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2004 PORSCHE® 911® GT3: A PURE SPORTS CAR FOR THE PORSCHE PURIST

ATLANTA – The 2004 Porsche 911 GT3 is a car that has been acclaimed as the Porsche for purists.

Power to go, to flow, and to stop

However, the GT3 is no mere homologation special. Although it does not carry what weekend racers might consider to be unnecessary ballast – things such as a back seat – it remains a car that can be a daily driver.

380 horsepower without turbocharging

A reduction of the moving masses within the engine allows Porsche's 3.6-liter, six-cylinder horizontally opposed engine to spin more freely, producing more horsepower and torque while allowing the GT3 to maintain the same fuel consumption ratings as other 911 models.

The 2004 911 GT3 is rated at 380 (SAE) horsepower (at 7,400 rpm) and at 285 lb.-ft. of torque at 5,000 rpm. In first, second, third and fourth gears, the engine revs to 8,200 rpm before its computerized rev limiter is activated. Eighty percent of the engine's maximum torque is available at as few as 2,000 rpm.

For purposes of comparison, the 2004 Porsche 911 is rated at 315 horsepower (SAE), and the 2004 Porsche 911 Turbo provides 415 horsepower (SAE).

In track testing, the 2004 Porsche 911 GT3 accelerates from a standing start to 60 mph (97 km/h) in 4.3 seconds and achieves 100 mph (161 km/h) in only 9.4 seconds.

Brakes are bigger than the 911 Turbo's

To balance this power, the GT3 is equipped with 13.78-inch (350 mm) front brake discs and six-piston fixed calipers that increase the contact area between the pads and the discs.

The six-piston brake calipers are painted red in a carry-over of a Porsche tradition. The GT3's front discs are almost an inch larger than those on the 2004 911 Turbo. The rear discs are 13 inches (330 mm), just like the Turbo's.

Front discs are 1.34 inches (34 mm) thick, cross-drilled and inner-vented with cooling ducts patented by Porsche. The sickle-shaped ducts inside the discs act like a turbine, making a significant contribution to cooling behavior.

The rear rotors are 1.10 inches (28mm) thick, cross-drilled and inner-vented, and four-piston calipers are used.

To reduce the transmission of temperatures from the brakes to the hydraulic fluid, brake caliper pistons are separated by heat-insulating circonium ceramic inserts.

Enhanced aerodynamics provide several benefits

Precise streamlining of the car's body includes a swept-back nose, sculpted side sills and a fixed, large rear spoiler. These components reduce lift forces on both front and rear axles. Such improved aerodynamics and the more powerful engine result in a top track speed of 190 mph (306 km/h).

The aerodynamic package also provides more flow to cool the GT3's braking system. Spoilers are integrated into the vehicle's wheel wells to direct air to the brake discs and calipers.

The GT3's wheels also enhance brake cooling and in conjunction with the brake spoilers reduce temperature loads by 20 percent under racetrack conditions.

Weighty matters

The 2004 Porsche 911 GT3 weighs in at a mere 3,043 pounds, so each of its 380 horsepower (SAE) has less than eight pounds to propel. That is a better power-to-weight ratio than the 911 Carrera® or even the 911 Turbo.

In addition to lighter engine components including pistons, connecting rods and valvetrain, the GT3 has lightweight wheels and, of course, only two leather-covered seats.

Lighter components reduce rotating masses

Pistons are lightened – by nearly an ounce (.03 kg) per piston – through the use of shorter piston jackets. Piston pins are made of a new, high-strength material that reduces weight by another .9 ounce (.03 kg) per cylinder.

Titanium connecting rods have been lengthened, but precision forging and shot-peening reduces their weight by .075 ounces each.

These pistons and connecting rods run so smoothly that no vibration dampers are needed on the crankshaft. This saves nearly another five pounds in rotating masses. The crankshaft rides on eight bearings and has a plasma-nitrided finish that enhances its strength and stability.

Lighter valvetrain allows higher rpm

Porsche evaluated every moving component in the cylinder charge cycle in pursuit of weight reduction. Engineers were able to reduce the weight of the 2004 Porsche 911 GT3's valves by 19 percent.

Intake and exhaust valves have a dome-shaped profile. They also are .2 inches (5.1 mm) smaller in diameter. Valve tappets are specially hardened through carbon-nitriding, and the tappets also have a new ball-shaped bottom profile. These new tappets reduce valvetrain weight by more than 1 pound (.45 kg).

Meanwhile, the engine's intake and exhaust cams have sharper contours. The new tappets and cams allow for more rapid valve opening and higher valve lift. Double valve springs assure proper valve closure.

Friction between the various parts of the valvetrain has been reduced and therefore less oil flow is necessary for lubrication.

VarioCam® provides power, fuel economy and emission control

As with all Porsches, the GT3's engine benefits from Porsche VarioCam technology. VarioCam is an intake camshaft adjustment system that modifies valve timing to provide maximized power while enhancing fuel economy.

The GT3 uses the latest, infinitely variable VarioCam technology to achieve the finest tuning of engine characteristics including power, torque and emission management.

Fuel economy and emissions are further enhanced by the engine's ME 7.8 management system that features "E-gas" technology. The gas pedal and throttle butterfly are separate, which helps optimize both fuel consumption and emissions without any effect on the engine's immediate response to the driver's commands.

Performance-oriented air systems

The GT3 engine draws its air through an air filter but without needing an intake funnel. The intake manifold, which is made of light alloy, operates in two stages: a resonance flap remains closed in the 2,500-5,500 rpm range to provide high torque. Beyond the 5,500 rpm, the resonance ace flap is open in the interest of maximum horsepower.

The exhaust system is basically the same as on the 911 Carrera, so it features a twin-chamber design with exhaust gas from the left- and right-hand cylinders flowing separately through a lambda control oxygen sensor to the catalytic converter.

