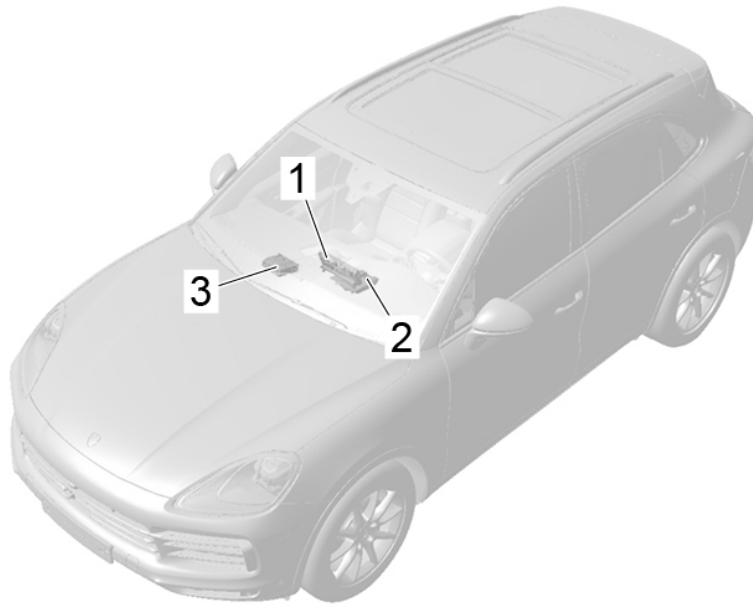




PORSCHE

PCM 5.X
(Porsche Communication Management)

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System overview: PCM (Porsche Communication Management) 5.X

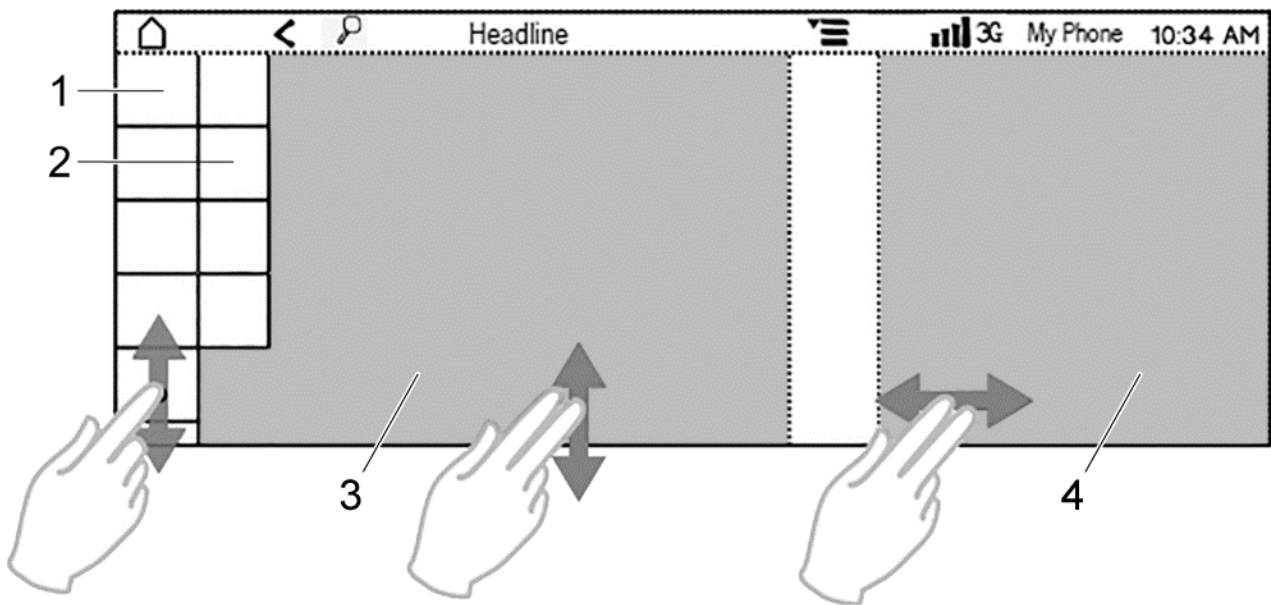
- | | | | |
|---|--|---|---------------------|
| 1 | Display and operator control unit with 12-inch touchscreen | 2 | Front control panel |
| | | 3 | Central computer |

