



**PORSCHE**

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## **2008 Porsche 911 Turbo Cabriolet**

In its inimitable fashion, Porsche blasts open-air sports car driving to the next level with the introduction of the 2008 911 Turbo Cabriolet. This third generation, or 997, Turbo Cabriolet is Porsche's most powerful, nimble and environmentally friendly convertible to date. Embodying the soul of Porsche, this latest open-top Turbo bristles with the carmaker's most sophisticated technologies, delivering a level of road-going performance commensurate with its status as the pinnacle of the Cabriolet model range.

### **Highlights**

Like the two generations before it, the latest 911 Turbo Cabriolet shares its essential architecture with the latest Turbo Coupe, most critically, that car's 3.6-liter horizontally opposed six-cylinder engine with twin variable-vane turboschargers and its all-wheel drive.

As configured in the Turbo Cabriolet, that engine develops 480 bhp and 460 lb.-ft. of torque while meeting LEV-II emissions standards and being fuel efficient enough to not be penalized as a gas guzzler. The EPA rates the Turbo Cabriolet at 15 mpg in the city. The manual gearbox delivers 24 mpg on the highway test, and the Tiptronic S version 23 mpg.

Like the Turbo Coupe, the new Turbo Cabriolet is available with the optional Sports Chrono Package Turbo with its overboost feature that allows bursts of an additional 45 lb.-ft. of torque as desired by the driver.

Driving through either a standard-equipment six-speed manual or optional five-speed Tiptronic S transmission, the engine's output is maximized at all four tires by an electronically controlled all-wheel drive system, Porsche Traction Management (PTM), marking the first application of this technology on any Porsche Cabriolet.

### **Sure-footed in inclement weather**

Stability is further enhanced by Porsche Stability Management (PSM) and Porsche Active Suspension Management (PASM) allowing the enthusiast driver to confidently and fully explore the new Turbo Cabriolet's stunning performance capabilities. In factory tests, the new convertible with Tiptronic S transmission accelerated to 60 mph (96 kph) in just 3.5 seconds, track speed of 124 mph (200 kph) in 12.6 seconds and topped out at a track speed of 193 mph (310 kph).

With the manual transmission the Turbo Cabriolet accelerated to 60 mph (96 kph) in a mere 3.8 seconds, 124 (200 kph) in 12.8 seconds with a top track speed of 193 mph (310 kph).

It is worth noting that Porsche's experienced test drivers accelerated to 60 mph 0.3 seconds more quickly with a Tiptronic S-equipped car than in one with a manual transmission. This is another example of Porsche's engineers bringing higher levels of performance to a broad range of skilled drivers.

The Turbo Cabriolet is also certified as a Low Emissions Vehicle, category two (LEV-II) thanks to its engine's efficiency. Besides the twin turbochargers, the 3.6-liter boasts Porsche VarioCam Plus variable intake timing and lift system under the purview of its Motronic® engine controls.

### **Aerodynamically efficient and stable**

Like its Turbo Coupe sibling, the '08 Turbo Cabriolet boasts a distinctive and aerodynamically efficient body shell with a coefficient of drag of only 0.31 when its soft top is closed. In addition, this third generation Turbo Cabriolet marks the first time that Porsche engineers were able to match the extremely low lift coefficients of the Turbo Coupe, when the Cabriolet's roof is closed. Maximum high-speed stability is attained thanks to the split rear wing which automatically extends 2.56 inches (65 mm) when the vehicle is moving at approximately 75 mph (120 kph). This feature, unique to the Turbo Cabriolet, ensures maximum high-speed downforce on the rear axle for added driver confidence.

