery charger must be connected to conserve battery power.

If the battery is discharged or faulty, the trunk lid can be opened using an emergency release.



Trunk Release





Emergency release is located on the left corner of the trunk lid

Front Outside Light

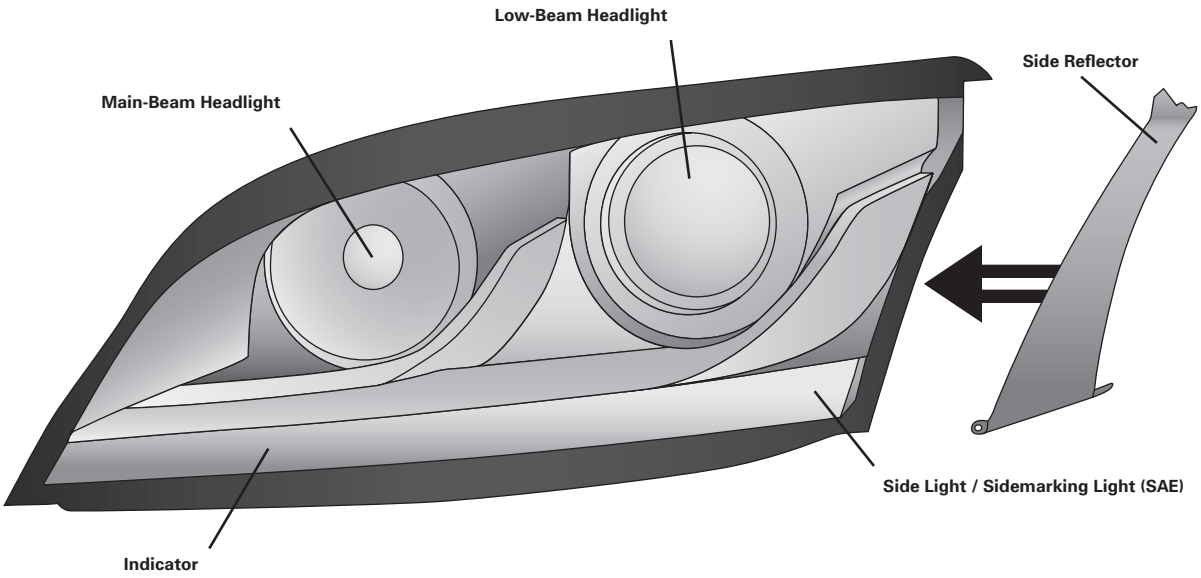
Headlights

The Audi TT has three headlight variants:

– Halogen headlights

– Bi-xenon headlights with AFS

Halogen Headlights



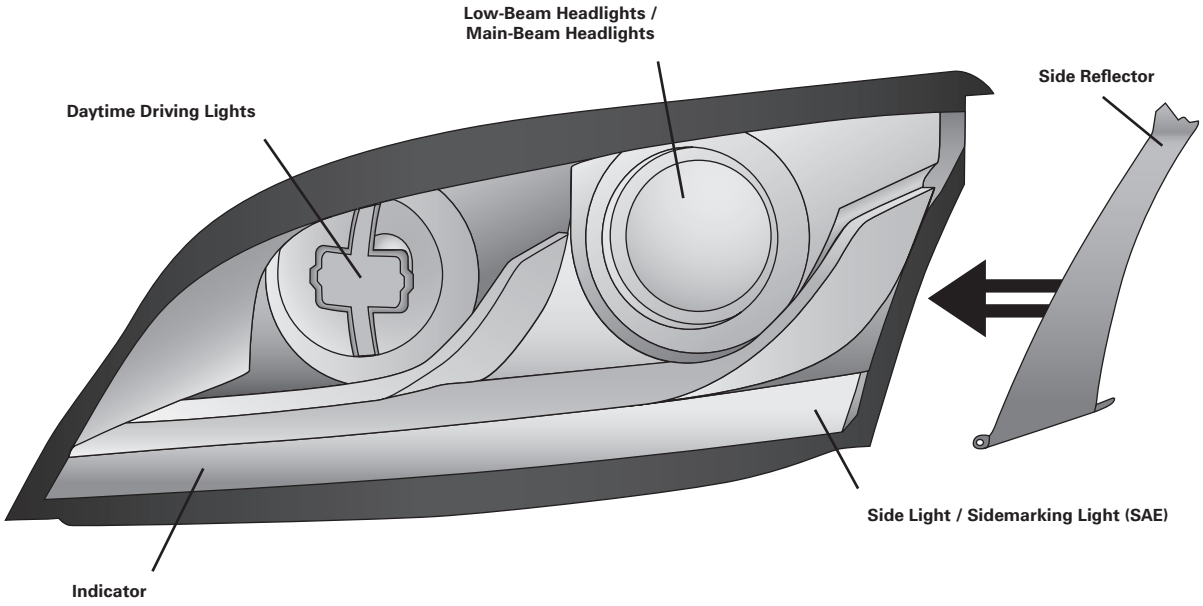
Bulbs Used in Halogen Headlights

12 V bulb	Type	Rated Power
Side lights	W5W	5 watts
Low beam headlights	H7	55 watts
Main-beam headlights	H7	55 watts
Indicators	H21W	21 watts
Sidemarking lights	WY5W	5 watts

Note

All headlight variants may not be available at the market introduction of the vehicle.

Bi-Xenon Headlights with AFS



Bulbs Used in Bi-Xenon Headlights with AFS

12 V bulb	Type	Rated Power
Side lights	H6W	6 watts
Low beam headlights	D1S	35 watts
Main-beam headlights	D1S	35 watts
Indicators	H21W	21 watts
Sidemarking lights (SAE)	WY5W	5 watts

Light Bulb Replacement

All light bulbs in the headlights can be replaced using the vehicle tool kit. The headlights can be removed without taking off the bumper.

For information on light bulb replacement, refer to the Audi TT Owner's Manual.

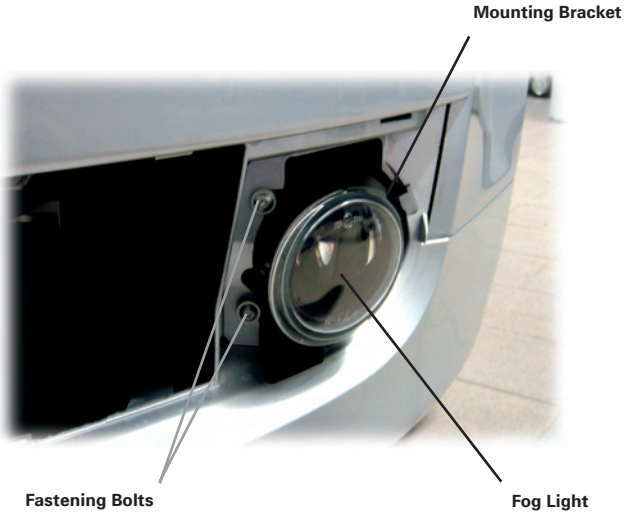
Note

For instructions for removing the headlights and details of safety requirements for gas discharge lamps, refer to current service repair information.

Fog Lights

The fog lights on the Audi TT are located in the bumper. The H1 -1- bulbs have a rating of 55 watts, and can be replaced with the vehicle tool kit.

For fog light removal procedures, refer to the Audi TT Owner's Manual.



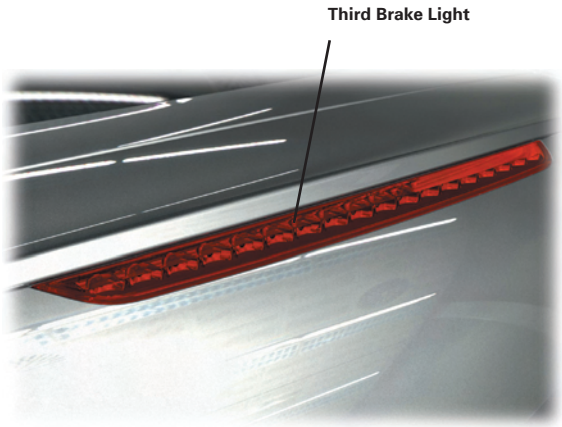
Sidelights

The sidelights, which use LED technology, are housed in the door mirror housings. They are activated by their respective door control modules. Both the sidelights and the electrically adjustable sideview mirror drive motor can be replaced individually in the service area.

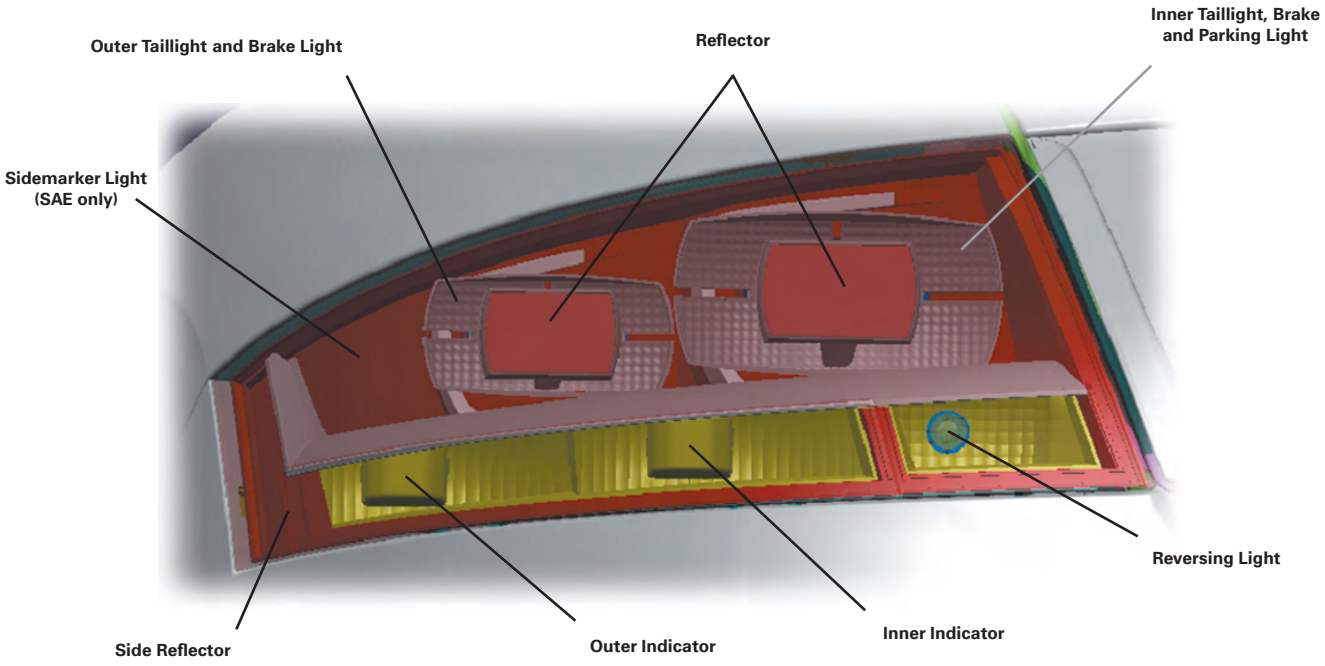


Third Brake Light

The third brake light is located on the trunk lid under the rear spoiler. It uses LED technology and can only be replaced as a complete assembly.



