

# Solving the Mysteries of Ignition Interlock

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2015 TDZ Workshops



# Overview

## Ignition Interlock Programs

- ◆ All 50 states have an Ignition Interlock Program
- ◆ Administrative
- ◆ Court based
- ◆ Hybrid



# Research Program Benefits and Limitations

## ◆ Benefits

- ◆ Reduces DWI recidivism on average 64% when installed
- ◆ Reduces the economic impact of impaired driving by \$3 - \$7 for every \$1 spent
- ◆ Provides a pathway for legal driving

## ◆ Limitations

- ◆ ALONE long term effect on reducing DWI re-offense is low
- ◆ Should be coupled with effective behavior changing program
  - ◆ Drug and Alcohol courts
  - ◆ Treatment

Participation rates - 20,000+ eligible - 8,000+ participants



# Minnesota Program History

- ◆ Minnesota starts an administrative pilot program in 2007
- ◆ Legislative directive in 2011
- ◆ Minnesota court involvement continues to increase
- ◆ 8000+ participants



# Minnesota Changes for First and Second Time Offenders

- ◆ Lowers AC level for enhanced sanctions from 0.20 to 0.16
  - ◆ Includes license plate impoundment
- ◆ Lengthens revocation time-periods
  - ◆ First-time offenders with an AC of 0.16 or greater = 1 year
  - ◆ Second-time offenders with an AC less than 0.16 = 1 year
  - ◆ Second-time offenders with an AC level 0.16 or greater = 2 years
- ◆ Full driving privileges will be granted with installation of ignition interlock
  - ◆ No allowance for a limited license
  - ◆ Last three months must have no failed tests for alcohol detected by the Ignition Interlock device prior to reinstatement



# Minnesota Changes for Three or More Offenses

- ◆ Revocation periods are based on number of offenses
  - ◆ Third offense= three years, fourth offense= four years and fifth offense= 6 years
  - ◆ Limited driving privileges for first year
  - ◆ Full driving privileges for the remaining period of time demonstrating abstinence
- ◆ Ignition interlock is used to monitor chronic DWI offenders and demonstrate abstinence
  - ◆ Maintains treatment requirement
  - ◆ Eliminates 5 letters
  - ◆ Eliminates requirement of AA meetings



# Why the program changes?

- ◆ Research driven
  - ◆ Swift and certain action for performing at-risk driving behavior
  - ◆ Targeted high-risk drivers
    - ◆ 80% of intoxicated drivers involved in a fatal crash had one or more previous DWI
  - ◆ Targeted high-risk time periods
    - ◆ First 12 months after a DWI arrest
- ◆ Creates a pathway for legal driving
  - ◆ Nationally 70% drive illegally



# Violation for Driving a Vehicle without Ignition Interlock

- ◆ Misdemeanor
- ◆ “drive, operate, or be in physical control of any motor vehicle that is not equipped with a functioning ignition interlock device.”

The ignition interlock restriction is denoted on the back of the drivers license



Minn. Stat. § 171.09, subd. 1(g).



# Employment Variance

- ◆ Allows a person to drive a company owned vehicle during employment without ignition interlock
  - ◆ Not self employed
  - ◆ Not a rental car
- ◆ Employer will work with Driver and Vehicle Services to obtain variance



Minn. Stat. § 171.306, subd. 4(b).

**TOWARD  
ZERO  
DEATHS**

# Minnesota Department of Public Safety Ignition Interlock Vendor Oversight Program

Jim Beauregard  
Vendor Oversight Liaison



# What is Vendor Oversight?

Vendor Oversight is the assurance of quality control on many levels.