Knowing full well that electronic controls and aerodynamic aids need a solid base upon which to work, Porsche engineers created an extraordinarily stout body structure for the Turbo Cabriolet. The 2008 911 Turbo Cabriolet boasts a class-leading torsional stiffness of 9000 Nm/degree. The benefits of such structural rigidity extend well beyond crisp handling and smooth ride to occupant protection. The car's A-pillars and windshield frame are strong enough to serve as a front rollbar. This is complemented by a rear rollbar which automatically deploys from behind the rear seats in the event of a rollover. The Cabriolet's occupants are further protected in case of an accident by six airbags: dual frontal airbags as well as two seat-mounted front thorax airbags and door-sill mounted head airbags.

Porsche firmly believes that accident avoidance is the ultimate safety feature. The new 911 Turbo Cabriolet, like the Turbo Coupe, boasts awesome stopping power, thanks to 13.78-inch (350 mm) diameter rotor disc brakes at all four wheels. The front rotors are internally vented and are clamped by six-piston, fixed calipers. The rear rotors stopped by four-piston fixed calipers. For those drivers wanting additional braking performance, the Turbo Cabriolet is available with Porsche Ceramic Composite Brakes (PCCB).

### **Added features, not weight**

Despite the body's rigidity, Porsche engineers minimized its mass. The Turbo Cabriolet, with manual gearbox, weighs just 155 pounds (70 kg) more than its Coupe counterpart. Careful design and construction of the Cabriolet's folding top helped with the weight savings. The roof is made of fabric and lightweight metal, and the roof assembly weighs only 93 pounds (42 kg).

This minimal mass above the beltline, when the top is closed, helps contribute to the Turbo Cabriolet's low center of gravity, another important contributor to the car's stability.

The folding roof opens or closes automatically via a center-console mounted button, so either driver or front-seat passenger has access to it. Though it opens and closes most quickly when the car is at a standstill, the roof may be operated while the vehicle is moving at speeds up to 30 mph (50 kmph). Naturally, windows are automatically opened or closed by the roof mechanism as needed. The entire operation takes about 20 seconds when the car is not moving. As with previous models, a removable hardtop is available as an option.

### **Family resemblance**

Folding top aside, the new Turbo Cabriolet shares the Turbo Coupe's exterior features, including the iconic front air intakes and oval Bi-Xenon® headlights. Other Porsche 911 Turbo model hallmarks include LED directional indicators mounted in the front side cooling-air openings and the horizontally split air intakes for the turbocharger intercoolers mounted aft of the doors.

Like the Turbo Coupe, the 911 Turbo Cabriolet comes standard with leather upholstery and interior trim as well as a Bose® surround sound system with a seven-channel digital amplifier and 13 speakers. The Turbo Cabriolet also features Porsche Communications Management (PCM) including a navigation system as standard.

### **Body Details**

#### **Building on a solid foundation**

Mechanically and aesthetically, the newest 911 Turbo Cabriolet shares a great deal with the current 911 Turbo Coupe. Beneath the metal, however, are critical differences as Porsche engineers created an open-top body to meet their own exacting standards. These standards mandated a body shell with the necessary structural rigidity to deliver Porsche level high-speed handling, over-the-road comfort and occupant protection, while still being light in weight to maximize the engine's awesome potential for breathtaking acceleration and agility at speed.

The result is a Cabriolet body with a class-leading torsional rigidity of 9000 Nm/degree. Yet, the newest Turbo Cabriolet weighs merely 155 pounds (70 kg) more than its Turbo Coupe sibling. In fact, the 997 Turbo Cabriolet actually weighs less than the 996 Turbo Cabriolet it replaces, despite the new car's added features and technologies. The manual gearbox version is 11 pounds (5 kg) lighter; the Tiptronic S model 22 pounds (10 kg) lighter.

#### **Unbending principles demand a rigid structure**

Porsche engineers insisted that the floor and side panels are both spot welded and bonded for extra strength. They attached additional side-sill reinforcements at the floor's outer edges. These are plates welded into the side sills and to triangular joint plates at the door-hinge pillars at the rear and the A-pillars at the front. More structure is gained through the use of longitudinal arms, front and rear, along the car's body. These arms are of tailored blanks made of high- and ultra-high strength steel, laser welded.