Motorsports-style engine design

Porsche uses the GT3 engine to homologate the engines it uses in international motorsports competition. Because of the need in racing to make changes very quickly, often in response to changes in regulations concerning engine displacement limits, the cylinder housing, cylinder head and crankshaft housing are combined into a single unit for the three cylinders on either side of the crankshaft. This also increases the engine's torsional stiffness.

Cylinder liners for the GT3 engine are made from a light alloy of aluminum coated with Nikasil. The cylinder heads are made of extremely temperature-resistant light alloy.

The GT3 engine also features dry-sump lubrication. With its oil tank separate from the engine, a dry-sump system can provide optimum lubrication even with the extreme application of brakes while racing. For the GT3, five oil pumps are used to provide the needed lubrication.

Six-speed manual transmission

As a car intended for true enthusiast drivers, the 2004 Porsche 911 GT3 is equipped with a six-speed manual transmission.

The gearbox also features splash oil lubrication and new external fluid cooling, similar to those used by Porsche racecars. A pump extracts the hot oil and sends it through an oil/water heat exchanger. After such cooling, the transmission fluid is sprayed as required on the individual gears, allowing more precise application to avoid "critical" temperatures in the gearbox.

Reinforced body

The 2004 Porsche 911 GT3 shares much of its body panels with the Porsche 911 Carrera 4. However, the GT3's body is reinforced to meet the demands it may face on the racetrack. These reinforcements provide both enhanced passive safety and also increase torsional stability by 25 percent. This stiffer chassis provides a platform for the car's suspension to perform as designed and engineered.

Carefully tuned aerodynamic package

The Porsche GT3 Cup racing program helped develop the car's aerodynamic package. The GT3 has an 0.30 coefficient of drag. A 1.5-inch (38.1 mm) deep "lip" spoiler around the front of the car significantly reduces airflow beneath the GT3. The position of the air vents guides most of the air coming out of the radiators directly to the brake system instead of beneath the car, where it could create unwanted lift.

Airflow around the rear wheels is improved by the aerodynamically optimized side sill covers as well as the wheel spoilers. As with all Porsche 911 models, the GT3 underbody is covered from the front axle to the engine by three large composite panels that enhance aerodynamics. These panels also enhance component cooling with vent openings at appropriate points.

The new fixed rear wing also provides new efficiencies. For racetrack events, the rear wing can be set to three different positions to match the aerodynamic balance to the specific track conditions.

Low center of gravity

The GT3 rides on firmer springs, shocks and anti-roll bars.

The anti-roll bars are adjustable and the suspension system is compatible with the use of race springs to fit various track requirements.

On the front, outside thread damper legs and height-adjustable spring plates provide the possibility for fine adjustments needed on the racetrack. At the rear, the anti-roll bars have four adjustment settings and the damper leg features a single-sleeve gas pressure damper for firmer response in compression and rebound modes. For competition driving, the rear suspension is built to accept outside thread damper legs and height-adjustable spring plates just like those on the front of the car.

Support bearings have a single ball joint resting on metal, not rubber. This allows precise damper piston pin mounting with only a minimal influence on axle kinematics when springs are compressed. This design also provides two assembly positions for the different camber of road and race tires.

Limited-slip rear axle

The GT3 is equipped with an asymmetric-control limited-slip differential. To get the engine's power safely to the road in a standing start, slip is limited to 40 percent. Once under power, the slip factor changes to 60 percent because the engine no longer is operating at its maximum torque and also because this configuration helps minimize oversteer under load changes through a turn.

Wheels and tires matched to car's potential

Eighteen-inch wheels have the GT3 logo on their hub covers. Front wheels are 8.5 inches wide and the rear rims are 11 inches wide. Tires are 235/40 ZR 18 in front and 295/30 ZR 18 in the rear.

Ceramic brake discs available

The GT3's stopping power can be further enhanced with optional Porsche Ceramic Composite Brakes (PCCB®) that are 50 percent lighter and reduce unsprung weight by nearly 40 pounds.

This optional setup features cross-drilled, inner-vented ceramic discs and special brake linings. PCCB offers advantages in both high- and low-speed braking. Compared to metal brake discs, abrasion is extremely low because of the very hard surface of the ceramic discs. This means a longer service life. Ceramic discs also are immune to corrosion.

ABS is the only electronic dynamic control

The 911 GT3's only electronic control system is the anti-lock braking system with intervention parameters matched to the car's chassis and suspension settings.

Interior designed to be efficient

The GT3's interior is available in three colors. The door trim, rear carpet, hand brake lever handle and the tachometer all feature the GT3 logo.

Thanks to the car's free-spinning engine, the green area on the tachometer extends to 8,200 rpm.

The two bucket seats are well bolstered and covered in leather. The seats weigh some 20 pounds (9.1 kg) less than the standard 911 Carrera seats, and another 17 pounds (7.7 kg) is saved by the lack of a rear-seating surface.

The three-spoke steering wheel can be telescoped as much as 1.6 inches (40.6 mm) for precise positioning for various drivers.

Standard equipment also includes driver and passenger front and side airbags as well as power windows, remote locks and an alarm system. Air conditioning and radio with in-dash CD are also standard.

The GT3 can also be equipped with bi-xenon headlights.

Extensive warranty

Every new Porsche car sold in the United States and Canada is covered by a four-year/50,000-mile (80,000 kilometer), bumper-to-bumper limited warranty, which includes Porsche's roadside assistance program. The galvanized body and 26-step paint and anti-corrosion process enable Porsche to warranty each car against rust perforation for 10 years and unlimited mileage. In addition, Porsche guarantees the paint will be free of defects in material or workmanship for four years or 50,000 miles.

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