Solving the Mysteries of Ignition Interlock

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Minnesota Department of Public Safety
2015 TDZ Workshops

TOWARD ZERO DEATHS

Ignition Interlock Programs

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

- NHTSA model specifications released in May 2013
- NHTSA program guideline released November 2013

Ignition Interlock Devices

Ignition Interlocks are designed to protect the public by incapacitating drunk drivers

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What is an Ignition Interlock?

- An ignition interlock is a breath-testing device attached to a car's starter
- It prevents the car from being started when a pre-set level of alcohol is detected in the breath sample provided by the driver of the vehicle

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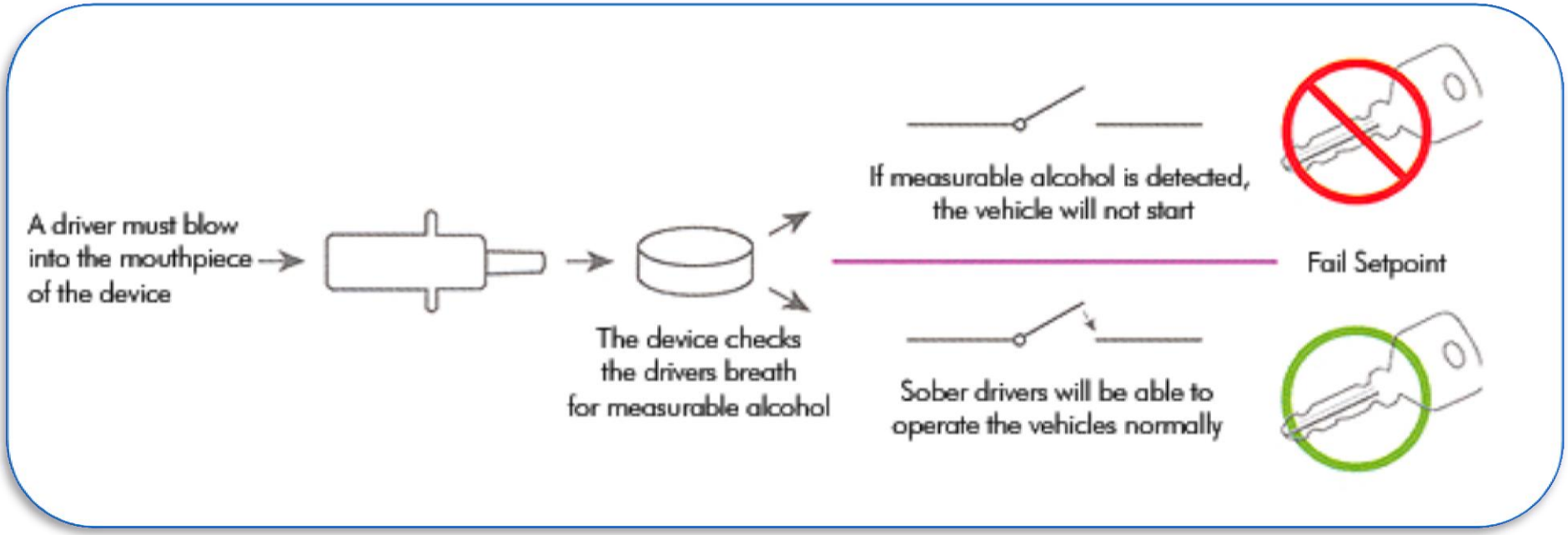
Ignition Interlock Operation



.020 BrAC

Breath Sample

- Breath sample consists of 1.5 liters of breath
  - The same sample size as most evidential breathalyzers
- To assist in preventing non-human breath samples, devices employ the following types of sample acceptance
  - Hum Tone
    - Humming and blowing at the same time
  - Blow and Suck Back
    - Blowing for 3-5 seconds and then sucking back for 2-3 seconds, then blow again for 1-2 seconds

MN Ignition Interlock Devices

- Initial sample – MN Fail Point .020 BrAC
- Second sample (rolling re-test) in 5-7 minutes
- Random re-test every 15-45 minutes
- Photos are captured with each sample
- Driver is given 10 minutes to provide a re-test
  - Warning lights
  - Audible tone
  - Worded text

