Self Study Programme 944647AG

Audi A4 (type 8W)
Infotainment and Audi connect

Audi
Service Training

The material in this Self Study Program (SSP) may contain technical information or reference vehicle systems and configurations which are not available in the Canadian market.

Please ensure you reference ElsaPro for the most current technical information and repair procedures.

Infotainment

As you would expect from Audi, the infotainment system in the Audi A4 offers a perfect combination of driver orientation, networking and intuitive operation.

- Ergonomic and intuitive operation
- Fewer buttons and menu layers

- High-resolution displays
- Seamless graphical transitions
- LTE, Audi connect

- Audi phone box with wireless charging
- Simultaneous connection of 2 phones via HFP

- Bang & Olufsen Sound System with 3D sound

- Navigation maps in 3D design
- Predictive route data

647_001

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The Self Study Programme teaches a basic understanding of the design and mode of operation of new models, new automotive components or new technologies.
It is not a Repair Manual! Figures are given for explanatory purposes only and refer to the data valid at the time of preparation of the SSP.
This content is not updated.
For further information about maintenance and repair work, always refer to the current technical literature.

Note

Reference

Introduction

Compared with the previous model, the infotainment package for the Audi A4 (8W0) has been totally revised. The Audi A4 is the first Audi model to feature the second-generation MIB Scale system.

Overview of versions

Three versions of the MMI are available for the Audi A4:
- MMI Radio plus
- MMI Navigation
- MMI Navigation plus

From a technical point of view, MMI Radio plus is identical to the second-generation MIB Standard system.
MMI Radio plus with Connectivity Package and MMI Navigation are based on the new MIB Scale line.
MMI Navigation plus is a second-generation MIB High system.

MMI Radio plus (I8E)


7.0“ TFT colour monitor with 800 x 480 pixel resolution
without navigation (7Q0)
Basic operating unit
5“ monochrome display in instrument cluster with driver information system (9S5)
AM/FM radio
CD drive (MP3, WMA, AAC)
1 SDXC card readers
AUX-in jack and 5V USB charging port (UE3)
Basic sound system (8RM)
Bluetooth interface (9ZX)
Optional equipment
7“ display in instrument cluster with driver information system (9S7)
Audi music interface with 2 USB ports and AUX-In jack (UE7)
Audi phone box including wireless charging (9ZE)[3]
Audi phone box light (for wireless charging only) (9ZV) [3)/4)]
Audi sound system (9VD)
Bang & Olufsen Sound System with 3D sound (9VS)
Digital radio DAB (QV3)[6]
Audi Auto SOS & Audi connect vehicle-specific services (IW3)[7]
Prewiring for Rear Seat Entertainment (9WM)

1) 7UH for countries without navigation map data
2) EL0 for markets without Audi connect
3) 2x HFP (2 mobile phones can be coupled via Hands-Free Profile)
4) For markets in which no coupling box (external aerial connection for smartphone) is available
5) The Audi connect data module then becomes a fully fledged telephone module mit SAP
6) If digital radio (QV3) and TV tuner (QV1) are ordered together, the PRNR is QU1
7) Auto SOS only (IW1) or Auto SOS & Service (IW3), depending on country

MMI Radio plus (I8S) with Connectivity Package (PNV)	MMI Navigation (I8S)	MMI Navigation plus (I8H)
		
		
7.0“ TFT colour monitor with 800 x 480 pixel resolution	7.0“ TFT colour monitor with 800 x 480 pixel resolution	8.3“ TFT colour monitor with 1024 x 480 pixel resolution
Pre-wiring for navigation unit (7UH)	3D SD navigation (7UG)	3D SSD navigation (7UG)[1)]
Mid operating unit	Mid operating unit	MMI touch
5“ monochrome display in instrument cluster with driver information system (9S5)	5“ monochrome display in instrument cluster with driver information system (9S5)	7“ display in instrument cluster with driver information system (9S7)
AM/FM radio	AM/FM radio	AM/FM radio
		Satellite radio for North America (Sirius) (QV3)
		Jukebox (10 GB)
CD drive (MP3, WMA, AAC)	CD drive (MP3, WMA, AAC)	DVD drive (audio/video)
2 SDXC card readers	2 SDXC card readers	2 SDXC card readers
Audi music interface and Audi smartphone interface with 2 USB ports and AUX-In jack (UI2)	AUX-in jack and 5V USB charging port (UE3)	AUX-in jack and 5V USB charging port (UE3)
Basic sound system (8RM)	Basic sound system (8RM)	Basic sound system (8RM)
Bluetooth interface (9ZX)	Bluetooth interface (9ZX)	Bluetooth interface (9ZX)
	UMTS/LTE data module (EL3) [2)]	UMTS/LTE data module (EL3)[2)] including Audi connect (IT1)
7“ display in instrument cluster with driver information system (9S7)	7“ display in instrument cluster with driver information system (9S7)	Audi virtual cockpit (9S8)
	Audi music interface and Audi smartphone interface with 2 USB ports and AUX-In jack (UI2)	Audi music interface and Audi smartphone interface with 2 USB ports and AUX-In socket (UI2)
Audi phone box including wireless charging (9ZE)[3)]	Audi phone box including wireless charging (9ZE) [3)/5)]	Audi phone box including wireless charging (9ZE) [3)/5)]
Audi phone box light (for wireless charging only) (9ZV) [3)/4)]	Audi phone box light (for wireless charging only) (9ZV) [3)/4)/5)]	Audi phone box light (for wireless charging only) (9ZV) [3)/4)/5)]
Audi sound system (9VD)	Audi sound system (9VD)	Audi sound system (9VD)
Bang & Olufsen Sound System with 3D sound (9VS)	Bang & Olufsen Sound System with 3D sound (9VS)	Bang & Olufsen Sound System with 3D sound (9VS)
Digital radio DAB (QV3)[6)]	Digital radio DAB (QV3)[6)]	Digital radio DAB (QV3)[6)]
	TV tuner (QV1)[6)]	TV tuner (QV1)[6)]
	Audi connect (IT1)	
Audi Auto SOS & Audi connect vehicle-specific services (IW3)[7)]	Audi Auto SOS & Audi connect vehicle-specific services (IW3)[7)]	Audi Auto SOS & Audi connect vehicle-specific services (IW3)[7)]
		1 Audi tablet (9WE)
		2 Audi tablet (9WF)
Prewiring for Rear Seat Entertainment (9WM)	Prewiring for Rear Seat Entertainment (9WM)	Prewiring for Rear Seat Entertainment (9WM)

MIB Scale

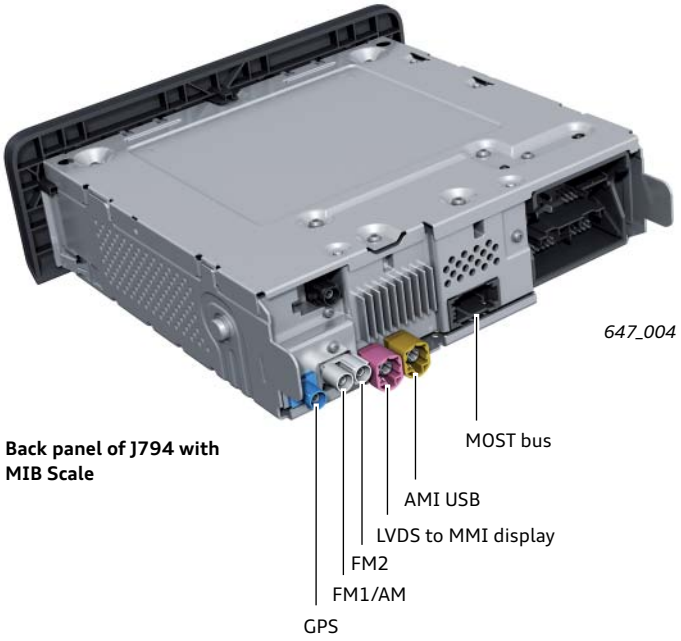
The MIB Scale equipment line is featured in the Audi A4 (type 8W0) for the first time. Two different control unit versions are installed. They differ from one another in that one has a data module and the other does not. Their marketing names are:

- MMI radio with Connectivity Package (without data module)
- MMI Navigation (with data module)

J794 with MIB Scale *647_003*

The MIB Scale can have a range of features including:

- Digital radio tuner
- Satellite radio tuner
- 2 SDXC card readers
- Single CD drive
- 800 x 480 pixel video output
- 3D navigation with map data on SD card
- Internal audio amplifier
- Bluetooth interface
- Speech dialogue system
- Mobile data module (UMTS/LTE) and SIM card reader
- Provision of predictive route data



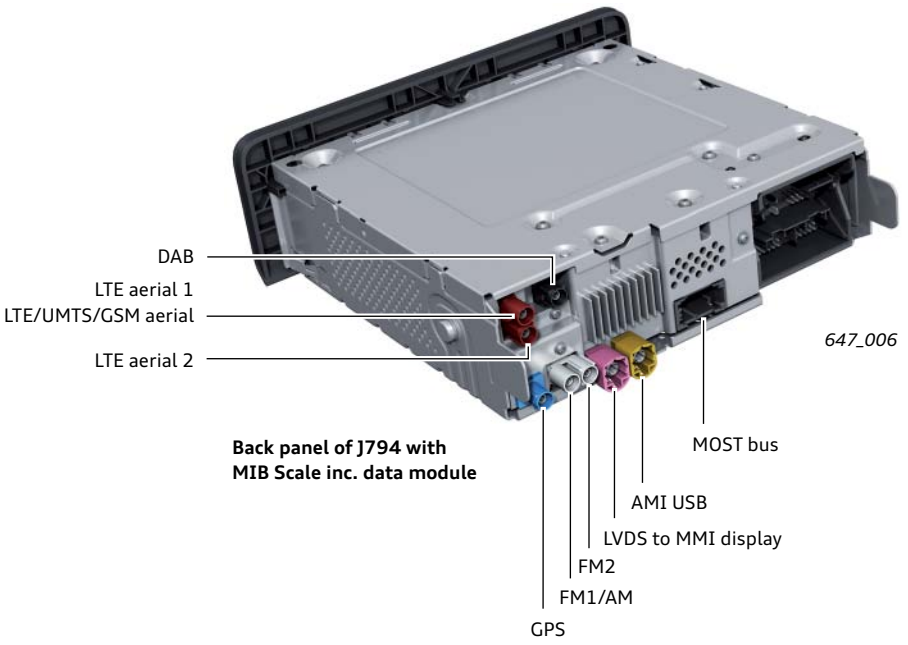
647_004

Back panel of J794 with MIB Scale

Directory

Like MIB High, MIB Scale has the capacity to manage 4000 directory entries from coupled smartphones. In this case, too, there are 4 profiles which are created automatically. If a fifth smartphone is coupled, the profile which has not been in use for the longest is deleted.
An additional 1000 local directory entries can be created.

