Infotainment and assistance systems

Your personal Cayenne

The new Cayenne represents a major step towards the intelligent vehicle. Whether deployed internally or in contact with the environment, networking technology has unlocked countless new functions and reached new standards of quality. The functions are easier and more intuitive to operate. With Porsche Connect, the driver has continuous access to the Internet and a wide range of services. Alongside this, new and redeveloped assistance systems take the burden off the driver.

With the Porsche Advanced Cockpit, the Cayenne offers a new type of interaction between the driver and vehicle. The system is based on the display and operating concept of the sports car, originally developed for the Panamera and overhauled for use in the Cayenne. The instrument cluster features the traditional Porsche central tachometer flanked by two seven-inch displays. The driver can control all key functions using three core components: The full-HD touch display of the Porsche Communication Management (PCM) system, the multifunction steering wheel to control the on-board computer, and the touch-sensitive Direct Touch Control in the centre console to interact with selected functions.

New PCM as an intelligent control centre

The 12.3-inch PCM display is not dissimilar to a tablet. The system is just as easy and intuitive to operate and adjust to your personal preferences. Using predefined tiles, customers can quickly and easily create a “home screen” with their preferred functions, including favourite radio stations and navigation destinations, frequently used telephone numbers or an option to activate the sports exhaust system. On the right-hand side of the screen, an info widget can be selected to enable access to other PCM functions. Thus, for example, the navigation feature can be displayed in the interaction area in the centre of the screen while the call function is also being used on the right. Up to six individual profiles can also be configured. In addition to defining a large number of interior settings, a profile is also used to store preferences for lights, driving programmes and assistance systems.

Just a few taps and swipes are all that is needed to navigate through the menus. The new PCM responds even before the user makes physical contact: If a hand approaches the screen, a column opens on the left-hand side of the screen showing the further sub-functions available in the current menu. The user simply swipes with their fingertip – just like on a smartphone or tablet – to scroll through the options. The new PCM also allows you to zoom in or out and rotate the display using two fingers. It also recognises handwriting, so you can simply write your navigation destination on the screen. The Cayenne and Cayenne S are equipped with the HiFi speaker system as standard; the Cayenne Turbo comes with the new BOSE® Surround Sound System. The top-of-the-range system is the latest version of the Burmester® 3D High-End Surround Sound System, featuring the new Auro 3D® format, which creates a realistic concert hall atmosphere within the car.

New: Five programmed modes for on and off-road

The new PCM now also acts as a command centre for all the driving dynamics systems in the Cayenne. One of the most important changes: The various off-road settings are no longer selected via individual buttons in the centre console, but instead via a specific menu on the screen. In this menu, the five newly defined off-road modes are displayed in 3D...
against the backdrop of selected scenery. Depending on the selections made, the control system optimally conditions the engine idling, the switching strategy of the Tiptronic S, the PTM all-wheel system, torque distribution to the rear axle, and the PSM stabilisation programme to suit the application. If the relevant equipment is fitted, the modes also adjust the air suspension including ground clearance, the PASM damper system, PDCC rolling-motion compensation and the rear axle steering to suit the off-road profile.

The car is configured for road use as standard. If the driver enters easy off-road terrain, such as a gravel track or a wet grass field, he can select the “Gravel” mode. For muddy forest tracks or deeply rutted roads, the driver can use the “Mud” setting. The car also boasts a mode for sand and a “Rock” option for the hard and uneven surfaces found in rugged terrain. When combined with the optional Offroad Package, the menu offers additional displays for the steering angle, transverse gradient and longitudinal incline which help drivers to get the best out of the vehicle when driving off road. If the vehicle is equipped with Surround View, a Top View function is also available that shows the vehicle within its surroundings.

**Park Assist with reversing camera and Surround View**

Porsche supports the driver of the new Cayenne in day-to-day driving with a three-level system of parking assistance systems. The standard front and rear Park Assist provides visual and acoustic information to the driver when manoeuvring and parking. The system uses ultrasonic sensors fitted to the front and rear of the vehicle. Park Assist is optionally available with a reversing camera. This helps with manoeuvring by showing a colour camera image on the PCM screen with dynamic support lines and distances to potential obstacles. Using four individual cameras, the Park Assist system with Surround View calculates a 360° view, which helps with parking and manoeuvring. The resolution of the camera image displayed on the PCM screen has now almost doubled, making the picture significantly sharper.

