

INSTRUCTION & OPERATION MANUAL



Leakfinder[®]

Model No. WV622N-VWKIT

Diagnostic Smoke[®] Machine
with Integrated Nitrogen Generator
and non-contaminating UltraTraceUV[®] Tracer Dye Solution



Caution and Usage Tips



- ALWAYS USE *Leakfinder*® WITH VEHICLE ENGINE TURNED OFF.
- DISCONNECT *Leakfinder*® from the vehicle prior to starting the engine or prior to running any on-board monitor, including the DMTL or LDP. Damage caused by not following proper operating procedures will not be covered by the vehicle warranty or the *Leakfinder*® warranty.
- Use this equipment in the manner specified by the manufacturer.
- Follow common sense safety precautions.
- Use UltraTraceUV® Smoke Solution Part No. WV0712UV in *Leakfinder*®. Using a non-approved solution; may cause damage to vehicles being tested; may cause personal injury and may void vehicle and equipment warranties.
- Do not leave *Leakfinder*® hose connected to the vehicle's EVAP system if tests are not being performed. Natural vacuum or pressure created by the fuel in the fuel tank can damage the *Leakfinder*® pressure gauge if it exceeds the pressure limitations of the gauge.
- Do not perform test near source of spark or ignition.
- Wear appropriate eye protection.
- Wear yellow glasses supplied when using ultraviolet light.
- Air pressure supplied to *Leakfinder*® can be between 3.4 to 17 bar (50 ~ 250PSIG).
- When using alternate source of UV light, use light that includes 405 nanometer (nm) UV light range and wear yellow glasses.
- When operating *Leakfinder*® in near freezing temperatures, cycle the operation of *Leakfinder*® 20 seconds <ON> and 20 seconds <OFF> for approximately the first minute of operation. This will allow *Leakfinder*® to reach optimum operating temperature.
- When testing an engine's intake or exhaust system for leaks, it is best if the engine is cold. Small leaks may be sealed due to thermal expansion.
- Be sure supply hose is completely unwound when using *Leakfinder*® or excessive amounts of smoke vapor will condense inside the hose.



Please note: It is essential that you maintain a proper filtration system for the compressed air being supplied to the *Leakfinder*®. Excessive moisture or oil in the air supplied to the *Leakfinder*® can contaminate its integrated nitrogen generator and voiding its warranty. Proper filtration will insure many years of trouble-free operation.

NOTE: If your compressed air system operates using an automatic air line oiler; it must be removed from the air supply feeding the *Leakfinder*®, or it will damage the nitrogen generator.

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Thank You and Congratulations! Your Leakfinder® WV622N-VWKIT Evaporative Emissions System Tester (EEST) & Smoke Machine is approved for Evaporative Emissions System (EVAP) leak-testing for both gasoline and ethanol vehicles.

Your tester incorporates STAR Diagnostic Smoke® Technology, *inside*. It is the simplest and quickest way to find many vehicle system leaks. Smoke vapor-generating leak detectors containing STAR Technology *inside* are the only leak detectors in the world approved by automakers (OEMs) for EVAP and other system testing.

The patented technology *inside* your Leakfinder®, including the vapor-producing solution (UltraTraceUV®), was designed in collaboration with major OEMs, in order to establish a standard for leak detection. It is designed to be safe for vehicle systems and will not void factory warranties.

It is also the only smoke technology in the world that meets SAE INTERNATIONAL Published Papers' safety standards recommendation to use a smoke tester designed to function with an inert gas (such as Nitrogen, Argon or CO₂) when testing a vehicle's fuel evaporative (EVAP) system [SAE: 2007-01-1235 & 2008-01-0554].

Included with Leakfinder® WV622N-VWKIT

UltraTraceUV®: (WV0712UV) this is the only Automaker-Approved UV smoke-producing solution in the world. This non-contaminating solution's chemistry is designed to not damage vehicle components and contains a special dye that deposits at the exact location of a leak. Each bottle will perform approximately 300 tests. (12 oz. / 355 ml).
(Part No. is for one bottle. Two bottles included with WV622N-VWKIT).



Combination Light: (WVA-065) white light, for easier smoke location and ultraviolet (UV) light, to highlight the fluorescent dye deposited at the exact location of a leak. Also has laser pointer.

Note: For eye safety & UV enhancement; always use yellow glasses when using UV light.



Standard Size Service Port Adapter: (WVA-006) connects to factory service port on many OBD-II vehicles.



