Braking, Stopping, or Crashing?

By Wayne 'Traveler' Kirkpatrick,
Sr Road Captain

Normally, we never think about braking until we absolutely have to do it. Sound crazy? Think about it. When you first got on a bike, you were more interested in how to make it go than you were in how to stop it. When you taught someone how to ride a bike, you started by showing them how to make it go before you showed them how to make it stop.

With today's technology, we have about three basic types of braking systems, each with it's own dynamics. We have regular hydraulic / cable brakes, independent brakes, linked brakes, ABS brakes and, combinations of all three.

To brake effectively….that is, to stop without skidding out of control and quick enough to not hit anything, we need to understand some braking dynamics and systems.

Which Brakes to Use

Front / rear balance affects a motorcycle's dynamics, and that's why most bikes have independent front and rear brake controls. It is generally accepted that around 70 percent of braking efficiency is done by the front wheel, which uses the hand lever on the right grip, and 30 percent by the rear, which is operated by the right foot pedal. Look at racing bikes and you will notice that the front wheel has two large brake rotors while the rear wheel has one small rotor.

Front brakes provide this level of efficiency because weight transfer from slowing down will shift the bike's balance from the rear wheel to the front, enabling the front tire to handle more load and not slip out of control. When there is less downforce on the rear tire, it becomes much easier to lock-up and slide that wheel, resulting in a loss of control. Optimum braking efficiency is, obviously, accomplished by judicious use of both front and rear brakes simultaneously.

Road Conditions and Braking

Different road conditions require different braking techniques, and you'll want to use your motorcycle's front brakes gingerly when traction is iffy. Locking up the front wheel can easily cause you to lose control of your bike. Locking up the rear wheel is less likely to cause you to lose control. Not that it won't, it's just less likely.

Approach areas with the potential for less traction like oil residue at toll booths, intersections, and parking lots, with extra caution. Ride as close to "Neutral" acceleration as possible. Accelerate or decelerate very gingerly. And. it takes quick reflexes, so cover your brake pedal / lever and stay alert to any loss of traction. Remember that it's much easier to recover from a rear wheel lockup than it is a front slide.

How Hard to Brake

Learning the finer points of your bike's braking performance is key to keeping your bike in control, so it's a good idea to explore those limits in a safe environment. Practice repeated stops in an abandoned parking lot, and you'll start to get a feel for the amount of effort that triggers tire slip. Try stopping with your front wheel only, your rear wheel only, and then a combination of both. That way, you'll get a sense of how hard you can apply the brakes in an emergency.

Once you become familiar with your bike's brakes, the sensations of weight transfer will start to feel more apparent. Stopping hard enough on the front wheel might even lift the rear wheel up and, using the rear brakes hard enough will cause a skid. You will also find that you can get away with applying more pressure at higher speeds. Learn those limits, and you'll be much better prepared for the unexpected.

The introduction of linked brakes and Anti-lock Braking Systems (ABS) may totally change your braking technique so practice, and get familiar, with those as well.

The Lean Angle Issue

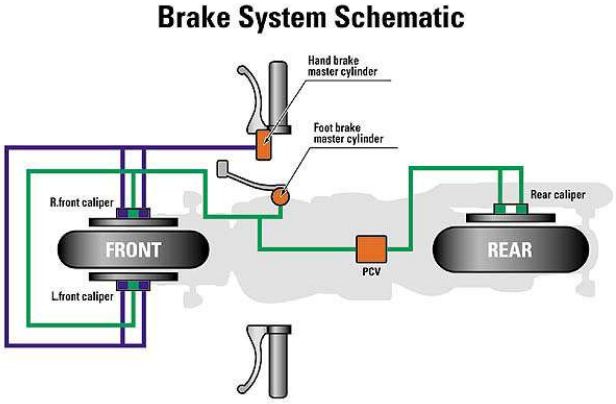
Tires are most effective when they are upright, so you'll need to keep that in mind when you start to lean your bike over. Under ideal conditions,100 percent of a tire's grip is available when it is fully upright and making full contact with the road, roughly at about 90 degrees. Once that angle starts decreasing, the tire's ability to maintain grip will erode. Though grabbing the front brake might not break the tire free when it's upright, the same effort could cause a skid when the tire is leaned over.

That loss of traction can instantly lead you to "tuck" the tire under, triggering a low-side wipeout. Some braking effort can be applied while a motorcycle is turning, but the bike will be far less tolerant of brake input when increased lean angles are involved. Be very aware of your lean angel when you brake while turning. Skilled riders know to do most, if not all, of their braking before entering a curve.

Braking According to Your Bike

The 70/30 braking ratio can shift slightly based on the type of bike you are riding. Cruisers and choppers can handle more rear braking because they carry more weight over their rear wheel due to the rearward position of the saddle, while sport bikes can tolerate higher front braking effort because their forks are more vertical and their wheelbases are shorter. Read your owner's manual to determine the stopping capability of your bike, in distance, at specified speeds. Remember, however, that these specifications are under ideal conditions i.e., good traction, good brakes, good tires, and good reaction time.

Linked Brakes



Many bikes today are equipped with linked brakes, which are designed to actuate both front and rear brakes through a single lever or pedal. When you activate either the front brake lever, or the rear brake pedal, the system applies both front and rear brakes at the same time. Some systems are only rear-to-front linked, while others work both ways, but the goal is the same with both: to remove some of the guesswork involved with choosing between the front and rear brakes.

Linked brakes are usually activated only at a speed over 15 mph. This allows for the use of the rear brake under 15 mph when making tight, slow turns such as in a parking lot or when preforming a U Turn.

Most typical riders can't produce stopping distances as short as those created by linked braking systems. But, again, practice and get comfortable with how to use your linked – brake system.

Anti-lock Braking Systems

Many bikes now have anti-lock braking systems (ABS), which are designed to detect tire slip and "pulse" the brakes so they don't skid. The system allows the rider to apply full effort at the hand or brake levers without worrying about locking up the tires, but ABS isn't effective when a bike is leaned over.

Though it's difficult to match the stopping distance of an ABS-equipped bike in wet or compromised traction situations, not all riders are enthusiastic about computerized brake intervention. Once you practice braking with ABS, you will probably become a believer.

The newer the bike, the more likely that you'll encounter more sophisticated braking systems. Currently, some bikes are equipped with linked ABS brakes, some now have overriding traction control systems and some have integrated lean – angle systems.

If there was ever a reason to practice braking, and particularly emergency braking, it is with any bike with these sophisticated systems be it a new bike or even your current bike.

Learn how to stop safely unless…..you enjoy venison served in a hospital bed.