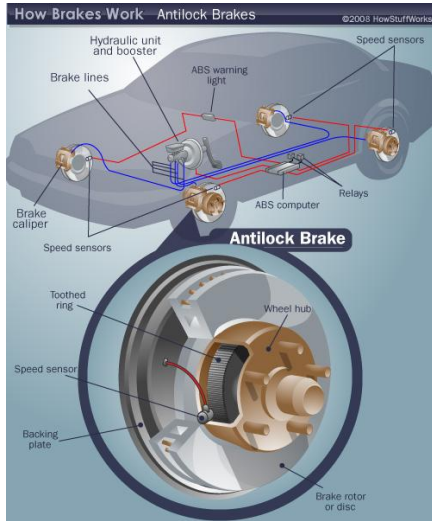


## Just the Basics -10 - Alphabet Soup

When I got my Porsche from Roy, he was very diligent about explaining all of the nifty drivers' aids the car had. Of course, I was thinking the entire time, "Just gimme the keys and let me go play with my new toy!"

If you didn't get the spiel, weren't listening or just want to get an idea of what is happening with the newer Porsche cars, you are in luck! Here is a list of what the electronic 'nannies' are and what they do to help drivers. A lot of the info is from Porsche and some is my 2 cents worth. When in doubt, always check with Porsche. It should be noted that other manufacturers have similar systems but usually have different names.



**ABS – Antilock Brake System.** (Introduced in the early '70's). ABS prevents lock up of brakes by releasing and grabbing the wheel(s) that is locking. You may feel shuddering or vibration in the brake pedal in older systems. This is NORMAL!!! Do NOT release brake pedal!!!!

You may also hear some tire squeal, particularly on dry roads. This is normal too. There is some information about this in the Friction Circle and Slip Angles topic.

**PSM – Porsche Stability Management** (or 'Please Save Me!' to track junkies). It uses ABS to brake a wheel that is slipping on acceleration. This system worked in tandem with ABS and automatically maintains stability even at the limits of dynamic driving performance. Sensors continuously monitor the speed, yaw velocity (rotational movement, or over/understeer) and lateral acceleration (side G forces) of

the car in a turn. Using this information, PSM is able to calculate the actual direction of travel at any given moment. If the car begins to oversteer or understeer, PSM reduces power and applies selective braking on individual wheels to restore stability.

Under acceleration on wet or low-grip road surfaces, PSM improves traction – as well as agility and safety – using the automatic brake differential (ABD) and anti slip regulation (ASR).

Integrated ABS is designed to minimize braking distances.

If you prefer an ever sportier drive, PSM can be switched off. For your safety, however, PSM remains set to intervene if the vehicle is braked and ABS assistance is required. ABS and ABD remain switched on at all times. Also included with PSM are engine drag torque control (EDC), precharging of the brake system and brake assist. If you suddenly release the accelerator pedal, PSM automatically prepares for your next action: the braking system is precharged so that the brake pads are already in light contact with the brake discs. Maximum braking power is therefore achieved much sooner. Brake assist detects a panic braking situation and generates the brake pressure required for maximum deceleration.

**One concern:** If you get tires that are wider than normal, the sidewall height must be revised so revolutions per mile are similar to the stock set up. Too much difference between the front and rear revolutions per mile will cause PSM to intervene when not wanted or needed. Tire Rack has revs per mile stats on all their tires.

Personally, I do not like PSM on a track car. Even if I switch it off, it automatically resets itself under braking in turn #1 at Roebing Road. As I come around turn #2, I am on the throttle and intentionally using some oversteer. In the middle of the turn, when I am counting on the weight in the rear, the power is cut and the PSM applies the brakes to my right rear wheel. You maintain control, but it is not a fun thing. PTV and Sport buttons may solve that problem.



**PASM - Porsche Active Suspension Management** is the electronic damping (shock absorbing) control system. It actively and continuously regulates damping forces according to driving style and road conditions. In addition, the suspension is lowered by 10 mm. PASM has two modes, which can be selected using a separate button on the centre console: ‘Normal’, which is a blend of performance and comfort, and ‘Sport’ or “Sport Plus” where the setup is much firmer.

To ensure efficient control interventions, a multitude of sensors in the 911 record the body movements that accompany powerful acceleration, braking or uneven road surfaces. The PASM control unit evaluates the driving conditions and modifies the damping force on each of the wheels in accordance with the selected mode.

In ‘Sport’ mode, the suspension is set to a harder damper rating. On uneven roads, PASM immediately switches to a softer rating, thereby improving contact between the wheels and the road. When the road surface improves, PASM automatically reverts to the original, harder rating. If ‘Normal’ mode is selected and the driver’s style becomes more assertive, PASM automatically switches to a harder rating. Damping firms up, and driving stability and road safety are increased.



#### **The SPORT button**

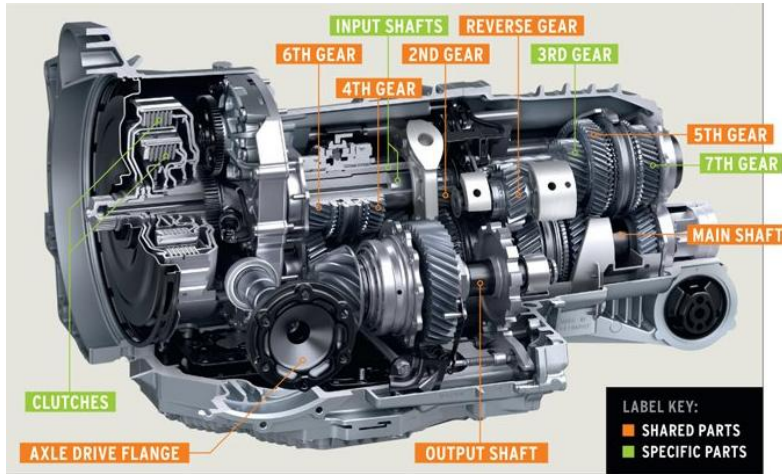
The **SPORT** button enables you to select a suspension setup where the emphasis is on either comfort or sporty performance as mentioned in PASM.

