Engine and drivetrain

Enhanced power, greater efficiency

For the new 911, the focus was on further development of the turbocharged flat-six engines. In addition to compliance with the latest emission standards with a gasoline particulate filter (GPF), a central goal was to achieve further enhanced performance. New, larger turbochargers with symmetrical layout and electrically controlled wastegate valves, a completely redesigned charge air cooling system, increased compression and use for the first time of piezo injectors combine to attain engine improvements in all relevant areas: responsiveness, power, torque characteristic, efficiency and revving ability. In addition to the 22 kW (30 PS) increase in power to 331 kW (450 PS) at 6,500 rpm, the engine offers 30 Nm higher torque of 530 Nm between 2,300 rpm and 5,000 rpm.

Two symmetrical, larger turbochargers replace the previous identical parts. The compressor and turbine wheels therefore rotate in opposite directions. Thanks to newly developed, lightweight cast manifolds and adapted turbine housings, it was thus possible to improve the air flow at the turbine inlets and outlets. This in turn contributes to increased efficiency, responsiveness, torque and power.

The wastegate valves are no longer controlled by a vacuum, but electrically using stepper motors. This has the benefit of 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: relocated charge air coolers centrally over the engine

The two charge air coolers have swapped position with the air cleaner compared with the previous models. 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 dethrottling of the process air path. In combination with the larger charge air coolers, this significantly improves cooling efficiency.

The complete standard engine was the focus of further development and numerous details have been optimised. For the first time, piezo-controlled injectors perform direct fuel injection into the combustion chambers. Piezo injectors open and close faster than the previous solenoid-operated components. As a result, the injection quantity can be divided into up to five injections per cycle. The pressure level of 200 bar was maintained.

Asymmetrical valve lift for better swirling in the combustion chamber

The variable valve control VarioCam Plus controls gas exchange with asymmetrical intake camshafts in the small valve lift for the first time. The two adjacent valves of a cylinder open here with different lifts in this partial load position. Whereas previously the small valve lift of both intake valves was a uniform 3.6 millimetres, it is now 2.0 millimetres and 4.5 millimetres on the new engine. This dethrottling in the partial load range and various other detailed optimisations have improved fuel management and therefore combustion – reducing consumption and emissions.

Enjoy emotional sound both inside and outside
The unmistakable sound of the 911 Cabriolet also contributes to the driving pleasure of this sports car. That’s why the engineers 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 attractive sound experience typical 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 control system permits both optimum power development as well as an emotional sound. The flaps are actuated electrically by means of stepper motors. This makes it possible to now also set intermediate positions – for an even more emotional sound experience. A sports exhaust system is also available. Whereas the standard system has two double tailpipes, the sports exhaust system has two oval outlets.

**Newly developed eight-speed dual-clutch transmission**

The Cabriolet versions of the 911 Carrera S and 911 Carrera 4S will also be initially equipped exclusively with the eight-speed Porsche Doppelkupplung (PDK). Compared with the seven-speed transmission in 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 made it possible to realise a longer final-drive ratio, thereby further reducing the 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.

**Sport Chrono Package with a new mode switch**

The Sport Chrono Package is the go-to choice when it comes to increasing driving performance and driving pleasure. This 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. The driving modes are selected by means of the new mode switch in the steering wheel, and the active mode is displayed in the instrument cluster in each case.

The dynamic engine mounts – with a new more central position at the engine’s centre of gravity – combine the advantages of 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 this mode, ambitious drivers can get even closer to the dynamic limits 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 permits measurement of lap times and driving data on race tracks. This data can be recorded and managed via the smartphone and also 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 then standard Sport function can also be activated only by means of the mode switch in this case.

**911 Carrera 4S with enhanced front-wheel drive**

The front-axle final drive on the all-wheel drive versions, consisting of clutch and differential, is now water-cooled and has reinforced clutch discs to increase robustness and load capacity. Together with PTM (Porsche Traction Management), the enhanced
front-axle final drive supports 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.