The floor of the front luggage compartment has an aluminum triangular load-bearing structure. Besides adding frontal rigidity, the component absorbs crash energy and passes the impact forces to the longitudinal arms in the front of the car. This structure forms a load path, guiding impact forces at the front in the event of a collision to both wheel carriers at the sides and to the front axle final drive unit.

The load-bearing elements for the doors are pressure-cast light-alloy, another Porsche first. This is the first time such a frame has been used in a visible surface design on a production car. Besides bringing the stiffness and stability required, these frames reduce the number of individual components on the door to five. The combined weight savings of the new Cabriolet's aluminum doors and decklid are 31 pounds (14 kg) over the predecessor model.

Porsche engineers saved even more weight by using composite synthetic fiber for the rear decklid and its integrated rear wing.

### **Easy opening, lightweight weatherproofing**

As befits any Porsche Cabriolet, the new 911 Turbo Cabriolet has a classic soft folding top. Made of lightweight fabric carried on an alloy frame, the power-operated roof weighs only 93 pounds. And low mass was critical in the top's design since minimal weight above the car's beltline contributes to the car's agility and minimizes body roll in turns.

Thanks to the roof's three-layer construction, the top also delivers a high level of insulation, despite its low weight. The topmost layer is made of impregnated polyacrylonitrile which repels dirt and water. That outer layer receives an exclusive Porsche flame treatment which removes all the fine fluff on the fabric surface, helping keep the surface clean and giving the roof a homogenous look. That finishing touch for the roof's outer layer leaves the surface so smooth that it does not disturb the airflow over it any more than the standard metal top does, which is an outstanding contributor to the new Turbo Cabriolet's aerodynamics. The roof's intermediate layer is made of synthetic rubber, which insulates the passenger cabin from both noise and weather. The bottom, innermost surface is polyester, which helps the top keep its firm shape and gives the car's passenger cabin a cozy, luxurious finishing touch.

The front of the top carries a low-weight magnesium panel, mounted between the leading edge and the first roof support bracket, which adds stability to the assembly. Finally, a plastic panel inserted between the top's layers adds structure and further insulation. The rear panel of the top holds a heated glass backlite. When retracted, the top folds in a "Z" pattern, neatly protecting its components and retaining its crisp shape.

### **Staying dry on the fly**

The complete operation—opening or closing—including lowering and raising side windows as needed is completely automatic. There is no need to manually latch/unlatch the roof or secure its tonneau cover. The roof opens and closes automatically via a center-console mounted button. The process of opening or closing the roof takes about 20 seconds when the car is stationary.

However, since Porsche engineers know full well there are times when the roof may have to be raised quickly while on the move, the roof mechanism may be operated at vehicle speeds up to 30 mph (50 kph). Roof operation on the fly takes about 26 seconds.

As with the previous model, the Turbo Cabriolet may be ordered with an optional hardtop. The aluminum roof weighs only 73 pounds (33 kg) and has a heated glass rear window, which conveniently receives its necessary power from the roof's rear attaching points.

### **Coupe-like aerodynamics**

Critical to the engineers and designers at Porsche was that the new 911 Turbo Cabriolet deliver the same high-speed driving experience as its sibling, the Turbo Coupe. This meant, among other things, that the open-top model be equally aerodynamic and stable at high speeds as the fixed-roof version.

Like the 911 Turbo Coupe, the new Turbo Cabriolet has a drag coefficient of 0.31 when its soft top is closed, despite the fact that the roof is fabric, not metal. Equally impressive is the fact that the new 911 Turbo Cabriolet, with its roof closed, has the same low level of lift forces as the Coupe version. This car marks the first time that Porsche aerodynamicists have been able to accomplish this feat. As a result, lift forces on the front axle at the car's top track speed of 193 mph (310 kmph) are only about 18 kg, or 39.6 pounds. This translates to solid steering feel and superb stability for increased driver confidence, regardless of speed.