PCM (Porsche Communication Management) 5.X

The PCM (Porsche Communication Management) 5.X, comprises Display and operator control unit and central computer provide the driver with numerous Infotainment applications and comfort functions.

Driving settings can be configured and air conditioning, driver assistance systems, comfort systems and the various services can be used using PCM. The PCM is operated using the display and operator control unit with 12-inch touchscreen and the control panel in the front centre console.

The control panels and displays are connected via CAN bus to the PCM central computer. This is connected to the gateway via CAN bus and to the CD/DVD autochanger and amplifier via MOST bus.



Overview: Operation

- | | | | |
|---|------------------|---|--------------------------|
| 1 | Main menu | 2 | Submenu |
| 3 | Interaction area | 4 | Preview/information area |

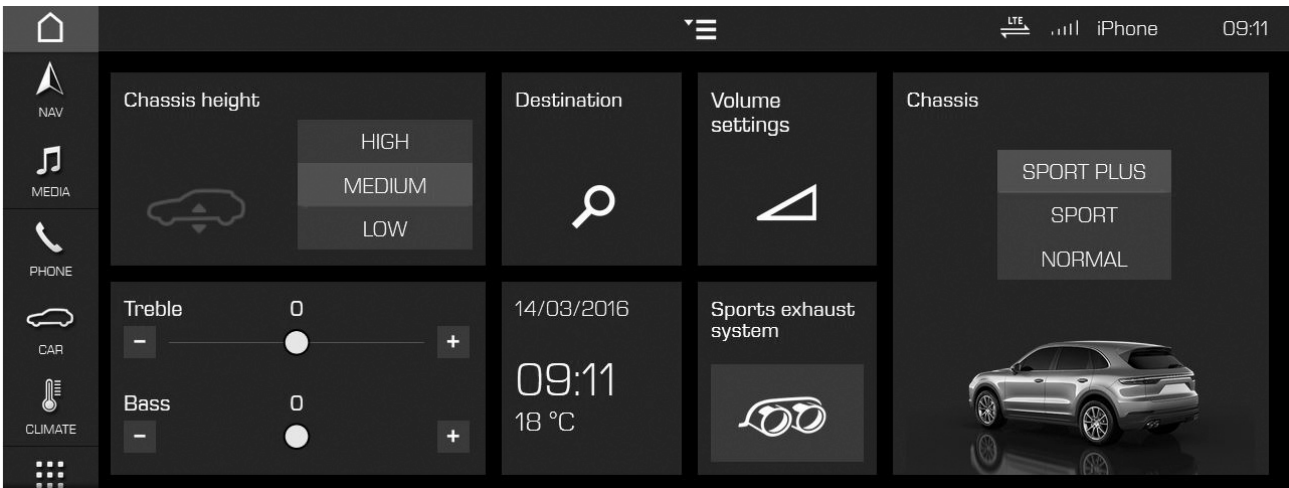
Operating logic

Options are selected in the main menu by means of gesture control using one finger. Two fingers are used for gesture control in the interaction area. The Info widget area can be used both with one or two fingers.

The PCM main menu is always visible. If the system's proximity sensors detect a finger moving close to the touchscreen, the PCM automatically displays the submenu. The most important information about the system status is also displayed for the driver in the status line at the top of the screen. The Home, Search function and Additional menu buttons are also shown here. At the right of the screen, the Info widgets can also be displayed along with other PCM functions. For example, the Navigation system can be displayed in the interaction area in the middle of the screen while the driver uses the telephone function at the right of the screen at the same time.