# Interlock Sensor Technology

- ◆ Semiconductor sensor
  - ◆ Over the counter personal devices
- ◆ Electrochemical fuel cell sensor
  - ◆ PBT
  - ◆ Ignition Interlocks-NHTSA 98% accuracy
- ◆ Infrared detection
  - ◆ DMT/evidentiary devices



# Vendor Oversight Includes



- ❖ Review of best practices from other states
- ❖ NHTSA and state standards for interlock devices
- ❖ Vendor/service centers
- ❖ Calibration/Testing
- ❖ Circumvention Investigations
- ❖ Field testing
- ❖ Education

# Device Certification Standards



- ❖ **Device overview**
  - ❖ Calibration
  - ❖ Operating parameters
  - ❖ Anti-circumvention standards
  
- ❖ **Independent testing**
  - ❖ NHTSA 2013 standards.
  - ❖ MN standards – independent certification report is required

# Vendor Visits



- ❖ MN standards/rules review
- ❖ Service center technician training materials
- ❖ Background checks
- ❖ Lockout code usage - who has codes?
- ❖ Mobile Service
- ❖ Calibration
- ❖ Device version/firmware/software

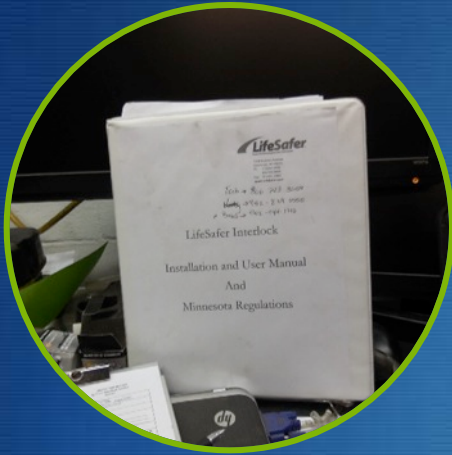


# Service Centers

- ❖ Record retention
- ❖ Client education
- ❖ Materials storage







# Service Center installation/calibration standards

- ❖ Installation manuals
- ❖ Tools
- ❖ Work area
- ❖ Labels/shrink-wrap
- ❖ Wiring (connections)
- ❖ Dry gas/Wet bath





# Service Centers

- ❖ Installation manuals
- ❖ Tools/equipment
- ❖ Work area
- ❖ Technician standards
  - ❖ Knowledge
  - ❖ Communications

# Calibration of Ignition Interlock

- ◆ Calibration is a process by which a tester uses an alcohol reference sample to determine if a interlock device accurately measures the BrAC of a user.
  - ◆ Calibration interval. The maximum time period that an alcohol interlock may be used without a calibration check.
  - ◆ Calibration stability. The ability of an alcohol interlock to hold its correct calibration over a defined time period.
  - ◆ Service interval. The maximum time period that an alcohol interlock may be used without maintenance or data download.



# Calibration of Ignition Interlock

- ❖ Who is calibrating the interlock?
- ❖ How were they trained?
- ❖ Do they understand the importance of calibration?
  - ❖ Two common methods used to calibrate interlock devices
    - ❖ Dry Gas
    - ❖ Wet Bath



# Dry Gas Calibration

- ◆ Introduction of a pressurized dry standard gas of a specified concentration of alcohol into the interlock device and compares the resulting BrAC reading with the alcohol percentage in the dry gas mix.



# Dry gas calibration



Many gas manufacturers will provide chart for pressure adjustment due to altitude.



## Breath alcohol concentration (BAC) adjusted for altitude and air pressure

Altitude (ft)	Pressure (mmHg)	.030 g/210L	.050 g/210L	.080 g/210L	.100 g/210L
0	760	0.030	0.050	0.080	0.100
250	753	0.029	0.049	0.079	0.099
500	747	0.029	0.049	0.078	0.098
750	740	0.029	0.048	0.077	0.097
1000	734	0.028	0.048	0.077	0.096
1250	728	0.028	0.047	0.076	0.095
1500	722	0.028	0.047	0.076	0.095
1750	716	0.028	0.047	0.075	0.094
2000	709	0.027	0.046	0.074	0.093
2500	697	0.027	0.045	0.073	0.091
3000	685	0.027	0.045	0.072	0.090
3500	673	0.026	0.044	0.070	0.088
4000	662	0.026	0.043	0.069	0.087
4500	650	0.025	0.042	0.068	0.085
5000	639	0.025	0.042	0.067	0.084
5500	628	0.024	0.041	0.066	0.082
6000	617	0.024	0.040	0.064	0.081
6500	606	0.023	0.039	0.063	0.079
7000	595	0.023	0.039	0.062	0.078
7500	584	0.023	0.038	0.061	0.076
8000	574	0.022	0.037	0.060	0.075
8500	564	0.022	0.037	0.059	0.074
9000	554	0.021	0.036	0.058	0.072
9500	544	0.021	0.035	0.057	0.071
10000	534	0.021	0.035	0.056	0.070
10500	524	0.020	0.034	0.055	0.068
11000	514	0.020	0.033	0.054	0.067
11500	505	0.019	0.033	0.053	0.066
12000	496	0.019	0.032	0.052	0.065