### **Sitting back solidly unlike any other**

Even more astounding is that the new Turbo Cabriolet benefits from approximately 27 kg (59.4 pounds) of downforce at the rear axle. That makes the new 911 Turbo Cabriolet the only production convertible in the world with rear downforce. To get optimum downforce, the Turbo Cabriolet's rear split wing extends a total of 65 millimeters or 2.56 inches, which is 30 millimeters or 1.18 inches further than the rear wing of the Turbo Coupe. The wing moves out automatically at 75 mph (120 kph). The wing retracts automatically when the car slows below 40 mph (60 kph).

As with other 911 models, the Turbo Cabriolet's underside is virtually smooth, practically covered front to rear. This careful attention to the underside keeps turbulence to a minimum as the airflow beneath the car is controlled. This required six polypropylene panels beneath the manual gearbox model's body. They cover almost twice as much area as on the previous model.

### **A steady, cool but quiet breeze**

Proper drivetrain cooling is ensured by three radiators. As with the Turbo Coupe, radiators are mounted behind vent openings in front of both front wheels. A third radiator is installed in the center of car's nose and is fed by large intake scoops. In addition, the intake scoops for all three radiators are connected to provide very efficient air distribution. At 186 mph (300 kph), 4000 liters of air per second flow through the radiators.

To minimize resistance, Porsche aerodynamicists developed a deflector blade to direct the air out of the center radiator. This guides the air down to the floor without creating any lift forces in the process.

In addition, the side radiator diverter blades are larger than before for improved airflow and to minimize lift forces on the front wheels. Finally, the front differential is vented by four front underbody channels. A rear opening vents the gearbox.

Superb aerodynamics in an open-top car also mean a quiet and buffeting-free passenger cabin. Porsche aerodynamicists broke new ground by using specially created test dummies to measure airflow and turbulence in an open cockpit. As a result, they were able to develop a wind deflector that minimizes cockpit turbulence.

### **Sharing a unique chassis**

As a member of the Porsche 911 family, the Turbo Cabriolet rides on the fully independent suspension pioneered for that series. As the top of the open 911 line, however, the Turbo Cabriolet also comes standard with Porsche Active Suspension Management (PASM).

Mechanically, the front suspension consists of Porsche configured MacPherson struts—with gas pressurized, electronically controlled single-sleeve shocks—longitudinal and lateral arms and antiroll bar. At the rear, each wheel is located by a multilink setup with five control arms, coil springs mounted over electronically controlled, twin sleeve gas pressurized shocks, with an antiroll bar. Essentially, these components are the same as those found under the Turbo Coupe, with some important modifications mandated by the Cabriolet's open roof. Specifically, the Cabriolet's rear springs are longer than the Coupe's to allow the extra downforce at the rear created by the additional extension of the rear spoiler.

Compared with its predecessor, the new open-air 911 Turbo has a lighter suspension, the four lightweight spring struts alone accounting for a nearly 6-pound (2.4 kg) weight savings. The car's stance has also been widened compared to the previous car, with 0.71-inches (18 mm) more front track and a 0.79-inch (20 mm) wider rear.

### **Right for the ride**

The shocks are all under the purview of PASM. Reacting to road and driving conditions, PASM adjusts the shocks individually, altering their firmness within fractions of a second. The driver selects one of two settings, Normal or Sports. The Normal mode provides a softer ride, with the system automatically switching over to a more sporting program as the driver becomes more aggressive. In Normal mode, PASM delivers a more comfortable ride over various road surfaces than a system with conventional shocks. The Sports mode activates a harder shock control map, comparable to the typical features of a sports suspension, and acts to minimize body roll during hard cornering.

For the new Turbo Cabriolet, Porsche engineers have enhanced the system to work in conjunction with PTM all-wheel drive and Porsche Stability Management (PSM). Constantly adjusting to the driver's style as well as conditions, these systems help the driver maintain control without intruding or coarsely wresting control from the driver. The result is an extraordinarily high-level of driver confidence while enjoying the car's impressive traction and high-speed stability capabilities.

