



U.S. Department
of Transportation

National Highway
Traffic Safety
Administration

TRAFFIC TECH

Technology Transfer Series



DOT HS 812 406

May 2017

Examining the Feasibility of Alcohol Ignition Interlocks for Motorcycles

Impaired driving is a major factor in vehicle crashes and traffic fatalities. The use of alcohol ignition interlocks is growing as a countermeasure to combat the high rate of offender recidivism for Driving While Intoxicated (DWI); however, while there is an increase in interlock use on passenger vehicles to reduce DWI recidivism, there has been only limited use of these devices on motorcycles. Of the approximately 279,000 interlock devices installed in the United States in 2012, estimates show that only 0.1 percent to 0.2 percent of that total were installed on motorcycles.

Motorcycle fatalities increased from 3,270 deaths in 2002 to 4,612 deaths in 2011. In 2011, 30 percent of motorcycle riders involved in fatal crashes had blood alcohol concentrations (BACs) of .08 grams per deciliter (g/dL) or higher, more than for any other type of vehicle. Therefore, it is appropriate to examine the feasibility of wider use of alcohol ignition interlocks to help reduce alcohol-related crashes and fatalities on motorcycles. NHTSA funded this study to examine the use of interlocks on motorcycles throughout the country, and to determine the significant issues affecting the use of alcohol ignition interlocks on motorcycles.

The research team in this study conducted in-depth discussions with interlock manufacturers, installers, State officials, and riders with interlocks installed on their motorcycles to address the many issues involved. In addition, researchers conducted an analysis of interlock breath test event records from motorcyclists, the results of which mirrored event records for passenger vehicles.

Key Issues for Motorcycle Alcohol Ignition Interlocks

Feasibility: The research team interviewed interlock manufacturers operating in the United States, as well as three major installers. Those interviewed agreed that motorcycle interlocks are technically feasible, though there are some important issues that still need to be addressed.

Current Availability: Currently, there are only two manufacturers providing limited support for ignition interlocks on motorcycles in the United States. The other interlock manufacturers do not allow the installation of their devices on motorcycles.

Passenger Vehicle Interlocks Used on Motorcycles: No interlocks designed specifically for motorcycles are available at this time.

Currently, interlocks used on motorcycles are the same ones used on passenger vehicles. With regard to interlocks, motorcycles introduce a number of issues not found on passenger vehicles, and there was considerable difference of opinion among manufacturers as to whether the current equipment is adequate for use on motorcycles.

Secure Storage: Interlocks on motorcycles are susceptible to theft. A secure locking compartment may be required to protect equipment from theft. One manufacturer suggested using a removable handset for the sampling unit to preclude theft when left unattended. This creates the potential for damage should the handset be dropped on the hard road surface. Damage from units being dropped is not as big a problem when used in passenger cars.

Weather: A secure compartment may also be required to protect motorcycle interlocks from weather conditions. It is difficult to keep interlock units completely dry due to weather exposure. Moisture can lead to corrosion and device failure. It is possible to weatherproof interlocks, but this is likely to increase the cost of the equipment.

Vibration: Motorcycles generate a lot more vibration than automobiles. There are currently specifications for vibration resistance for automobile interlocks. No information is available at this time on the potential adverse effects of the additional vibration of motorcycles on the interlock devices currently being used on them.

Battery Power: Interlocks draw power (about 20-50 mA) from the battery whether the motorcycle is running or not. The storage capacity of a motorcycle battery is about one-tenth of the capacity of an automobile battery. This necessitates some kind of battery-trickle charger when the motorcycle is not used for several days to offset the drain on the smaller motorcycle batteries. According to some manufacturers, it is possible to overcome this power limitation by altering the equipment design.

In addition to the issue of power availability on a motorcycle charging system, power fluctuations, electrical noise, and transient spikes are common in motorcycle electrical systems. These problems are not common in automobiles. A motorcycle-specific device could be designed around these

issues, but existing interlocks cannot easily overcome these power-related challenges.

