



Evaporative Emissions Tester containing OEM EVAP-Approved Smoke Technology and UltraTraceUV[®] Solution



Operator's Manual

Model No. EELD601



Safety Precautions and Usage Tips

WARNING: TO PREVENT PERSONAL INJURY AND / OR DAMAGE TO EQUIPMENT



- Due to the volatile fumes that are present in the vehicle's fuel vapor recovery (EVAP) system, we strongly recommend that you do not add oxygen to the EVAP system by using shop air to generate the smoke. Instead, we strongly recommend – as do most automakers – you use a non-combustible inert gas, such as nitrogen or argon, when testing the vehicle's EVAP system for leaks.
- Use this equipment in the manner specified by the manufacturer.
- Understand operating procedures / Follow all safety precautions.
- Correctly connect power supply to battery and chassis ground.
- Use **only** OEM-approved UltraTraceUV® Diagnostic Smoke Solution No. P0716UV. Altering the solution; may cause damage to the vehicle being tested; will void the warranty; may cause tester malfunction; may cause damage to property or may cause personal injury.
- Do not use with running vehicle engine.
- Do not perform test near source of spark or ignition.
- Do not leave the EELD601 hoses or power cables connected to the vehicle for extended periods of time if tests aren't being performed.
- The 12V DC battery source you use to power the EELD601 must be in good condition and fully charged.
- Wear eye protection that meets OSHA standards.
- Follow safety precautions when using ultraviolet light source.
- Optimum input pressure for the EELD601 is 100 PSI (6.9 bar), although will operate in a pressure range of 50-125 PSI (3.4-8.6 bar)
- Store and operate the EELD601 in upright position.



- ✓ Smoke exiting a very small leak is even easier to see if **after** filling the system with smoke you cycle the ON / OFF button. This will introduce smoke and allow the system pressure to decrease; making the leak even more visible.
- ✓ The bright halogen spotlight supplied is an excellent way to highlight the smoke exiting a leak.
- ✓ Use a good quality UV lamp (not supplied), which includes 400 nanometer (nm) in its ultraviolet range, to look for the fluorescent deposit at the exact location of the leak(s).
- ✓ When operating the EELD601 in near freezing temperatures, cycle the ON / OFF button 30-seconds ON and 30-seconds OFF for approximately the first minute or two of operation. This will allow the Tester to reach operating temperature.
- ✓ When testing an engine's intake or exhaust system for leaks, it is recommended that the engine be cold - small leaks may be sealed due to thermal expansion.

Table of Contents

Caution & Usage Tips	iii
Introduction	1
Technical Specifications	1
Tester Overview	2
Accessories	3
Initial Setup	4
Prior To Performing EVAP Tests	4
Tester Hookup	5
Testing Procedure	6-8
Other Leak Detection Applications	9-13
Calibrating System-Pressure	14
Troubleshooting Chart	15
Contact Info	16
Frequently Asked Questions	17
Warranty	18

Congratulations! You are in possession of the most useful, yet simple to operate Evaporative Emissions (EVAP) System diagnostic tester available today. The EELD601 versatile 12-volt design was specifically developed to diagnose vehicle EVAP systems for leaks, while maintaining it simple and straight-forward to operate. In addition, the EELD601 will also find intake manifold system leaks, exhaust system leaks and under-dash vacuum system leaks. It will also diagnose many other closed systems where you may suspect a leak, as well as pinpointing wind and water leaks entering the vehicle's passenger or trunk compartments. Its design allows the operator to confirm the integrity of the system being tested by utilizing a simple pass/fail metered-air system and then its smoke pinpoints the leak(s). The EELD601 uses UltraTraceUV®, a special non-toxic non-corrosive fluorescent Diagnostic Smoke® solution; in fact, it's the only ultraviolet (UV) solution approved by OEMs. This solution is a unique and patented chemical that when vaporized and introduced into a system to be tested will exit at any leak point depositing an ultraviolet-activated fluorescent dye 'fingerprint' at the exact location of a leak. To locate the source of the leak you simply use a halogen light to look for the smoke exiting the leak or use a conventional UV lamp to view the dye deposit left behind, pinpointing the exact location of the leak.

Note: The EELD601 arrives filled with a full charge of UltraTraceUV solution that will last approximately 500 tests. All you need to do is check the solution level and top off to the "Full" mark on the dipstick regularly (same as you would use the dipstick of a car's engine).

