

## The Facts About Hydroplaning

What is it? What to do about it?

Riding in the rain safely is a matter of dressing properly, understanding traction, making sure you can see, and making sure that you can be seen. Seeing and being seen are bigger concerns than traction in its self.

I don't like cleaning the bike afterwards, but I do enjoy riding in the rain. Some riders, especially here in So. Utah where rain is rare, will park their bikes if rain is in the forecast. If you as a rider are uncomfortable riding in the rain, that is OK. After all, why would anyone want to ride a motorcycle when the roads are slippery, it's hard to see, and you're getting wet?

The key element in being able to enjoy a day riding in the rain is good rain gear. These days virtually all rain suits from reputable motorcycle accessory shops will keep you dry in a rain storm. The factors that set some apart are ease to put on, conspicuous colors, and comfort.

There is nothing like a hard, biting rainstorm to convince someone of the advantage of a full-cover helmet. Rain drops can hurt at 65 mph, so you want your face covered. You may also not want the dark lenses of your sun glasses. A full-coverage face shield on an open-face helmet will block the rain drops, but lets more water get onto your face and drip down the inside of the shield than a full-face helmet.

Staying comfortable is important. Soggy socks or water running down your crotch distracts you from the task at hand. Furthermore, if you get wet and cold, fatigue erodes that mental edge you need to stay alert of the traffic around you.

Once you have dressed for the rain you have only two issues to confront: *Traction and Vision*. Traction seems to be the primary concern for most riders usually because they aren't sure how much grip they have available. Some surfaces such as manhole covers, bridge gratings, painted areas, and places where the built-up of oil and grease have not washed off the pavement become much slipperier when wet. How much traction do you have? The easiest way to test traction is to feel for it with your rear brake. Assuming you know how much deceleration you can develop on dry pavement before the rear tire breaks loose, you have a gauge of what's available if you repeat the test when the road is wet. This also assumes that you have a reasonable amount (say 3/16 of an inch) of tread depth. If you do this at moderate speeds on a flat, straight road it won't become a thrill ride. Avoid locking up the rear wheel on a steeply crowned road, where it will tend to slide downhill and out of line.

Some situations should be confronted with extreme caution. Railroad tracks can do harm when they are wet. The standard advice is to cross a railroad or other metal tracks at a right angle, even in the dry. When they are wet, this is imperative. Otherwise, you risk having the tire slip into the groove alongside the track, which will immediately ruin your whole day. Other large metal road surfaces or metal sections running parallel to your direction of travel are expansion joints, for example, are equally hazardous and should be approached cautiously and upright. A thin strip of metal can usually be crossed while leaned over mildly; tires slip then catch again after crossing. However, a large metal surface such as a bridge grate, a manhole cover or a cattle guard, may permit the tire to slip too much to recover traction. Painted surfaces can be almost as slippery as metal.

Places where the oil doesn't get washed away by rain falling on it can be thrilling. Watch out for surfaces where water gets carried in but doesn't fall on the road with the force or in the quantity to remove the oil. Toll booths and parking garages offer a chance to experience this sort of low-traction excitement. Everybody knows where the Zion tunnel is. Vehicles dropping water onto the roadway inside the tunnel and the slower speed limits makes for more oil and slippery conditions exist. The oil in the tunnel makes it feel a bit slippery when it's dry. When it rains, the surface is like an ice rink. It's potentially dangerous for motorcyclists, especially one who rides in expecting a momentary relief from the wet road.

Hydroplaning is the result of your tires moving FAST across a wet surface so fast that they do not have sufficient time to channel the water away from the center of the tire. The result is the tire is lifted by the water away from the road and all traction is lost.

Of course the word 'fast' is a relative term. Tread design, tread depth, weight of motorcycle, tire pressure, depth of water and even the consistency of the water (whether it is highly aerated or not) all play a part in determining at what speed the tire will begin to hydroplane. It is a pretty safe bet to assume that any speed in excess of 60 MPH is fast enough to support hydroplaning regardless of the other variables. This is not to say that at 55 MPH you are safe. A formula that comes close to predicting the speed at which you will hydroplane, assuming at least 0.2" of water is on the ground, is:  $(10.27 \times \text{the sq. rt. of the tire pressure})$ , which shows that if your tires hold 35 psi, hydroplaning can be expected at 60.76 MPH. Tires with 41 psi of air in them should expect hydroplaning at about 65.75 MPH. Another formula that is somewhat more accurate, though much harder to calculate, is:  $(7.95 \times \text{the sq. rt. of the tire pressure} \times \text{contact patch width divided by the contact patch length})$ . This formula shows that the wider the contact patch is relative to its length, the higher the speed required to support hydroplaning. I bring this to your attention because it is contrary to my understanding that a wider tire is more susceptible to hydroplaning than is a narrower tire, yet this particular formula seems to yield a closer approximation of the threshold hydroplaning speed.

In any event, there are two absolutely essential NO-NO's to remember should you experience the beginning of hydroplaning:

- Do NOT apply your brakes
- Do NOT try to steer in any direction but straight ahead

Though I am not formally trained in the matter I would suggest that the only thing you can possibly do to help the situation is to feather your clutch to moderate your speed without the possibility of drive train 'snap' that would result from an abrupt change of the accelerator.

I hope there is an idea in there that you can work with. Frankly, if you start to hydroplane and action is not taken, the odds are that you are going to go down unless you keep the front wheel pointed absolutely straight ahead and it is of the briefest of durations.

While on this subject I would like to make another observation about your tires. If you look at the tire tread pattern you will also see that the grooves are cut in such a way as to tend to channel water away from the center of the tire if it is rotating in accordance with the arrow stamped on the side of the tire.



However, if you look at some different types of front tire tread patterns, they are aligned in exactly the opposite direction. That is, one tends to channel water towards the center of the tire. This CANNOT be the most effective way to diminish the odds of hydroplaning! Some manufactures would think differently. Use your own judgment. Remember, "ONLY YOU" are the pilot in command when it comes to taking the controls of your own motorcycle.

There's one more thing to remember. Please ride safe at all times. Going outside the envelope will ruin your day.

See you all on the road.

Brad Kitchen – SUHOG Safety Officer