

CONDUCTING A SUBJECT TEST

Standard Operating Instructions

- | | |
|--|---|
| 1. Remove unit from box. Note temperature window on back of unit. | Liquid crystal reading of 20° to 40°C indicates the unit is in the operating temperature range. |
| 2. Mount mouthpiece. (SET button must be depressed). | |
| 3. Press READ button and hold down for 5 to 10 seconds to verify unit is ready to use. | .000 displayed for 5 to 10 seconds indicates the instrument is clean and ready for sampling. |
| 4. Depress SET button. | Cocks the sample valve and prepares unit for subject sample. |
| 5. Instruct subject to blow steadily for as long as possible. | |
| 6. Push READ button <i>before</i> exhalation ceases (but not less than 3 seconds after blowing starts). | |
| 7. Keep READ button depressed until maximum reading is obtained (i.e. reading remains constant for three to five seconds). | |
| 8. Record the result. | |
| 9. Discard mouthpiece and depress SET button. | |

Preparing A Subject For A Screening Test

Please refer to the guidelines and procedures established by your Federal, State, county, and/or local jurisdictions when conducting any breath alcohol test protocols. In the event you are not governed by legislation, we offer the following suggestion for conducting a breath alcohol test.

Prior to Testing:

- Clear the subject's mouth of any foreign substances.
- Do not allow the subject taking the test to: eat, drink, or use tobacco products.
- Ask the subject if he/she has consumed any alcohol based products in the last 15 minutes.
 - If the subject responds "No", **Test immediately.****
 - If the subject reports "Yes", do not run a test, but observe the subject for at least 15 minutes. **Then Test.**

** If a zero tolerance reading of .010 is obtained, wait eight (8) minutes. Then test. On the other hand, if a DUI reading of .080 is obtained, wait (8) minutes. **Then test.**

In either case, if the second reading exceeds the legal limit, the Screening Test should be considered positive, as mouth alcohol, if present, dissipates dramatically in two minutes.

Performing a Subject Test

Before initiating a test, explain to the subject what you want him or her to do. *Example:* "When I tell you I want you to take a deep breath hold it for a moment then blow continuously through this mouthpiece until I tell you to stop." Clear and simple instruction will help the subject give you a good sample. With a clean mouthpiece mounted and the SET button depressed, ask the subject to blow as long as possible. The first portion of breath from the subject should be wasted off if quantifying a deep lung breath sample is the object of the test process. Sampling early will produce a low result since the alcohol content in tidal breath is less than the alcohol concentration in a deep lung breath sample. It will take about 3 to 5 seconds to empty the lungs through the mouthpiece. Toward the end of this period, while the subject is still blowing, the READ button should be depressed. The action of the valve will draw a sample of deep lung breath into the fuel cell from the passing breath stream.

NOTE: Using Mouthpieces Of Other Design Than Those Supplied By The Manufacturer May Cause Inaccurate Readings By As Much As 10-20%. For Instance, Whistling Or Overly Restrictive Mouthpieces Can Either Draw Room Air Into The Breath Sample Or Pressurize The System Causing Inaccurate Readings.



Division of Epidemiology
Injury Control Section

FORENSIC TESTS FOR ALCOHOL BRANCH

Table of Contents

Fuel Cell Technology.....1-2

Pharmacology of Alcohol.....3-6

North Carolina Administrative Code.....7-9

 .0501 Screening Tests.....7

 .0502 Approval: Use.....7-8

 .0503 Calibration.....8-9

Alcoholic Breath Simulator.....10

Alcoholic Breath Simulator Log.....11-12

North Carolina General Statutes.....13-17

 G.S. 20-16.3 Alcohol Screening Tests Required..13-14

 G.S. 20-16.3A Impaired Driving Checks.....14

 G.S. 20-138.1 Impaired Driving.....15

 G.S. 20-138.7 Transporting Open Container.....15-17

Alcohol Screening Test Devices.....18-44

 Alco-Sensor (II & III).....18-23

 Alco-Sensor IV.....24-28

 S-D2.....29-33

 PBA-3000.....34-41

 BT-3 & Alcotec.....42-44

**THIS MATERIAL IS PURPOSED SOLELY AS A TRAINING MANUAL
FOR LAW ENFORCEMENT PERSONNEL AND IS NOT INTENDED FOR
DISTRIBUTION TO THE GENERAL PUBLIC.**

March 1997

North Carolina Department of Environment, Health
and Natural Resources

Forensic Tests for Alcohol Branch

ALCOHOL SCREENING TEST DEVICE TRAINING

- 8:30 - 9:00 Course Orientation and History of Fuel Cell
Technology
- 9:00 - 9:50 Pharmacology of Alcohol
- Break
- 10:00 - 10:50 Administrative Rules and Regulations
- Break
- 11:00 - 12:00 NC Statutory Authority
- 12:00 - 1:00 Lunch
- 1:00 - 1:50 Principle of Operation of Alcohol Screening Test
Devices
- Break
- 2:00 - 2:30 Alcoholic Breath Simulator/Simulator Log
- 2:30 - 3:30 ASTD Calibration
- Break
- 3:40 - 4:30 Review & Discussion/Course Closing

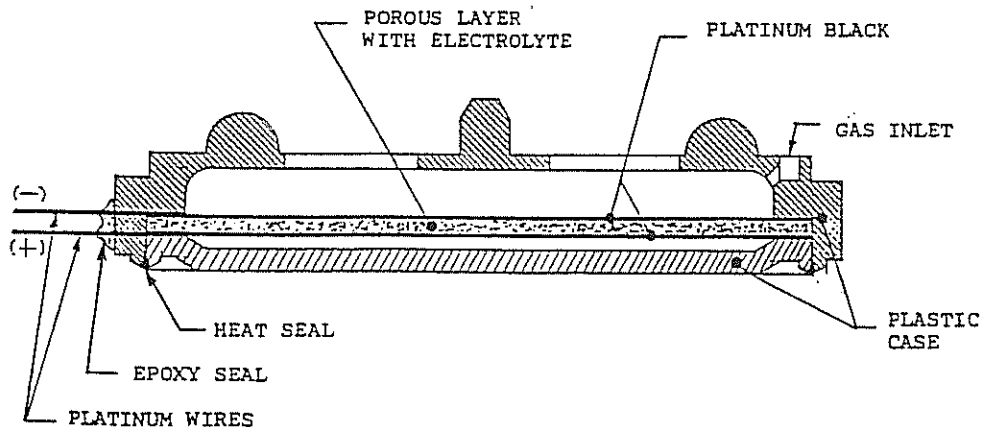
ALCOHOL SCREENING TEST DEVICES

FUEL CELL TECHNOLOGY

The current most commonly used Alcohol Screening Test Devices utilize a fuel cell as a sensor to detect the presence and quantity of alcohol present in a breath sample.

The device known as a fuel cell was originated in 1839 by Sir William Grove. He discovered that if two platinum electrodes were immersed in a sulfuric acid electrolyte, and hydrogen was supplied at one electrode and oxygen at the other, an electric current was produced as long as gas was supplied to the device. The chemical reaction was the same as if the hydrogen were burned, but in this case, electricity was produced directly instead of heat.

An early 1960's college group from Innsbruck, Austria is credited with the first practical construction of a fuel cell as an alcohol detector. This detector has evolved into the present day cell used in all fuel cell based breath alcohol instruments worldwide.



In its simplest form, the alcohol fuel cell consists of a porous, chemically inert layer coated on both sides with finely divided platinum (called platinum black). The porous layer is impregnated with an acidic electrolyte solution, and platinum wire electrical connections are applied to the platinum black surfaces. The entire assembly is mounted in a plastic case which has a gas inlet that allows a breath sample to be introduced.

The exact chemistry of the reaction that takes place in an alcohol fuel cell is open to some conjecture, but it is thought by a number of researchers that alcohol is converted to acetic acid in a two step process (ethanol > acetaldehyde > acetic acid). This conversion produces two negatively charged electrons per molecule of alcohol (on the upper surface on the cell).

Consequently, positively charged hydrogen ions (protons) are freed in the process which migrate to the lower surface of the cell and combine with oxygen to form water, consuming one electron per hydrogen ion. Thus the upper surface has an excess of electrons and the lower surface has a deficiency of electrons. If the two surfaces are connected electrically, a current will flow through this external circuit to neutralize the opposing charges of the upper and lower surface.

With suitable amplification, we can determine the amount of current produced. This is proportional to the amount of alcohol consumed by the fuel cell. Other alcohols such as methanol or isopropanol will also be converted in a cell, but because their composition is different, the rate of reaction is also different.

* In simpler terms, the fuel cell as an alcohol detector works by simply creating electrical voltage when alcohol is introduced onto the surface of the cell. The more alcohol present, the more voltage produced.

PHARMACOLOGY OF ALCOHOL

1. Common facts about alcohol (Ethanol)
 - a. Ethanol is beverage alcohol.
 - b. Attraction for Water.
 - c. Toxic.
 - d. Clear, colorless, pungent odor, burning taste sensation.

2. General Facts about Drugs (Forney, Indiana University)
 - a. Effect of a chemical (alcohol) is directly related to its concentration at that site in the body where it has the effect. Within limits, the higher the concentration, the greater the effect.
 - b. Effect of a drug (alcohol) may last as long as it is present in the critical site (storage site may be inactive: alcohol in the stomach has no impairing effect).
 - c. Sites may be organ, muscle, gland, nerve or vessel.
 - d. The bigger you are, the more it may take (to create the desired effect).

3. Central Nervous System Depressant
 - a. Ethanol must be present in the brain for impairment to occur.
 - b. Brain communicates with body via electrical impulses.
 - c. Ethanol reduces the electrical activity of the brain.

4. Appreciable Impairment
 - a. Appreciable-noticeable.
 - b. Impairment-a decrease in fitness to safely perform the task in issue [resultant of the acute effects of drug(s) on the CNS and/or other body organs and functions].

5. Absorption/Equilibration/Elimination

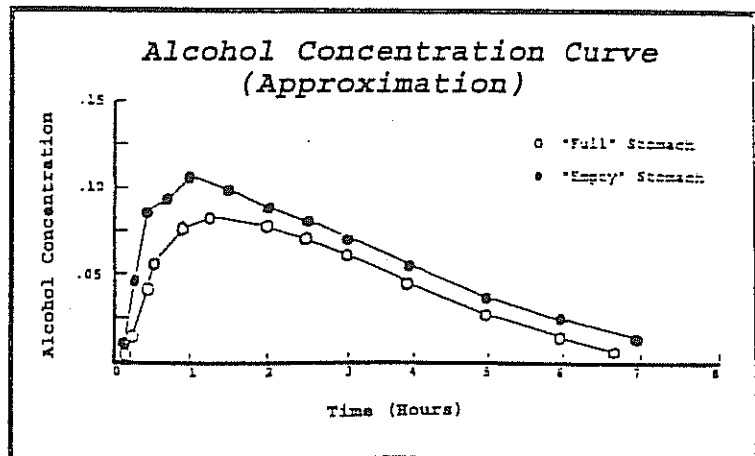
- A. Absorption - the process of moving alcohol from the stomach and upper small intestine to the blood compartment.
 1. The path of ethanol through the body:
 - a. The usual method for alcohol to enter the body is by ingestion of an alcoholic beverage (mouth into gastrointestinal tract).
 - b. When the alcohol reaches the stomach, a vast majority of it is stored. Due to the poor capillary network covering the exterior stomach lining, only a very small portion of the alcohol will be absorbed through the stomach lining and into the bloodstream. The vast majority of the alcohol will be held in the stomach until the opening of the pyloric sphincter.
 - c. As the pyloric sphincter relaxes, it opens the passage from the stomach into the duodenum (upper small intestine).
 - d. As alcohol flows into the porous small intestine, the ethanol molecules pass through the porous intestinal lining into the surrounding capillary network.
 - e. The most significant effect on alcohol absorption is the quantity of food substances ingested with or immediately prior to consumption of an alcoholic beverage (slows absorption).
 - f. As a general rule, complete absorption of all consumed ethanol normally occurs within 1/2 to 3 hours.

B. Equilibration

1. The process of Equilibrating alcohol between blood and all other tissue compartments. A naturally occurring dynamic equilibrium created by alcohol's natural attraction to water.
 - a. The greater the water content of a tissue, the greater it's alcohol content will be in relation to other tissues.
 - b. The small size of an ethanol molecule allows for passage through membranes while remaining an intact molecule.
 - c. Since the concentration of alcohol is directly proportional to the body water content, the concentration will vary according to the body weight.

c. Elimination

1. The process of breaking down (liver metabloism) or excreting (lungs and kidneys) alcohol by the body.
 - a. Alcohol curve/elimination rate - In order to accumulate alcohol in the body, the rate of absorption must exceed the rate of elimination. When consuming ceases and absorption has been completed, the alcohol concentration will gradually fall as the alcohol is eliminated (primarily by the liver).



- b. Metabolic processes (liver) account for about 90-95% of all consumed alcohol.
- c. The remaining 5-10% of all consumed alcohol is eliminated through either excretion or evaporation.
- d. The average rate of elimination generally is between 0.015 and 0.018 Alcohol Concentration (AC) per hour.

2. How Alcohol Appears in the Breath

- A. The exchange of alcohol from blood to breath occurs in the alveoli of the lungs. The alveoli are minute sacs in the lungs which are richly supplied on their outer membranes with capillary blood. The small size of an alcohol molecule allows the alcohol to evaporate through the membranes separating the blood flow from the alveoli, thus allowing alcohol to appear in the breath as an unchanged chemical.
- B. When utilizing an ASTD, it is important to collect a deep lung sample. If a deep lung sample is not obtained, the sample will be diluted with breath from the upper respiratory tract which contains a lesser amount of alcohol. The resultant AC as reported by the ASTD would be lower than the person's actual body AC.
- C. To obtain an accurate breath sample, follow the manufacturer's procedures and current rules and regulations 15A NCAC 19B, Section .0502.