The PCM also allows input via handwriting recognition and voice control. Instead of entering letters using the keyboard, letters can now also be written on the touchscreen. Many PCM functions can also be controlled by voice command. These functions ensure much greater comfort and safety for the driver.

System function



Overview: Start screen

Start screen

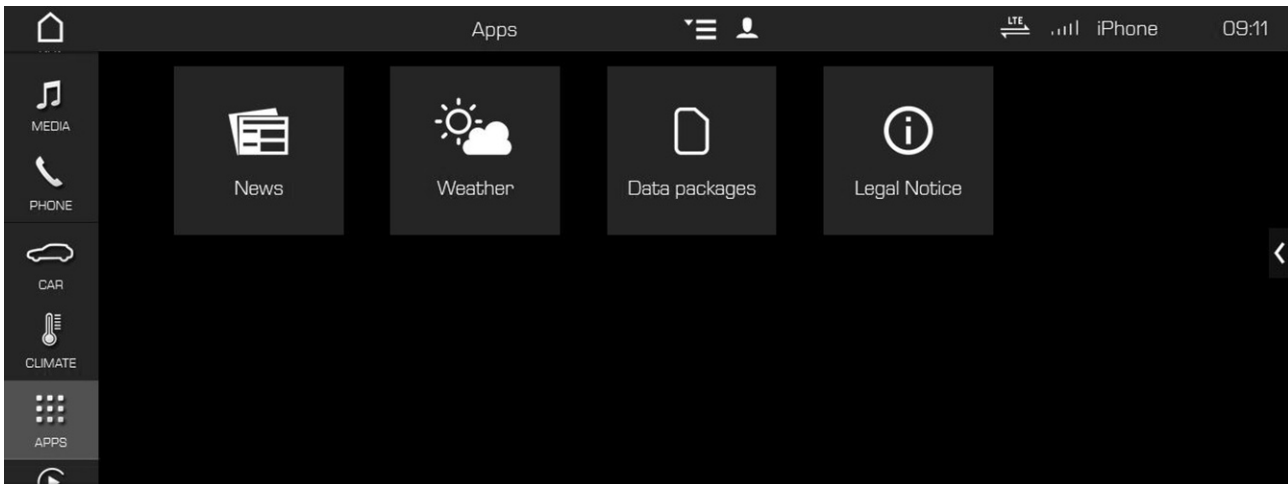
The PCM start screen can be personalised. So-called Info widgets can be used to define tiles for the most important personal functions. This means that different functions, such as Sport modes, iPod control and telephone functions, can be controlled via a personalised display.



Overview: Widgets

Widgets

The Info widget can also be personalised. Contents from the category selection can be dragged to the tiles on the Home screen. This means that the driver always has fast access to the most important personal widgets.



Overview: Services menu item

Services

In order to use the services, the customer must have purchased them, must have registered in the customer portal and must have accepted the general terms and conditions. Some services will only be shown fully following personalisation in the customer portal.

Other services can be used via the Porsche "One Connect App" on the customer's smartphone. The Porsche "One Connect App" can be downloaded under the keyword "PCM Connect" in the App Store.

The Porsche Connect services provide useful added features and additional functions in the PCM.

Navigation Plus:

- Real-time Traffic
- Online Map Update
- Smart routing
- Satellite map

Finder:

- E-Charging
- Petrol stations
- Restaurants
- Hotels
- Parking
- POI search

Other:

- News, including Twitter
- Weather
- Flight Info (only China)
- Event Info (China only)
- Concierge Info (only China, Japan)

Connectivity

The IT-based back-end services as well as the "One Connect App" and Apple CarPlay can be accessed online using PCM 5.X.

The back-end services and parts of the "One Connect App" can be shown in the PCM 5.X receiver. All services can also be shown on the smartphone using the "One Connect App".

