



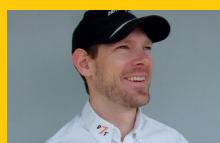
# DON'T STOP ME NOW!

In this month's coaching article, Porsche Driving Consultant, Neil Furber, reveals the secrets of trail braking...

If you've been following this series of driver coaching articles, you'll have noticed I keep referencing trail braking. Finally, it's time to look at this subject in detail. At the simplest of levels, trail braking is the process of releasing the brake pedal as you turn in to a corner. It's an exchange from braking to steering, a complete contrast with the safe, stable cornering achieved by core technique, as outlined in the October 2019 issue of *GT Porsche* (order a copy at [bit.ly/issuesgtp](http://bit.ly/issuesgtp)). Trail braking improves front end grip

dynamically to improve car rotation and corner entry. Get it right and you'll enjoy many benefits. Get it wrong, however, and disaster awaits!

When it comes to performance driving, possibly the hardest thing to learn and get right is *how* to release the brake pedal, especially when blending with corner entry. Trail braking is an advanced technique – you aren't trail braking simply by releasing the brake pedal in a bend. To help understand what trail braking is, here's a couple of typical scenarios.



## DRIVING FORCE

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## AGILITY THROUGH INSTABILITY

We'll consider a keen beginner arriving at a bend a little fast. Perhaps they'll brake late, turn the steering wheel whilst still on the brake pedal (due to continued excess speed) and then, hopefully, get off the brake pedal somewhere early in the bend. If all goes well, our beginner can get back on the throttle with minimal gathering up mid-bend. It may feel fast, but we're talking drama rather than actual speed. Perhaps you can identify with this? Perhaps you're already working on planning your braking and your transition to the throttle ahead of the curve to maintain balance?

By contrast, let's analyse an expert navigating their way around the same bend. Perhaps they'll brake late, turn the steering wheel whilst still on the brake pedal and release the brake during the bend. Perhaps a quick adjustment at the wheel, back to the throttle pedal, and off up the next straight. No drama, real speed. But wait! This sounds similar to the beginner's efforts. Indeed it does. The difference is in the way everything has been done, as well as subtlety in timing and knowledge of what to expect.

During the first example, our beginner may have been lucky. If road conditions, entry speed, cornering line or exact driver inputs pushed any one of the car's tyres to the limit of grip (a topic covered in



the March 2020 issue of *GT Porsche*), there was potential for a loss of control, even if the driver makes a few adjustments or some electronics pull the car back in line. For heavy brake pressures the car may have run wider than desired – much of the front tyre grip is used for braking, leaving little for steering. A sudden brake release mid-bend, once speed is low enough to feel comfortable, can introduce a sudden rotation as the front tyres 'bite'. This could lead to the tail stepping out. We're talking corner entry understeer and mid-corner oversteer here. For lower brake pressures, the car may have felt more

dynamic, more agile, or, perhaps, the tail may have stepped wide as the rear of the Porsche lost grip.

The closer you push towards tyre limits, the more sensitive your Porsche will be to your inputs. Mid-engined driving dynamics amplify this and reward you most when you get it right. This is much of the pleasure gained from driving a Boxster or Cayman. If there's one important lesson here, it's that turning into a corner whilst braking creates agility through instability. Make the car too agile and it can have significant consequences for your wallet!

## FEELS LIKE FLOATING

Once you exceed car park and low road speeds, you're effectively driving a hovercraft. It may not feel like it, but this is the case, even from 30mph. As you approach circuit driving speeds the 'hovercraft' may become more apparent, at least as you reach tyre limits. It's no longer just a case of brakes being there to slow you down and the steering wheel enabling turning into corners. Think of it like this: the steering wheel introduces rotation – it's a destabilising device. The brake pedal is also a tool for weight-transfer and pitch control – it defines how much the chassis leans nose forward and how heavy the front of the car can become. To make this clearer, and less technical, let's break down a corner into three sections: core technique would start with straight-line braking (and downshift if required) to slow the car, followed by brake release and application of a steady (balanced) throttle and, finally, turning into the bend at steady speed. We'll forget the second half of the bend



for the moment. In this case, we've not used the controls for much more than their basic functions. Trail braking gives us a few more tools to play with. Rather than these three distinct phases up to mid-corner, the second is removed. Speed-reduction is blended with the turn-in. It's now that the brake pedal can be used to control weight transfer and pitch of the chassis for improved performance. The steering wheel behaves differently and can

become more or less responsive as a function of the brake. You may need much less hand movement to make the car follow the bend. Rather than release the extra braking-induced vertical load from the nose of the car before the corner, the goal is to maintain at least some of this up to the point at which you'll start to steer. We mustn't forget that the front tyres are already stressed by braking and will receive further stress in cornering as you increase your steering wheel angle into the turn. To prevent them exceeding their limits, you'll need to ease off the brake pedal. This reduces the braking stress and should be done both progressively and marginally ahead of building new cornering stress as you steer. Concurrently, the bodyshell attitude will change, and though it's a passive reaction to your inputs, the dampers (and the tyres!) affect how quickly it can follow. You should aim to time your transition from brake to steering to suit the *flow* from nose-down (pitch) to side-down (roll).

## NEXT MONTH

Steering on the throttle



### FLOW AND THE WING-BACKED CHAIR

We'll look at the intricacies between weight transfer and body pitch and roll in a future article, but, for now, let's consider them one and the same. As you create or change loads on the tyres through acceleration, braking and cornering, the static weight distribution of your Porsche will evolve into an ever-variable dynamic weight distribution. As should be clear by now, braking shifts a portion of the rear weight's proportion to the front tyres, effectively making the front of the car heavier whilst tipping the nose forwards. It's the transition of this static distribution (to, respectively, front-heavy, side-heavy and then rear-heavy as you brake, corner and accelerate) which is important. Again, finesse and timing will

keep everything under control, even as you approach the top end of the 'spirited' scale. Try to think of your hand and feet motions as a 'flow' from heavy braking with no steering, through progressively reduced braking as you feed in steering to reach zero braking and all the steering angle required for the bend.

Congratulations — you've trail-braked beautifully into the bend! Now hop to the throttle pedal and get ready to squeeze on as you unwind for the next straight. You've improved your car's agility, unlocked on-track performance and reduced front tyre wear. Relax as you practise, as if you're sat in my figurative wing-backed chair. I'll see you for more coaching next month.