NORTH CAROLINA ADMINISTRATIVE CODE
T15A: 19B .0500

ALCOHOL SCREENING TEST DEVICES

.0501 SCREENING TESTS FOR ALCOHOL CONCENTRATION

(a) This Section governs the requirement of G.S. 20-16.3 that the commission examine devices suitable for use by law enforcement officers in making on-the-scene tests of drivers for alcohol concentration and that the commission approve these devices and their manner of use. In examining devices for making chemical analyses, the commission finds that at present only screening devices for testing the breath of drivers are suitable for on-the-scene use by law enforcement officers.

(b) This Section does not address or in any way restrict the use of screening tests for impairment other than those based on chemical analyses, including various psychophysical tests for impairment.

.0502 APPROVAL: ALCOHOL SCREENING TEST DEVICES: USE

(a) Alcohol screening test devices that measure alcohol concentration through testing the breath of individuals are approved on the basis of results of evaluations by the Injury Control Section. Evaluations are not limited in scope and may include any factors deemed appropriate to insure the accuracy, reliability, stability, cost, and ease of operation and durability of the device being evaluated. On the basis of evaluations to date, approved devices are listed in Rule .0503 of this Section.

(b) When the validity of an alcohol screening test of the breath of a driver administered by a law enforcement officer depends upon approval by the Commission of the test device and its manner of use, the test shall be administered as follows:

- (1) The officer shall determine that the driver has removed all food, drink, tobacco products, chewing gum and other substances and objects from his mouth. Permanent dental devices that are of non-porous material need not be removed.
- (2) Unless the driver volunteers the information that he has consumed an alcoholic beverage within the previous 15 minutes, the officer shall administer a screening test as soon as feasible. If a test made without observing a waiting period results in an alcohol concentration reading of 0.08 or more, the officer shall wait five minutes and administer

an additional test. If the results of the additional test show an alcohol concentration reading more than 0.02 under the first reading, the officer shall disregard the first reading.

- (3) If an officer has any question concerning any screening test results, to help him determine whether there is probable cause for believing the driver to be impaired by an impairing substance the officer may request that the driver submit to one or more additional screening tests and, if appropriate, wait a reasonable period between tests.
- (4) In administering any screening test, the officer shall use an alcohol screening test device approved under Rule .0503 of this Section in accordance with the operational instructions supplied with or listed on the device, except that the waiting periods set out in this Rule supersede any period specified by the manufacturer of the device.

.0503 APPROVED ALCOHOL SCREENING TEST DEVICES: CALIBRATION

(a) The following breath alcohol screening test devices are approved as to type and make:

- (1) ALCO-SENSOR (with two-digit display), made by Intoximeters, Inc.
- (2) ALCO-SENSOR III (with three-digit display), made by Intoximeters, Inc.
- (3) BREATH-ALCOHOL TESTER MODEL BT-3, made by RepCo., Ltd.
- (4) ALCOTEC BREATH-TESTER, made by RepCo., Ltd.
- (5) ALCO-SENSOR IV, manufactured by Intoximeters, Inc.
- (6) PBA 3000, manufactured by Life Loc, Inc.
- (7) SD-2, manufactured by CMI, Inc.

(b) The agency or operator shall verify instrument calibration of each alcohol screening test device at least once during each 30 day period of use. The verification shall be performed by employment of an alcoholic breath simulator using simulator solution in accordance with these Rules or an ethanol gas canister.

- (1) Alcoholic breath simulators used exclusively to verify instrument calibration of alcohol screening test devices shall have the solution changed every 30 days or after 25 calibration tests, whichever occurs first.

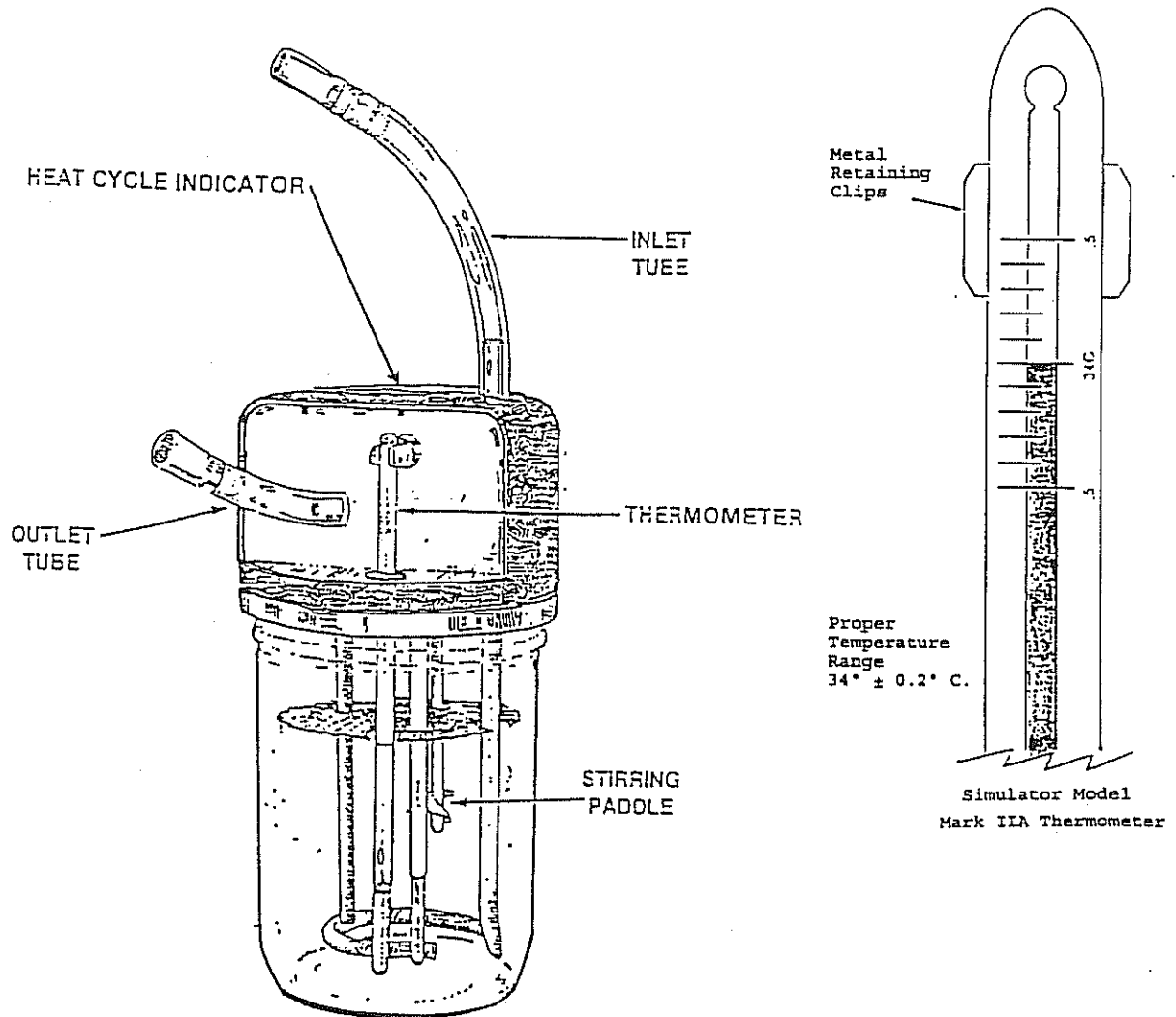
- (2) Requirements of Paragraph (b) and Subparagraph (b)(1) of this Rule shall be recorded on an alcoholic breath simulator log designed by the Injury Control Section and maintained by the user agency.

Alcoholic Breath Simulator

An Alcoholic Breath Simulator is a specially designed constant temperature water-alcohol solution bath instrument devised for the purpose of providing a standard alcohol-air mixture.

It is used as an external standard in conjunction with a breath testing instrument to determine proper calibration of the breath tester.

The simulator temperature is electronically maintained at $34^{\circ} \pm .2^{\circ}$ Celsius. The stirring paddle wheel inside the simulator solution assures constant temperature throughout the solution.



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**ALCOHOLIC BREATH SIMULATOR LOG
 FOR ALCOHOL SCREENING TEST DEVICES**

NOTE: Solution shall be changed every 30 days or after 25 tests, whichever occurs first.

Solution Changed By: (Print Name)				Simulator Serial No:	
Solution Certification No.		Date Solution Changed		Date Solution Expires	
Test No.	Officer's Name (Print)	Screening Device		Simulator Test	
		Type	Serial No.	Date	Result
1					0.
2					0.
3					0.
4					0.
5					0.
6					0.
7					0.
8					0.
9					0.
10					0.
11					0.
12					0.
13					0.
14					0.
15					0.
16					0.
17					0.
18					0.
19					0.
20					0.
21					0.
22					0.
23					0.
24			11		0.
25					0.

See Special Instructions on Back.

ALCOHOLIC BREATH SIMULATOR LOG FOR SCREENING TEST DEVICES

Purpose: To maintain a record of all alcoholic breath simulator tests utilizing alcohol screening test devices.

Preparation: Any person verifying calibration on an alcohol screening test device shall complete all applicable blanks for each simulator test conducted.

Special Instructions:

The agency or operator shall verify instrument calibration of each alcohol screening test device at least once during each 30-day period of use. The verification shall be performed by employment of an alcoholic breath simulator using solution in accordance with current Rules or an ethanol gas canister. Expected result for simulator prepared at: 0.10 = 0.10 or 0.09; 0.08 = 0.08 or 0.07.

If the expected result is not obtained, enter "CAL" in the result column, adjust the screening test device and repeat simulator test. Continue this process until the expected result is obtained and recorded.

USE THE FOLLOWING CODES FOR "TYPE"

CODE

- 1 ALCO-SENSOR (two-digit display)
- 2 ALCO-SENSOR III (three-digit display)
- 3 Breath-Alcohol Tester Model BT-3
- 4 Alcotec Breath-Tester
- 5 Alco-Sensor IV (*)
- 6 PBA 3000 (*)
- 7 SD-2 (*)

(*) Approved effective 4/1/93

Disposition: One form is to be used for each simulator and shall be retained for three years from the date the solution was changed.

Additional copies of this form may be printed by the user agency. Any questions concerning this form should be directed to:

Forensic Tests for Alcohol Branch
Injury Control Section
P.O. Box 29601
Raleigh, North Carolina 27626-0601
Telephone: (919) 733-3225

North Carolina General Statutes

G.S. 20-16.3 Alcohol screening tests required of certain drivers; approval of test devices and manner of use by Commission for Health Services; use of test results or refusal.

(a) **When Alcohol Screening Test May Be Required; Not an Arrest.** A law enforcement officer may require the driver of a vehicle to submit to an alcohol screening test within a relevant time after the driving if the officer has:

- (1) Reasonable grounds to believe that the driver has consumed alcohol and has:
 - a. Committed a moving traffic violation; or
 - b. Been involved in an accident or collision; or
- (2) An articulable and reasonable suspicion that the driver has committed an implied-consent offense under G.S. 20-16.2, and the driver has been lawfully stopped for a driver's license check or otherwise lawfully stopped or lawfully encountered by the officer in the course of the performance of the officer's duties.

Requiring a driver to submit to an alcohol screening test in accordance with this section does not in itself constitute an arrest.

(b) **Approval of Screening Devices and Manner of Use.** The Commission for Health Services is directed to examine and approve devices suitable for use by law enforcement officers in making on-the-scene tests of drivers for alcohol concentration. For each alcohol screening device or class of devices approved, the Commission must adopt regulations governing the manner of use of the device. For any alcohol screening device that tests the breath of a driver, the Commission is directed to specify in its regulations the shortest feasible minimum waiting period that does not produce an unacceptably high number of false positive test results.

(c) **Tests Must be Made with Approved Devices and in Approved Manner.** No screening test for alcohol concentration is a valid one under this section unless the device used is one approved by the Commission for Health Services and the screening test is conducted in accordance with the applicable regulations of the Commission as to the manner of its use.

(d) Use of Screening Test Results or Refusal by Officer. The results of an alcohol screening test or a driver's refusal to submit may be used by a law enforcement officer, a court, or an administrative agency in determining if there are reasonable grounds for believing that the driver has committed an implied-consent offense under G.S. 20-16.2. Negative or low results on the alcohol screening test may be used in factually appropriate cases by the officer, a court, or an administrative agency in determining whether a person's alleged impairment is caused by an impairing substance other than alcohol. Except as provided in this subsection, the results of an alcohol screening test may not be admitted in evidence in any court or administrative proceeding.

G.S. 20-16.3A Impaired driving checks. A law enforcement agency may make impaired driving checks of drivers of vehicles on highways and public vehicular areas if the agency:

- (1) Develops a systematic plan in advance that takes into account the likelihood of detecting impaired drivers, traffic conditions, number of vehicles to be stopped, and the convenience of the motoring public.
- (2) Designates in advance the pattern both for stopping vehicles and for requesting drivers that are stopped to submit to alcohol screening tests. The plan may include contingency provisions for altering either pattern if actual traffic conditions are different from those anticipated, but no individual officer may be given discretion as to which vehicle is stopped or, of the vehicles stopped, which driver is requested to submit to an alcohol screening test.
- (3) Marks the area in which checks are conducted to advise the public that an authorized impaired driving check is being made.