Rear Outside Light



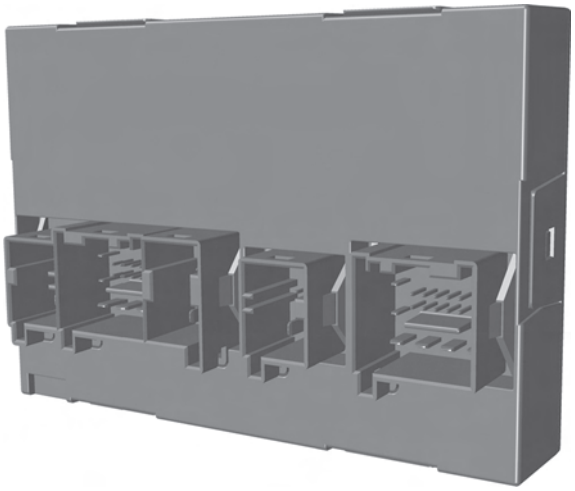
12 V bulb	Type	Rated Power
Taillights and brake lights	P21W	21 watts
Back-up lights	W16W	16 watts
Indicators	W16W	16 watts

Comfort System Central Control Module J393

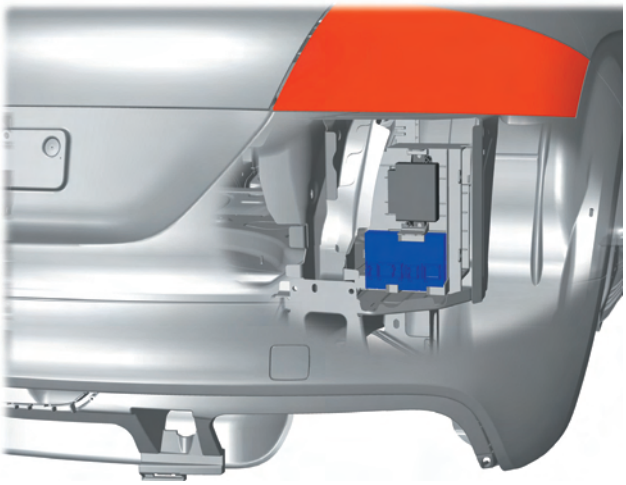
Tasks

J393 has the following tasks:

- Central locking master
- Anti-theft alarm system master
- LIN master for communication with the components of the anti-theft alarm system
- Control of the automatic electrically adjustable rear spoiler
- Activation of the luggage compartment lights
- Read-in of the handbrake contact switch
- Data exchange with other control modules across the Comfort System CAN-bus
- Self-diagnosis and diagnosis of connected components



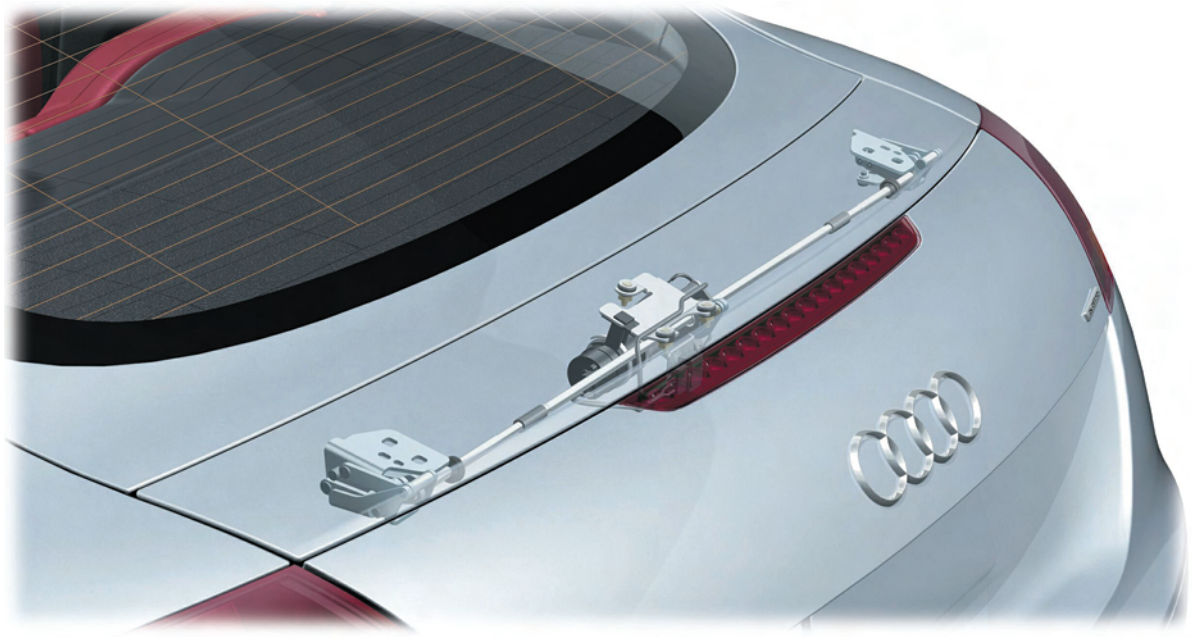
J393 is located at the rear of the right inner wheel well. It is accessible through the luggage compartment after removing the side covers.



Automatic, Electrically Adjustable Rear Spoiler

The integrated electrically controlled rear spoiler is standard equipment on the Audi TT. It provides additional driving stability when driving at high speeds.

Rear Spoiler in Lower End Position (retracted)



Rear Spoiler in Upper End Position (extended)



Design of the Rear Spoiler

The rear spoiler consists of two components which can be ordered separately:

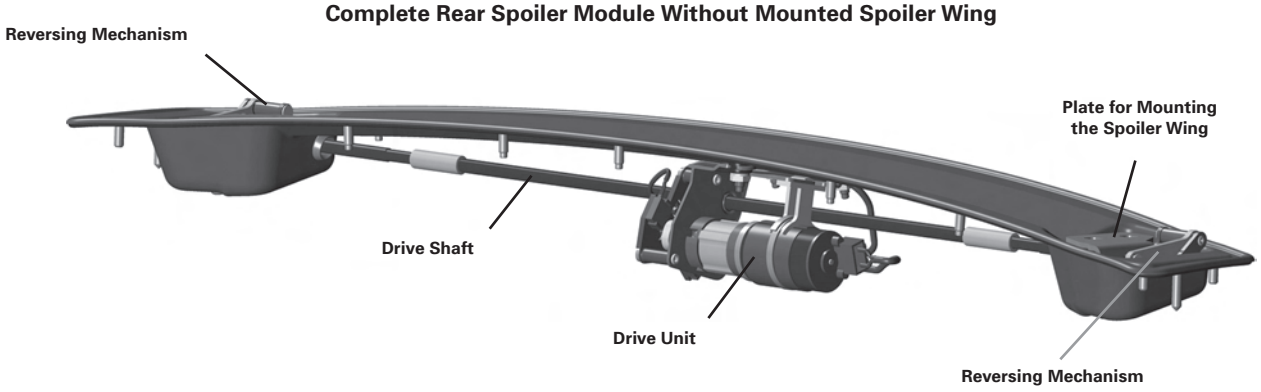
– Rear spoiler module

– Spoiler wing

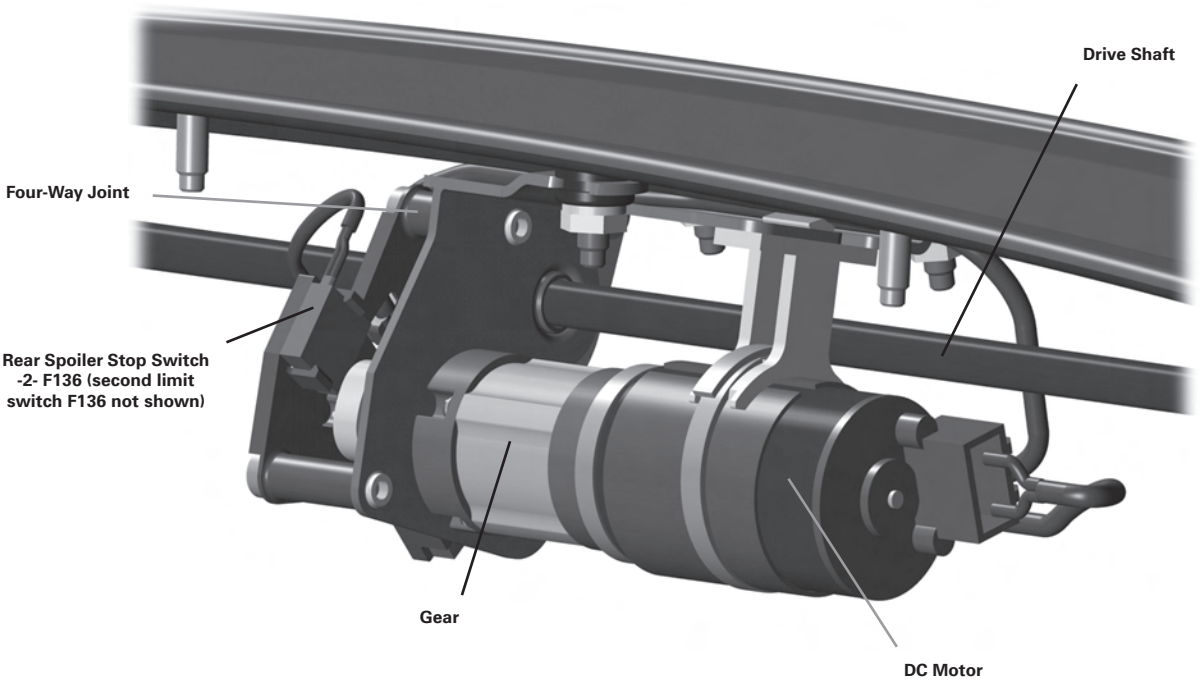
A DC motor mounted on the rear spoiler module transmits a rotary movement to the input shaft through a gear and special joint (four-way joint). The shaft converts this movement to an upward or downward movement of the left and right reversing mechanisms.