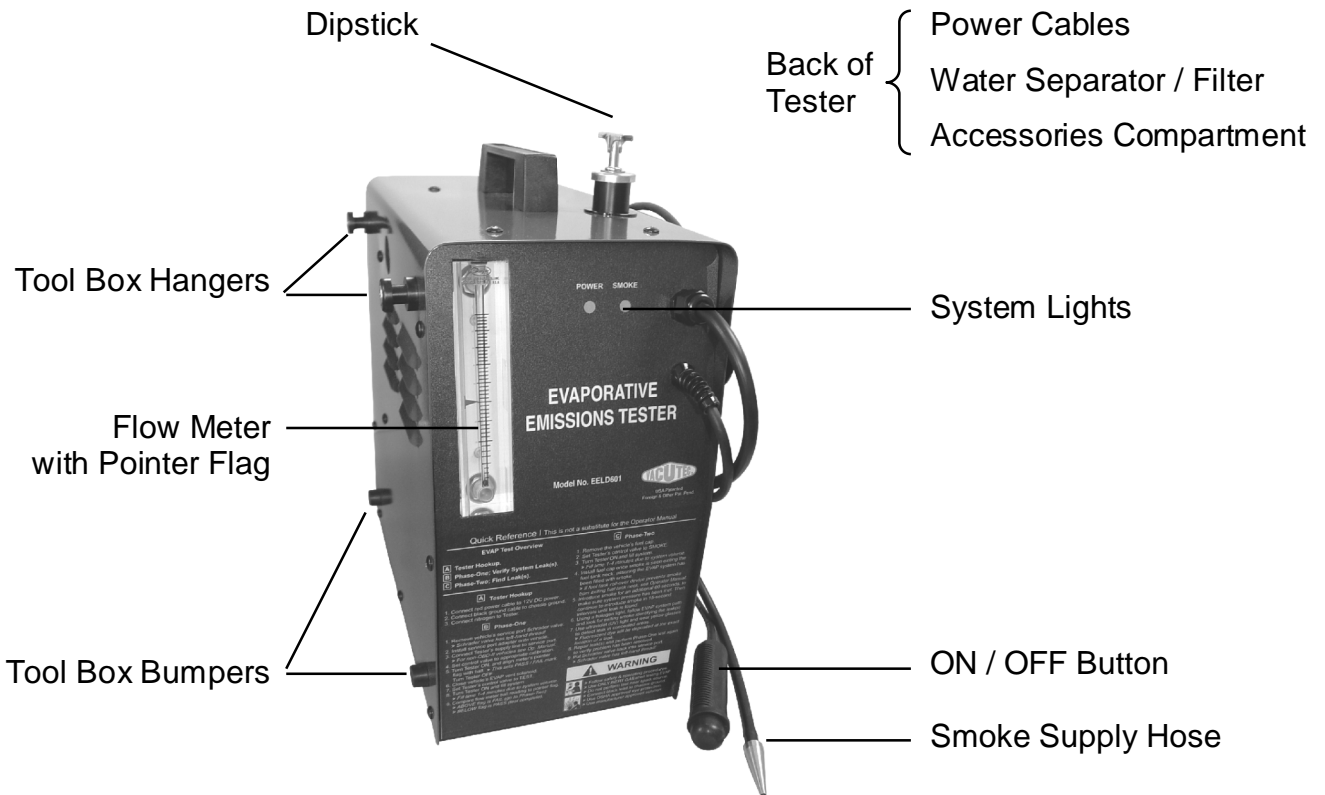
Note: The automaker sets the standard practice of choosing what gas source is to be used when testing the EVAP system for leaks. Virtually all automakers today, that have approved the use of smoke technology for EVAP testing, recommend or require the use of a non-combustible gas, such as nitrogen or argon, to test the potentially volatile EVAP system of a vehicle. (The science supports this position). Since we build our equipment to OEM specifications, we recommend you follow the automakers' recommendations and choose the safer practice of using a non-combustible gas to test the EVAP system. The EELD601 can also be used with compressed air (shop air) when testing systems other than the EVAP system.

The EELD601 automatically sets the critical pressure that must be maintained during EVAP testing, as long as you provide an input pressure between 50psi and 150psi (optimum pressure being 100psi). The EELD601 is refillable by the end-user as the smoke-producing solution is consumed. The smoke it produces, as well as the UltraTraceUV dye, is non-toxic and non-corrosive. The EELD601 needs no assembly and requires no maintenance, except the regular topping off of the smoke solution.