An Internet connection can be established via available online access points, such as LTE or WiFi (hotspot). To make full use of all services, a smartphone as well as an additional SIM card or an eSIM card integrated in the vehicle is required.

It is also possible to establish a connection between the vehicle and smartphone. Information on the smartphone, e.g. apps, contacts or organizer appointments, can then be retrieved and selected directly using the smartphone.

Other functions

The PCM user interface not only shows the functions of the Porsche Communication Management system itself, but also provides the central user interface for a large number of adjacent systems with which the PCM communicates via bus systems.

The driver can also configure various settings for chassis and damper control or for the spoiler level mode, for example. The air conditioning functions can also be controlled centrally and conveniently using the PCM. Settings for air vents, various modes or the auxiliary heater are available.

Many functions of the driver assistance systems are also controlled from the PCM. The image captured by the ParkAssist reversing camera is also shown on the PCM's 12-inch touchscreen.

In the CAR menu, the driver can configure and activate or deactivate vehicle and system settings for comfort functions. Optional functions, such as massage seats and ambient lighting, are available depending on vehicle equipment.

HiFi system

Numerous settings can be configured in the PCM Sound menu, depending on which sound system is installed. Balance and sound can be adjusted by moving the cursor.

Various sources are available depending on equipment, connection status and country. The interfaces to the CD/DVD drive can be used for playing media on the PCM from playback media such as audio/video DVDs and CDs. There are also USB ports located in the smartphone tray in the centre console.

In conjunction with the optional Porsche Rear Seat Entertainment system, reception on the rear screens is even possible while driving.

The CD/DVD drive is located in the luggage compartment at the left in direction of travel.

Navigation

The PCM features a hard drive navigation system with individually configurable map display. Maps can be displayed in 2D, in perspective and even in 3D in selected areas. Navigation is available on request with dynamic route guidance and using Traffic Message Channel (TMC) data. Navigation for points of interest (POIs) or for contacts from the phone book is also possible. The navigation system in the Porsche Cayenne learns frequently driven routes and can therefore suggest alternative routes for the driver when traffic is heavy on these routes.