Two limit switches for detecting the lower and upper limit positions are actuated by the four-way joint.

Complete Rear Spoiler Module Without Mounted Spoiler Wing



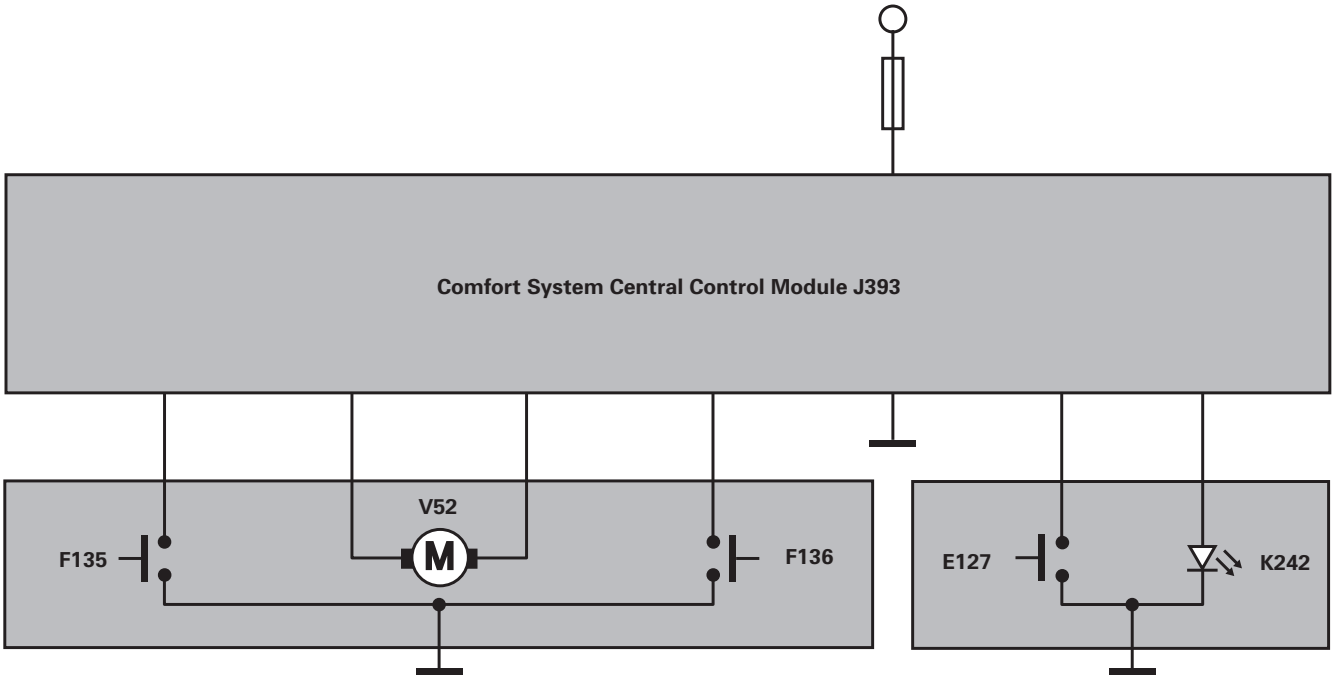
Adjustable Rear Spoiler Drive Unit



Rear Spoiler Function

The rear spoiler is controlled by Comfort System Central Control Module J393. The control module activates Rear Spoiler Motor V52 and reads limit switches F135 and F136. The switches are used to identify both limit positions of the spoiler.

Comfort System Central Control Module J393 also reads Rear Spoiler Switch E127 and activates Rear Spoiler Adjustment Indicator Lamp K242, depending on its current status.



Legend

E127 Rear Spoiler Switch

F135 Rear Spoiler Stop Switch -1-

F136 Rear Spoiler Stop Switch -2-

J393 Comfort System Central Control Module

K242 Rear Spoiler Adjustment Indicator Lamp

V52 Rear Spoiler Motor

Rear Spoiler Operation

Automatic Mode

The rear spoiler is extended automatically when a speed of 75 mph (120 kph) is exceeded. When the vehicle speed drops below the 50 mph (80 kph) speed threshold again, the rear spoiler is retracted automatically.

Note

When Transport mode is activated, Automatic mode is active and Manual mode is deactivated. It is not possible to extend and retract the rear spoiler by pressing Rear Spoiler Switch E127 when Transport mode is set.

Manual Mode

The rear spoiler can be extended up to a speed of 75 mph (120 kph) by briefly pressing and releasing Rear Spoiler Switch E127.

The rear spoiler can also be retracted and extended between 12 mph (20 kph) and 75 mph (120 kph) by briefly pressing and releasing E127. The rear spoiler cannot be retracted at speeds greater than 75 mph (120 kph).

When driving at speeds between 0 mph/kph and 12 mph (20 kph), E127 must be kept pressed while the rear spoiler is retracting. If the switch is released while the rear spoiler is retracting, the rear spoiler will stop in its momentary position. Actuating E127 again will cause the rear spoiler to extend again.

Rear Spoiler Adjustment Indicator Lamp K242 is integrated into E127. It illuminates whenever the rear spoiler is extended manually. As soon as the spoiler is retracted again or the system switches to Automatic mode (the vehicle is traveling faster than 75 mph [120 kph]), K242 turns OFF.



System Malfunctions

Faults in the rear spoiler system are indicated to the driver by the illumination of the spoiler warning lamp in the tachometer.

As a bulb check, the warning lamp lights for three seconds after the ignition is switched ON and then goes out.

The rear spoiler is automatically extended if any of the following faults occur:

- Comfort System Central Control Module J393 does not receive a road speed signal
- J393 is unable to receive any CAN messages
- Implausible signals from switches F135 and F136
- Less than 10.5 Volts at J393



Note

If a fault is detected in the rear spoiler function, the ESP can no longer be switched OFF manually. If the ESP is switched OFF at this time, it is reactivated automatically.

Diagnosis

The rear spoiler is diagnosed by first accessing Comfort System Central Control Module J393 through Address Word 46.

Adaptations and Output Check Diagnosis are also available through the scan tool.

There is a new data block for the rear spoiler function. It contains the following information:

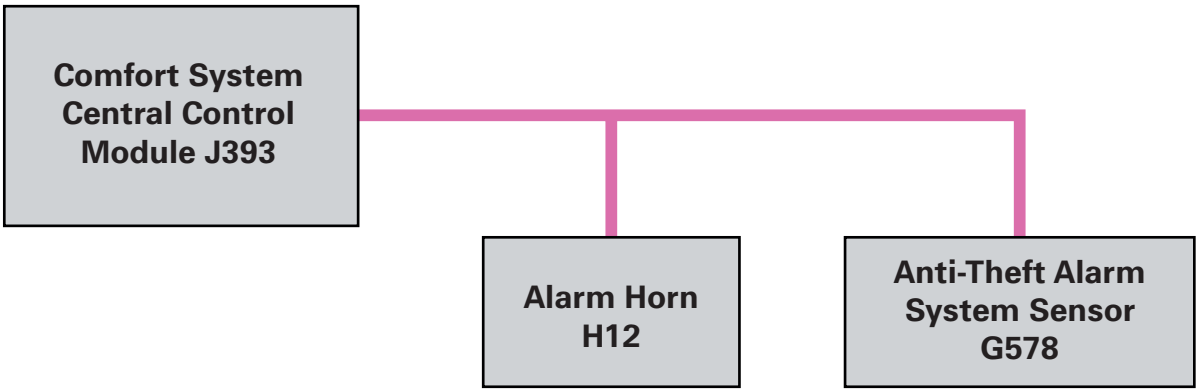
- Switch for detecting the end position “rear spoiler retracted” is actuated or not actuated
- Switch for detecting the end position “rear spoiler extended” is actuated or not actuated
- E127 is actuated or not actuated
- K242 in E127 is ON or OFF