Plug-in battery Cables: (WVA-072) connects to Leakfinder® and 12VDC battery.



Smoke Diffuser: (WVA-003) locates leaks around doors, windows, sunroofs and trunk compartment seals.



Manifold: (WVA-170) Use with adapters below.



Adapter: (WVA-171) 12 mm Male and female Set with locking clip.



Adapter: (WVA-172) 10 mm Male and female Set with locking clip.



Adapter: (WVA-173) 8 mm Male and female Set with locking clip.



Adapter Cone Large: (WVA-067)



Wing Nut Expansion Plug: (WVA-180) Seals off /plug the EVAP system (NVLD)



Exhaust Cone: (WVA-001)



Included with Leakfinder® WV622N-VWKIT

Fuel Neck Cap Adapter Threaded: (WVA-142)



Fuel Cap Receiver Assembly: (WVA-143)



Vehicle/Cap Test Hose Assembly: (WVA-144)



Optional Accessories

Bladder Plug with Through Hole: (WVA-096)
 For sealing irregular sizes (from Ø47-152mm) and to introduce smoke.
 Includes spare bladder replacement.



Bladder Plug with Through Hole: (WVA-132)
 For sealing irregular sizes (from Ø31-90mm) and to introduce smoke.
 Includes spare bladder replacement.



Bladder tube replacement: WVA-098 for bladder WVA-096 (48.5mm ø)



Bladder tube replacement: (WVA-149)for bladder WVA-134 (22mm ø)



Filter Elements Kit: (WVRP-103) 5 micron, .01 micron and Carbon-activated.



Capless Adapter: fits Ford and G.M. double-door capless fuel tank neck (WVA-078). Adapter for applying pressure &/or vacuum to the fuel tank.
 Brilliantly simple

- Specifically designed for new double-door capless fuel tanks.
- Reusable.
- Use with any smoke machine or other leak detection device. **5-year warranty.**



Universal Adapter (Standard): (WVA-063)
 Brilliantly simple

- Quickly pops-on most fuel tank filler necks
- Reusable
- Use with any smoke machine or other leak detection device **5-year warranty**



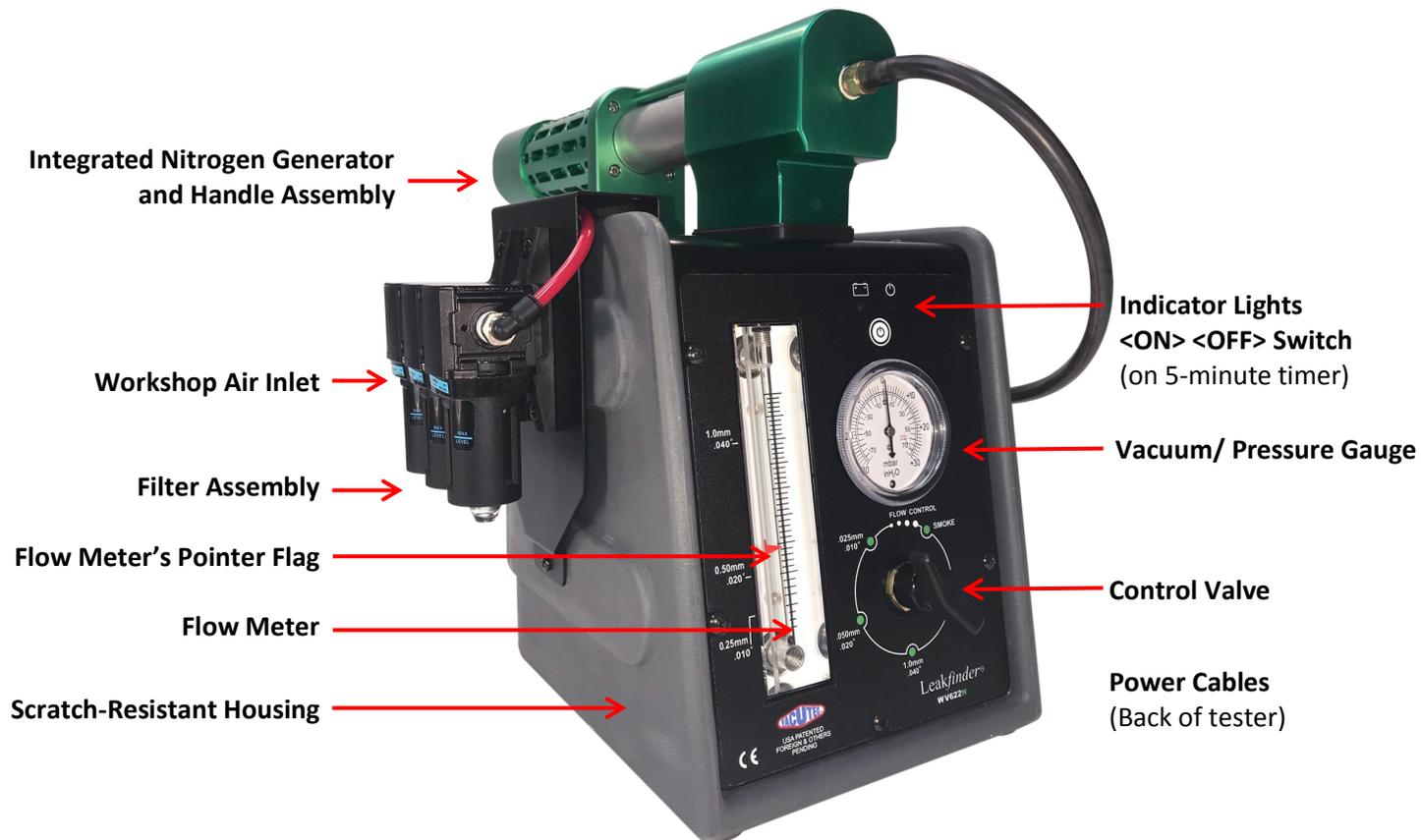
Power Converter (WVA-080) connects to smoke tester and grounded wall power outlet, to avoid using the vehicle battery as a power source. **(USA plug)**
AC input: 100-240V AC/5A 50/60Hz | **DC output:** 12V 25A