J794 with MIB Scale inc. data module *647_005*



647_006

Back panel of J794 with MIB Scale inc. data module

MMI versions

MMI Radio plus

The Audi A4 is equipped as standard with MMI Radio plus (I8E). Technically, the unit is based on the second-generation MIB Standard system.
MMI Radio plus has the following features:

- Radio with phase diversity, FM dual tuner (very high frequency) and AM tuner (medium wave)
- Single CD drive for audio playback (mp3, wma, aac)
- 1 SDXC card reader for audio playback (mp3, wma, aac)
- Internal audio amplifier rated at 4 x 20 watts (8RM)
- 800 x 480 pixel video output
- 7.0" MMI display
- Remote control panel in the centre console
- AUX-In connection (UE3) and one 5V charging port in USB format (UE3)
- Bluetooth interface for HFP [1] and A2DP
- Speech dialogue system

Display with MMI Radio plus *647_007*

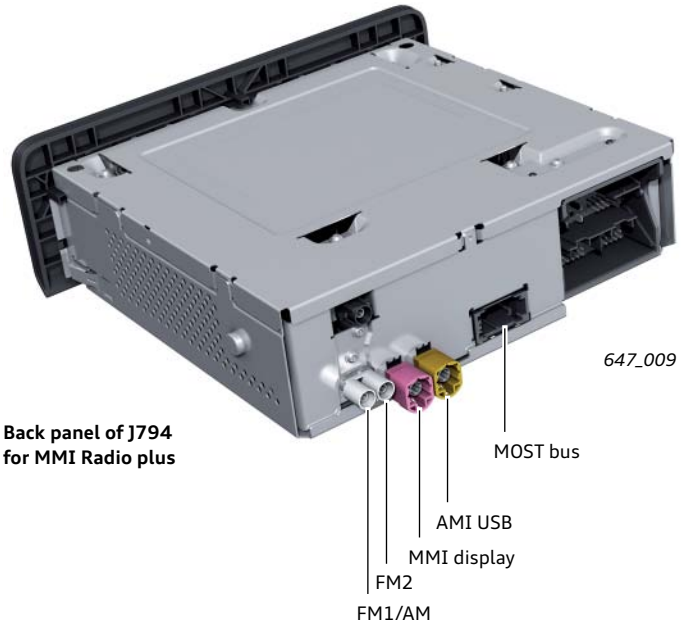
It may also have the following options:

- Audi phone box (9ZE)[1]
- Audi music interface with 2 USB data ports and AUX-In jack (UE7)
- Internal audio amplifier for Audi sound system rated at 180 watts (9VD)
- External audio amplifier for Bang & Olufsen Sound System with 3D sound and more than 700 watts power output (9VS)
- DAB tuner (digital radio) (QV3)

J794 for MMI Radio plus *647_008*

If the vehicle has the PR numbers "I8E" plus "7Q0", this means that it is fitted with MIB Standard (MMI Radio plus).

[1] If only the Bluetooth interface is installed in the Audi A4, only one smartphone can be coupled via HFP. If the Audi phone box is also installed, 2 smartphones can be simultaneously coupled via HFP.



647_009

Back panel of J794 for MMI Radio plus

MMI radio plus with Connectivity Package

If customers cannot decide whether or not they want a navigation system when ordering a new vehicle, they have the option of selecting the MMI Radio plus (I8E) with Connectivity Package (PNV). In this case, the requisite navigation hardware is pre-installed in the information electronics control unit 1 J794. Technically, the unit is based on the second-generation MIB Scale system. It has the following features:

- Radio with phase diversity, FM dual tuner (very high frequency) and AM tuner (medium wave)
- Single CD drive for audio playback (mp3, wma, aac, etc.)
- 2 SDXC card reader for audio playback (mp3, wma, aac, etc.)
- Internal audio amplifier rated at 4 x 20 watts (8RM)
- 800 x 480 pixel video output
- 7.0" MMI display
- Remote control panel in the centre console
- Audi music interface and Audi smartphone interface with 2 USB ports and AUX-In jack (UI2)
- Bluetooth interface for HFP and A2DP (9ZX)
- Speech dialogue system
- Prewired for navigation

It may also have the following options:

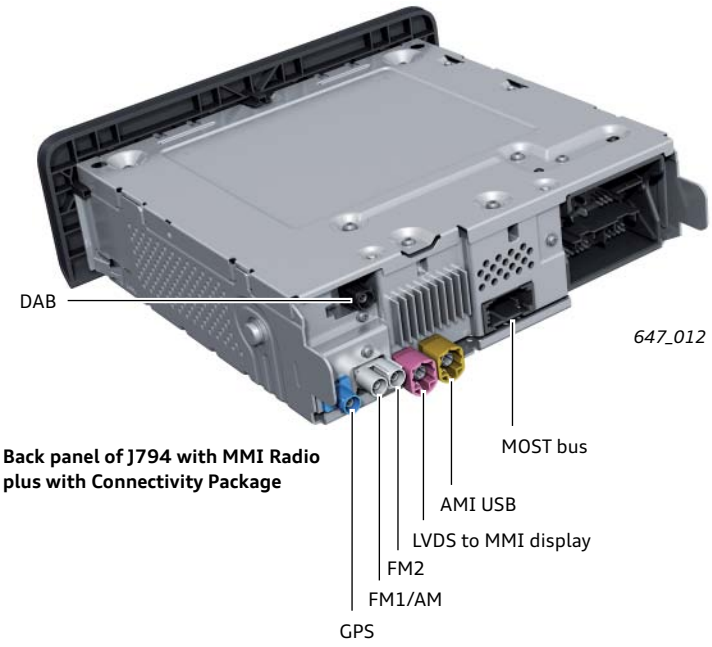
- Audi phone box (9ZE)
- Internal audio amplifier for Audi sound system rated at 180 watts (9VD)
- External audio amplifier for Bang & Olufsen Sound System with 3D sound and more than 700 watts power output (9VS)
- DAB tuner (digital radio) (QV3)

If the vehicle has the PR numbers "I8S" plus "7UH", this means that it has MMI Scale with navigation prewiring (MMI Radio plus with Connectivity Package).

The procedure for activating the navigation system is the same as for the previous systems with Connectivity Package. Once the navigation system has been activated, it has the same features as the MMI Navigation system, but no data module.

Display with MMI Radio plus with Connectivity Package *647_010*

J794 with MMI Radio plus with Connectivity Package *647_011*



647_012

Back panel of J794 with MMI Radio plus with Connectivity Package

MMI Navigation

MMI Navigation (I8S) is optional in the Audi A4. Technically, the unit is based on the second-generation MIB Scale system.
The MMI Navigation system has the following features:

- Radio with phase diversity, FM dual tuner (very high frequency) and AM tuner (medium wave)
- Single CD drive for audio playback (mp3, wma, aac, etc.)
- 2 SDXC card reader for audio playback (mp3, wma, aac, etc.)
- 3D navigation with map data on SD card (7UF)
- Internal audio amplifier rated at 4 x 20 watts (8RM)
- 800 x 480 pixel video output
- 7.0" MMI display
- Remote control panel in the centre console
- AUX-In connection (UE3) and one 5V charging port in USB format (UE3)
- Bluetooth interface for HFP and A2DP (9ZX)
- Speech dialogue system
- Mobile communications data module (UMTS/LTE) including Wi-Fi module
  (up to 150 Mbit/s) (EL3) with 3-month test phase of the Audi connect services (Europe)

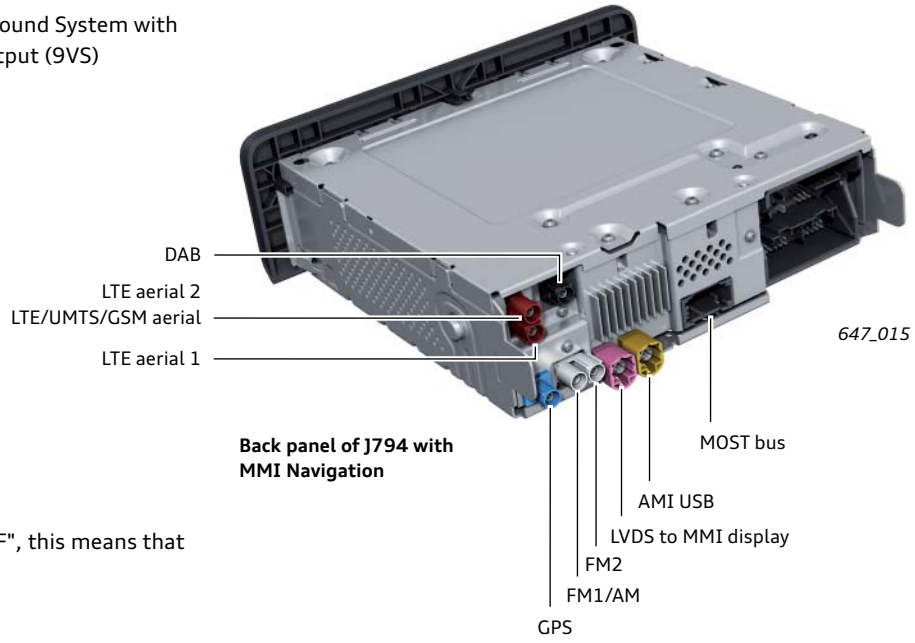
It may also have the following options:

- Audi phone box (9ZE)
- Audi music interface and Audi smartphone interface with 2 USB ports and AUX-In jack (UI2)
- Audi connect for 3 years (IT1)
- Audi connect including Wi-Fi module (up to 150 Mbit/s) for 3 years (IT1)
- Internal audio amplifier for Audi sound system rated at 180 watts (9VD)
- External audio amplifier for Bang & Olufsen Sound System with 3D sound and more than 700 watts power output (9VS)
- DAB tuner (digital radio) (QV3)

If the vehicle has the PR numbers "I8S" plus "7UF", this means that it is fitted with MIB Scale (MMI Navigation).

Display with MMI Navigation *647_013*

J794 with MMI Navigation *647_014*



Back panel of J794 with MMI Navigation *647_015*

Note
When the SD card with navigation data is removed from the SD card reader, no navigation is possible.

MMI Navigation plus

The MMI Navigation plus system is offered as a high-end version. The MMI Navigation plus system is based on the second-generation MIB High system and has the following features:

- Radio with phase diversity and FM dual tuner (very high frequency) as well as AM tuner (medium wave) and background tuner
- Single DVD drive for audio and video files
- 2 SDXC card readers for audio and video files
- SSD drive (approx. 64 GB)
- Jukebox (10 GB)
- 3D navigation with navigation data on solid-state drive including 3D building view
- Internal audio amplifier rated at 4 x 20 watts (8RM)
- AUX-In connection (UE3) and one 5V charging port in USB format (UE3)
- Bluetooth interface for HFP and A2DP (9ZX)
- Premium interactive speech dialog system
- 1024 x 480 pixel video output
- 8.3" MMI display
- MMI touch
- Mobile communications data module (UMTS/LTE) including Wi-Fi module (EL3)
- Audi connect with 3-year subscription (IT1) [1)]
- Map update online [2)]