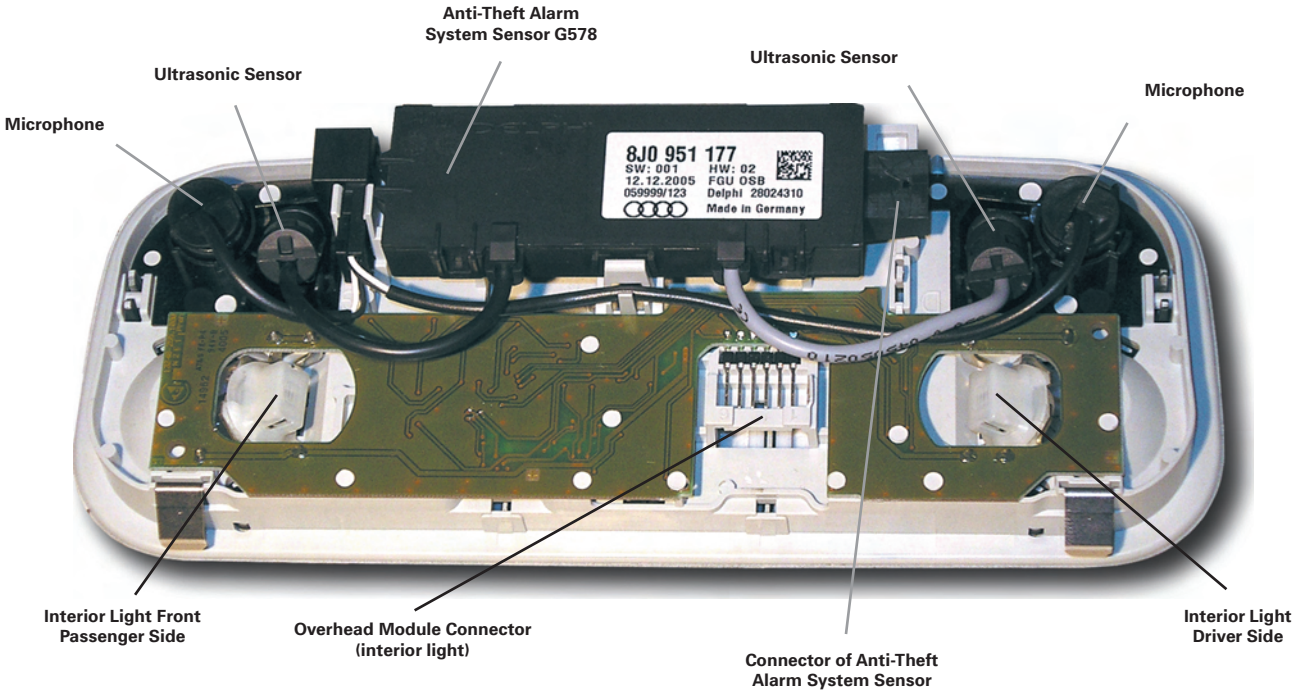
Anti-Theft Alarm System

New Features

Radar Interior Monitoring Control Module -1- G303 and Inclination/Anti-Theft Control Module J529 are now combined as a single unit in Anti-Theft Alarm System Sensor G578.

G578 is a slave control module that reports to Comfort System Central Control Module J393 through a LIN bus. G578 is located in the overhead module of the TT.

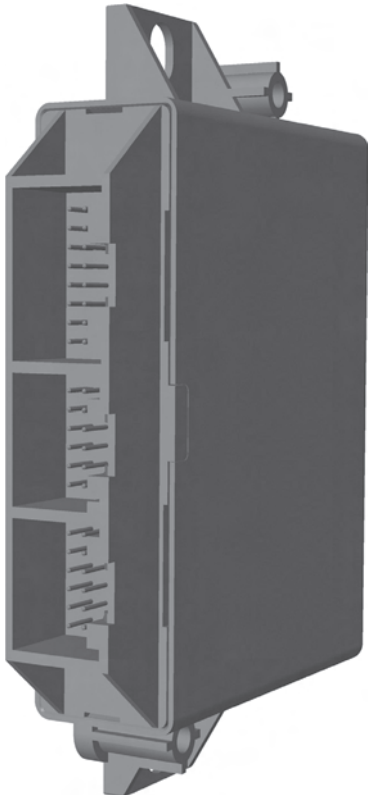




Parktronic

Introduction

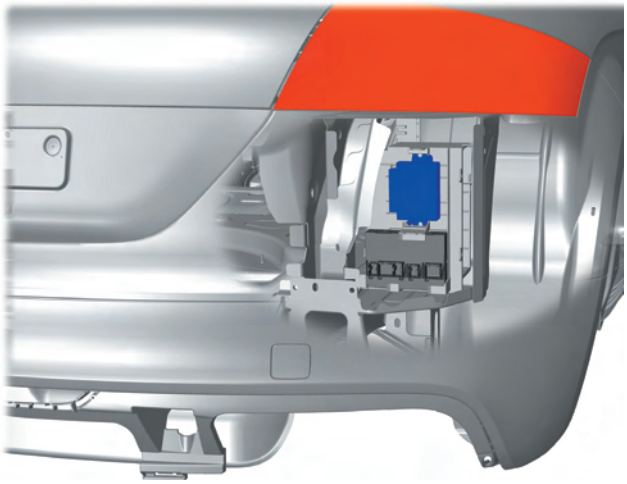
A four-channel rear acoustic parking system with ultrasonic sensors is available as optional equipment for the new TT. Four acoustic parking sensors monitor the area behind the vehicle. They are integrated into the rear bumper cover.



Parking Aid Control Module J446

The Parktronic is similar to those used in other Audi models, differentiated only by the software.

Parking Aid Control Module J446 is located behind the right rear wheel well. It is accessible through the luggage compartment after removing the cover, located directly above Comfort System Central Control Module J393.



Acoustic Parking Adjustment Options

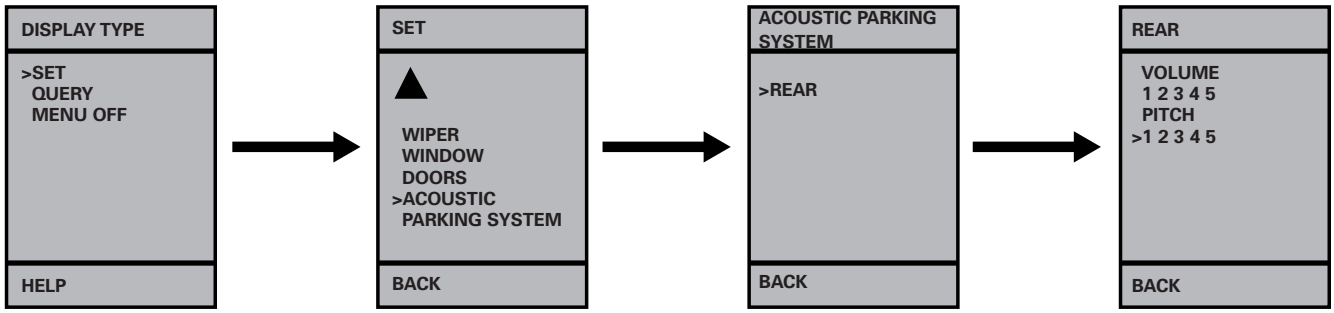
The volume and pitch (frequency) of the parking aid warning tone can be adjusted using the Driver Information System (Onboard Computer) in the instrument cluster.

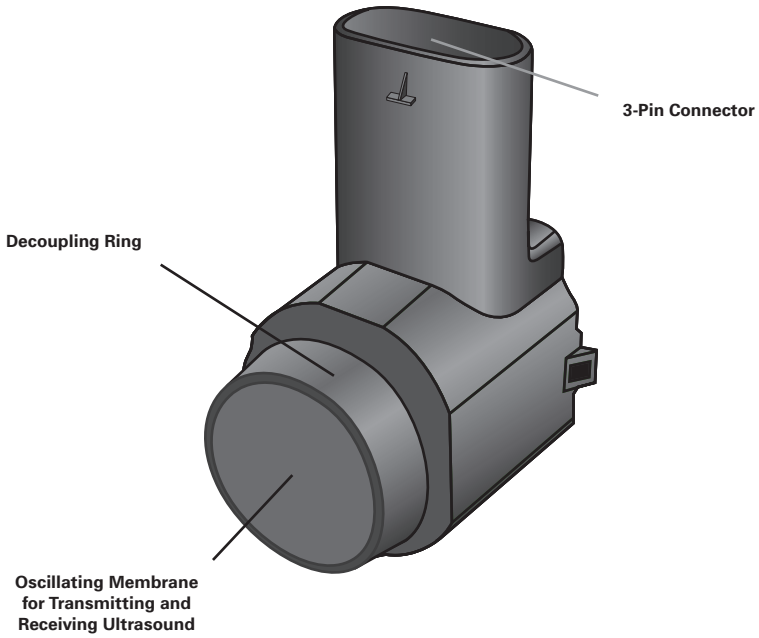
Volume and pitch can also be adjusted using scan tools.

Acoustic Parking Aid Sensors

Fifth-generation acoustic parking sensors are used in the Audi TT. This generation of sensors was first used in the Audi Q7. These sensors are much smaller than the fourth generation sensors and no longer have a fixed plastic housing to accommodate the oscillating membrane.

The plastic housing has been replaced by an expandable decoupling ring, which is fitted on the ultrasonic sensor. The decoupling ring must be removed to paint the acoustic parking sensor.