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MN Ignition Interlock Devices

- Device must be downloaded and calibrated every 30- 60 days or the device will go into "lock out" in 5-7 days
  - Lock Out does not allow the operator to start the vehicle until the device has been serviced
- Early recall "lock out in 5 days" occurs when certain violations are recorded

Benefits and Limitations

- Benefits
  - More than 10 significant evaluations of interlock programs have demonstrated reductions in recidivism ranging from 35-90%; an average reduction of 64% (Willis et al. 2005)
  - Reduces the economic impact of impaired driving by $3 - $7 for every $1 spent
  - Provides a pathway for legal driving (70% will drive illegally)
- Limitations
  - **ALONE** long term effect on reducing DWI re-offense is low 25%
  - Should be coupled with effective behavior changing program
    - Drug and alcohol courts
    - Treatment

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

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Good Ignition Interlock Programs

- View ignition interlocks as a core component in any drunk driving strategy
- Prohibit semiconductor sensors
- Utilize a certification and approval process for devices and vendors
- Emphasis on education for lead practitioners and for public
- Note interlock restriction on driver license
- Service in rural areas

Good Ignition Interlock Programs

- Vendor Oversight program
- Indigent funding available and rely on multiple criteria for determination
- Automated standardized reporting
- Inclusion of screening/assessment and treatment for long-term risk reduction
- View the Law Enforcement community as a partner

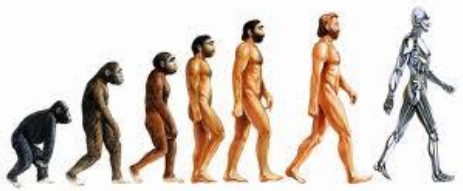
TOWARD ZERO DEATHS

Good Ignition Interlock Programs

- Increased emphasis on education:
  - For all program/agency staff
  - Public education is essential to clarify goals and shape perceptions of program.
  - Offenders and family
  - UK study, offenders agreed device:
    - stopped them from driving drunk;
    - reduced their drinking and helped change drinking habits;
    - invoked serious thought about drinking habits;
  - Investment in training and informational materials.

II Evolution and Growth

- Increase growth in installations
- Ongoing advances in research, technology



- Increasingly become a core component in any drunk driving strategy
- Program expansion to include more drivers
- Increased program ownership and attention to operational practices by authorities across the board
- Increased educational efforts
- Establishment of vendor oversight programs

Minnesota Program History

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

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.

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

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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 Center Inspection

- Record retention
- Client education
- Materials storage

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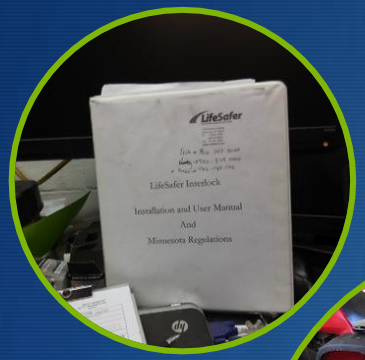

Service Center Inspection

Installation/calibration/technician standards

- Installation manuals
- Tools
- Work area
- Labels/shrink-wrap
- Wiring (connections)
- Dry gas/Wet bath
- Technician standards
  - Knowledge
  - Communications

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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.