Technical Specifications:

Vacutec® EELD601			
Height	17 in. (43.2 cm)	Supply pressure	13.0 in. H ₂ O
Width	8 in. (20.3 cm)	Supply volume	10 liters per minute
Length	15 in. (38.1 cm)	Operating temp. range	45°F to 140°F (7.2°C to 60°C)
Weight	23 lb. (10.4 kg)	Smoke supply line	10 feet (3m)
Shipping weight	26 lb. (11.8 kg)	Power Supply line	10 feet (3m)
Power supply	12 volts DC	Remote starter cable	10 feet (3m)
Power consumption	13 amps.		
Maximum Relative Humidity>		80% for Temperatures up to 140°F (60°C)	
Conditions of Use>		Indoor / Outdoor (if not wet)	
Pollution Degree: 2			

Tester Overview:



Component Description

System Lights: **Green** light turns ON continuously; indicating sufficient 12-V DC power.
Green light blinking; indicates insufficient 12-V DC power (weak battery).
Red light indicates smoke production.







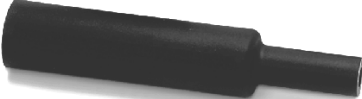



Flow Meter: and pointer-flag is used to establish a quick Pass / Fail when determining if the vehicle being tested has a .040" or .020" leak.

ON / OFF Button: is used to operate the tester. The tester stays ON for five (5) minutes after the Start Button is pressed. Pressing the button again turns tester OFF before the five minute period.

Supply Hose: used to introduce the Diagnostic Smoke into the system being tested.

Dipstick: used to maintain proper smoke solution level throughout the year.

Accessories Included:

	<p>No. WVA-06 – Service Port Adapter (Standard Size) connects to factory service port on most OBD-II vehicles.</p> <p>No. WVA-049 – Schrader Removal / Installation Tool fits both sizes of Schrader valves in vehicles with factory OBD-II service port fittings.</p>
	<p>No. WVA-01 – Exhaust Cone is used to either introduce smoke into the exhaust system; into any system that fits the cone's tapered size; is used as an exhaust plug when testing a dual exhaust system; or exhaust plug when testing the intake vacuum system.</p>
	<p>No. WVA-02 – Cap Plug Kit is used to seal the intake ducting of the engine being tested. They may be used to seal either the inside diameter of an opening, or flip them over and seal the opening at the outside diameter.</p>
	<p>No. HS400AC – Halogen Spotlight highlights the smoke when searching for leaks.</p>
	<p>No. P0716UV – UltraTraceUV™ Smoke Solution Unit arrives with a full charge of solution – enough to perform approximately 500 tests. Top off regularly.</p>
Available Accessories – Not Included	
	<p>No. WVA-042 – Small Service Port Adapter connects to factory service port on some vehicles.</p>
	<p>No. WVA-03 – Smoke Diffuser allows the operator to lay down a thick path of smoke along doors, sunroof, windshield and window seams so any air disturbance, caused by exiting internal cabin pressure, may be observed.</p>
	<p>No. WVA-041 – Inert Gas Supply Hose has a 25 ft. length. The ¼" end is used to connect to the gas supply and the quick-disconnect to the tester.</p>
	<p>No. 200-22-227NG – 100PSI Pre-Set Gas Regulator can be used on any nitrogen, argon or helium gas cylinder with any smoke machine containing STAR EVAP-Approved Diagnostic Smoke Technology.</p>
	<p>WVA-050 – Metal Cart Station secures the EELD601 or any Vacutec brand smoke machine and gas cylinder.</p>

Initial Setup:

The EELD601 requires NO assembly.

Note: The EELD601 arrives filled with a full charge of Smoke-Producing Solution that will last approximately 500 tests. We recommend you top off regularly in order to always keep the solution level near the “Full” mark. Evaporative Emissions System Overview:

The vehicle's Fuel Vapor Recovery (EVAP) System is the most neglected part of the vehicle's emission system, according to the Environmental Protection Agency (EPA).

The vehicle's EVAP system is used to collect fuel vapors from the fuel tank. These vapors are stored in a canister filled with activated charcoal. The EVAP system allows the fuel vapors to be drawn from the canister and combust during certain operating conditions. This process is called canister purging since the fuel vapors are purged from the canister. OBD-II requires Powertrain Control Module (PCM) monitoring for proper operation of the EVAP system and for possible leaks to the atmosphere.

A faulty EVAP system will allow hydrocarbons (HC) to escape into the atmosphere. **Factory emission tests have determined that an EVAP system with a leak as small as .020” can yield an average of 1.35 grams of HC per vehicle driven mile. This is over 30-times the current allowable exhaust emissions standard.** In addition to causing HC emissions, failure of this system wastes fuel and many times creates customer-complaints of “gasoline odors”. With the introduction of On Board Diagnostics (OBD), the automotive industry has been capable of determining that a vehicle's evaporative system has a leak. Prior to the technology in the EELD601, determining where the EVAP leak was had been a difficult and time-consuming challenge.