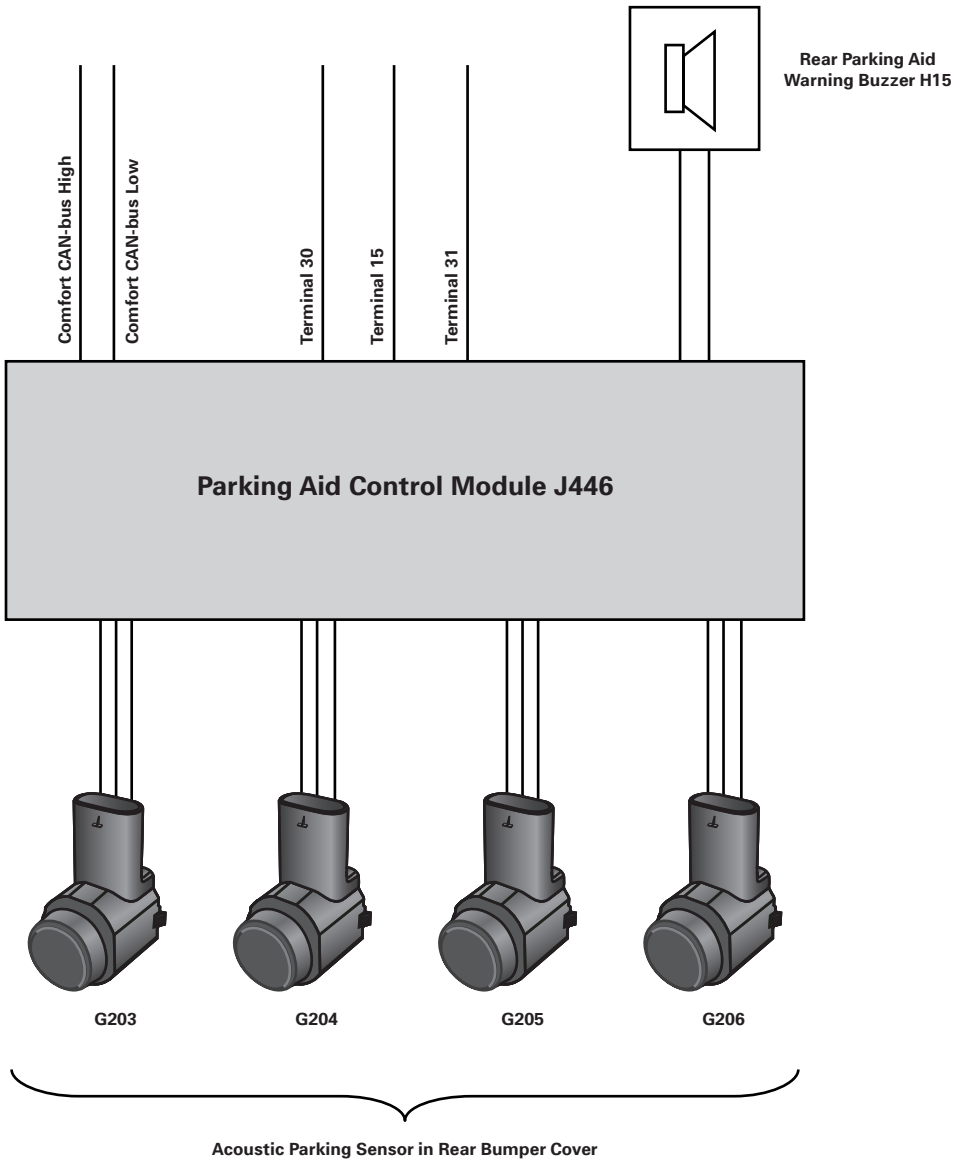




Functional Diagram

The following lines lead to Parking Aid Control Module J446:

- Two lines from the Comfort System CAN-bus
- Three lines to the power supply
- Two lines for the Rear Parking Aid Warning Buzzer H15
- Three lines to each of the four acoustic parking sensors (two lines for power supply and one digital signal line for data exchange)



Notes

Audi concert and symphony II + Radios in 2-DIN Housing

A new generation of Audi concert and symphony II + radios are available for the Audi TT.

The main new features of the radios are:

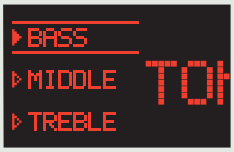
– FM tuner with phase diversity

– MP3 compatible CD drives





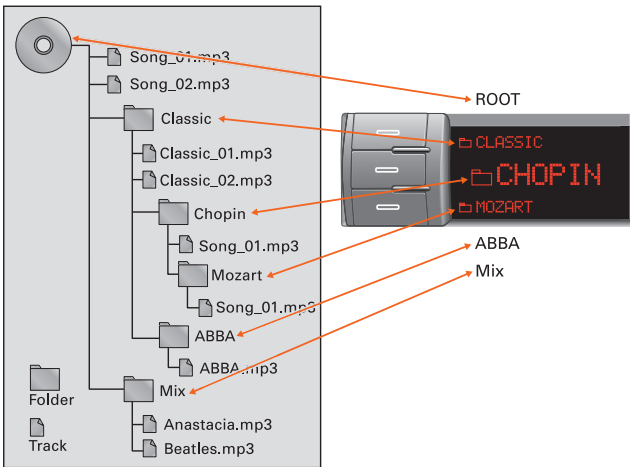
Specifications — All Radios

	Tuner
	RDS FM/AM radio
	Display of stored station with RDS name display
	FM tuner with phase diversity
	Internal and external drives
	Internal CD drive, CD text capable: information stored on the audio CD about the artist and title is shown on the display The internal drive in the Audi concert and Audi symphony II + radios is MP3 compatible
	Control of an optional auxiliary 6-disc CD changer or an optional auxiliary iPod adaptor
	Telephone
	Mute function for hands-free telephone: if the mobile phone adapter is factory-fitted, muting is through the Infotainment CAN-bus A direct wiring plug contact is provided for retro-fit solutions
	I.F. input for hands-free telephone: when the radio is switched ON, the vehicle loudspeakers are used as loudspeakers for the hands-free telephone The hands-free telephone cannot be operated through the radio
	Control
	Control through optional multi-function steering wheel
	Display on the driver information display
	Sound
	Integrated 2 x 20 W amplifiers, connectivity for auxiliary amplifier
	Speed-dependent volume control (GALA) through Infotainment CAN-bus
	Sound coding according to body type, interior trim (fabric/leather) and engine type
	Service
	Comfort coding: after the power supply to the radio has been disconnected, it is not necessary to enter a PIN if the radio is restored to operation in the same vehicle
	Diagnosis through CAN-bus

The CD drives of the Audi concert, Audi symphony II +, and Audi Navigation Plus (RNS-E) radios are all MP3 compatible.

The diagram below shows the arrangement of the folders on the MP3 CD in the radio. Folders which do not contain MP3 files are now shown on the radio display. When selecting a folder, the previous folder, the folder currently selected, and the next folder are shown on the display.

The first 16 letters of the CD folder name are shown on the radio display.

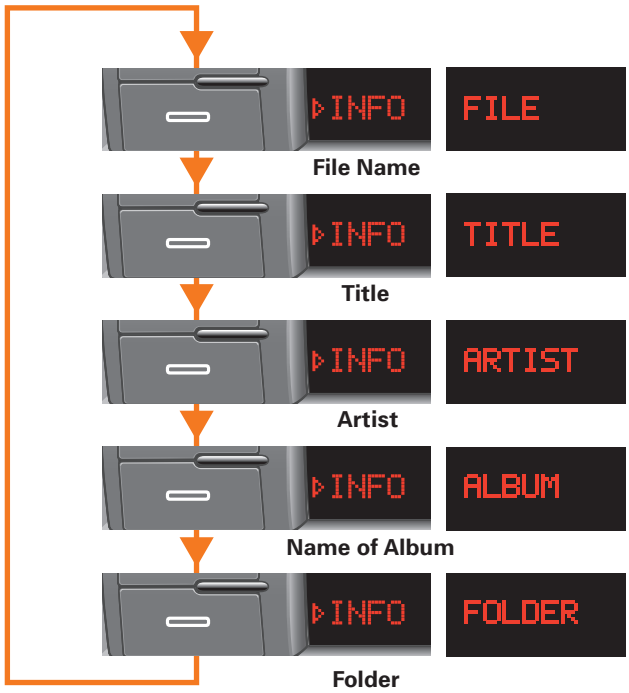


In MP3 playback mode, the ID3 text tag of the MP3 file can be viewed by pressing the INFO key. The info key can be used to scroll from one display to another.

The file name, title, artist, and album can be displayed.

Menu texts are displayed in English.

The display language of the radios cannot be changed.



Note

In Audi concert and Audi symphony II + radios, only the internal CD drive is MP3 compatible. The optional auxiliary CD changer cannot play MP3 CDs.

Country Specific Versions

Audi concert and Audi symphony II + radios are modified for the North American market. The modifications are:

– Different function key lettering and functions

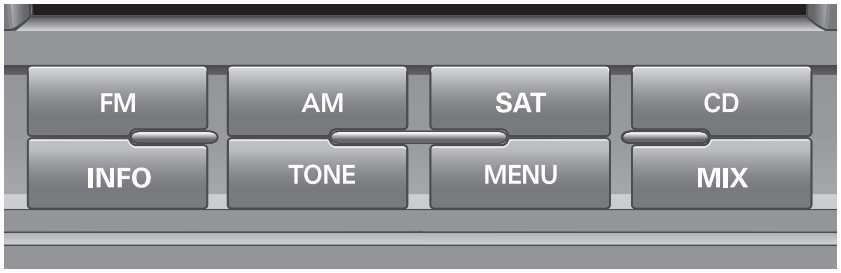
  ► SAT: the radio can also be used to control the Sirius satellite tuner

  ► INFO: the info key can be used to read information on the set radio station when the radio is in operation. In MP3 mode, the name of the album (ALBUM), the name of the artist (ARTIST), and the CD title (TITLE) are read off the ID3 tag of the MP3 file

– Optimization of the FM/AM tuner for the North American market

  ► RDBS in lieu of RDS

  ► Station seek adapted to the frequency spacings of the radio stations

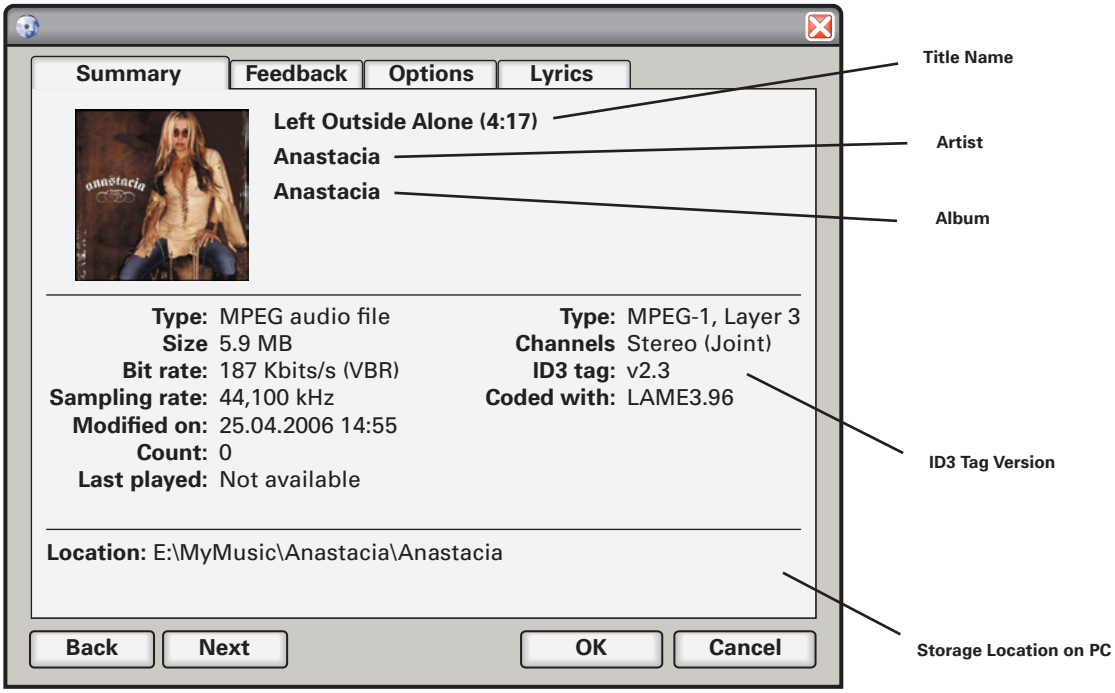


MP3 Basics — ID3 Tag

The ID3 tag is a field containing additional information which can be attached to MP3 audio files. ID3 stands for “Identify an MP3.” MP3 files contain ID3 tags.

