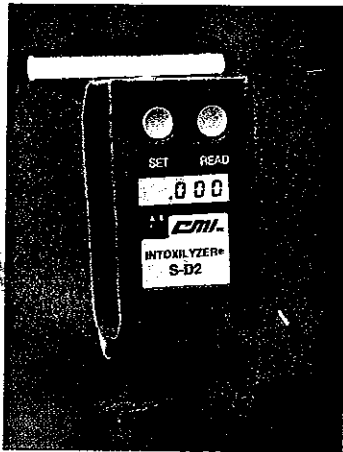


INTOXILYZER® S-D2

OPERATOR'S MANUAL



EMI INC.



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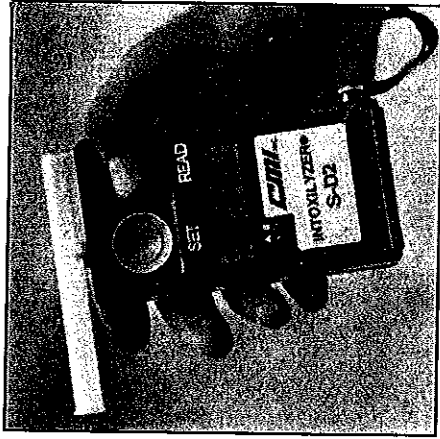


INTRODUCTION

The Intoxilyzer® S-D2 represents a well established concept in breath alcohol testing analysis. It is used worldwide in law enforcement, transportation and workplace safety applications. The S-D2 is just one of the range of instruments manufactured by CMI, Inc. for these purposes.

The Intoxilyzer® S-D2 is accurate and reliable, allowing a complete breath test procedure to be conducted in about one minute.

This manual describes the operation, maintenance, calibration check, and calibration adjustment of the S-D2. This manual should be read completely and fully understood by each operator prior to testing a subject. It is further recommended that operators practice the breath testing process before giving an actual "in the field" test.



PRINCIPLES OF OPERATION

The Intoxilyzer® S-D2 uses an electrochemical fuel cell, containing two platinum electrodes, to detect and measure the concentration of alcohol vapor in expired breath. When breath is drawn into this fuel cell, by means of the sampling system, a small voltage is generated in proportion to its breath alcohol concentration. This fuel cell is fed to an electronic amplifier and displayed on a digital meter (liquid crystal).

The S-D2 incorporates two breath sampling lights, controlled by an interlinked pressure switch and timer system. The sampling lights show the operator if the subject is blowing correctly, and when he has provided a suitable sample of breath for analysis.

The instrument is simple to operate and may be used as often as required, provided that a suitable delay is allowed between successive tests. This time delay allows the fuel cell to clear itself of alcohol and prevents the possibility of additive readings. If no alcohol is present in a test, a second test may be analyzed immediately, since the fuel cell voltage is already at zero. Unless the breath alcohol level of the subject is very high,

the instrument will generally be clear enough to receive and analyze the second sample in less than two minutes.

INSTRUMENT FEATURES

1) Mouthpiece

This is attached to the sampling port. For hygienic reasons, mouthpieces are supplied separately packed and are disposable. A new mouthpiece must be used for each breath test. This minimizes health concerns and prevents cross-sample alcohol contamination.

2) Sampling Port

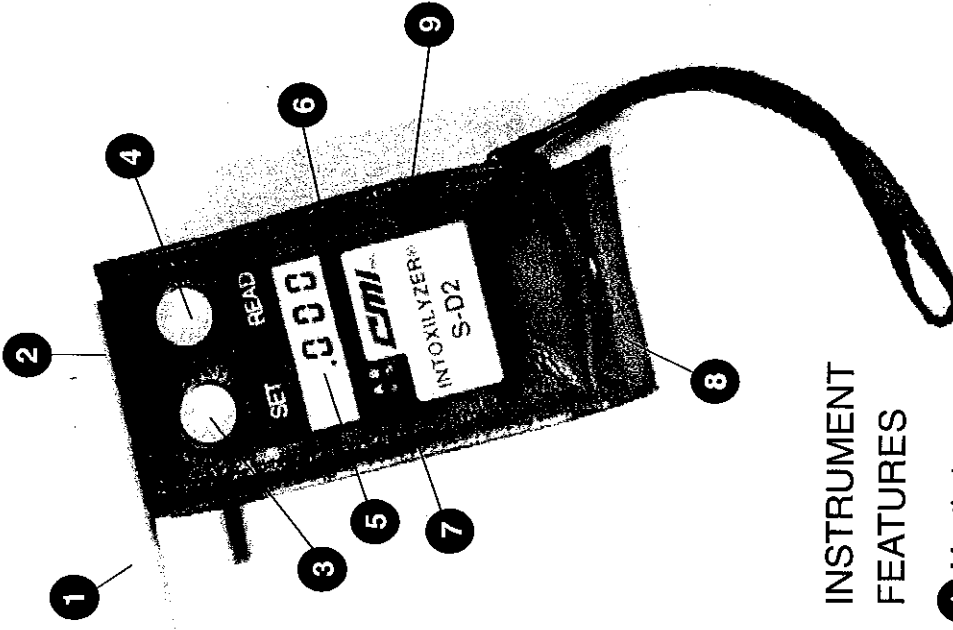
This forms the entrance to the fuel cell detector. When inserted into the small hole in the side of the mouthpiece, it allows a small portion of breath to be drawn into the instrument for analysis.

