

November 9, 2023

The Honorable Ann Carlson  
Acting Administrator  
National Highway Traffic Safety Administration  
1200 New Jersey Avenue, SE  
Washington, DC 20590

**Petition for rulemaking: Upgrade Federal Motor Vehicle Safety Standard No. 122, Motorcycle Brake Systems (49 CFR 571.122), to require antilock braking systems (ABS) for new on-road motorcycles**

Dear Acting Administrator Carlson:

The Insurance Institute for Highway Safety and Highway Loss Data Institute (IIHS–HLDI) first petitioned the National Highway Traffic Safety Administration (NHTSA) to require ABS on all new on-road motorcycles in 2013 (Moore & Teoh, 2013). In the 10 years since then, evidence of ABS effectiveness has continued to accumulate, and it has become far more common among new motorcycles in the United States. Despite this, NHTSA has taken no action to require this life-saving technology. Therefore, IIHS–HLDI hereby petition NHTSA to upgrade Federal Motor Vehicle Safety Standard No. 122, Motorcycle Brake Systems (49 CFR 571.122), to require ABS on all new on-road motorcycles sold in the United States.

**Evidence of ABS effectiveness**

The latest study by IIHS (Teoh, 2022) includes a much broader sample of motorcycles compared with our previous research (Teoh, 2011, 2013)—65 motorcycle models vs. 13—and shows that motorcycles with optional ABS have fatal crash rates 22% lower than those same motorcycles without ABS. Further, it shows that ABS is associated with lower fatal crash rates for all types of on-road motorcycles investigated. The latest research by HLDI (Basch et al., 2015; Highway Loss Data Institute, 2014, 2016) shows that motorcycle ABS is associated with 21%–24% lower collision claim frequencies and, importantly, that the ABS effect did not vary when controlling for riders' associated automobile claim frequencies. This finding refutes the notion that observed ABS benefits are simply due to safer riders being more likely to purchase the ABS option.

Recent research in Europe has also found benefits. Rizzi et al. (2015) estimated ABS to be associated with a 24%–34% reduction in injury crashes across three countries and a 34%–42% reduction in fatal crashes, using head-on crashes as a comparison group. An in-depth study from Germany estimated that ABS could prevent 26% of motorcycle crashes (Lich et al., 2015). Another in-depth study (Rizzi, Strandroth, et al., 2016) found that fatal sliding crashes were far less common among motorcycles equipped with ABS. Yet another study (Rizzi, Kullgren, et al., 2016) showed that motorcycle ABS reduced the number of emergency care visits as well as both the risk and severity of impairing injuries in crashes.

The evidence of ABS effectiveness outlined above is in addition to what was already known back in 2013. By 2013, ABS was known to improve test-track braking performance among both novice and experienced riders (Vavryn & Winkelbauer, 2004), and in a variety of situations (Gail et al., 2009; Green, 2006). A NHTSA study (Green, 2006) noted that novice riders can be expected to achieve high levels of braking performance when using ABS-equipped motorcycles. In-depth studies estimated that anywhere from 17% to 50% of motorcycle crashes could have been prevented had those vehicles been equipped with ABS (Gwehenberger et al., 2006; Rizzi et al., 2009; Roll et al., 2009). The latest studies at the time comparing crash rates for motorcycles with and without ABS indicated a 31% reduction in fatal crash rates (Teoh,

2013) and a 20% benefit (or 31% with combined control braking systems) for collision claim frequency (Highway Loss Data Institute, 2013) for motorcycles with ABS. The ABS benefit for collision claims was even stronger during the first month of the insurance policy (Highway Loss Data Institute, 2012). Even back in 2013, the evidence of ABS effectiveness was solid, and coupling that with the latest evidence, it is now indisputable that ABS improves motorcycle safety.

### **Proliferation of ABS among motorcycles in the United States**

The proportion of new motorcycle models that have ABS as standard equipment has steadily increased, from about 1% in 2003 to 20% in 2013 and now to 59% in 2023 (Insurance Institute for Highway Safety, 2023a). While this is certainly an improvement, it still leaves a 30%–40% gap in terms of new motorcycle models that do not have ABS. Moreover, only 20% of motorcycles registered in the U.S. in 2023 have standard ABS (Teoh, 2023a), as clearly not everyone owns a new motorcycle. NHTSA has the unique ability to close this gap and accelerate the penetration of ABS into the motorcycle fleet.

The rapid increase in equipping ABS on new motorcycles likely can be attributed to two factors: increased acceptance by consumers, and production practices driven by the many countries throughout the world that have required ABS on new motorcycles. Both factors would reduce the difficulty of requiring motorcycle ABS here in the United States. NHTSA should follow the lead set by all European Union member states, the United Kingdom, Brazil, Japan, Taiwan, Australia, New Zealand, and India in requiring this life-saving technology.

### **Off switch/warning and other considerations to explore in the rulemaking process**

We are aware that ABS can negatively affect motorcycle handling in loose-surface conditions, so it is reasonable to allow (or require) an off switch for ABS for use in such conditions. It would also be reasonable to require the display of a readily-visible warning light indicating when the system is disabled (or malfunctioning), which could help remind riders to re-enable ABS when entering a paved roadway, or serve as a quick check that ABS is indeed off when riding in loose-surface conditions. There may be other important considerations that can be identified from public comments and addressed during the rulemaking process.

### **Mandatory ABS as one part of riding in a safe system**

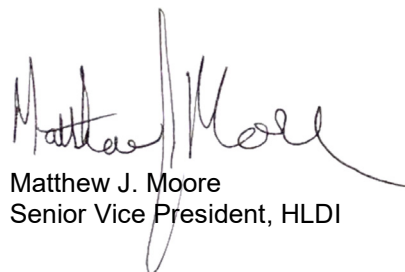
While ABS obviously doesn't prevent every crash or death, it is clearly a powerful tool for improving motorcycle safety. In 2021, the latest year of data currently available, motorcyclist crash deaths reached an all-time high of 6,084 (Insurance Institute for Highway Safety, 2023b), so it is imperative that this trend be reversed quickly. The most effective way would involve the Safe System approach, which recognizes that humans make mistakes and are vulnerable, and that safety is maximized by redundancy. The U.S. Department of Transportation adopted Safe System thinking as part of its National Roadway Safety Strategy. As recently outlined by IIHS (Teoh, 2023b), ABS on all new on-road motorcycles would be an important component of a Safe System for motorcycling. This would leave fewer crashes and deaths for other countermeasures to address, meaning more riders arriving safely at their destinations.

In summary, IIHS–HLDI request NHTSA begin rulemaking to require motorcycle ABS, without further delay, as a key step in improving safety for motorcyclists on our nation's roads.

Sincerely,



Eric R. Teoh  
Director of Statistical Services, IIHS



Matthew J. Moore  
Senior Vice President, HLDI

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