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Driver Alcohol Detection System For Safety (DADSS) – Pilot Field Operational Tests (PFOT) Vehicle Instrumentation & Integration of DADSS Technology.

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Abstract

The Driver Alcohol Detection System for Safety Program – a joint effort between the National Highway Traffic Safety Administration and the Automotive Coalition for Traffic Safety since 2008 - has been developing unique, in-vehicle breath-and touch-based alcohol detection systems to address the problem of alcohol-impaired driving. The sensors under development are intended to be passive, seamless with the driving task, non-intrusive, accurate, fast, reliable, durable, and requiring little or no maintenance. When installed in vehicles, the technology is intended to prevent alcohol-impaired driving when the driver's blood alcohol concentration is at or above 0.08 %. Sensor technology, now in Phase III of development, is undergoing more extensive testing in real-world driving environments. Research vehicles are being fitted with breath-based alcohol sensors and comprehensive Data Acquisition Systems (touch-based sensors will be integrated once they have completed the requisite test protocols). Pilot Field Operational Trials have recently begun, and data are being collected. In this paper, an overview is provided of the instrumentation and integration of the test vehicles in readiness for field trials. Data is being collected from the DADSS alcohol sensors as well as from breath-alcohol reference sensors. Instrumentation also has been installed to track environmental conditions, vehicle system data, and test participant video. The data are uploaded via 4G and WIFI and stored in the cloud. These data will be critical in determining the effectiveness (accuracy, precision) of the DADSS sensors in real-world driving environments and when compared with breath alcohol reference sensors. They will also be used to evaluate the effects of repeated use and vehicle mileage on sensor function and in diverse environments, analyze driver behavior and user acceptance, analyze and assess the impact of the DADSS sensors using real-world data, improve awareness of in-vehicle alcohol detection systems and assess potential impact of the sensors on alcohol-impaired driving. The findings will be used to refine the DADSS Performance Specifications and ultimately for modifying the systems designs and enhance product development. The DADSS technology, if proven to be reliable and reproducible under diverse environmental and biological conditions, would represent a significant technological breakthrough in crash avoidance and a significant advance in driver monitoring technologies in vehicles.