



PORSCHE



## The new Porsche 911

Press Kit

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**911 Carrera S:** Fuel consumption combined 8.9 l/100 km; CO<sub>2</sub> emissions combined 205 g/km

**911 Carrera 4S:** Fuel consumption combined 9.0 l/100 km; CO<sub>2</sub> emissions combined 206 g/km

The consumption and CO<sub>2</sub> emission values were determined in accordance with the new Worldwide Harmonised Light Vehicle Test Procedure (WLTP). The NEDC values derived from this should continue to be specified for the time being. These values cannot be compared to the values determined in accordance with the NEDC measuring procedure used up to now.

Further information on the official fuel consumption and official, specific CO<sub>2</sub> emissions of new passenger cars is available in the "Guidelines on fuel consumption, CO<sub>2</sub> emissions and power consumption of new passenger cars" [Leitfaden über den Kraftstoffverbrauch, die CO<sub>2</sub>-Emissionen und den Stromverbrauch neuer Personenkraftwagen], which are available free of charge from all sales outlets and from Deutsche Automobil Treuhand GmbH (DAT).

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The eighth generation of an icon

## The new Porsche 911

More powerful, faster, digital – the Porsche 911 is now entering its eighth generation. Unmistakably committed to the Porsche design DNA, with a much more muscular look and an interior featuring a 10.9-inch touchscreen monitor, the new 911 is timeless – and also modern. Intelligent control and chassis elements as well as innovative assistance systems combine the masterfully uncompromising dynamism that the classic rear-engine sports car is famed for, with the demands of the digital world.

Oliver Blume, CEO of Porsche AG: "The eighth generation of the 911 is even more powerful, even more emotional, and even more efficient than its predecessor – and also offers extensive digital features. And in spite of all the innovations, the 911 is still just what it has always been: a puristic sports car and the pulsing heart of Porsche – our icon."

The next generation of flat-six turbocharged engines has been further developed and is more powerful than ever before, with 331 kW (450 PS) in the S models. The drive efficiency has been further optimised, and emissions reduced by way of an improved injection process and a new layout for the turbochargers and charge air cooling system. Power is delivered by a newly developed eight-speed dual-clutch transmission. The top speeds are now 308 km/h (Carrera S) and 306 km/h for the Carrera 4S all-wheel-drive version. Both 911 models beat the four-second mark for acceleration from zero to 100 km/h: the rear-wheel-drive Coupé needs 3.7 seconds and the 911 Carrera 4S with all-wheel drive just 3.6 seconds. This makes both cars 0.4 seconds faster than the previous model in each case. This advantage is increased by a further 0.2 seconds with the optional Sport Chrono Package. The 911 is setting new fastest lap times even on the toughest circuits around the world. A 911 Carrera S has completed the Nordschleife of the Nürburgring in just 7 minutes and 25 seconds – five seconds faster than the previous model.

Additional highlights include Porsche Wet Mode to make driving on wet roads even safer, Night Vision Assist with thermal imaging camera, as well as comprehensive connectivity that uses swarm intelligence. The package is completed by three exclusive digital services that were unveiled with the new

911 in Los Angeles on 27 November 2018: the Porsche Road Trip app for those long-distance journeys, the Porsche 360+ personal assistant, and the web-based Porsche Impact emissions calculator to neutralise your individual carbon footprint.

## An exterior design that draws on earlier generations of the 911

The exterior design is familiar and yet undoubtedly new. The eighth-generation 911 is wider, more assertive, and more advanced. Wider wings arch over the large 20-inch wheels at the front and 21-inch wheels at the rear. The rear-wheel-drive models now match the bodywork width of the existing all-wheel models. The rear axle is 44 mm larger here. The front end – generally 45 mm wider – revives a traditional feature of earlier 911 generations: a forward-extended bonnet with a distinctive recess in front of the windscreen. Both elements lengthen the front of the vehicle and give it a dynamic look. At the same time, the newly developed LED headlights illustrate how technology has advanced in the 911. These headlights are integrated into the wings almost seamlessly, taking the typically-911 round and upright form. Flush integration of the electrical pop-out handles in the doors emphasises the tapered and smooth side contour. The exterior mirrors have also been redesigned, and are now optimised to minimise wind noise. It is also possible to fold the mirrors in electronically.

The rear of all models is dominated by the significantly wider, variable-position spoiler and the seamless, elegant light bar. The vertically arranged louvres of the air intake echo the contours of the rear window, and the centrally located third brake light has also been integrated in the intake louvres – this is not visible when the rear spoiler is extended, so a brake light has also been incorporated into the spoiler itself. As a distinguishing feature, the rear-wheel-drive models have black louvres, while the all-wheel-drive models have chrome elements in the rear grille. With the exception of the front and rear sections, the entire outer skin is now made from aluminium.

## Redesigned interior with clear lines

The interior is distinctive, with clear, straight lines and recessed instruments defining the dashboard. 911 models from the 1970s provided the inspiration here as well, with the new dashboard spanning the entire width between two horizontal wing levels, just as it did in the original 911. Alongside the centrally positioned rev counter, two thin, frameless freeform displays deliver information to the

driver. Now 10.9 inches in size, the centre screen of the Porsche Communication Management (PCM) can be operated quickly and without causing distraction. Below it, a docked-on control panel of five buttons – styled to look like classic toggle switches – creates the transition to the centre console with touchpad. The seats have also been completely revamped. The new design reduces the vehicle weight by around three kilogrammes, while the adapted geometry offers significantly better lateral support in the shoulder area. Although the seat is now positioned five millimetres lower and has a minimally thinner seat cushion, seating comfort has been improved overall.

In terms of digitalisation, the 911 takes the next step into the future with permanent connectivity as well as new functions and services. The standard PCM features include online navigation based on swarm data as well as Porsche Connect Plus.

## Sophisticated assistance systems enhance safety and comfort

In a world first, Porsche has developed Wet Mode, included as standard. This function detects water on the road, preconditions the control systems accordingly and warns the driver, who can then set the car up to focus on safety by simply pushing a button or using the mode switch on the steering wheel (Sport Chrono Package). The warning and brake assist system, also fitted as standard, detects the risk of collisions with vehicles, pedestrians, and cyclists, and initiates a warning or emergency braking if necessary. Night Vision Assist with a thermal imaging camera is optionally available for the 911 for the first time. Adaptive cruise control, available on request, comprises automatic distance control with a stop-and-go function and reversible occupant protection.

## The next generation of flat-six engines

The turbocharged flat-six engines also enter the next generation with the new 911. In addition to compliance with the latest emissions standards by way of a gasoline particulate filter, the primary focus of advanced development here was on further enhancing performance. New, larger turbochargers with symmetrical layout and electrically controlled wastegate valves, a completely redesigned charge air cooling system, and use for the first time of piezo injectors combine to attain engine improvements in all relevant areas: responsiveness, power, torque characteristic, endurance,

revving ability. In addition to performance enhancement of 22 kW (30 PS), achieving 331 kW (450 PS) at 6,500 rpm, the 911 Carrera S engine achieves an extra 30 Nm of torque: 530 Nm in total. This is available within a wide range of speeds, from 2,300 to 5,000 rpm.

The 911 Carrera S costs from 120,125 euros in Germany and the 911 Carrera 4S from 127,979 euros, including value added tax and country-specific equipment.

## **The Porsche 911 mythology, right on the wrist**

Porsche Design is honouring the new generation of the 911 with a special-edition watch limited to 911 pieces: the "911 Chronograph Timeless Machine Limited Edition." The unmistakable design of the automotive icon is reflected in the puristic design of this timepiece and the contouring of the titanium housing. Even the generously dimensioned black dial is derived from its motorised fore-runner. The white pointers and indicators guarantee maximum readability both in the cockpit and on the wrist. The totalisator at 6 o'clock references the sports car icon with the markings at 3/6/9 and 11. The same is true for the silhouette of the 911 flyline on the dial, and the strap that is produced using original Porsche interior leather. The special edition will be available from April 2019 in an exclusively boxed edition which also includes a special limitation badge.

