THROTTLE CONTROL

Correct application of your throttle builds grip, confidence and can make you a cornering master. Here's how...

Words Ryan Decarteret with John Westlake **Pictures** Too Fast Media

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Using your throttle correctly makes this easier and more fun

IF YOU WATCH a highly skilled rider on the road or racetrack you can see when they brake, what line they take and how they position their body. But it's very difficult to see exactly how they're using the throttle, which means we often miss just what a crucial part it plays in riding well, particularly around corners.

Of course, you use the throttle in a straight line too, but this is generally much simpler. Advanced riders will often talk about using 'acceleration sense' to describe using the throttle alone to match road conditions as you ride along, but in reality this is more about reading the road than skilled throttle twirling. If you read the road well in advance it's usually fairly simple to adjust your speed using the throttle rather than the brakes because of the extended time available to react.

In bends, things get a lot more complicated because you're balancing cornering forces, weight transfer and even suspension movement – all with your throttle. Consequently, at Rapid, we like to think about corners in three phases: entry; mid-corner; exit. But before we get to that, we need to understand how opening and closing the throttle affects one of the fundamentals of riding a motorcycle. Let's talk traction.

‘You might think your bike squats under power, but its geometry actually makes it lift instead’

▶ Your inputs have a big say in how much traction your tyres give

▲ Think positive - but don’t be too aggressive on the throttle in mid-corner

How to create grip (or lose it...)

Many riders underestimate the effect they can have on traction, and assume it just depends which tyres are fitted, how warm they are, what pressures they’re running and the state of the tarmac. These are important, certainly – but they’re only half the story, because traction doesn’t just depend on the coefficient of friction (a ratio describing the ‘grippiness’ of two surfaces in contact). It also depends on the force pushing the tyre down into the road – we can dramatically affect that using the throttle and brakes.

The basic physics of what happens here is simple enough: an increase in weight increases the force between two surfaces, which improves traction. Run your finger lightly over a surface and you’ll get little traction. Increase the pressure and you’ll get a lot more. Braking or rolling off the throttle shifts weight off the rear tyre, reducing its traction, and on to the front tyre, *increasing* its traction. Likewise, accelerating increases rear traction, and decreases front traction.

But the effects of your throttle control are even more profound because of the bike’s suspension. This is designed to maintain traction by keeping the tyres in contact with the road and it works best in the middle of its range. How do you keep it in that sweet spot? By using throttle control, and it’s especially important in corners.

▲ On gentler corners, minimising adjustments keeps everything in the sweet spot

Phase 1: corner entry

The ideal throttle position here depends how challenging the corner is. In an easy, rolling bend, where approach and exit speeds are similar, it’s often best to keep the throttle rolled on at the entry stage. This balances traction between the tyres, limits weight transfer, settles the suspension in its sweet spot and keeps ground clearance at its maximum by lifting both the front and rear. This last point sounds counter-intuitive because you might expect a bike to squat under power (even a little bit), but in fact the geometry of the chain run, swingarm and sprockets means that acceleration causes the rear to lift. It’s why race bikes have adjustable swingarm pivots and 300bhp MotoGP bikes need a special device to make them squat out of corners.

However, in a more challenging corner where the bike is working harder (such as a tighter or off-camber bend), it’s usually better to enter the corner with the throttle off. This increases traction on the front tyre at the point when the steering input is made, and improves the steering geometry of the bike by compressing the forks and decreasing the rake (the angle of the forks relative to a line perpendicular to the road).

This makes it much easier for you to steer accurately, quickly and more sharply into the corner – it’s a particularly useful technique to deploy with adventure bikes because of their longer-travel suspension and lazier steering geometry.

Phase 2: mid-corner

This is almost always best handled on a positive throttle. This means you open the throttle just enough to maintain speed (cornering forces scrub off speed, so the roll-on counteracts it). Positive throttle increases stability because it equalises weight – and therefore traction – through both tyres, gets the suspension in its sweet spot, and increases ground clearance.

Because of this, your goal is to have a positive throttle the very moment the bike is settled after turn-in. Beware being too aggressive, though. If you get on the throttle too early or too aggressively you risk either ➔

▲ Shutting off completely entering a sharper bend gets you properly set up for rolling the throttle back on

increasing speed, which will increase the radius of your arc and make the bike run wide, or overpowering the tyre and losing traction.

If you're not sure how aggressive you can be, think about it in terms of units of grip. Let's assume you have a maximum of 100 units available from your tyre before it slides. These 100 must be shared out among cornering, braking and acceleration forces; so if you're at maximum lean and using all 100 units of traction, you have none left for braking or throttle. At this point, if you crack the throttle open more than a whisker, the rear (or possibly even the front) will start to slide.

This means we can use the throttle (or brakes) when cornering but we need to take lean angle into consideration. So if you enter a corner under heavy braking, the brakes need to be tapered off as you increase lean angle. And if you want to get back to the gas on the way out of a bend you need to time the roll-on with standing the bike up. Which brings us to...

Phase 3: corner exit

As soon as you can see the corner opening up, you can begin a steady throttle roll-on, and at the point where you can see some distance down the road, you can optimise performance by timing your roll-on with standing the bike up.

As the lean angle reduces, more traction is available for throttle and there's more weight transfer on to the rear tyre. These two factors allow for seriously fast exit speeds. However, especially on slippery roads, it is important that you don't get greedy with the throttle. Remember those 100 units. Getting back to on the throttle too early, and with too much lean angle, will seriously threaten traction. The key is timing. *R*

▶ **Treat every corner as an opportunity to practise your new-found skills**

▼ **Seeing is believing: don't wind on that throttle until the corner opens up**

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Visual skills. Improving the way you see and interpret detail at speed can take you to a whole new level of riding. We show you how.

PUTTING IT INTO PRACTICE

Experiment with corner entry

If you're used to going into corners on a positive throttle – as many riders are – it will seem very odd going in with engine braking slowing you down.

To start with, you may find you're going slower mid-corner. But the benefits of weighting the front tyre going into corners are so great that it's worth persevering. As you get more comfortable with the feeling, gradually increase your mid-corner speed by getting back to positive throttle earlier – as soon as the bike has settled on its line. This will stabilise the bike and maintain your speed, ready for your exit drive. Small steps are the key to success, though; it's a technique that can take months to get the hang of.

Check your vision

If you're struggling to get on the throttle nice and early out of corners, it may have nothing to do with your throttle control. Notice where you're looking as you go through a bend, because there's no way you can safely open the throttle if you're not looking in the right place: you need to be able to see the corner opening up and then the clear road ahead. For more on this, revisit the first Masterclass (June 2023 issue) and work on looking for the corner's limit point.

Be *smooooth*

As your pace and confidence pick up, you may find yourself becoming harsh with the throttle as you rush to get on and off the power. This is a bad habit, because the jolts it creates could cause the rear to break traction. If you've ever been pillion with an expert rider you'll know they finesse the throttle as the power comes in, and then wind it on deceptively quickly. You feel a silky-smooth whoosh, not a jolt. You see the same thing in the data traces of top racers – delicate throttle increases mid-corner, then a smooth, progressive twist to full gas.

Check your mechanicals

A slack chain or a worn cush drive (the rubber shock absorber in the rear hub) can render your attempts at smooth throttle control utterly pointless – the slack in the system means you'll get a jolt no matter what you do. If they're okay and your bike continues to jerk, we bet it's an early fuel-injection model (KTMs and Yamahas were the main villains). A reputable tuner should be able to sort it by remapping the ECU.