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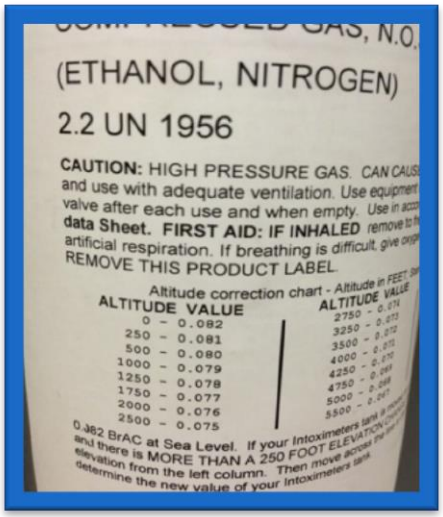
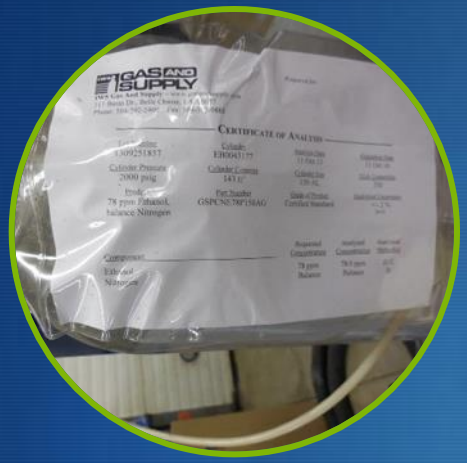
Dry gas calibration

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



Breath alcohol concentration (BAC) adjusted for altitude

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 Inspection

Dry Gas

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

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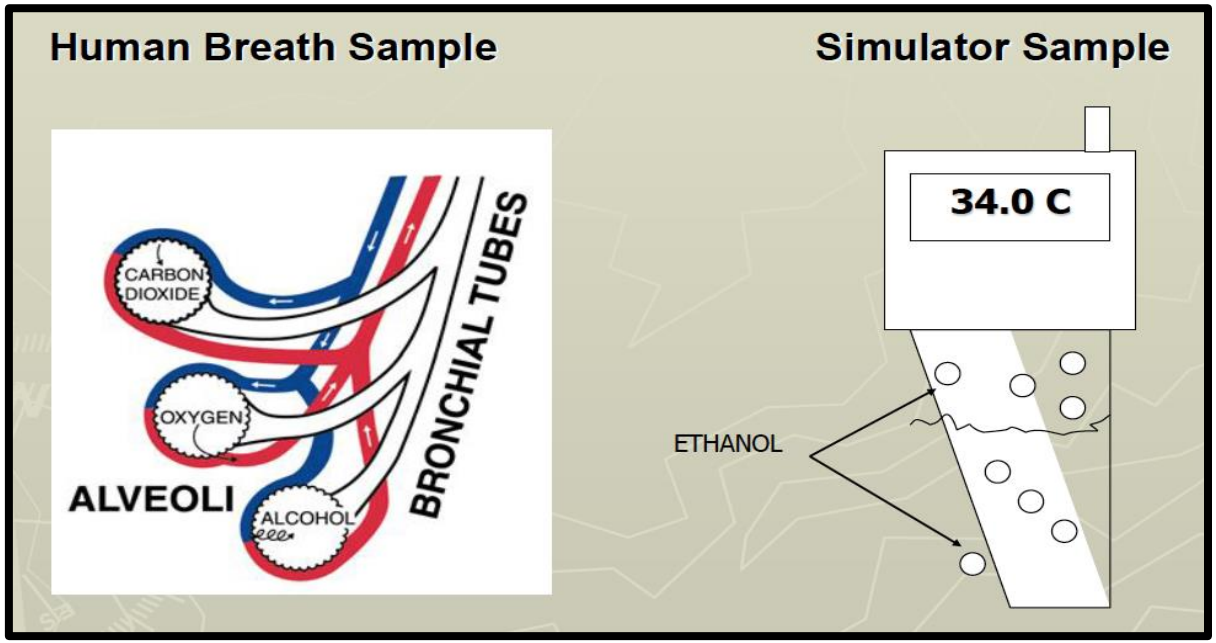
Wet Bath Calibration

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



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Wet Bath Calibration Inspection

