



STEEL HORSES

Understanding the Dynamics of a Motorcycle Accident

By Peter R. Thom and Timothy A. Logsdon

Regardless of a motorcyclist's skill set or how cocooned he is with safety gear, any motorcycle road trip can end at heaven's pearly gates instead of the home garage. In its sobering Traffic Safety Facts/Motorcycles (2007) report, the National Highway Traffic Safety Administration (NHTSA) reveals that motorcyclists are about 35 times more likely than passenger car occupants to die in an accident and eight times more likely to be injured per vehicle mile traveled. Even more astonishing is the fatalism of career motorcyclists who accept that they are seconds away from disaster anytime they crank the throttle.

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At least they stack the odds in their favor with motorcycle licensing and training, wearing helmets and leather, and purchasing insurance coverage. Others who are unlicensed, untrained and unfortunately, underinsured burden society with the price of their wild-riding ways, often saddling taxpayers with the cost of hospitalizations and rehabilitation. The margin separating them from catastrophe is even slimmer.

Resisting the lure of these powerful beasts is difficult because so few modern inventions answer the call of the wild as pleasurably as a fast, roaring motorcycle. That is why more than seven million (and counting) are registered in the U.S. alone. If you factor in commute congestion and unstable gas prices, an economical, mileage-efficient motorcycle seems like a great choice. On the downside, the growing number of riders translates into more accidents for the NHTSA to track.

The current statistics are a wake-up call. Motorcycle accidents are rising when the other accident categories are falling. Behind the numbers are the accidents themselves: Which riders have accidents? Which models? Are there "typical" motorcycle accidents? How do accident investigators approach motorcycle accidents?

The Bike

On-road motorcycles fall into three general categories: sport performance, touring and cruiser models. Cruisers comprise half of on-road motorcycle purchases, with Harley-Davidson commanding 50 percent of the marketplace. The typical Harley rider is a 47-year-old male earning more than \$80,000. According to the Insurance Institute for Highway Safety (IIHS), the death rate

of cruisers (coupled with standard motorcycles) was 5.7 per 10,000 registered motorcycles in 2005.

Touring cycles, favored by older riders, are the amenity-loaded luxury vehicles of the on-road motorcycle fleet. Designed for long-distance rides with passengers and luggage, they vary from 800cc to 1,600cc and can weigh more than 1,000 pounds. According to the Insurance Information Institute (I.I.I.), touring models have the highest average loss payments at \$15,696, a figure that reflects a hefty sticker price. IIHS touring segment fatalities were 6.5 per 10,000 registered motorcycles in 2005.

Sports performance models are the genetically engineered athletes of the motorcycle group. At the high end are the super sports, including the fabled Suzuki Hayabusa. Aptly nicknamed the "crotch rocket," the 2008 Hayabusa accelerates to 60 miles per hour in 2.6 seconds and to 180 miles per hour in 15.9 seconds. Such beasts challenge the skills of professionals on racetracks; just imagine the mismatch of skill to power on public roadways with less-experienced riders. Not surprisingly, this is the class favored by riders 30 years old and younger. While horsepower varies among the models in this category, the aerodynamic styling, light weight, and handling of the super sports makes them irresistible. Their exhilarating acceleration is what ultimately leads to disaster by narrowing the rider reaction margin to milliseconds. IIHS fatality statistics are high for the super sports—at 22.5 per 10,000 registered motorcycles in 2005—while the broader category of sports performance motorcycles is 10.7, less than half of the super sports' fatalities. Super sports also incur the highest theft and collision losses.

See page 5 for the *Top Ten Questions for Smart Claims Adjusters* that can lead to a successful motorcycle investigation.