## **The masterpiece from Zuffenhausen – seven generations of a cult athlete**

A legend is born at the International Motor Show Germany (IAA) in Frankfurt. It's 12 September 1963: Porsche presents the hotly anticipated successor to the 356 – a sports car which 15 years previously had launched this car manufacturer's brand history in Gmünd, Austria. 111,995 examples of the original 911 – initially called the 901 – are built before the model is discontinued.

Ten years later, in 1973, the G series 911 is launched with fundamental changes. Many of these have become necessary because of stricter safety specifications in the USA – an important export market. The Stuttgart-based car manufacturer relies on powerful turbo engines and a galvanised body in its top model, additionally launching a Cabriolet version of the 911 and the Speedster, alongside the Targa. 198,496 Porsche 911 G Series are built by 1989.

Its successor, referred to internally as type 964, comes to market in 1988. The first model variants of the 964 generation show just how advanced the new 911 is: all-wheel drive is introduced to the series for the first time on board the Carrera 4, with Porsche having originally designed it for the 959 high-performance sports car. The 911 Carrera 2 with rear-wheel drive follows in 1989. At the same time, the Cabriolet and Targa versions also celebrated their debut alongside the Coupé. For all versions it's true that, beneath the trusted bodywork – barely modified apart from integrated bumpers – 85 % of the 964 is made from newly designed parts. From October 1993, after 63,762 third-generation Porsche 911s are produced within six years, the new successor is ready.

The fourth generation of the 911 – the 993 – is one of the most desirable editions. Initially, Porsche offer it only as a Coupé and Cabriolet. The Targa does not make its debut until 1995, at which time it arrives incorporating a new concept: instead of a removable hardtop, it has a glass roof with a large surface area, which can be descended under the rear window. The chapter of air-cooled engines also ends in 1998 after the production of 68,881 vehicles.

With the fifth generation of the 911, Porsche stops using air-cooled engines in 1997. The 996 represents the biggest departure in this classic's family tree. The company is in a state of financial upheaval. After 34 years, the sports car manufacturer comprehensively realigns its icon with the 996 generation. The focus is on reducing production costs – a process started in the model's predecessor, by ensuring the greatest possible compatibility of parts with other production series such as the new Boxster, and updated safety and emissions specifications, among other initiatives. Production doesn't end until 2005. With 175,262 units sold, the 996 is the long-underestimated success model in the more than 40-year history of the 911.

From 2004, the type 997 Porsche 911 is more multifaceted than ever: customers can choose from a Coupé or Targa, Cabriolet or Speedster, rear- or all-wheel drive, narrow or widened bodywork, with water-cooled naturally-aspirated and turbo engines, a GTS or the GT2, GT2 RS or GT3 sport versions, or either of two GT3 RS models. Including special models, the range has a total of 24 model variants – supplemented by a wide range of personalisation options. With 213,004 vehicles out there, the sixth generation of the 911 again hits a production record.

From 2011, the 991 embodies the highest development stage of the Porsche 911 to date. It is an extraordinary reflection of this sports car manufacturer's leitmotif: striving for the best possible efficiency. This can be seen in all aspects, starting with its evolved design. A more compact silhouette, tension-charged surfaces, and precisely defined details mean the 991 looks more powerful than any other previous 911 – an effect that is heightened by the wider track and the wheelbase that has been extended by ten centimetres. It also features adaptive aerodynamics: the 911 was the first series sports car from Porsche to adopt this technology from the 918 Spyder hybrid super sports car. The 991 generation of the 911 is the absolute best seller in the history of this icon. 217,930 of them were built by October 31, 2018. In total, Porsche has produced 1,049,330 series 911s since its debut in 1963.

## Design and Interior

# Precise sportiness

An unmistakably familiar match with the Porsche design DNA and yet undoubtedly new: the new 911 is wider, more assertive, and more muscular. New LED headlights and a bonnet in the style of earlier generations of the 911 combine innovative, ground-breaking design elements with distinctively Porsche advanced features. An even sportier look has been achieved with wings that are up to 45 millimetres wider, and larger wheels on the rear axle. The vehicle width is emphasised by a newly structured rear featuring a new, continuous LED light strip and distinctive third brake light.

## Bonnet in the style of the G series

The front end revives a traditional feature of the earlier G series 911: a forward-extended bonnet with a distinctive recess in front of the windscreen. Both elements lengthen the front of the vehicle and create a dynamic look, while at the same time completely new LED headlights indicate the advanced technology in the 911. These headlights are almost seamlessly integrated into the wings, and have a typically 911 look – round and upright. The optional LED matrix headlights have a tailored design to suit their advanced technology, and are a real visual highlight. Optimised day-time running lights ensure that the 911 has greater presence. The four-point signature has been extended in a three-dimensional line to the rear, while front air intakes have been combined and given a sense of visual unity with a continuous black intake trim. Horizontal lines dominate here also. The front light modules are now much narrower.

## Wide body with smooth surfaces

With an unchanged wheelbase, the new 911 is now 20 millimetres longer and a great deal wider: generally 45 millimetres at the front axle and 44 millimetres at the rear axle of the Carrera S. These changes give the new 911 an even flatter look, particularly when viewed from the front. The modern, straight lines of the front end are continued consistently in the side view. The door gives the impression of having been seamlessly inserted between the front and rear wings, with straight lines and no frills. The sweep of the side contour begins lower down than on the previous model, moving the visual centre of gravity lower and thereby underlining the more compact appearance of the new 911. This

impression is further emphasised by the wheels at the rear axle, which are around an inch larger. Flush door handles which pop out electrically on approach, and a rectangular, aerodynamically enhanced exterior mirror design complete the calm, powerfully modelled vehicle side. The exterior mirrors have also been redesigned, and are now optimised to minimise wind noise. It is also possible to fold the mirrors in electronically. The standard black lower mirror trim is also optionally available in the vehicle colour.

## Rear end with new LED light strip

With its pronounced recessed contours and low apron termination, the rear end is archetypally characteristic of the 911. The low position of the number plate, along with the new, one-piece LED light strip together produce a dramatic look, and clearly differentiate the new generation from its predecessors. A high-gloss black rear trim panel visually combines the rear window and engine grille into a single unit that adjoins the enlarged extending spoiler. The vertically arranged louvres of the air intake echo the contours of the rear window, and the centrally located third brake light has also been integrated in the intake louvres – this is not visible when the rear spoiler is extended, so a brake light has also been incorporated into the spoiler itself.

As a distinguishing feature, the rear-wheel-drive models have black louvres, while the all-wheel-drive models have chrome elements in the rear grille. The rear spoiler is positioned directly below the air intake and is now significantly wider, extending almost to the outer edge of the tail lights. This means that there is only one join on each side, making the upper part of the rear end appear smoother. At the same time, the rear spoiler has been newly designed with 25 % greater air flow area, so offering much-improved aerodynamic properties.

The new continuous LED light strip immediately draws the eye to the rear. This light strip is unbroken by any seams or joins, for a design that makes the new 911 absolutely unmistakable at night. Integrated tail light modules have made it possible to redesign the direction indicators, which now enclose and visually support the light strip. They also frame the three-dimensional PORSCHE logo, below which the model designation is inscribed, in a newly created font that is ultra modern, yet pays homage to the style used at Porsche in the 70s.

The coherent look of the vehicle continues on the rear apron, where the number plate has been pushed downwards, and is now located between the tailpipes of the exhaust system. These are flush-integrated into the rear end, meaning there is no visual interruption to the downward line, while the integration of reflectors and outer air outlets into the black area at the rear also creates a visual impression that is quieter, more linear and wider.

## Completely revamped interior

The completely new interior is a milestone in the development of the 911. The new cockpit is a reminder of the virtues found even in the very first 911 generation: clarity and formal unambiguity. For example, the traditional analogue rev counter is now flanked by two frameless freeform displays that appear to float. Just as it did in the original 911, the new dashboard covers the entire width between two horizontal wing levels. In the middle, a docked-on control panel with five pushbuttons – styled in a classic toggle switch look – forms the transition to the centre console with integrated touchpad. An ignition key is no longer provided, as the new 911 features Keyless Go and a switch to start the engine – on the left of the steering column of course. In short, analogue precision and digital integration have been blended together in a manner that is typical for the brand.