The Turbo Cabriolet, like the Coupe, has power-assisted, variable-ratio rack-and-pinion steering as standard. The steering wheel is adjustable for both height and reach.

### **Deceleration to match acceleration**

Like all Porsche vehicles, the 911 Turbo Cabriolet boasts extremely effective brakes. The all-disc, antilock brake system uses large, 13.78-inch (350 mm) diameter rotors and fixed calipers at all four wheels. The front brakes have the same six-piston calipers as the Carrera GT, while the rears utilize four pistons. The caliper pistons have ceramic inserts which insulate them and help keep heat from transferring to the brake fluid during long periods of hard braking.

The brakes themselves are cooled by carefully directed airflow. In front, air moves through two openings in the front spoiler to a wide duct in one of the front underbody panels and on to the front axle. Unlike the previous model, the new Turbo Cabriolet's rear brakes also have dedicated cooling air ducts.

For even greater stopping power, the Turbo Cabriolet is available with Porsche Ceramic Composite Brakes (PCCB) as an option. Besides replacing the metal rotors with ceramic composite, PCCB brings rotors that are almost eight percent larger than standard: 14.96 inches (380 mm). Among the benefits of PCCB are a 50-percent weight reduction compared to metal brakes, quicker response, superb resistance to fade and zero corrosion.

Like the Turbo Coupe, the new Turbo Cabriolet rides on massive, low profile tires. For instant steering response, the front tires are 235/35ZR19 mounted on 8.5Jx19 inch light alloy wheels. The rear is carried by 305/30ZR19 tires on 11x19-inch alloy wheels. A tire-pressure monitoring system is standard equipment.

To save 22 pounds (10 kg) and space, the Turbo Cabriolet carries no spare tire. Instead the car has a small electric air compressor and emergency tire sealant. This allows the driver to safely drive at speeds up to 50 mph (80 kph) to have the tire properly repaired or replaced.

### **Powertrain Details**

#### **Astounding output per liter**

As with every Porsche Turbo sports car before it, the heart of the new 911 Turbo Cabriolet lies behind the passenger compartment: the unique Porsche turbocharged six-cylinder engine.

The 3.6-liter flat six develops 480 bhp (353 kW) at 6000 rpm, or an awesomely efficient 133 bhp (98.1 kW) per liter. Given the convertible's low 3649-pound mass, the 911 Turbo Cabriolet has an outstanding power-to-weight ratio of only 7.6 pounds/hp. But knowing full well that torque is what moves the automotive world, the Porsche engine designers developed a twin turbocharged engine that offers a peak torque of 460 lb.-ft. (620 Nm) available over an extremely broad range, from 1950 rpm to 5000 rpm. The optionally available Overboost feature briefly ups the torque peak to 505 lb.-ft. (680 Nm) from 2100 rpm to 4000 rpm.

As astounding as the Turbo Cabriolet's brutal acceleration is its miserly fuel consumption. The EPA rates the Turbo Cabriolet at 15 mpg in the city.

The manual gearbox delivers 24 mpg on the highway test, and the Tiptronic S version 23 mpg. Despite its segment leading performance potential, the Turbo Cabriolet does not carry a gas guzzler penalty.

The Turbo Cabriolet is also certified as a Low Emissions Vehicle, category two (LEV-II) thanks to its engine's efficiency. Besides the twin turbochargers, the 3.6-liter boasts Porsche VarioCam Plus variable intake timing and lift system under the purview of its Motronic® engine controls.