3) 'SET' Button

This button forms part of the sampling system. When fully depressed, the button locks to set the instrument ready for sampling. When the 'SET' button rises, the sample to be analyzed is drawn directly into the fuel cell detector.

4) 'READ' Button

This button has two functions:
 1) to release the 'SET' button and take the sample,
 2) to switch on the amplifier and display systems



INSTRUMENT FEATURES

- 1 Mouthpiece
- 2 Sampling Port
- 3 'SET' Button
- 4 'READ' Button
- 5 Alcohol Level Display
- 6 Calibration Control (on side)
- 7 Breath Sampling Lights
- 8 Battery (on bottom)
- 9 Leather Case

The **'READ'** button is spring loaded. Momentary depression will take the breath sample. Constant pressure is required to switch on the amplifier and display systems.

5) Alcohol Level Display

This three digit, liquid crystal display shows the breath alcohol concentration of the subject. The display has built-in illumination and is activated by depressing the **'READ'** button.

If the figure on the left shows **'L'** when the **'READ'** button is depressed, the battery needs to be replaced.

6) Calibration Control

This screw control, located on the right side of the case, is used for periodic calibration adjustments with either a dry gas standard or wet bath simulator.

7) Breath Sampling Lights

Light **'A'** illuminates to indicate that the subject is blowing *hard enough* to obtain a proper breath sample. Light **'B'** illuminates when the subject has blown *long enough* and indicates when the **'READ'** button should be pressed. In other words, light **'B'** illuminates when the subject has provided a suitable sample for breath analysis.

8) Battery

The battery is located directly behind the sliding base on the bottom of the S-D2. It powers the amplifier, digital display and sampling lights and

should be replaced when the letter **'L'** appears on the left side of the display.

9) Leather Case

The S-D2 is supplied in a leather protective case. The unit should be kept inside the case at all times, except when calibrating, changing the battery or during maintenance.



SUBJECT BREATH TEST

The operating sequence for testing a subject with the Intoxilyzer® S-D2 is simple, consisting of the following basic steps. These should be understood and followed to insure maximum efficiency of operation.

OPERATION CHECK LIST

1. Ready Check
2. Set
3. Attach Mouthpiece
4. Instruct the Subject
5. Take Sample
6. Observe Reading
7. Remove and Discard Mouthpiece
8. Reset and Wait

AMBIENT TEMPERATURE

The Intoxilyzer® S-D2 is designed primarily for use in the 32-104° degrees Fahrenheit (0-40° Celsius) temperature range. Keeping the instrument within this range insures minimum condensation of alcohol and water from the

breath and permits both accurate and rapid breath alcohol measurements.

It is recommended that in very cold weather the instrument is stored in a pocket (preferably inside a coat) and returned there after use.

PRELIMINARY

Ask the subject when he/she last took anything by mouth. Some foods and even "non-alcoholic" drinks may contain traces of alcohol, which the subject may later claim affected the result of the test through a "mouth alcohol" effect. To prevent this, wherever possible, insure that a delay of about 20 minutes has elapsed since the subject took anything by mouth—even medicines which may contain alcohol.

Do not even allow the subject a glass of water prior to the test since this will cool the mouth and dilute the saliva, temporarily reducing the amount of alcohol in the breath, and, consequently, the instrument reading.

Insure that no radio transmitter is currently being used in the immediate vicinity of the test.

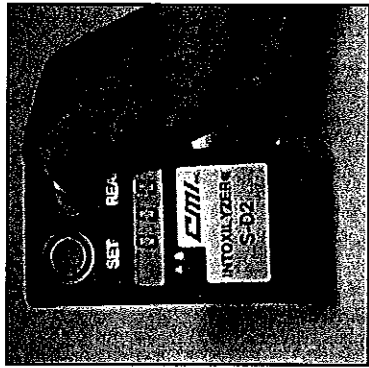
DETAILED PROCEDURE

This section describes in detail how the Intoxilyzer® S-D2 is used in a breath test and examines what is actually happening at each stage of the operation. These instructions are also given in the form of a checklist on the card which accompanies the instrument as well as in the "Introduction" section of this operator's manual.

1) READY CHECK

The instrument should first be checked to insure it is ready to receive a sample. This is accomplished by

checking to insure the fuel cell is discharged and free of alcohol from any previous sample. Elimination of alcohol from the fuel cell should take no longer than two minutes—except in unusual cases—depending on how much alcohol was actually present in the last sample.

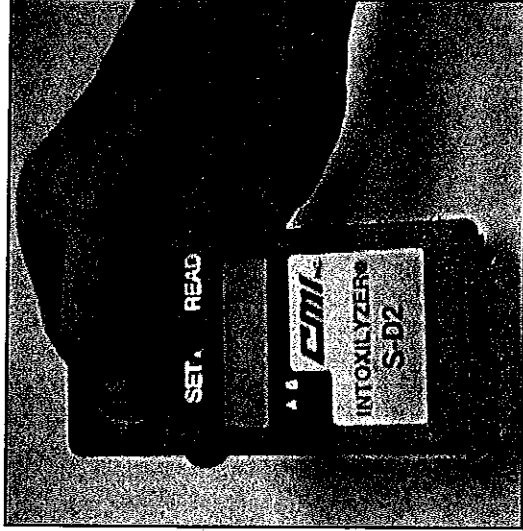


To complete the **READY CHECK**, depress the 'READ' button for at least ten seconds.

