Open Letter To Roman

Below is my Facebook response to Roman's question on downhill cornering techniques. A number of other people responded but Roman emailed me directly and "demanded" a response, in his mad Russian non-offensive sort of way. Below is a 20 minute brain dump late at night. In hindsight, Roman has zoned in on the most difficult skill – riding fast around steep downhill corners. Good on him for figuring out the question!

Hi Roman,

Thankyou for seeking out my views, for what they are worth. I can only speak about what works for me and a number of observations. And it is about what works on the road, not on the track where the limits can be pushed and the science is more technical. Steve Mudford is your best man for those conversations.

I guess the most obvious thing is the question itself. Downhill corner versus ordinary flat corner. The reality is there is little difference, only in a downhill corner you are at the limits earlier. Like riding in the wet or on the dirt. All the same rules apply. Having said that, cornering downhill is the hardest thing to do - the fear/fun factor is the greatest - because you reach the limits (of grip) earlier and hence the margins of error are smaller. Conversely, riding uphill is the easiest - because it is all about the braking, and gravity is working for you when riding uphill, and against you riding downhill.

It is all about smoothness too. The smoother you are, the faster you are. The less you upset the balance of the bike, the better it will perform. Braking potentially upsets the balance of the bike. It consumes suspension travel (which you need for a bump mid-corner). And if you are pushing hard, hitting a bump mid-corner is bad news. Hence you have to keep something in reserve.

Smoothness is a function of gear changing and braking and moving your body around on the bike and steering inputs. Probably lots more subtle elements too.

There are two theories of going around corners, both equally valid. The first is to complete all your braking before tipping in fast. A point and shoot approach, squaring off the corners. The second (which I employ) is braking right up to the apex, with maximum braking at the start and minimum braking at the apex. The idea is to compress the front end (maximum grip), tip in which generates addition force through the front tyre, balanced by releasing the front brake gradually all the way to the apex. The idea is that the forks do not bob up and down, you get a shorter wheel base with the forks compressed and hence quicker/easier turn in. The forks need to compress and stay compressed all the way to the apex at which point more and more power is applied and the forks start to extend as the front gets lighter and the wheelbase longer. This aids stability. The critical thing is being smooth.

Rear brake use. Again there are two valid theories. The first says use the rear brake to assist in tipping the bike into a corner. It works. Put the rear brake on mid corner and see what happens. I used this method for the first 30 years riding. A more extreme extension of this method is to use the rear brake to moderate the power as well - keep the throttle open but control the speed, particularly in tight twisties, with heavy use of the rear brake. Racers tend to do this because they want maximum power all the time! It is very hard on pads as you can imagine.

My preferred method now is not to use the rear brake at all. Under heavy braking the rear wheel tends to come off the ground and hence is totally ineffective. Typically crashes in corners with inexperienced riders are a rear wheel lockup. The reason is that when the rear tyre locks all stability is lost and the rear wheel tracks downhill at the speed of gravity - 9.8 metres per second per second. ie very fast. The rear end will immediately try and overtake the front. All roads are cambered - high in the middle - and hence there is a "downhill". The rear tyre will track downhill.

No rear brake allows the rear suspension to work at its absolute best (as no travel is consumed with the braking) and keeps the rear wheel planted on the ground for as long as possible and will track properly as soon as contact is made with the road again should it be off the ground. I am still fighting my now natural instinct to use the rear brake in an emergency/panic stop. But I am still on my original rear pads on this bike after 72,000 km so I am winning the mental battle - but it is still a conscious effort.

Cornering basics:

- Be in the right gear. If I am going across the Reefton then I will just ride the torque curve and sit almost exactly at 5500 revs (and move up and down the gearbox to maintain those revs). If I want to push harder, then I will shift up the rev range, say to 6500 revs, and just stay there. The least gear changes, the smoother the bike will be, so the other way is to just put the bike in say 3rd or 4th and run right up to 10,000 rpm and back down to 6,000 rpm - in the one gear. Again two styles, equally valid.