Under the roof-like wing, the dashboard has a black recessed horizontal operating level. From the driving position, this is dominated by the five classically round Porsche instruments, with the analogue rev counter in the middle: the exposed glass edges of the seven-inch freeform displays emphasise their elegance and lightness.

The adjacent new 10.9-inch PCM touchscreen display is flush-mounted, and the trim surface in front of the control unit serves as a hand rest to support fast and distraction-free operation. Underneath, there is a new switch unit with five buttons for direct access to important vehicle functions. These can be operated intuitively thanks to their exposed position. Depending on the range of features available, Wet Mode can be activated by pressing a button, for example, or the PASM damper can be made tighter. The central air vent is the transition to the centre console. This has a touch-sensitive high-gloss surface that corresponds to the PCM display.

## New option: Ioniser for clean air

The optional ioniser in the air flow of the climate control system is also new. It serves to reduce the number of germs and other pollutants in the air, improving the air quality in the passenger compartment and thereby noticeably enhancing the well-being of vehicle occupants.

The functionality of the Porsche dual-clutch transmission (PDK) selector has been reduced, so it is now far more compact than previously, thanks to fully electronic control of the new eight-speed PDK. The form and surface texture have been adapted to the design of the touch switches. The clearly structured, puristic door panelling combines elegance with a high level of functionality, and also offers plenty of storage space.

The new steering wheel generation embodies typical Porsche principles, such as lightness and precision, in an even more distinctive and attractive way. The multifunction control elements blend harmoniously into the steering wheel and emphasise its lightness: the revamped mode switch has a more modern look and is now easier to use, and the control stalks have also been redesigned for perfect functionality and ergonomics. GT steering wheels are optionally available in various versions. All steering wheels are 360 millimetres in diameter.

## Next seat generation with more comfort

The seats have also been completely revamped. Lightweight construction means that the new design reduces vehicle weight by around three kilograms, while adapted geometry provides significantly improved lateral support in the shoulder area. Although the seat is now positioned five millimetres lower and has a very slightly thinner cushion, seating comfort has nonetheless been considerably improved. The new seats also evoke the simple operation of earlier 911 models, by way of classic leather loops to more easily facilitate ergonomic folding. A new seam pattern in combination with the completely reworked backrest shell gives a significantly different appearance that blends harmoniously into the interior. The rear seats in the new 911 have also been improved. They now have a backrest that is around 20 millimetres higher and a wider seat cushion.

The inner sides of the doors have been redesigned to continue the horizontal lines of the dashboard, while the high-quality metal door trim elements transition seamlessly to the newly designed door openers, creating a visual unity. This new geometry of the trim surfaces offers extensive personalisation options in combination with a wide choice of Exclusive trims.

For the first time, Porsche is offering a partial leather interior in the colours Black or Slate Grey as an option for the new 911. With this option, the seat centre sections, seat bolsters and front head restraints are in smooth-finish genuine leather. The dashboard upper section and door shoulders are also covered with the same material. As it was for the previous model, a full leather interior is also optionally available. A new option is additional decorative stitching, which is also available in a contrasting colour. In this case the steering wheel also features contrast stitching. The leather interior is available in the colours Black, Slate Grey, Graphite Blue and Bordeaux Red.

## Engine and drivetrain

### **Enhanced power, greater efficiency**

The new 911 also brings a new generation of turbocharged flat-six engines. Advanced development has been primarily focused on further enhancing performance, alongside meeting the latest emissions standards by including a gasoline particulate filter (GPF). New, larger turbochargers with symmetrical layout and electrically controlled wastegate valves, a completely redesigned charge air cooling system, increased compression, as well as the newly implemented piezo injectors combine to attain engine improvements in all relevant areas: responsiveness, power, torque characteristic, efficiency and manoeuvrability. In addition to the 22 kW (30 PS) increase in power to 331 kW (450 PS) at 6,500/min, the engine offers 30 Nm higher torque, at 530 Nm between 2,300 rpm and 5,000 rpm.

The new six-cylinder engine features forced induction by an almost completely new intake system. Two mirrored turbochargers replace the previously used identical parts. In addition, the compressor and turbine wheels are now arranged in mirrored configuration in relation to the engine, and therefore rotate in opposite directions. The diameter of the turbine wheels has been increased by three millimetres to 48 millimetres, while the 55-millimetre compressor wheel is now four millimetres larger. Thanks to a newly developed lightweight cast manifold and the adapted turbine housings, it has been possible to improve the air flow conditions on the turbine inflow and outflow. This contributes to increasing efficiency, responsiveness, torque and power.

Control of the wastegate valves is also new. The valves are no longer adjusted by a vacuum, but electrically using stepper motors, making boost pressure control faster and more precise overall. The maximum boost pressure of the 911 Carrera S with GPF is around 1.2 bar.

### **Increased efficiency: charge air coolers now under the rear lid grille**

Further downstream in the intake section, compressed air flows through the two newly positioned charge air coolers, which were previously installed in the location of the air filter – they have now swapped places. Instead of being located at the sides in the rear wings, the charge air coolers are

now located directly over the engine in a central position under the rear lid grille. This new position permits improved air inflow and outflow of the cooling air and the dethrottling of the process air path, while the increased size of the charge air coolers significantly boosts their efficacy.

The entire basic engine has been targeted for further development, and numerous details have been optimised. For the first time, piezo-controlled injectors directly inject fuel into the combustion chambers. Piezo injectors open and close even more rapidly than the previous solenoid-operated components, meaning that the injection volume can be divided across up to five injections per cycle. In addition, the injector opens outwards so that fuel is distributed better and in finer droplets into the combustion chamber. Without the new piezo injectors, the only way to implement these improvements would have been by increasing the injection pressure; the chosen method has made it possible to retain the pressure level of 200 bar.

## Asymmetrical valve lift for better combustion

The VarioCam Plus variable valve control system uses asymmetrical intake camshafts with a small valve stroke to control gas exchange for the first time. In this arrangement, the two adjacent valves of a cylinder open in this partial load position at different partial strokes. Where previously both intake valves had a uniform 3.6-millimetre small valve stroke, on the new engine the lift is at 2.0 millimetres and 4.5 millimetres. This dethrottling in the partial load area and various other detail optimisations have improved fuel management and therefore combustion – reducing consumption and emissions. Smoother running at low engine speeds and loads also increases comfort on the road. When full stroke is selected for higher engine performance, both inlet valves of the cylinder open with parallel strokes.

## Emotional sound both inside and out

The unmistakable sound of the 911 also contributes to the driving pleasure of this sports car. That's why the engineers have paid great attention to the sound balance of the intake and exhaust sides when carrying out further development. The exhaust systems have been revamped to offer a characteristic and appealing sound experience for the Porsche 911, in spite of stricter noise requirements and installation of the gasoline particulate filter. The twin-branch exhaust system

now includes map-controlled and fully variable exhaust flaps. This regulation capacity enables both optimum power development and an emotional sound profile. The flaps are electrically actuated by stepper motors. This also makes it possible to now set intermediate positions – for an even more emotional sound experience. A sports exhaust is also available. While the standard system has two double tailpipes, the sports exhaust system has two oval outlets.

## Completely newly developed eight-speed dual-clutch transmission

The 911 Carrera S and 911 Carrera 4S are being launched exclusively with the first eight-speed dual-clutch transmission (PDK) for Porsche sports cars. Compared with the seven-speed transmission of the previous models, the new PDK offers a host of improvements. The driver can directly feel the enhanced combination of comfort, performance and efficiency. All gears have new ratios: first gear is now shorter and eighth gear longer than before. This has made it possible to implement a longer final-drive ratio, thereby further reducing engine speeds in the upper gears. The result is harmonious ratio stepping and further potential for reducing fuel consumption. Maximum speed can still be achieved in sixth gear. The use of a controlled oil pump and advanced fuel-efficient engine oils are further measures that reduce both power losses and fuel consumption. The oil pressure required for changing gear and clutch operation is controlled based on demand, and power losses in the transmission are reduced.