Wet Bath Simulator

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

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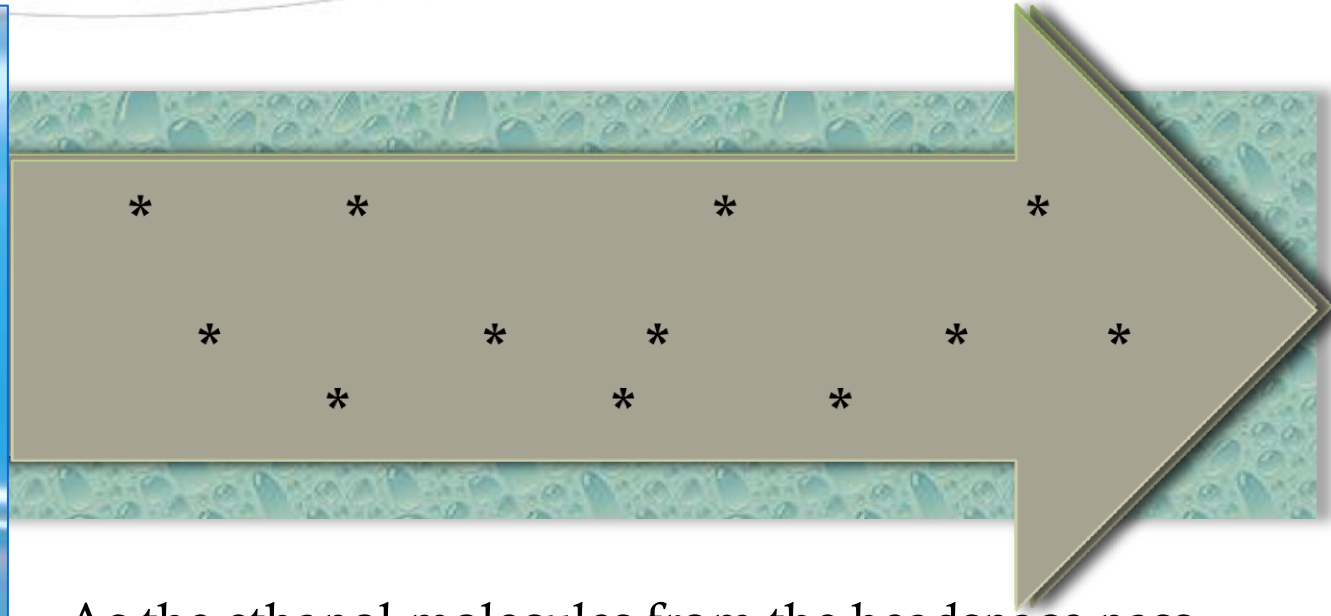
Condensation In Simulator Tubing



As the ethanol molecules from the headspace pass through the tubing filled with moisture, less molecules enter the device, therefore calibration may not be accurate.

Device Calibration Inspection

Wet bath simulators

- Temperature issues
- Calibration dates

TOWARD ZERO DEATHS

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 _____ ˚C _____ ˚C Measured Displayed		Seal Pressure Test Good Leaks		Calibration date	
Reference Solution/Gas Manufacturer	Storage	Tank Pressure psi	Lot Number	Expiration Date	Predicted Value	PBT Result			
Documentation on file?				Verified YES NO N/A					

Corrective action(s) will be noted below each section.

		Description
Device		
	Problems	
	Firmware Version	
	Corrective Action:_____	
Installation Standards and Specifications		
	Equipment	
	Tech support	
	Vendor support	
	Labels/Shrink	
	Problems	
	Corrective Action:_____	
Camera Standards		
	Mounts	
	Software	
	Corrective Action:_____	
Maintenance and Calibration		
	Clients	
	Downloads	
	Calibration	
	Problems	
	Circumvention	

Corrective Action:_____

INSPECTION REPORT
Ignition Interlock Service Center

Client Education		
	Handouts	
	Videos	
	Separate Area	
	Training	
	Corrective Action:	
Service Center		
	Cleanliness	
	Fee Sheet	
	Corrective Action:	
Technician		
	Training	
	Corrective Action:	

NOTICE AND ORDER OF ADMINISTRATIVE ACTION

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.

