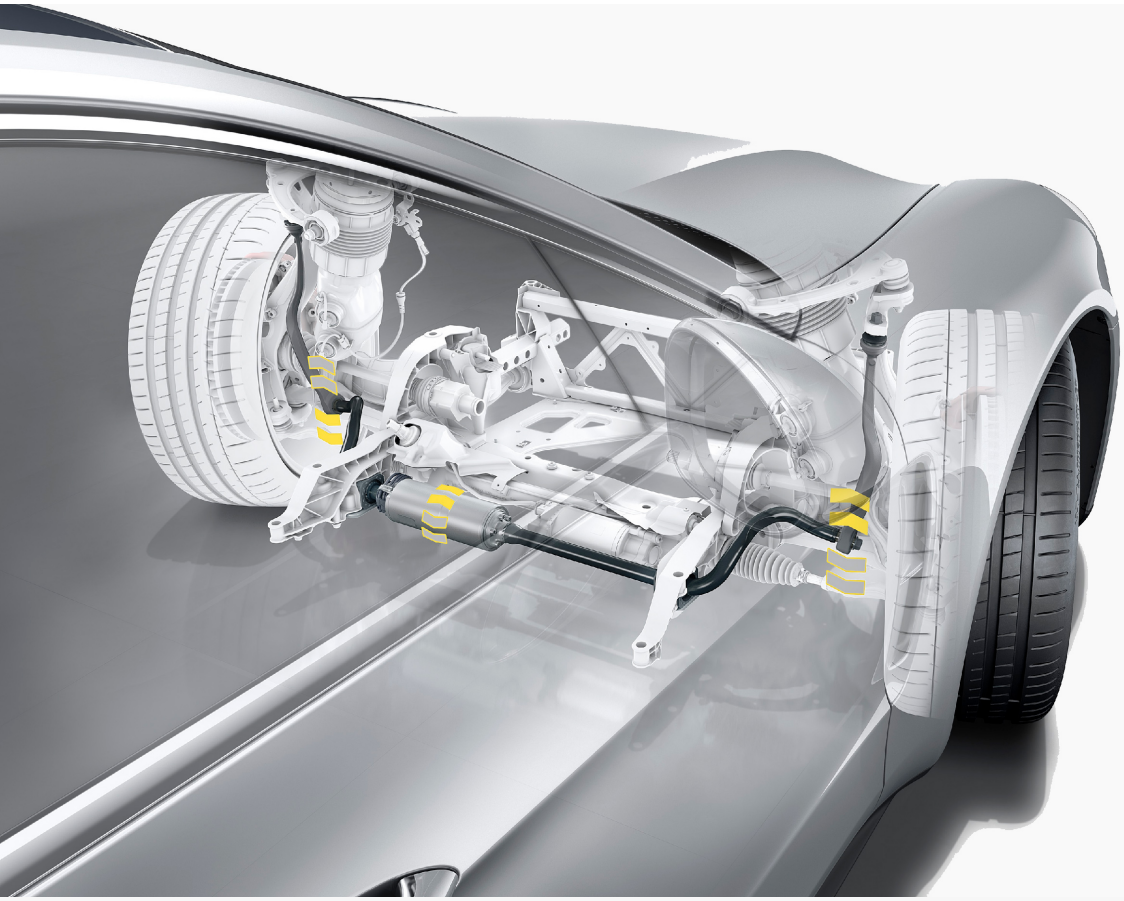


Active Balance

06/04/2017 It almost seems as if Porsche has outwitted physics itself with the new Panamera. One of the many reasons for this superb feel is the Porsche Dynamic Chassis Control Sport (PDCC Sport), an active anti-roll stabilization system.

It's what keeps the laws of physics at bay and the Panamera parallel to the road even in high-speed cornering sequences. Magic? No. It's Porsche engineering acumen! The two central components of the PDCC Sport system are the electromechanical anti-roll bars on the front and rear axles. Porsche integrated an electric motor into each of the anti-roll bars; the motors connect the right and left anti-roll bar halves in a manner that allows them to twist in opposite directions. When the Panamera drives into a corner, the motors kick in and keep the Gran Turismo perfectly horizontally balanced on the asphalt.

A look at the details illuminates exactly what takes place. It's instructive in this regard to take a brief look at the general function of a purely mechanical, passive anti-roll bar—a twistable bar connecting the two wheel suspensions of an axle. If a wheel and its suspension are compressed through a corner and the opposite wheel is pushed away from the body, the twisting of the anti-roll bar distributes the forces and limits the compression and decompression of the wheels. The anti-roll bar, therefore, reduces the

lateral inclination, or body roll, of the car. But there are limits. If the forces and suspension travel are too large, the body tilts distinctly to one side and driving stability suffers. Even the first Panamera had active anti-roll stabilization, but that was a hydraulic system and not an electromechanical system like the one in the new Panamera.

The components and function of the PDCC Sport

Hydraulic systems require a permanently powered pump and therefore use more energy than an electromechanical solution that is only active temporarily. Moreover, an electromechanical anti-roll bar reacts more quickly. This is why, for the new Panamera, Porsche developed such an economical and dynamic system. It requires a 48-volt energy supply, rather than a 12-volt system, to provide the power necessary to twist the anti-roll bars. Another advantage: the 48-volt system is more compact, as the higher voltage with the same output makes it possible to use cables with substantially smaller diameters, for example.

The components and function of the PDCC Sport in detail: the electromechanical components are located in the center of the anti-roll bar. They consist of an electric motor, a sensor board (which records and stores important parameters of the anti-roll bar), and a gearbox. Outside of the anti-roll bar, the control unit is integrated into the car. If the vehicle drives into a corner, the electric motor instantaneously twists the left and right halves of the anti-roll bar in opposite directions. In doing so, it generates massive torque, which reduces the compression and decompression of the wheels beyond the capabilities of a purely mechanical anti-roll bar, effectively suppressing the roll of the Panamera. This horizontal balance results in driving dynamics that are ordinarily reserved for upper-echelon sports cars like the Porsche 911.

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