## Fast gear changes for better dynamics

The new fast gearshift enables the driving dynamics of the 911 to be experienced even more intensely. This function is available for shifting up both in manual mode, and when Sport Plus is activated, also in automatic mode. As with the 911 GT sports cars, this means much shorter response times and faster gear changes. Fast gearshifts are generally used at high engine speeds and loads, and require significantly improved clutch switching during the gearshift operation. The hydraulically controlled clutch changeover takes place much faster thanks to an additional filling bypass.

## Sport Chrono Package with a new mode switch

The Sport Chrono Package is the first choice when it comes to increasing driving performance and driving pleasure. The package includes the new mode switch with Sport Response button and PSM Sport Mode, dynamic engine mounts, as well as the stopwatch and the Porsche Track Precision app. Driving modes are selected by means of the new mode switch in the steering wheel, and the currently active mode is displayed in the instrument cluster.

The dynamic engine mounts – which have a new position better aligned to the engine's centre of gravity – combine the advantages of both hard and soft engine mounts. They increase both driving comfort and driving stability thanks to electronic control. The PSM Sport mode is separately switchable and adjusts the stability system to an especially sporty mode, in which ambitious drivers can get even closer to the limit range of their vehicle in a safe environment. Inspired by motor sports, the Sport Response button offers the option of setting engine and transmission responsiveness to maximum performance for 20 seconds. The Porsche Track Precision app enables measurement of lap times and driving data on race tracks; using a smartphone, this data can be recorded and managed, as well as shared and compared with other drivers.

In combination with the optional Sport Chrono Package, the new Wet Mode, which is standard for all 911 models, can be selected via the mode switch. The standard Sport function can then also be activated only by means of the mode switch.

## The 911 Carrera 4S with more powerful front-wheel drive

The enhanced performance of the new 911 Carrera 4S goes hand-in-hand with the further development of the front-axle drive. The clutch and differential unit is now water-cooled and has reinforced clutch discs to increase robustness and load capacity. The increased actuating torques at the clutch improve its adjustment accuracy and as such also improve the function of the additional front-axle drive. In total, the refined front-axle transmission in combination with PTM (Porsche Traction Management) support even better traction on snow, as well as in both wet and dry conditions. In the area of driving dynamics, the precision, performance and load capability for race track use have been optimised.

## Chassis and brakes

# Motor racing technology: mixed tyre diameter and width for the first time

The chassis of the Porsche 911 sets standards for sports cars – and has done so in every generation for more than 50 years. With the chassis of the new 911, Porsche further exploits the driving dynamics potential. The basis for this is provided by the new mixed tyre configuration, with 20-inch wheels on the front axle and 21-inch wheels on the rear axle. At the same time, the tyres on the rear drive axle are significantly wider than on the front wheels. This results in a track that is 46 mm wider at the front of both models, as well as a 39 mm-wide track width at the rear of the 911 Carrera S. This combination enables the rear axle to build up higher lateral stability, and further improves the traction of the rear-wheel-driven 911. The mixed tyres also have a considerable influence on the vehicle balance. The handling is even more neutral and controllable. The vehicle has an extremely low understeer or oversteer tendency and therefore provides the driver with higher safety reserves, particularly with a dynamic driving style. The refined chassis design is completed by the next generation of Porsche Active Suspension Management (PASM), offering a significantly enhanced balance of sportiness and comfort. The PASM chassis is equipped with controlled shock absorbers as standard. It can be replaced with the PASM sports chassis, for a 10-millimetre-lowered body.

## Sportier and more comfortable: further developed PASM with a wider spread

Porsche has extensively further developed PASM for the new 911. The latest generation of dampers features fully revised engineering. The main stage valve and the pressure chambers for the rebound and compression stage are controlled within a few milliseconds by means of a high-precision control valve that is infinitely adjustable using magnetic force. This enables precise adjustment of the damping force at any time. In addition, the Porsche chassis specialists have developed separate software controls for the new damper technology, which perfectly align the damper function to their application in the new 911.

The combination of new hardware and software results in significant advantages. When needed, the new PASM offers significantly softer damping than the previous system, and therefore greater comfort both in the compression and rebound stage. Quick, brief stimuli in particular – for example from cobblestones – are damped with much greater success. At the same time, the new PASM offers the opportunity to have the dampers act more firmly, resulting in significant driving dynamics advantages with respect to roll stability, road connection, steering behaviour, and possible cornering speeds.

A PASM sports chassis lowered by ten millimetres is also available. The entire setup is designed specifically for enhanced driving dynamics and enables both greater agility on curves and more stability on high-speed stretches.

### **The Wet driving programme: the world's first wetness recognition – fitted as standard**

The new 911 is the first in the world to feature an innovative system for recognising significant wetness on the road, including the Wet driving programme that can be manually selected at any time. This program has been specially developed to support the driver in wet conditions. The system uses acoustic sensors in the front wheel housings to recognise sprayed-up splash water, and in this way can detect wetness on the road. This makes it fundamentally different from windscreen wiper rain sensors, which only react optically to water droplets on the windscreen, independently of the road conditions. The response behaviour of the PSM and PTM systems is preconditioned if a road is recognised as wet. The system informs the driver of the detected wetness and recommends manually switching to Wet mode.

The corresponding function can either be activated in the new button bar above the centre console or is integrated in the mode switch with the optional Sport Chrono Package. If the driver activates this mode, the Porsche Stability Management (PSM), Porsche Traction Management (PTM), aerodynamics, optional Porsche Torque Vectoring (PTV) Plus, and drive responsiveness are adapted to the conditions in such a way as to guarantee the best possible driving stability. From 90km/h, the rear spoiler is adjusted to maximum downforce, the cooling air flaps open, the accelerator pedal characteristic is flatter, and PSM Off or Sport mode can no longer be activated. The Wet driving

programme is essentially based on a concept that the Porsche Advanced Development department had already developed to functional maturity in the middle of the 1990s, as part of the Prometheus European research programme.

## New brake system setup with optimised brake response

The new wheel sizes with further-developed tyres led to a completely new chassis setup. This resulted in renewed improvements in wet grip and dry handling as well as in rolling resistance. The spring and anti-roll bar rates are higher and the brake system operates more precisely. Because the new rear wheels can transmit a higher braking force, the diameter of the rear brake discs has been increased from 330 millimetres to 350 millimetres. The brake pedal ratio has been shortened. The pedal is now made of an organic sheet composite material consisting of steel, carbon fibre and plastics. It weighs around 300 grams less than the previous steel component. There is a more immediate brake response, and the driver can also feel a very precise pressure point because of the firm connection. Sporty drivers in particular will value this optimised feedback. The brake system modifications are rounded off by the change from a pneumatic brake booster to an electric booster.

The race track-proven Porsche Ceramic Composite Brake (PCCB) is still optionally available for all 911 models. The ceramic brake offers low weight and practically no fading.

## Direct steering ratio for greater agility

In order to further increase the agility and dynamic turn-in behaviour of the new 911, the steering ratio is around 11 % more direct on the standard sports cars and approximately 6 % more direct on vehicles with optional rear-axle steering. The 911 is even more agile as a result and provides even greater driving pleasure on winding roads. A new, typically Porsche steering controller is also used for improved feedback on the steering wheel. Thanks to the enhanced algorithm, the road conditions – dry, wet or snow – can be better taken into account to achieve the desired handling.

The comfort-oriented Power Steering Plus is optionally available. At low speeds, this steering operates with an adapted steering support, enabling particularly easy manoeuvring and parking.

## Rear-axle steering plus lightweight battery

The rear axle steering improves both day-to-day usability and performance. The system has been further adapted for the new 911. Depending on driving speed, it directs the rear wheels to move up to two degrees either in the same direction as the steering angle on the front axle, or in the opposite direction. The result is that the 911 is even more agile when cornering, and its smaller turning circle makes it easier to manoeuvre in urban traffic. Higher speeds increase driving stability, when changing lanes for example. The rear-axle steering is also linked to use of a new lithium iron phosphate battery. This technology has its origins in motor sports.

The service life of the lithium iron phosphate battery is 2.5 times that of a conventional lead-acid battery, but at 12.7 kilograms, it weighs less than half as much. The optional Porsche Dynamic Chassis Control (PDCC) is also available with rear-axle steering option. This system features active anti-roll bars and practically eliminates body roll when cornering.