Received By:

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

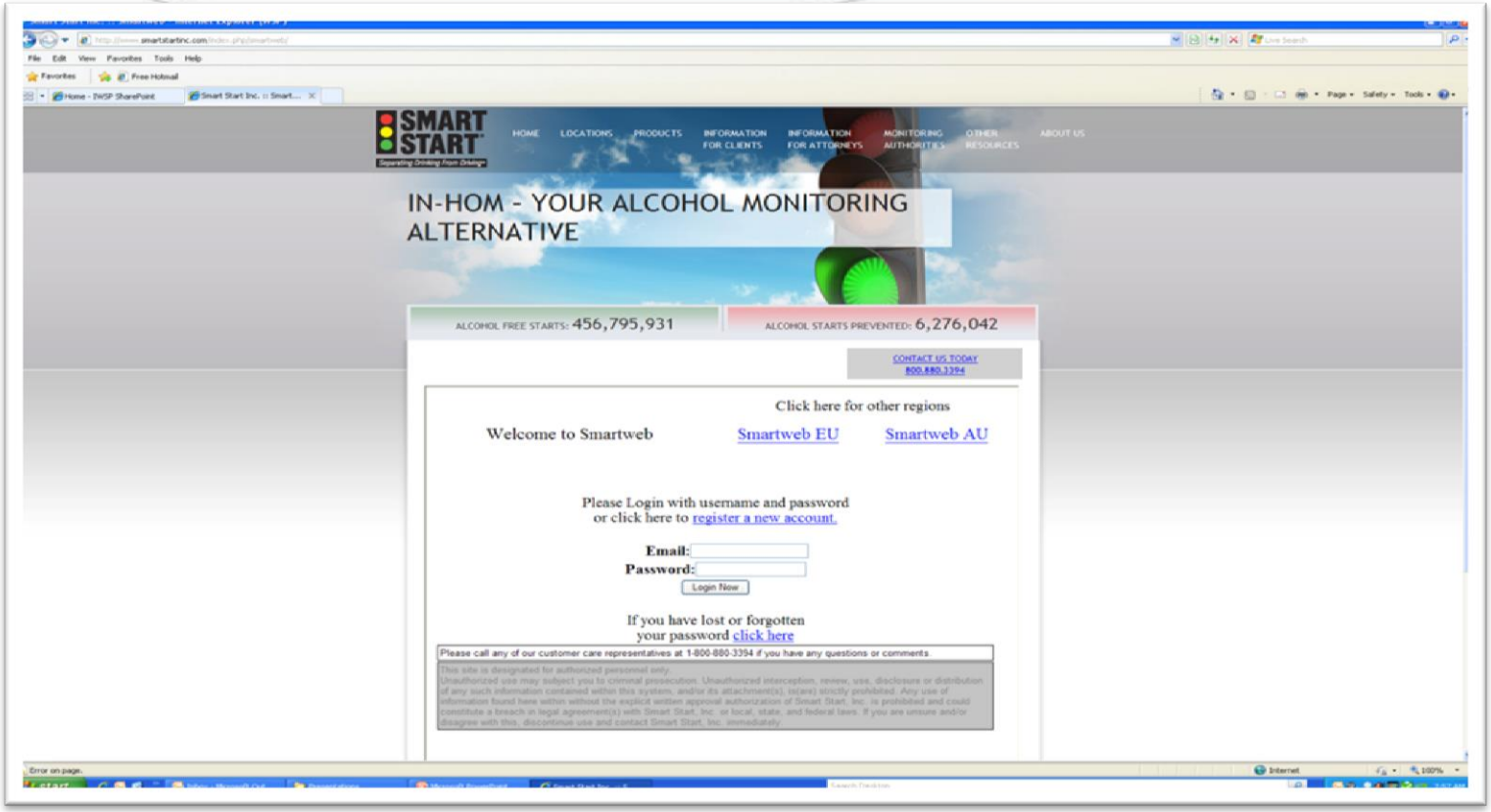
Inspector's Signature

TOWARD ZERO DEATHS

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
  - Calibration data

Database Access



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TOWARD ZERO DEATHS

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	

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TOWARD ZERO DEATHS