The main contents of the ID3 tag are the name of the artist, the name of the album, and the name of the track. The ID3 tag is an integral part of the MP3 file.

The ID3 tag can be generated and edited on a PC using standard MP3 converters and player software. The ID3 tag version can be read out as shown below, for example, using iTunes, the PC software for the Apple iPod.



Note

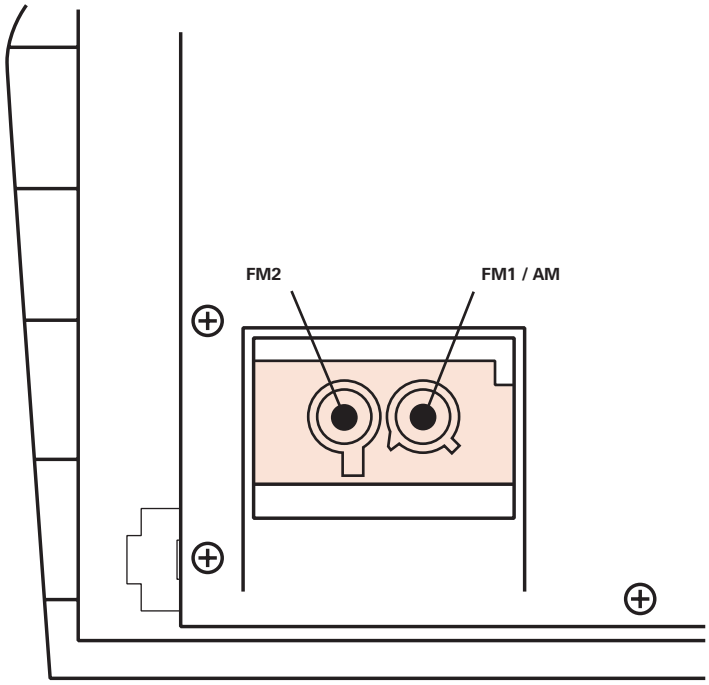
Various versions of the ID3 tag exist. Check the operating instructions for the Audi radio you have to see which ID3 tags are supported. Only then is it possible to show the information in the display.

Antenna System

Audi concert and Audi symphony II + radios use phase diversity technology antennas. Each radio has two antenna inputs which can be diagnosed separately.

Radios with phase diversity do not have a separate diversity switch. The diversity function is integrated into the radio. Only one antenna is connected to each of the two radio antenna inputs, thus simplifying diagnosis. Each antenna signal can be read out in a separate data block.

Although only two antennas are used, reception quality and interference immunity are better than those of previous systems.



Note

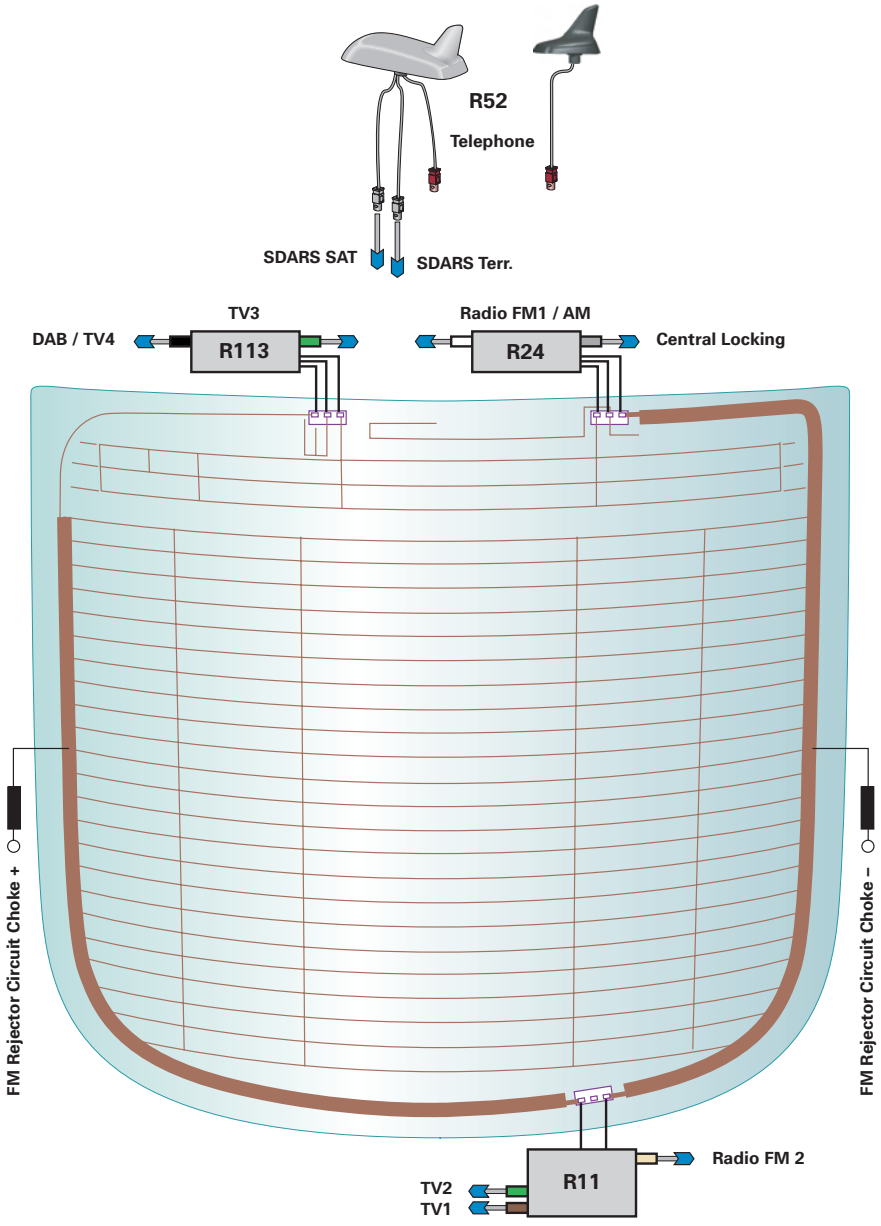
Although different FM antennas are used depending on the radio type, the radios all have the same style connectors.

Audi concert and Audi symphony II + radios cannot be exchanged with Audi Navigation Plus (RNS-E) models because of the antenna difference (phase diversity versus switched diversity). Reception is compromised when the wrong antenna system is used.

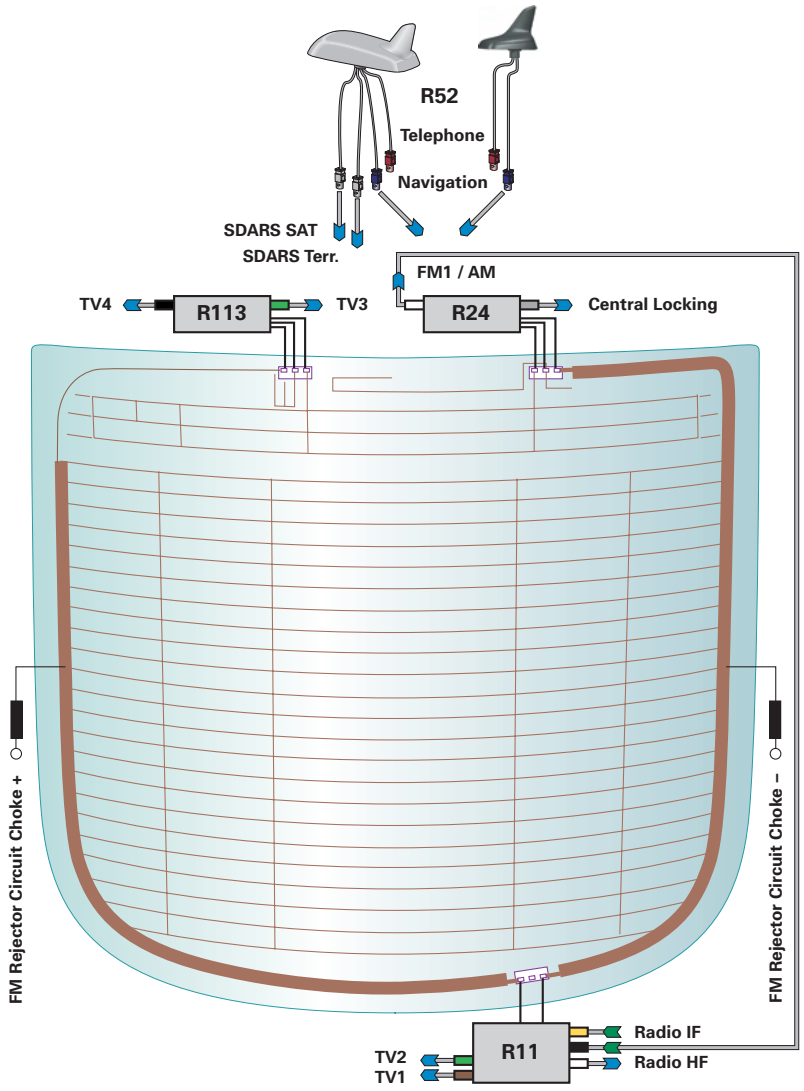
In the Audi TT, most antennas are integrated into the rear window. Only the navigation antenna (GPS), the telephone, and digital satellite radio (North America only) antennas are integrated into the roof antenna.

Amplifiers for the various systems are fitted at the top left and right, as well as the bottom right of the rear window. The bottom right antenna module is available in variants for phase diversity and switched diversity.

