



STEER CLEAR

In this month's coaching article, Porsche Driving Consultant, Neil Furber, explains what's meant by 'steering on the throttle' and how it can be useful for Porsche owners to learn this important performance driving technique...

Regular readers will recall my previous *GT Porsche* driver coaching articles outlining core technique for cornering and dealing with weight transfer, as well as the limit of grip. More specifically, the advice I offered in the October 2019 edition of the magazine (order a back issue at bit.ly/issuesgtp) was all about keeping things safe and stable on the twisty stuff. Principally, I explained how to provide maximum vehicle stability into and through a corner by dealing with braking *before* the corner and then keeping the chassis as flat as possible in pitch (nose up/down) in order to 'balance' the car's

weight correctly across front and rear tyres. Additionally, holding the steady speed necessary to balance the car will ensure the driven wheels are torque-neutral. By this, I mean there's no positive or negative engine torque applied — there's no acceleration or deceleration. Both driven and undriven tyres can be used 100% for cornering and, in the case of an older rear-wheel drive Porsche, this can make a huge improvement to safety. In other words, in normal circumstances, you'll have a healthy margin for error when it comes to how much of the rear grip you're using.

Let's consider 'what if?!' and explore outside of core technique (from the point

of corner entry) as a means of examining the fine line between improved drivability and a loss of control. When it comes to performance driving and the potential for loss of control, certainly, it's a case of prevention being better than cure. Whether it's a greater understanding of theory or improved skill behind the wheel, if you know what to expect from your actions and what to avoid, proactively, you can dodge nasty surprises. Having an appreciation of how the throttle pedal can change your Porsche's cornering dynamics and, importantly, learning this manipulation in a safe environment will immeasurably improve your driving ability and confidence behind the wheel.

IT'S ALL CONNECTED...

Much like the old spiritual song, *Dem Bones* ("shin bone connected to the knee bone" etc.), when cornering, your right foot is connected to just about everything accountable for how your Porsche responds to what's being asked of it. You can open, maintain or close the engine's throttle (if we ignore diesel engines for a moment!), providing positive engine torque or *twisting force* for acceleration, an option to maintain steady speed or negative engine torque — also known as engine braking — which runs through the clutch (or fluid coupling) into the transmission and via the series



of shafts, gears, differential(s) and hubs, before arriving at the driven wheels. Influenced by inflation pressure and helpful friction, the wheel rims transfer torque to tyres and, finally, the tyres can provide a tractive or braking force via their interaction with the road surface. Oh, and these forces will have an effect on fore and aft weight transfer. This improves or degrades the front and rear tyre grip potential and affects the car's trajectory in a bend. Admittedly, all of this may sound complex, so let's break the process down into separate components.

BACK TO TYRES

If you read my articles at least semi-regularly, you may have noticed how often I reference tyres. This is because, fundamentally, performance driving is entirely linked to tyres and their contact patches (the area of tread in contact with the road surface at any one time). Whether you realise it or not, your inputs make use of and manipulate each of your Porsche's four contact patches. The more you understand of this behaviour through theory, feel or both, the more of your Porsche's full potential will be realised. Essentially, we can forget all the mechanical bits between your right foot and the tyre. Instead, we can focus, simply, on tyres and weight transfer.

