

Body, aerodynamics and ergonomics

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 complete outer shell of the new Cayenne is made exclusively 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 below four kg/hp for the Cayenne Turbo, the new models boast class-leading weight-to-power ratios.

Cayenne Turbo with world's first adaptive roof spoiler and air brake

In the new Cayenne Turbo, Porsche Active Aerodynamics (PAA) transitions into 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 highly 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 rear spoiler. 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.

Further enhancements to ergonomics and seat comfort

The latest generation of the Cayenne stays true to its origins: Unlike conventional SUVs, the driver and passengers in the new Cayenne don't feel like they're sitting high up. Instead, they are one with the car – just like in every other Porsche. The interior is ergonomically designed around the driver. All operating elements can be reached directly with ease. As in a Porsche 911, the Cayenne also boasts the typical, rising centre console. More than just a design element, it provides the shortest and most ergonomic path from the steering wheel to the most important vehicle functions. The multifunction steering wheel is designed according to the same principle and combines outstanding ergonomics with a futuristic aesthetic.

New adaptive sports seats based on sports car design

The Cayenne Turbo features a new generation of adaptive sports seats that are more sports-car-like than ever before. The seats in the top-of-the-range model are easily recognisable: as in a sports car, the headrests are integrated into the backrests, rather than attached as separate components. Together with the raised side bolsters and the unique stitching on the seat centre, the sports seats not only deliver a sporty look, but score highly in terms of ergonomics, too. The adaptive sports seats come with heating as standard, plus seat ventilation as an additional option. The top-of-the-range seat is standard in the Cayenne Turbo, and available as an option in all other models. If an owner selects the sports seats, the rear seats are finished in the same look, and also receive the raised side bolsters.

The standard seat in the Cayenne and Cayenne S is the comfort seat, featuring eight-way electric adjustment. The seat offers secure lateral support for sporty drivers and fatigue-free comfort on longer journeys. In all models, the class-leading, high-quality seats are partially finished in leather as standard. This means that the seat centres, side bolsters and centre headrest strips are finished in leather at the front and back. The rear seat system has a length adjustment range of up to 160 mm, and offers ten adjustment positions in two-degree increments from 11 to 29 degrees. The rear seats also feature a cargo position, with the backrest in an almost vertical position to increase the luggage compartment volume by up to 100 litres compared to the previous model. If even more space is required, the backrests can be folded forwards asymmetrically to create a flat

loading floor. Using these features, the luggage compartment volume can be adjusted between 770 litres and 1,710 litres (Cayenne Turbo: 745 l to 1,680 l) when the maximum possible area is used. Comfort seats with 14-way adjustment, which can also be equipped with seat heating, are also available as an option.