To conduct a **READY CHECK**, depress the 'READ' button and hold it down for at least ten seconds. This will release the 'SET' button and switch on the amplifier and display circuits. Observe the display; it should not exceed .002 after ten seconds. If the display does not show .002 or less during the ten second **READY CHECK**, the fuel cell may have traces of residual alcohol from a previous sample. If this occurs after a previous test, depress the 'SET' button to lock and wait one minute before repeating the **READY CHECK**. If the left digit shows 'L', replace the battery.

2) SET

Once the **READY CHECK** is complete, the sampling system must now be **SET** to prepare it to draw a breath sample into the fuel cell for analysis. Press down the 'SET' button until it locks. This pushes down the diaphragm and holds it against a spring-loaded catch. This action also places a short-circuit across the fuel cell, which accelerates its inter-sample recovery time.

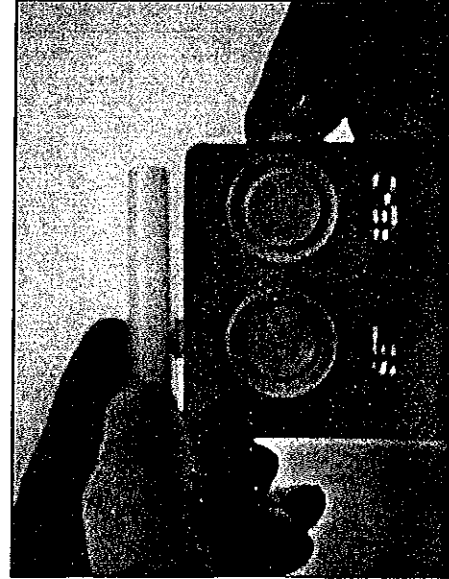


Press the 'SET' button until it locks.

3) ATTACH MOUTHPIECE

Attach a mouthpiece to the sampling port on the top of the S-D2. This sampling port forms the entrance to the fuel cell and pressure switch and it is essential that the mouthpiece is pushed fully onto it.

The subject must be offered the wide-bore, lipped end of the mouthpiece to blow through. If the subject blows into the other end, the pressure switch will not be activated and the sampling lights will not operate. The instrument



Firmly attach a new mouthpiece to the sampling port.

is now ready to receive a breath sample from the subject for analysis.

A WORD ABOUT MOUTHPIECES...

The S-D2's sampling port is designed specifically for the particular S-D2 mouthpieces sold by CMI, Inc. It is strongly recommended that mouthpieces for the S-D2 be ordered from CMI at 1-800-835-0690.

4) INSTRUCT THE SUBJECT

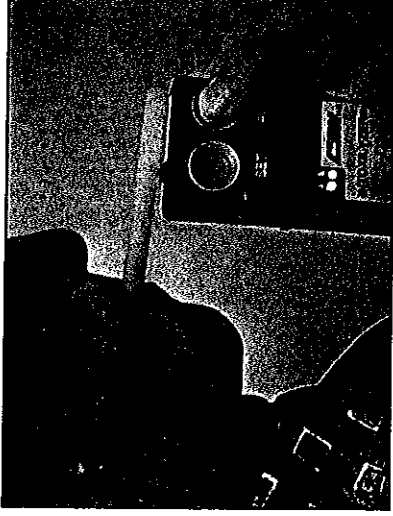
Instruct the subject exactly what must occur to provide a suitable sample of breath for analysis. Tell the subject to take a deep breath, blow strong enough to bring on light 'A' and keep blowing at that pressure long enough to bring on light 'B'. The subject must then continue blowing until told to stop and you have taken the sample by pressing the 'READ' button. Warn the subject that if both sampling lights fail to come on, there will not be a suitable sample of breath for analysis.

If the subject blows too hard then he/she may run out of breath before the 'B' light comes on: just a *moderate* breath flow rate is required.

Finally, the subject should keep hands away from the instrument. If the subject clasps it, your view of the sampling lights or your operation of the sampling mechanism could be obstructed.

5) TAKE SAMPLE

Tell the subject to take a deep breath and blow through the wide-bore, lipped end of the mouthpiece. The subject must blow strongly enough to bring on sampling light 'A' and then continue to blow at this pressure until the 'B' light is activated. At this point, the subject will have expelled top lung air so that deep lung air is now being blown



The subject blows until light 'B' is activated. The operator then pushes the 'READ' button.

through the mouthpiece. Press the 'READ' button to release the catch holding down the 'SET' button, allowing it to rise. This pulls up the diaphragm, drawing a small portion of breath from the mouthpiece directly into the fuel cell detector.

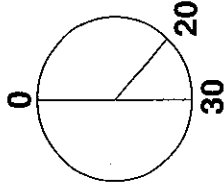
It is imperative that the subject is still blowing when the sample is taken. Both sampling lights must be on when the sample is taken. The subject must, therefore, continue blowing until told to stop. If the subject stops blowing prematurely, the sampling lights will go out.

