ALCOHOL IGNITION INTERLOCK: TECHNOLOGY UPDATE

Enhancements to alcohol interlock technology have been substantial in the past seven years. This rapid pace of advancement has facilitated the monitoring of program participants by providing access to the visual identification of drivers, geographic location and real-time information. It has also created flexibility and enabled program administrators to tailor the level of participant supervision in accordance with risk. However, these advances have also necessitated concerted efforts by states to keep pace with changes in device technology and ensure that program regulations and practices are adapted to acknowledge new features. At the same time, the importance of device management and maintenance remains paramount to protect the integrity of these programs.

This fact sheet summarizes important highlights from presentations about technology during the May 2019 Association of Ignition Interlock Administrators annual conference. Sensor technology is described along with important information related to calibration of devices and field testing. Global position system features are also described.

Fuel Cell Sensors

Are fuel cell sensors the most viable technology for ignition interlocks?

Yes, fuel cell sensors are highly efficient, easy-to-use and provide an accurate measure of a driver's breath alcohol concentration (BrAC). Fuel cell sensors use an electrochemical process where the alcohol in a person's breath reacts with a catalytic electrode and produces an electrical current. The strength of the current can be used to measure the level of alcohol in the breath sample.

What are the benefits of a fuel cell sensor?

Fuel cell sensors are highly accurate and are specific to alcohol. Additionally, these devices are not affected by ambient air in the vehicle, meaning the system does need not to be purged after a test. This reduces the recovery time needed between breath tests. Furthermore, fuel cell sensors are not susceptible to positives from organic hydrocarbons such as cigarette smoke, and can hold their calibration (i.e., the ability to measure accurately and repeatedly over time) longer than devices using semiconductor sensors.

Interlock Device Calibration

Why is the regular calibration and maintenance of interlock devices important?

The calibration of devices is essential to the accuracy and reliability of breath alcohol

readings for long periods of time. Results of BrAC tests are frequently used to determine compliance and failed tests can result in an extension of program participation in many jurisdictions. Breath test results may also be used as evidence in court proceedings.

Typically, most states require interlock devices be calibrated at least every 60 days, although well-maintained devices can often hold their calibration for up to 180 days. Program participants are frequently required to attend the service center more regularly to conduct a visual inspection for tampering and so the data captured by the device can be downloaded and reviewed by state authorities.

How are devices calibrated?

To ensure reliable BrAC readings, ignition interlock devices should be regularly calibrated through one of two methods: wet bath simulators or dry gas. During calibration, the accuracy of devices is measured using a dry-gas or wet-bath instrument that provides a proper scale to the ignition interlock for measuring alcohol molecules from a breath sample. During the calibration process the device is exposed to an alcohol vapor of a precise and pre-determined concentration. If the device is not accurately measuring the BrAC, the device can then be adjusted or re-calibrated to ensure the correct measurement of future samples. The reliability of data from ignition interlock devices is dependent upon the accurate use and maintenance of the calibration equipment. In addition to checking the calibration of the device, other features of a service appointment include downloading data from the device, logging the odometer reading of the vehicle, inspecting the device (i.e., wiring and connections) to ensure it works properly and examining the device for evidence of tampering.

AIIPA's best practices for alcohol interlock device calibration can be can be found online at: https://drive.google.com/file/d/1pUlFiPywS9T_UiWlYtxJ6Ldied7KGyik/view

Device testing and field-testing

Why is field testing important?

Field testing often occurs prior to the certification of the device as well as periodically after certification, or as part of a renewal of the certification. A jurisdiction may choose to schedule annual field testing of devices. The purpose of a field test is to confirm that devices respond to events in accordance with administrative rule or statute in the jurisdiction. The purpose of this process is not to test the accuracy of the device, but instead to ensure the device meets the required configuration profile(s) in a jurisdiction. For example, a field test may be conducted to verify the device triggers a running re-test within five minutes of the vehicle being started and at specified intervals thereafter. This encourages standardization of devices, ensures uniformity of programming, and helps to ensure required device features are activated.

Field testing can also assist in building relationships between vendors and state agencies through the provision of feedback. It is beneficial to keep vendors apprised of field testing and to make them aware of how their devices perform in relation to state standards/requirements. One strategy that can be utilized is to send vendors a checklist of items being studied during field testing so they are aware of expectations and standards to be met.

What practices should be included in the field-testing of an interlock device?