Prior to performing EVAP tests:

When the vehicle's engine is turned off, the OBD-II EVAP System is generally venting in one form or another. Use a scanner and 'close' the EVAP System in order to perform any leak tests. **Remember that ALL tests with the EELD601 are performed with the engine OFF!**

It is best to perform all testing in calm air, so that the smoke exiting the leak will not be blown away impairing your view of the leak.

Virtually all of the automakers today that use smoke technology recommend or require you use a non-combustible gas, such as nitrogen, to generate the smoke when testing the vehicle's EVAP system. There is strong documented science supporting the hazards of introducing excessive oxygen into the fuel vapor space of a vehicle. The potential hazards and liability are too great to ignore. **We strongly recommend you follow the automakers' recommendation / requirement and use Nitrogen to test the EVAP system.** Nitrogen is easily obtainable and inexpensive to buy. In addition, the EELD601 is also designed to perform its functions with conventional shop-air, if being used to test systems other than the EVAP System.

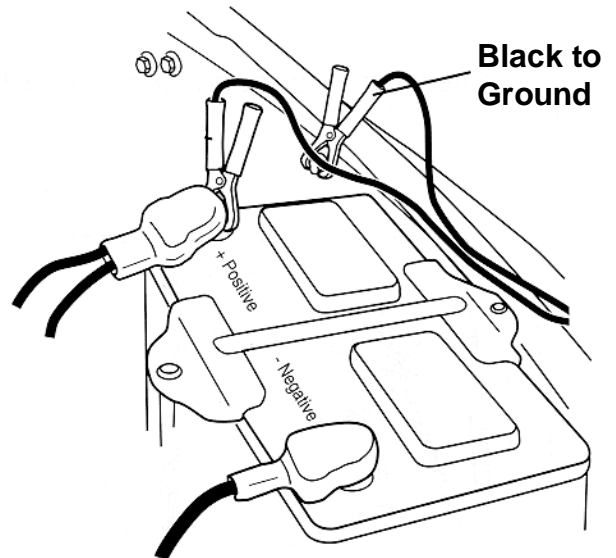
Evaporative System Test & Diagnosis:

Tester Hookup:

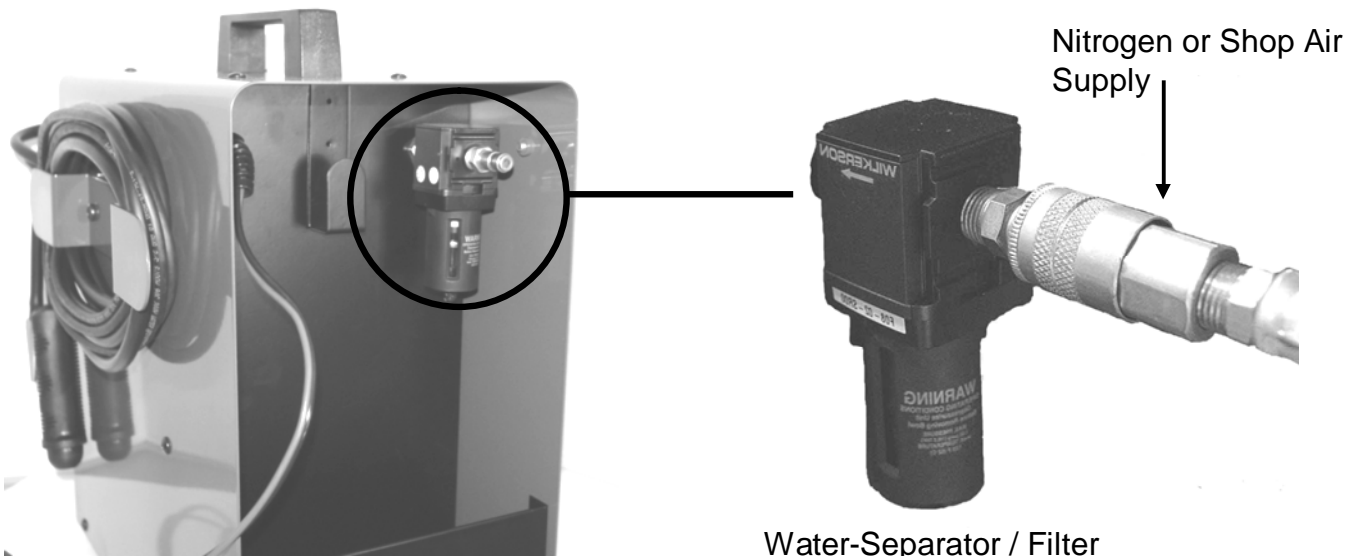
1. Connect the EELD601 red power cable to a 12-Volt DC power supply. If you are using a battery, be sure it is in good condition and fully charged!
2. Connect the EELD601 black ground cable to the vehicle's chassis ground. Check to see that the EELD601 'Power Indicator' lamp is on, but not blinking, indicating good battery contact.