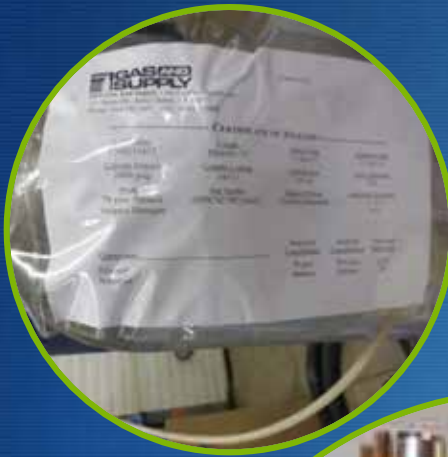




# Dry Gas Calibration

## Dry Gas

- ❖ Records
- ❖ Storage
- ❖ Pressure
- ❖ Hoses
- ❖ Testing
- ❖ Altitude





# Wet Bath Calibration

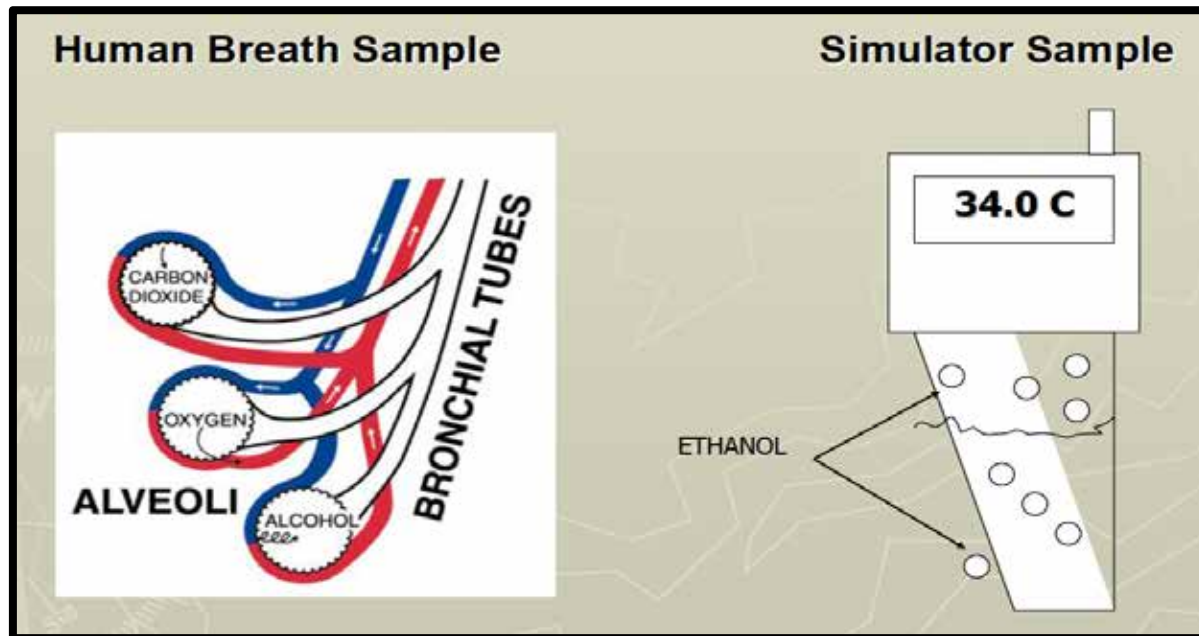


An electronically temperature controlled instrument that when used with an Alcohol Reference Solution, will provide precise and accurate calibration standards for use with alcohol breath test instruments



# Why We Use Simulators

- ❖ Provide a sample that closely resembles a human breath sample.
- ❖ Ensure that the Breath Alcohol instrument you are using is working/calibrated correctly.