This section does not prevent an officer from using the authority of G.S. 20-16.3 to request a screening test if, in the course of dealing with a driver under the authority of this section, he develops grounds for requesting such a test under G.S. 20-16.3. Alcohol screening tests and the results from them are subject to the provisions of subsections (b), (c), and (d) of G.S. 20-16.3. This section does not limit the authority of a law enforcement officer or agency to conduct a license check independently or in conjunction with the impaired driving check, to administer psychophysical tests to screen for impairment, or to utilize roadblocks or other types of vehicle checks or checkpoints that are consistent with the laws of this State and the Constitution of North Carolina and of the United States.

or drugs.--

(a) **Offense.** *It is unlawful for a person less than 21 years old to drive a motor vehicle on a highway or public vehicular area while consuming alcohol or at any time while he has remaining in his body any alcohol or a controlled substance previously consumed, but a person less than 21 years old does not violate this section if he drives with a controlled substance in his body which was lawfully obtained and taken in therapeutically appropriate amounts.*

(b) **Subject to Implied-Consent Law.** *An offense under this section is an alcohol-related offense subject to the implied-consent provisions of G.S. 20-16.2.*

(c) **Odor Insufficient.--***The odor of an alcoholic beverage on the breath of the driver is insufficient evidence by itself to prove beyond a reasonable doubt that alcohol was remaining in the driver's body in violation of this section unless the driver was offered an alcohol screening test or chemical analysis and refused to provide all required samples of breath or blood for analysis.*

(d) **Alcohol Screening Test.--***Notwithstanding any other provision of law, an alcohol screening test may be administered to a driver suspected of violation of subsection (a) of this section, and the results of an alcohol screening test or the driver's refusal to submit may be used by a law enforcement officer, a court, or an administrative agency in determining if alcohol was present in the driver's body. No alcohol screening tests are valid under this section unless the device used is one approved by the*

Commission on Health Services, and the screening test is conducted in accordance with the applicable regulations of the Commission as to its manner and use.

(e) **(Effective January 1, 1995) Punishment; Effect When Impaired Driving Offense Also Charged.** *The offense in this section is a Class 2 misdemeanor. It is not, in any circumstances, a lesser included offense of impaired driving under G.S. 20-138.1, but if a person is convicted under this section and of an offense involving impaired driving arising out of the same transaction, the aggregate punishment imposed by the court may not exceed the maximum applicable to the offense involving impaired driving, and any minimum punishment applicable shall be imposed.*

(f) **Limited Driving Privilege.--***A person who is convicted of violating subsection (a) of this section and whose drivers license is revoked solely based on that conviction may apply for a limited driving privilege as provided in G.S. 20-179.3. This subsection shall apply only if the person meets both of the following requirements:*

(1) *Is 18, 19, or 20 years old on the date of the offense.*

(2) *Has not previously been convicted of a violation of this section. The judge may issue the limited driving privilege only if the person meets the eligibility requirements of G.S. 20-179.3, other than the requirement in G.S. 20-179.3(b)(1)c. G.S. 20-179.3(e) shall not apply. All other terms, conditions, and restrictions provided for in G.S. 20-179.3 shall apply. G.S. 20-179.3, rather than this subsection, governs the issuance of a limited driving privilege to a person who is convicted of violating subsection (a) of this section and of driving while impaired as a result of the same transaction.*

G.S. 20-138.1 Impaired driving

(a) Offense. A person commits the offense of impaired driving if he drives any vehicle upon any highway, any street, or any public vehicular area within this State:

- (1) While under the influence of an impairing substance; or
- (2) After having consumed sufficient alcohol that he has, at any relevant time after the driving, an alcohol concentration of 0.08 or more.

(b) Defense precluded. The fact that a person charged with violating this section is or has been legally entitled to use alcohol or a drug is not a defense to a charge under this section.

(c) Pleading. In any prosecution for impaired driving, the pleading is sufficient if it states the time and place of the alleged offense in the usual form and charges that the defendant drove a vehicle on a highway or public vehicular area while subject to an impairing substance.

(d) Sentencing Hearing and Punishment. Impaired driving as defined in this section is a misdemeanor. Upon conviction of a defendant of impaired driving, the presiding judge must hold a sentencing hearing and impose punishment in accordance with G.S. 20-179.

(e) Exception. Notwithstanding the definition of 'vehicle' pursuant to G.S. 20-4.01 (49), for purposes of this section the word 'vehicle' does not include a horse, bicycle, or lawnmower.

G.S. 20-138.7 Transporting an open container of alcoholic beverage after consuming alcohol

(a) Offense. No person shall drive a motor vehicle on a highway or public vehicular area:

- (1) While there is an alcoholic beverage other than in the unopened manufacturer's original container in the passenger area; and
- (2) While the driver is consuming alcohol or while alcohol remains in the driver's body.

(b) Subject to Implied Consent Law. An offense under this section is an alcohol-related offense subject to the implied-consent provisions of G.S. 20-16.2.

(c) Odor insufficient. The odor of an alcoholic beverage on the breath of the driver is insufficient evidence to prove beyond a reasonable doubt that alcohol was remaining in the driver's body in violation of this section, unless the driver was offered an alcohol screening test or chemical analysis and refused to provide all required samples of breath or blood for analysis.

(d) Alcohol Screening Test. Notwithstanding any other provision of law, an alcohol screening test may be administered to a driver suspected of violating subsection (a) of this section, and the results of an alcohol screening test or the driver's refusal to submit may be used by a law enforcement officer, a court, or an administrative agency in determining if alcohol was present in the driver's body. No alcohol screening tests are valid under this section unless the device used is one approved by the Commission for Health Services, and the screening test is conducted in accordance with the applicable regulations of the Commission as to the manner of its use.

(e) Punishment. Effect When Impaired Driving Offense Also Charged. Violation of this section shall be punished as a Class 3 misdemeanor for a second or subsequent offense. A fine imposed for a second or subsequent offense may not exceed one thousand dollars (\$1,000). Violation of this section is not a lesser included offense of impaired driving under G.S. 20-138.1, but if a person is convicted under this section and of an offense involving impaired driving arising out of the same transaction, the punishment imposed by the court shall not exceed the maximum applicable to the offense involving impaired driving, and any minimum applicable punishment shall be imposed. A violation of this section shall be considered a moving violation for purposes of G.S. 20-16 (c).

(f) Definitions. If the seal on a container of alcoholic beverages has been broken, it is opened within the meaning of this section. For purposes of this section, 'passenger area of a motor vehicle' means the area designed to seat the driver and passengers and any area within the reach of a seated driver or passenger, including the glove compartment. The area of the trunk or the area behind the last upright back seat of a station wagon, hatchback, or similar vehicle shall not be considered part of the passenger area. The term 'alcoholic beverage' is as defined in G.S. 18B-101(4).

G.S. 18B-101(4) "Alcoholic beverage" means any beverage containing at least one-half of one percent (0.5%) alcohol by volume, including malt beverages, unfortified wine, spirituous liquor, and mixed beverages.

(h) Limited Driving Privilege. A person who is convicted of violating subsection (a) of this section and whose driver's license is revoked solely based on that conviction may apply for

a limited driving privilege as provided for in G.S. 20-179.3. The judge may issue the limited driving privilege only if the driver meets the eligibility requirements of G.S. 20-179.3, other than the requirements in G.S. 20-179.3(b)(1)c. G.S. 20-179.3(e) shall not apply. All other terms, conditions, and restrictions provided for in G.S. 20-179.3 shall apply. G.S. 20-179.3, rather than this subsection, governs the issuance of a limited driving privilege to a person who is convicted of violating subsection (a) of this section and of driving while impaired as a result of the same transaction.

Alco-Sensor



- A. Analytical Principle - The Alco-Sensor II, III, IV produced by Intoximeters Inc., St. Louis, Missouri, all utilize an electrochemical fuel cell as an alcohol sensor.
1. Cell membrane absorbs alcohol and converts it to an electric current.
 2. The amount of current generated is proportional to the concentration of alcohol present.
 3. The higher the alcohol concentration, the greater the current output of the fuel cell.
 4. Test results are shown on a digital display and reported as an alcohol concentration expressed as grams of alcohol per 210 liters of breath.

B. Major Components of the Alco-Sensor

1. Internal components
 - a. Fuel cell (alcohol sensor)
 - b. Breath sampling valve
 - c. Battery (9 volt)

2. External components
 - a. Temperature display
 - b. SET button
 - c. READ button
 - d. Digital display
 - e. Breath sampling port
 - f. Calibration adjustment screw
 - g. Battery compartment door

Operation of the Alco-Sensor

1. Observe temperature strip to assure an operational temperature of the Alco-Sensor between 20° C and 36° C (68° F - 98° F). The device will operate at temperatures as low as 0° C but the response is sluggish and some accuracy is sacrificed. Once the unit is at operating temperature, it will function properly in ambient temperatures of 0° C to 100° C.
 - * If 888 is displayed (88 on an Alco-Sensor II), the 9 volt battery is weak and needs replacing. Factory literature indicates a life expectancy of 500+ tests for a 9 volt alkaline battery.

2. Attach mouthpiece, press "READ" button and hold down. Check to see if .000 (.00 on the Alco-Sensor II) is constant.

- * Alco-Sensors purchased after November 1981 have an automatic zeroing feature. When the "READ" button is depressed all the way down, the digital display should show -.00 with the minus sign flashing at least once or twice (when the "READ" button is held down for a 10 second period).
 - * The "READ" button operates in two stages. First, it releases the spring loaded diaphragm/sampling valve which draws a 1 cc sample of breath. Secondly, at the bottom of its travel (full depression of the button), it switches the instrument "on" electronically.
3. Depress and lock the "SET" button.
 - * The "SET" button cocks the valve when depressed all the way and also "shorts" the cell. This accelerates the destruction of any alcohol left on the cell so that the time delay between tests is minimized.
 4. Instruct the person to give a sample (assure a minimum approximate 5 second continuous breath so that a deep lung sample may be collected).
 5. Push "READ" button before exhalation ceases (allow a minimum of 3 seconds breath prior to pushing "READ" button).
 6. Keep "READ" button depressed until reading stabilizes. Read maximum reading obtained.
 - * An alcohol concentration reading takes between 15 to 60 seconds to develop in the standard fuel cell device. This reading will hold for a few moments before decreasing. During this period, the "READ" button can be released and reactivated without affecting the value. However, the "SET" button should not be depressed during this period as it will destroy the accumulating reading.
 7. Push "SET" button to accelerate elimination of reading (this purges and electronically cleans the cell surface).

8. USE EXTREME CAUTION AND CARE in removing the mouthpiece from the breath sampling port. "Flipping or thumping" the mouthpiece to remove it from the port can cause breakage of the nipple from the port, rendering the unit unusable.
9. ALWAYS LEAVE "SET" BUTTON DEPRESSED WHILE NOT IN USE.

Alco-Sensor Calibration

1. Calibration is the process of ensuring that the ASTD produces an accurate breath alcohol measurement.
 - a. Equipment needed for calibration:
 - * Alcoholic Breath Simulator (34° C ± .2° C) with a .08 alcohol concentration solution.
 - * Screwdriver compatible with the calibration adjustment screw.
 - * Standard Alco-Sensor mouthpiece.
 - b. Calibration Verification
 1. Insure instrument temperature is within the acceptable limit and the SET button is depressed.
 2. Depress the "READ" button and verify that the display reads .00 (.000).
 3. Attach mouthpiece to instrument.
 4. Depress "SET" button.
 5. Connect the mouthpiece to the exit port of the simulator.
 6. Deliver simulator sample by blowing into the simulator for at least 5 seconds.
 7. Just prior to terminating sample flow, depress READ button.

* A simple way to achieve the two previous steps is to blow a constant breath for 5 seconds. At the count of the fourth second, depress the READ button.

8. Hold down READ button until digital display reading stabilizes.
9. Compare test results with the known alcohol concentration of the simulator. If the results do not agree within the acceptable level of the known concentration, a calibration adjustment is needed.

Calibration Adjustment (Alco-Sensor)

1. Insert the screwdriver blade in the calibration screw located in the hold on the right side of the instrument.
2. Turn the screw two full turns **CLOCKWISE**.
3. Attach a mouthpiece to the breath testing unit and to the exit port of the simulator.
4. Blow into the inlet port of the simulator for approximately 5 seconds. On the 4th second of the 5 second count, depress the "READ" button.
5. Quickly remove the Alco-Sensor from the simulator and insert the screwdriver into the calibration screw.
6. Carefully observe the reading. Once the reading surpasses the known value of the simulator solution, immediately turn the calibration screw **COUNTERCLOCKWISE** until your display value reflects the known value of the simulator solution. If you are quick enough, the reading will continue to rise and the screw should be turned back again to bring the reading back to the simulator value. Eventually, the display value will stabilize. When the display value holds the expected results for 5 seconds, the unit is calibrated.