Accessories Storage Case (WVA-168)



Product Overview

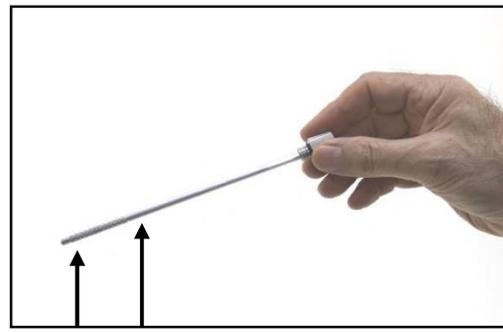


Technical Specifications

Height	13.5 in. (34 cm)	Solution Max. Volume	12 oz. (355 ml)
Length	13 in. (33 cm)	Supply pressure	14 in. H ₂ O (34.9 mbar 3.49
Width	9 in. (23 cm)	Supply volume	kPa) 10 liters per minute
Weight	20 lb. (9 kg)	Smoke supply line	15 feet (4.6 mm)
Shipping weight	25 lb. (11.3 kg)	Power supply line	8 feet (2.4 mm)
Power supply	12 volts DC	Power consumption	15 amps.

Initial Setup

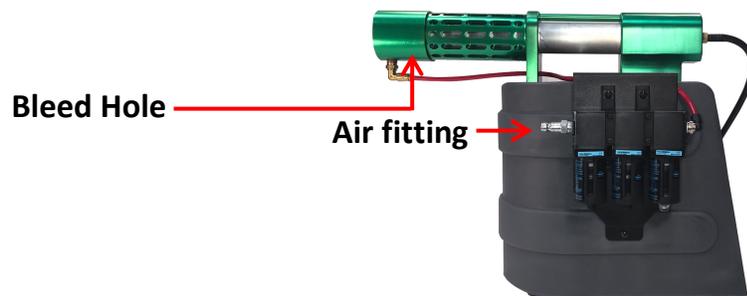
1.



Low Full

a. Pour entire contents of one 12 oz. UltraTraceUV® solution bottle into the smoke chamber.
NOTE: Use second bottle supplied to regularly maintain at or near FULL mark.

2.



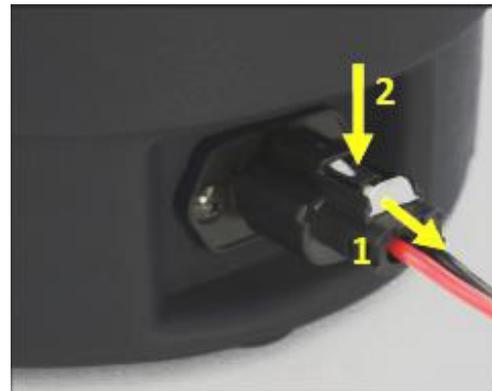
b. If not supplied; install correct air fitting onto the **Leakfinder**®. Use Teflon® thread-sealer. Be sure the thread-sealer is not allowed to enter the nitrogen generator's housing. Connect workshop air to air fitting. Set air pressure between 3.4 to 10.3 bar (50 ~ 150 PSIG).