# Wet Bath Calibration

## Wet Bath Simulator

- ❖ Hoses
- ❖ Condensation
- ❖ Secure connections
- ❖ Temperature
- ❖ Device calibration
- ❖ Cleanliness
- ❖ Storage
- ❖ Solution standards/records



# Device Calibration



## Wet bath simulators

- ❖ Temperature issues
- ❖ Calibration dates

**MINNESOTA DEPARTMENT OF  
PUBLIC SAFETY IGNITION  
INTERLOCK INSPECTION REPORT**

**INSPECTION REPORT  
Ignition Interlock Service  
Center**

Inspector		Inspection Date		Vendor	
Service Center Name				Phone Number	
Service Center Physical Address					
Document/Records Review Location					
Technician(s) Present Yes		No			
Simulator Manufacturer and Model		Serial Number	Temperature Measured °C      Displayed °C		Seal Pressure Test Good Leaks
Reference Solution/Gas Manufacturer	Storage	Tank Pressure psi	Lot Number	Expiration Date	Predicted Value
Documentation on file?				Verified YES	NO
				N/A	
<b>Corrective action(s) will be noted below each section.</b>					
		<b>Description</b>			
<b>Device</b>					
Problems					
Firmware Version					
Corrective Action:					
<b>Installation Standards and Specifications</b>					
Equipment					
Tech support					
Vendor support					
Labels/Shrink					
Problems					
Corrective Action:					
<b>Camera Standards</b>					
Mounts					
Software					
Corrective Action:					
<b>Maintenance and Calibration</b>					
Clients					
Downloads					
Calibration					
Problems					
Circumvention					
Corrective Action:					



<b>Client Education</b>	
Handouts	
Videos	
Separate Area	
Training	
Corrective Action:	
<b>Service Center</b>	
Cleanliness	
Fee Sheet	
Corrective Action:	
<b>Technician</b>	
Training	
Corrective Action:	
<b>NOTICE AND ORDER OF ADMINISTRATIVE ACTION</b>	
<p>I have received a copy of the inspection report. If deficiencies were noted, this report constitutes a written warning. I understand that failure to make any correction(s) noted above may result in enforcement action by the MN Department of Public Safety.</p> <p>Received By: _____</p>	

**PURSUANT TO SECTION \_\_\_\_\_**

THE BASIS FOR THIS ACTION IS AS FOLLOWS:

Technician Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Email

Address: \_\_\_\_\_ Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_

Comments: \_\_\_\_\_

The effective date of this action is \_\_\_\_\_. I hereby  
 acknowledge receipt:

Service Center Representative or Technician Signature

Inspector's Signature

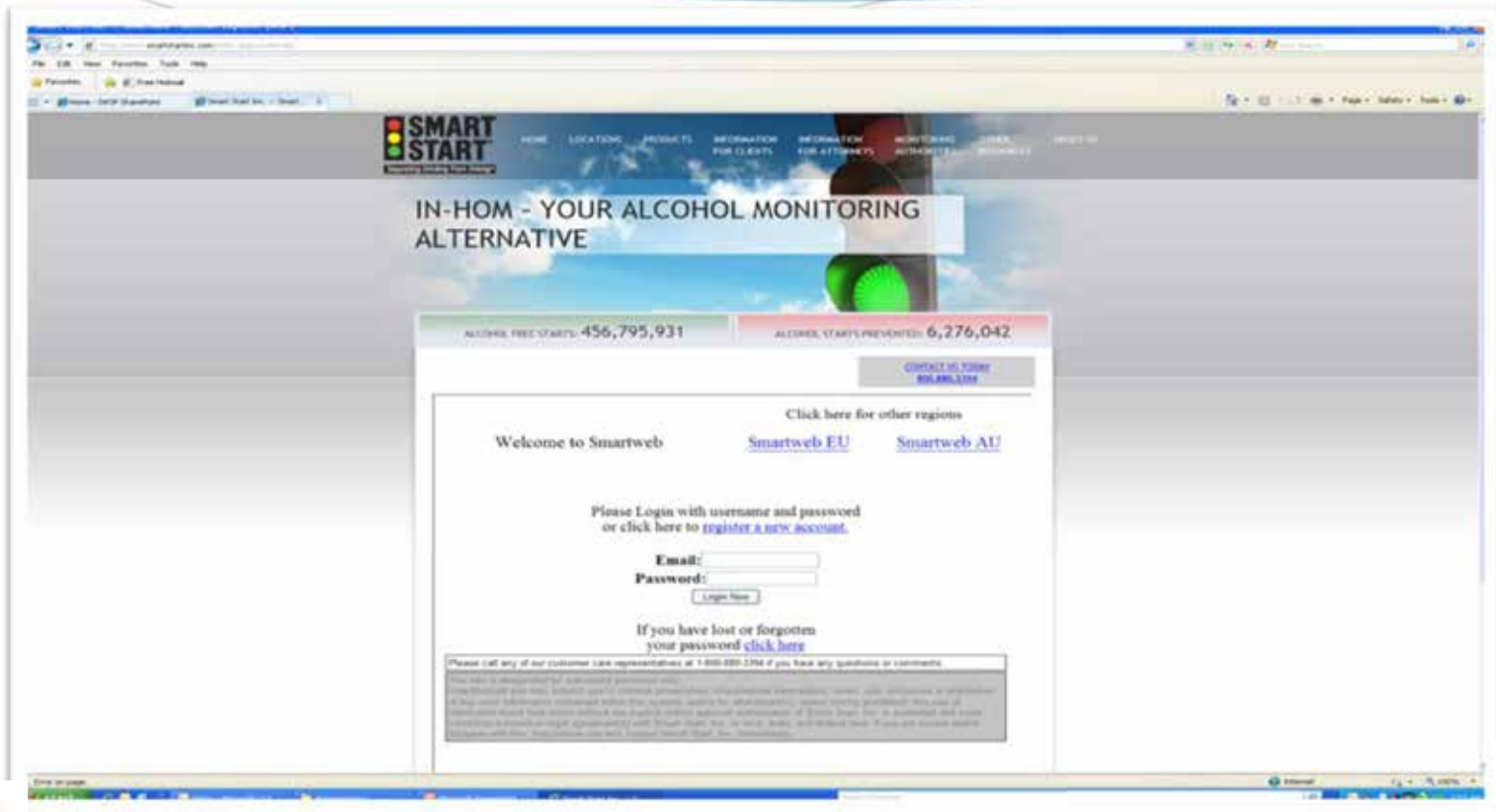


# Circumvention Investigation

- ❖ **All devices record the following information**
  - ❖ Any efforts to disable the device
  - ❖ Date/Time of vehicle use
  - ❖ Pass/Fail records
  - ❖ BrAC Levels
  - ❖ Start and Stopping of vehicle engine
  - ❖ Service reminders “Lock Out Mode”
  - ❖ Date service performed
  - ❖ Photos



# Database Access





# Circumvention Investigations

02/22/2014 09:53:38	Initial Test-Violation	0.044
02/22/2014 09:53:39	Temporary Lockout Start	
02/22/2014 09:54:13	Disconnected Head	
02/22/2014 09:54:42	Engine Start	13.053v
02/22/2014 09:58:42	Circumvention	
02/22/2014 10:02:42	Circumvention	
02/22/2014 10:06:42	Circumvention	
02/22/2014 10:10:42	Circumvention	
02/22/2014 10:14:42	Circumvention	
02/22/2014 10:18:38	Connected Head	
02/22/2014 10:18:44	Connected Head	
02/22/2014 10:18:45	Violation Grace Period Start	7200 minutes remaining
02/22/2014 10:19:12	Rolling Retest Requested	
02/22/2014 10:19:15	Picture Requested	Test Started
02/22/2014 10:19:35	Rolling Retest-Violation	0.031
02/22/2014 10:20:09	Disconnected Head	
02/22/2014 10:22:41	Circumvention	
02/22/2014 10:23:19	High Battery Voltage	13.798v
02/22/2014 10:23:19	Engine Stop	13.798v
02/22/2014 11:15:00	Engine Start	14.474v
02/22/2014 11:18:59	Circumvention	
02/22/2014 11:22:59	Circumvention	
02/22/2014 11:26:59	Circumvention	
02/22/2014 11:30:59	Circumvention	
02/22/2014 11:34:59	Circumvention	
02/22/2014 11:38:59	Circumvention	
02/22/2014 11:42:59	Circumvention	
02/22/2014 11:46:59	Circumvention	
02/22/2014 11:50:43	Connected Head	
02/22/2014 11:50:49	Connected Head	
02/22/2014 11:50:50	Violation Grace Period Start	7108 minutes remaining
02/22/2014 11:50:50	Circumvention	Circumvention
02/22/2014 11:51:03	PC Connected	

