

Design and body

Lightweight construction with sports car genes

A Porsche Cayenne is instantly recognisable, and the new generation has developed and enhanced this unmistakable identity. Its completely new yet still familiar exterior design strongly reflects the Porsche brand identity, and underlines the ambition of the Cayenne to be the sportiest vehicle in its class. With an exterior length increased by 63 millimetres without any change to the wheelbase (2,895 millimetres) and a roof height reduced by nine millimetres compared with its predecessor, the elegant, streamlined impression of the Cayenne, which is 4,918 millimetres long and 1,983 millimetres wide (excluding mirrors), has been noticeably enhanced.

The front of the new Cayenne is synonymous with performance. The pronounced bonnet with the distinctive 'power dome' emphasises the wings that lead into the redesigned headlight contour. The appearance of the LED headlights is dominated by the three-dimensional light modules, arranged in a sophisticated formation. The lateral trim strips on the central air intake now point outwards, emphasising the width of the vehicle and highlighting its athletic appearance. The front end is dominated by the trademark large air intakes, with the Cayenne and Cayenne S featuring silver-coloured slats for optimum cooling of the turbo engines. Air blades on the exterior of the air intakes channel the cooling air into the openings.

The Cayenne Turbo is now visually set apart from the other models to an even greater degree than before. With their combination of matte and high-gloss black surfaces, the enlarged air intakes in the exclusive front end give the impression of being a commanding single, continuous air intake. The black frames of the lateral air intakes emphasise this effect. At night, the Cayenne Turbo is set apart from the other models with its double-row front light modules.

Side view boasts more dynamic proportions

The new Cayenne has lost nothing of its compact appearance, although it has grown at least 6 cm in length while retaining the same wheelbase. Quite the opposite, in fact: The new proportions make it appear even more dynamic. The side windows are narrower than on the previous model, with a sharper decline towards the rear, in keeping with the low roof line at the rear. Both elements make the vehicle appear lower to the ground and more streamlined. Crease lines on the roof frame further reinforce the visual depth. The redesigned rear wings further emphasise the sports car genes of the Cayenne. Like a pair of broad shoulders, they support the rear end.

In a further nod to its sports car genes, the newly designed alloy wheels measure in at around an inch larger in diameter. The tyre diameters and wheel arches have also grown accordingly – a further indication of the Cayenne's enhanced performance.

The side view of the Cayenne Turbo is particularly distinctive thanks to the 21-inch, brightly polished Cayenne Turbo wheels in dark titanium emblazoned with the coloured Porsche crest and wheel arch extensions painted in the vehicle colour. The exterior mirrors and the door side trims are also finished in the vehicle colour on the top model. Further visual highlights include the white brake callipers on the innovative Porsche

Surface Coated Brakes, which are fitted as standard on the Cayenne Turbo.

Trademark Porsche: Wide rear end with integrated light strip

The rear end of the new Cayenne features horizontal lines to emphasise its depth and width. The three-part light strip extending between the tail lights alone clearly identifies the new SUV generation as a Porsche from afar. As well as the actual light strip, other high-quality glass-look features include the three dimensional “Porsche” logo – a further nod to the sports car. The new colour co-ordinated roof spoiler features straight lines, and the tear-off edge has a more subtle design than that of the predecessor model. In contrast, the Cayenne Turbo boasts an adaptive roof spoiler. Exclusive to the elite model, the inclusion of this adaptive spoiler is a first in the SUV segment. What's more, the Cayenne Turbo is easily identifiable by its distinctive twin tailpipes. The original rear design of the elite model is rounded off by a rear apron painted in the same colour as the vehicle exterior.

Lightweight construction and active aerodynamics

In designing the new Cayenne body, Porsche has consistently applied the same lightweight construction principles that it uses in its sports cars. The main premise behind this approach is to use the right material in the right place. As a result, the new Cayenne body is constructed in a mix of steel and aluminium that combines significant weight advantages with high rigidity. The materials used include micro-alloyed, high-strength steels and multiphase steels that provide highly dynamic torsional rigidity in the bodyshell. Aluminium is used on a large scale in areas subjected to lower levels of stress. For instance, the outer shell of the new Cayenne is made completely of aluminium, including the roof, floorpan assembly, front section, doors, wings, engine compartment lid and luggage compartment lid. Furthermore, recycled plastics are used wherever these materials fully satisfy technical requirements. The new Cayenne models are now around 95 per cent recyclable.

In total, the smart use of materials has reduced the weight of the bodyshell by up to 135 kilograms – although this loss is, in part, compensated for by the expanded range of equipment. In spite of this, the Cayenne S, for example, weighs in at 65 kilograms less than its predecessor. Compared to the equivalent model from the first generation back in 2002, the weight saving equates to 225 kilograms, or around ten per cent. The innovative lithium-ion-polymer starter battery – which weighs ten kilograms less than comparable traditional lead batteries – makes a further contribution to the weight savings. It also offers a three to four-times longer service life. At 5.8 kg/hp for the Cayenne, 4.6 kg/hp for the Cayenne S and 3.9 kg/hp for the Cayenne Turbo, the new models boast class-leading weight-to-power ratios.

Cayenne Turbo featuring adaptive roof spoiler and air brake – a world first in its segment

The new Cayenne Turbo heralds the arrival of Porsche Active Aerodynamics (PAA) in the SUV segment. The top-of-the-range model is the first vehicle in its class with a specific adaptive roof spoiler. As in the 911 Turbo, the spoiler adapts the aerodynamics and downforce to suit the driving conditions. In its initial position, the spoiler is a seamless continuation of the roof contour and forms a shape that optimises the flow of air over the Cayenne. Above speeds of 160 km/h, the roof spoiler tilts by six degrees into the performance position, increasing the stabilising force on the rear axle up to maximum speed. If the driver switches to Sport Plus mode, the spoiler changes to a 12.6-degree position that increases the road holding of the tyres for even sportier dynamics on fast

bends. If the optional panoramic roof system is open, the spoiler adjusts to an angle of 19.9 degrees at speeds in excess of 160 km/h, helping to balance out air turbulence. The fifth position – “Airbrake” – is spectacular and effective. When the vehicle brakes rapidly at speeds between 170 km/h and 270 km/h, the spoiler panel extends to a 28.2-degree position. The spoiler functions as an air brake, which acts to increase the pressure on the rear axle and boost stability during braking. At full braking from a speed of 250 km/h, the airbrake position reduces the braking distance by up to two metres.

Active cooling air flaps and air curtain for all Cayennes

The new aerodynamics concept also includes active cooling air flaps for all Cayenne models. This technology resolves the conflict between providing the necessary cooling and optimal aerodynamics. When closed, the flaps reduce air resistance and are opened only when the need for cooling increases. Active flaps regulate the flow through all cooling air openings, and are controlled independently. Another innovation is the “air curtain”, which allows the air to escape from the wheel arches in front of the wheels in a targeted manner, while also accelerating it. This significantly minimises the air turbulence that normally occurs around the wheels. The lateral air intakes at the front of the car are equipped with air blades, which direct even more of the flow into the air intakes.

The underbody of the new Cayenne is almost completely covered. This design feature improves the air flow under the car, which in turn optimises the aerodynamic performance. In the Cayenne and Cayenne S, the new fixed roof spoiler runs in a straight line, and is almost completely finished in the vehicle colour. It culminates in an understated tear-off edge. The side flaps on the D-pillar, which are important for the aerodynamics, are positioned in the black area extending from the tear-off edge, resulting in an elegant and streamlined rear design for the new Cayenne.