Audi concert and Audi symphony II + Radios with Phase Diversity



Audi Navigation Plus (RNS-E) Radio with Switched Diversity System



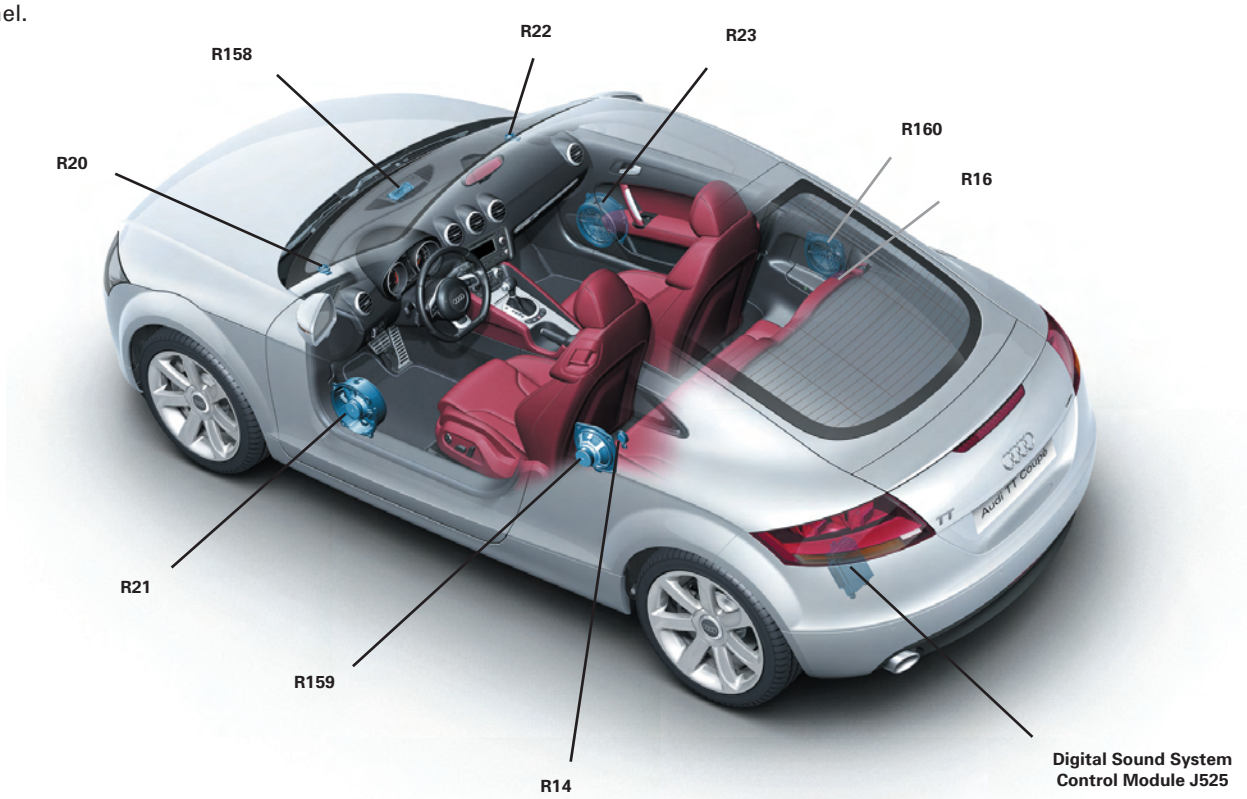
Antenna	Function
Antenna Amplifier R24	Analog radio antenna amplifier (FM1, AM) Central locking antenna amplifier
Radio, Telephone, Navigation System Antenna R52	Telephone antenna, navigation antenna Digital satellite radio antenna (SDARS, North America only)
Antenna Amplifier -2- R111	Analog radio antenna amplifier (FM2) TV antenna amplifier -1- TV antenna amplifier -2-
Antenna Amplifier -4- R113	TV antenna amplifier -3- TV antenna amplifier -4- Digital terrestrial radio antenna amplifier (DAB)

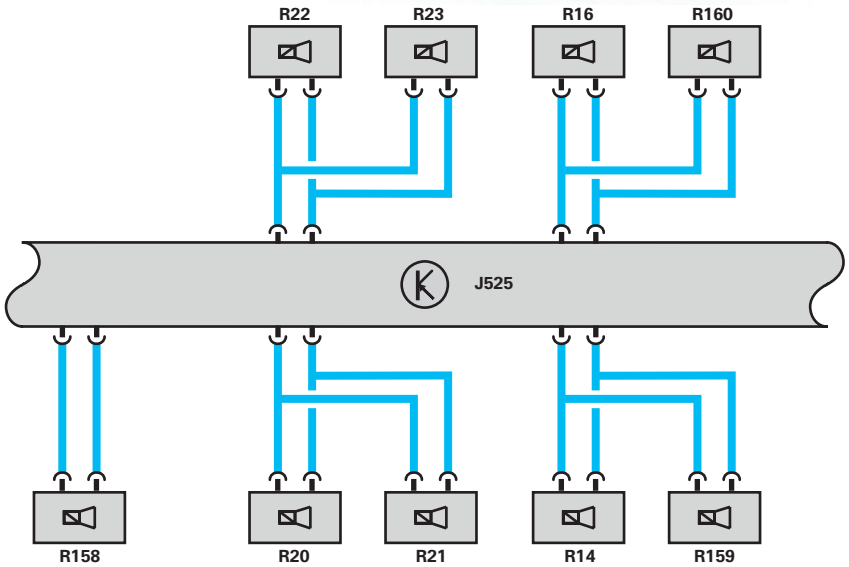
Standard Sound System

The standard sound system is the base equipment of the Audi concert and Audi symphony II + radios, as well as the Audi Navigation Plus (RNS-E) sound system. These radios do not use an internal amplifier.

The standard sound system uses five-channel DSP Digital Sound System Control Module J525. It is diagnosed through the Infotainment CAN. The amplifier supplies the front two-way systems, the rear two-way systems, and the central loudspeakers integrated into the instrument panel.

All speakers are diagnosed through the DSP amplifier through the VAS scan tool. Access is through Address Word 47. Vehicle model, equipment, networking, and type of driving noise compensation are also coded into the DSP amplifier.





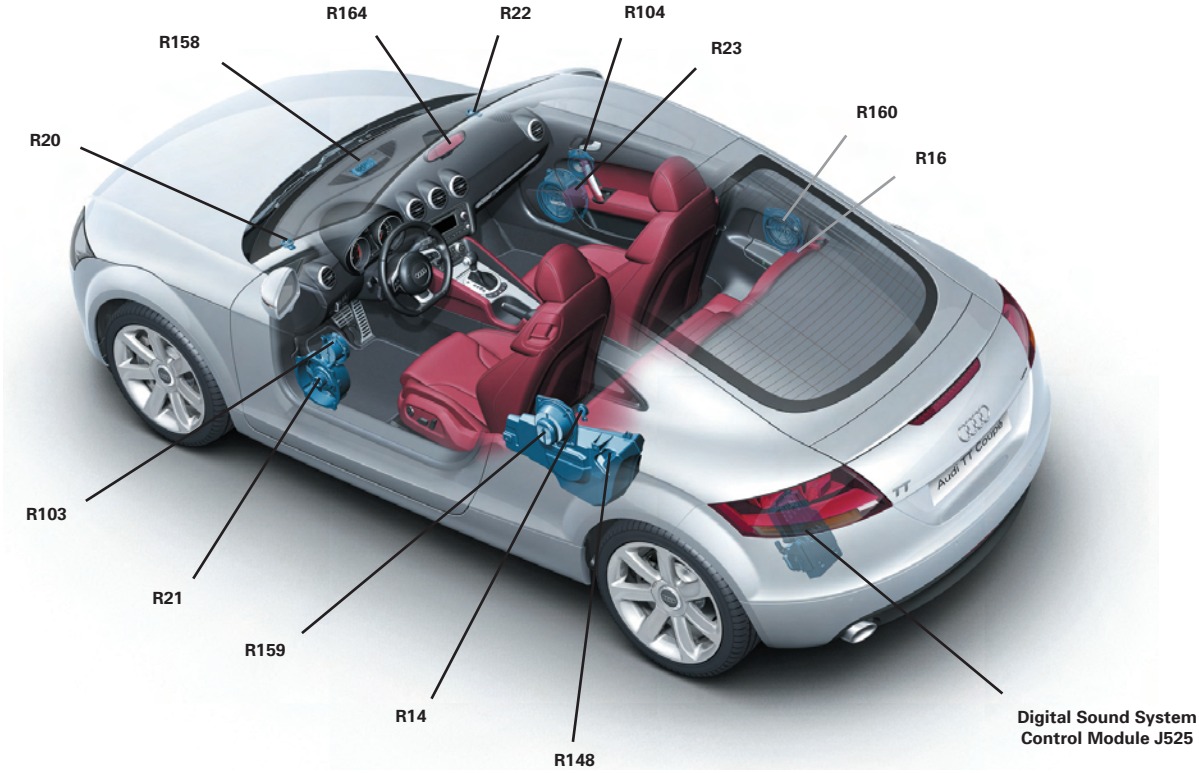
BOSE Surround Sound

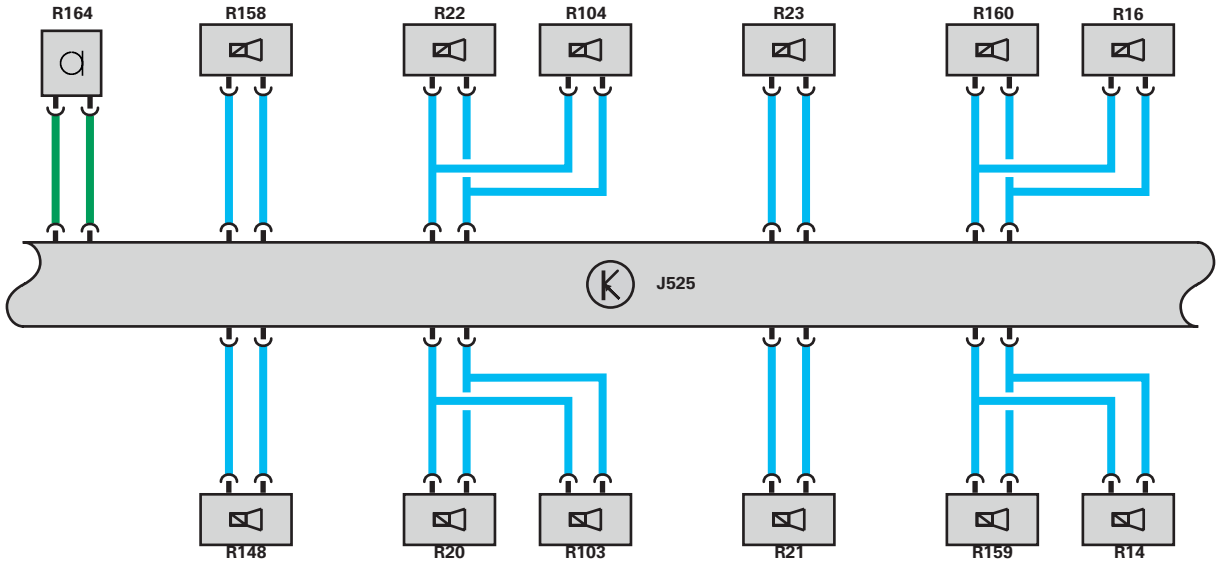
A BOSE surround sound system is a TT infotainment option. The sound system features BOSE 6000 amplifier technology with eight-channel DSP amplifier and Audio Pilot. The amplifier drives a total of twelve loudspeakers. It was adapted specifically for use in the TT.