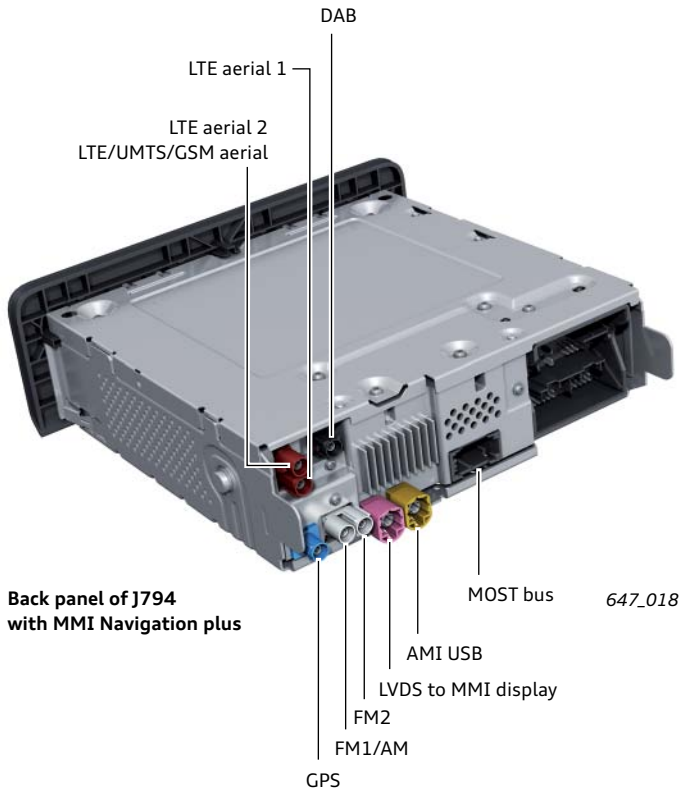
MMI Navigation plus display *647_016*

J794 for MMI Navigation plus *647_017*

The following optional equipment can be ordered for MMI Navigation plus:

- Audi phone box (9ZE)
- Audi music interface and Audi smartphone interface with 2 USB ports and AUX-In jack (UI2)
- DAB tuner (digital radio) (QV3)
- SDARS tuner (NAR spec digital radio) (QV3)
- Internal audio amplifier for Audi sound system rated at 180 watts (9VD)
- External audio amplifier for Bang & Olufsen Sound System with 3D sound and more than 700 watts power output (9VS)
- TV tuner (QV1)

If the vehicle has the PR numbers "I8H" plus "7UG", this means that it is fitted with MIB High (MMI Navigation plus).



Back panel of J794 with MMI Navigation plus *647_018*

1) 3-year subscription for Europe
2) For the first 5 six-monthly map updates

Sound

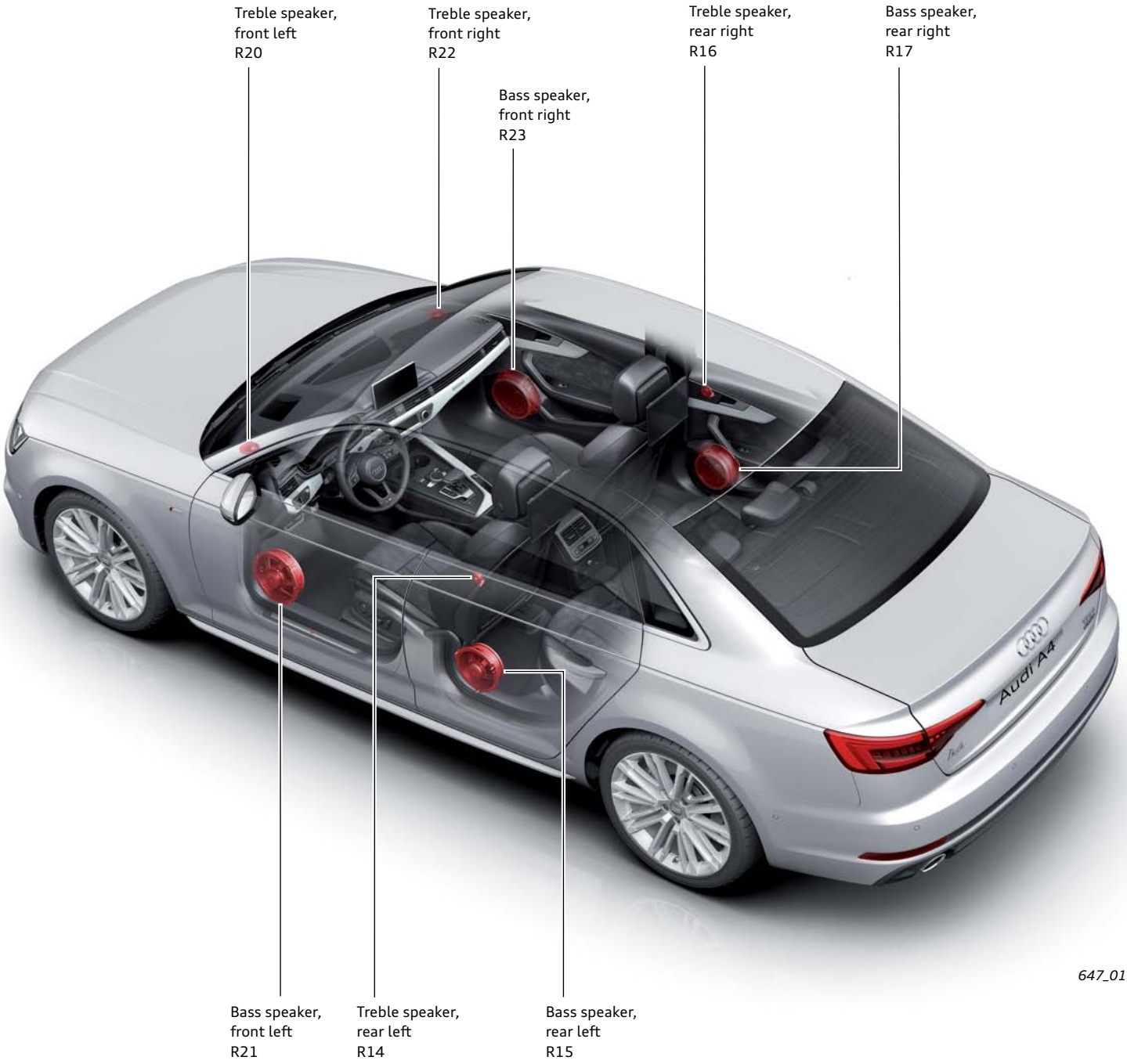
The Audi A4 has 3 different sound systems:

- Basic sound system (8RM)
- Audi sound system (9VD)
- Bang & Olufsen Sound System with 3D sound (9VS)

The Bang & Olufsen Sound System includes the 3D sound feature introduced in the Audi Q7 (4M). The various sound systems available for the Audi A4 are shown below.

Basic sound system (8RM)

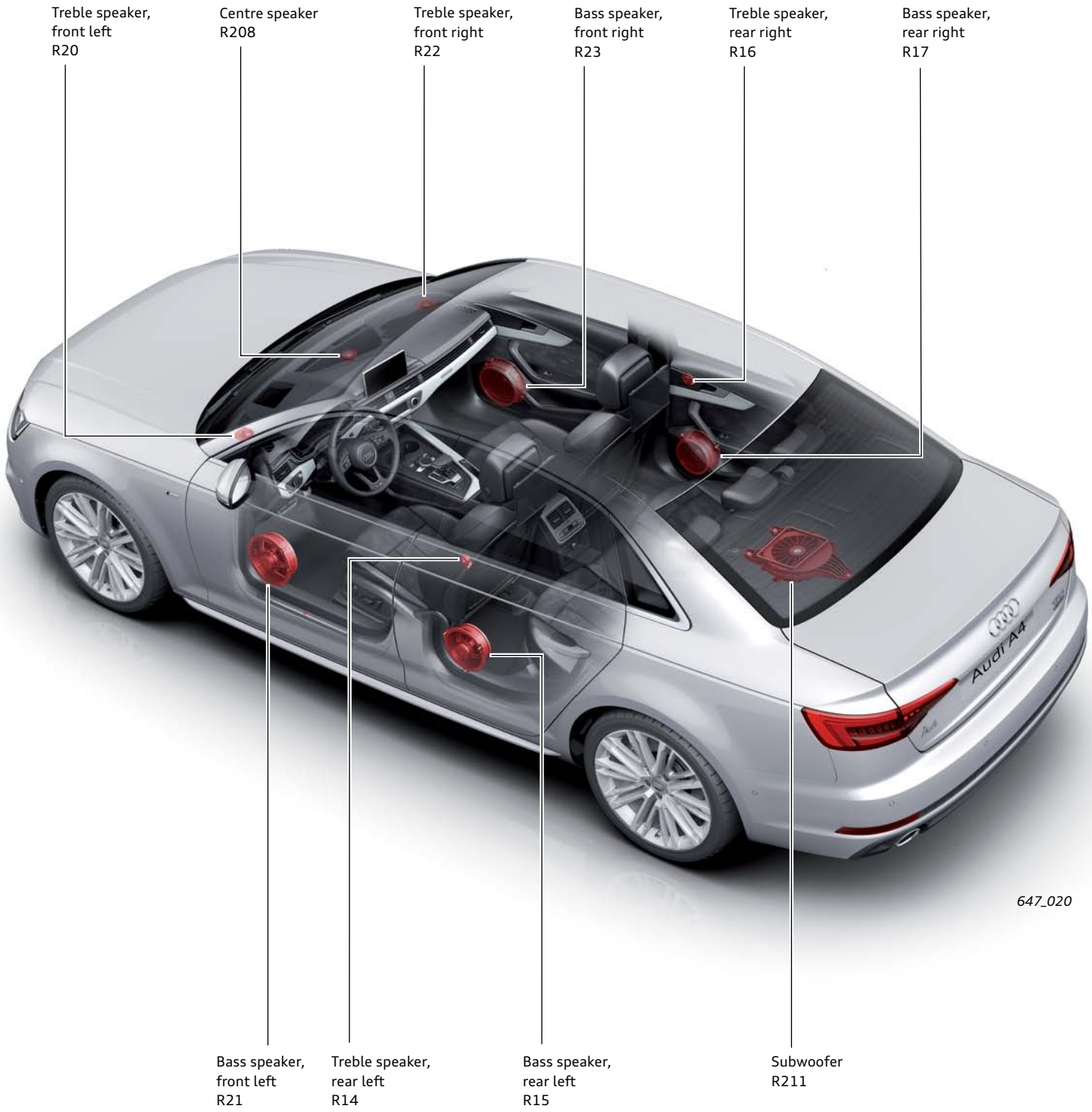
The Basic sound system has 8 speakers. It has a 4-channel amplifier with a total power output of 80 watts. It is integrated in the information electronics control unit 1 J794.