- Choose the correct line. Increased visibility allows you to go faster - because it is safer - you can see. So out to the right on left hand corners, and out to the left on right hand corners. Try and open up the corner. You have to be careful noting that the extreme left hand side of most roads will be more worn than the any other part of the road. For instance, the left hand shock on your car always wears out before the right hand. So I keep away from the extreme left hand side of the road – unlike Misho who uses more of the road. I think this is because I am older and used to worse road surfaces than exist nowadays (believe it or not). So, following Misho, I am always half a metre to the right in a left hand corner. It happens automatically. I just have to lean more!

- Ride slower to go faster. Slow in, fast out is much smoother- and ultimately faster.

Tricks (what you learn from experience):

- tipping into a corner will automatically wash off 20 to 40 km/h due to the increased friction. So use that knowledge to brake less.
- use the camber of the road to your advantage. Some roads have a "berm-like" area near the centre of the road that you can "push off". Provides additional grip. It is like being on a dirt bike riding around the inside of a steep walled hole. Read the road.
- the bike is better than you, so don't fight it. Let the suspension do its job. Less braking is faster, better handling, smoother.
- good suspension (this is the bit you are missing and is the answer you are looking for). Good suspension means the bike will steer faster and safer and is naturally more balanced and feels glued to the road which equals confidence and creates a level of trust. I have always spent the money on suspension, not bling or engine performance gains. The real gains in riding pleasure are in improving your suspension.

I hope these few ideas give you food for thought. They are just a quick brain dump when I am very tired at the end of the day. I'll probably think of more things tomorrow.

Here are another few things I thought of the next day:

Modern bike steer much better (faster, easier to change direction) than even bikes from 10 years ago for all the well-publicised reasons, mass centralisation being the most important, then maybe bike geometry. Jump on a modern bike and your corner speed immediately jumps 10% or more - just because of the bike! Did you know Dennis' CBR600 has been for sale for a few weeks with no offers? Might be a good time to negotiate!

Practice, practice, practice. If you ride infrequently, then your skill set goes backwards. It takes a period to get back to the level that you were, let alone improve. So, like anything of value, you need to practice to maintain your current level, and practice/get training to get to the next level. Professional training is invaluable such as provided by the Superbike School, HART etc and will dramatically improve your skills - in one day! A race track environment offers the chance to repeat the same corner over and over, incrementally pushing your/bike's limit in a relatively safe environment - no bumps or oncoming traffic and plenty of runoff. Of course it teaches you about braking and if you know more about your braking limits, then of course you can go deeper into a corner knowing you can brake confidently if required - because you have practiced it. Get some training!

Tyres are a major part of the cornering equation. Worn tyres offer less grip (tread depth is directly proportional to grip) and erode confidence. New tyres steer brilliantly - they turn in fast, and offer a more comfortable ride - absorb the bumps better. Modern tyres are fantastic.

Experience of the road is a hidden factor in high corner speeds. If you know the corner opens up or is just a kink, then you are more willing to maintain a higher corner entry speed. You know what to expect. This is one of the few advantages of getting old - the accumulation of road riding experience. After a while of riding with the Club you start to memorise (unintentionally) every corner - and its characteristics - bumpy entry/exit, increasing/decreasing radius, camber, etc. You learn when it is safe(r) to push and when it is not. Some roads are more dangerous/technically challenging/unforgiving/fun than others. The Licola road is the currently favoured crash hot spot, for instance. It is also brilliantly fun and challenging to ride.

Wear the right clothing - be comfortable. Don't have any distractions like cold or wind noise or sun glare or dirty visor. Focus, focus, focus. Get in the "zone".

Get a dirt bike and do some off road riding - lots of benefits.

I best stop ...

So, in summary, if it is your intention to go faster around corners:

- Get expert training to improve your skills and to learn your bike's capabilities (and your own)
- Practice, practice, practice
- Make your bike as good as it can be mechanically
- Grow old fast and accumulate lots of experience

I wish you luck and expect to see you on more rides!

Cheers

Ben Warden