NOTE: The nitrogen generator naturally expels oxygen during the nitrogen-generation process. It is normal to hear a small amount of oxygen exiting the generator's **bleed hole** when connected to workshop air.

3.



c. Connect power cord and push white tab toward tester to lock position.



To remove plug:

1. Pull white tab to unlock.

2. Push inner tab downward, while at the same time pulling plug away from tester.

Initial Setup, *continued*

4.



Leakfinder®

Air Compressor

Air pressure between 3.4 to 17 bar
(50 ~ 250 PSIG)

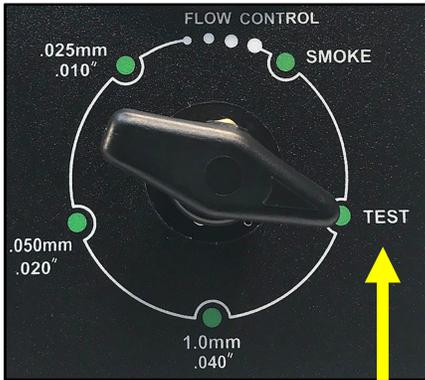


It is very important to keep the *Leakfinder*® nitrogen generator assembly free of oil, water and other contaminants, in order to maintain a high nitrogen purity and long service life. In order to do that, you need to be sure and maintain a clean filter system on your air supply into the *Leakfinder*®. In addition, install the Filter Assembly Kit WVRP-104, or equivalent.

Under normal use, we recommend you replace the filter elements inside Filter Assembly Kit WVRP-104 once a year and use only approved Filter Elements Kit Part No. WVRP-103, as noted in Optional Accessories page in this manual. Turn filter bowl ¼ turn in counter-clock direction to gain access to the filter elements.

IMPORTANT NOTE: In order for the moisture and contaminants that collect in the filter bowls to drain, air must be disconnected and re-connected to the machine's Air Fitting. So do not leave air source to the machine connected for days at a time, or the filters will never drain, which can damage the nitrogen generator system. An occasional disconnect and reconnect to air is sufficient.

Control Valve Overview



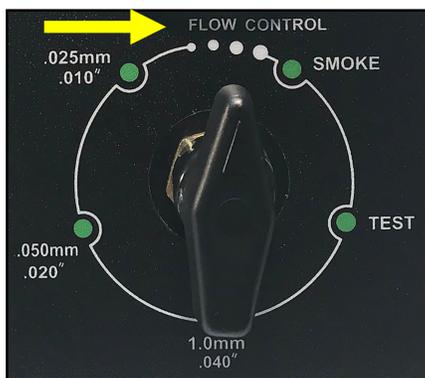
TEST: Delivers nitrogen, without smoke, and a very accurate flow meter reading. This setting is for determining if a leak exists and how large it is.

NOTE: Leak size is discussed in **Basic EVAP Test** section of manual.

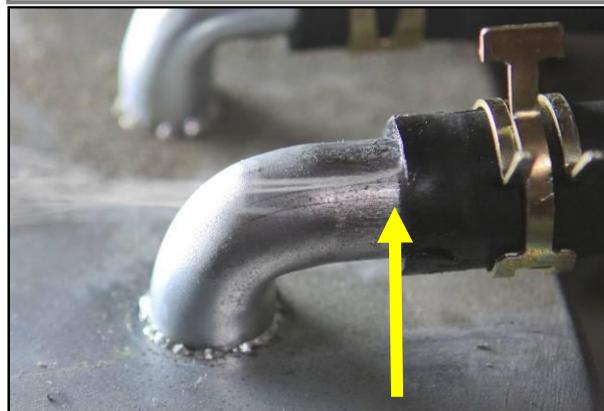
SMOKE: Delivers maximum smoke volume.



FLOW CONTROL: Controls smoke volume.
> Locating the leak source is sometimes easier with less smoke volume. First, fill system with smoke, at full volume, then reduce volume while still introducing smoke.

