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CRASH TALK

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Motorcycle Crashes

by Donald K. Pohl, P. Eng.

Motorcycle crashes that we investigate typically involve the question, “was the motorcyclist speeding”? The collision is typically at an intersection in which a motorcycle T-bones another vehicle. This requires an analysis of the three collision phases:

1. pre-impact
2. crash
3. post-impact

The post-impact roadway evidence typically involves the motorcycle sliding from its impact position, to the rest point. There is extensive published testing of motorcycles sliding on their sides, from which we can calculate a reasonable post-impact speed range. This is usually the easy part.

The crash phase consists of evaluating the damage to the motorcycle and other vehicle. This can be challenging, depending on what part of the passenger vehicle was struck. For example, if the front of the motorcycle struck the passenger’s door of the other vehicle, there may be published crash test data to refer to. However, the damage to the passenger vehicle is substantially different if it’s struck in a stiffer area, such as the axle. In these cases, there is much less data to refer to, and much more variability in the data.

The last phase of the collision to be analyzed involves the pre-impact phase, which usually consists of a skid mark or marks on the roadway. Most motorcycles have independent front and rear brakes – the front brake is operated with the rider’s right hand, while the rear brake is operated with the rider’s right foot. This is very different from an automobile, where a single foot brake application brakes all four wheels. With a motorcycle, a rider can brake with the front brake, rear brake, or both. Often, a rider will brake hard with the rear brake and lock the rear tire, resulting in a single skid mark. An experienced rider can maintain a rear wheel skid for an extended distance, and the speed from such a skid is easy to calculate.

However, the problem that often arises is whether the rider also braked with the front brake, and if so, by how much? If a rider locks the front brake, the motorcycle becomes gyroscopically unstable and falls over within roughly a second if the front brake is not immediately released. Therefore, riders have to be careful to apply threshold front braking, without locking the tire, which can be a challenging feat in an emergency situation. If a rider brakes too little with the front brake, or not at all, then the stopping distance greatly increases. Just as is the case with automobiles, front brakes provide the most braking for motorcycles, due to the weight shift forward upon brake application. Therefore, front brake application is crucial for stopping in the shortest distance. Because there is often little or no evidence to

prove whether a rider braked with a front brake or not, a wide range of possible speeds results – because we have to allow for a range of possibilities from no front braking, to full front braking.

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Currently, most motorcycles don't employ anti-lock braking systems (ABS), although they are becoming more common. Once ABS becomes common on motorcycles, riders will be able to apply both brakes as hard as possible, without the fear of locking the front tire and falling down.

Lastly, most motorcycles don't record electronic crash data, as most automobiles now do. There are a small number of motorcycle models that do record crash data now, and that will likely increase. In the future, we expect electronic data will become more and more common on motorcycles, just as it has with automobiles.

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Recalls

- 2017-18 Harley Davidson, various models, 12,750 units in Canada, clutch seals leak causing inability to disengage clutch.
- 2019 Freightliner New Cascadia and Western Star 5700 models, 551 units in Canada, steering wheel could come off.
- 2018 Honda Odyssey, 11,252 units in Canada sliding power doors may stick and not close properly, opening while vehicle is in motion.

To check recalls, go to www.tc.gc.ca/recalls

Did You Know?

- Ontario traffic rules state that horse-drawn sleighs must have more than one bell. www.wheels.ca
- Craig Assenheimer of the Edmonton office is our heavy truck expert. He has extensive training and can advise options available. Craig can be contacted at 780-425-1150 ext. 225 or craig@grahamryan.com.

Winter Tires by GRC Engineers

Given the time of year, a discussion of winter tires is appropriate. We are seeing more and more vehicle operators choosing to use winter tires in the summertime. Once winter tires are worn beyond their prime (less than 6/32" of tread), it's time for new winter tires. However, some drivers are choosing to get some extra mileage out of their worn-out winter tires by using them in the summertime. This may generally be fine, but there can be issues. Winter tires typically are "squirmier" than summer tires, as winter tires have deep sipes (narrow transverse grooves in the tread block) to help grip ice or hard-packed snow. In summertime heat, the tires can become even squirmier, decreasing handling. An all-season or summer tire is still best for summer conditions.

Another serious issue is when drivers use winter tires in the summer and then continue to use those tires in the winter. The summertime heat tends to make those winter tires harder, greatly decreasing their winter performance. Lastly, using winter tires in warm conditions typically wears them out much more rapidly than colder conditions. As a result, they are no longer performing as a winter tire (and often not performing as well as a good all-season tire would in winter conditions). We have investigated crashes where a vehicle had winter tires on the vehicle, but were worn below 2/32" – the legal limit in summer. This is a recipe for disaster on our Alberta roadways in the wintertime.

For winter tires to be effective, they should be softer than an all-season or summer tire and they should have many more sipes to grip a slippery roadway. Check your winter tires and make sure there are **four** good winter tires (**not 2**) on the vehicle!

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