Field-testing interlock devices encompasses a wide range of tests related to the performance of it under specific conditions in accordance with state rules or certification requirements. The following tests may be included in a field test:

- tests of non-alcohol products and food to determine if they produce false positives;
- confirmation of various lockout scenarios;
- attempts to use non-human breath samples;
- disconnection of power;

- test configuration profile/violations;
- occurrence and timing of running retests;
- test anti-circumvention features; and,
- restart of stalled motor vehicle.

The test protocol should include the creation of specific events to verify responses to re-test refusals, high-BAC fails, and circumvention attempts. If possible, the device should be installed in a state vehicle for whatever length of time is needed to test all device requirements (e.g., for example, 30 days may be too long and resource intensive). At least two state employees should be present when conducting the tests; one should take notes of events which can then be matched against responses logged by the device to measure accuracy while the other drives the vehicle.

Testing of the performance of anti-circumvention features includes whether devices can be circumvented using common methods often found online such as balloons filled with "clean" air, air compressors, charcoal, and hoses. Identifying these methods can be done by using a search engine or YouTube to search "how to bypass an interlock" and "how to make my interlock pass", among others. Circumvention information is widely available online for participants and testing these methods is beneficial to ensure devices cannot be bypassed or tampered with to avoid failed breath tests.

Field-testing can also include testing the device is installed correctly and it did not impact the functioning of the vehicle. This testing includes turning the vehicle on and off in addition to testing the horn, lights, and brakes. It is also recommended to test the temporary lockout by continuously blowing fails to ensure the lockout does work.

Interlock device feature: GPS

What is the purpose of the GPS feature on the interlock?

The GPS feature can be used as a risk management tool for offenders who are non-compliant with the interlock restriction. It can serve as a graduated sanction in response to repeated violations by offenders during the interlock period. In addition to tracking everywhere offenders drive their vehicle, the GPS can also be used for geofencing. A geofence is a virtual perimeter around a real-world geographic area and can be generated through radius around point locations or a predetermined set of boundaries. This is beneficial in that it means law enforcement officials and parole or probation officers could easily configure restricted zones for individual offenders.

What are the benefits of a GPS?

GPS capabilities in interlock devices have significantly evolved in recent years. One of the benefits of GPS is the ability to determine patterns regarding violations, including where they drink and where violations primarily occur (i.e., at home or at a restaurant). Additionally, GPS is beneficial in determining the jurisdiction in which a violation occurred. This is important for law enforcement as it may impact the ability of police services to file charges associated with program violations.

An advantage of GPS includes the ability of program administrators to respond to violations more quickly, and offenders are more likely to associate the consequences of failed tests with the event. In other words, the swiftness of responses creates accountability for offenders and is more likely to deter unwanted behaviors. It also provides useful evidence in court and enables officers to take action on violations.

What data is captured by the GPS?

The GPS can capture the time, date, latitude and longitude, altitude, and speed.

When does the device capture GPS data?

The GPS can capture data at various points throughout the driving process. It can capture coordinates upon vehicle start up and shut down. The GPS can also provide real-time mapping capabilities where the entire driving route is captured in real-time.

The GPS can transmit data whenever it is connected to a cellular network. A network is required for the interlock device to transmit information to from interlock to the manufacturer database or portal. Given the

wide availability for data to be transmitted and the cost associated with it, states can select when they want captured data to be transmitted to the manufacturer. For example, states can

choose to have data uploaded upon calibration (i.e., every 30-60 days), at a set point each day (i.e., 3:00am), or in real time, with live tracking of the vehicle. Another important consideration is the data management capacity of the state. Given the large amount of data produce via the GPS, it is important state data systems are capable of managing and storing data received. The type of data collected can vary in cost and should be discussed with the manufacturers based on the needs of the state.

Based on presentations by: Smart Start; Drager; ADS; Intoxalock; Diane Brockley-Drinkman, WI

ABOUT THE ASSOCIATION OF IGNITION INTERLOCK PROGRAM ADMINISTRATORS

The Association of Ignition Interlock Program Administrators (AIIPA) is an organization composed primarily of federal, state, county, parish, or municipal employees who provide specialized knowledge to an ignition interlock program. The organization was formed in November, 2011 as a result of the National Ignition Interlock Summit sponsored by the Governors Highway Safety Association (GHSA), the National Highway Traffic Safety Administration (NHTSA), and the Centers for Disease Control and Prevention (CDC).

Prepared by:

Hannah Barrett & Robyn D. Robertson
Traffic Injury Research Foundation
171 Nepean Street, Suite 200,
Ottawa, ON, Canada K2P 0B4

AIIPA would like to thank the diamond sponsors for their continued support:

Our Gold Sponsors:

CIIM

Lowcost Interlock

Our Silver Sponsors:

Alcohol Countermeasure Systems

Guth