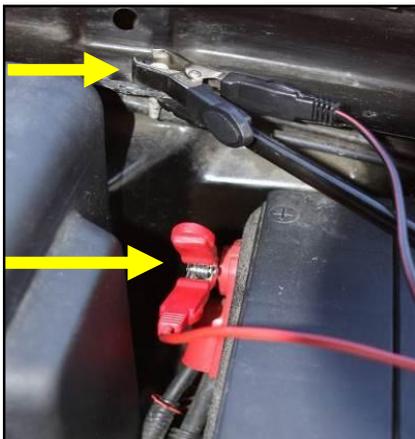


Note: Flow Control does not affect delivery pressure; it only affects flow volume.



Basic Test Procedure

1.



- a. Connect red clip to 12V-DC power.
- b. Connect black clip to chassis ground.

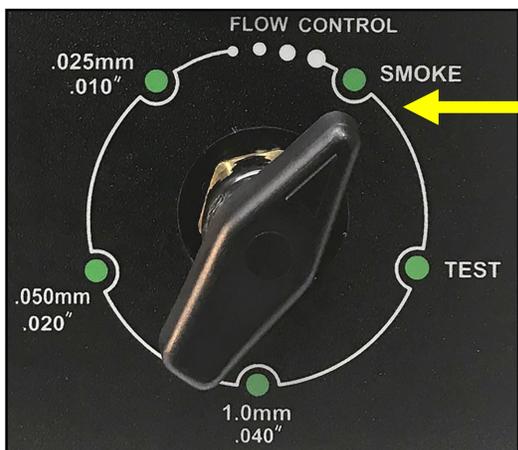


- c. Use adapter cone supplied to access intake/induction system and connect smoke supply hose to adapter cone.

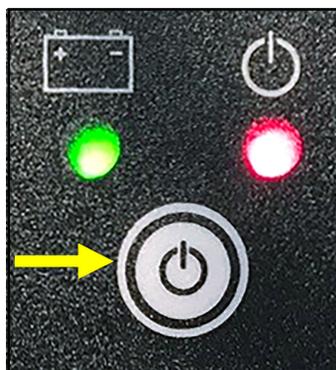


Be sure and completely unwind smoke supply hose when connecting to the vehicle. A hose that is left wound up will collect excessive smoke vapor inside the hose which may impede smoke vapor flow through the hose. If this occurs, allow the supply hose to drain prior to its next use.

2.



- a. Position to SMOKE (full flow).

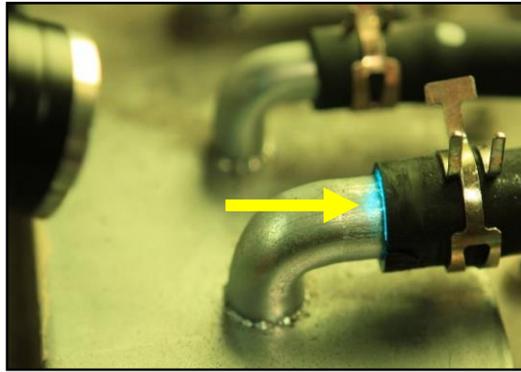


- b. Press START button.

- > Green and red lights turn <ON>.
- > A *blinking* green light indicates a weak battery.
- > System is on a 5-minute timer.

Basic Test Procedure, *continued*

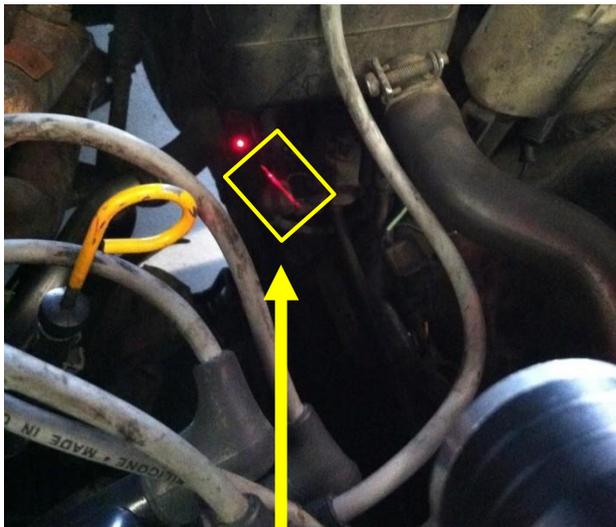
3.



Use white light to find the smoke.



Use UV light and yellow glasses to find the dye.



