

## EMERGENCY BRAKING

NOTE #1:

**KNOWING all the info below, and DOING it, are entirely two different things!** *PRACTICING* a plan and a technique is the *only* way to ensure you will do it when faced with it in an emergency (gross motor skill - muscle memory).

Statistics show that the average rider (you and me), when faced with a sudden emergency braking situation, often revert to the instinctive braking reaction we all developed in Driver's Education back in high school. That is; eyes fixated on the threat, slamming on the brake pedal and a white knuckle grip until impact - read PANIC. Many never employ the front brake at all when panicked! Practicing a *replacement* gross motor skill - muscle memory is the *only* way to build an adequate emergency braking scheme for a motorcycle (you already have an adequate panic reaction for a car) ;-)

NOTE #2:

Nearly a whole book can be devoted to this topic. So this **IS** the quick-and-dirty version.

NOTE #3:

Generally speaking, a **PLAN and a TECHNIQUE** for *swerving* is the smarter avoidance choice when suddenly presented with a conflicting obstacle. Sometimes, like in group riding however, braking is your *only* choice. We will leave swerving for another day/conversation.

NOTE #4; for those of you with ABS:

**Keep in mind that when your ABS has kicked in YOU HAVE ALREADY PASSED maximum braking/minimum stopping distance and are SKIDDING** (the ABS is working to minimize it). **ABS does NOT stop you shorter.** Only *practicing* an emergency braking plan and technique will stop you at or near maximum efficiency.

NOTE #5; The 3 stages of total stopping distance (TSD) we need to be aware of:

Each of these translate into a portion of your total stopping distance (TSD). When you can get a jump start on, or bypass one or more of these stages, you dramatically reduce total stopping distance. Use a plan that does that. Here are the 3 stages:

1. **The time/Distance to Recognize the threat**
2. **The time/Distance to React to the threat** (begin moving to employ your technique)
3. **The time/Distance to Apply the/a technique** (operating BOTH brakes at or near their maximum efficiency)

NOTE #6; You can turn/swerve hard, or you can brake hard. **You cannot, however, turn/swerve hard AND brake hard! When you need to brake hard, straighten up the bike FIRST.**

### A PLAN AND A TECHNIQUE FOR EMERGENCY BRAKING

3 PLANS:

- PLAN: ALL intersections, and adjoining side roads, are potential threats, *actively* look for them. If there are secondary indications of a possible threat (like a car in the left turn lane of opposite direction traffic), cover your brakes (*eliminates* TSD item #2 above) and/or change lanes to a further one that allows for more room for you to react (*reduces* TSD item #2 above). Better yet, do both when possible.
- PLAN: Unless you can prove in a court of law that you have super human reflexes STRICTLY adhere to the "1 and 2-second rule" minimums (*required* by our SOP) when group riding. The rule is all about reaction time not arbitrary distances. When in town at 25 mph, the formation will be tight. On the open road and higher speeds, this rule results in larger distances between riders. And it is *supposed* to! The allotted *reaction time* however, remains the same.
- PLAN: *EXPECT* the Leader in a group ride to stop at ANY intersection! (reduces TSD item #1 above) The flimsy excuse that you "didn't expect him/her to stop" is a waste of breath on the informed. Leading a ride means having to make last second stop-or-go decisions - expect them.

TECHNIQUE:

Like the soft scraping of your footboards I've discussed with you before, to know your safe bike lean angle limit, there is value in knowing how much brake pedal pressure is needed to skid your rear tire. Never use more than half of this pressure in your emergency stopping technique. In fact, for consistency and simplicity reasons, I suggest this same brake pedal pressure limit on ALL stops. Then when panicked you won't be diverting brain cells to *trying* to do it differently.

Like it or not, please understand that during an emergency stop, you will not be capable of complex fine motor skills. Adrenalin alone will limit you to only the most gross motor skills. Concentrating on more than one item becomes unrealistic. So...apply your standard rear brake pedal pressure (half) and concentrate on ONE thing - modulating your FRONT brake!

So...you've been practicing and when an emergency braking situation presents itself, YOU remember to go half brake pedal and use your front brake. Congratulations, except that...you snatch the front brake and the pumping adrenaline makes your hand snap shut like a bear trap! The dreaded front tire skid! Here is where the "modulating" part of using your front brake comes in.

Here is a technique I like. Practice applying front brake in 3 stages of pressure (you can practice this with normal stops too).

1. The first stage is the lightest (shaking hands with a girl) ;-) Just enough to get the bike nose diving and shifting weight to the front tire (80% of motorcycle braking). Keep in mind that during this weight transition, the REAR tire is increasingly losing braking effectiveness (less and less weight here) and is WHY I suggest never devoting more than half pressure to it.
2. The next stage of increasing pressure on the front brake lever is the mid range one (shaking hands with a good friend). This completes the weight transfer to the front tire and compression of the front fork, increasing its stopping power.
3. The final stage of increasing pressure on the front brake lever is the highest pressure you will use (trying to impress Big Otis with your manly handshake). The front brake should be applied to its MAXIMUM by the time the bike comes to a complete stop. As you get slower and slower your squeeze gets stronger and stronger. The goal is to reach maximum squeeze (no more lever travel available) just as you reach zero mph under good traction conditions. Less than ideal traction (wet, etc.) dictates slowing the rate of increasing squeeze.

Done properly, all 3 of these levels of increasing pressure should be accomplished in about 1 second for the entry level practice quick stop (15-20 mph). Some say counting it out 1-2-3 in that one second, works for them. Obviously stopping at higher speeds stretches out the time it takes to do all 3 pressures.

Summation:

With some slight variations of opinion, it is understood that about 80% of motorcycle braking effectiveness comes from the front brake, and about 20% from the rear. A technique that uses nearly all of the effectiveness of the front brake (80%) and half of the rear brake (10% or half of the available 20%) gets you into near the 90% range - Whopping stop capability! Those that have practiced this technique at our RLAP practices typically reduce their first attempt results by 40%!

Most of the things one might practice with a motorcycle allow one to develop some fine motor skills. Emergency swerving and emergency braking however, are done in the adrenaline world of near panic and are strictly gross motor skills (muscle memory). Changing from a negative muscle memory (the slam on the brake pedal to impact situation we discussed at the beginning) to a positive one (applying front brake in 3 stages of pressure) takes practice. One or two sessions is not enough to change ingrained reaction.

## CAUTIONS:

Do your first few attempts at these techniques at slow speeds and with a friend or two. Once you have a handle on the techniques, you can practice on your own. Start at 15 or 20 mph and work your way up in 5 mph increments. Take your time, don't rush right out and attempt doing this at 65 mph. But DO dedicate yourself to practicing right up to the speeds you regularly ride at. I practice 3 things every time I take the bike out - this is one of them.

If you get too aggressive front brake modulation and DO manage to skid the front tire, it is imperative that you immediately release brake lever pressure to end the skid and re-modulate to continue the stop. Failure to do so quickly could result in a "low-side" spill.

Just the opposite is true for the rear brake. Rear brake skids can be safely held skidding all the way to a stop if the bike is straight up. Holding it in this skidding situation to a complete stop is recommended by many experts (yes you can still steer). One *CAN* quickly release pressure on a skidding rear tire, BUT **MUST BE ABSOLUTELY CONFIDENT** that the rear tire is still tracking in the path of the front tire. Even small amounts of out-of-alignment with the front tire could result in a "high side" spill.

Ride safe, ride smart,  
Rocket  
Safety Officer