6) OBSERVE DISPLAY

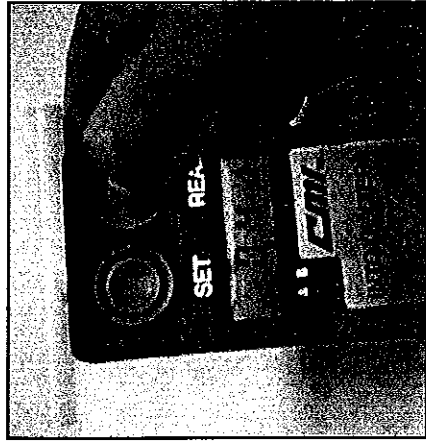
Withdraw the instrument from the subject and continue to hold down the 'READ' button. The fuel cell now develops its signal, which takes about 30 seconds to complete from the time of sampling. The maximum sample reached is a measure of the amount of alcohol in the breath sample.

As the fuel cell charges, it will cause the display reading to rise. The final value will be displayed after 20-30 seconds and is the alcohol concentration of the subject.

If the 'READ' button is accidentally released during this time, the fuel cell signal will not be affected as long as the 'SET' button is not depressed. Simply re-press the



The fuel cell will take 20-30 seconds to reach its maximum voltage and produce a final reading.



'READ' button within the 30 second signal development time to continue reading the alcohol level on the digital display.

It is important that the 'SET' button is not touched during the reading development time. This would flush the alcohol from the cell and partly discharge its voltage and reduce the alcohol level.

7) DISCARD MOUTHPIECE

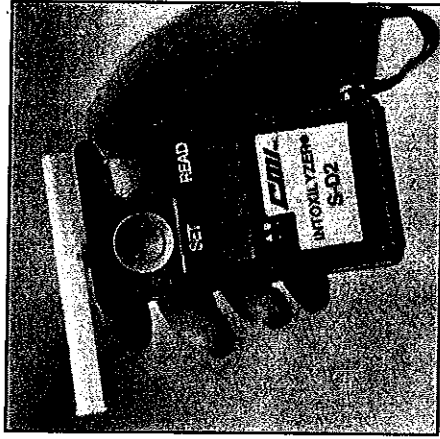
Having completed the test and observed the alcohol reading, you should now remove and discard the mouthpiece. Never use the same mouthpiece for subsequent tests, on either the same or different subjects.

8) RESET AND WAIT

The instrument must now be RESET so it will be ready for another test. This RESET is done by depressing the 'SET' button until it locks. This flushes out the fuel cell and short-circuits its electrodes, allowing its voltage to return more quickly to zero.

If the display shows .003 or higher as a result of the test, it may take several minutes before a satisfactory READY CHECK can be obtained before re-use of the S-D2.

CALIBRATION REQUIREMENTS: USE OF THE DRY GAS STANDARD



The Intoxilyzer® S-D2 uses an electrochemical fuel cell to detect and measure the concentration of alcohol in expired breath. The sensitivity of the instrument changes slowly with time, due to aging of the platinum electrode within the fuel cell. This change in sensitivity is very slight and calibration will not normally change significantly over a six month or longer period.

Monthly calibration checks are recommended to determine when calibration adjustment is needed.

Either a dry gas standard or wet-bath simulator may be used to generate the standard alcohol vapor required.

THE ALCOHOL STANDARD

Calibration checks and adjustments can be conveniently done using a dry gas standard. This consists of a mixture of alcohol in air or nitrogen.

The quantity of alcohol in the gas is accurately known and is shown on the label. Therefore, when

the instrument is calibrated using a dry gas standard, subsequent breath tests will indicate the subject's blood alcohol concentration (BAC).

Dry gas standards are supplied in one of three ranges, each range based around a legal limit which is in wide use: .045% BAC, .085% BAC and .105% BAC.

THE GAS STANDARD

The gas canister is a high-pressure, disposable cylinder fitted with a regulator. It contains enough gas for approximately 300 calibration checks or adjustments.

The label on each cylinder is marked with an expiration date. The gas should not be used after that time due to deviation of alcohol concentration of the gas mixture outside the analytical specifications of the instrument. The value shown on the label is within 2% of the true value of the gas mixture.

When the cylinder is empty or time-expired, the regulator can be safely unscrewed from the cylinder and retained for use with a new cylinder. The old cylinder can then be disposed or recycled.

USING A DRY GAS STANDARD AT HIGH ALTITUDE

The concentration of alcohol in the dry gas standard is calculated and carefully controlled to give the correct vapor concentration when the cylinder is used at sea level at normal atmospheric pressure. At lower atmospheric pressures, the concentration of alcohol in the vapor leaving the cylinder will be less. The change in alcohol concentration due to normal atmospheric pressure changes at sea level is so small as to be negligible, but if the dry gas standard was used at a high altitude, significant errors would result if suitable corrections were not made.

It should be emphasized that the sensitivity of the S-D2

ALTITUDE CORRECTION CHART

Elevation from Sea Level	Correction Factor
0	1.000
500	.981
1000	.962
1500	.943
2000	.925
2500	.907
3000	.889
3500	.872
4000	.854
4500	.837
5000	.820
5500	.804
6000	.787
6500	.771
7000	.755
7500	.740
8000	.724

itself to alcohol is **not** affected by changes in atmospheric pressure; it is only the concentration of the alcohol in the vapor from the dry gas standard that is affected.

The Altitude Correction Chart on the preceding page gives the correction factors which should be applied to the stated dry gas value when calibration checks or adjustments are made at various altitudes above sea level.

Correction factor sample:

Suppose the dry gas standard you are using has a value of .045% BAC at sea level, but it is being used at an altitude of 500 feet.