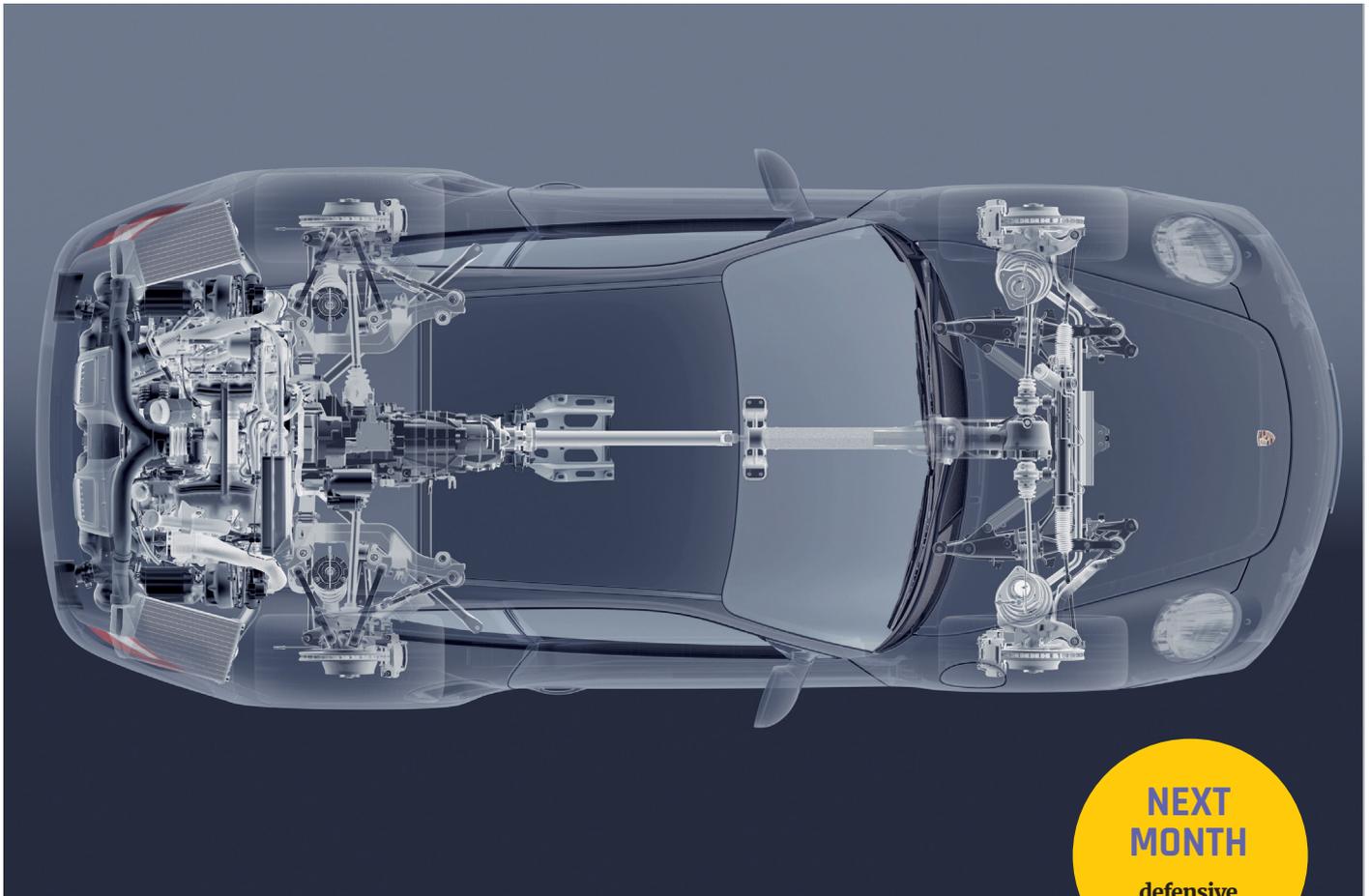
Whereas core technique required a *balanced* throttle before turning the steering wheel (the exact throttle position to hold a steady vehicle speed), pressing the pedal to a greater or lesser degree will change how your Porsche behaves at entry to a bend. If you've released the throttle completely (or press it less than required for steady speed), the car will decelerate as a consequence of engine braking (negative torque). This makes your Porsche nose-heavy through weight transfer, increasing front grip and making the front tyres more effective in cornering. Conversely, the rear tyres will lose some grip. The result is a car that'll turn into the bend more easily.