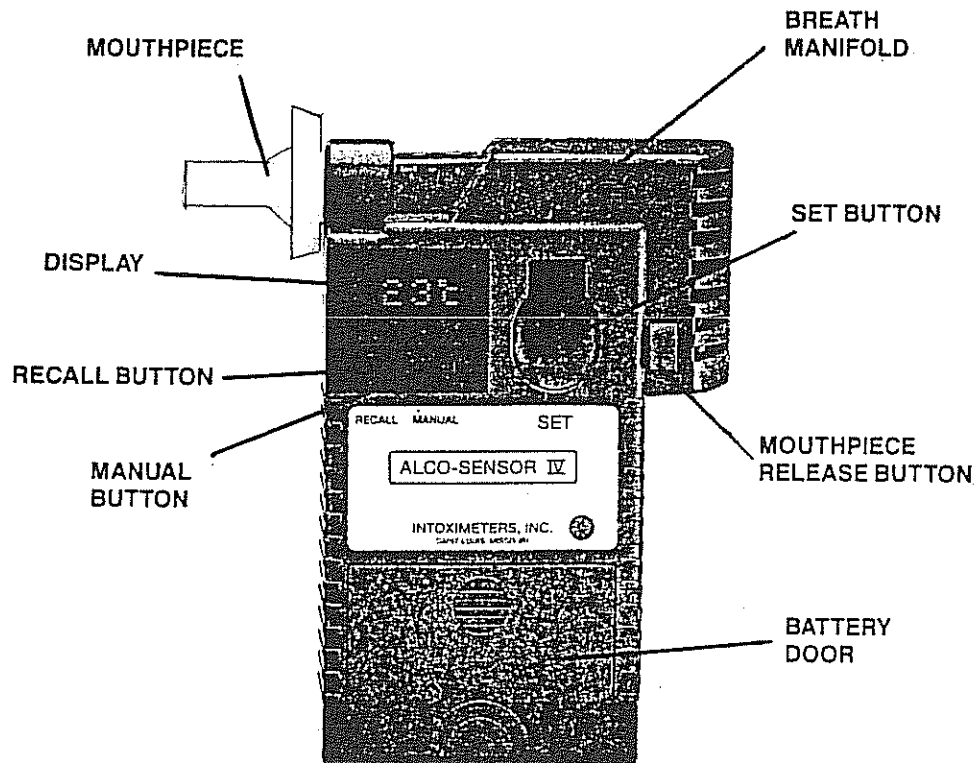
7. Once you are satisfied with the reading, depress the SET button.

NOTE: Under no circumstances should the screw be turned clockwise on an Alco-Sensor to increase the number displayed by the unit during the adjustment phase. If during the first adjustment the reading is carried below the value of the simulator, DO NOT bring the value back up by turning the screw clockwise. Wait and see if the reading rises to the desired value. If it rises past the desired value, bring it back down to the desired value by again turning the screw as directed.

BATTERY REPLACEMENT

1. Slide Battery door open.
 2. Remove old Battery and disconnect.
 3. Connect new Battery and replace.
 4. Close Battery door.
 5. Verify Calibration of device.
- * Manufacturer recommends Alkaline Batteries.

Operation of the Alco-Sensor IV



Mount Mouthpiece. Remove the unit from its case and mount a new mouthpiece. This will power up the unit and activate the display. If the battery is too low, the first display will be "Bat".

Note Temperature. The temperature in °C will be displayed for three seconds after turn-on. The Alco-Sensor IV is designed to provide maximum accuracy when the unit temperature is between 10°C and 40°C. Below 10°C, the fuel cell process becomes progressively slower, measurement times become longer and some information begins to be lost, so that accuracy begins to decline. Clearing time for the cell increases and, consequently, the required interval between tests is increased. On the other hand, temperatures above 40°C tend to degrade fuel cell performance and shorten the useful life of the cell. All Alco-Sensor IV's with a serial number higher than 002343 will not allow a test if the unit is out of the proper operating temperature range. If the temperature is

outside of the proper operating range, take appropriate corrective action by removing the mouthpiece and placing the instrument in a cooler or warmer environment.

Depress Set Button. If the previous test has been properly concluded, the pump mechanism should already be cocked and "Set" will not appear. If this was not correctly done, or if by impact or rough handling the mechanism has been sprung, this instruction requires the pump to be restored to its cocked position. The test cannot proceed until it is done.

"Blnk" appears on the Alco-Sensor IV display while the unit draws a blank sample and checks for alcohol residue on the fuel cell only. The busy signal ">:<" displays while the check is being run. If the fuel cell is clean, ".000" appears.

If the fuel cell is not clean, ".XXX" (a numeric value) appears followed by "Wait". Eject the mouthpiece and wait 15 seconds to one minute (depending upon the magnitude of the reading) before attempting to re-initialize the test with a new, clean mouthpiece. Do not blow by mouth through the manifold as this can retard the clearing.

If "Set" appears, depress the Set Button to cock the breath pump and the unit is ready for a breath sample.

Collect a Breath Sample. At the beginning of this step, the busy symbol ">:<" is displayed while the Alco-Sensor IV monitors the breath flow sensor for stability. (A display of "Man" at this point indicated that the breath flow sensor is disabled and that only a manual sample is possible.) When the display shows "Test", instruct the person to deliver a long, steady breath sample through the mouthpiece. A (+) sign appears to indicate that the subject is blowing hard enough to complete an automatic sample. If (+) does not appear, stop the subject and instruct the person to blow harder. When the person has blown a minimum volume of approximately 1.2 liters, a second (++) sign appears. The sample will be taken only when this condition has been met and the flow diminishes indicating that the end of the exhalation is approaching. If both conditions are met in 10 seconds or less, the unit will automatically sample. If more than 10 seconds elapse or if blowing is interrupted before the second (+) sign appears, the unit will display "NoGo" and return to the beginning of Step 5 to start another sample attempt.

If the person has obviously impaired breathing, it is recommended that the sample be taken manually as close to the end of exhalation as possible by pressing the Manual Button. This sample technique can be used with an uncooperative person to get the best possible reading under the circumstances.

A total of 3 minutes is allocated to achieve a successful sample either automatically or manually. At the end of 3 minutes, "Void" appears and the test must be started again at Step 1

(mount mouthpiece).

Any time the sampling pump does not successfully draw a sample on either the manual draw or automatic command, the display will show "Void". After 3 seconds an intermittent beep indicates that the mouthpiece should be removed to turn the power off.

Reading Displayed. As soon as a successful breath sample has been taken, the busy signal ">:<" is displayed to indicate the Alco-Sensor IV is analyzing the breath sample.

On some units: After a few seconds a 2 digit display (.XX) will appear for 3 seconds in addition to the busy symbol ">:<". This is an approximation of the final reading to better than 10%. The display will continue to indicate busy until the final 3 digit display appears in 20-30 seconds. It is accompanied by a 3 second series of beeps.

Depress Set Button and Remove Mouthpiece. After the 3 digit display disappears, "Set" appears. Depress the Set Button and eject the mouthpiece unless you need to recall the test result. When the pump is cocked with the Set Button, an intermittent beep signals that the mouthpiece should be removed to turn the unit off. At any time during this beeping period and before the mouthpiece is ejected, depressing the Recall Button will display the 3 digit result of the test just completed.

Until the Set Button is depressed after a test, the Recall function is not available. Once the Set Button has been engaged, depressing the Recall Button will display the final reading of the current test. After the mouthpiece is ejected, the test result cannot be recalled.

Calibration Verification

The verification of calibration is achieved by introducing a sample of known alcohol concentration through the Alco-Sensor IV's sampling system and checking to see that the unit reads the sample within the acceptable range (as listed in the Rules and Regulations, definitions section).

The test is performed when the temperature range of the Alco-Sensor IV is between the normal acceptable limits of 10°-40°C.

1. Assure proper temperature of the Alcoholic Breath Simulator.
2. When the Alco-Sensor IV reaches "Test" "Cal", attach the open end of the mouthpiece to the simulator outlet.

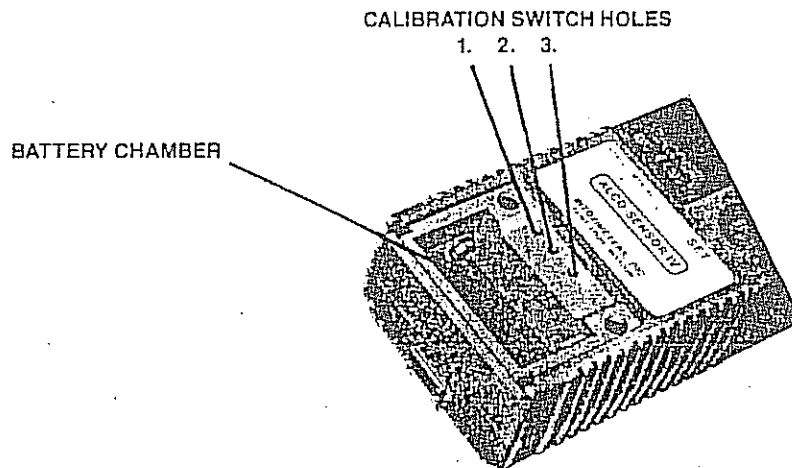
DOZHAN.

3. Blow into the simulator inlet port for 4 seconds. Avoid blowing so hard that the aqueous solution is forced into the Alco-Sensor IV mouthpiece. On the 3rd second, press the Manual Button on the Alco-Sensor IV to take a sample (the goal is to have the alcohol-water vapor still flowing through the Alco-Sensor IV when the sample is taken).
4. Detach simulator from mouthpiece carefully so that the mouthpiece is not unseated from the unit.
5. If the reading is within the acceptable limits as listed in the Rules and Regulations, the unit is deemed properly calibrated.

Calibration

When a unit does not read a standard within acceptable limits, it must be re-calibrated by the following procedures. The unit must be calibrated when its temperature is between 23-27°C. If the temperature is not within the required range, the unit will not permit a calibration.

1. Remove battery cover to expose calibration holes.



2. Insert a mouthpiece and follow the standard operation until the Alco-Sensor IV displays a blank reading of ".000".
3. While ".000" is still being displayed, use the calibration tool and press Access Hole #3 and hold down until ".XXX" (the actual number will be that used for the last calibration that was run). When the ".XXX" display appears, release Access Hole #3. If the temperature is not in the range of 23°-27°C,

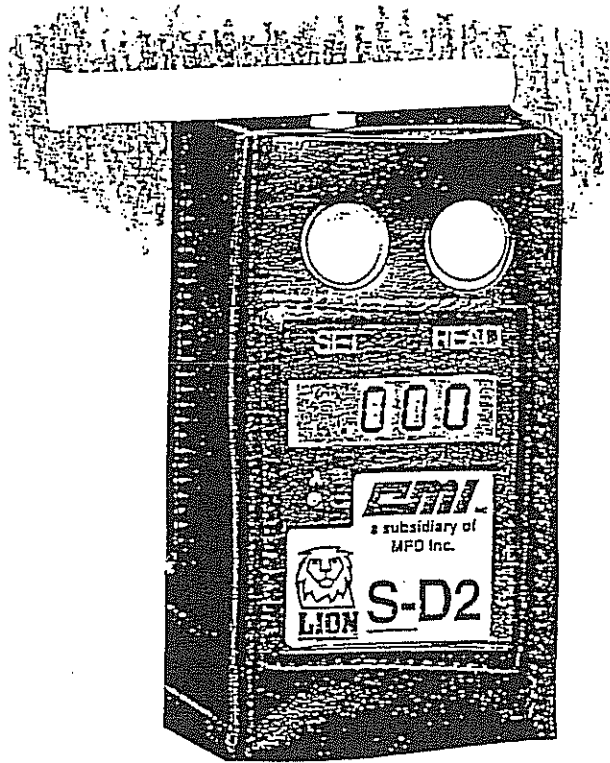
- instead of ".XXX", the display will be "Tmp<" or "Tmp>" and the unit will "Void". If this occurs, remove the mouthpiece and allow the instrument to come into the proper range of 23°-27°C.
4. If, after a few seconds, the display goes to "Set", the Set Button should be depressed to cock the sample pump. ".XXX" will return to the display.
 5. With ".XXX" shown on the display, using the calibration tool, adjust the number up (Access Hole #1) or down (Access Hole #2) until the value of the standard being used is displayed.
 6. Push Access Hole #3 again. The display must read "Cal" to proceed. This is the equivalent of "Test" in a normal sequence.
 7. Attach the open end of the mouthpiece to the simulator outlet.
 8. Blow into the simulator inlet port for approximately four seconds. On the third second, press the Manual Button on the Alco-Sensor IV to take a sample (the goal is to have the vapors still flowing through the Alco-Sensor IV when the sample is taken). Avoid blowing so hard that the aqueous solution is forced out of the simulator and into the mouthpiece of the Alco-Sensor IV. Detach the simulator from the mouthpiece carefully so that the mouthpiece is not unseated from the unit.
 9. The depression of the Manual Button in the previous step activates the sampling valve. The Alco-Sensor IV analyzes the output from the fuel cell and automatically makes the necessary calibration adjustment to the exact number that was programmed in Step 5.
 10. Conclude the test as usual by pressing the Set Button when "Set" appears. Remove the mouthpiece at the intermittent Beep.
 11. After a 2 minute wait, use a new mouthpiece to run another sample from the simulator for verification of the calibration.

BATTERY REPLACEMENT

A "Bat" display indicates the Battery is weak and needs replacing.

1. Slide the Battery door open.
2. Remove the old battery.
3. Insert a new battery (9 volt Alkaline).
4. Close the Battery door.

S-D2



- A. Analytical Principle - The S-D2 is an Alcohol Screening Test Device manufactured by CMI, Inc. of Owensboro, Kentucky. It utilizes an electrochemical fuel cell as an alcohol sensor.
1. Cell membrane absorbs alcohol and converts it to an electric current.
 2. The amount of current generated is proportional to the concentration of alcohol present.
 3. The higher the alcohol concentration, the greater the current output of the fuel cell.
 4. Test results are shown on a digital display and reported as an alcohol concentration expressed as grams of alcohol per 210 liters of breath.

