

Braking Techniques

Learning to ride a motorcycle is very complicated. Skills have to be learned and perfected to make your riding safe and efficient. It seems that most folks can get on a modern motorcycle and ride off with out much problem until they come to a corner or have to stop. It's my belief the most important skill to learn and perfect is braking. Going fast means nothing, and you will be going too fast at 2 mph if you can't stop.

Most new riders and a lot of more experienced riders have some real misconceptions about brakes, just how to use them correctly. This will be the first of our safe riding tips with the help of some of the professional MSF instructors from around the world we will attempt to enlighten you. Remember everything we tell you should be tried in a safe environment first, and should be practiced to become skill you can use.

One more item to remember which is not covered below, keep your eyes focused where you are going and keep the front wheel straight when coming to a stop. If your eyes look away from destination you will either over brake or under brake to a stop and may find yourself in the middle of an intersection. Over braking can get you hit from behind. Allowing the front wheel to turn at the end of the stop will produce fall over which cannot be stopped, not a graceful way to stop and it can be very expensive.

The brake, which does most of the work, is the front brake. The old quotes of 75:25 front to rear ratio, but this is highly misleading. It depends on several factors including:

- Type of bike. If you try a 75:25 emergency stop on a step-through, you will fall off as you lock the front wheel! On the other hand on a sportbike, you're wasting 25% of your front brake - you can brake hard enough with the front to wave the rear wheel in mid-air. Longer, heavier tourers or customs, trail bikes or older bikes with weaker drum brakes allow (or even demand) the use of progressively more rear brake to come to a swift halt. Loading.
- The more weight you have on the bike, particularly if you have a passenger, the more rear brake you can use

Points to remember about using the brakes

(Warning - these are general rules about how to use conventional brakes... I have no specific experience of linked braking systems)

There is no real magic to the brakes except HOW you use them.

- Brakes are there to get your speed right and get you out of trouble in an emergency
- Two things are common to all bikes
- Locking the front wheel is the end of the game,
- The fear of hard braking!
- Practice using them so you know how they feel under different conditions
- Gentle applications
- Emergency stops
- In wet and dry conditions
- Loaded
- Two-up
- Understanding that efficient braking uses them harder at the beginning than at the end. Knowing your braking limits puts you in control.

Braking Rules

Three rules of front brake use

1. Don't snap them on - the bike goes unstable and at worst the front suspension can bottom and cause the front wheel to lock.
2. Use while the bike is upright - used suddenly in a bend will either cause the front tire to lock or stand the bike upright
3. Don't leave it too late - smooth and progressive braking should be your target on the road

Apply the brakes smoothly and progressively to the desired pressure, letting the suspension settle, then ease off at the end, letting the suspension rebound slowly. Try for a smooth one-shot progression, not a series of jerky on-off-on actions.

Try this - from 30 mph or so brake hard to a slow walking pace, then try and pull away again. If you moderate the front brake use as mentioned above, you should be able to move away smoothly with no wobbles.

Braking Tips

Applied progressively on a good surface, modern bikes can brake surprisingly hard with no danger of locking the front wheel. Even in the wet, a decent set of tires delivers surprising amounts of grip.

Watch the road surface - the surface can vary from grippy to slick in a matter of inches - if it's shiny, it's probably slippery!

Practice emergency stops regularly - the front must be applied first and does most of the work.

On a modern sportbike, the braking balance under maximum braking is 100% front brake, 0% rear brake - the rear wheel will be in the air.

Maximum braking is obtained just before the wheels lock.

Don't grab the brakes - apply the brakes smoothly to the desired pressure, letting the suspension settle.

Braking for corners

The key to cornering is arriving at the corner with the bike settled on the suspension. This means that you need to be traveling at the right speed with the brakes released, the weight transferred to the rear with a gentle application of throttle and the suspension balanced. You can do this by using pro-active braking or acceleration sense (see below). The choice is yours, but whichever technique you choose, you should aim to get and keep the suspension balanced front and rear - keep it smooth. Sudden use or release of brakes, brutal use of throttle and clutch or clumsy gear changes upset the bike by changing tire load. The faster you go, the more dramatic the effect.