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

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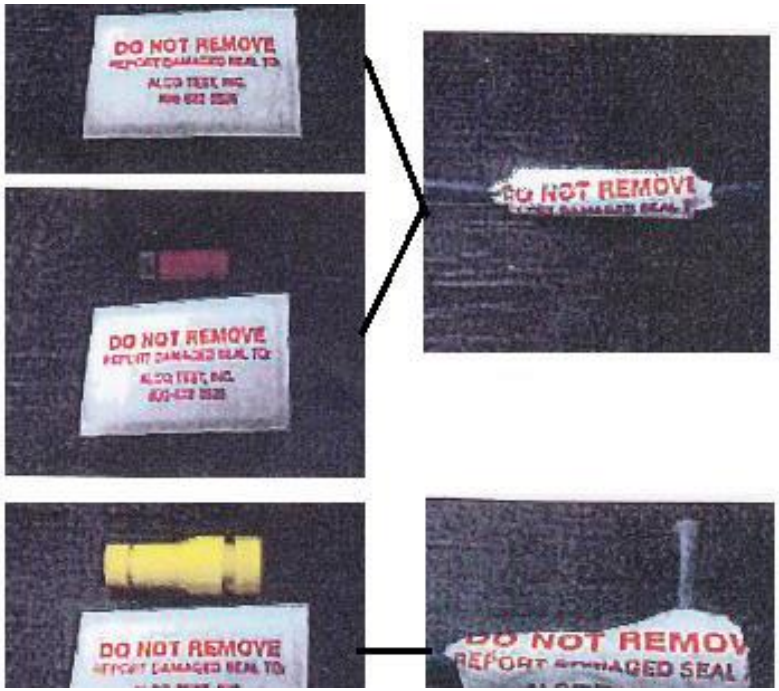
Circumvention Prevention



TOWARD ZERO DEATHS

Filtered air samples

Filtered air samples

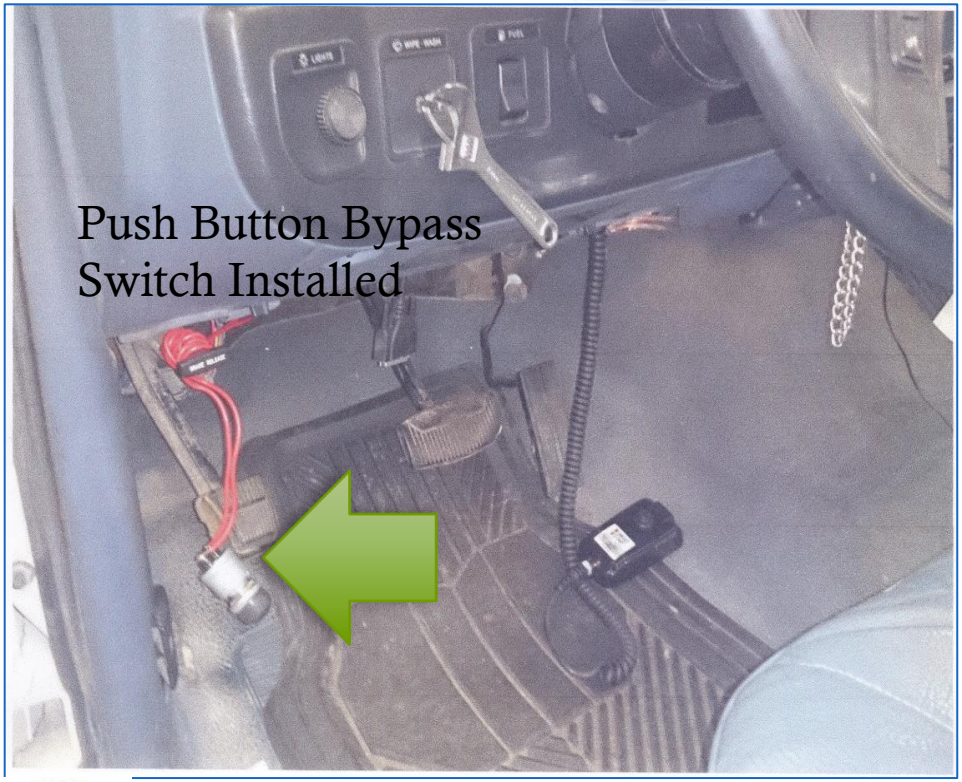
Circumvention Investigations

- 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

Circumvention

Hard wire bypass or “Starter bridge”