B. Major Components of the S-D2

1. Internal components
 - a. Fuel cell (alcohol sensor)
 - b. Breath sampling valve
 - c. Battery (9 volt)

2. External components
 - a. Temperature display
 - b. SET button
 - c. READ button
 - d. Digital display
 - e. Breath sampling port
 - f. Calibration adjustment screw
 - g. Battery compartment door
 - h. Amber (A) light
 - i. Green (B) light

Operation of the S-D2

1. Open case, insure that the temperature strip is within the operating temperature range of 20° C (68 ° F) - 36° C (98° F).
2. Ready Check - Press "READ" button and hold down for at least 10 seconds. Observe display. This should read ".000". If higher reading is shown, depress and lock "SET" button, wait approximately 2 minutes and again press "Read" button. Check the display to see if ".000" is constant. If the first digit displays "L", the battery needs replacing.
3. Depress and lock the "SET" button.
4. Attach Mouthpiece - Attach the breath sampling port to the hole in the side of a new mouthpiece.

5. Take Sample - Instruct the individual to place his lips on the mouthpiece and provide a long and steady sample. He must blow with sufficient pressure to illuminate light "A" and long enough to illuminate light "B". When light "B" comes on, press and hold "READ" button. This depression of the "READ" button creates a vacuum which pulls approximately 1 cc of the person's breath across the face of the fuel cell. Tell the person to stop blowing.
6. Observe Reading - Continue depressing the "READ" button and observe display as it rises to its maximum reading. This reading represents the person's alcohol concentration.
7. Reset - Depress and lock "SET" button. This button should remain locked in the depressed position at any time the unit is not in use.
8. USE EXTREME CAUTION AND CARE in removing the mouthpiece from the breath sampling port. "Flipping or thumping" the mouthpiece to remove it from the port can cause breakage of the nipple from the port, rendering the unit unusable.

S-D2 Calibration

1. Calibration is the process of ensuring that the ASTD produces an accurate breath alcohol measurement
 - a. Equipment needed for calibration:
 - * Alcoholic Breath Simulator at proper temperature ($34^{\circ} \text{C} \pm .2^{\circ} \text{C}$) with a .08 alcohol concentration solution.
 - * Screwdriver compatible with the calibration adjustment screw.
 - * Standard S-D2 mouthpiece.
 - b. Calibration Verification
 1. Insure instrument temperature is within the acceptable limit and the SET button is depressed.

2. Depress the READ button and verify that the display reads .00 (.000).
3. Attach mouthpiece to instrument.
4. Depress SET button.
5. Connect the mouthpiece to the exit port of the simulator.
6. Deliver simulator sample by blowing into the simulator for at least 5 seconds.
7. Just prior to terminating sample flow, depress READ button.
 - * A simple way to achieve the two previous steps is to blow a constant breath for 5 seconds. At the count of the fourth second, depress the READ button.
8. Hold down READ button until digital display reading stabilizes.
9. Compare test results with the known alcohol concentration of the simulator. If the results do not agree within the acceptable level of the known concentration, a calibration adjustment is needed.

Calibration Adjustment (S-D2)

1. Insert the screwdriver blade in the calibration screw located in the hold on the right side of the instrument.
2. Turn the screw two full turns COUNTERCLOCKWISE.
3. Attach a mouthpiece to the breath testing unit and to the exit port of the simulator.
4. Blow into the inlet port of the simulator for approximately 5 seconds. On the 4th second of the 5 second count, depress the READ button.
5. Quickly remove the breath tester from

the simulator and insert the screwdriver into the calibration screw.

6. Carefully observe the reading. Once the reading surpasses the known value of the simulator solution, immediately turn the calibration screw **CLOCKWISE** until your display value reflects the known value of the simulator solution. If you are quick enough, the reading will continue to rise and the screw should be turned back again to bring the reading back to the simulator value. Eventually, the display value will stabilize. When the display value holds the expected results for 5 seconds, the unit is calibrated.
7. Once you are satisfied with the reading, depress the SET button.

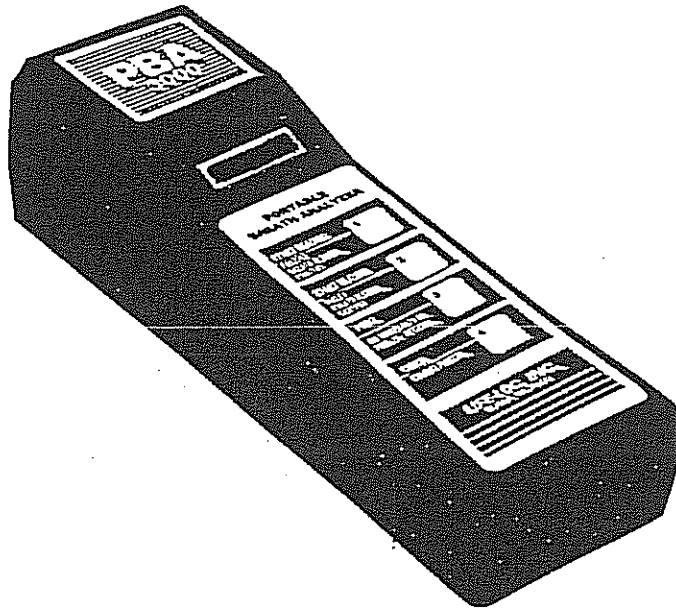
NOTE: Under no circumstances should the screw be turned counterclockwise on an S-D2 to increase the number displayed by the unit during the adjustment phase. If during the first adjustment the reading is carried below the value of the simulator, **DO NOT** bring the value back up by turning the screw counterclockwise. Wait and see if the reading rises to the desired value. If it rises past the desired value, bring it back down to the desired value by again turning the screw as directed.

BATTERY REPLACEMENT

1. Slide Battery door open.
2. Remove old Battery and disconnect.
3. Connect new Battery and replace.
4. Close Battery door.
5. Verify Calibration of device.

* Manufacturer recommends Alkaline Batteries.

PBA 3000



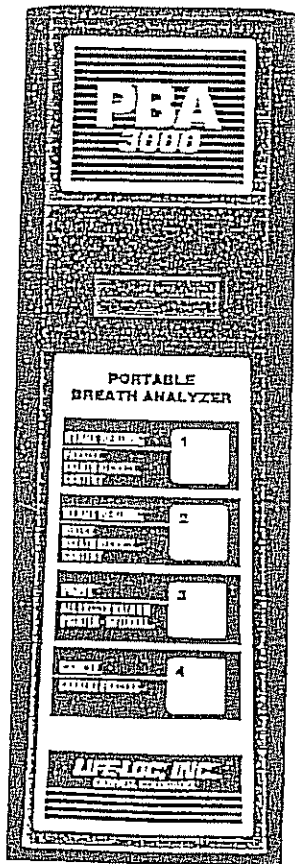
The PBA 3000 is a portable breath analyzer manufactured by Life Loc, Inc., Wheat Ridge, Colorado.

This device utilizes an electrochemical fuel cell sensor and is capable of measuring breath alcohol in not only a direct sampling mode, but also in a passive mode.

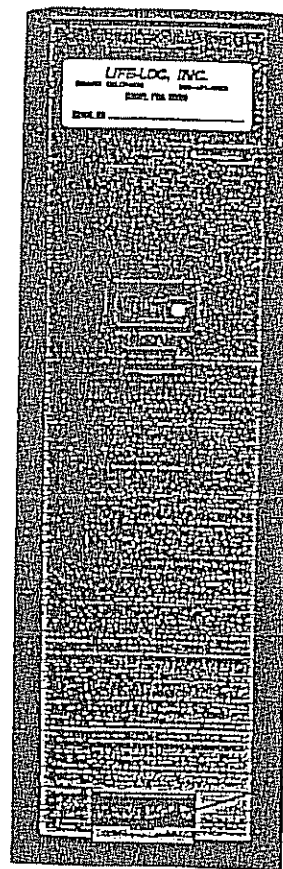
Major Components of the PBA 3000

1. Internal Components
 - a. Fuel cell (alcohol sensor)
 - b. Internal pump
 - c. Batteries (8 AA)
2. External Components
 - a. Keypad #1 (Passive sampling)
 - b. Keypad #2 (Direct sampling)
 - c. Keypad #3 (Print)

- d. Keypad #4 (Cancel)
- e. On/off switch
- f. LCD (Display)
- g. Battery compartment door
- h. Green indicator light
- i. Sampling port
- j. Proximity sensor
- k. External printer port



Front of Unit



Back of Unit

Passive Sampling

Passive sampling is achieved by the unit drawing in a sample of ambient air near the mouth and nose of the person in question. The PBA 3000 will then analyze this air and provide a reading of the person's alcohol concentration.

When using a passive device, certain factors need to be considered which could affect a reading. Recently applied cologne or perfume (which normally contains alcohol), open containers of alcoholic beverage, or ambient breath alcohol from other occupants of the car could positively affect a passive result. Windy conditions could result in a dilution of the passive sample and thereby lower results.

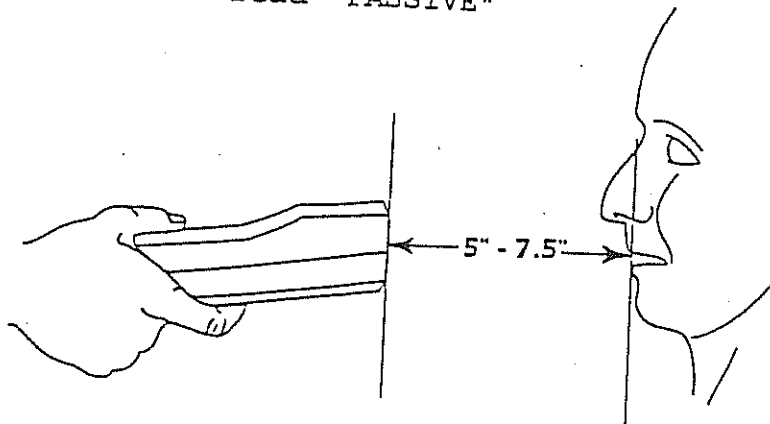
A result obtained from a passive sample is perhaps best used to simply aid in the officer's determination of the presence of alcohol on a person's breath. This may result in the officer furthering his investigation through additional sobriety tests to include performing a direct sample analysis if necessary.

1. Turn unit on (on/off switch on back of unit)
The display on the face of the unit will indicate the current battery level in an E---F format. Factory literature predicts a normal battery life expectancy of 500+ tests.

After the battery evaluation is complete, the unit will automatically perform a complete self diagnostic check.

2. To ready the unit for a passive test, press the #1 keypad twice.

The LCD will now read "PASSIVE"



The most accurate passive test is achieved with the unit 5-7½" from the person's mouth and nose. The unit automatically senses the distance and indicates on the

display when the proper distance is achieved:

- a. Aim the unit directly at the person's mouth and nose
 - b. If the unit is too far from the person, "TOO FAR" will appear on the LCD
 - c. If the unit is too close to the person, "TOO CLOS" will appear on the LCD
3. When the proper distance has been reached, the green light will illuminate, the word "SAMPLING" will appear on the display, and an internal pump will automatically draw an air sample into the sensor for measurement.

This sampling process lasts approximately 5 seconds. It is important to maintain the proper positioning of the unit during this sampling period.

4. Once the pump stops, the unit will analyze the sample received and the test result will appear on the display.
5. If no alcohol was detected, the display will read "AC .000", the unit will then clear the display in 15 seconds in preparation for the next test.
6. If alcohol was found to be present in the sample (.01 or higher), the alcohol concentration will appear on the display and will increase in value until a final reading is reached. The time required for a final reading is 30 seconds. Once the final alcohol concentration is reached, it will be displayed for 3 minutes or until the next test is begun.

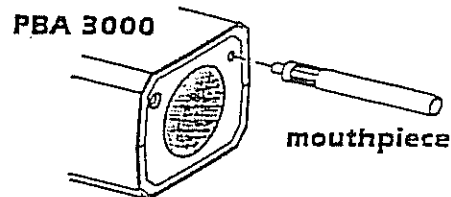
Maintaining this continued display allows the operator to watch the person being tested and his surroundings and not focusing only on the unit LCD.

7. While the final AC is displayed, the PBA 3000 will automatically purge the sensor to prepare for the next test. This process takes 60 seconds and is indicated by a flashing "f" on the display.

When the purge cycle is complete, the flashing "f" will disappear from the display and the unit may be readied for another passive test by pressing Keypad #1.

Direct Sampling

1. Remove a mouthpiece from its sealed wrapper and insert the mouthpiece into the small hole on top of the PBA 3000.



A check valve included in the sampling system prevents reverse air flow and potential contamination from a previously tested subject.

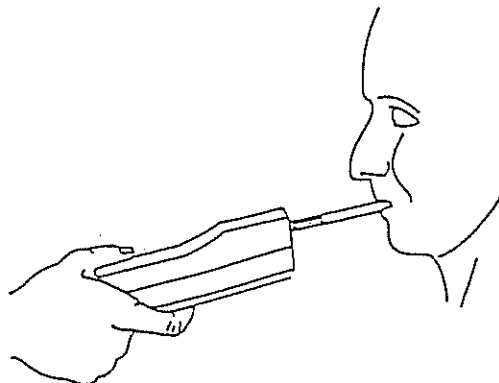
* Important to accurate direct sampling is the collection of a deep lung breath sample. Collecting such a sample requires the operator to collect a sample at the proper point of the person's exhalation.

2. To begin the Direct test immediately following a passive test, press keypad #2 once.

If the instrument has been turned off, turn it on and press keypad #2 twice.

The display will read "READY" followed by a number indicating that the unit is ready for Direct Test #___.

3. Instruct the person to deliver a long, steady breath. While the person is blowing into the mouthpiece, listen for the air exhausting through the mouthpiece vent (to insure the person is not faking by placing his tongue over the tip of the mouthpiece).



When the person has expelled nearly all his breath, press keypad #2 and the unit will immediately take a sample.