'A'



'B'



> The laser light can 'see' the smoke vapor even if the naked-eye cannot as demonstrated by this difficult to see smoke vapor leak. Notice the yellow box in image 'A' showing where the laser light is reflected by the almost invisible smoke vapor leak. Then image 'B' finds the leak with the UV light.

Other Leak Samples

Leakfinder® can be used in virtually any vehicle low pressure system suspected of having a leak, such as; intake / induction, intercooler and turbocharger, vacuum, exhaust, EVAP and even wind/water leaks. Can also be used to verify air solenoid functions and test components prior to assembly.

Exhaust

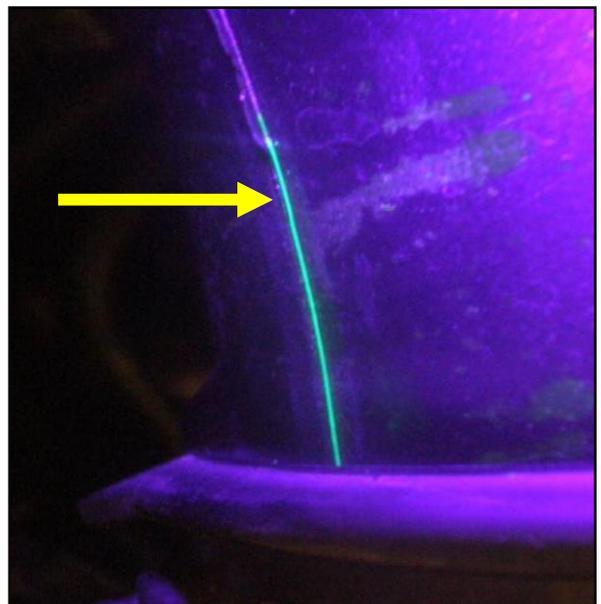


Fluorescent Dye Deposit

The UltraTraceUV® smoke solution contains a special ultraviolet-activated fluorescent dye that deposits at the exact location of a leak. Use the UV light provided to highlight the dye.

> *The longer the smoke is allowed to exit a leak, the more dye will be deposited.*

> *This technology has been designed so that the dye deposits only if there is pressure-differential. So for instance; the dye will deposit when exiting a leak but will not deposit during a wind and water leak test.*



Other Leak Samples, *continued*

Wind and Water Leaks

1. Set vehicle's climate control to 'Fresh Air' (not to re-circulate). Set blower on full speed.

> *This creates positive cabin pressure.*

2. Connect supply hose nozzle to Smoke Diffuser.

3. Lay smoke path along seals.

4. Look for smoke disturbance indicating a leak.

No smoke disturbance means 'No Leak' >



< Smoke disturbance pinpoints the leak

Basic EVAP Test

- A flow meter ball indicating flow = flow going into (or through) the system being leak-tested. This is normal while the system is being filled with smoke.
- A flow meter ball indicating flow *after* the system is filled = a leak in the system being tested. The higher the ball is in the flow meter, the larger the leak size.
- No flow in flow meter = no flow through the system, or no leak.

Control Valve Leak Size Reference Points

The tester's control valve has calibrated leak size orifices built into it. The .010" (0.25 mm), .020" (0.5 mm) and .040" (1.0 mm) reference points calibrate the flow meter in order to *quantify* the leak size in the system being leak tested.

Calibrate the Flow Meter

1. Position the Control Valve to a leak size. **(Figure 1)**.
2. Press START button and observe the measurement of the flow meter's indicator ball.
3. Position the flow meter's red pointer flag so that it aligns with the measurement observed in the previous step **(Figure 2)**.

NOTE: This flow meter measurement indicates the EVAP Pass or Fail line for that leak standard.

Testing the EVAP System

1. Connect *Leakfinder*® supply line to EVAP system.
2. Position Control Valve on either TEST (non-smoke) or SMOKE (full flow).
3. Press START button and fill the system until the flow meter ball stops descending. Observe position of ball as compared to red flag.

- > Above red flag = FAIL.
- > Below red flag = PASS.

NOTE: If system failed and if previous test was performed in TEST mode (without smoke), then you must alleviate all pressure from EVAP system so that smoke can be introduced. Then set control valve to SMOKE (full flow) setting, introduce smoke and look for smoke and/or dye to find the leak(s).

NOTE: The flow meter measurements for quantifying a leak are most accurate when the *Leakfinder*® Control Valve is in TEST setting.