**Adaptive cruise control with stop-and-go function**

The Cayenne is equipped with a cruise control system with speed limiter function as standard, to help the driver regulate the car’s speed and distance from other vehicles. The system can be activated between 30 and 240 km/h. The optional adaptive cruise control increases the range of functions considerably. Using a radar sensor positioned in the middle of the central air intake and the vehicle cameras, the system monitors the distance to vehicles in front and adjusts the distance automatically. It also detects vehicles crossing in front of the vehicle from other lanes. If required, the system brakes to match the speed of the vehicle in front until standstill. Wherever possible, it also uses the coasting function to reduce fuel consumption. The system offers greater driving comfort and safety, particularly in slow-moving traffic. The automatic distance control of the adaptive cruise control is available between 30 and 210 km/h.

Thanks to the stop-and-go function, the vehicle is able to pull off again automatically even after braking to a standstill. If the car is stopped for longer than three seconds, a short tap on the accelerator pedal or a restart via the control stalk is all that is needed to move off again.

The stopping distance reduction system, which is also integrated into the Cayenne, helps to prevent collisions or at least reduce the collision speed. The system provides an initial visual warning, followed by an acoustic warning if the vehicle approaches the car in front
too quickly. In a further stage, the system jolts the brakes briefly. If necessary, braking initiated by the driver will be increased to full braking. If the driver does not react, the system automatically initiates emergency braking. In this case, the side windows and panoramic roof system close automatically. The seat-belt tensioners for the driver and passengers are also activated. At the same time, the system activates the hazard warning lights to warn vehicles approaching from behind.

**InnoDrive as an electronic co-pilot**

The new Porsche InnoDrive with adaptive cruise control is a particularly ingenious feature: Using the navigation data, it calculates the optimum acceleration and deceleration values for the next three kilometres, and activates these settings via the engine and the Tiptronic S, as well as the brake system. In doing so, the electronic co-pilot takes corners, gradients and maximum speeds into account. It detects the current traffic situation using radar and video sensors and adjusts the control process accordingly. The InnoDrive system, which was developed internally at Porsche, improves efficiency. Vehicle functions such as coasting, deceleration fuel cut-off and braking interventions are controlled in a fuel-efficient manner based on the predictive navigation data.

Porsche InnoDrive also brings significant benefits in terms of comfort and dynamics. The system even recognises roundabouts, and adjusts the vehicle speed to match the circumstances ahead. When Sport mode is activated, InnoDrive switches to a more dynamic map. Using the integrated adaptive cruise control system, the radar and video sensors also monitor the distance to the traffic ahead, and permanently adjust this distance accordingly.

**Anticipatory pedestrian protection**

For the first time, the Cayenne is now equipped with an anticipatory pedestrian protection system as standard. The system considerably reduces the risk of collisions with pedestrians by issuing a visual and audible warning if a pedestrian or cyclist is located in the collision area. To enable this, the technology evaluates signals from the front camera. If the vehicle is moving towards a person too quickly, the brakes are applied. If the driver then also actsuates the brake, the vehicle is brought to a complete stop. If the driver does not react, the system automatically initiates emergency braking.

**Lane Keeping Assist including traffic sign recognition**

Lane-changing manoeuvres in fast-moving traffic are one of the most frequent risks in day-to-day driving. The optional Lane Keeping Assist system monitors the car’s position using a camera, and responds by providing steering support if the driver leaves the lane without indicating. Lane Keeping Assist significantly increases comfort and safety, particularly on long-distance journeys. In addition to steering assistance, a further audible and visual warning on the instrument cluster can be activated in the PCM. The system is active within a speed range of 65 to 250 km/h.

The Lane Keeping Assist system is combined with traffic sign recognition technology. Traffic sign recognition uses the same camera and detects normal speed limits, temporary speed displays, overtaking restrictions and indirect instructions, such as place-name signs. The traffic sign recognition technology is situation-dependent, and also uses other vehicle systems. If the rain sensor detects wet conditions, for example, the speed limit display system will take this into consideration and show weather-related speed limit indicators.