## Lift system for the front axle

The optional electro-hydraulic lift system allows the front axle to be raised by around 40 millimetres. Thanks to the increased approach angle and ground clearance, at the front axle, the system makes it easier to drive into garages and multi-storey car parks, for example.

## 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.

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## Electrics and electronics

# Intelligent LED headlights for better visibility

Porsche has developed a whole host of new safety and assistance systems for the new 911. The new optional LED matrix headlights with PDLS Plus catch the eye in particular. These represent the apex of Porsche lighting technology. The energy centre of the matrix headlights is made up of 84 individual LEDs which work together, with lenses positioned in front of them, and the high-power LED of the auxiliary high beam. The generated light beam corresponds in range and intensity to laser light. The light is distributed so that the driver always benefits from maximum illumination of the roadway without dazzling or disturbing other road users. The complex headlight module consists of several components that can be controlled very flexibly, and independently of each other, on the basis of camera data, navigation data and vehicle conditions.

Intelligent control of light distribution means that it has also been possible to integrate additional functions that significantly increase driving comfort and safety. The system is therefore able to detect and selectively dim highly reflective traffic signs. In addition to masking oncoming traffic on a segment-by-segment basis, the Boost function also increases illumination of the vehicle's own driving lane at the same time. This directs the driver's view in a targeted way, thereby increasing comfort and safety. The cornering light is switched on and off with smooth transitions and therefore reduces strain on the eyes.

The 911 is equipped with LED headlights from the factory as standard. These already include auxiliary high beam and dynamic range control. They form the basis for the optional headlights with PDLS Plus. The latter additionally include dynamic cornering light, high beam assist as well as motorway and fog light functions. The LED matrix headlights are a completely new development.

## Assistance systems with additional options

The new 911 offers a combination of assistance systems as standard. These make driving in everyday traffic safer and more comfortable. The camera-assisted warning and brake assist system considerably reduces the risk of collision with vehicles, pedestrians and cyclists. As the first stage, the system

warns the driver visually and acoustically. There is then a braking jolt in the second stage if there is a higher level of danger. A braking operation initiated by the driver is reinforced up to full braking if necessary. If the driver does not react, automatic emergency braking activates to mitigate the consequences of a collision.

The optionally available adaptive cruise control system considerably extends the functional range. The package comprises automatic distance control with a stop-and-go function and reversible occupant protection. Using the radar sensor located in the middle of the central air intake and the cameras, the system monitors the distance from vehicles driving in front and automatically adapts. Vehicles that cut in from adjacent lanes are also detected. If necessary, the system will brake to a standstill when following a vehicle in front. It will also use the coasting function when possible to reduce fuel consumption. In slow-moving traffic in particular, the system therefore offers increased driving comfort and safety.

Thanks to the stop-and-go function, the 911 is able to independently move off again after braking to a standstill. If the vehicle is stopped for longer than 15 seconds, it is sufficient to briefly press the accelerator or resume the function with the control stalk to let the vehicle move off again. The side windows and slide/tilt sunroof are automatically closed if an emergency braking situation occurs. The reversible belt tensioners for driver and front passenger are also activated.

## Lane Keeping Assist with traffic sign recognition

Lane changes on roads with multiple lanes are among the most common risk situations. The optional Lane Keeping Assist is camera-based and reacts with steering assistance if the driver changes lane without indicating. The system ensures greater comfort and considerably improves safety on long-distance journeys in particular. In addition to steering assistance, an additional acoustic warning can be activated in the PCM. The system is active in the speed range between 65 and 250 km/h.

Lane Keeping Assist is combined with a traffic sign recognition function. This makes use of the same camera and detects permanent and temporary speed displays as well as "no overtaking" signs and indirect restrictions related to place name signs, for example. Operation of the traffic sign recognition function is situation-dependent and makes use of other vehicle systems. For example, it takes into

account wet conditions based on information from the rain sensor and displays weather-dependent speed limits. In order to offer greater safety when driving on unknown and twisting country roads, the system displays direction information on the instrument cluster display before sharp bends.

## Lane Change Assist with visual warning

The further-developed Lane Change Assist function can be used in addition to Lane Keeping Assist. This system uses a radar sensor to detect the distance and speed of the following traffic in the adjacent lanes. If the system determines that the speed and distance of following vehicles are too critical for a lane change, a visual warning is displayed in the left or right exterior mirror. The system can detect vehicles in a distance range up to 70 metres and is active in a speed range between around 15 and 250 km/h.

## New: Night Vision Assist with thermal imaging camera

Using an intelligent thermal imaging camera, Night Vision Assist detects persons and animals in darkness and shows them to the driver. The system has a range of up to 300 metres. The electronic system is able to classify the respective heat source and to distinguish between an animal and parked motorcycle with a warm engine, for example. Night Vision Assist is deactivated in built-up areas in order to prevent false warnings such as may be caused by dogs on a lead on the pavement, for instance. In combination with the optional LED matrix headlights, the detected persons or animals are also marked by brief flashing.

## From ParkAssist to Surround View

Assistance systems make manoeuvring and parking with the new 911 much easier. The front and rear ParkAssist – now fitted as standard – supports the driver with visual and acoustic warnings. This function uses ultrasonic sensors located at the front and rear of the vehicle. ParkAssist can also be optionally supplemented with a reversing camera. This guides the driver by displaying a colour camera image on the PCM with dynamic guide lines and distances from potential obstacles. ParkAssist with

optional Surround View additionally calculates a 360° top view from four individual cameras. The PCM display now includes significantly sharper resolution, almost twice as high as it has been in previous models.

## New PCM with simplified operation

The new Porsche Communication Management (PCM) with online navigation makes it much easier to control the extended Infotainment functions. Numerous vehicle functions that were previously operated via the instrument cluster or centre console can now be configured in a graphically attractive way via the 10.9-inch touchscreen display of the PCM in the new 911. Map data for most European countries is pre-installed. Perspective map views and 3D navigation maps are available in many cases.

The system is intuitive to use and can be adapted to suit personal tastes. Using predefined tiles, drivers have a quick and easy way to create their own home screen including their preferred functions, such as favourite radio stations, sat nav destinations, telephone numbers, or the sports exhaust activation function. An information widget can be added to the right-hand side of the screen, enabling users to access other functions in the PCM. For instance, the interactive area in the middle of the screen can be used to display the sat-nav, while the right-hand side is used for the phone function.

It is possible to navigate through the menus with just a few finger taps and swipe movements. Just as on a smartphone or tablet, scrolling is performed by simple swiping with a finger tip. The new PCM is also capable of pinch-in and pinch-out operations or display rotation with two fingers. As an additional feature, the display can recognise handwriting: navigation destinations can simply be written on the screen. Many of the PCM functions can be conveniently used by means of the online-supported voice control function, fitted as standard.

## Choice of three sound systems

In addition to the standard Sound Package Plus, sound systems from BOSE® and Burmester® are still offered for the new 911. With twelve speakers and a total output of 570 watts, the optional BOSE® Surround Sound-System offers an extremely balanced and true sound experience. The top system remains the Burmester® High-End Surround Sound System, also with twelve speakers and a total output of 855 watts.

## Apps and services from Connect Plus

The new 911 features 100 % connectivity. The many different options are part of Porsche Connect Plus, which comes as standard. Using the Porsche Communication Management (PCM) system, the driver can now access Amazon Music, Smart Home functions from the service provider Nest and Radio Plus, an intelligent combination of conventional reception and web radio. Thanks to the integrated LTE-capable SIM card, the new 911 is permanently online. This function is also included in the standard equipment. Also fitted as standard: the Porsche Connect app with simplified operator guidance for the central Connect functions.

Radio Plus is a further new feature. This service with integrated web radio function means that a favourite radio station has practically an unlimited range if the chosen station offers an online radio channel. If the sports car leaves the range for terrestrial reception via FM or digital radio, the system automatically switches to online streaming. The 911 features the improved "seamless" changeover function for the first time, so that it is practically impossible to hear the change in broadcasting source.