4. The unit will display in a manner identical to the test result display sequence of the passive mode.

If no alcohol was detected, the unit will be ready for another test in 15 seconds.

If alcohol was detected, the final reading will be reached in 30 seconds, followed by the 60 second purge cycle.

When the flashing "f" stops (indicating the end of the purge cycle), the unit will be ready for another test.

*TURN OFF UNIT WHEN NOT IN USE.

Calibration of the PBA 3000

Calibration is the process of adjusting the PBA 3000 to accurately measure the alcohol content of a breath sample.

In order to properly calibrate the PBA 3000, you will need an alcoholic breath simulator and simulator solution.

Our current rules and regulations as listed in the NC Administrative Code allow for either a .10 or a .08 vapor solution for the purpose of calibration and verification. The certified stock solution produced by the Environmental Organic Chemistry Branch in the State Lab in Raleigh, necessary to produce the simulator solution, is no longer produced in the concentration to provide a .10 result.

PBA 3000's with a serial number of 4000 and higher are equipped with software which allows for the use of .08 AC for calibration and verification.

Units with serial numbers less than 4000 must be factory updated to allow for the use of a .08 solution for these purposes.

Items Required for Calibration

1. Alcoholic Breath Simulator
2. PBA 3000
3. Mouthpiece

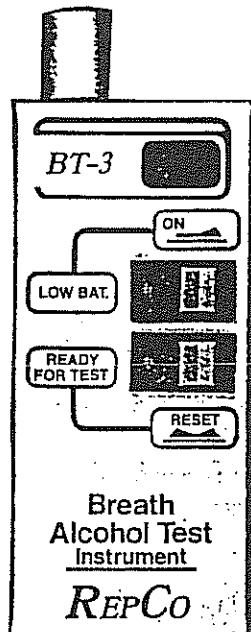
Calibration Procedure

1. Connect a mouthpiece to the vapor out port on the simulator.
2. Press the following keypad sequence to enter the "Autocal" mode:
 - a. Press keys 4 and 2 simultaneously
 - b. Press keys 4, 3, 1, and 2 in sequence. The display will then read "AUTOCAL".
 - c. Press key 2 to enter the direct calibration mode. The display will then read "DIRECT".
3. Line up the PBA 3000 with the mouthpiece previously connected to the vapor out port of the simulator and insert the mouthpiece into the PBA 3000.
 - a. Press key 1 and the display will read "CALIBRATE".
 - b. Press key 1 again and watch the top of the unit for a green light.
 - c. When the green light comes on, deliver a vapor sample by blowing into the inlet port of the simulator for approximately 5 seconds.
 - d. Remove the unit from the simulator and lay the unit on it's side. DO NOT TURN THE UNIT OFF.
 - e. Wait for the final reading and the complete purge cycle.
4. Press key 4 twice to exit the calibration mode after the purge cycle is complete.
5. Turn the unit off for 10 minutes. You have completed the initial phase of calibration.

Verification

1. After waiting 10 minutes, turn the unit on and again enter the Autocal mode by pressing keys 4 and 2 simultaneously, then press keys 4, 3, 1, and 2 in sequence. The display will now read "AUTOCAL".
2. Press key 2 and the display will read "DIRECT".
3. Insert the mouthpiece from the simulator into the inlet port at the top of the PBA 3000.
4. Press key 2 and the display will read "VERIFY".
5. Press key 2 again and watch the top of the unit for the green light.
6. When the green light comes on, deliver the sample of air for approximately 5 seconds (until the green light turns off).
7. Once again, remove the unit from the simulator, place it on it's side and DO NOT TURN IT OFF. Wait for the final reading and the completed purge cycle.
8. The display should read a three digit result which when truncated (drop the third digit) reads either .08 or .07.
9. If it does not read within the acceptable limits, turn the unit off and repeat the calibration verification sequence.
10. Complete all necessary entries on the Alcoholic Breath Simulator Log. Refer to the special instructions on the back of the log as necessary.

BT-3 & Alcotec



Analytical Principal - The ALCOTEC and BT-3 are Alcohol Screening Test Devices produced by RepCo., Ltd. of Raleigh, North Carolina. They each utilize a taguchi cell as an alcohol sensor.

OPERATING PROCEDURE

1. Turn the unit on and allow 2 to 3 minutes for warmup. The green "Ready" lamp will illuminate when the instrument is ready for testing. Depress the "Reset" switch to manually reset the unit to ".00". The unit is now ready for testing.
2. Insert a disposable mouthpiece into the opening in the top of the unit.
3. Have the person to blow a long steady breath into the mouthpiece, making sure you analyze a deep lung sample.
4. Observe the alcohol concentration by noting the digital display.
5. TURN UNIT OFF WHEN NOT IN USE to conserve batteries.

GENERAL INFORMATION

1. The BT-3 and ALCOTEC are designed to operate at normal room temperatures of 60-70°, but will function properly at temperatures above and below room temperature. If the unit is extremely cold, the display may not reset to .00 until the unit has been warmed. The unit may be warmed by turning it on and putting it inside a pocket. When the digital display can be reset to .00, the unit is ready for testing. If the unit is extremely hot, it may need to be cooled by placing it in a cooler or shaded area.
2. To facilitate clearing after a test, lay the unit on its side so that the rear air outlet remains unobstructed.
3. Always adhere to the administrative rules to safeguard against reading mouth alcohol.

POWER REQUIREMENTS

The BT-3 and ALCOTEC require 8 AA batteries. Although regular AA batteries are acceptable, the manufacturer of the devices suggests Alkaline batteries for extended battery life.

To replace batteries, remove the back cover and carefully remove the battery holder by pulling the holder out from the bottom of the unit (so as not to damage the wiring). Insert batteries in both sides of the battery holder, being sure to observe the polarity of the batteries. Reinstall the battery holder. Rechargeable Ni-Cad batteries are permissible for these units.

CALIBRATION

1. Turn the unit "On" and allow approximately 2 to 3 minutes for warmup. If the unit has not been used for several days, allow a 10 minute warmup prior to calibration. The green "Ready" lamp will illuminate when the BT-3 is ready for testing. Depress the "Reset" switch to attain a ".00" reading on the digital display.
2. Connect the output of the simulator to the input of the unit.
3. Blow into the simulator for a period of at least 5 seconds. Observe the unit display which should read within the acceptable limits of the known concentration of the simulator sample. If the reading needs adjusting, adjust the unit Calibration Control located on the right side of the unit and accessed through a hole in the unit's metal case. Adjust clockwise to

increase the reading and counterclockwise to decrease the reading. Care should be taken to adjust in increments of 3 to 5 degrees only. After adjusting, repeat the simulator sampling and observe the displayed reading. Repeat as necessary to obtain an acceptable reading.

ZERO ADJUSTMENT

In the event the unit fails to display "00" after sufficient warmup time and the "Reset" switch has been properly depressed, proceed as follows:

1. Remove the battery compartment cover.
2. Visually locate the "Zero Set" control which is accessed through the small hole in the rear of the unit just above the battery compartment.
3. Using a small screwdriver, while depressing the "Reset Switch", adjust the control clockwise to increase and counterclockwise to decrease the displayed reading to attain the "00" reading.

Note: The "Zero Adjust" procedure should not affect the calibration of the unit provided the unit was calibrated when the "Zero Set" was properly adjusted.

DRIVING

STOP

INITIAL CONTACT

INTERVIEW

SOBRIETY EVALUATION

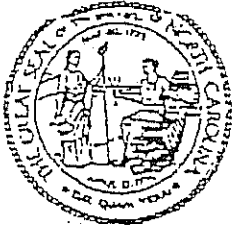
**General Visual
Assessment**

**Divided Attention
Exercises**

**Preliminary
Breath Test**

ARREST

DRIVE AWAY



F.T.A. Electronics Laboratory
 Parker-Lincoln Building
 Room 1B-211
 2728 Capital Boulevard
 Raleigh, N.C. 27604
 Phone: (919) 733-3225
 FAX: (919) 733-9575

Attention:

- Larry T.
- David R.

Alcohol Screening Test Device

Date	Device: Make / Model	Serial Number
------	----------------------	---------------

Agency Name	Address / Location	Contact Person & Telephone
-------------	--------------------	----------------------------

Please Give SPECIFIC Description of Problem / Malfunction:

To Be Completed By FTA Electronics Laboratory ONLY!

Repairs / Comments:	

Date Received: / /
 Date Returned: / /

Received By: _____
 Returned By: _____

FORENSIC TESTS FOR ALCOHOL BRANCH

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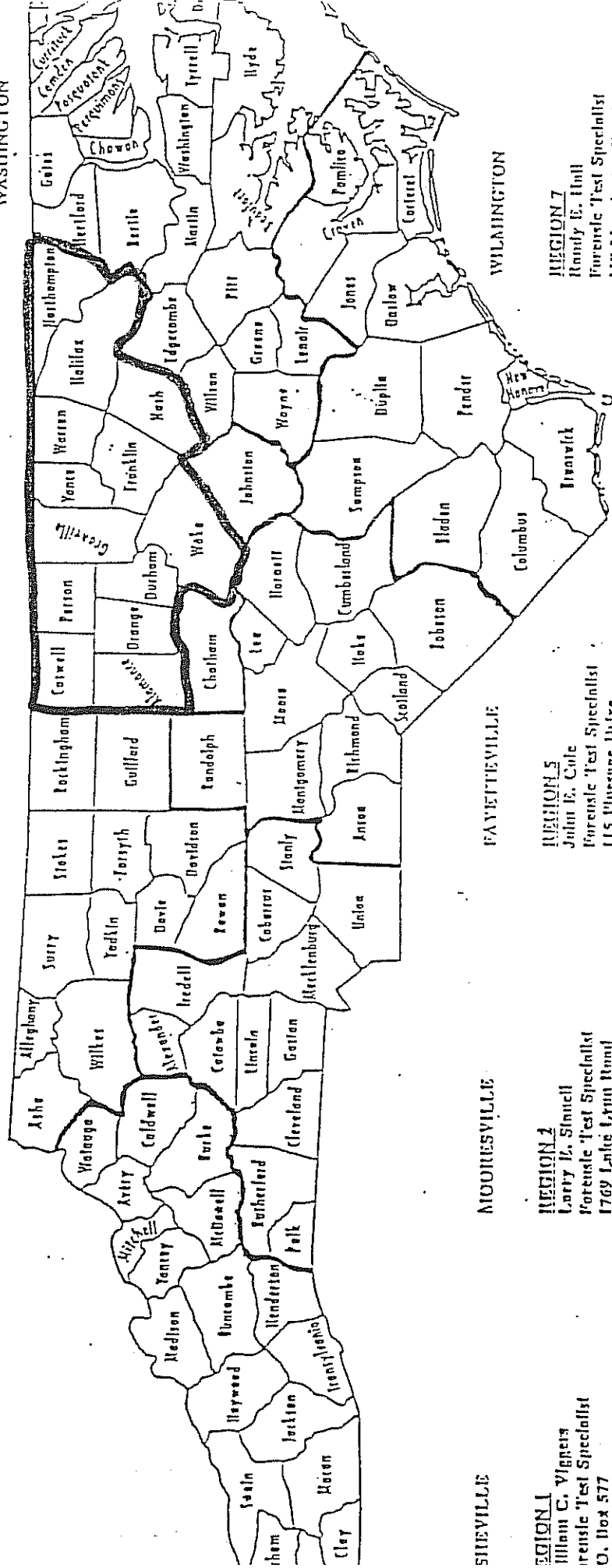
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WILMINGTON

Alco-Sensor III

General Operation

Intoximeters

St. Louis Missouri

PRINTED FEBRUARY 2003

If you are using the Alco-Sensor III for evidence, the waiting period between arrest and testing should conform to your local jurisdiction rules for testing.

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WARRANTY

Unless otherwise determined by the purchase agreement Intoximeters, Inc. warrants to the original user-purchaser that all new *Intoximeter Breath Alcohol Analyzers* are free from defects in material and workmanship, under normal use and service, for a period of twelve (12) months from original invoice date. The following are not covered under this warranty: consumables or supplies (i.e. mouthpieces, calibration gas, ink ribbons, printer paper) nor any damage which has, in Intoximeters Authorized Sales/Service Outlet opinion, been the result of misuse, alteration, accident or abnormal conditions of operation or handling. Also excluded from coverage under this agreement are printers and other hardware that are not manufactured by or for Intoximeters Inc. and do not carry the Intoximeters trademark, trade name, or logo affixed to them.

Software is warranted to perform substantially in accordance with the accompanying written materials. Software is warranted to be free from defects in materials and workmanship under normal use and service for a period of twelve months from original invoice date.

If the product, under warranty, is returned to an Intoximeters Authorized Service Center and, upon examination, it is determined to be defective, Intoximeters Authorized Sales/Service Outlet obligation is limited to repair, replacement or refund of purchase price. Intoximeters Authorized Sales/Service Outlet reserves the option to choose repair, replacement or refund as the means to satisfy this obligation.

CAUTION: THE INTOXIMETER BREATH ALCOHOL ANALYZERS CONTAINS STATIC-SENSITIVE MEMORY DEVICES. THE UNIT'S CASING SHOULD ONLY BE OPENED BY A FACTORY AUTHORIZED TECHNICIAN.

This warranty does not apply if: the product has been repaired or modified by someone other than a factory authorized technician without written permission from Intoximeters; if parts other than Intoximeters approved parts are used in replacement or repair; or if any Intoximeters serial number has been removed or defaced.