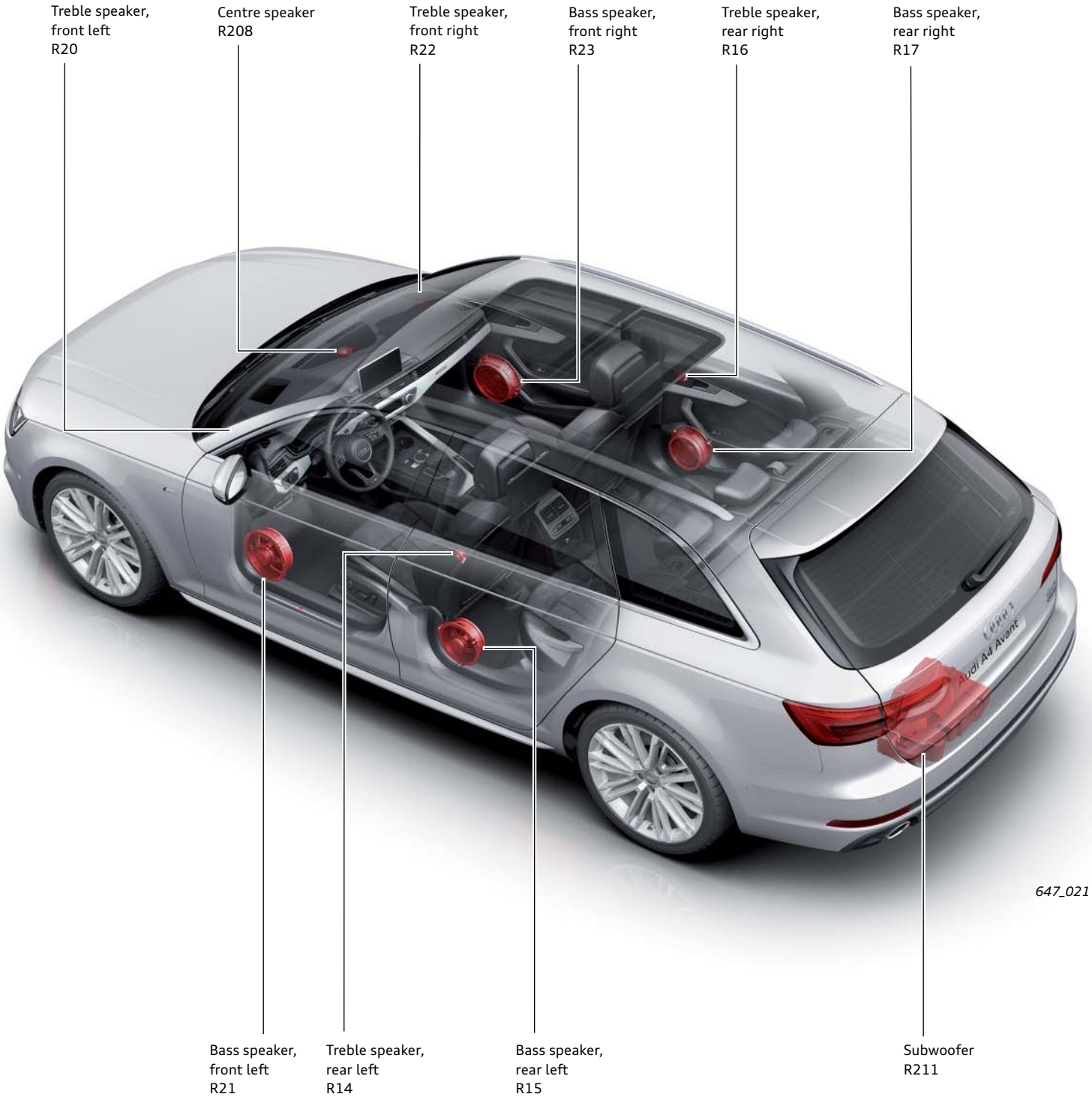


647_019

Audi sound system (9VD)

The Audi sound system has 10 speakers. The accompanying 6-channel amplifier has a power output of 180 watts. It is integrated in the information electronics control unit 1 J794.
The position of the subwoofer varies depending on vehicle type.

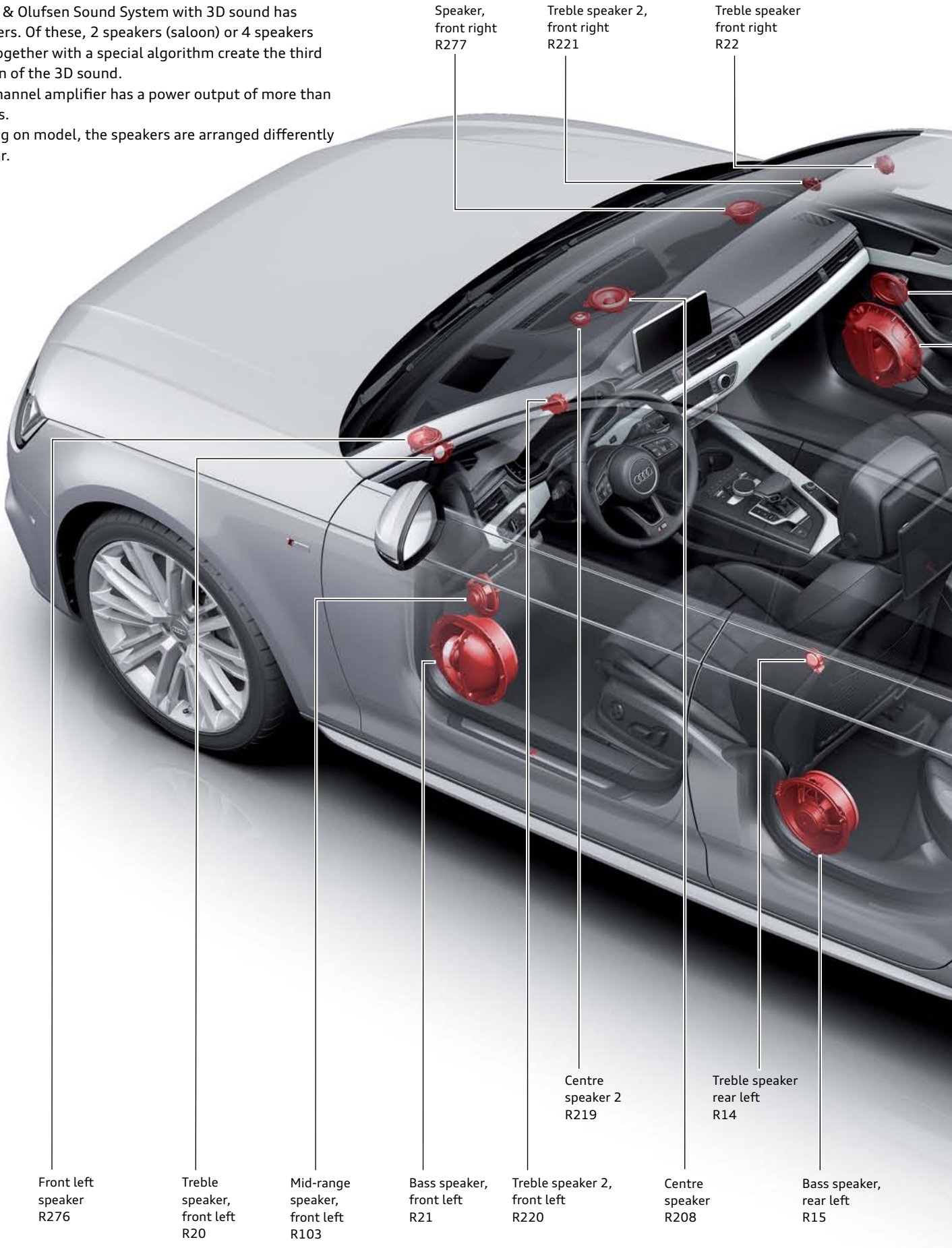



Treble speaker, front left R20
Centre speaker R208
Treble speaker, front right R22
Bass speaker, front right R23
Treble speaker, rear right R16
Bass speaker, rear right R17
Audi A4 Avant
Bass speaker, front left R21
Treble speaker, rear left R14
Bass speaker, rear left R15
Subwoofer R211

647_021

Bang & Olufsen Sound System with 3D sound (9VS)

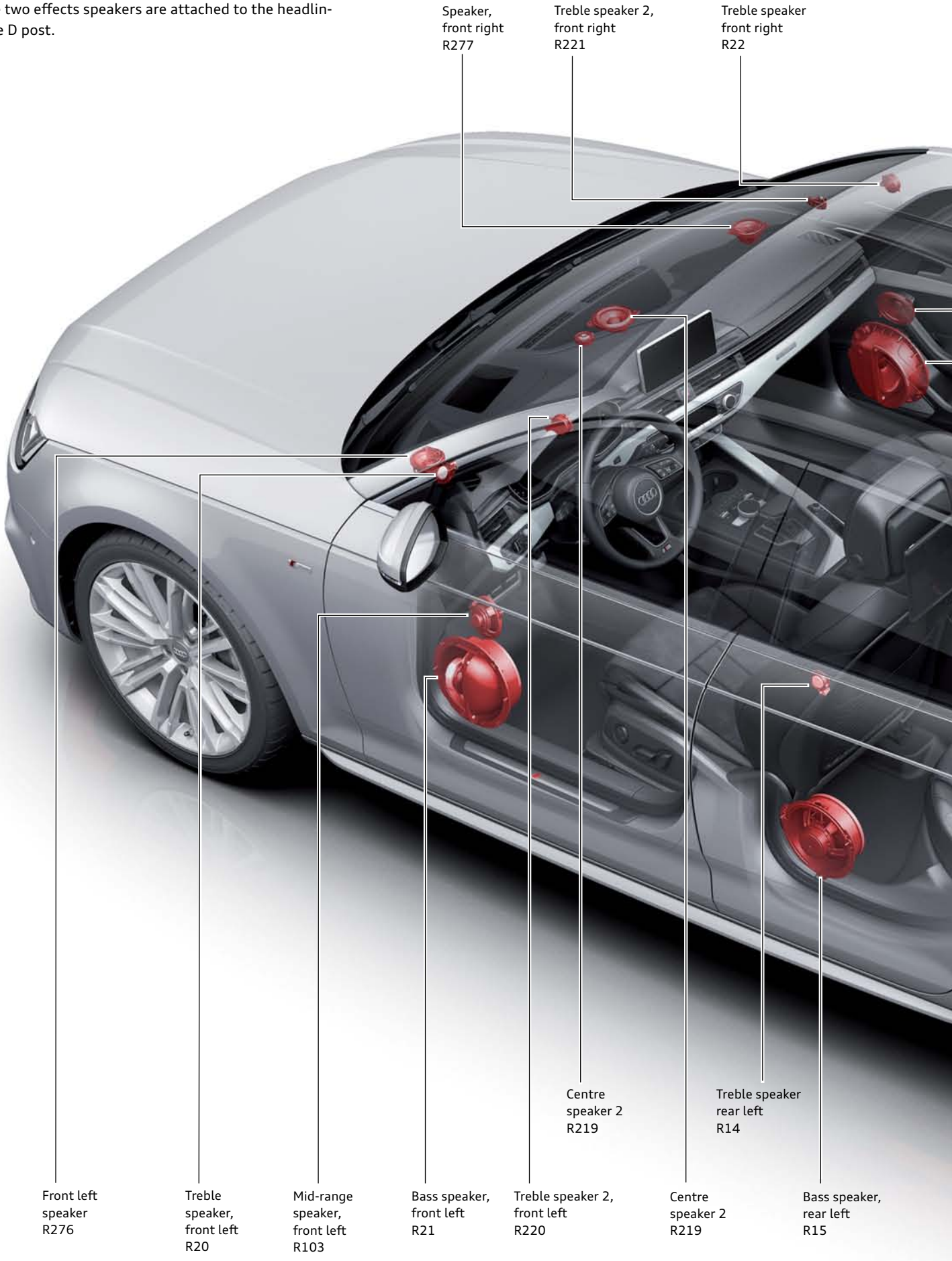
The Bang & Olufsen Sound System with 3D sound has 19 speakers. Of these, 2 speakers (saloon) or 4 speakers (Avant) together with a special algorithm create the third dimension of the 3D sound.
The 16-channel amplifier has a power output of more than 700 watts.
Depending on model, the speakers are arranged differently at the rear.