Also, the electronic engine management system switches the engine mapping to offer an even sharper response. In **SPORT** mode, Porsche

Doppelkupplung (PDK) ensures that upshifts take place at higher engine speeds and downshifts happen sooner. Coasting mode and the auto start/stop function are deactivated.

In **SPORT PLUS** mode, the electronic engine management makes the engine even more responsive. It will hold gears longer (PDK) and it will search for a lower gear when possible. In **SPORT PLUS** mode, the trigger threshold for PSM is raised. Agility is perceptibly enhanced when braking for corners with PSM, allowing sportier braking and exit acceleration.

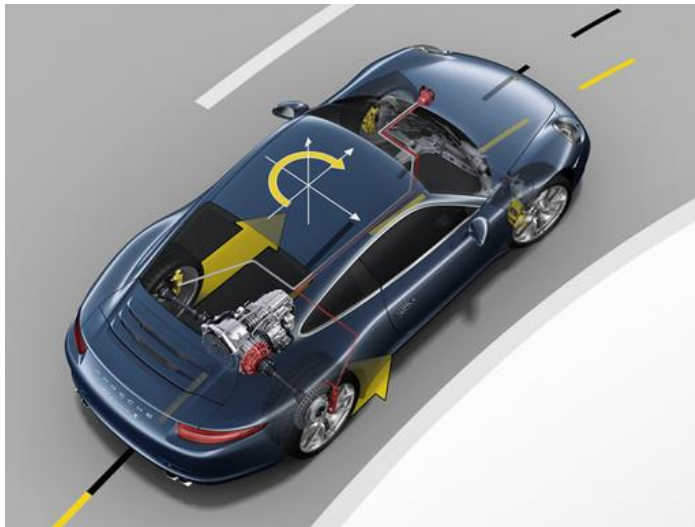
I advise track participants to use the **SPORT** mode only. In **SPORT PLUS** mode, the transmission may downshift unexpectedly. If a driver encounters a situation where they feel uncomfortable, such as carrying more speed on the straight than they are used to or carrying speed through a turn, they tend to lift off the throttle a bit. Having the car downshift at this point can cause further consternation and possibly loss of control. **SPORT** mode gives novice drivers all the performance they need.



**PDK – Porsche Doppelkeplung**  
Doppel (twin or double) keplung (clutch) transmissions have been around since the 1920's, but was not adapted in auto use until Porsche did it in 2005.

The design of the PDK is similar to two conventional gearboxes in one. The odd numbered gears are housed on one assembly and the even numbered gears on another, each assembly having its own clutch. While one gear is engaged, PDK

pre-selects the next gear based on driver input. If you are accelerating, it will pre-select the next higher gear. If you are braking it will select the next lower gear. When the next gear is requested, drive is switched from one clutch gear to the other in milliseconds, delivering gear changes with no loss of drive. Gear changes take place in approximately 0.08 seconds. It automatically blips the throttle when downshifting resulting in a smooth transition under all situations. The PDK gear box is smaller than a traditional box because the gears do not have to be in sequence like a manual transmission. Since a computer does the selection, it can choose from any location on the assembly. A large first gear could be next to a small sixth gear for example.



**Porsche Torque Vectoring – PTV and PTV +.** As a function of steering angle and steering speed, accelerator pedal position, yaw rate and vehicle speed, PTV and PTV Plus are able to improve steering response and steering precision by specific braking of a rear wheel. To be more precise, this means that when the car is driven assertively into a corner, moderate brake pressure is applied to the inside rear wheel. Consequently, a greater amount of drive force is distributed to the outside rear wheel, inducing an additional rotational pulse (yaw movement) around the vehicle's

vertical axis. This results in a direct and sporty steering action as the car enters the corner. At low and medium vehicle speeds, PTV (Manual) and PTV Plus (PDK) significantly increase agility and steering precision. At high speeds and when accelerating out of corners, the rear differential lock ensures greater driving stability. With PTV, the differential lock is regulated mechanically; with PTV Plus, it is regulated electronically and the torque distribution is infinitely variable. Whichever system is fitted, it interacts with Porsche Stability Management (PSM) to improve driving stability on a range of surface conditions, including the wet and snow. For the driver, this means remarkable stability, easier handling and outstanding traction as well as greater agility at every speed with precise steering and stable load transfer characteristics.



### **Porsche Dynamic Chassis Control – PDCC**

PDCC is an active anti-roll system that suppresses lateral body movement during cornering maneuvers. In addition, it minimizes the lateral instability of the vehicle on uneven ground.

This effect is achieved with the aid of hydraulic stabilizing actuators in the form of cylinders designed to optimize camber. Lateral roll is counteracted by forces generated at each individual wheel, based on steering angle and lateral acceleration.

The results are improved dynamic performance and increased ride comfort at all speeds, as well as optimized turn-in and stable load transfer characteristics.

In simple terms, the tires and vehicle hold the road better and you can steer through corners faster and in a more relaxed manner.

PDCC sets standards for handling performance, ride comfort and driving pleasure. Your ‘usual’ way suddenly becomes the Porsche way.