**Lane Change Assist with Turn Assist**
The latest, enhanced version of the Lane Change Assist system can also be used as a complement to Lane Keeping Assist. The system uses a radar sensor to detect the distance and speed of traffic behind the car in adjacent lanes. If the speed and distance to the driver’s vehicle are deemed a risk for changing lanes, a warning is shown in either the left or right exterior mirror. The system detects vehicles at a distance of up to 70 metres, and is active at a speed range of between approximately 15 and 250 km/h. A further feature of the new Cayenne is Turn Assist. After approaching a junction, the Turn Assist system displays an optical warning for objects nearing the vehicle in its blind spot. When pulling off with one of the indicators active, the driver is assisted by the Turn Assist until reaching the activation speed of the Lane Change Assist.

Night Vision Assist with thermal imaging camera

Night Vision Assist uses an intelligent thermal imaging camera to detect people and animals when driving in the dark, and flags up their presence and position to the driver. The system operates at distances of up to 300 metres. The electronics are able to classify the relevant thermal source and to distinguish an animal from a parked motorcycle with a warm engine, for example. Night Vision Assist is deactivated in built-up areas to avoid possible false warnings such as dogs on a leash on the pavement. If the vehicle is fitted with optional LED matrix headlights, detected people or animals are illuminated in a beam of targeted light.

New LED light system with adaptive matrix headlights

Porsche has equipped the new Cayenne with cutting-edge light technology. The latest LED technology is used in the headlights and the rear lights in all models. LED main headlights are standard equipment in the Cayenne and Cayenne S; the Cayenne Turbo comes with LED headlights equipped with the Porsche Dynamic Light System. LED matrix main headlights with the Porsche Dynamic Light System Plus are the new top-of-the-range option. This system generates a beam of light from 84 individual LEDs, which work together with upstream lenses or reflectors. The system is also equipped with a camera that detects vehicles ahead, as well as oncoming traffic on the other side of the road. It uses this information to precisely control the distribution of the high beam light to prevent other road users from being dazzled. In the Cayenne, the driver always benefits from maximum illumination of the road ahead – particularly with high beam activated – without affecting other road users.

The complex headlight module is made up of several components that can be controlled in a highly flexible and independent manner based on camera data, navigation data and vehicle statuses. Thanks to the intelligent beam distribution, other functions can be integrated that significantly increase driving comfort and safety. For example, the system is capable of detecting highly reflective traffic signs and selectively masking them to reduce glare for the driver. The intelligent light system also provides a special setting for oncoming traffic. The boost function not only fades out the beam directed toward oncoming traffic in segments but also boosts the illumination of the driver's own lane. This guides the driver’s view, thus increasing comfort and safety.

New apps and new services from Connect Plus

The new Cayenne is fully networked and connected. The expanded Connect Plus services are available through the integrated LTE-enabled SIM card and the new PCM. The previously separate “Car Connect” and “PCM Connect” apps have been merged into a new, more intuitive single app. The Offroad Precision App has been specially developed
for the Porsche Cayenne, allowing the driver to control and record an even more thrilling off-road experience.

The wide range of new services on offer includes Radio Plus, which allows users to continue listening to a radio station online if the car leaves the terrestrial receiver range. The new Voice Pilot adds online support to the voice control of the PCM. This improves the detection accuracy of the natural-language input to such an extent that even complex commands can be recognised and executed. In the new Cayenne models, navigation route calculation is performed both online and in the PCM at the same time, using the very latest information. The map data for navigation is kept up to date at all times using online updates. Other new features include “Finders” (which allow the driver to quickly identify navigation destinations via the Internet), additional remote functions and various safety and emergency services.

**A Cayenne exclusive: Offroad Precision App**

With the new Offroad Precision App, Porsche is enabling Cayenne drivers to document, evaluate and improve their off-road trips and performance for the first time. The “Trip” feature works in a similar way to popular running apps on smartphones. Once recording is active, the technology automatically records all relevant data, including the driver, vehicle, route, times and GPS data. This information is then used to create automatic route and elevation profiles that can later be viewed on a map. The entire journey can also be captured on video. The recordings are made either via a smartphone or an externally controlled action camera. The “Sharing” function on the smartphone can be used to share trips via social networks. In the app’s “Personal progress” mode, the driver’s own performance is evaluated using a bonus system. The app’s tutorial offers off-road novices a thorough primer about how to drive the Cayenne correctly off road. It also contains an overview of off-road parks where drivers can gain their first off-road experiences in a safe environment. The Offroad Precision App is available for iOS and Android.