

Body and aerodynamics

## **More rigid body with even higher aluminium share**

With the new 911, Porsche has further developed the mixed body construction throughout the vehicle and designed a completely new body structure. The steel share of 63 percent in the previous model has now been more than halved to 30 percent, for example. Apart from the front and rear aprons, the outer skin is now made fully of aluminium. The new door design, made from aluminium sheet, reduces the bodyshell weight without negatively impacting stability or quality.

In addition to high-strength steels, there is increased use of extruded aluminium profiles in the bodyshell, such as for the front and rear longitudinal members, inner and outer door sills and floor reinforcements. Their share has been increased from three to 25 percent. Porsche has also used more die-cast aluminium parts on the new 911. These components include the front spring strut mount, rear tunnel housing, rear carrier, and shock absorber mounts, for example.

The body components grouped directly around the passenger cell, as well as the A and B pillars and side roof frame, are made from ultra high-strength, hot-formed steels. These absorb the main loads to meet crash requirements and contribute to the intelligent lightweight construction: to achieve comparable strength using aluminium components would require additional bulk and more weight. For the first time worldwide, the new 911 Carrera Coupé also has a curtain airbag.

The enhanced body concept of the new 911 does not just ensure greater passive safety for the occupants, but also means the car bodyshell has higher rigidity. Compared with the previous model, the 911 Carrera 4S Coupé achieves torsion and bending values that are improved by 5 %. As a result, the 911 stays unwaveringly on course even when driven sportily on road sections with different surfaces.

The optional roof systems are an exception to the full aluminium concept for the outer skin. Whereas the standard 911 Coupé has full light alloy panelling, the optional slide/tilt sunroof is made of steel. A glass roof with inner roller blind is also optionally available.

### **New engine mounts reduce vibrations**

The redesigned supporting structures also permitted modification of the engine mounts with very noticeable benefits for driving dynamics. Previously, the engine was connected to a crossbar via two mounts located relatively far back. This crossbar was in turn bolted to the longitudinal members. On the new 911, the crossbar is completely omitted and the engine mounts are integrated directly in the longitudinal members, around 20 cm further forward. The front connection to the transmission mounts is unchanged. As a result of the new position and tuning of the engine mounts, there is a significant reduction in the engine oscillations transmitted to the vehicle chassis. This improves comfort when driving on poor roads at slow speeds as well as at higher speeds, for example when driving over bumps. At the same time, the driving dynamics benefits from the more rigid engine connection with the chassis. Fast, uneven corners can be taken even more sportily because the engine transmits fewer vibrations to the chassis with its weight. The directional stability of the 911 is therefore improved.

## **Adaptive aerodynamics with greater control range**

The enhanced active aerodynamics of the new 911 again extends the vehicle's ability to combine energy efficiency and performance. To achieve this, the active element control strategy for the rear spoiler and cooling air flaps was modified depending on driving speed and driving mode. The new 911 now regulates its aerodynamics in the range between the efficiency-optimised Eco mode and the Performance configuration for optimum driving dynamics.

The new adaptive rear spoiler makes a significant contribution to aerodynamic optimisation: it is now significantly larger and wider. With its 45-percent larger aerodynamically effective area, it offers an improved balance between drag and reduced lift. The additional Eco intermediate position is completely new. This spoiler position creates the lowest aerodynamic resistance, thus minimizing fuel consumption. Fully extended to the Performance position, the rear spoiler completely compensates for the lift at the rear axle. Together with the minimum lift at the front axle, the new 911 therefore offers safe and stable handling even at very high speeds.

The rear spoiler of the new 911 is adjusted to three main positions depending on the driving situation and selected driving mode. The rear spoiler remains retracted up to a speed of 90 km/h. The rear spoiler moves to Eco position if the vehicle continues to accelerate. It remains in this position up to a speed of 150 km/h. Above this, the rear spoiler automatically travels to Performance position. In Sport, Sport Plus and Wet modes, the rear spoiler already extends to Performance position from a speed of 90 km/h. Top speed is always reached in the Performance position.

### **Spoiler supports charge air cooling**

The Performance position can also be set when the vehicle is stationary and at low speeds, using a softkey in the PCM. An additional function of the rear spoiler is supporting charge air cooling. The rear spoiler is already extended from 60 km/h if the charge air temperature is high, in order to prevent loss in performance. As an additional functional enhancement, the compensation position extends the rear spoiler further when the sliding roof is open at speeds above 90 km/h.

The improved active aerodynamics components now also include continuously variable cooling air flaps in the front section. Previously these could be adjusted in three stages. The flaps open and close depending on temperature, load and speed, appropriate to the relevant situation. The two air intakes at the sides have been increased in size compared with the previous model. The flaps are completely closed in the speed range between 70 and 150 km/h if there are no parameters opposing this. This means that the 911 has the lowest air flow resistance, and fuel consumption is reduced. The flaps open from 150 km/h and are fully open at speeds above 170 km/h. This mode provides the best possible aerodynamic balance and optimum driving dynamics at high speeds. When the sliding roof is open, the flaps are already adjusted to this position from 120 km/h. The flaps are always open if the driver switches on Sport or Sport Plus mode.