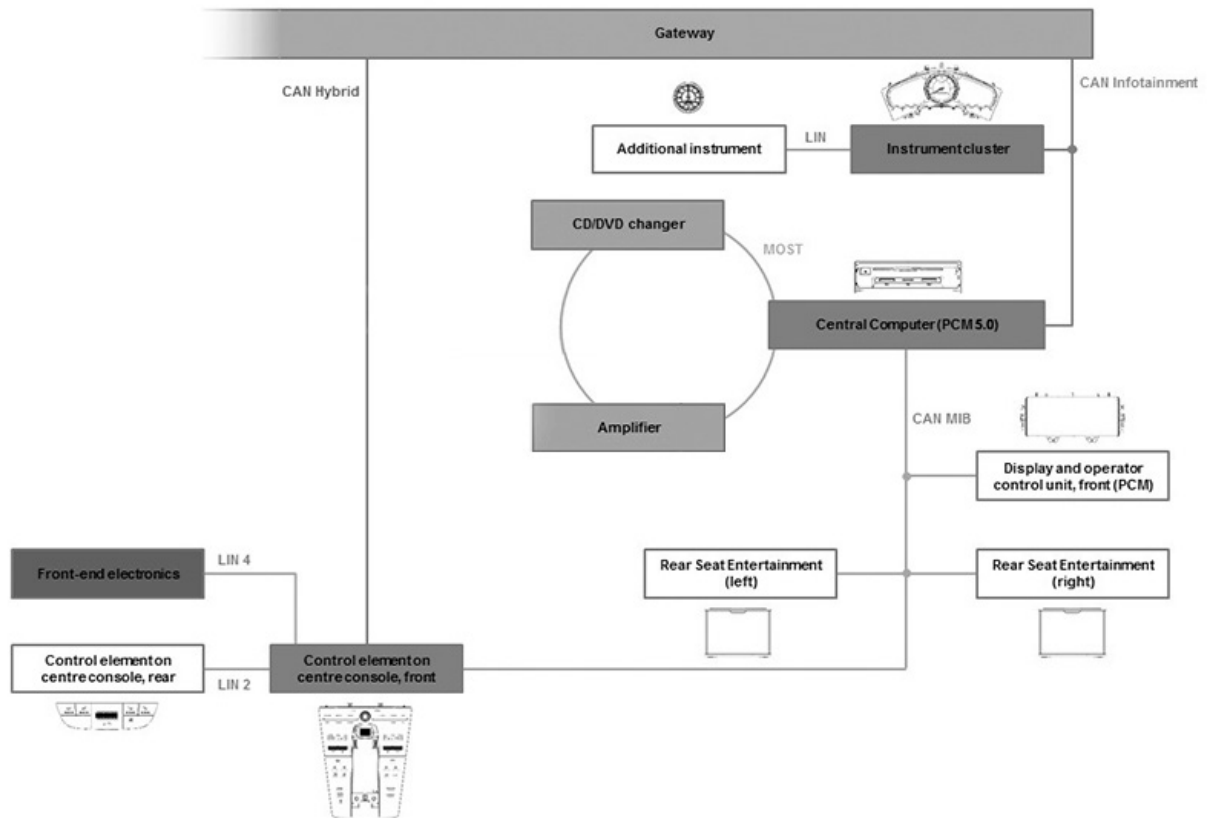
Phone

Depending on equipment and country variant, the smartphone tray in the centre console makes it easy to connect mobile phones that support the Hands-Free Profile (HFP). The smartphone is connected to the telephone module via Bluetooth®.

With the smartphone tray, the smartphone is integrated much better into the vehicle. The direct connection of the smartphone to the vehicle's external antenna is always guaranteed when the smartphone is in the tray. This reduces the power consumption of the smartphone and improves the reception quality.

The LTE telephone module includes a WiFi function, which allows wireless Internet access by means of a data-enabled SIM card. Smartphones and other mobile devices can be connected to the vehicle and to the Internet via WiFi.

In the PHONE menu on the PCM, the driver can also access the phonebook with all contacts and favourites, manage all text messages or e-mails, write new messages, reply to messages that were received or listen to messages using the Read out function.