Retesting Issues: After the initial breath test to start the motorcycle, riders with interlocks are required to take additional breath tests while the motorcycle is in operation. This is also required of passenger vehicle operators with ignition interlocks. Performing the retests while operating a motorcycle is riskier than doing so while operating a passenger vehicle. This has led some States to allow installers to forego the requirement of running retests for interlocks on motorcycles, despite the lack of written statutory support in the vehicle code. Some States appear ready to accept an exception for motorcycles that allows for an engine-off dismount rather than a running retest. While running retests should be performed when the vehicle is not in motion, they may not always be done that way. Motorcyclists interviewed for this study admitted to conducting retests while in motion, one noting that it was most difficult when in stop-and-go traffic, when both hands were needed for handling the brakes and clutch.

Riders cannot easily hear the auditory tone that signals a need for a retest. Using a supplemental visual cue (a flasher) mounted on the handlebars, instead of an auditory one, is not a foolproof solution because it requires the rider to often look down to see if the signal is lit, potentially adding a safety hazard. One alternative currently in use relies on an increasingly louder auditory signal that, in the absence of a response from the operator, eventually activates the horn to notify riders that it's time to retest. One manufacturer said that the risk element could potentially be removed if running retests were conducted using a transdermal skin sensor that detects alcohol vapor. Other manufacturers felt that this was impractical, at least on a cost basis, since it requires adding a second alcohol sensor for a product that is, at best, for a very low volume of customers.

Liability: Some manufacturers and installers expressed concern that there is an unknown degree of liability exposure if there is a crash of an interlock-equipped motorcycle, particularly by someone performing a running retest. This is the primary reason cited by the majority of the interlock companies for not pursuing this business, or for being very wary of it. By contrast, other manufacturers and installers believe the liability risks are controllable by requiring riders to sign liability waivers.

Installation: Installation time for motorcycle interlocks may be longer than for passenger vehicles (sometimes more than 2 hours) since there is greater variation between motorcycles in wiring systems and other configuration aspects (e.g., location of batteries, storage compartments). Unlike for cars, motorcycle schematics are not readily available for installers. In addition to having to learn how to install devices on different systems, some modern motorcycles have an electronic control unit (ECU) or onboard computer that must be integrated with new equipment, much like in automobiles; but unlike automobiles, telephone support may be less available from motorcycle manufacturers. Interlocks are usable only on motorcycles that have an electrical switch starter. While these are present on the majority of motorcycles, there are now hybrid gas-electric motorcycles that might complicate installation.

Circumvention Potential: Some motorcycles have both switch-starters and kick-starters. This makes them easier to circumvent (to bypass the starter circuit). The rider, even if there is also a switch-starter, could easily bypass any motorcycle with a kick-start option, though this would be recorded as a circumvention event.

Cost: Cost does not appear to be that different from costs for interlocks on passenger vehicles, though increased installation fees may be required to adapt interlock models designed for passenger vehicles for installation on motorcycles. Without more demand, manufacturers are unlikely to develop motorcycle-specific interlock devices.

A motorcycle interlock that is designed to accommodate motorcycles does not exist at this time, but an adequate and safe motorcycle interlock program is possible with existing equipment. The biggest concerns are safety and liability, which can likely be overcome with changes in the statutes.

How to Order

To order *Examining the Feasibility of Alcohol Ignition Interlocks for Motorcycles* (60 pages), prepared by Pacific Institute for Research and Evaluation, write to the Office of Behavioral Safety Research, NTI-130, NHTSA, 1200 New Jersey Avenue SE., Washington, DC 20590, fax 202-366-2766, or download from www.nhtsa.gov. Randolph Atkins, Ph.D. was the Contracting Officer's Technical Representative for this project.



U.S. Department of Transportation
**National Highway Traffic Safety
Administration**
1200 New Jersey Avenue SE., NPD-310
Washington, DC 20590

TRAFFIC TECH is a publication to disseminate information about traffic safety programs, including evaluations, innovative programs, and new publications. Feel free to copy it as you wish. If you would like to be added to an e-mail list, contact TrafficTech@dot.gov.