



*By Bill Gilbert for the NNJR Chief Instructors*

### Summary

- PSM must stay ON
- AEB (auto braking) and LKA (lane keeping) must be turned OFF before each on track session
- Drivers are often unaware of how PSM and traction control are helping them stay on track. Drivers and instructors must look for PSM lights, unusual rear brake wear, and more.
- “Track,” “Drift” and similar modes in other marques should not be used.

### Background

With every new model, Porsches (and other marques) get delivered with more sophisticated “driver aid” technology (sometimes referred to as “electronic nannies”). DE instructors are often concerned that these traction control and stability management systems hide driving mistakes by students. Put another way, if the student were driving the same way in a car without these technologies, they would be off the track. In this article, we’ve pulled together the best current advice we can find for instructors (and students) to deal with these technologies.

First, a few terms.

- PSM, Porsche Stability Management, is often referred to as “Please Save Me.” PSM looks for pending understeer, oversteer or spin and brakes one or more wheels to counteract the undesirable car behavior. It will also act as traction control using the brakes and/or throttle.
- On some Porsches, ABD (Automatic Brake Differential) and PTV (Porsche Torque Vectoring) are tied to PSM; they use the rear brakes and the throttle for traction control.
- Of course, ABS (Anti-Lock Braking System) uses a computer to prevent brakes from locking by quickly releasing, then reapplying the brakes.
- Other technologies that come into play are PASM (essentially a smart suspension), Sport mode settings (“Sport”, “Sport +”), rear wheel steering, PDK transmissions, Lane Keeping and AEB (auto braking) systems.

The major technologies are described below.

- But first, the most common question: should I turn PSM off? Short answer: NO.
  - Long answer from Cass Whitehead, Chief Driving Instructor at the Porsche Driving School: before you turn PSM off, tell me exactly where and why it came on during the last 5+ laps. (Autocross and Car Control Clinics are good places to learn what happens when PSM is off; the track is not).

For instructors: make sure your students leave PSM and Traction Control on. It is highly unlikely that a Green, Yellow or Blue student has any reason to turn it off. If you are instructing an intermediate or advanced driver, leave PSM on and help them figure out where PSM is active (see PSM section below).

For drivers: don’t expect an instructor to ride with you on track if you turn PSM off. If you are a solo driver and thinking about turning PSM or traction control off, re-read Cass Whitehead’s advice several times along with the details on PSM below. And remember that we are aware of many drivers, including very experienced ones, who crashed immediately after turning PSM off.





## Electronic Driver Aid Technologies on Track

ABS and ABD/PTV cannot be turned off. Sport and Sport+ are often chosen by the driver when going on track but they may not be appropriate for novice drivers since they can make the car more sensitive and add to the overload (esp. Sport +). It's also worth noting that Cass Whitehead says Sport+ isn't always the fastest, even for a pro driver. For those with a PDK, there is another choice: manual or automatic? Answer: automatic until the driver is very competent with everything else.

A newer technology is automatic braking. It is on some Porsches since 2017 called Automatic Emergency Braking System (AEB), on some newer BMWs and most other new cars. AEB is now standard on most new cars sold in the US. PCA has issued guidance saying these systems must be turned off.

Some newer Porsches also have Lane Correction / Lane Keep Assist. This technology makes automatic steering corrections to keep the car centered in its lane (by reading the lane markings). Like AEB, it is also common on BMWs and many other cars including late model Corvettes. Like AEB, these systems must be turned off and stay off to drive on the track.

If your car has either or both of these systems, it is your responsibility to know how to turn them off and to do so. If your student has a newer car, you should always ask about these systems, preferably in your introductory email so that the student has time to study their owner's manual.

### IMPORTANT NOTES:

1. Most AEB systems will only stay turned off while the engine is running. As soon as the car is turned off, they default to ON. Therefore, it is necessary to turn the system off prior to each on-track session. The same may be true of some Lane Keep systems.
2. It is critical to know that these systems stay turned off and can't reactivate while driving on track. At this time, we believe that all Porsche, BMW and similar high performance cars will not reactivate while driving. But this may not be true of other cars. We will update this document if/when we find examples where AEB (or Lane Keep) does not stay off. These cars will not be allowed on the track.

### Other Marques: "Track", "Race", "Drift" Modes

Today, not only Porsche but also Audi, Corvette, Ferrari, McLaren and other manufacturers offer DE capable cars with over 450 HP; they often come with advanced systems designed for track use by experienced drivers in ideal conditions with specific track tires. It is critical to acknowledge the aggressive nature of these track, race and drift modes: they significantly increase the risk of losing control of the car on track, especially for drivers who may not be accustomed to the nuances of these high-performance settings.

- If an instructor is in the car, these modes must not be engaged.
- Drift mode should never be engaged at an NNJR DE. Any mode that locks the differential is also prohibited.
- If you are considering using one of these modes, please inform an NNJR Chief Instructor before going on track.