NOTE: When testing a closed system, such as the EVAP system, it is best to purge the 'non-smoke' air out of the system by leaving an opening in the system being filled (e.g. EVAP vent). Close the system once smoke exits that opening and continue to fill with smoke. This quickly fills the system with smoke.



Figure 1

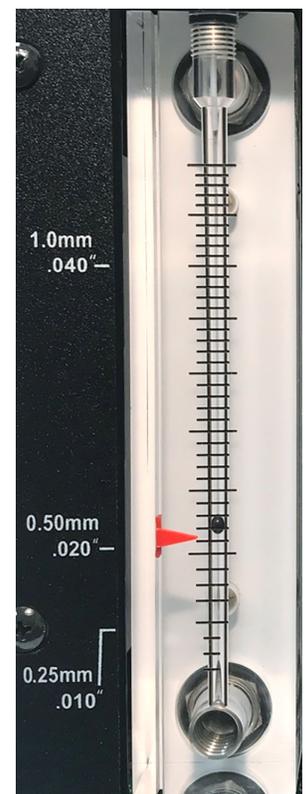


Figure 2

Vacuum/ Pressure Gauge Overview

The pressure gauge serves two basic functions:

1. Monitoring system test pressure, while performing a leak test in either TEST or SMOKE mode.
2. Measuring system pressure-decay (pressure loss) once system undergoing a leak test has been filled in either TEST or SMOKE mode.

NOTE: the pressure decay test is best performed immediately after the system undergoing a leak test has been filled in either TEST or SMOKE setting, since the system has already built up pressure.

NOTE: if performing a pressure decay test when smoke is not needed, then the test will be even more accurate if performed using the control valve setting of TEST.

Test Procedure:

1. Be sure the *Leakfinder*[®] has completed filling the system being leak tested, with Control Valve in either TEST setting or SMOKE (full flow) setting.
> A filled system is confirmed when the flow meter ball stops descending and the pressure gauge stops increasing in pressure.
2. If the *Leakfinder*[®] is still turned ON; turn it OFF (by pressing the button on the control panel) and immediately observe the pressure gauge for any decay, which would indicate a leak in the system being leak tested.

NOTE: to perform a 'vacuum' test on a system; use a tee connection at the end of the *Leakfinder*[®] supply hose and connect to a vacuum pump. When pumping the system to create vacuum, be very careful to pump slowly and do not exceed the pressure limitations of the gauge on the *Leakfinder*[®].



Do **NOT** run the vehicle's engine with the *Leakfinder*[®] supply hose connected to the vehicle. Normal engine vacuum will damage the pressure gauge!

Disconnect the *Leakfinder*[®] supply hose from the vehicle after performing an EVAP test. Natural vacuum or pressure created by the fuel in the fuel tank can damage the pressure gauge if it exceeds the pressure limitations of the gauge.

Calibrating Leakfinder® Output Supply Pressure

The Leakfinder® has been calibrated at the factory and preset to deliver approximately 14" H₂O pressure (35 mbar | 3.5 kPa), in TEST mode. It is normal for the Leakfinder® to deliver a slightly lower pressure in SMOKE mode.

However, follow the instructions below if it ever becomes necessary to calibrate the supply pressure that the Leakfinder® delivers.

- A. Perform steps 1-4 in **Initial Setup**, on pages 4-5.
 - B. Position Leakfinder's **Control Valve** on **TEST** mode. (Figure 3)
 - C. Place your finger at end of supply hose nozzle (or use leak-proof plug to cap supply hose nozzle). (Figure 4)
 - D. Press & release the start button on Leakfinder's control panel. (Figure 5)
- NOTE: While plugging supply hose nozzle; allow up to 30 seconds for pressure on Leakfinder's vacuum/pressure gauge to stabilize.**
- E. Verify pressure is at 14" H₂O on Leakfinder's pressure gauge. (Figure 6)
 - If pressure is approximately 14" H₂O and ball in flow meter is at zero, then the calibration is complete.
 - If pressure is not at 14" H₂O, or if ball in flow meter is not at zero, then immediately proceed to step F below.
 - F. Remove plastic cap, exposing pressure regulator adjustment. (Figure 7)
 - G. Turn tester <ON>. (Figure 5)

- H. Once again plug end of supply hose nozzle. (Figure 4)
- I. Using a flat blade screwdriver turn adjustment screw clockwise to increase pressure and counter-clockwise to reduce pressure.
Note: Do not turn adjustment screw more than ½ turn at a time.
Note: If reducing pressure; you must remove plug from the supply hose in order to relieve pressure build-up, then plug nozzle again and verify pressure reading on Leakfinder's gauge.

