



### Stopping power

Stopping our motorcycles is 50% of riding experience I think. In the beginning more of us had mishaps from stopping. Riding was the easy part, getting it stopped caused the problems. Many of our habits were formed from our first days of riding. When I learned to ride everyone always told me to never use the front brake. I was always curious why they put one on motorcycles if nobody used them. Of course reaching for the front brake lever riding in my backyard taught me pretty quickly why everyone quit using the front brake. My forearms still have the scars from my experimentation with the front brake. I imagine some of you reading this have the same scars to prove you used your front brake at the wrong time also.

I was not allowed to ride on the street until I was 14 and my first motorcycle was at 12. It was an interesting story on how I finally got one but my mother was pretty clear about motorcycles in our family- there would be none! (She changed her mind and became my biggest fan when I was racing).

I aspired to be a world class motorcycle racer and everything I read and studied to be one said that to stop a motorcycle in a short distance the front brake must be used and to top it off it was 70% of our stopping power. It took some practice to even began to use it, much less depend on it. Getting last place at the motorcycle races will make a 14 year old boy overcome some major fears for a \$3.00 plastic trophy. Learning was pretty painful and many bones were broken, along with countless injures.

When we really study the advancements of car and motorcycles we have to include the braking systems. Curiously, motorcycles have led the way on brakes. In about 1980 I read a Hot Rod magazine letter to the editor complaining about the magazine wasting pages on motorcycle test. In those days Hot Rod magazine would test a different motorcycle

every month. The editor wrote back saying that tomorrows automobile technology was on today's motorcycles and the brakes were mentioned as an example. At that time the bike mentioned had dual piston double expanding calipers that very few automobiles would have to this day.

In 1971 Suzuki's GT750 came with double expanding front drum brakes. The difference in stopping power was staggering when compared to a single expanding drum brake. It basically expanded the brake shoe from both ends instead of one. It felt like it was at least twice the stopping power with the same front brake lever pressure. Ironically the first disk brakes did not stop as well as the dual expanding drum brakes but disc brakes were new and that is what sold motorcycles (technology). I used to take the wheels off my race bikes every week and sand the brake pads to fit the drum trying to get as much pad surface to the drum and it could make a big difference if done right.

What I really hoped for in those days was that it was not a wet race because drum brakes became fairly useless in the muddy races. Of course when disk brakes came as standard equipment it took twice as much pressure at the grip to stop. In other words they didn't work as well as the drum brakes they were replacing. Fast forward to 2010 and it is staggering to think what brake technology is today. A great example is Anti lock brakes. They are a computerized brake system. There is not a soul that 30 years ago would have predicated that the brakes on a motorcycle could be controlled by a computer. The sensors on the wheel tell the computer the wheel is moving and when it senses the wheel not turning it releases the pressure in the brake system even though the brakes are still applied.

Sounds scary, but it is proven technology, and for that matter, not new anymore. It is just hard to imagine something can be monitored a couple hundred times a second! If someone would ask me to

sum up the biggest difference in a GL1800 verses a GL1500 it would have to be the brakes. I would guess they are 40% better on the GL1800. That is huge when there is very little visual difference. My imagination can't even begin to imagine what tomorrow's brakes might be but it will probably be on a Honda motorcycle when it happens.

Luckily the maintenance on today's motorcycle brakes is minimal. Keeping the brake fluid changed is about all it takes. It is inexpensive and can save big money if it is done on a regular basis. Moisture can penetrate microscopic pores around the seals and through the rubber hoses.

Brake fluid is designed to suspend the moisture equally in the fluid instead of separating like oil and water. Honda recommends running a DOT 4 rated fluid that is capable of handling more heat than a DOT 3 brake fluids. The classification indicates the boiling point of the fluid. The 3 stands for a minimum of 300° and of course the 4 is for a minimum of 400°. Since the 4 is higher and that is all Honda recommends it is better right?

Technically yes it is but here is the interesting part to this. The rating set by the government DOT (department of transportation) is a minimum figure knowing the fluid will be contaminated from moisture. When DOT 3 fluids reach a 3% contamination of water its boiling point is very close to 300°. This is dangerous because when the fluid reaches this point and it does boil you will have no brakes. This happens on dirt bikes quite often. When the brake fluid boils the vapor displaces the fluid and becomes compressible, whereas a normal hydraulic braking system works on the theory of fluid not being compressible.

When the fluid reaches this point the pedal will compress fully without stopping the machine. (Hence being compressible) What is interesting is when DOT 4 brake fluids reaches 3% contamination its boiling point is same as DOT 3 or lower. Although the DOT 4 brake fluid resists absorbing moisture better than the DOT 3 when it does it may not perform as well as the lower classified DOT 3. Most automobiles recommend DOT 3 because it is safer for extended use and has a higher boiling point when it does reach the contaminated state which is usually around 3% water.

The catch here is Honda recommends changing the brake fluid every 24 months or 12000 miles. If you follow their schedule there will be no problems. If you never intend to change the brake fluid you would be better with the DOT 3 classified fluids. It does not perform as good new as DOT 4 but performs better when contaminated. Brake fluid contamination can be tested with chemical strips or a refractometer. There are also some new electronic testers that I am told are very accurate.

If your thinking your Chevrolet pick up does not mention changing the brake fluid then your Honda Gold Wing doesn't need it changed either you couldn't be farther from the truth. Chevrolets have special lines and a system that is not designed to draw moisture from the air. They assume it will never need changed and your Honda motorcycles assumes it does need changed and this article was intended to educate you why the brake and clutch fluid should be changed. Please don't overlook this as a sales technique to get you to spend your money. It is actually very inexpensive to do if done on a regular basis. This is the real deal. DOT 4 brake fluids should be changed every 2 years period. It is dangerous not to. No brakes is not an option and can happen easier than you think.

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