### **Power on tap, instantly**

Key to the turbocharged engine's potent efficiency is the use of variable turbine geometry (VTG). Essentially, VTG uses constantly adjustable turbine blades to vary the turbine's cross-section precisely to the exhaust flow regardless of engine load and/or speed. At low rpm, the blades close to form small air gaps. This causes the exhaust gases flowing through the small cross-section to accelerate, spinning the turbine quickly—as though it were a small, low rotating mass turbocharger. At higher rpm, with its inherently greater exhaust-gas flow, the turbine blades open, increasing their cross-sections and simultaneously lowering turbine speed, maintaining a constant intake charge pressure. The full range of movement of the turbine blades takes merely 100 milliseconds and is controlled by the engine's Motronic® electronic control module (ECM). Action of the variable turbo vanes is so precise that there's no need for a turbocharger bypass valve to limit maximum boost. The intake charge from each of the engine's two turbochargers is cooled by a dedicated intercooler, each located ahead of a rear wheel, as has been a Porsche Turbo hallmark.

The result of this sophisticated engineering and complex manufacturing is a turbocharged engine that responds to the driver's demand for more power immediately. There is no time lag between stepping on the throttle and the expected rush forward of boost. In fact, the VTG delivers its rewarding surge of power as quickly as an engine with a mechanically driven supercharger, but without the penalty of the supercharger's parasitic power drain on the engine.

### **More for those who want it**

To ensure the expected high level of engine response and long life, maximum intake pressure is set to approximately 14.5 psi, or 1 bar. The optional overboost feature briefly allows approximately ten-second bursts of 17.4 psi or 1.2 bar at the touch of a console-mounted button. On-the-road tests show that with Overboost, 50 to 75 mph (80 to 120 kph) passing time—without downshifting from second highest gear—is just 3.6 seconds, vs. 3.9 seconds without the use of overboost.

Porsche engineers measure boost levels at sea level, under full load and at an ambient temperature of 68°F (20°C).

### **Keeping it cool**

Though the VTG concept has been applied to diesel engines for some time, it has not been commonly used with gasoline engines due to the higher heat of gasoline exhaust. Diesel exhaust temperatures are much cooler than gasoline engine exhaust, which places far less thermal stress on the turbocharger's components.



Diesel exhausts are approximately 1250°F (700°C), compared with gasoline engine exhaust temperature of about 1850°F (1000°C). In order to allow the turbine blades to adjust, rather than be fixed, Porsche engineers had to tame the demon heat by rethinking turbocharger design and materials. To ensure both high performance and a long, trouble-free service life, the turbo designers created turbochargers with adjustable turbine vanes and double redundancy cooling. In addition to the existing oil cooling for the turbo bearings, the turbo also has a water cooling system *and* a follow-up pump to keep the bearings temperatures under control.

Regardless of turbo design, all turbocharged engines are subject to more stress than their naturally aspirated equivalents. Consequently, the 911 Turbo Cabriolet's engine is the same as the Turbo Coupe's. That means it is a liquid-cooled, flat, or horizontally opposed, six-cylinder with dual overhead camshafts, four valves per cylinder, variable valve lift and timing, distributorless solid-state ignition, sequential electronic fuel injection and twin turbochargers.

The engine consists of a split, pressure-cast, light-alloy crankcase. The block is made in usual Porsche fashion with camshaft housing, cylinder head and cylinder housings bolted to the crankcase. Based on decades of Porsche racing success, the engine's lubrication system is a dry sump design, with the oil carried in a remote reservoir. This configuration permits a more compact engine, critical for superb road holding. To ensure more than adequate engine lubrication, the Turbo Cabriolet has nine separate oil pumps. There are two oil extraction pumps for the turbochargers, two oil extraction pumps on each cylinder head, and two oil extraction as well as one pressure pump in the crankcase. The extraction pumps ensure proper lubrication during long periods of hard braking.

There are two oil coolers which transfer the heat from the engine oil to the engine coolant. The engine coolant itself releases its heat at three separate heat exchangers mounted in the front of the car. Radiators are mounted ahead of both front wheels in addition to one mounted in the car's nose.