VERY IMPORTANT: If at any time during this calibration process the ball in the flow meter does not settle at zero mark, that can only indicate one of two issues.

1. Leakfinder could be producing too much pressure, causing the Leakfinder's internal EVAP safety pressure-relief valve to open, indicated by the flow meter measuring the flow rate of the over-pressure relief valve's leak. Proceed to step 'J' below to resolve this issue.
2. The tester itself could have a leak. Note: step 1 above must be resolved before an internal leak of the tester can be determined.

- J. Be sure steps A-E on this page have been met. Use a screwdriver to reduce Leakfinder's pressure by very slowly turning screwdriver counter-clockwise, while occasionally plugging the supply nozzle with your finger to verify if the safety pressure-relief valve has closes; indicated by the flow meter ball settling at zero mark. Start the calibration process over by starting with a low pressure setting and slowly work your way up to the 14 inch water setting.

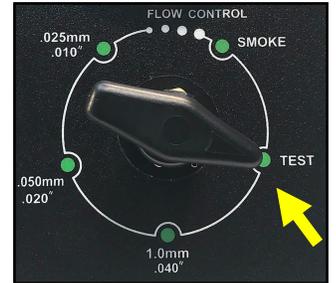


Figure 3



Figure 4



Figure 5



Figure 6

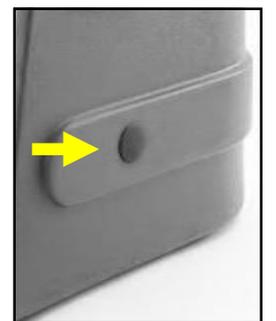


Figure 7

Troubleshooting Guide

Two lights on the control panel double as diagnostic lights.

Green	Red	Interval	Cause
✓		Blinks: 1 per second	Indicates weak battery power.
✓	✓	Blink simultaneously: 1 per second	Bad ground or power connection at smoke canister or short in circuit
✓	✓	Blink simultaneously: 4 times per second	Bad ground at smoke canister or open heating circuit
✓	✓	Blink alternately: 1 per second (System shuts down)	Bad ground or circuit board failure *

* If circuit board failure occurs, first disconnect power to your Tester for 10 seconds and reconnect. If failure code occurs a second time, disconnect Tester and contact Authorized Dealer.

Symptom	Likely Cause	Solution
The green power indicator lamp on the Tester does not turn ON.	1. Poor power-supply cable connection.	<i>1. Secure power connection at the machine and wall outlet.</i>
There is no air or smoke coming out of the supply hose.	1. Flow Control valve is closed, either on Control Valve, or at base of supply hose. 2. Air/gas supply to tester is insufficient. 3. Bad power-supply cable connection, or power converter is set too low.	<i>1. Open flow control valves. 2. Check for sufficient air/gas supply. 3. Secure power converter connections and/or increase power converter setting.</i>
Very little smoke coming out of the smoke hose or oil dripping from the smoke hose.	1. There is too much smoke condensation inside the smoke supply hose. > This usually does <u>not</u> indicate a failure.	<i>1. Position the hose lower than the Tester. Set control valve to TEST and turn Tester <ON> for one cycle, or until oil has drained from hose. Note: Completely unwind the nitrogen/smoke hose to reduce condensation and optimize the tester's performance.</i>

Warranty | Technical Support



CPS Products Inc.

CS@CPSproducts.com

LIMITED ONE (1) YEAR WARRANTY

Leakfinder® Evaporative Emissions System Tester & Smoke Machine

CPS Products Inc. warrant to the original purchaser; under normal use, care and service, tester shall be free from defects in material and workmanship for one years from the date of original invoice.

Seller's obligations under this warranty are limited solely to the repair or, at Seller's option, replacement of or refund of the original purchase price for, Equipment or parts which to Seller's satisfaction are determined to be defective and which are necessary, in Seller's judgment, to return the equipment to good operating condition.

Repairs or replacements qualifying under this Warranty will be performed or made on regular business days during Seller's normal working hours within a reasonable time following Buyer's request. All requests for warranty service must be made during the stated warranty period.

→ **Your Product Warranty has already been activated,
No need for you to send us any information.**

→ **For *Leakfinder*® Technical Support:**

1-888-822-8832 Mon-Fri 8:00am to 3pm Pacific Time

or CS@CPSproducts.com