Mid-range speaker, front right R104
Bass speaker, front right R23
Treble speaker, rear right R16
Bass speaker, rear right R17
Right effects speaker R210
Subwoofer R211
Audi A4
Effects speaker, left R209
Digital sound package control unit J525

647_022

In the Audi A4 Avant, the subwoofer is in the spare wheel well. The two effects speakers are attached to the headlining in the D post.




Mid-range speaker, front right R104
Bass speaker, front right R23
Treble speaker, rear right R16
Bass speaker, rear right R17
Right effects speaker R210
Audi A4 Avant
Effects speaker, left R209
Digital sound package control unit J525
Subwoofer R211

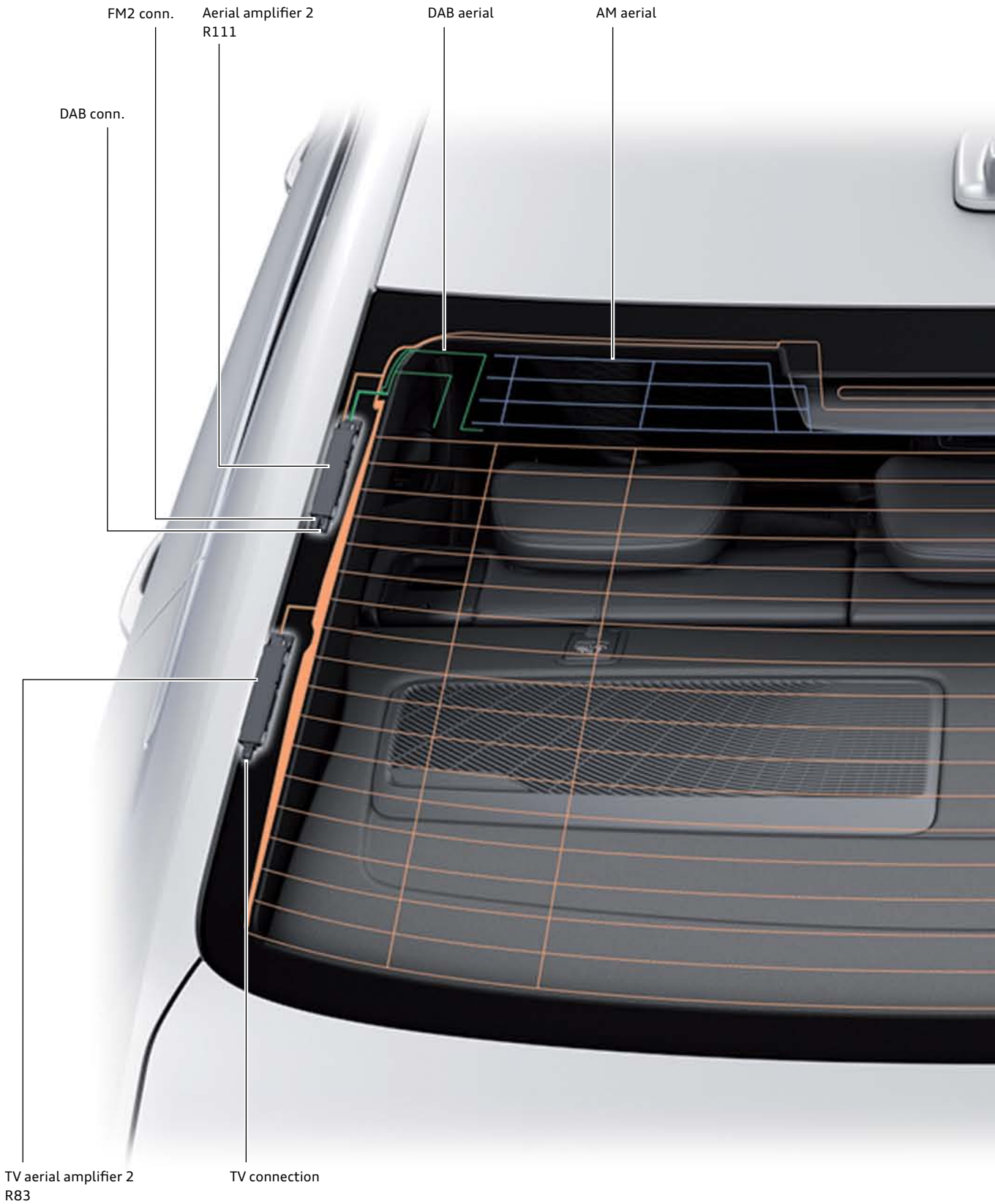
647_023

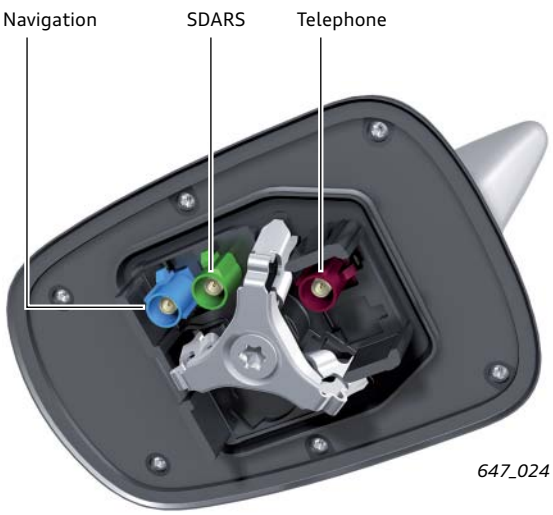
Aerials

Aerials overview

The aerials are positioned at the rear end and on the roof of the vehicle. In saloon models, the aerials are integrated in the rear window, roof and rear bumper. In an Audi A4 Avant, the aerials are distributed to the rear window, the roof, the rear spoiler, the rear right side window and the rear bumper.

The amplifier aerial connections to the information electronics control unit 1 J794 are dependent on vehicle specification. Only connections which are actually needed are installed.





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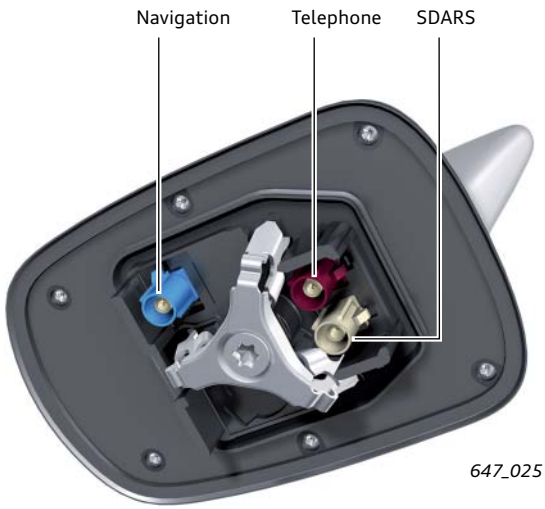
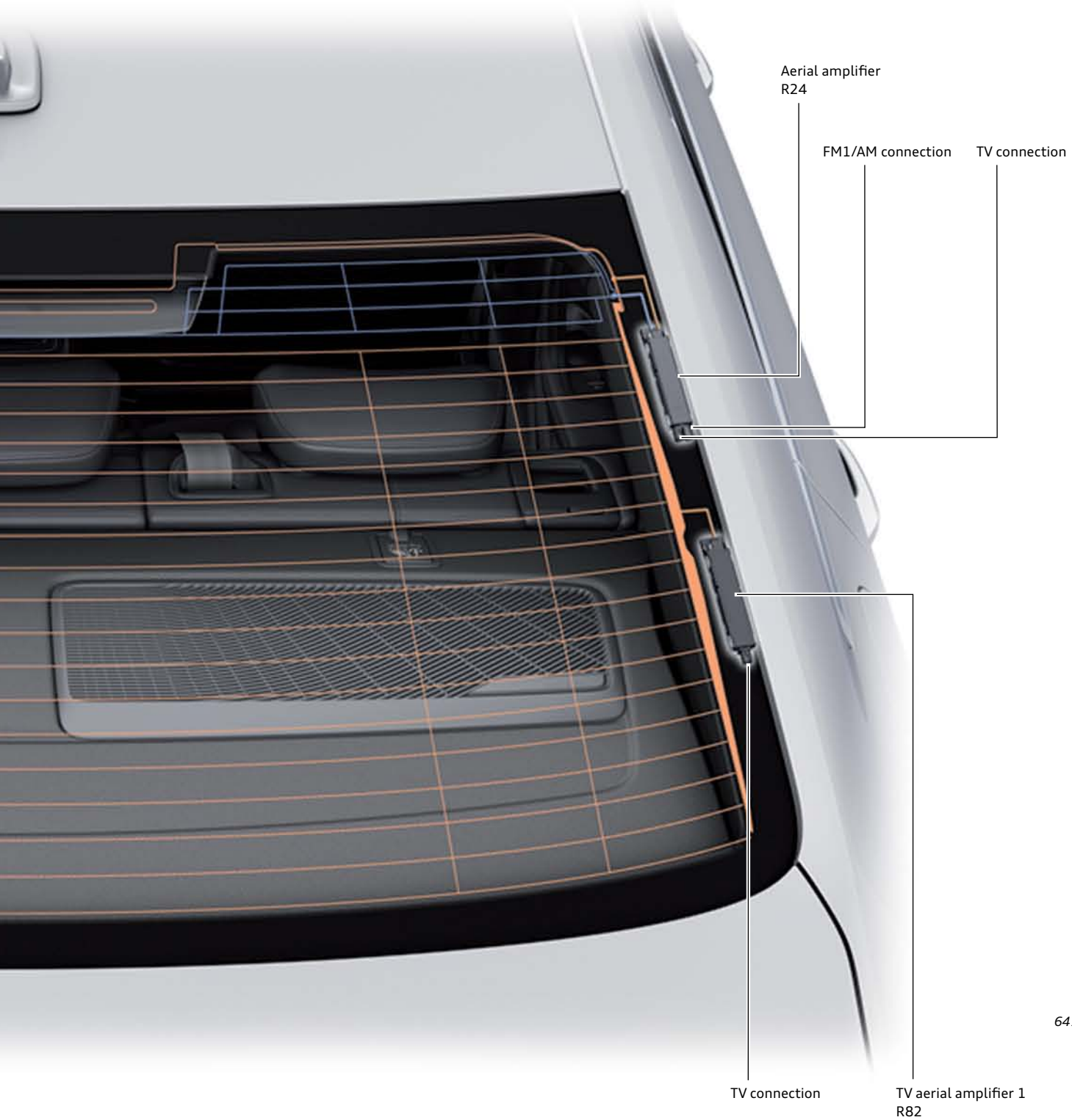


647_025



647_026


AM aerial
Aerial amplifier 2
R111
FM2 connection
TV connection
TV connection
FM1/AM connection
Aerial amplifier
R24
TV connection
TV aerial amplifier 1
R82

647_028

647_027

Telephone aerials

The number of available telephone aerials on the Audi A4 depends on the trim level. Depending on trim level, the Audi A4 has a maximum of 2 additional aerials in the bumper.