The crankshaft spins in eight main bearings. The six forged light-alloy pistons pump in Nikasil®-coated cylinder liners. The 3600 cc displacement engine is a highly responsive short-stroke design, with a cylinder bore of 100 mm (3.94 inches) and piston stroke of 76.4 mm (3.01 inches). There are four valves (two intake, two exhaust) per cylinder operated by dual overhead camshafts. Fuel injection is electronic and under the purview of the Digital Motor Electronics control module, as is the distributorless solid-state ignition system, which boasts individual coils for each cylinder.

### **Two different camshaft profiles**

The DME also controls valve action via Porsche VariCam Plus. This valve management system adjusts intake valve lift and timing based on engine speed and load. Though the VarioCam Plus operates far too quickly for the driver to be aware of it, the results are obvious. The effect is that of an engine with two different intake camshaft profiles, one set up for smooth and efficient around-town driving, the other a high-performance camshaft designed for higher speed. These two designs usually each preclude the other and most cars have a compromise of the two. Porsche VarioCam Plus removes the compromise and the driver benefits from the best of both driving worlds.

Valve timing is controlled via a vane cell adjuster which continuously varies the two intake camshafts positions relative to crankshaft. The adjustment range covers a 40° range of crankshaft angle. Valve lift is varied by a system utilizing two cup tappets, one resting in the other. These tappets are actuated by separate cam lobes of differing size. The engine control module directs oil pressure to the appropriate tappet based on engine speed and load parameters. When non-pressurized, the tappet moves under the camshaft lobe, but exerts no pressure on the valve, in effect free wheeling.

### **Transmitting the torque to the tires**

Like the 911 Turbo Coupe, the new Turbo Cabriolet is available with a choice of transmissions: six-speed manual gearbox is standard equipment. A five-speed Tiptronic S is optional. Both boast closely-spaced gear ratios for rewarding performance as well as overdrive top gears for relaxed and economical cruising.

Despite the 911 Turbo Cabriolet's awesome torque, the engine's output is handily channeled through the six-speed manual. Clutch actuation is hydraulic. Gear changes are crisp and direct thanks to the compact design of the powertrain unit and the solid linkage.

The optional five-speed Tiptronic S allows the driver to permit the transmission to shift gears automatically or shift for himself via steering-wheel mounted paddles. In startling contrast to other makers' automatic transmissions, the Tiptronic S in the Turbo Cabriolet delivers quicker acceleration than is possible with the manual gearbox. In track testing with factory drivers, the open-top 911 Turbo with Tiptronic S accelerated to 60 mph (96 kph) 0.3 seconds faster than the Turbo Cabriolet with six-speed manual gearbox. And unlike other makers' automatic transmissions, the Turbo Cabriolet's Tiptronic S starts from a stop in first, not second, gear for a quick launch.

### **The comforting stability of all-wheel drive**

To ensure that the engine's output is put safely and competently to the road, all 911 Turbo Cabriolets are equipped with the Porsche all-wheel drive system, Porsche Traction Management.

Unlike other manufacturer's all-wheel drive systems with viscous couplings, Porsche Traction Management relies on the instant response of an electronically controlled, electro-magnetic multiplate clutch pack to distribute engine torque to the front and rear wheels as conditions demand. Since it is electronically controlled, Porsche engineers integrated PTM with Porsche Stability Management (PSM). The systems complement each other to deliver the most available traction for supreme driver confidence regardless of the situation or road surface.

### **The Porsche purist's bias**

For spirited driving fun and crisp response, Porsche vehicles have been rear-wheel drive since the marque's inception. This is still the case with PTM. In most driving situations, power is directed to the rear wheels. Within 100 milliseconds of detecting impending wheel slippage, PTM can redistribute engine torque to the non-slipping wheels.

By constantly monitoring input from throttle- and steering wheel-position sensors as well as wheel-speed sensors, PTM anticipates slippage before it can occur.

If the driver floors the throttle, PTM instantly directs some engine power to the front wheels to prevent the rears from braking traction. By comparing data from the steering-wheel position sensor with other input, PTM and PSM are able to detect both under- and oversteer and redirect engine power or even apply braking to individual wheels as needed. As expected with a high-performance sports car, both PTM and PSM are active at all speeds.