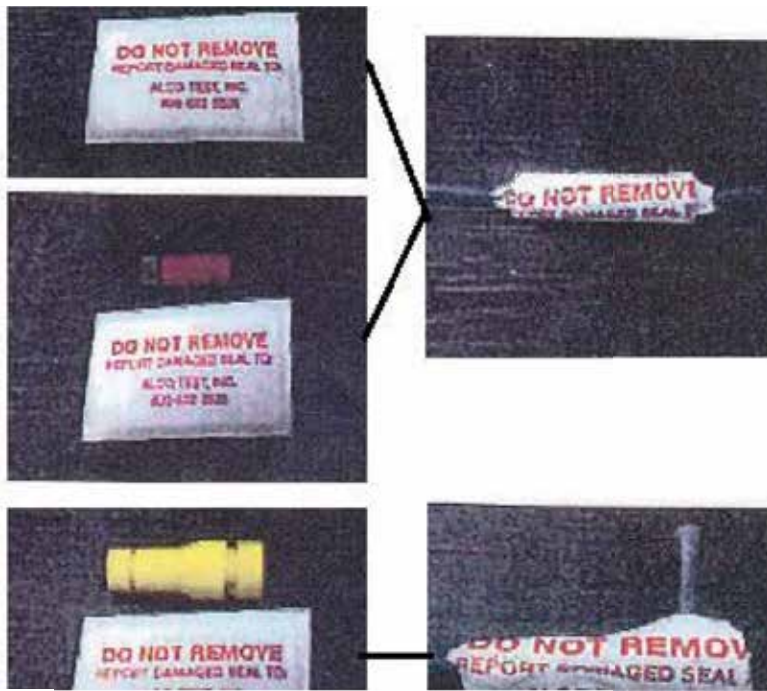


# Circumvention Investigations

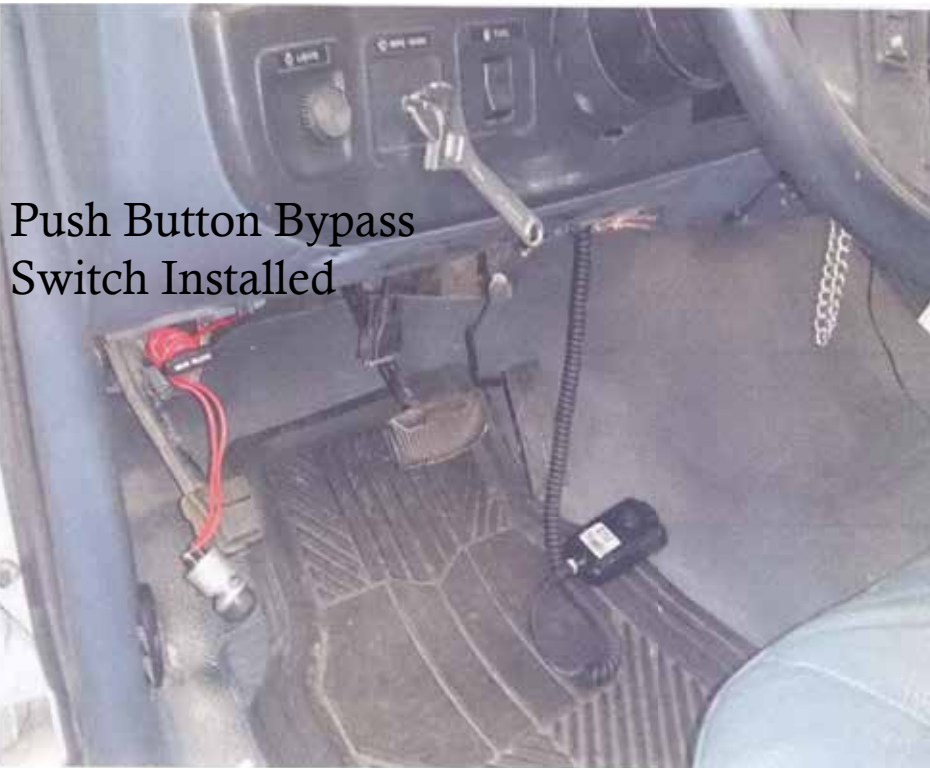
73 Smartlog Events		
Timestamp	Type	Details
02/22/2014 11:54:45	PC Disconnected	
02/22/2014 11:54:48	Power On	
02/22/2014 11:54:50	Engine Start	14.477v
02/22/2014 11:55:55	Connected Head	
02/22/2014 11:55:56	PC Connected	
02/22/2014 11:56:43	Connected Head	
02/22/2014 11:57:13	Rolling Retest Requested	
02/22/2014 11:57:16	Picture Requested	Test Started
02/22/2014 11:57:36	Rolling Retest-Violation	0.221
02/22/2014 11:58:09	Disconnected Head	
02/22/2014 12:00:38	Circumvention	
02/22/2014 12:04:38	Circumvention	
02/22/2014 12:08:38	Circumvention	
02/22/2014 12:12:38	Circumvention	
02/22/2014 12:16:38	Circumvention	
02/22/2014 12:20:38	Circumvention	
02/22/2014 12:24:38	Circumvention	
02/22/2014 12:27:23	Engine Stop	13.758v
03/20/2014 20:02:11	Connected Head	
03/20/2014 20:02:11	Violation Grace Period Start	7200 minutes remaining
03/20/2014 20:02:35	Picture Requested	Test Started
03/20/2014 20:02:43	Initial Test-Pass	0.000
03/20/2014 20:03:02	Engine Start	14.291v
03/20/2014 20:03:03	Picture Requested	Vehicle Started
03/20/2014 20:04:26	High Battery Voltage	13.476v
03/20/2014 20:04:26	Engine Stop	13.476v
03/20/2014 20:04:53	Connected Head	
03/20/2014 20:04:53	Violation Grace Period Start	7197 minutes remaining
03/20/2014 20:05:17	Picture Requested	Test Started
03/20/2014 20:05:25	Initial Test-Pass	0.000