Overview: Network topology

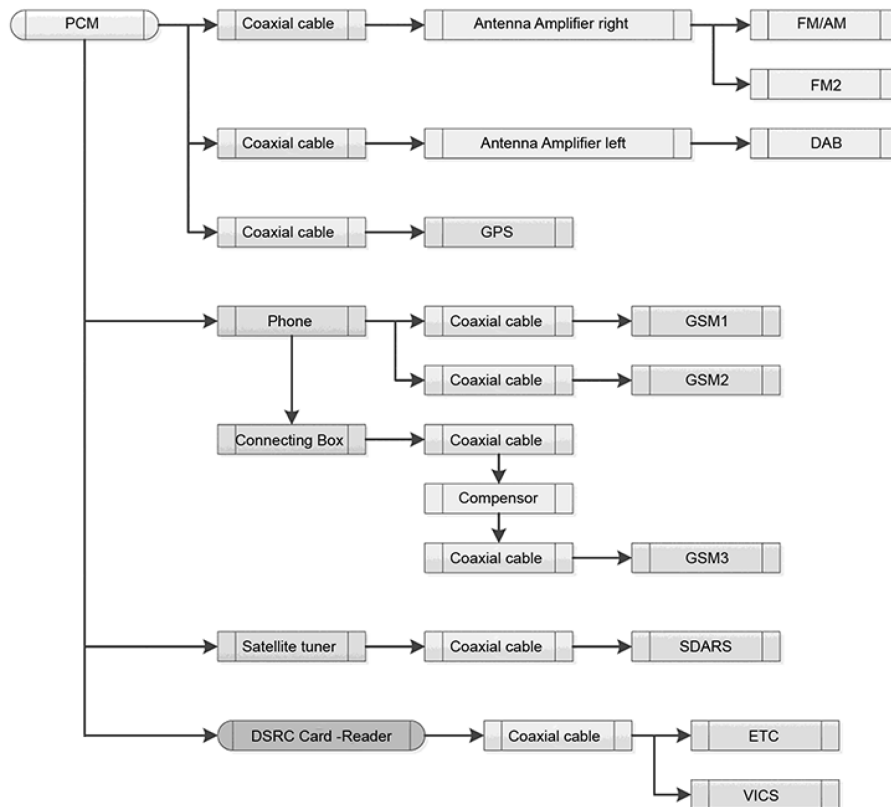
Network topology

The central computer of the PCM 5.X controls all functions of the PCM and provides the connection to the gateway and thus also to all adjacent systems in the vehicle.

The central computer is connected to the gateway via the Infotainment CAN and to the CD/DVD autochanger and amplifier via MOST bus.

There is also a connection to the display and operator control unit and to the control panel via an internal Private CAN. PCM diagnostics is guaranteed via the gateway's diagnostic CAN and via the Infotainment CAN for the PCM.

System function



Overview: Antenna topology

Antenna topology

The antenna signals for radio reception of the various frequencies and the signals from the GPS antennas are processed directly by the central computer.

DSRC, satellite and telephone signals are not sent to the central computer, but go directly to the relevant systems. The central computer only receives the signals from the FM/AM and GPS antennas directly.



View: Display and operator control unit

Display and operator control unit

Porsche Communication Management 5.X is available in all Cayenne models. The PCM is operated using the 12-inch touchscreen on the display and operator control unit, for example.

It can be used to control and configure numerous vehicle functions, such as Sport modes, telephone and message functions or driving settings.



View: Control panel

Control panel

The capacitive keypad encloses the selector lever and the control panels for the Infotainment system. The areas next to and above the selector lever contain the control functions for the seats as well as the heating and air conditioning controls.

The touchscreen provides haptic feedback to confirm input on the keypad. Many other buttons, which are usually arranged in the centre console, are replaced by the touchscreen.

Air conditioning functions, such as temperature, air flow, AUTO, Defrost, A/C MAX, air recirculation as well as seat heating and seat ventilation, can be controlled using the buttons on the control panel in the centre console or by selecting the relevant menu items in the PCM main display.

Standard HiFi audio system

The HiFi audio system installed as standard in the Porsche Cayenne has a total of 10 loudspeakers with a total output of 150 watts. In addition to the standard HiFi equipment, the following HiFi systems are optionally available:



Overview: BOSE® Surround Sound System

BOSE® Surround Sound System

The BOSE® Surround Sound System is available as an optional extra in the Porsche Cayenne.

It has a total of 14 loudspeakers with a total output of 710 watts as well as a digital amplifier and a passive subwoofer.

The BOSE® Centerpoint® technology allows playback of stereo sources in surround mode and thus produces a much better stereophonic sound compared with playback in stereo. With AudioPilot® noise compensation technology, you can enjoy the sound of the BOSE® Surround Sound System irrespective of vehicle speed and engine speed. Driving noises are recorded by a microphone, detected in real time and compensated by means of a frequency-dependent volume correction system. The Bose SoundTrue® enhancement technology counteracts the problem of music compression. As a result, parts of high-loss music tracks can be restored in the high-frequency range, thereby improving the sound.