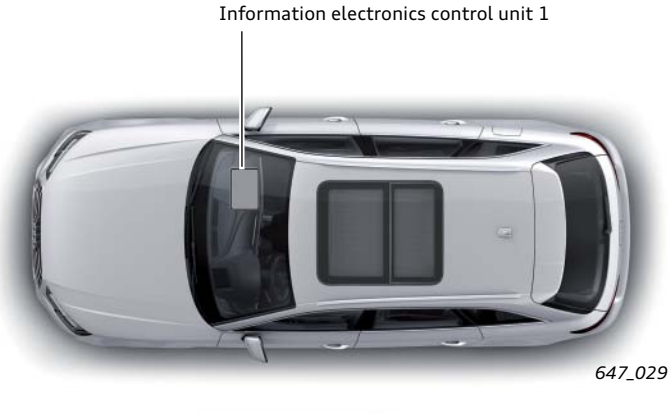
Depending on market and trim, the aerials have different functions. Basically speaking, the function of the aerial can be differentiated on the basis of the information transmitted:

- Language
- Data (reception and/or transmission of data)

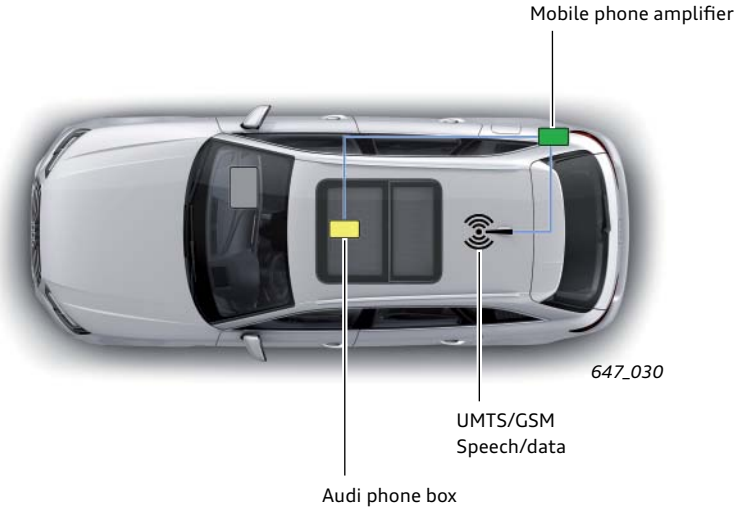
Note that LTE aerial 1 R297 receives data only, and does not transmit.
The current aerial configurations for various markets are shown below in a schematic form.

Aerial versions

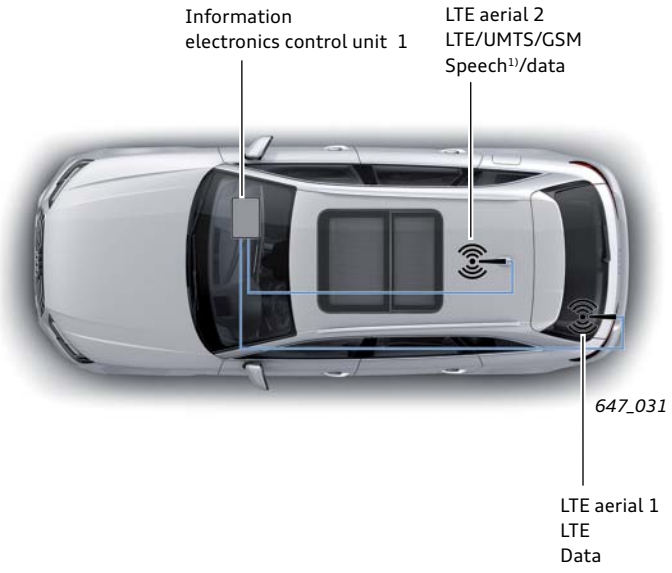
All markets without Audi connect and without Audi phone box



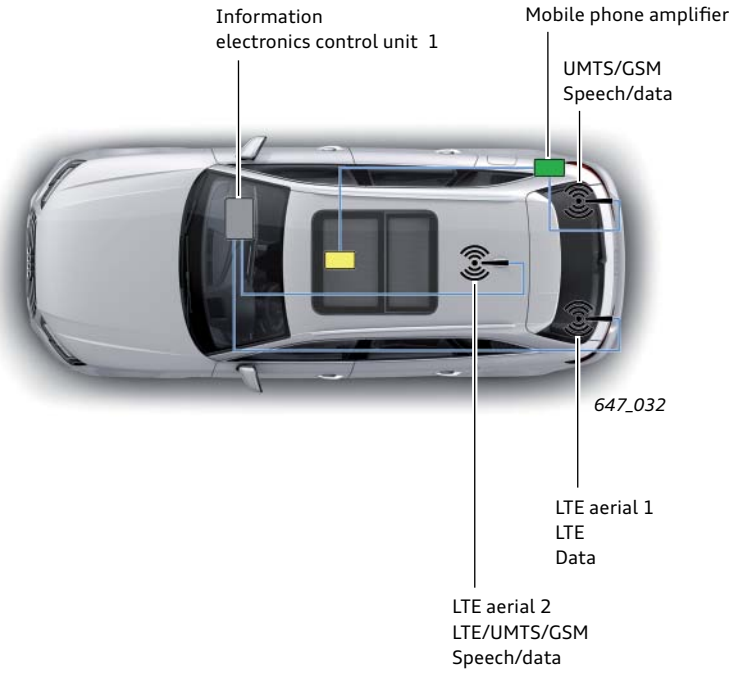
All markets without Audi connect and without Audi phone box



All market specifications including Audi connect and not including Audi phone box



European specification with Audi connect and Audi phone box



[1] not in USA

MMI display

MMI display

All Audi A4 models are equipped with a fixed display. There are two different displays depending on trim level. The displays differ from one another as follows:

8.3“ TFT colour monitor with 1024 x 480 pixel resolution and magnesium frame with a black laquered finish with:

- MMI Navigation plus

647_033

7.0“ TFT colour monitor with 800 x 480 pixel resolution and magnesium frame with a black lacquered finish with:

- MMI Navigation
- MMI Radio plus

647_034

Control panel

Multimedia system control panel E380

Six different control panels may be installed in the Audi A4. The choice of control panel depends firstly on whether an automatic gearbox or a manual gearbox is fitted.

Secondly, the control panels differ in structure and design depending on the infotainment system installed (MMI Radio plus, MMI Navigation or MMI Navigation plus).

"Basic" control panel
The "Basic" control unit has 8 freely assignable preset buttons. The following functions can be assigned to these buttons:

- Radio
- Playlist/album
- Telephone number

In addition, there are two rocker switches, the turn-push button and one button each for the following functions:

- MENU (skip to main menu)
- BACK (return to previous menu)
- Options menu (open left side menu)
- Options menu (open right side menu)

The following menus can be activated with the left rocker switch:

- CAR
- TEL

The following menus can be activated with the right rocker switch:

- RADIO
- MEDIA

"Basic" control panel with automatic gearbox *647_035*

"Basic" control panel with manual gearbox *647_036*

"Mid" control panel

The "Mid" control panel differs from the "Basic" version in three respects.

1. The following menus can be activated with the left rocker switch:
   - NAV/MAP (navigation or map)
   - TEL (Telephone)

2. The turn-push button has a 4-way joystick function in addition to the standard functions. This can be used to control various actions and menus depending on menu. Examples:
   - Moving the crosshairs in the navigation map
   - Moving the centre of sound
   - Move to the left: open or close options menu (right side menu)
   - Move to the right: open or close options menu (left side menu)
   - Move up: input field for active list menu
   - Move down: selection option in active medium. For example, a different station can be selected if radio mode is active.

3. The following functions can also be assigned to the preset buttons on the "Mid" control panel:
   - Navigation destination
   - TV station

"Mid" control panel with automatic gearbox *647_037*

"Mid" control panel with manual gearbox *647_038*

"MMI touch" control panel

In addition to the functions described above, the "MMI touch" control panel has a touch control function integrated in the turn-push button. The following functions can be activated:

- Input of letters, numbers and characters by automatic signature recognition
- Scrolling through album covers
- Navigating the 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 (e.g. directory)

"MMI touch" control panel with automatic gearbox *647_039*

"MMI touch" control panel with manual gearbox *647_040*

Other control elements

Two other control elements are no longer on the control panel E380.

Firstly, the on/off switch and volume control (driver side volume control E67), which is now located on the centre console. It is physically separate from the control panel E380 and is connected to the control panel by LIN bus.

With the manual gearbox, unlike with automatic gearbox, the preset buttons (operator control module for multimedia system E817) are located on the left of the selector lever - and are not integrated in control panel E380. These separately installed preset buttons are connected to the control panel E380 by LIN bus.

647_041

Driver side volume control E67

647_042

Operator control module for multimedia system E817

647_043

647_044

Button combinations for service personnel

System reset

To restart (reset) the system, briefly press the following combination of buttons simultaneously:

- NAV/MAP (or CAR)
- Turn-push button
- RADIO

Button combination for system reset *647_045*

Engineering menu

To access the Engineering menu, press the following buttons in succession and hold them down:

- NAV/MAP (or CAR)
- MEDIA

Button combination for the Engineering menu *647_046*

Screenshot

When a screenshot is taken, only the image transmitted from J794 is saved. The image is saved to the internal memory of the information electronics control unit 1 J794. To save a screenshot, press the following buttons in succession and hold them down:

- NAV/MAP (or CAR)
- Turn-push button

The display on the MMI monitor 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 1st screenshot is deleted.

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

- Insert a blank SD card into the left SD card reader (SD1).
- Select "5F – Basic setting" in the Guided Functions.
- Start the "Write analysis data to SD card" routine.

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

Button combination for screenshot *647_047*

Audi phone box

Audi phone box

The Audi A4 can be equipped with Audi phone box as an option. If the optional Audi phone box is not fitted, the existing cradle is the infotainment box.

The infotainment box is always equipped with an AUX-In jack and a 5V USB port. The AUX-In jack is for analogue audio transmission. The 5V USB port is for charging mobile phones only.

If the optional Audi phone box (9ZE) is fitted, a coupling aerial is located below the cradle. If a mobile phone is docked in the cradle, the mobile radio signal received from the exterior aerial is transmitted contactlessly. A module for wireless charging of the mobile phone is also located below the cradle.
For more information about wireless charging, refer to page 30.

Audi phone box *647_048*

Reference
For more information about the coupling aerial, please refer to Self Study Programme 609 "Audi A3 ’13".

Connection of 2 mobile phones

In the Audi A4 with Audi phone box, two mobile phones can be simultaneously connected to the vehicle via HFP (Hands Free Profile). This means that it is possible to use two mobile phones simultaneously via the MMI.

If the vehicle is equipped with Audi connect, a SIM card in J794 can be used for data connectivity at the same time as the two mobile phones connected via HFP. If no SIM card is inserted into J794, one of the two mobile phones can be connected via SAP (SIM Access Profile).

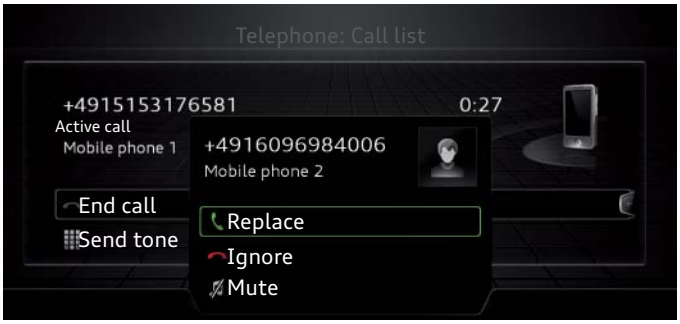
If two mobile phones are connected, the directory of the first phone (main phone) is displayed. Speech operation available is for the main phone. It is easy to toggle between the first phone (main phone) and second phone (additiona phone) via the options menu.