The Ride

According to the Motorcycle Industry Council, a non-profit trade group, the average motorcycle owner is a 40-year-old man with a median income of \$55,000, although the incidence of women buyers is increasing. Unlike the mid-1980's when laborers led in motorcycle ownership, today's owners are professionals and technical workers. Men comprise 91 percent of the fatality statistics; correspondingly, women suffer more than 90 percent of passenger deaths (NHTSA/2007)

Accident rates climb in warmer weather when motorcyclists in the seasonal states return to the roads. According to the IIHS, 56 percent of motorcycle accidents involve other vehicles and 44 percent are single-vehicle accidents. In multiple-vehicle accidents, 79 percent of the motorcycles involved front-end impact. Frequently, a left-turning vehicle will strike a motorcycle traveling straight, passing or overtaking that vehicle. Visibility is invariably at issue, as drivers either do not see motorcycles or underestimate their approaching velocity. Drivers also generally have a limited understanding of the stability and braking challenges riders face in emergencies. Thus, a motorcyclist might manage to avoid a collision only to be taken out by debris when his defensive swerve goes awry.

The IIHS reports that speed or alcohol impairment is common in single-vehicle crashes: 49 percent were speeding and 41 percent had blood alcohol

concentrations above legal limits. Speed is the principal cause of more than half of super sport fatal crashes but accounts for less than a quarter of cruiser and touring fatalities. Inebriation is a serious impediment to the rider's ability to maintain motorcycle control. However, studies show significant control loss by riders at concentrations below the legal limit.

The Investigation

Motorcycle accident investigations reveal an inescapable truth of life on the road: small issues can have big consequences. Motorcycles are far more susceptible to human error, road conditions, and the elements than passenger vehicles. This exposes the rider to the high probability of injury or death. Understanding the dynamics of a road trip gone wrong may require an expanded toolset and broader experience for an investigator than a standard automotive accident investigation. Thus, beseeching a motorcycle specialist will yield a more insightful analysis of the factors leading to the accident.

Of course, like any vehicular accident, the process starts with a CSI-like accident-scene inspection culminating in a physical examination of the damaged vehicle(s). At each stage the investigator should focus on clues that tell the motorcycle's crash narrative. At scene evidence, like skid marks, become crucial for gauging front- and rear-wheel alignment as well as speed and control issues, while



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Deadly Speed: A dramatic image of a fatal motorcycle accident that became an Internet sensation. Here is a case where the margin between perception of imminent danger and disaster was milliseconds for the super sport rider and the occupants of the vehicle—too short to avert the collision.

crash photos aid in determining terminal velocity and for documenting bent or broken components to be examined for pre- or post-accident failure issues. Marks and gouges are telltale signs of impact damage, whereas bearings, shafts, and welds will likely show failure evidence. Motorcycle tires frequently are the best source of accident sequence evidence. They tend to wear faster than those of passenger vehicles. Thus it is crucial to note signs of deterioration.

Beyond these standard procedures, an investigator should review other motorcycle-specific operational issues and contributing factors. Identifying the motorcycle model is the first step because each type has unique characteristics. The stable cruiser has slow-handling qualities because of laid-back ergonomics and raked front suspension. Hefty touring models are built for comfort rather than maneuverability, and the extremely responsive sport-performance motorcycles pose control challenges for novices.

Additionally, the investigator needs to probe rider issues that might affect safe operation. Did the motorcyclist carry a passenger? Additional weight can adversely affect handling and braking, especially when exceeding the manufacturer's gross vehicle weight rating (GVWR), which takes into account the bike, rider, passenger, luggage, and accessories. Accidents in touring models are frequently associated with under-inflation tire failures exacerbated by exceeding GVWR. How has the motorcyclist personalized his ride? Consumers and dealers often underestimate how the accessories they install affect braking, lighting, steering, and engine reliability. Thus, verifying component size, fastener torque, and interference with other components is crucial.

Critical, too, are owner maintenance habits, as inconsistent care makes safe motorcycle operation problematic, especially when owners routinely service their rides at home rather than at dealerships. Hit-or-miss practices means that important systems like lighting, which is prone to malfunction from engine vibration, fail frequently.

When focusing on accident details, the investigator should study the cosmetic damage suffered by the motorcycle. This is commonly referred to as the bike's "crash rash." Determining whether the rash is on the high side or low side indicates rider control issues prior to an accident. Typically, high-side accidents point to handling problems and low-side accidents result from traction loss. Telling clues can also be found by examining damage to riding gear and medical records.