For warranty service, contact your nearest Intoximeters Authorized Service Center to obtain an authorization return number and the address of the closest repair center. The product should be sent to the Service Center with a description of the difficulty (postage and insurance prepaid). Intoximeters Authorized Sales/Service Outlet assumes no risk for damage in transit. Intoximeters Authorized Sales/Service Outlet will pay return postage for a product repaired under warranty. If Intoximeters Authorized Sales/Service Outlet determines that the failure was caused by misuse, alteration, accident or abnormal condition of operation or handling, Intoximeters Authorized Sales/Service Outlet will provide an estimate of repair costs before the repairs are made. Following repair, the product will be returned to the purchaser via ground transportation prepaid (overnight or express delivery charges are additional), and the purchaser will be billed for the repair and the shipping cost.

Repaired components are warranted for a period of 90 days from the billing date of the repair. The warranty on repaired components are subject to the same limitations as this warranty. Components not repaired or replaced do not receive an extended 90 day warranty.

Warranty service is available outside the United States only on products purchased through an Intoximeters Authorized Sales/Service Outlet in the country of use, or if the Purchaser has paid the applicable Intoximeters international price. If Purchaser transports a product from the United States without having paid the applicable Intoximeters price, the product must be returned to the United States to receive warranty service. Purchaser shall pay for transportation to the service center and shall bear the risk of loss or damage in transit for all products so returned to the United States. Intoximeters reserves the right to invoice the Purchaser for importation costs of repair/replacement parts when the product purchased in one country is exported and submitted for repair or service in another country.

THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. INTOXIMETERS SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, WHETHER ARISING FROM BREACH OF WARRANTY OR BASED ON CONTRACT, TORT, RELIANCE OR ANY OTHER THEORY.

Note. Some countries or states do not allow the foregoing limitations. Other rights may also vary.

UNPACKING AND CHECKOUT PROCEDURE

Before your instrument was shipped from the factory it was checked for accuracy. However, before placing your instrument into operation, as part of your checkout procedure, you should perform a successful accuracy/calibration check to assure yourself that the instrument's calibration settings are still properly adjusted. Record the results in the proper calibration log/record.

INTRODUCTION

The Alco-Sensor III is a handheld (pocket sized) breath alcohol testing device designed to read breath alcohol concentration (BrAC) or estimate blood alcohol concentration (BAC). Nothing more than a disposable mouthpiece and a 9-volt alkaline battery are necessary to keep the Alco-Sensor III operational.

With normal usage the unit should provide thousands of tests before the sensor needs replacing. The plug-in 9 volt ALKALINE battery* should run 500 tests. Calibration is rapid and simple. An approved dry gas tank or a simulator with properly certified and maintained ethanol solution may be utilized for calibration.

* Other types of batteries may not produce 500 tests.

OPERATOR TRAINING

The results supplied by a properly calibrated Alco-Sensor III can be no better than the quality of the sample collected by the operator. Good sampling technique is essential to obtaining a deep lung breath sample, and a deep lung breath sample is essential to obtaining a breath alcohol reading that correlates with a blood alcohol sample drawn at the same time.

Possible training resources in your area: state organizations which train personnel in the use of the Alco-Sensor III, i.e., Health Departments; State Police; Municipal Police Academies; Junior College Systems, and others.

We have a VCR instructional tape, which may be purchased. Personalized training programs can be arranged at your facility. For additional information contact **Intoximeters** at (314) 429-4000.

INSTRUMENT CALIBRATION

The accuracy of an instrument is verified by running a known alcohol concentration (standard) through the Alco-Sensor III's sampling system, and verifying that the result is within an acceptable tolerance of the expected value of the standard. This is called an accuracy or calibration check. If the accuracy check reading is within the acceptable range, the Alco-Sensor III is considered calibrated. If the reading is not within the acceptable tolerance, the Alco-Sensor III must be calibrated.

TO PRODUCE ACCURATE RESULTS, THE UNIT MUST BE IN CALIBRATION. (*Note: A calibration is only required if the reading from an accuracy check is not within the acceptable tolerance.*)

PRINCIPLE OF OPERATION

ALCOHOL IN THE BREATH

The accuracy of any breath alcohol test is dependent upon the relationship between the concentrations of alcohol in the blood and deep lung breath.

The amount of alcohol in a properly collected breath sample is governed by the amount of alcohol in the bloodstream circulating in the lungs. To get a reading that accurately reflects the blood alcohol concentrations, a deep lung breath sample must be collected and analyzed.

A recent drink of an alcoholic beverage, a dose of medication containing alcohol or regurgitation could introduce "mouth alcohol" to a breath sample. A 15-20 minute deprivation period prior to testing will ensure "mouth alcohol" has not influenced the breath alcohol reading. (Refer to your rules and regulations governing a required deprivation period prior to testing).

OPERATING CONDITIONS

The Alco-Sensor III is designed for optimal performance at temperatures between 20°C (68°F) to 40°C (104°F). Instrument temperature can be checked by the liquid crystal thermometer built into the back panel. It reads the temperature in Celsius degrees and has a range of 20°C to 40°C. Temperature is important as the rate of the electrochemical reaction is affected by temperature. The unit will operate when the temperature of the instrument is as low as 0°C, but the response is sluggish and some sensitivity is sacrificed. The instrument can be used at any ambient temperature as long as a number is displayed in the temperature window on the back of the instrument.

If no figure is visible, the unit is either too hot or too cold. Placed in the shirt pocket, the unit will come to operating temperature in a short time.

The higher the operating temperature, the more efficient the unit becomes. These higher temperatures minimize condensation and assure rapid reading. Also the unit becomes reusable in a shorter period of time. The temperature of the unit can be maintained by carrying it in the shirt pocket where temperature is about 36°C.

Tests on the Alco-Sensor III can be run every 15 seconds when no alcohol is encountered, and every 2 minutes when a positive reading is registered.

ACCURACY

With a good deep lung breath sample the Alco-Sensor III reading of blood alcohol concentration (BAC) should not vary more than minus 5% from a blood sample drawn at the same time and analyzed properly.

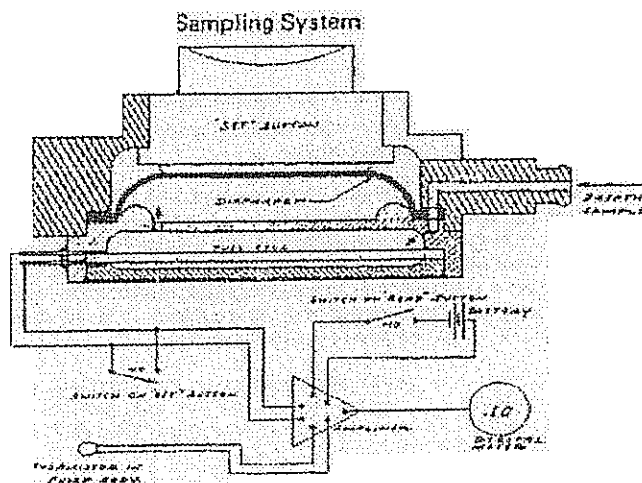
INTERFERRING SUBSTANCES

The Alco-Sensor III responds to alcohol which might be in the breath. However, it does not read acetone or hydrocarbons which might be found in the breath.

THEORY AND DESIGN OF THE ALCO-SENSOR III

GENERAL COMPONENTS

The Alco-Sensor III contains a fuel cell sensor and a spring-loaded diaphragm/sampling valve which, when released, draws a 1cc sample from the mouthpiece into the fuel cell for analysis. A signal is generated in the fuel cell in response to alcohol in the breath sample. An amplifier powered by the 9-volt alkaline battery, which has a 500+ test life, causes the result of the analysis to be displayed when the READ button is depressed.



The READ button operates in two stages. First, it releases the valve, taking a sample. Second, at the bottom of its travel, it switches the instrument "on" electrically.

The SET button cocks the valve when depressed all the way and also "shorts" the cell. This accelerates the destruction of any alcohol left on the cell so that the time delay between tests is minimized.

(CAUTION: To assure a correct result, no alcohol should be consumed within 15 minutes of a test, and the subject should not be allowed to smoke.)

With a clean mouthpiece mounted and the SET button depressed, ask the subject to blow as long as possible.

Using mouthpieces of other design than those supplied by the manufacturer may cause inaccurate readings by as much as 10-20%. For instance, whistling or overly restrictive mouthpieces can either draw room air into the breath sample or pressurize the system causing inaccurate readings.

FUEL CELL

The fuel cell is a plastic membrane coated with a thin layer of platinum black and an active chemical. (Field use indicates the cells generally have a life of 2-5 years.) When the READ button is depressed, the breath sample is drawn into the fuel cell. All the alcohol in the 1cc sample is immediately absorbed on the fuel cell and converted to acetic acid. The resulting electric current is measured and converted into a digitally displayed BAC reading.

DIGITAL DISPLAY

A BAC reading takes between 15 to 40 seconds to develop in the standard fuel cell unit. This reading will hold for a few moments before deteriorating. During this period the READ button can be released and reactivated without affecting the value. However, the SET button should not be depressed during this period, as it will destroy the accumulating reading.

If 888 is displayed the 9 volt alkaline battery is failing and needs replacing.

Units of Measure:

A digital result of .100 equates to:

- .100 grams of alcohol/100 mL of blood, or
- .100% Blood Alcohol Concentration (BAC), or
- .100 grams/210 liters of breath

CHECKING CELL READINESS

The Alco-Sensor III has an automatic zeroing feature. When the READ button is depressed completely and held for 5 to 10 seconds, the digital display should show .000.

If this does not occur, depress the SET button for a few moments and then check the instrument again.

CALIBRATION STANDARDS

Mini-Alco Can

ELEMENTS:

- A. Pressurized gas can. *Discard plastic collar from stem before use*
- B. Valve - Button activated flow control.

MAKEUP: Argon - Alcohol single phase gas mixture

CHARACTERISTICS:

- A. Ten test capacity.
- B. Twelve month shelf life.
- C. Expiration date is stamped on the label of the gas can.
- D. Gas value is effected by elevation variations. The gas value can be determined by consulting the chart that is included with the Mini-Alco Can instructions.

Dry Gas Standard

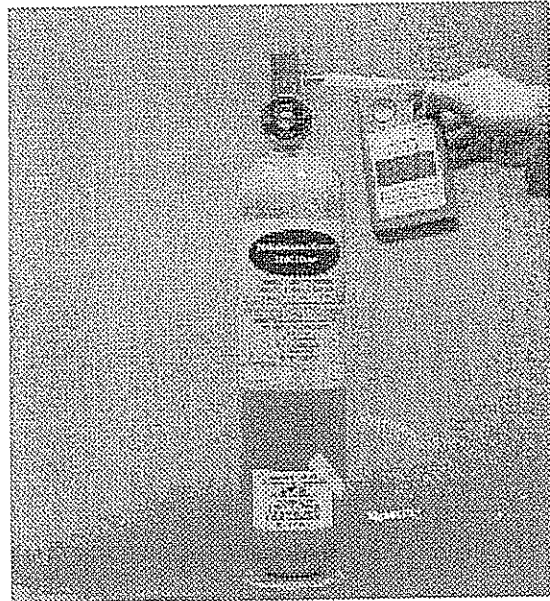
ELEMENTS:

- A. Pressurized approved dry gas tank.
- B. Small single staged approved regulator.

MAKEUP: NIST traceable tank contains a single-phased mixture of Nitrogen and Ethanol. (The concentrations available are .038% at sea level, and .082% at sea level and .100% at sea level).

CHARACTERISTICS:

- A. Flow rate of the regulator is 1.5 liters per minute.
- Used properly, a 105 liter tank should supply at least 500 samples.
- C. New tanks show approximately 1025 psi on the gauge. Follow instructions on the tanks to mount the regulator. When the regulator is initially mounted, depress the regulator control button and allow the gas to purge the valve for 10 seconds.
- D. Expiration date is stamped on the label of the dry gas standard.
- E. Tanks should only be used when they are between 10° - 40° C.
- F. If the tank has been maintained at temperatures below 0°C (32°F), see tank manufacturer's QAP for proper handling of the dry gas standard.



(Note: If you are using your dry gas standard in a number of locations, an optional device you may want to consider is the True-Cal Device. Variations in barometric pressure can affect the expected value of a pressurized dry gas standard, according to standard gas laws. The True-Cal device is designed to sense changes in barometric pressure and report an adjusted value for the dry gas standard. For additional information contact Intoximeters at 1-800-451-8639.)

Wet Bath Simulator (Standard)

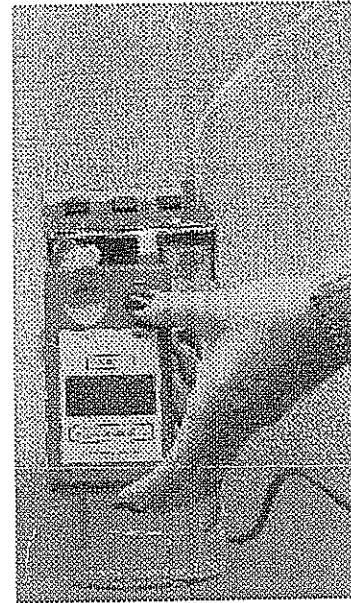
ELEMENTS:

- A. Glass jar which holds 500cc of solution.
- B. Jar head contains heater thermostat, stirrer, thermometer, inlet and outlet ports for sampling headspace gas standing above the solution.

MAKEUP: Solution is a water/alcohol mixture of a certified BrAC/BAC concentration.

CHARACTERISTICS:

- A. Follow solution manufacturer's recommendation for storage and use of solution. Studies have shown that after running 20 tests per bottle of solution, the solution value will be depleted by 2.4%.
- B. Liquid should be clear with no visible particles suspended in the solution.
- C. A simulator containing a solution of known BrAC/BAC value must be at the operating temperature of 34°C. The simulator top must be on securely so the system is airtight. To check, cover the outlet port and blow into the intake port. Air bubbles will not rise rapidly through the solution if the top is secure.