When one of the coupled mobile phones receives a call, this call is routed through the hands-free microphone. If the other coupled mobile phone receives a call at the same time, this is indicated on the MMI display (refer to Fig. 647_051) If the call is answered by other mobile phone, the first call is terminated.

If the connected mobile phones support a messaging service (text or email), they can be used simultaneously by both mobile phones and a SIM card inserted.

Connection manager menu *647_049*

Phone options menu with option for switching main phone *647_050*



Display for second call *647_051*

Display for text messaging services *647_052*

Note
Two smartphones can only be coupled simultaneously to the MMI if the optional Audi phone box is installed.

Wireless charging (country-dependent)

Wireless charging is the use of magnetic induction to charge a mobile phone. AC voltage is applied to a coil integrated in the charger (transmitter). This produces a constantly changing magnetic field. The receiver (mobile phone) also has a coil in which a voltage is induced by the changing magnetic field. The electronics in the receiver then supply charging voltage to the mobile phone.

Audi uses the Qi standard developed by the Wireless Power Consortium for this purpose. The Qi standard permits communication between the charger and the mobile phone during the charging phase.

Maximum power is 5 watts [1]. As smartphones have a working voltage of 5 volts, the maximum current is 1 ampere.

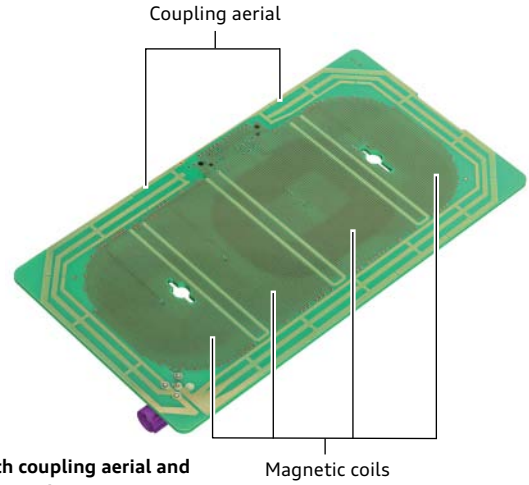
The wireless charging adaptor is integrated in the Audi phone box. The adaptor consists of the charging electronics and 4 separate magnetic coils. In this case, the aerial required for mobile phone reception is wound around the coils.

If the MMI is active (NO contact on), the charging electronics are activated by the phone-on signal. The charging electronics use (inductive and capacitive) sensors to check if there is an object in the Audi phone box. When a mobile phone which supports wireless charging is detected, the system starts the charging cycle by increasing the electrical current. This minimises power consumption in case charging is not needed. A charging cycle is depicted in the telephone menu by a symbol at the bottom right-hand side of the MMI display.

Only one coil is used per charging cycle. The charging electronics always use the best coil. In this case, the coil which transfers the highest electrical current to the mobile phone is the best. To continuously use the optimal coil, the mobile phone sends information to the charging electronics. In very simple terms, the mobile phone indicates when the received power level is too low. The charging electronics then increase the power output or switch over to another coil. If the mobile phone if receiving enough power again, this coil is used until the mobile phone requests charging again. Some mobile phones can also indicate that the battery is fully charged. The charging cycle stops when the charging electronics receive this information.

[1] The actual possible power consumption depends on the receiver.

Audi phone box *647_053*



PCB with coupling aerial and magnetic coils *647_054*

Audi phone box from below *647_055*

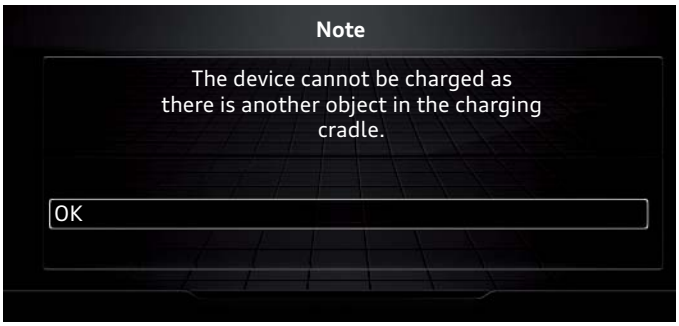
Display at starting of charging *647_056*

Note
Only mobile phones with suitable hardware are charged
The term Qi is of Chinese origin and means "vital energy".

System limitations

To minimise electromagnetic interference with other in-car systems, the range of the mobile phone is limited. For this reason, the mobile phone must be docked in the charging cradle to ensure optimal charging. If there are thick or metallic objects between the mobile phone and the charging cradle, charging is not possible.

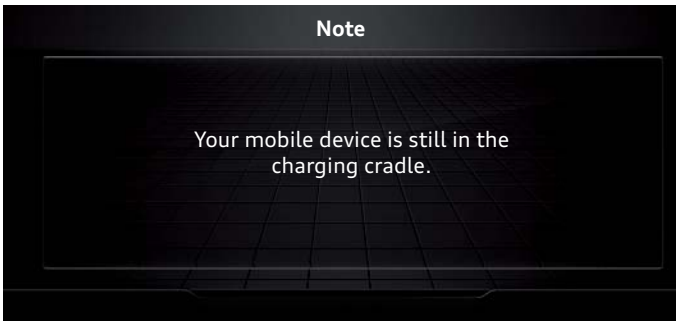
In certain cases (e.g. with coins), a message text is displayed in the MMI (see Fig. 647_057).



Display when charging is not possible *647_057*

If a mobile phone is detected in the charging cradle after switching off terminal S and opening the driver's door, a notification text and a notification tone are generated depending on setting. If the driver's door is opened very quickly (up to 3 s after terminal S off) , a notification may be given even if the mobile phone is removed from the cradle.

Heat is generated during inductive charging. Temperatures of up to 55 °C can be regarded as normal. The owner's manual also contains a notification text to this effect.

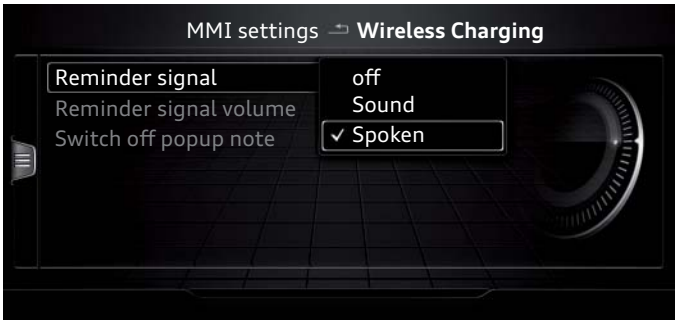


Reminder that no mobile device is docked in charging cradle *647_058*

Settings

The following settings can be used for wireless charging:

- on/off reminder signal
- sound (volume)
- spoken On / Off



Settings menu for wireless charging *647_059*

Note

In some countries where the Audi phone box with coupling aerial is not available, the Audi phone box can only be used for wireless charging. This is what is known as Audi phone box light.

Networking

Networking

The information electronics control unit 1 J794 is connected to the data bus diagnostic interface J533 via the infotainment CAN bus in all infotainment versions. The infotainment CAN bus is a high-speed bus with a max. data transfer rate of 500 kbit/s.

The following control units may be connected to the infotainment CAN depending on trim level:
- Information electronics control unit 1 J794
- Control unit in dash panel insert J285
- Control unit for windscreen projection (head-up display) J898
- Selector lever sensors control unit J587
- Data bus diagnostic interface J533

The MMI display J685 and the operating unit E380 are connected to the information electronics control unit 1 J794 via the Modular Infotainment Platform (MIB) CAN bus. In addition, the control units for rear left/right information display and operating unit J648/J649 are subscribers of this bus system. This MIB-CAN is a high-speed bus with a bandwidth of 500 kbit/s.

If the vehicle is fitted with an additional infotainment control unit (e.g. Bang & Olufsen Soud System ampifier, TV tuner), the infotainment system is also equipped with a MOST bus. This is also the case if the vehicle is equipped with a "Top" instrument cluster (9S7) and Audi virtual cockpit (9S8). The MOST bus is a MOST150 with a data transfer rate of 150 Mbit/s, where the information electronics control unit 1 J794 acts both as the system master and diagnostics master for the MOST bus.

The following control units may also be connected to the MOST bus depending on trim level:
- Information electronics control unit 1 J794
- Digital sound package control unit J525
- TV tuner R78
- Control unit in dash panel insert J285

Image transfer

The displays for the control unit in dash panel insert J285 are transferred from the information electronics control unit 1 J794 as follows:

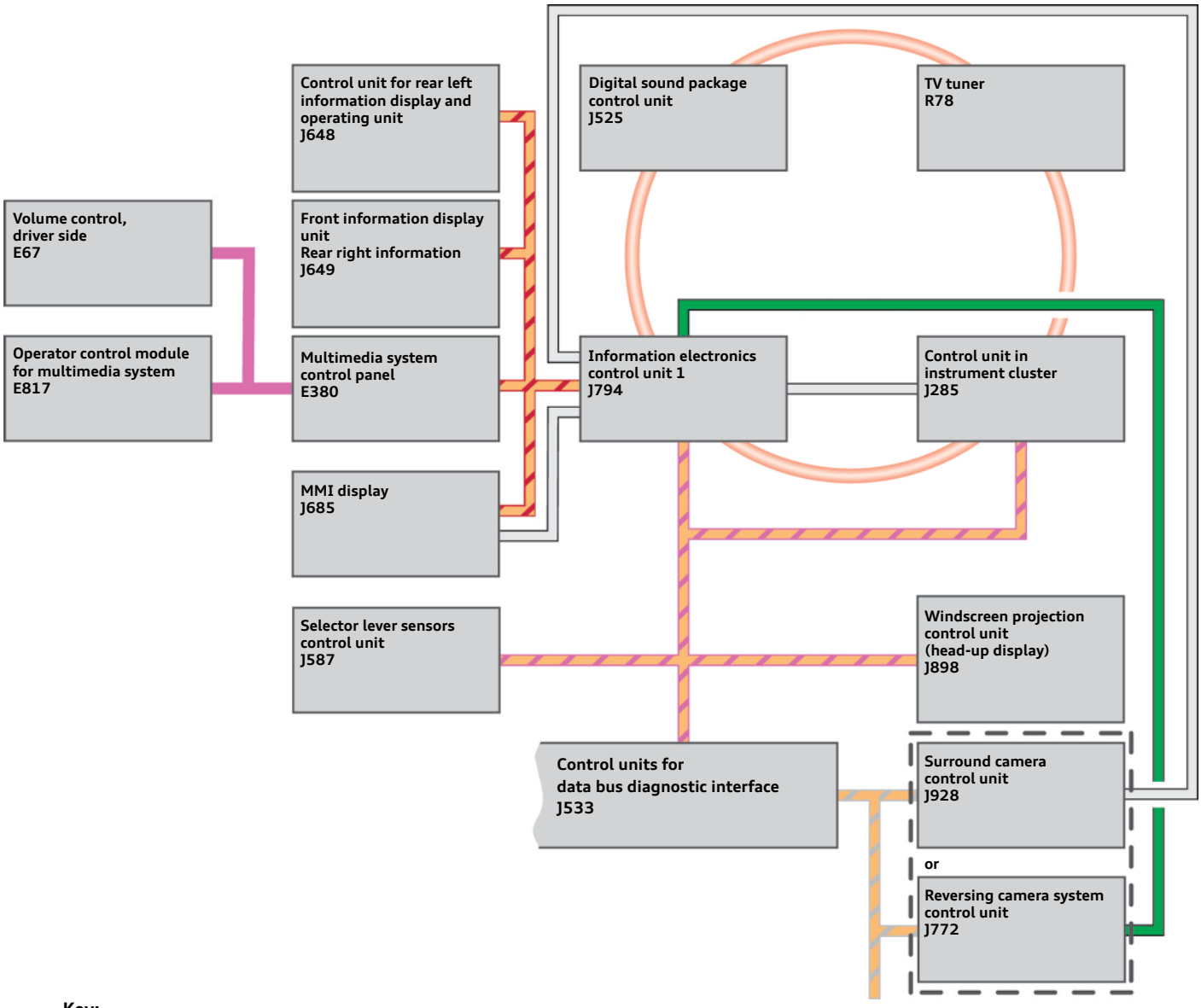
1. Audi virtual cockpit:
   - LVDS: The large navigation map and the detailed intersection maps use the LVDS connection as a transmission pathway.
   - MOST bus: All other content, such as list menus or covers and software updates of dash panel insert J285, is received via the MOST bus.
   - Infotainment CAN: All other content is communicated via the infotainment CAN.