## Online-navigation using swarm-based data

The online navigation function with real-time traffic information is now even simpler, faster and more comprehensive. The basis for the simple search for navigation destinations is the central "finder" – represented by a magnifying glass in the header bar of the PCM. This allows the user to search for destinations with simple terms. The finder also offers a host of additional information such as fuel prices, car parks with free spaces including prices and opening hours, or also user ratings for hotels and restaurants.

Voice input of navigation destinations is also just as simple thanks to the new Voice Pilot. The Porsche voice control function has been further developed once more. Thanks to online voice recognition, voice inputs are now much more intuitive than before. For example, it is possible to simply enter a navigation destination without address details.

Navigation calculation has also been optimised. This was made possible by simultaneous processing of on-board and online inputs. Route calculation for navigation therefore takes place at the same time both online and internally in the PCM. The PCM decides independently which navigation function has calculated the best route, but always starts with the result that has been calculated first.

The navigation system also processes so-called swarm data with the new Risk Radar service. This is anonymously recorded and transmitted data from correspondingly equipped vehicles on the traffic and road situation. On the basis of information from the vehicle sensors, this data provides warnings about fog, slippery roads and accidents, for example. In this way, the new 911 can help to minimise dangers and prevent accidents.

Navigation destinations can also be conveniently created not just in the PCM but also in advance of a journey, using the Porsche Connect app on a smartphone, or outside the vehicle on the "My Porsche" online platform.

## One for all: Porsche Connect app for Apple and Android smartphones

The Porsche Connect app now provides the driver with even simpler and more comprehensive access to different vehicle and Connect functions by smartphone. The app is divided into three main areas: "Navigation"; "My Vehicle" for vehicle-specific functions; and "Me" for user-specific services and settings.

## Porsche Track Precision app for sporty drivers

The Porsche Track Precision app allows 911 drivers to virtually save their experiences of driving enjoyment: The app permits detailed recording, display and analysis of driving data on a smartphone. Lap times can be automatically recorded via the PCM precise GPS signal, or manually by way of the steering wheel button in the optional Sport Chrono Package. Time measurement is even more precise with the lap trigger optionally available through Porsche Tequipment.

The user interface of the Porsche Track Precision app has been completely modernised for the new 911. Use of the app on a smartphone is now even more intuitive and user-friendly.

Worldwide endurance testing under extreme conditions

## Nine-eleven under pressure: a testing programme for the new generation

Before the eighth generation of the sports car classic is launched on the European market, the prototypes first have to complete the final testing programme around the globe. This means a great deal of stress for the new sports car. They are shuttling between climate zones with temperature differences of up to 85 degrees Celsius; sprinting across elevation changes spanning more than four kilometres; enduring traffic jams in major cities and setting new records on the racetracks. After all of this, every component of the car must function just as reliably as it did at the outset.

"In addition to its outstanding performance, it's the 911's suitability for daily use that has always put it in a class of its own," comments Andreas Pröbstle, Project Manager for the Complete Vehicle of the 911. "That's why we test the vehicle under all conditions, and in every type of weather and region. The vehicles' drivetrain must function as flawlessly as its fluids, systems, operating processes and displays – it's the only way we can be certain that the vehicle is able to travel through all regions of the world without faults," he adds.

The testing first focuses on Porsche's traditional core areas of expertise, such as the chassis and engine, which have been enhanced even further to heighten both performance and everyday use. Additionally, there are function tests and stress tests for the entirely new operating concept in the cockpit, as well as instruments and displays. The new driver assistance systems and extended connectivity must also rise to the challenges of the strenuous testing marathon: Porsche Connect differs from country to country, so testing its operation and functions is very resource-intensive.

In hot countries such as the Gulf States in the Middle East or Death Valley in the USA, the air conditioning, thermal management, and combustion behaviour need to pass functional tests in temperatures up to 50 degrees Celsius – so the interior components must not expand or contract and make noises when exposed to heat, for example. In Finland's minus 35 degrees temperatures, the test agenda focuses on areas such as cold start, heating and air conditioning, traction, handling and braking behaviour, as well as the response speed of the control systems related to driving dynamics.

The winding and demanding roads in the area of the European Arctic Circle offer optimum conditions for testing a sports car, while endurance runs have seen the new 911 test cars sprinting over China's roads and racing tracks in a traffic structure that is typical for that country, as well as proving that they run reliably on fuels whose qualities vary enormously.

The Nuerburgring is traditionally a part of the rigorous Porsche test and development programme. The engine, transmission, brakes and chassis must prove their mettle at the demanding racetrack located in the Eifel mountain region. In Italy, the test cars are driven round the high-speed Nardò test tracks, where the focus is not only on top speed but also cooling and handling. The test vehicles reach the lowest point of their endurance run in Death Valley, which descends to around 90 metres below sea level; while the thin air on Mount Evans, Colorado – reaching heights of 4,300 metres – was the challenge for the biturbo charging and the fuel system. By the time, testing is complete, the cars have been driven around three million kilometres in total.

A less spectacular component of testing, albeit no less important, is customer-oriented everyday testing on public roads in cities and cross-country throughout Germany. This portion of testing also sees significant mileage being covered, while complying with all traffic rules, in order to ensure that the complete vehicle and its systems are durable and suitable for daily use, so that the eighth generation of this sports car icon continues the tradition of being the best 911 of all time.

The seven generations of the Porsche 911

## Sports car icon since 1963

A legend is born at the International Motor Show Germany (IAA) in Frankfurt. It's 12 September 1963: Porsche proudly presents the eagerly anticipated successor to the 356. The new sports car, originally known as the 901, is following in great footsteps. To reflect the ambitions of the brand, Porsche is now playing in a higher league with the new model: a flat engine with six instead of four cylinders and air-cooled in the best traditions of the company, but delivering 130 PS straight away. When the new model came onto the market in 1964 it was called the 911 – the result of a discussion about naming rights with the automotive manufacturer Peugeot. The 911 is quickly accepted as a "genuine" Porsche because the performance of the new sports car exceeds all expectations. The stage is thus set for an unrivalled global career.

### **The original 911: the masterpiece from Zuffenhausen**

The expansion of the 911 model range then continued apace. In 1965, Porsche responded to a discussion in the USA that had branded cabriolets as dangerous in a typically pragmatic way: the company presented the 911 Targa as the first-ever "safety cabriolet", featuring a roll-over bar that was a good 20 centimetres wide, a removable roof section and rear mini soft top. This was known as the soft window. This was followed shortly afterwards by a panorama rear window with heatable glass. The name of the open-top variant – "Targa" – was derived from the Targa Florio endurance race in Sicily, which Porsche had already won four times.

In 1966, another design icon celebrated its world premiere along with the 160 PS 911 S: the Fuchs wheel. Probably the most famous wheel in automotive history entered new technological territory: being forged from one piece made it much lighter.

Additional model variants were ready in autumn 1967: the 911 T with 110 PS rounded off the range below the top model 911 S and the 911 E – the suffix "E" stood for petrol injection. This made it very clean: with these variants, Porsche was the first German car manufacturer to meet the strict US emissions regulations.

The continuous improvement of the 2+2-seater Porsche achieved a further milestone in the middle of 1968: from the 1969 model year, the wheelbase of the first 911 generation grew by 57 millimetres to 2,268 millimetres. Primarily, this gave the rear-engined sports car calmer handling. The 2.0-litre era ended in 1969: a four-millimetre larger bore increased displacement to 2,195 ccm. With the 1972 model year, the displacement increased even further to 2.4 litres, but the sports car was now also able to run on regular-grade petrol. Power ranged from 130 to 190 PS in the 911 S.

The 911 Carrera RS 2.7 became its very own legend with its "duck-tail" rear spoiler. This sports car weighed only 1,000 kilograms, developed a power output of 210 PS and had a top speed of over 245 km/h. In all, 1,525 cars left the factory gates in Zuffenhausen. This model therefore crowned the first 911 generation. A total of 111,995 original 911s were produced between 1963 and 1973.