Steering may feel slightly more direct and, if you're over-exuberant, there's a risk of losing the tail, particularly if going downhill on a wet day. Let's not forget, within the Porsche range, the rear tyres will also have a portion of their (reduced) grip used for engine braking, meaning there's far less spare grip at the rear than during 'balanced' cornering.

If you're a little heavy on the throttle pedal, but still nowhere near full throttle, the opposite will be true: your car will gain speed from positive engine torque and will become tail-heavy due to dynamic weight transfer. The front tyres will have lost some grip, the steering may feel slightly less responsive and the rear tyres will gain total grip. Some of this is 'spent' on acceleration (rear-wheel drive), but, on balance, there will be more grip at the rear than at the front. In this case, you'll find you may need to turn the steering wheel a little more than expected. You may even feel vibration from the front tyres or experience a classic

case of understeer. I've talked about this in previous driver coaching articles, but, for the benefit of readers new to *GT Porsche*, put simply, understeer is when a car drives straighter than desired. In contrast, oversteer is when a car rotates more than desired. An extreme example of understeer is when a car heads fully straight-on at a corner. Oversteer can be observed during the infamous 'spin'. Core technique is a great defence against both behaviours and, crucially, steering on the throttle can create or cancel the effect of either, helping you to regain control and enjoy more flexibility during cornering.





**NEXT
MONTH**

**defensive
driving**

MID-BEND POWER-PLAY

Generally, it's best to enter a bend with balanced throttle, but off-throttle, or even trail braking (covered in last month's driver coaching article), will improve vehicle agility and promote body rotation, which is useful at the race track. The majority of *GT Porsche* readers will find throttle control most interesting during a corner's mid-bend section. Starting from a balanced throttle position, you can either decrease or increase your throttle pedal pressure to tweak the car's trajectory through the corner. As an alternative to minor steering adjustments — or just to make the chassis more or less agile at specific moments — this may be linked to speed and local radius during a multi-radius bend. Most importantly, an understanding of action and reaction can prevent extreme outcomes if the unexpected happens.

If you squeeze onto the throttle pedal progressively from the mid-bend, you'll feel the car start to run wider (straighter) despite

maintaining steady steering. This is due to both increased speed and rearward weight transfer. Blending this with a gentle unwind of the steering will allow you to accelerate earlier and more smoothly as you transition from the corner to the straight. If you're a little too heavy on the pedal and the car starts to run too wide, too soon, just ease off the throttle and your Porsche will slow, the nose will dip and the car will tighten its line. For the road, very small throttle movements can be useful. On the track, there can be advantages to introducing much greater variation, which can induce welcome dynamic chassis behaviour.

For those of you with more powerful Porsches, such as a GT3, it doesn't take much for progressive squeeze of the throttle pedal (for subtle weight transfer and steering change) to pass the gateway to massive engine power. From this point onward, the

driven tyres will attempt to spin-up due to being already loaded in cornering. They become 'saturated' and have no grip left to spare. At this point, they'll break free and, in the case of most Porsches, the rear will step wide. Naturally, as per many of my driver coaching articles, we're back to the word *finesse*. The way (and how much) you squeeze will dictate whether you generate a gentle transition to the straight, a positive rotation leading to mild corner exit oversteer or, dramatically, a huge oversteer event. When you've developed your skills sufficiently, you can use mid-level power to help the car rotate whilst accelerating. Despite the rearward weight transfer from acceleration, the extra engine torque will load the rear tyres toward their limits and start a graceful 'walking' of the rear, more laterally than usual. As ever, smooth, gentle throttle movements applied with plenty of *finesse* are the order of the day.



DRIVING FORCE

Neil Furber is *GT Porsche*'s resident driving expert. With a background as a mechanical engineer in Formula One, he brings a unique technical insight to driver coaching. Splitting his time between the French Alps and the UK, Neil coaches drivers through his brand, Drive 7Tenths (drive7tenths.com) and is also a Porsche Driving Consultant at Porsche Experience Centre Silverstone. Have a question about coaching? Email him at enquiries@drive7tenths.com.