# Circumvention Prevention



# Circumvention Investigations



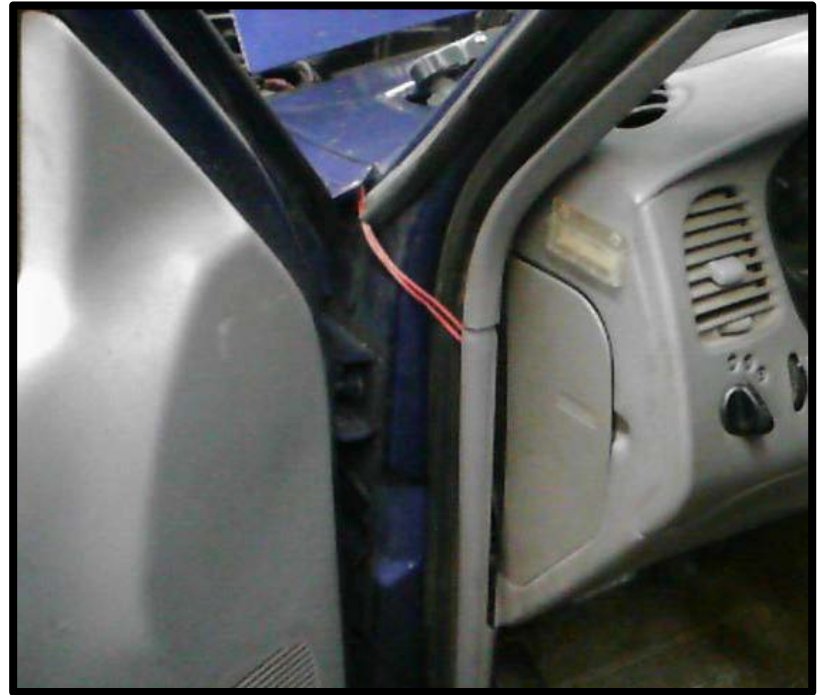
Push Button Bypass  
Switch Installed

## Bypass Created:

- A Bypass Switch interrupted the ground and hot wires prior to reaching the BAIID
- When the switch was turned on: it closed the ignition circuit, allowed the vehicle to start, and the BAIID did not recognize the vehicle was on

Push Button Bypass Switch  
Installed

# Circumvention Investigations

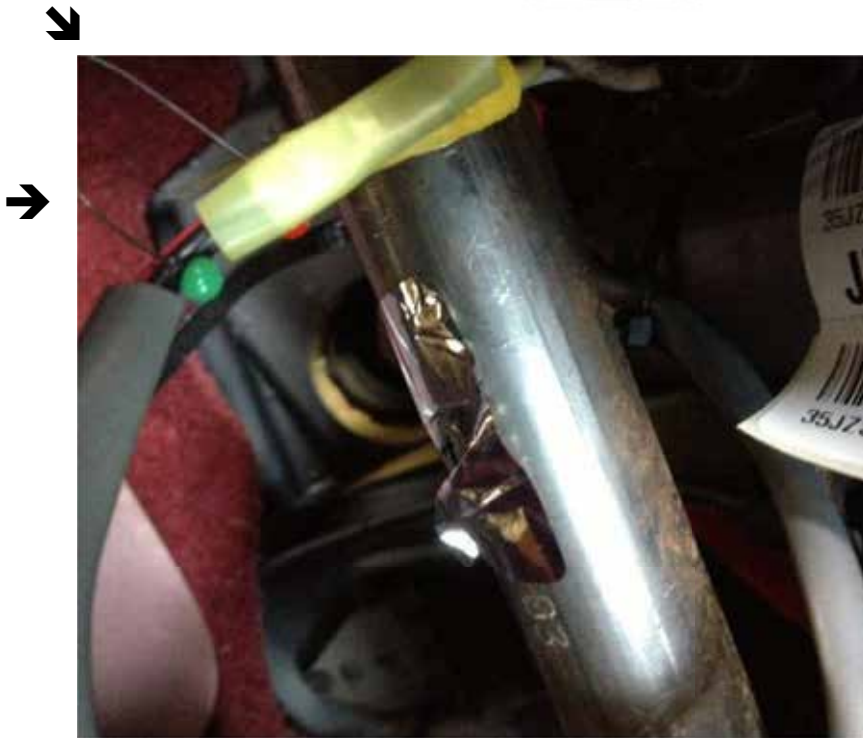


# Circumvention Investigations



**TOWARD  
ZERO  
DEATHS**

# Circumvention Investigations



- ◆ Tamperproof seal removed
- ◆ Sewing Pins inserted through the ground and hot wires
- ◆ When pressed together the circuit was closed and the vehicle was able to start without a breath sample

# Circumvention Investigations



- ◆ Altered Breath Sample: Stored Air
- ◆ • Utilized an Air Mattress pump to supply the exhaled breath sample
- ◆ • When the inhale portion was necessary, the air nasal was removed and the individual supplied the inhale portion
- ◆ • The vehicle was able to start with the individual altering the submitted breath sample



# Field Testing

- ◆ The purpose of a field test is to confirm that devices respond to events in accordance with administrative rule or statute
  - ◆ Warm up time
  - ◆ Breath volume
  - ◆ Etc.
- ◆ To test for possible interference issues
  - ◆ Mouthwash
  - ◆ Hand Sanitizer
  - ◆ Non-human air samples
  - ◆ Etc.



# Education

## Education for:

- ❖ Law Enforcement
- ❖ Probation
- ❖ Courts
- ❖ Legislators
- ❖ Media

● [How Ignition Interlock Works](#)

● [Law Enforcement Roll Call](#)



# Questions?

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