## **The G model: The 911 gets off to a flying start with technical innovations**

The 911 entered its tenth year in 1973 – with the most far-reaching changes that Porsche had made to its successful model series so far. The Stuttgart-based car manufacturer used powerful turbo engines in its top model and a galvanised body for every vehicle, and additionally launched a Cabriolet version of the 911 and the Speedster on the market in addition to the Targa. Its path to becoming an icon was now already clearly laid out at the latest.

However, the long-running model first had to prove how adaptable it was. The stricter safety regulations in the USA demanded that all new cars withstand a collision at eight km/h without damage when driving forwards and reversing. Zuffenhausen therefore introduced the impact bumpers with rubber lip that are characteristic of the G model in front of the luggage compartment lid. These bumpers could be compressed by up to 50 millimetres without any damage to important vehicle parts. The collision energy was absorbed by flexible impact absorbers on the US version, and Porsche offered these as an option for all other markets. Moreover, safety in general was very important for the second 911 generation. This was shown by many details – from standard three-point seat belts and front seats with integrated head restraints through to impact surfaces in the newly designed sports steering wheels.

The six-cylinder engine in the standard 911 already featured the 2.7-litre displacement of the 911 Carrera RS of the previous generation right at the start. This increased to 3.0 litres shortly afterwards. As from 1983, this even increased again to 3.2 litres, with a power output of up to 250 PS for the 911 SC RS. The enormous development potential of the air-cooled flat engine meant that there was always room for more surprises.

The 3.0-litre flat engine at the rear of the 911 Turbo reached much higher power levels as from 1974. The turbocharger technology adopted from motor sports initially powered this super sports car with 260 PS. From 1977 onwards, an additional intercooler and an increase in displacement to 3.3 litres provided an extra boost – the result was an impressive 300 PS. This translated into performance values that were practically unrivalled in the middle of the 1970s: 5.2 seconds for the sprint from zero to 100 km/h was just as unbelievable as a top speed of more than 260 km/h. Another legend was born with the Turbo.

Nevertheless, dark clouds were gathering on the horizon: new sports cars from Porsche with transaxle technology (engine at front, transmission at the rear axle) such as the 924 and 944 model series with four cylinders and the 928 series with eight cylinders were intended to step into the footsteps of the 911. However, the transaxle heirs to the 911 throne did not establish themselves and the demand for the evergreen remained as high as ever. Porsche then took the right decision: a change in strategy. The future of the 911 was therefore secured for the time being. As from 1982, a Cabriolet version was also offered for the first time alongside the Coupé and Targa. This was even followed by a 911 Carrera Speedster in 1989, marking the end of the second 911 generation – 2,103 of these were delivered with the turbo-width body and only 171 in the slim export version. The G model was built in the period between 1973 and 1989, and Porsche produced 198,496 of these vehicles during these 16 years.

## The type 964: a new start with this 911

The third generation of this sports car, known internally as the type 964, combined the traditional silhouette of the classic model with state-of-the-art technology. It was also a bet on the future of the company, which was experiencing economic challenges – a bet that this third generation would win.

The first model variant immediately showed just how advanced the new 911 was: an all-wheel drive that Porsche had originally designed for the high-performance sports car 959 was introduced to the series for the first time on board the Carrera 4. With electronically controlled and hydraulically regulated power distribution, it was well ahead of its time. The all-wheel-drive system used the sensors of the anti-lock braking system (ABS) which – just like power steering – then became fitted as standard in this model, rather than being an optional extra.

The 911 Carrera 2 with rear-wheel drive followed in 1989. At the same time, the Cabriolet and Targa versions also celebrated their debut alongside the Coupé. What's more, under that familiar body – in practice only modified by having integrated bumpers – 85 % of the 964 also consisted of newly designed parts

At 3.6 litres, the air-cooled flat-six engine reached new heights in terms of displacement, and delivered 250 PS in the Carrera 2/4 models. One of the technical innovations in the boxer engine was its twin-spark ignition, which Porsche had originally developed for greater operational reliability in aircraft engines. At the same time, the aerodynamic lift at the rear axle was almost completely eliminated due to the rear spoiler now being retractable. And there was another new feature: the adaptive Tiptronic gearbox, which allowed smooth gear shifting without any interruption in power.

The 911 Jubilee model was one of the most distinctive variations of the 964 generation, with only 911 of these special, limited-edition cars to mark 30 years of the 911 made available on the market in 1993 – and they sold out quickly. With wide wings at the front and rear, this model combined the drive unit of the Carrera 4 with the Coupé body and chassis with 17-inch-wheels of the 911 Turbo, but came without its rear wing. Porsche combined the exclusive exterior colour Viola Metallic with a full leather interior in Rubicon Grey.

Adding to the exclusivity, the 911 Speedster was launched in 1993 with a shortened windscreen, modified roof structure, and signature double-bubble cover behind the front seats. 930 cars were built on the basis of the Carrera 2 Cabriolet, plus a further 15 vehicles with a wide turbo-look body.

The turbocharged versions were the top-of-the-range 911 type 964 models. The 911 Turbo initially adopted its predecessor's 3.3 litre engine, which at that time produced 320 PS, and the 911 Turbo S engine delivered an impressive 381 PS. The model was switched to the new 3.6-litre engine with 360 PS at the start of 1993, and the next in line was already knocking at the door from October of that year, and so the sports car icon took the next step. Porsche produced a total of 63,762 type 964 vehicles between 1988 and 1994.

## **The 993: Pinnacle of the air-cooled era and the last of its kind**

One thing is certain, and not just for fans of sports cars from Zuffenhausen: the fourth generation of the 911 – the 993 – is one of the most desirable editions in the history of this classic vehicle. Although practically only the roofline remained unchanged, the new model impressed with an exciting interpretation of the 911 design DNA beginning in 1993. The natural interplay of concave and convex forms, integrated bumpers, flush-mounted windows and the wide rear end with its angled tail-light panel set the hearts of almost all sports car enthusiasts aflutter. Even the new front wings – a flatter design made possible by new polyellipsoid headlights – quickly found widespread approval.

The 993 also underlined its leading position in the sports car segment with its technical features – such as the completely redesigned LSA aluminium chassis, which combined lightweight construction, stability and agility. Up to the present day, the multi-link suspension is considered to be the ultimate development stage of the "Weissach" rear axle, which made history with its self-steering properties. The result: even better driving dynamics and enhanced suspension comfort.

The new generation also set standards with its drive unit: the 911 Turbo with standard all-wheel drive came with two turbochargers in 1995. The effect: outstanding 408 PS. At the same time, the 3.6-litre biturbo engine impressed with the lowest exhaust emissions of all series-production units at the time. At the rear of the two-wheel-driven 911 GT2 – and limited to an edition of 100 – it even produced up to 450 PS.

Initially, Porsche offered the 993 only as a Coupé and Cabriolet. The Targa did not make its debut until 1995, at which time it arrived with a new concept: Instead of a removable hardtop, it had a broad electric glass roof which slid under the rear window. There was also another body variant as a series-production model: the all-wheel-drive Carrera 4S – followed slightly later by the Carrera S – combined the wide body and chassis of the 911 Turbo. Only the rear wing was omitted.

The flat-six engine provided another reason why the 993 is so popular among collectors and fans: it was the last 911 unit to feature classic air cooling. Initially with a power output of 272 PS, the two-valve model – again equipped with twin-spark ignition – already delivered 285 PS from 1995 onwards. Porsche also optionally offered a 300 PS variant. The manual transmission was also new: with a top speed of now up to 270 km/h, it received a sixth forward gear to cover this speed range without curtailing the engine's power development due to a long ratio. The gear changes were also once again more precise.

In the end, staking everything on the 911, Type 993 paid off for Porsche. The chapter of air-cooled engines in this unique model history ended with the fourth generation of this iconic sports car in 1998. The second era then started after 35 years. It was the beginning of a time that would see unparalleled success. For the 911. And for Porsche. Porsche produced a total of 68,881 vehicles of the Type 993 between 1993 and 1998.

## The 996: First 911 with water-cooled flat engine

With the fifth generation of the 911 introduced in 1997 – the type 996 – Porsche took the bold step to stop using air-cooled engines. After 34 years, the sports car manufacturer completely revamped its icon with the new 911 and in doing so solved a number of urgent challenges. As part of a process that had started with the predecessor, the focus was on reducing production costs through maximum compatibility of parts with other model series, such as the Boxster, as well as on meeting updated safety and emissions regulations. Porsche found its path into the future with the 996.