A three-way system and an additional subwoofer are installed in the left side trim of the rear seat bench. As with other current BOSE sound systems, a microphone is integrated into the overhead module to record background noise.

The DSP amplifier utilizes the background noise information picked up by the microphone to frequency-adjust the output signals to the loudspeakers.

All speakers are diagnosed through the DSP amplifier through the scan tool. Access is through Address Word 47. The vehicle model, equipment, networking, and type of driving noise compensation are also coded in the DSP amplifier.





Apple iPod Adaptor

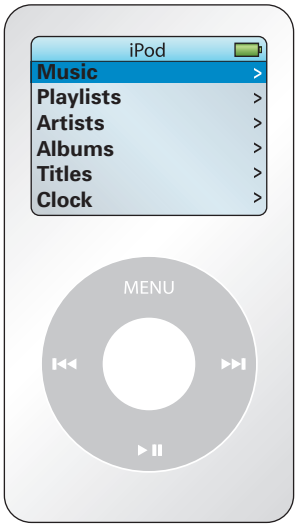
The Audi iPod adaptor can be used to connect the Apple iPod to the Audi concert, Audi symphony II +, and Audi Navigation Plus (RNS-E) radios used in the new TT. An adaptor converts the CD changer messages from the radio for the iPod. It can be connected as an alternative to an auxiliary CD changer.

Simultaneous operation of the CD changer and iPod adaptor is not possible, because both devices use the same port on the radio.

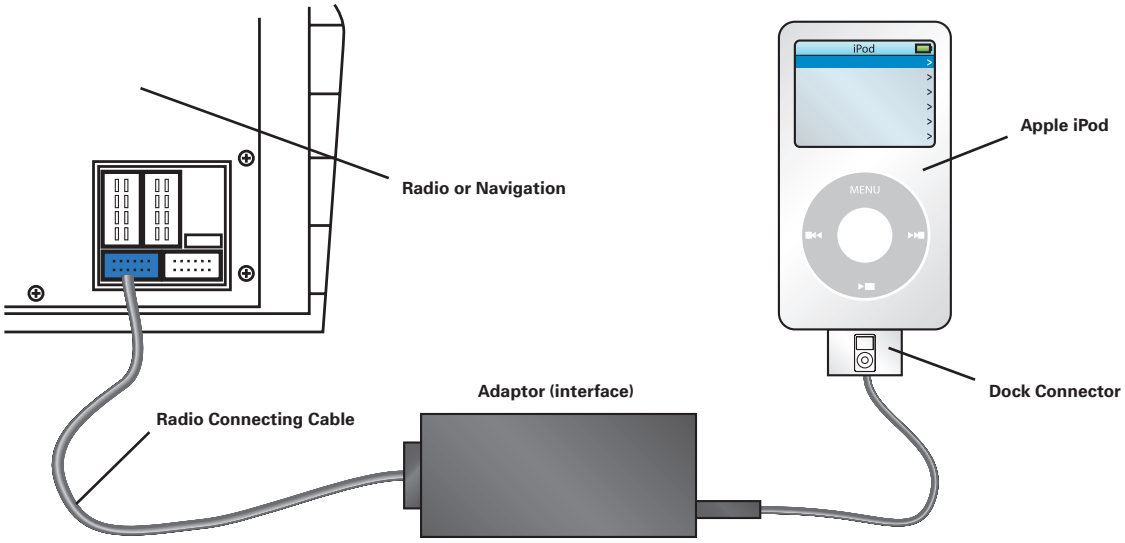
All iPods with Dock Connector, a 30-pin blade terminal, can be connected to the adaptor iPod. Models without a dock connector (those having only a USB port) cannot be connected to the iPod adaptor.

The iPod adaptor allows the iPod to be operated using the CD changer control functions. The displays of the Audi concert, Audi symphony II + and Audi Navigation Plus (RNS-E) radios only support a maximum of six CDs and 99 tracks per CD.

For this reason, they cannot display folders, artists and tracks like the iPod display. To overcome this system limitation of the CD changer interface, an operating concept adapted to the interface has been developed.







The Apple iPod and associated PC software (iTunes) have a function for programming playlists. A playlist can have a freely selectable name and contain any number of songs in a fixed sequence.

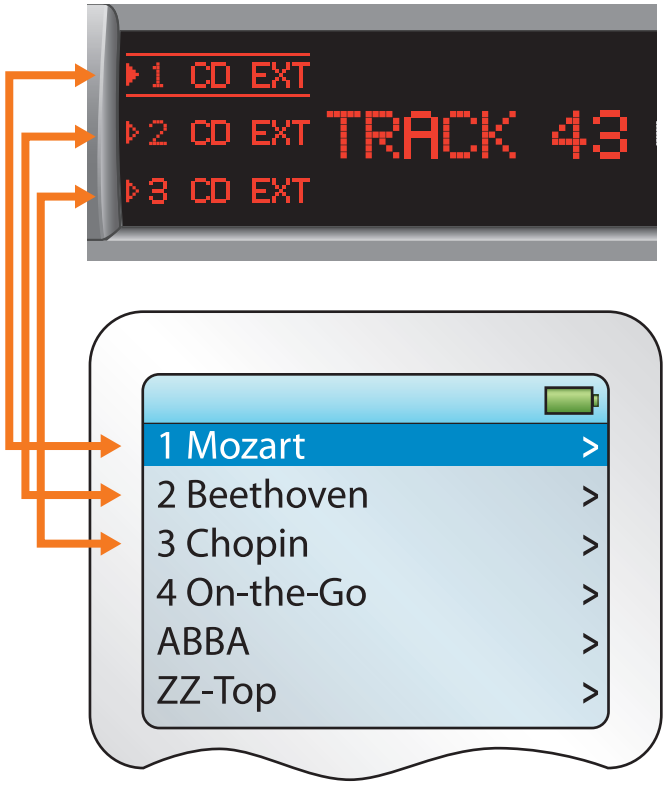
The iPod adaptor loads the first five playlists in alphabetical order. A corresponding CD number is assigned to each playlist. The first alphabetical playlist appears on the radio as CD 1, the second playlist as CD 2, and so on. All tracks are loaded in alphabetical by artist.

To program special playlists for iPod use in the car, it is recommended to place a number in front of the playlist name.

When playlists are sorted in alphabetical order, a number always takes precedence over the letter "A." The playlists "1_Mozart," "2_Beethoven," "3_Chopin," etc. are loaded by the adaptor based on the preceding number in the order CD1 = 1_Mozart, CD2 = 2_Beethoven, CD3 = 3_Chopin.

The songs are displayed as Track 01, Track 02, etc. like on the CD changer. The numbering on the radio display goes up to Track 99. All tracks in a playlist can be played. If more than 99 tracks are stored in a playlist, only the last two digits of the track number are displayed for tracks 100 and upward. Track 00 is displayed for track 200 and Track 37 for track 1037.

When the radio is ON, the rechargeable battery of the iPod is charged using the iPod adaptor. To disconnect the iPod from the adaptor, switch the radio OFF.

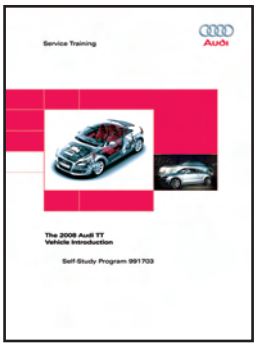




Self-Study Programs for the Audi TT

SSP 991703 The 2008 Audi TT Introduction

- Body
- Occupant Protection
- Engine
- Suspension System
- Electrical System
- Air Conditioning
- Infotainment



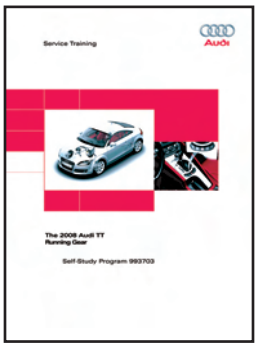
SSP 992703 The 2008 Audi TT Electrical and Infotainment Systems

- Control Module Locations
- Topology and Networking
- Electrical and Comfort System Electronics



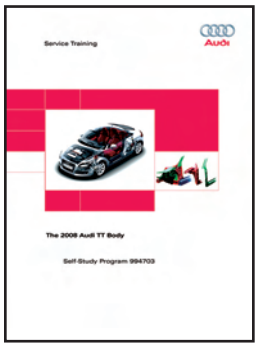
SSP 993703 The 2008 Audi TT Running Gear

- Axles
- Brake System
- Steering System
- Audi Magnetic Ride
- Other Features



SSP 994703 The 2008 Audi TT Body

- Audi Space Frame (ASF)
- Joining Techniques and Production Processes
- Vehicle Safety Concept
- Dimensions



Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this SSP.

The Knowledge Assessment may or may not be required for Certification.

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 ”CRC Certification” Link

For assistance, please call:

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Learning Management Center Headquarters

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(8:00 a.m. to 8:00 p.m. EST)

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