### **Always under the driver's command**

Given the demands and expectations of the typical Porsche driver, PSM has been designed to act seamlessly and all but invisibly. Porsche engineers programmed the system to allow the driver to fully enjoy the Turbo Cabriolet's agility and speed without coarse interference and abrupt actions. But the highly skilled, enthusiast driver who may wish to fully experience the Turbo Cabriolet's balance and ultimate handling limits can temporarily switch off PSM. Simply hitting the brake pedal instantly re-engages the system.

Even more traction for the 911 Turbo Cabriolet can be had with an optional mechanical differential lock with asymmetric distribution. The differential lock is available only with the manual gearbox and provides 22 percent locking under power, and 27 percent otherwise.

### **Safely ensconced**

Porsche engineers are fully aware that no matter how nimble a car may be or how skilled its driver, some accidents are unavoidable. They are also sensitive to the fact that the occupants of any open-top car can be more vulnerable than those in a car with a fixed metal roof. To ensure that the driver and passengers of the new Turbo Cabriolet are as well protected as possible, the car's designers took several critical measures.

All four seats on the new 911 Turbo Cabriolet have three-point inertia-reel seatbelts. The front units have belt-latch tensioners and force limiters. The seatbelts are supplemented by dual frontal, two-stage airbags and the Porsche Side Impact Protection system (POSIP), unique in an open-top sports car.

The POSIP safety system includes thorax airbags on the outside of the front seatbacks, head airbags in the doors, and side impact protectors in the doors. The head airbags are housed in the door-sill beneath the window. In the event of a side impact, both thorax and head airbags inflate, with the head airbag forming a flat cushion against the window opening.

### **Topless and topsy turvy**

Keeping occupants safe in case of a rollover is problematic in an open-top car. Porsche engineers, therefore, ensured that the windshield frame is strong enough to serve as a fixed rollbar, so there are ultra-high-strength steel pipes inside both A-pillars. At the rear, a similarly reinforced, spring-loaded U-shaped rollbar deploys instantly should dedicated rollover sensors detect an impending accident. Those same rollover sensors trigger the front seatbelt tensioners to secure the driver and front passenger in their seats.

## **Luxurious accommodations**

Identical to the interior of the Turbo Coupe, the new 911 Turbo Cabriolet features power windows, automatic climate control, height- and reach-adjustable steering column, leather upholstery and trim, and a Bose® surround sound system. In the new Cabriolet, Porsche Communication Management (PSM) with a navigation system is standard equipment.

The new Cabriolet has Porsche Turbo specific instruments with aluminum-colored faces, lit by white light-emitting diodes. The large center dial integrates the boost gauge in the form of a bar diagram.

As in the Turbo Coupe, the audio unit is a Bose® surround sound system with a seven-channel digital amplifier powering 13 speakers. However, unlike the Coupe, the bass speaker is mounted in the front passenger footwell, rather than in the rear. While the PCM with navigation is standard in the Cabriolet, a handsfree telephone with electronic log is optional. The PCM boasts a large 5.8-inch screen mounted beneath an MP3/compact disc player. A separate six-CD changer is available optionally. The DVD-based navigation system relies on a dedicated DVD player mounted in the luggage compartment.

## **Standard and optional**

Also on the list of standard equipment are automatic dimming exterior mirrors, a tire pressure monitor, and a radar-based antitheft system.

Among the additional optional features are the Park Assistant, which uses ultrasound to measure the distance between the bumpers and objects to the front and rear of the car and the Sports Chrono Package Turbo with overboost. Besides allowing the driver to command short bursts of extra engine torque thanks to brief periods of increased turbocharger pressure, this extraordinary feature provides the enthusiast driver with truly sporting settings of the engine control module, PSM stability system and PASM adjustable shocks, with the touch of the Sports button on the console and a stomp on the accelerator.

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