

An Examination of Motorcycle Antilock Brake Systems in Reducing Crash Risk

Abstract

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Author Information: Graeme F. Fowler, Rose M. Ray, Su-Wei Huang, Ke Zhao and Todd A. Frank

To prevent wheel lockup (and possible loss-of-control and capsize) during hard braking, motorcycle manufacturers have equipped motorcycles with antilock brake systems (ABS) either as an option or as standard equipment. Several studies utilizing real-world crash data have been published, which estimate the effectiveness of motorcycle ABS in reducing the risk of a crash based on varying assumptions. These investigations have reported mixed results. The present investigation relies upon the fatality analysis reporting system (FARS) and the Florida police-reported crash databases to further investigate the effectiveness of motorcycle ABS by expanding upon and refining previous approaches. Notably, a case-control approach is used, whereby crashes involving ABS- and non-ABS-equipped motorcycles are divided into five groups with a varying likelihood that ABS will affect the risk of crashes in that group. The group of crashes with the least likelihood of being influenced by ABS is considered the control group and used as a measure of exposure to crashes. This methodology attempts to reduce any selection biases that might exist in the two motorcycle classes.

The results support the hypothesis that ABS is effective in reducing the crash risk in some crash types. However, it was found that the case-control approach does not incorporate all factors that might influence the overall effectiveness of ABS, e.g., motorcycle class and operator age. Accounting for these additional factors would likely require the use of regression analyses and would benefit significantly from additional data.