ACCURACY CHECK PROCEDURE

Before beginning have these items available: instrument, calibration standard, new mouthpiece

Using Mini-Alco Can

- 1. Remove plastic sleeve from top of Mini-Alco Can.
- 2. With a light back and forth motion, attach valve to stem on top of Mini-Alco can.
- 3. Attach short end of new mouthpiece to plastic nozzle on valve. (This will be called *MINI-ALCO ASSEMBLY* throughout the procedure).
- 4. Check temperature strip on back of Alco-Sensor III – any visible number verifies proper operating temperature.
- 5. Depress READ button, .000 should be seen for at least 5 to 10 seconds.
- 6. If .000 is not seen, depress SET button and recheck in one minute. (Follow Step 5 again. If .000 is still not seen for 5 to 10 seconds, contact **Intoximeters** at 1-800-451-8639. The unit must display .000 for 5 to 10 seconds before proceeding with the Accuracy Check).
- 7. Depress SET button on Alco-Sensor III.
- 8. Attach *MINI-ALCO ASSEMBLY* to the *ASIII*.
- 9. Observe the value marked on the Mini-Alco Can – this is the target value at sea level. (Note the elevation value on the chart).
- 10. Depress valve on Mini-Alco Can for 6 seconds. On the 4th to 5th second of the 6 second count, depress the READ button and hold it down. (*NOTE: The vapor must be flowing through the mouthpiece when the READ button is depressed*).
- 11. Release the valve on the Mini-Alco Can.
- 12. Remove the *MINI-ALCO ASSEMBLY* from the Alco-Sensor III and observe the reading until it becomes stable for 5 seconds.
- 13. The displayed result should be within $\pm .010$ of the value marked on the Mini-Alco Can.
- 14. If the reading does not meet the specified tolerance, the unit requires a calibration adjustment. (Follow instructions below – under CALIBRATION PROCEDURE).

Using Dry Gas Standard

- 1. Follow instructions on the dry gas standard to mount the regulator.
- 2. Purge regulator by depressing button/valve on regulator for approximately 3 to 4 seconds before running your first accuracy check of the day.
- 3. Attach new mouthpiece to the end of the regulator line – small plastic tubing.

4. Check temperature strip on back of Alco-Sensor III – any visible number verifies proper operating temperature.
5. Depress READ button, .000 should be seen for at least 5 to 10 seconds.
6. If .000 is not seen, depress SET button and recheck in one minute. (Follow Step 5 again. If .000 is still not seen for 5 to 10 seconds, contact **Intoximeters** at 1-800-451-8639. The unit must display .000 for 5 to 10 seconds before proceeding with the Accuracy Check).
7. Depress SET button on Alco-Sensor III.
8. Carefully attach Alco-Sensor III to mouthpiece assembly.
9. Observe the value marked on the Dry Gas Standard – this is the target value. (Note the elevation value on the chart).
10. Depress regulator control button for 6 seconds. On the 4th to 5th second of the 6 second count, depress the READ button and hold it down. (NOTE: The gas must be flowing through the mouthpiece when the READ button is depressed).
11. Release the regulator control button.
12. Carefully detach the mouthpiece assembly from the ASIHI and observe the reading until it becomes stable for 5 seconds.
13. The displayed result should be within $\pm .010$ of the value marked on the Dry Gas Standard.
14. If the reading does not meet the specified tolerance, the unit requires a calibration adjustment. (Follow instructions below – under CALIBRATION PROCEDURE).

Using Wet Bath Simulator (Standard):

1. Prepare Wet Bath simulator for use – a simulator containing a solution of known BrAC/BAC value must be at the operating temperature of 34°C.
2. Liquid should be clear with no visible particles suspended in the solution.
3. The simulator top must be on securely so the system is airtight. To check, cover the outlet port and blow into the intake port. Air bubbles will not rise rapidly through the solution if the top is secure.
4. Check temperature strip on back of Alco-Sensor III – any visible number verifies proper operating temperature.
5. Depress READ button, .000 should be seen for at least 5 to 10 seconds.
6. If .000 is not seen, depress SET button and recheck in one minute. (Follow Step 5 again. If .000 is still not seen for 5 to 10 seconds, contact **Intoximeters** at 1-800-451-8639. The unit must display .000 for 5 to 10 seconds before proceeding with the Accuracy Check).
7. Depress SET button on Alco-Sensor III.
8. Attach mouthpiece to Alco-Sensor III and then to simulator.
9. Observe the value of the solution – this is the target value.
10. Blow into the inlet port of the simulator for 6 seconds. On the 4th to 5th second of the 6 second count, depress the READ button and hold it down. (NOTE: The vapor must be flowing through the mouthpiece when the READ button is depressed).
11. Stop blowing into the inlet port of the simulator.
12. Carefully detach the ASIHI from the simulator and observe the reading until it becomes stable for 5 seconds.
13. The displayed result should be within $\pm .010$ of the value of the solution.
14. If the reading does not meet the specified tolerance, the unit requires a calibration adjustment. (Follow instructions below – under CALIBRATION PROCEDURE).

CALIBRATION PROCEDURE

When to Perform a Calibration

A calibration procedure should be performed when the result of an accuracy check indicates the unit does not read a standard within your testing program's specified acceptable tolerances.

Calibration Procedure

Before beginning have these items available: instrument, calibration standard, new mouthpiece, calibration screwdriver.

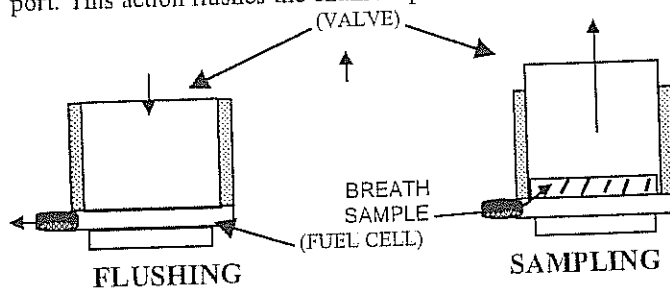
1. Observe **target value** of calibration standard you are using.
2. Insert screwdriver in calibration screw located in hole on right side of unit.
3. Turn screw two full turns **clockwise**.
4. Attach calibration assembly to Alco-Sensor III.
5. Depress valve on calibration standard for 6 seconds. (If you are using a Wet Bath Simulator & Solution as the calibration standard, you should blow into the inlet port of the simulator). On the 4th to 5th second of the 6 second count, press the READ button. (*NOTE: The gas/vapor must be flowing through the mouthpiece when the READ button is depressed*).
6. Carefully detach the Alco-Sensor III from the calibration assembly and insert the screwdriver in the calibration screw.
7. Observe the display on the ASIII. Once the reading has surpassed the target value of the calibration standard, immediately turn the calibration screw **counterclockwise** until the target value and the reading on the ASIII are the same. (If the reading on the ASIII again rises above the target value, the calibration screw should again be turned **counterclockwise** until the target value of the calibration standard and the reading on the ASIII are the same). **When the reading on the ASIII and the target value of the calibration standard are the same and remain constant for 5 seconds, the unit is calibrated.**

Note: After initially turning the calibration screw clockwise to begin the Calibration Procedure, under no circumstances should the calibration screw be turned clockwise to increase the number displayed on the ASIII. If during the first adjustment counterclockwise the reading on the ASIII is carried below the target value of the calibration standard, DO NOT bring the value up by turning the screw clockwise. Wait and see if the reading rises to the target value. If the reading surpasses the target value immediately turn the calibration screw counterclockwise until the target value of the calibration standard and the reading on the ASIII are the same. If not, repeat the calibration procedure.

8. Once you are satisfied with the reading displayed on the ASIII, depress the SET button.
9. It is essential to verify the calibration. Wait 3 minutes, then run an accuracy check using a new mouthpiece. (Follow the step by step procedures previously described in Accuracy Check Procedure). The reading should be within $\pm .003$ of the target value of the Calibration Standard. If it is not -- wait another three minutes and then repeat the Calibration Procedure followed by an Accuracy Check.

FLUSHING

Depressing the set button purges 1cc of air from the fuel cell chamber and out through the mouthpiece port. This action flushes the chamber prior to each test, but the cell surface may still retain alcohol.



If any residual alcohol is present in the system, a positive reading is displayed when the READ button is depressed and held down for 5 to 10 seconds.

CAUTION: Sufficient time must be allowed after each test for all traces of alcohol on the cell surface to be eliminated. This can be accelerated by locking the SET button down to short circuit the cell. If the Alco-Sensor III is ready to use, a .000 will be displayed continuously when the READ button is held down for 5 to 10 seconds.

Even when exposed to breath samples with high alcohol levels, a cell should clear within 2 minutes when the SET button is depressed and the unit is kept in the pocket.

FOR ACCURATE RESULTS, THE ABOVE PRECAUTIONS MUST BE OBSERVED OR CUMULATIVE READINGS WILL RESULT.

CONDUCTING A SUBJECT TEST

Standard Operating Instructions

1. Remove unit from box. Note temperature window on back of unit.

Liquid crystal reading of 20° to 40°C indicates the unit is in the operating temperature range.
2. Mount mouthpiece. (SET button must be depressed).
3. Press READ button and hold down for 5 to 10 seconds to verify unit is ready to use.

.000 displayed for 5 to 10 seconds indicates the instrument is clean and ready for sampling.
4. Depress SET button.

Cocks the sample valve and prepares unit for subject sample.
5. Instruct subject to blow steadily for as long as possible.
6. Push READ button *before* exhalation ceases (but not less than 3 seconds after blowing starts).
7. Keep READ button depressed until maximum reading is obtained (i.e. reading remains constant for three to five seconds).
8. Record the result.
9. Discard mouthpiece and depress SET button.

Preparing A Subject For A Screening Test

Please refer to the guidelines and procedures established by your Federal, State, county, and/or local jurisdictions when conducting any breath alcohol test protocols. In the event you are not governed by legislation, we offer the following suggestion for conducting a breath alcohol test.

Prior to Testing:

- Clear the subject's mouth of any foreign substances.
- Do not allow the subject taking the test to: **eat, drink, or use tobacco** products.
- Ask the subject if he/she has consumed any alcohol based products in the last 15 minutes.
 - If the subject responds "No", **Test immediately.****
 - If the subject reports "Yes", do not run a test, but observe the subject for at least 15 minutes. **Then Test.**

** If a zero tolerance reading of .010 is obtained, wait eight (8) minutes. **Then test.** On the other hand, if a DUI reading of .080 is obtained, wait (8) minutes. **Then test.**

In either case, if the second reading exceeds the legal limit, the Screening Test should be considered positive, as mouth alcohol, if present, dissipates dramatically in two minutes.

Performing a Subject Test

Before initiating a test, explain to the subject what you want him or her to do. *Example:* "When I tell you I want you to take a deep breath hold it for a moment then blow continuously through this mouthpiece until I tell you to stop." Clear and simple instruction will help the subject give you a good sample. With a clean mouthpiece mounted and the SET button depressed, ask the subject to blow as long as possible. The first portion of breath from the subject should be wasted off if quantifying a deep lung breath sample is the object of the test process. Sampling early will produce a low result since the alcohol content in tidal breath is less than the alcohol concentration in a deep lung breath sample. It will take about 3 to 5 seconds to empty the lungs through the mouthpiece. Toward the end of this period, while the subject is still blowing, the READ button should be depressed. The action of the valve will draw a sample of deep lung breath into the fuel cell from the passing breath stream.

NOTE: Using Mouthpieces Of Other Design Than Those Supplied By The Manufacturer May Cause Inaccurate Readings By As Much As 10-20%. For Instance, Whistling Or Overly Restrictive Mouthpieces Can Either Draw Room Air Into The Breath Sample Or Pressurize The System Causing Inaccurate Readings.

BATTERY REPLACEMENT

A 888 display indicates that the battery is not strong enough to support an accurate reading and needs replacing.

PROCEDURE:

- A. Slide battery door open.
- B. Remove old battery and disconnect.
- Connect new battery (use only 9-volt alkaline batteries) and replace.
- Close battery door.
- Check calibration of unit.

SMOKING

Under no circumstances should raw smoke be blown into the instrument. Cigarette and cigar smoke will shorten the life of the fuel cell and increase the cost of maintenance.

STORAGE

Storage in cold or moderately hot environments will not harm the Alco-Sensor III. Avoid extreme humidity or very dry storage areas for prolonged periods. The more extreme the storage temperature, the longer it will take to get the unit adjusted to proper temperature.

TO EXPEDITE CLEAN UP, HAVE THE SET BUTTON DEPRESSED WHEN INSTRUMENT IS NOT IN USE.

OTHER APPLICATIONS OF THE ALCO-SENSOR III

DETECTION OF ALCOHOL USING ACCESSORIES:

• Quick Draw – Passive Alcohol Adapter – This accessory easily attaches to your Alco-Sensor III and allows the instrument to perform a passive screening test to determine the presence of alcohol in the air surrounding a subject or an open container. (This adapter can also be used to sample an unconscious person).

FOR: Repairs
 Supplies
 Mouthpieces
 Batteries
 Calibration Equipment

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Intoximeters

World Leader in Breath Alcohol Testing for Over Fifty Years

April 29, 2003

To Whom It May Concern:

The Alco Sensor and Alco Sensor III are identical in their operation, and analysis of breath samples. The only remarkable difference in these units is the digital display. The Alco Sensor has a two (2) digit readout, the Alco Sensor III has a three (3) digit readout.



Donald F. Gault
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Cc: NCHIL1