Using the chart on page 16, the correction factor would be (0.981). Therefore, the corrected value of the dry gas standard would now be (.045 x .981 = .044% BAC).

USE OF A WET BATH SIMULATOR

If required, a wet bath simulator can be used instead of a dry gas standard to perform calibration checks and adjustments on the S-D2.

A wet bath simulator should be used according to its own instructions. Pay particular attention to the alcoholic strength and temperature of the solution used.

A mouthpiece should be attached to the simulator outlet for direct attachment to the sampling port on the instrument. A flow rate of air of about 1.5-2 liters per second should be used. Any higher rate may result in the formation of an aerosol and lead to excessive cooling of the solution itself.

The simulator vapor must be allowed to pass through the mouthpiece for at least ten seconds before the sample is taken for analysis.



CALIBRATION CHECK PROCEDURE

The calibration check procedure insures that the Intoxilyzer® S-D2 is reading alcohol levels correctly and alerts the operator that a calibration adjustment is needed.

CALIBRATION CHECK CHECKLIST

1. Ready Check
2. Set
3. Sample the Standard
4. Read the Display
5. Reset and Wait

DETAILED PROCEDURE

It is recommended that a calibration check be performed at least once every month.

To insure that the instrument's fuel cell is at its optimum sensitivity, there should be no breath tests done on the unit in the previous ten minutes before a calibration check is done.

1) READY CHECK

This insures that the instrument is ready to take a sample of the dry gas standard and tests whether the fuel cell is completely discharged and free of alcohol from a previous sample. It also insures that the battery has sufficient power to drive the electronic circuitry.

Press the '**READ**' button and hold down for at least ten seconds. This will release the '**SET**' button and activate the electronics. During these ten seconds, the display should not read more than **.002**. A higher reading shows that alcohol may still be present in the fuel cell. If this occurs, depress the '**SET**' button to lock, wait one minute and repeat the ten-second **READY CHECK**.

If the letter '**L**' is displayed, replace the unit's battery.

2) SET

Assuming the **READY CHECK** has been completed, depress the '**SET**' button to lock. This prepares the instrument to sample the dry gas standard.

3) SAMPLE THE DRY GAS STANDARD

Follow the procedure below to sample the standard:

- a) Use a new mouthpiece and attach its lipped end to the outlet on the regulator button.
- b) Insert the S-D2's sampling port into the hole on the mouthpiece.
- c) Hold the instrument with your thumb near the '**READ**' button.
- d) Depress the regulator button so that gas begins flowing through the mouthpiece.
- e) After about five seconds of continuous gas flow, **AND WHILE GAS IS STILL**

FLOWING, press the '**READ**' button which draws a sample of gas into the unit.

Continue to hold down the '**READ**' button.
f) When the sample has been taken, release the regulator button to stop the gas flow.

IT IS ESSENTIAL THAT THE GAS IS STILL FLOWING WHEN THE 'READ' BUTTON IS PUSHED.

4) READ THE DISPLAY

Disconnect the instrument from the mouthpiece—continuing to hold down the '**READ**' button—and observe the display. The value shown on the S-D2 should rise steadily and then stop, about 20-30 seconds from the time the sample was initially "taken".

If the final reading is within $\pm 0.005\%$ BAC of the known value of the gas standard, the instrument is calibrated properly and no adjustments are needed.

If the maximum reading displayed shows a deviation from the value of the standard, then calibration adjustment is required, which is outlined in the next section.

5) RESET AND WAIT

After the final alcohol reading is noted, depress the '**SET**' button to lock. This allows the fuel cell to clear itself of alcohol before using the instrument for more tests. This will take approximately two minutes.



CALIBRATION ADJUSTMENT

Calibration adjustment is required when a calibration check indicates the S-D2 has deviated from a known standard of alcohol vapor.

Adjusting the S-D2's calibration compensates for any change in sensitivity of the fuel cell detector over a period of time. Calibration adjustment should not normally be required more than two or three times per year.

It is very important that this section be read and understood completely before attempting to recalibrate the S-D2.

THE CALIBRATION CONTROL

Calibration is done by using the small screw adjustment located on the right side of the instrument. It is accessed through a hole in the S-D2's outer case. Turning the control clockwise decreases the reading on the alcohol level display in response to the sampling of the gas standard.

THE DRY GAS CALIBRATION VALUE

Since the fuel cell detector responds linearly to the concentration of alcohol vapor in the standard, the actual value of the dry gas standard used for calibration is not important, provided that the instrument is actually calibrated to this value.

CALIBRATION ADJUSTMENT CHECKLIST

1. Preliminary
2. Ready Check
3. Set
4. Sample the Dry Gas Standard
5. Adjust the Display to the Value of the Dry Gas Standard
6. Reset and Wait

DETAILED PROCEDURE

The calibration adjustment process assumes three conditions:

- The instrument has not analyzed more than two samples containing alcohol within the previous hour or any sample within the previous ten minutes.
- The instrument is in its normal operating temperature range, and
- The battery does not need replacement.

1) PRELIMINARY

The instrument must first be removed from its protective leather pouch. Remove the wrist strap by detaching the split ring from the metal pillar. Then, insert the screwdriver included with the S-D2 into the hole in the pouch and ease the leather upwards taking care to prevent the pillar from catching on the pouch. At the same time, push the instrument upwards from the bottom of the pouch, easing the pillar under the edges of the hole.