Approaching a corner/turn, the brakes have only one function - to get the bike at the right speed on the approach to the corner. By the time you make a steering input, you should have completed your braking and be back on the power by gently opening the throttle. There are two reasons:

- To let the SUSPENSION settle into a NEUTRAL or SLIGHT REARWARD balance - a hint of throttle will just load the rear slightly. Neutral suspension/slight rearward balance with the forks at their normal static sag or slightly unloaded is where the bike steers easiest and most accurately. With the front brake on and the weight forward, the forks are compressed, trail reduced and the steering becomes heavy and generally more difficult to work accurately, and the bike tends to sit up and run straight on.
- To reduce the LOAD on the FRONT tire. The front tire has two jobs - it has to steer the bike and it has to brake the bike. There is a finite amount of grip to do both jobs. At gentle lean angles and steering inputs this is not a problem, there is sufficient grip to do both jobs, though as mentioned above braking tends to make the steering unwieldy. As you speed up and use more extreme lean angles, you are increasing the loading on the tire required to steer the bike. If you are applying the brake at the same time, the point will come where the combination of the two loads exceeds available grip, and you will lock or slide the front tire, which happens so fast it almost always results in a crash.

On a modern sportbike on a good surface, it is almost impossible to lose the front end unless

- You are on the brakes
- You are using extreme lean angles or the surface is slippery (both tires are likely to let go in either case)

Keeping the power on in a corner unloads the front and allows it to steer, and induces some drift from the rear tire and actually tightens the corner up slightly. You are not likely to slide the rear in a corner unless:

- You are heavily on the rear brake and locking or skipping the rear wheel
- You are heavily on the throttle and spinning the rear wheel (possible in slippery conditions on a moderately powerful bike, or if you are brutal with the throttle or even if you are careless with the clutch)
- You are using extreme lean angles or the surface is slippery (both tires are likely to let go in either case)

Under all but the most extreme angles of lean or poor road conditions the rear tire has more than enough grip to cope with the forces of cornering with no problems at all.

Avoid excessive engine braking or coasting:

- Let the clutch out slowly to avoid suddenly loading the rear tire
- The gearbox is for accelerating, the brakes for slowing

When riding fast, judge the braking force and distance required carefully. Get it wrong and you end up gradually increasing braking force until you are braking much too hard, much too late.

It is better to apply too much brake too early than too much too late - you can always speed up but slowing down in a bend is very difficult.

Getting it all wrong!

We all get it wrong on occasion and if you are going a little too fast for the bend you have three options

1. **Keep the power on and lean the bike over harder.** Usually the best way to deal with the problem if you are riding fast as you usually have some grip to spare, and the weight transfer to the rear allows the front tire to carry on with its job of steering - most bike/tire combinations exceed their owners abilities. It just takes a lot of nerve to do it.
2. Pick the bike upright and brake hard for a moment before leaning over again. Although this is often recommended, it is only of any use if you have some space to spare, and if we had space to spare, we could probably make the corner anyway!
3. **Apply the brakes gently while leaned over.** Most modern sportbikes will carry some brakes in the corner/turn if you are careful but remember the tires are using most of their available grip to turn the bike. On a race bike fitted with track compound tires on a race track surface, it is possible to turn into the corner still braking hard with the front, and for the rear to be in mid-air or barely in contact with the surface, but this is extremely unlikely to happen on the road on all but the most sports oriented bikes with only the very best of riders!
 - Application of the brakes should be gentle and progressive
 - Grabbing guarantees you lock up the front or stand the bike up - if you lock the front, you are going to crash. If you stand the bike up, you're going straight on anyway!
 - The back brake can often do some work, but don't stomp on it
 - When you release the brakes, do so carefully and slowly to avoid unloading the suspension suddenly - this can unload the front tire on the rebound and also causes problems with steering (see below)
 - To make the turn with the front loaded you will probably have had to make positive steering input to overcome the sitting up effect that most bikes exhibit while braked into a turn - when you release the brakes the change in steering geometry usually makes the bike suddenly turn harder and tip into the corner. Be ready for this and minimize the effects by releasing the brakes slowly and use smooth steering inputs.

Acceleration Sense

Do you actually need to brake at all? All you need is to always arrive at the right speed!

In many cases you can use the throttle to control your speed, but remember

- Avoid rolling into a corner/turn on a closed throttle or on the brakes because you got it slightly wrong - use the brakes in good time - that's what the brakes are there for! I'd rather use what I have heard called "comfort braking" than go in off-throttle and off-line!
- No brakes means no warning you are slowing to following traffic
- Don't overdo it! Choose pro-active braking or acceleration sense as you wish, but use common sense. Slowing from a 60 to a 30 speed limit on the throttle will require you to start decelerating much further away from the corner/turn than the vehicle behind will expect

This style of riding is fine as an exercise in observation and planning and on roads where a major change of speed is not required, but don't get into the situation where you roll off the throttle in silly places and put yourself in potential danger from following vehicles just because slowing in a more conventional place would mean touching the brakes.