2. "Top" instrument cluster:
   - MOST bus: the navigation data (incl. map) and software updates for J285 are transmitted via the MOST bus.
   - Infotainment CAN: All other content is communicated via the infotainment CAN.
   - The "Top" instrument cluster does not have an LVDS interface.

3. "Medium" instrument cluster:
   - All content is communicated via the infotainment CAN.
   - The "Medium" instrument cluster does not have an LVDS interface or a MOST bus interface.

Note
A special networking case is the equipment variant MMI Radio plus (i8E) in combination with the "Top" instrument cluster with 7“ colour display (9S7). In this case, the instrument cluster does not have an interface to the MOST bus.

Topology



647_060

Audi connect

Audi connect (depending on market)

The Audi A4 marks significant growth in the Audi connect family. In addition to previously known services such as weather or news online, Audi connect also offers services which allow the vehicle to be accessed directly.

To differentiate between the various services and systems, two new terms are used:

1. **Audi connect infotainment services**
   This package combines services which are communicated via information electronics control unit 1 J794.

647_061

2. **Audi connect vehicle-specific services**
   This package combines services which are communicated via the data bus diagnostic interface J533.

647_062

To allow these services to access the vehicle, the data bus diagnostic interface J533 is equipped with a UMTS/GSM-compatible mobile communications module including an embedded SIM card .

Audi connect infotainment services (depending on market)

In the Audi A4 customers are offered two different infotainment systems in which they can use the Audi connect infotainment services (IT1).

1. MMI Navigation
2. MMI Navigation plus

If the Audi A4 is equipped with MMI Navigation, then it already has an UMTS/LTE module (PR number: EL3). This allows the following functions to be used:

- Wi-Fi hotspot for connecting mobile devices to the internet
- MMI connect app
- Audi connect three-month free trial valid from delivery

With MMI Navigation, the customer has the option to order Audi connect services for a period of three years either directly upon ordering the vehicle or at a later date. After delivery, the customer can purchase the licence for Audi connect services through an Audi partner.

Models with MMI Navigation plus and UMTS/LTE module include a three-year subscription to Audi connect infotainment services.

Depending on country, services available for the Audi A4 include:

- Audi traffic information online
- Google Earth map with Google Street View
- Weather
- News online
- Twitter

If the vehicle has MMI Navigation plus and Audi connect, the delivered navigation map (country dependent) can be updated online with the first five six-monthly updates.

Main menu with Audi connect icon *647_063*

Audi connect main menu *647_064*

Audi connect options menu *647_065*

Note
The PR number for the ex-works Audi connect package is IT1. If the vehicle has the PR number IT0, this means it was ordered without the Audi connect package.

Audi connect vehicle-specific services (depending on market)

The Audi connect emergency call & service (IW3) package is optional for the Audi A4. In this case, the vehicle has a data bus diagnostic interface J533 including a UMTS/GSM-compatible mobile communications module with an embedded SIM card. This module sends vehicle-specific data to a server at Audi.

After registration and authentication, the customer can access this data using myAudi.
The customer also has the option to access this data via the MMI connect app.

The services

Depending on country, various services are available.
They are also subdivided into 2 categories:

- Audi connect emergency call & service
- Audi connect vehicle control

This is followed by an overview and a brief explanation of the individual services.

Audi connect emergency call & service

Audi emergency call

In the event of an accident involving deployment of a pyrotechnic restraint system (e.g. airbag), the system automatically makes a voice connection to the Audi Emergency Call Centre. All relevant data (e.g. position, last direction of travel and number of occupants) is also transmitted. The Audi Emergency Call Centre then initiates whatever action is necessary.
The emergency call can be activated manually by the customer using the SOS button.

Online roadside assistance

In the event of a breakdown, customers can call their national Audi Service Centre by pressing the roadside assistance button E275. The service centre also receives the vehicle's status information and the position, enabling it to quickly provide the customer with whatever assistance is needed.

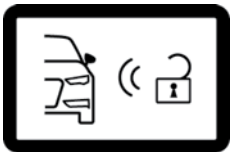
Audi Service enquiry

If the customer has activated this service in myAudi and selected a service partner, the vehicle automatically sends the vehicle's status information to this service partner. This information is sent 14 days before the service interval display in the instrument panel lights up. This allows the Audi Service partner to proactively contact the customer and arrange a service appointment.

Audi connect vehicle control

Vehicle status report

This function displays
various items of vehicle status information (e.g. mileage, doors locked or unlocked, window open or closed and tank level) to the customer in myAudi or in the Audi connect app.



Remote Lock&Unlock

Customers can lock or unlock their vehicle using the Audi connect app.

Car Finder

Shows the last parked position on a map.

Remote auxiliary heating

If the vehicle is equipped with an optional auxiliary heater, it can be started using the MMI connect app.

Reference
For more information about the vehicle-specific services, refer to the relevant Audi Service TV programmes at Audi Training Online.

Note
The emergency call, online roadside assistance and Audi Service enquiry services are available free of charge for 10 years for date of initial registration.

Function/data transfer

The data bus diagnostic interface J533 collects and sends the data required for each service. It transmits the data as follows:

Via internet to the Audi server

- After terminal 15 off
  - Vehicle status report (e.g. locking status, mileage, battery charge)
  - Position
- Before a service event, for the service partner selected in myAudi
  - Service interval
  - Vehicle data: same as ServiceKey3 (e.g. mileage, fault alarms, fluid levels)
- After a roadside assistance call, for the importer's Audi Service Centre
  - Vehicle data: same as ServiceKey3 (e.g. vehicle identification number, fault alarms, fluid levels)
  - Position
  - Last direction of travel

Via text message and via voice channel (inband modem), after Audi emergency call direct to Audi Emergency Call Centre; e.g.:

- Position
- Last direction of travel
- Occupants (based on number of fastened seat belts)

647_073

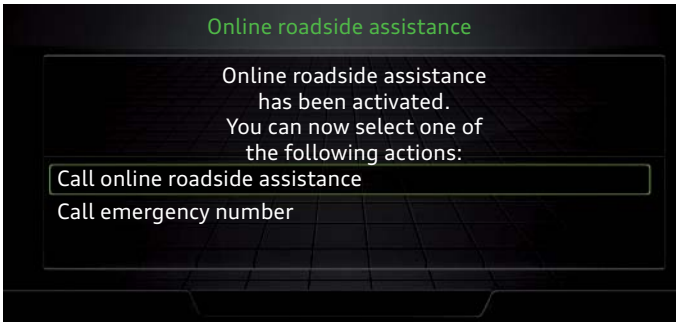
Auto SOS & roadside assistance call

In the event of an accident, the airbag control unit J234 determines the severity of the impact. Impacts are subdivided into 2 categories and communicated to the data bus diagnostic interface J533 via the data bus system and a discrete cable.

In a category 1 impact, the online roadside assistance call is activated automatically. A message is displayed on the MMI screen. The user can now decide whether to call for roadside assistance or to call the emergency number.

In a category 2 impact, an Auto SOS call is activated and a voice call to the Audi Emergency Call Centre is initiated.

In both cases, the vehicle identification number, the location of the vehicle and the last direction of travel are transmitted.



Display after automatically initiated roadside assistance call

647_074

Note
If the Audi Emergency Call Centre cannot be reached, the system will try to connect to the emergency number applicable in the country of use. At present, no vehicle data is transferred when an emergency number is called.

The hardware

To implement the vehicle-specific services, a UMTS/GSM-compatible mobile communications module is integrated in the data bus diagnostic interface J533.

Altogether, the system comprises the following components:
- Mobile communications module integrated in J533
- SIM card embedded in J533
- Driver's side microphone integrated in overhead module
- Emergency call module speaker R335
- Mobile communications aerial integrated in J533
- Separate aerial for emergency call module E263
- Emergency battery A16 in J533
- Emergency call button E276 integrated in overhead module
- Roadside assistance button E275 integrated in overhead module
- GPS aerial R50

In this constellation, the system is known also as a "connected gateway".

GPS aerial
In vehicles without a navigation system (MMI Radio plus), the GPS aerial R50 is connected directly to the connected gateway J533 in order to determine the location of the vehicle. In vehicles with a navigation system, J533 receives the GPS data from the information electronics control unit 1 J794 via the data bus.

Mobile communications aerials
The system has 2 mobile communications aerials. If required, the aerial with the better mobile reception is used.

The 1st aerial is integrated in the data bus diagnostic interface J533. The 2nd aerial is located centrally below the dash panel. In Audi A4 saloons with windscreen heating, the 2nd aerial is fitted below the parcel shelf.

Speaker
The Audi emergency call is output through a separate emergency call module speaker R335 in the driver footwell.

647_075

Mobile communications module
The UMTS/GSM-compatible mobile communications module is responsible for data transfer to the Audi server as well as the voice connection during emergency and roadside assistance calls.

SIM card
This particular SIM card is an embedded SIM card, and not a standard insertable SIM card. It is known also as an e-SIM (embedded SIM). The e-SIM itself cannot be replaced separately. If necessary, the data bus diagnostic interface J533 must be replaced.

Emergency battery
This is required to power the Auto SOS function. The emergency battery comprises 2 special rechargeable batteries and can be purchased through Audi Original Parts.
The emergency battery is kept continuously charged during normal vehicle operation. The emergency battery has a fixed replacement interval of 7 years.

Button
The emergency call button E276 and the roadside assistance button E275 are installed in, and evaluated by, the front overhead module. Their signal is sent via LIN bus to the electrical system control unit J519 and then relayed via the data bus to the diagnostic interface J533.
The emergency call button has an integrated green-red LED which indicates the following states:

- Green: function available
- Flashing green: function active
- Red: function unavailable

The roadside assistance button has an integrated red LED which lights up as soon as the roadside assistance call is activated.

Microphone
Audi emergency and roadside assistance calls are routed through the microphone on the driver's side only.
This is the microphone which, without connected gateway J533, is otherwise connected directly to the information electronics control unit 1 J794. The microphone signal is relayed from J533 to J794 during a normal telephone call.

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