2) READY CHECK

This insures that the instrument is ready to take a sample of the dry gas standard and tests whether the fuel cell is completely discharged and free of alcohol from a previous sample. It also insures that the battery has sufficient power to drive the electronic circuitry.

Press the **'READ'** button and hold down for at least ten seconds. This will release the **'SET'** button and activate the electronics. During these ten seconds, the display should not read more than **.002**. A higher reading shows that alcohol may still be present in the fuel cell. If this occurs, depress the **'SET'** button to lock, wait one minute and repeat the ten-second **READY CHECK**.

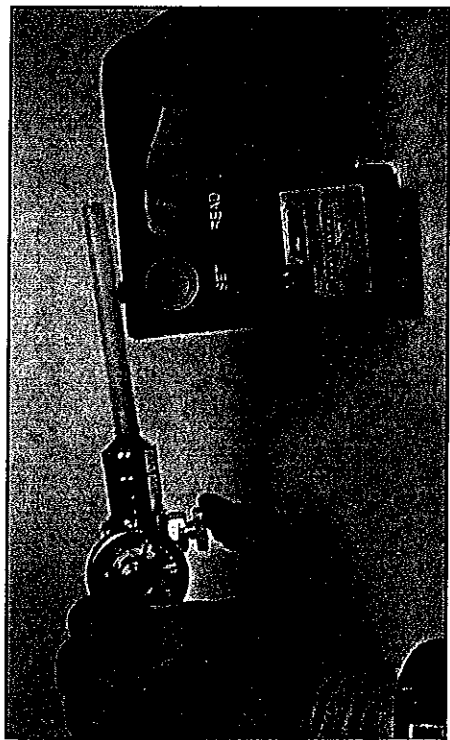
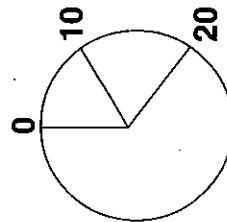
If the letter **'L'** is displayed, replace the unit's battery.

3) SET

Assuming the **READY CHECK** has been completed, depress the **'SET'** button to lock. This prepares the instrument to sample the dry gas standard.



Perform a **READY CHECK** and then **SET** the instrument.



Sample the dry gas standard.

4) SAMPLE THE DRY GAS STANDARD

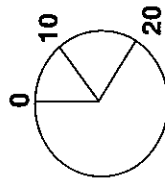
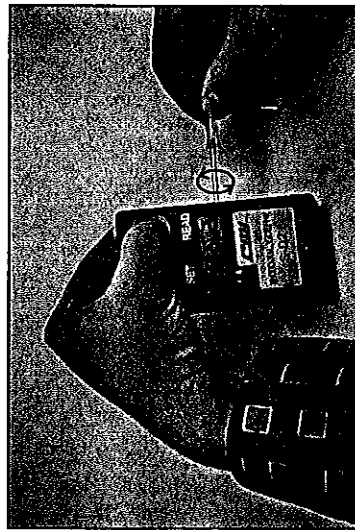
Follow the procedure below to sample the standard:

- a) Use a new mouthpiece and attach its lipped end to the outlet on the regulator button.
- b) Insert the S-D2's sampling port into the hole on the mouthpiece.
- c) Hold the instrument with your thumb near the **'READ'** button.
- d) Depress the regulator button so that gas begins flowing through the mouthpiece.
- e) After about five seconds of continuous gas flow, **AND WHILE GAS IS STILL FLOWING**, press the **'READ'** button which draws a sample of gas into the unit. Continue to hold down the **'READ'** button.
- f) When the sample has been taken, release the regulator button to stop the gas flow.

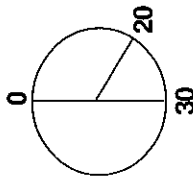
IT IS ESSENTIAL THAT THE GAS IS STILL FLOWING WHEN THE 'READ' BUTTON IS PUSHED.

5) ADJUST THE DISPLAY TO THE VALUE OF THE DRY GAS STANDARD

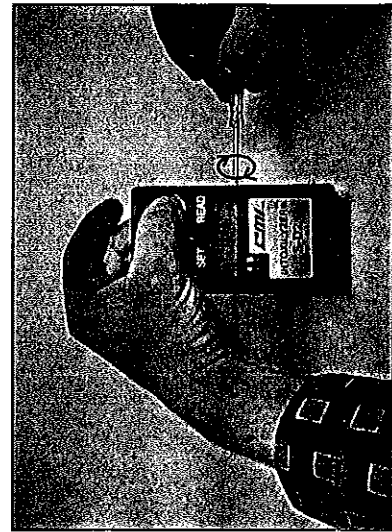
Continue to hold down the 'READ' button and turn the calibration control screw on the right side of the S-D2 counter-clockwise until, after about ten seconds, the display reading exceeds the value of the dry gas standard. As the display rises still further, due to continued charging of the fuel cell, turn the control clockwise to maintain the display at the dry gas standard value. As the fuel cell reaches its peak voltage, the control will require no further adjusting. The instrument is now calibrated. Do not turn the control to increase the reading once the display (fuel cell voltage) has passed its peak reading.



Adjust the display slightly counter-clockwise to exceed the dry gas standard value.



Turn the screw slightly clockwise to hold the display at the dry gas standard value.