Overview: Burmester® 3D High-End Surround Sound System

Burmester® 3D High-End Surround Sound System

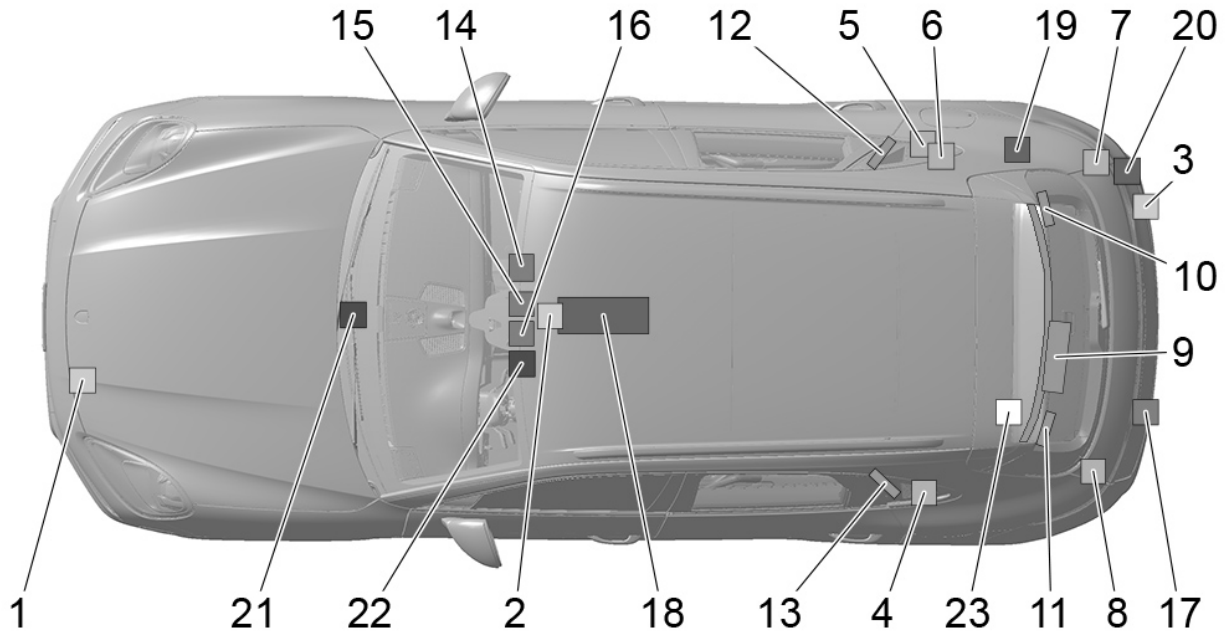
The Burmester® 3D High-End Surround Sound System is also available as an optional extra in the Porsche Cayenne.

It has a total of 21 individually activated loudspeakers and a total output of 1,455 watts. The system also has a 400-watt active subwoofer and a Class D digital amplifier.

The 21 loudspeakers are made of die-cast aluminium frames with highly efficient neodymium magnets. This ensures greater efficiency and more dynamic music playback. Even the bass power amplifiers now feature Class D technology in order to further reduce power loss.