It did this by preserving classic proportions and combining them with modern technology – in short, re-inventing a sports car legend and preparing it for the future. The 996 had a difficult legacy to follow, but it also represented the first chapter of a new era. That was already clear in the design.

The result was a newly developed body, which impressed with an elegant, no-frills look. The dimensions also grew: The new 911 was now 18.5 centimetres longer, and the wheelbase was also lengthened for the second time in the history of the model series. This increased by 80 mm, while the body width also added another three centimetres. The interior also benefited from these changes: the 996 offered more elbow room and a more generous feeling of spaciousness. The dashboard also had a new look: the five round instruments merge into each other – another break with tradition.

However, the greatest revolution was at the rear. The flat engine design was preserved – but not its air cooling, because this cooling principle did not have enough reserves to comply with the increasingly strict emissions regulations. In contrast, the newly developed water cooling system was ready for the future. This was also true for its performance: the four-valve six-cylinder engine generated 300 PS from a displacement of 3.4 litres, therefore matching the legendary 911 Turbo 3.3. After the engine facelift with a displacement of 3.6 litres, this increased to 320 PS, and in the anniversary edition "40 years of Porsche 911", the power output even reached 345 PS.

The 911 Turbo also received a new water-cooled flat engine. This came with an impressive track record: as a 3.2-litre six-cylinder engine, it had already powered the 911 GT1 to victory in the Le Mans race in 1998. Thanks to twin turbocharging, it delivered 420 PS in the series-production vehicle. This 911 Turbo was therefore the first series model from Porsche to break the 300-km/h barrier. In the 911 GT2, the unit even produced up to 483 PS. The PCCB with ceramic brake discs also made its debut in the extreme sports car and was standard equipment in the GT2. This was 50 percent lighter than the brake with standard brake discs and had a service life of up to 300,000 kilometres.

With the same engine but without turbocharging, the 911 GT3 marked the start of a new era: it offered pure driving pleasure both on the road and on the race track as part of Track Days. It also formed the basis for the Porsche brand cups, and was the starting point for many race victories of Porsche customer motorsport all over the world. In the 996, the 3.6-litre naturally-aspirated engine initially had an output of 360 PS, and then 381 PS. The 911 GT3 RS followed in 2003 as an even sharper edition. Between 1997 and 2005, Porsche produced a total of 175,262 Type 996 vehicles.

## The 997: Technology offensive, new design and great variety for the 911

From 2004, the Porsche 911 was available in more different versions than ever before: Customers could choose from a Coupé or Targa, Cabriolet or Speedster, rear- or all-wheel-drive, narrow or widened body-work, with water-cooled naturally-aspirated and turbo engines, a GTS or the GT2, GT2 RS or GT3 sport versions, or either of two GT3 RS models. Including special models, the range had a total of 24 model variants – supplemented by a wide range of personalisation options.

With the design of the type 997, Porsche made the 911 even sharper thanks to a more dynamic and powerful look. The Carrera was already noticeably more masculine with more pronounced shaping of the rear end, while the width of the S, GT and Turbo models grew by 44 millimetres. The type 997 set itself apart from its predecessor by the steeper, round clear-glass headlights, marking a return to an important style element of the air-cooled 911 models. After the facelift in July 2008, the front end featured bi-xenon headlights and LED daytime running lights.

The 997 generation of the Porsche 911 also set new benchmarks on the technical side as well. The 3.6-litre six-cylinder engine of the Carrera initially produced 325 PS. The cylinder bore was increased by three millimetres for the S models. With a displacement of 3.8 litres, this became the largest flat engine in a series-production 911 thus far.

For the model update in 2008, Porsche thoroughly revamped the engine range and introduced direct fuel injection for the first time. The fuel consumption and emissions fell significantly as a result, but the performance figures shot upwards: 345 PS for the 3.6-litre version, 385 PS in the 3.8-litre six-cylinder model. The new 911 Carrera GTS, which closed the gap between the S models and GT3, even produced 408 PS.

The 911 Turbo also benefited from the technology offensive: Its 3.6-litre engine was the first petrol engine to be equipped with a turbocharger with variable turbine geometry. The later changeover to a displacement of 3.8 litres and direct fuel injection permitted an initial leap from 480 to 500 PS. The 911 Turbo S even came with 530 PS, combined for the first time as standard with a seven-speed dual clutch transmission. Only the 911 GT2 RS was faster and more powerful. Its engine developed 620 PS, enough for a lap time of 7:18 minutes on the Nürburgring North Loop.

The GT3 models also benefited from increased power, from initially 415 to 435 PS. The RS 3.8 even delivered 450 PS. However, the crowning achievement was the GT3 RS 4.0. This vehicle, produced in a limited edition of 600 units, generated 500 PS.

The 997 generation also featured a number of remarkable special edition models, such as the 911 Sport Classic. Each of the 250 units in the edition found a buyer within just 48 hours. The 911 Speedster – also with a power output of 408 PS – was offered by Porsche in a limited series of 356 units. The 911 Turbo S Edition 918 Spyder was a special case: this model was designed to shorten the waiting time of the future owners of a new 918 Spyder before they took delivery of their hybrid super sports car – only these 918 happy customers were able to order the special-edition model. Porsche produced a total of 213,004 sports cars of the type 997 between 2004 and 2012.

## **The 991: the 911 passes the one million mark**

From 2011 onwards, the Type 991 represented the most technically advanced 911 model to date. The 991 looked more powerful than any other 911 before – an effect that was heightened by the wider track and a wheelbase stretched by ten centimetres. It also featured adaptive aerodynamics: the 911 was the first series sports car from Porsche to adopt this technology from the 918 Spyder hybrid super sports car.

The newly designed interior of the 991 was based on the architecture of the Carrera GT. It combined classic 911 elements such as the five round instruments – one as a high-definition multifunction display – with modern design and enhanced ergonomics. At the same time, the new Porsche Communication Management (PCM) was introduced with improved connectivity, multitouch monitor and real-time traffic information.

The brand icon was more athletic and more powerful than ever before. The lightweight body in aluminium-steel design was again more rigid and helped to reduce the weight by 45 kilograms. The entry-level six-cylinder engine made do with a displacement of 3.4 litres, but still developed 350 PS. The S models produced 400 PS from 3.8 litres, and the GTS even delivered 430 PS from the same displacement.

Following the new edition of the 991 launched in 2015, the 911 Carrera models also relied on the power of two turbochargers. In combination with a three-litre engine, the power outputs of the three Carrera versions, standard, S and GTS, were now 370, 420 and 450 PS respectively. A 911 Carrera accelerated from zero to 100 km/h in less than four seconds. The fuel consumption and exhaust emissions were reduced.

The available power also reached new dimensions with the Turbo and GT variants, with no less than 700 PS in the 911 GT2 RS. With a top speed of 340 km/h, this was the fastest series-production 911 in the model history. The 911 GT3 RS with 520 PS from its 4.0-litre high-speed naturally-aspirated engine featured more motorsports technology than Porsche had ever before offered in an on-road vehicle.

A highlight of the model range was the 911 Targa, which incorporated the classic idea of this concept with a wide bar instead of the B pillars, and combined this with a clever roof design. Other highlights were model variants such as the weight-optimised 911 Carrera T, the extremely lightweight 911 R, which was produced in a limited edition of 991 vehicles, as well as the 911 GT3 RS with a weight of only 1,370 kilograms. The special-edition model "50 years of 911" was also highly coveted, with exactly 1,963 units being built. An important place in the company's history is occupied by the Irish Green sports car with numerous exclusive features which rolled off the production line in Zuffenhausen on 11 May 2017: the one-millionth 911. The 450 PS jewel remains in the ownership of Porsche AG.

The 991 generation of the 911 was the absolute best seller for Porsche. 217,930 units were built in the period from 2011 to 31 October 2018 and counting. In total, Porsche has produced 1,049,330 series 911s since its debut in 1963 to end of October 2018.