If the display reading cannot be brought up to the dry gas standard value, the fuel cell has reached the end of its life and should be replaced. See the next section for more information.

6) RESET AND WAIT

After the final alcohol reading is noted, depress the 'SET' button to lock. This allows the fuel cell to clear itself of alcohol before using the instrument for more tests. This will take approximately two minutes.

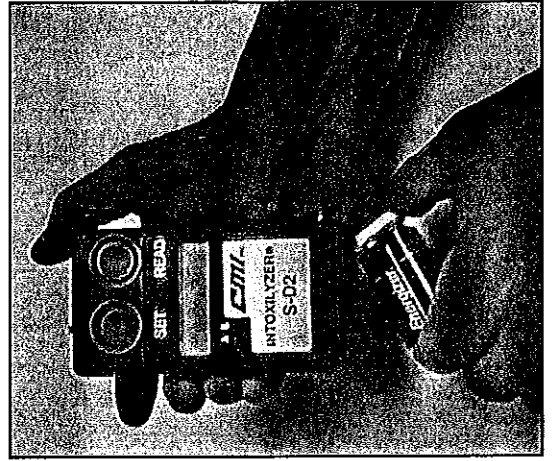


ROUTINE FIELD SERVICE CHECKS

Although the calibration check procedure shows whether the instrument reads the dry gas standard correctly, performing the following checks at monthly intervals will insure that your S-D2 is in proper working order with regard to its other functional systems.

BATTERY CHECK AND REPLACEMENT

If, when the 'READ' button is depressed fully down, the left digit on the display shows the letter 'L', then the battery is low in voltage and must be replaced. The battery compartment is at the base of the instrument,



Insure that the new 9-volt battery is correctly connected to the contacts.

which must be removed from its protective pouch to change its battery. The S-D2 requires one 9-volt battery. First, remove the wrist strap by detaching the split ring from the metal pillar. Then, insert the screwdriver included with the S-D2 into the hole in the pouch and ease the leather upwards as to prevent the pillar from catching on the pouch. At the same time, push the instrument upwards from the bottom of the pouch, easing the pillar under the edges of the hole. Access to the battery is obtained by sliding away the cover at the base of the instrument. When replacing the battery, be sure to separate the contact carefully and insure that the replacement battery is securely connected and fitted inside its compartment inside the instrument. After the battery is in place, the cover and protective pouch can be reinstalled.

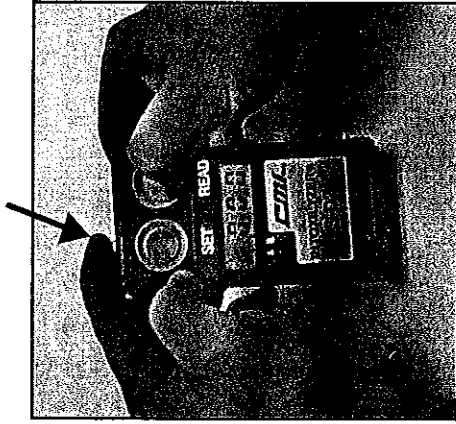
SAMPLING SYSTEM CHECK

A simple routine check on the operating efficiency of the sampling system may be done by the following steps:

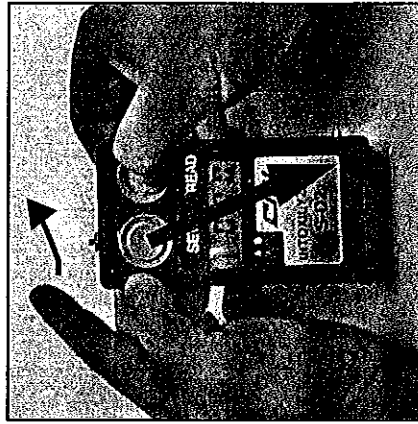
- a) Press the 'SET' button to lock in the down position and place a forefinger tightly over the sampling port forming an airtight seal.
- b) Press the 'READ' button fully down and observe the 'SET' button. It should not rise since air cannot be drawn into the system. If the 'SET' button DOES rise at this time, then there is probably a leak in the system, and a qualified technician should be consulted. Remove your finger from the sampling port and the 'SET' button should immediately rise. If the 'SET' button rises slowly after you remove your finger from the sampling port, the sampling system may be blocked, and the instrument should be returned to a qualified technician.

DO NOT, FOR ANY REASON, COVER THE SAMPLING PORT AND FORCE DOWN THE 'SET' BUTTON FROM

ITS UP POSITION. THIS WOULD RUPTURE THE SAMPLING DIAPHRAGM OR FUEL CELL ELECTRODE AND NECESSITATE THE REPLACEMENT OF EITHER OR BOTH OF THESE PARTS.



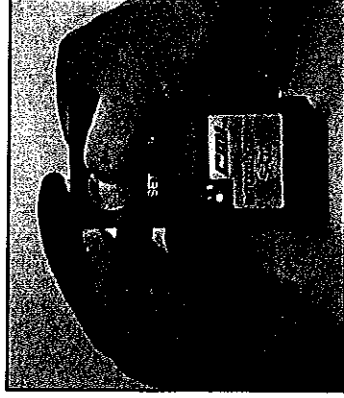
Check the S-D2's sampling system by 1) pressing the 'SET' button to the locked position and placing a forefinger over the sampling port. 2) Press the 'READ' button down and observe the 'SET' button, which should not rise.