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## ABS



ABS is the oldest technology (on Porsches since 1985) and fortunately one that the driver and instructor can feel and (usually) hear. It is also easy to use as a learning tool. If ABS has been activated on a dry track, the driver has just driven over the limit and it's time to brake earlier. For those looking for the last tenth, remember that peak braking force occurs just before ABS kicks in.

As instructors, we wish the other technologies were so obvious to the driver.

## PSM



PSM (generically Electronic Stability Control) first showed up in 1998 as an option on 996 and Boxster and was standard on all models by 2005. A second generation of PSM was introduced on the 997, 987 Boxster and continued to 991.1. The latest, third generation is on 991.2, 992 and 718. Here is a summary of their characteristics:

- First gen PSM can be somewhat intrusive for a skilled driver but it does turn on a dashboard light when activated. It can be turned off, though it will reappear in certain emergency situations (e.g. ABS activation on both front wheels).
- Second gen PSM limits are affected by Sport and Sport + settings. The limits are higher (less intrusive) with each step. Pro drivers say they can drive as fast with second gen PSM on as with it off and never have the PSM activate.
- Third gen PSM is not affected by Sport settings (which are set with a rotary knob). PSM has its own buttons: Normal, Sport and Off. Sport is even less intrusive for a talented driver but novice drivers should leave PSM in Normal.



In theory, if any PSM is active, the driver should see a light on the dash. In practice, many drivers never see the light even when activating PSM on several corners every lap. In some cases, the instructor may be able to see the light but often it is hard to see. As a result, instructors need to trust the “seat of their pants” about what is happening. Often there will be a slight wiggle or other unusual feeling. For yellow and especially blue and more advanced students, instructors should ask the student to find the PSM light before they go on track and ask the student to glance at it regularly.

As a student starts going faster, they will probably trigger PSM. Best case is that the student and instructor see/feel it. Both then know that they’ve reached the limit or made a mistake .

For students who have done several events, we can ask: How often do you have to replace rear brake pads vs. the fronts? We can also look at the rear calipers. If the rear calipers are discolored (we’ve seen purple calipers on Caymans) or the rear pads are being replaced as often as the fronts, then we know that PSM has been active.

Cass Whitehead talks about using PSM as a learning tool “with an occasional nibble.” Ross Bentley and other expert driving coaches say essentially the same thing. I strongly recommend reading Speed Secrets Weekly 207 for several expert views, all of whom clearly advise against turning PSM off. Here is one quote from Ross:

*“If a driver is unable to do what I'm talking about here - knowing the limits of their car with the driver aids on - there is no way they should turn them off.”*

### **PTV, ABD, etc.**

If PSM activation is sometimes hard to discern, PTV/ABD is even worse. We are aware of highly experienced drivers who were unaware they were triggering PTV. And there is no light on the dash to tell us! As a result, instructors have to become a detective. For a novice driver, these systems generally shouldn’t come into play, except for someone seriously overdriving the car. For students who have done several events, we can ask: How often do you have to replace rear brake pads vs. the fronts? If the rear pads are being replaced as often as the fronts, then we know that PTV has been active. 991’s, 992’s and 718 generation Cayman’s deserve special attention since these systems are so seamless for the driver. One technical note: PTV, ABD etc. are linked to PSM; i.e. run by the same computer so that they work in an integrated fashion. But it doesn’t matter to the instructor which one is active: we just want to know that the computer is helping the driver.

If you would like to learn more about these systems, check out [this detailed explanation](#).

### **Rear Axle Steering**

Rear wheel steering helps at both low and high speeds. For our purposes, the high-speed effect is that a car turn in much more quickly and may surprise the driver and/or instructor. In some cases, instructors will need to have their student slow down their hands and/or adjust their turn in points. It also makes a heavy car (e.g. 911 Turbo) feel much lighter, which could lead to over confidence on the part of the driver.





### Automatic Emergency Braking and Lane Keeping Systems

As noted above, for the safety of all participants PCA does not allow vehicles with AEB or Lane Keep to run at PCA DE events unless the system can be and is turned off. Here is the PCA minimum standard

- Cars with Automatic Braking and/or Lane Drift Correction Systems / Lane Change Assist will only be allowed to participate in DE events if the systems can be turned fully off while the car is on-track. Proof of the ability to fully shut off these systems must be provided (i.e. information in Owner's Manual, etc.).

### Summary

Many instructors wish that all students would learn to drive in an older car without any stability management or traction control (maybe ABS). But that day has come and gone. As a result, we all have to learn how to read the electronic aids in ways that assist our students. Our first objective is to keep our students and ourselves safe. This means leaving the electronics active (except Automatic Emergency Braking and Lane Keeping Systems) in all on-track situations and explaining to our students why this is the best way to learn. The second objective is to use the electronic limits as a teaching tool. This means helping our students know when they are active so they can adjust their driving to not trigger them. We should strive to avoid the situation where a driver becomes dependent on stability management or traction control but doesn't know it.

The NNJR Chief Instructors invite further comments and suggestions for dealing with the challenges posed by electronic driving aids.

