

By
Michael Thiem

Photos by
Matthias Martin

There are no fewer than four compelling reasons to want the new Porsche 911 Carrera 4 and 4S all-wheel-drive models: their powerful engines, their reduced fuel consumption, and the new electronically controlled Porsche Traction Management (PTM) all-wheel-drive system. That's three. The fourth is more emotional in nature: these vehicles offer astonishing driving dynamics.

Premiere

A Car for All Seasons





Make way for fun: the test-drivers on the former airstrip in Gross Dölln venture to the outer limits of driving dynamics. Where Russian fighter jets used to take off to patrol the East Berlin skies, the Carrera 4S sticks safely to the road at 250 km/h (155 mph).

**In control on any surface and in any situation:
A switch on the steering wheel lets you shift manually**





Perfection in every detail—both in technology and in design: The Porsche double-clutch transmission (PDK) has eclipsed the old Tiptronic S with faster shifting times and lower fuel consumption. It has seven gears, which are shifted electro-hydraulically without interruption of the power delivery. Bi-xenon headlights illuminate the roadway—now also standard in the Carrera 4 models

The most important part came in the form of a hands-on model, courtesy of Porsche. At the driving presentation of the new Carrera 4 and 4S models at Liebenberg Manor north of Berlin, journalists watched a demonstration of the new all-wheel-drive technology, in the form of a full-scale model of the so-called ball ramp—a component consisting of a metal plate just 8 centimeters (3.15 inches) in diameter. It also has a second plate, two centimeters smaller, with 35 teeth, like a gear wheel. The plates are connected by six balls and an axle; when you turn them, the distance between them increases. This unusual component is the key element in the new all-wheel-drive system. This actuator ensures an excursion to the limits of driving dynamics; the guests at the presentation learned what the ball ramp, which weighs less than 500 grams—about a pound—can accomplish. The interplay between Porsche Traction Management (PTM), the Porsche double-clutch transmission (PDK), and the new engines has boosted power, driving fun, and safety as well.

Site visit to Gross Dölln: five kilometers (three miles) north of this village of 450 residents in the Uckermark district of the state of Brandenburg, there is a former Soviet air force base. To-

day, the 1,560 hectares (3,850 acres) of training area in the Schorfheide-Chorin Biosphere Reserve is home to Europe's largest driving training center. The deserted and dilapidated barracks are submerged in a thick deciduous forest. In the middle of it all is a runway three kilometers long and 100 meters wide (9,850 x 330 ft.)—ideal conditions for safe test-drives in the new Porsche all-wheel-drive models.

The Guards Red Carrera 4S Cabriolet is ready to start. The 3.8-liter boxer engine snorts one more time, a deep rumble that electrifies the neutral observers. The Sport Chrono Plus and Launch Control lights indicate all systems are go. Left foot on the brake, while the right floors the accelerator. At 6,500 rpm, the brake is released, and the vehicle almost seems to stand still. But just for a few milliseconds; then, the 385 hp send it off like a rocket. And that's exactly what the ball ramp helps achieve. The electronically controlled PTM, which has replaced the viscous multiple-disc clutch and had previously been installed only in the 911 Turbo, recognizes that a racing start is planned, and reacts immediately—it switches to 100-percent all-wheel drive. The multiple-disc clutch is closed, so that no wheels can spin. ▶

In interplay with the Porsche double-clutch transmission, the Carrera 4S accelerates to 100 km/h (62 mph) in 4.3 seconds. It sprints to 200 km/h (125 mph) in 15.9 seconds, and the measuring system tops out at 255.1 km/h (158.5 mph) at the end of the 2.4-kilometer (1.5-mile) track.

Russian fighter jets once took off from here at that speed to patrol the sky over East Berlin. But the Carrera 4S Cabriolet is certain to stay on the roadway—to demonstrate its power once again, this time with an emergency stop. The Porsche computer reacts within 100 milliseconds, and a ring magnet opens the ball ramp electrically again, in order to support the delay for sudden braking. In less than six seconds, the 911 is standing still. And the best part: throughout the braking maneuver with the Porsche Ceramic Composite Brake (PCCB), the 911 remains steerable and stays in its lane.

Dr. Erhard Mössle is at the track and is impressed, again and again. And yet the presentation of this kind of power is everyday routine for the overall project manager for the 911 Turbo, the Carrera 4, and the Targa 4. But these capabilities seem ex-

traordinary, even to this expert. “The possibilities of this system are virtually unlimited,” says Mössle enthusiastically. “The vehicle is more agile, the driver has a greater feeling of safety, and in every test situation he notices that the system is doing something to help him.”

One example is the slalom course. Half of the 200-meter (655-foot) track is dry; on the other half, a film of water simulates wintry road conditions. That calls for the PTM. Without the electronically controlled all-wheel drive, and with the Porsche Stability Management (PSM) turned off, the limits are reached very quickly. On a wet surface, the vehicle sometimes even loses control at less than 40 km/h (25 mph). That makes the dynamic handling systems of the new Carrera 4 and 4S all the more impressive in the next round. As soon as the rear swings out when the acceleration in front of the pylons is too great, PTM immediately directs more torque to the front axle. Provided the speed isn’t too high, the car almost literally turns as if it were on rails. “It’s impressive, the way this vehicle can be stabilized,” says Mössle. And Porsche instructor Gunnar Wilss radios a kind of weather forecast into the cockpit of the test-drivers: “Do you feel the traction? The PTM is dragging you back in the right direction. This is the kind of thing that makes you long for a real winter again.”

The Carrera 4S presents itself proudly and dynamically on Brandenburg’s country roads



Whether on snow or a dry road, the power distribution between all four wheels has long since become a question of active safety. In the 911 all-wheel-drive models, the close relationship between the most important drive components is a key factor. The engine and the transmission have never meshed so well. It takes at most a hundred milliseconds to evaluate such data as engine torque, steering angle, wheel speed, and the driving-dynamics signals. The vehicle “thinks ahead,” and can help defuse dangerous situations before they even arise. With the previous viscous multiple-disc clutch, a rear wheel first had to spin before the front axle would go to work. Now, supported by the ball ramp, the PTM reacts and transfers the torque before any slip occurs. The discs are pressed together in an infinitely variable process in reaction to the longitudinal path that the actuator travels. The more the ball ramp presses itself together, the more torque transferred to the front axle. Even if many a Porsche fan would shudder at the idea of a front-wheel drive mode, even if it is only temporary, they may be convinced by the traction it provides when accelerating out of a curve.

The 4.43-meter (14.53-foot) all-wheel-drive Porsche roars into the first hairpin turn on the handling course at almost 180 km/h (112 mph). Braking. Acceleration. The forces acting upon the vehicle are enormous. But the driving power is optimally distributed. The locking differential on the rear axle, a standard feature, also shows how well the Carrera 4 family is designed for driving dynamics. It locks 22 percent under power and 27 percent in overrun mode, thus improving traction on variable road surfaces and in sharp turns, and optimizing driving stability in case of a load shift in curves. This feature enhances cornering performance and can boost driver confidence.

The journalists took models of the ball ramp home with them as souvenirs. With that component in your baggage, you can really explain the operation of the new all-wheel drive, even at the security gate at the airport. ◀