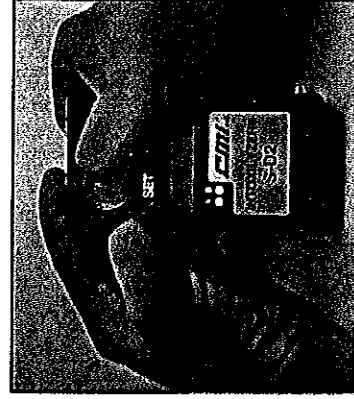
BREATH SAMPLING LIGHT CHECK

This procedure checks the operation of the breath pressure switch and the timing and operation of the breath sampling lights:

- a) Insure that the 'SET' button is in the locked down position.
- b) Place a forefinger over the sampling port and apply continuous pressure to the 'SET' button. This should activate the pressure switch and cause sampling light 'A' to illuminate, followed by light 'B' approximately 2½ seconds later.



Check the S-D2's sampling lights by 1) locking the 'SET' button, and then 2) placing a forefinger over the sampling port and applying continuous pressure to the 'SET' button. The 'A' light should activate, followed about 2½ seconds later by the 'B' light.



TEST FUEL CELL SWITCH

When an alcohol sample has been taken, the reading is cleared from the display and fuel cell recovery is accelerated by depressing the 'SET' button. This short circuits the fuel cell electrodes and accelerates its discharge; immediate discharge is not generally possible since alcohol will still be present on the electrode surface.

To test and insure that this circuiting switch is working properly, the following procedure should be done:

- Take a sample of dry gas standard into the S-D2.
- Hold down the 'READ' button and observe the display as it starts to increase to the standard value. While still holding down the 'READ' button, press the 'SET' button fully down—you will be holding both buttons down at the same time. This should cause the display to reset to .000.
- Allow the instrument to clear before using for further breath tests.

If the fuel cell reset switch test fails, the instrument should be returned to an authorized agent for inspection and repair.

FUEL CELL REPLACEMENT

When the fuel cell has reached the end of its working life, as seen by the inability to calibrate the instrument (see previous section), the complete instrument should be returned to the manufacturer for a replacement fuel cell to be fitted.



POINTS TO REMEMBER

The following information, if applied to the operation of your S-D2, will help prevent any problems.

TEST PROCEDURES

Learn the operating sequence thoroughly, and with a little practice, you will soon be completing tests in a little more than one minute:

- Ready Check
- Set
- Attach Mouthpiece
- Instruct the Subject
- Take Sample
- Observe Display
- Discard Mouthpiece
- Reset and Wait

READY CHECK

Each breath test must be preceded by a satisfactory READY CHECK.

MOUTH ALCOHOL

Twenty (20) minutes should pass between the

consumption of alcohol and a breath test using the S-D2. This period allows for any "mouth alcohol" to be dispersed.

MOUTHPIECE

Use a new mouthpiece for every test and insure that the subject blows through the lipped edge, wide-bored end. It is strongly recommended that only mouthpieces from CMI, Inc. be used.

SMOKING

Smoking just prior to a breath test will not influence the result, but tobacco smoke should not be blown through a mouthpiece attached to the instrument. Tobacco smoke could damage the fuel cell.

FOOD AND DRINK

Do not allow the subject to eat or drink before a breath test. Although this will not generally affect the result of the analysis, certain cough drops may contain alcohol. A subject could later claim that the coffee to calm his nerves was laced with something stronger causing a high blood alcohol concentration.

STORAGE BETWEEN TESTS

Always store the S-D2 with the 'SET' button down. This will keep the cell discharged so that the instrument is always ready for a breath test, provided that a satisfactory READY CHECK was obtained prior to taking the sample.

Avoid storing the unit in temperature extremes.

RADIO TRANSMITTERS

Do not use the S-D2 in close proximity to radio transmitters while they are transmitting.

PHYSICAL SHOCK

The S-D2 is rugged and reliable but should be treated with respect. Normal physical shock encountered in the field will be no problem, but a hard jolt like a drop on the floor or ground could be damaging. If you suspect that a drop may have damaged the unit, perform a calibration check.





INTOXILYZER® S-D2 SPECIFICATIONS

MODEL:	Intoxilyzer® S-D2
DETECTOR:	Electrochemical fuel cell sensor
SPECIFICITY:	Alcohol detector is unaffected by acetone, paint and glue fumes, foods, confectionery, methane and practically any other substance likely to be found in breath (apart from those which contain alcohol).
ACCURACY:	Better than ±5% around the calibrated level of a known alcohol standard.
BREATH SAMPLING:	Aspirating sample system with subject blowing through disposable mouthpiece.
DISPLAY:	Illuminated three-digit liquid crystal display giving direct alcohol level readout.

ANALYSIS TIME: Approximately one minute per test.

CALIBRATION: With dry gas standard or "wet bath" simulator.

RECOMMENDED OPERATING TEMPERATURE: 32-104° degrees Fahrenheit (0-40° Celsius).

POWER SUPPLY: 9-volt battery with sufficient power for at least 500 tests.

DIMENSIONS: 2¾" wide x 1½" deep x 5" high (in pouch).

WEIGHT: 7½ ounces (including pouch and battery).

WARRANTY: 12 month warranty, excludes damage caused by mishandling or improper use. Please consult CMI, Inc. or your local agent for full details of the warranty.