Next, the investigator should weigh environmental factors. Obviously, motorcyclists are more

susceptible than drivers to weather. High temperatures contribute to dehydration, while even mild cold weather can chill the rider to the point of hypothermia. Details such as the time of day and sun position are also important because motorcycle goggles and face shields are susceptible to glare.

Road design or conditions can also play roles. Winding roads make for great riding, but even experienced riders can drift left of center. Furthermore, any deterioration in the road surface can trigger problems for riders of all skill levels. All of these details feed into the greater analysis of the crash factors. The downside is that no matter what issues contributed to a motorcycle accident, insurance carriers routinely face high-dollar value claims resulting from traumatic injury, even death. The first line of defense for controlling costs is hiring an accident reconstruction firm with motorcycle expertise.

The Insurance Carrier

Standing sentinel for the motorcyclist is the insurance carrier, but pricing coverage is challenging in a soft market when risk exposure is on the upswing. National motorcycle fatalities are commanding a growing share of total vehicle fatalities and the largest cohort of riders—those older than forty—is seeing a historic rise in deaths and injuries.

Carriers with strong presence in the power sports marketplace are astute providers of motorcycle coverage. For example, GEICO's strategy balances underwriting discipline with safe-riding advocacy delivered via the Internet. By clicking its web site's motorcycle insurance link, visitors can obtain information about coverage terms, product offerings, and pricing. They can also tap into other rider resources such as MyGreatRides.com, a company-powered forum for motorcyclists, and the Motorcycle Safety Foundation. GEICO, Progressive, and Allstate (with its interactive Allstate Garage) lead the trend of providing customized on-line portals for motorcycle-riding enthusiasts.

Certainly, new riders benefit from this Internet bonanza, but major carriers realize that safe cycling is a lifetime habit and that establishing a 24/7 connection with their insureds is essential to supporting that goal. Ultimately, a proactive commitment to risk reduction programs for motorcycling is the right strategy for a carrier with a power sports portfolio.

Steel Horses was published initially in Claims magazine 06/09. Peter R. Thom is principal of Peter R. Thom and Associates and Associate Timothy A. Logsdon is a 30-year power sports industry veteran.

Damage Control

Smart claims adjusters know what questions to ask following a motorcycle accident. Here are the top 10 inquiries that can lead to a successful investigation:

- Were there any witnesses to the accident? Are their stories consistent with those of the involved parties? If the rider was with a group, be sure to interview the other riders. Note if there was a passenger, and record any injuries.
- What was the year, make, and model of motorcycle involved? Speeding is much more likely in accidents involving super sport bikes, whereas overloading is much more common in accidents involving touring bikes. Thoroughly document the condition of the motorcycle, noting any aftermarket accessories.
- Are maintenance records available for the motorcycle? Examining the rider's maintenance practices may reveal a lot about their concern for their own safety. Check dealer records for any recalls or technical service bulletins.
- Was the motorcyclist licensed and trained in motorcycle safety? Novice riders have higher probabilities of suffering single-vehicle accidents caused by their inexperience and weak riding skills. Note any protective apparel worn by the rider and/or passenger and document any crash damage to it.
- What day of the week and time of day did the accident occur? For accidents occurring between 6:00pm Friday and 6:00am Monday, there is a higher likelihood of alcohol being involved.
- Are the tires in good condition? Measure each tire's tread depth and inflation pressure. Motorcycle tires wear much faster than passenger vehicle tires and need to be replaced more frequently. Low inflation pressures can contribute to poor handling.
- Did the motorcycle leave skid marks? If two parallel skid marks are visible, the rider may have lost control under heavy braking conditions. If only one skid mark is visible, then the rider may have braked only one wheel. A locked front brake results in a heavy curved skid mark with subsequent evidence of bike crash marks on roadway.
- If there are any scrapes on the roadway before the point of impact, then is there corresponding abrasion on the motorcycle's foot pegs? If a foot peg contacts the roadway surface due to a too-aggressive lean angle, the motorcycle may lose rear wheel traction.
- Is the accident damage to the motorcycle on the high side or the low side? High-side and low-side accidents have different characteristics and different causes.
- Is gravel, oil, or other debris present on the roadway? Motorcycles are much more challenging than passenger vehicles to control. Roadway debris may be a contributing factor to the accident.