Circumvention Investigations



A Bypass Switch interrupted the ground and hot wires prior to reaching the BAIID

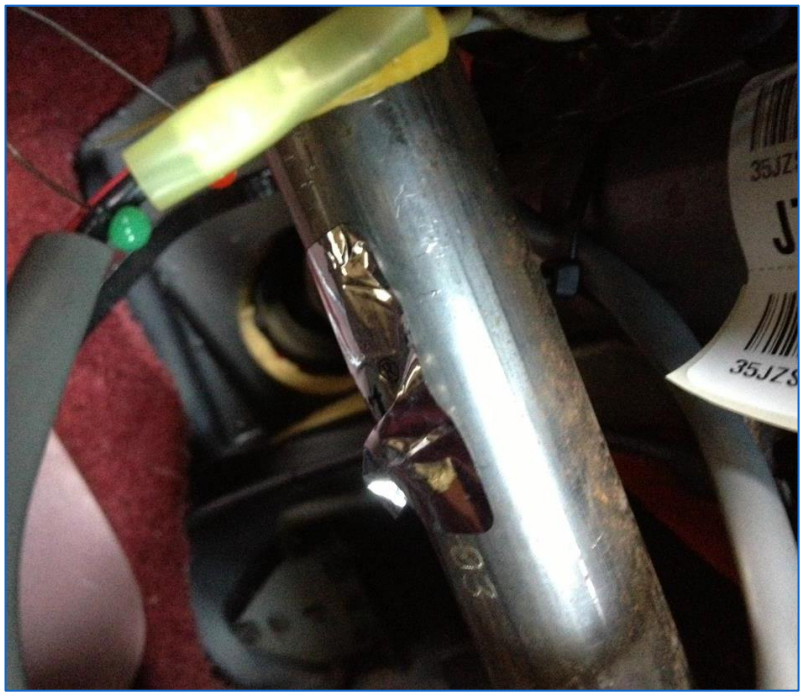
When the switch was turned on: it closed the ignition circuit, allowed the vehicle to start

The BAIID did not recognize the vehicle was on

Circumvention Investigations

Circumvention Investigations

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

Field Testing

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

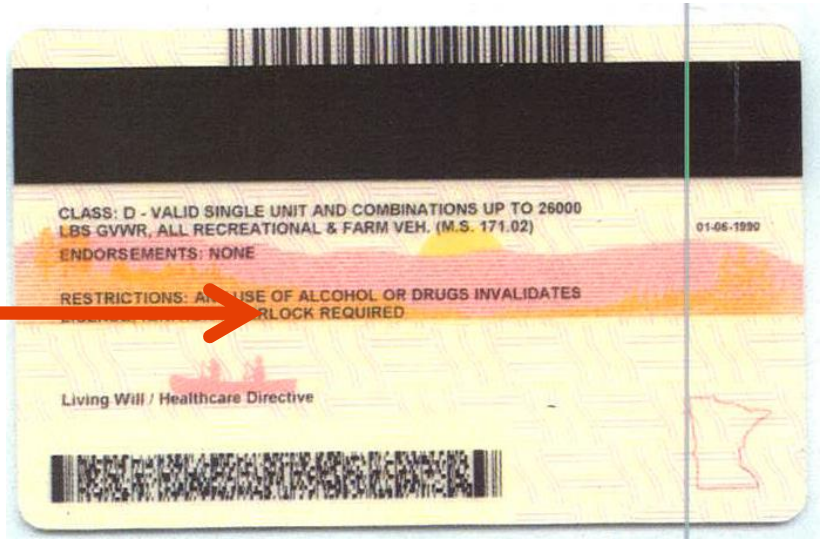
Violation for Driving a Vehicle without Ignition Interlock

- Misdemeanor

Minn. Stat. § 171.09, subd. 1(g).

- "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



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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).

Education

Education for:

- Law Enforcement
- Probation
- Courts
- Legislators
- Media

- How Ignition Interlock Works
- Law Enforcement Roll Call

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TOWARD ZERO DEATHS

Questions?

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