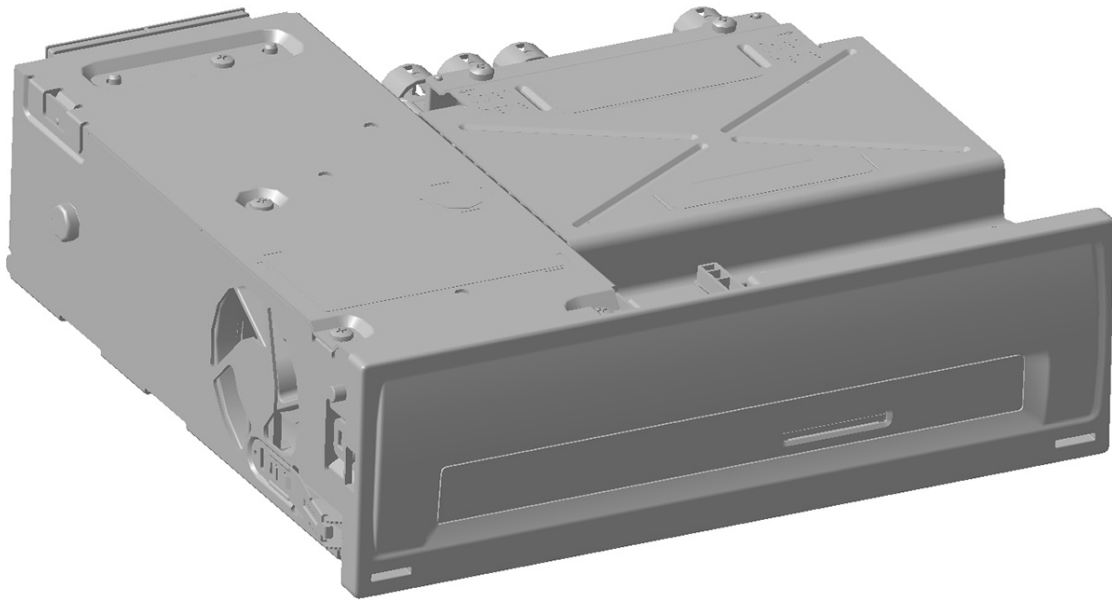
The Burmester® Air Motion Transformer was also improved using special aluminium vapour plating. The result is particularly fine and clear high-range playback without any sharpness. The Auro 3D® technology used by Burmester® uses two additional loudspeakers in the A-pillar to produce a sound modelled on the ambient effect of the renowned Galaxy Studios. These are regarded worldwide as the reference standard for perfect music playback.

System components



Overview: Antennas

1	Bluetooth antenna 1	12	SHS antenna
2	Bluetooth control unit	13	DAB1 antenna
3	Bluetooth antenna 2	14	GPS antenna (head unit)
4	LTE antenna 1	15	LTE1/GSM antenna (head unit)
5	LTE antenna 2	16	WLAN antenna (head unit)
6	LTE antenna 3 (Russia)	17	LTE2 / GSM antenna (head unit)
7	GPS antenna (VTS Russia)	18	Coupler box
8	E-Call or GLONASS GPS antenna (RoW / Russia)	19	Compensator for connection box
9	AM / FM antenna with control unit	20	LTE / GSM coupler box
10	AM / FM1 / FZV / DAB2 antenna	21	ETC antenna (Japan)
11	FM2 antenna	22	VICS antenna (Japan)
		23	SDARS antenna (USA)



View: Central computer

Central computer

The central computer is the central control unit for numerous Infotainment applications and comfort functions in the vehicle. It is also the central interface between PCM 5.X and adjacent systems, which can be operated using the PCM. The SD card reader can be used to import music onto the 10 GB memory. A Jukebox is also available. It is installed in the glove compartment at the right.

PCSI - Porsche Connect Service Information

With the introduction of the Porsche Cayenne, new functions within PIWIS are available to the workshop. The PCSI (Porsche Connect Service Information) offers enhanced options for fast, targeted fault finding and diagnosis of Porsche Connect.

The following functions are available within the PCSI:

- Quick view of current faults in services and server failures.
- History search based on faults in services and server failures in a period in the past.
- Display of the functions registered to the customer and licence validity information when entering the chassis number.
- Display of faults in registered functions when entering the chassis number.
- Central access to fault finding media specific to Porsche Connect.

PCS - Porsche Connect Support

Dealers or customers can send questions that arise directly to Porsche Connect Support.

Porsche Connect Support provides support and assistance particularly for the following questions about Porsche Connect:

- The customer has a question about Porsche Connect that does not relate to the vehicle and cannot be answered by the dealer using the available information media.
- The workshop employee has a question about Porsche Connect that he cannot resolve using the available information media.

(The contact details for Porsche Connect Support can be found in the PCSI.)

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