CAUTION: To prevent personal injury, do NOT connect the EELD601 black cable to battery ground! A spark in the vicinity of the battery can cause an explosion!



3. Depending on the tests you are performing, connect either an inert gas, such as nitrogen, or shop air supply line to the EELD601 water-separator / filter connection located on the back of the tester.
 - > Be sure the supply pressure to the tester is between 50 psi and 150 psi (100psi optimum)
 - > When testing EVAP systems: Connect the tester to an inert gas source, such as nitrogen.
 - > When testing systems other than EVAP: Connect the tester to shop air.



Testing Procedure:

1. Verify the vehicle's fuel level is below the base of the fuel tank neck.
2. Determine if the vehicle's EVAP system you are testing is governed by a .040" or .020" acceptable leak requirement standard.
3. Locate the vehicle's EVAP Service Port and remove the green cap (Figure 1). Remove the Schrader valve that is inside the Service Port using the tool provided (See Figure 2).

WARNING: The Schrader valve is installed with a left-hand thread!

IMPORTANT: The EVAP Service Port on OBD-II vehicles was designed with a Schrader valve prior to considering smoke vapor as a means for diagnosing EVAP leaks. It has been determined that this smoke, when passed through this Schrader valve, will have a tendency to partially condense and not be as dense and as effective as when it comes directly out of the smoke machine. For this reason, when testing with smoke, you must remove the Schrader valve prior to introducing smoke vapor through the vehicle's service port. Use the tool provided and turn in a clockwise rotation to remove the Schrader valve.

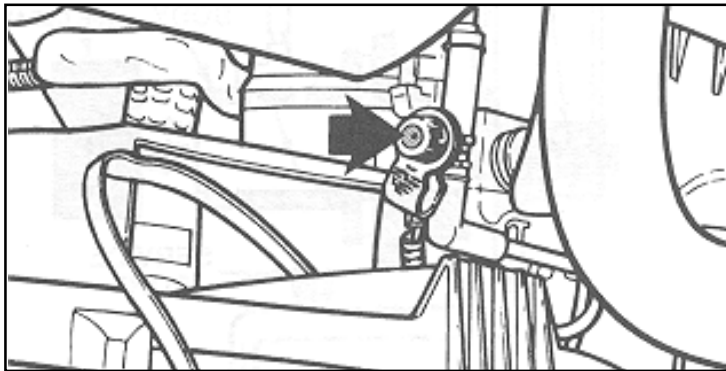


Figure 1



Figure 2



Figure 3

4. Install the EVAP Service Port Adapter that is provided with the tester. (See Figure 3)
5. Insert the EELD601 supply hose into the EVAP Service Port Adapter. (See Figure 4)

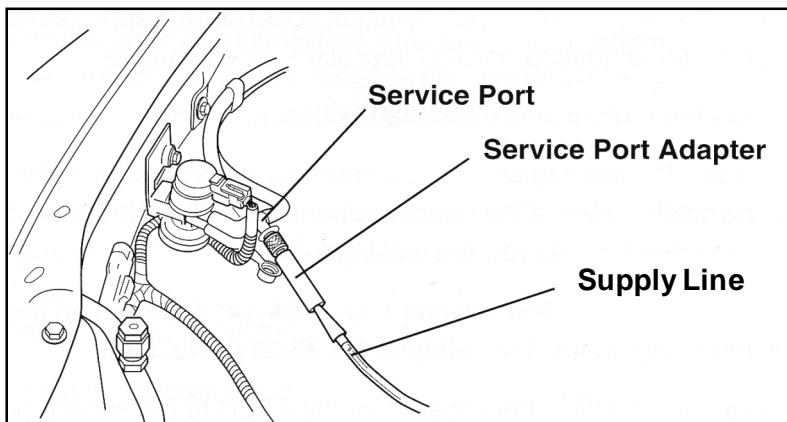
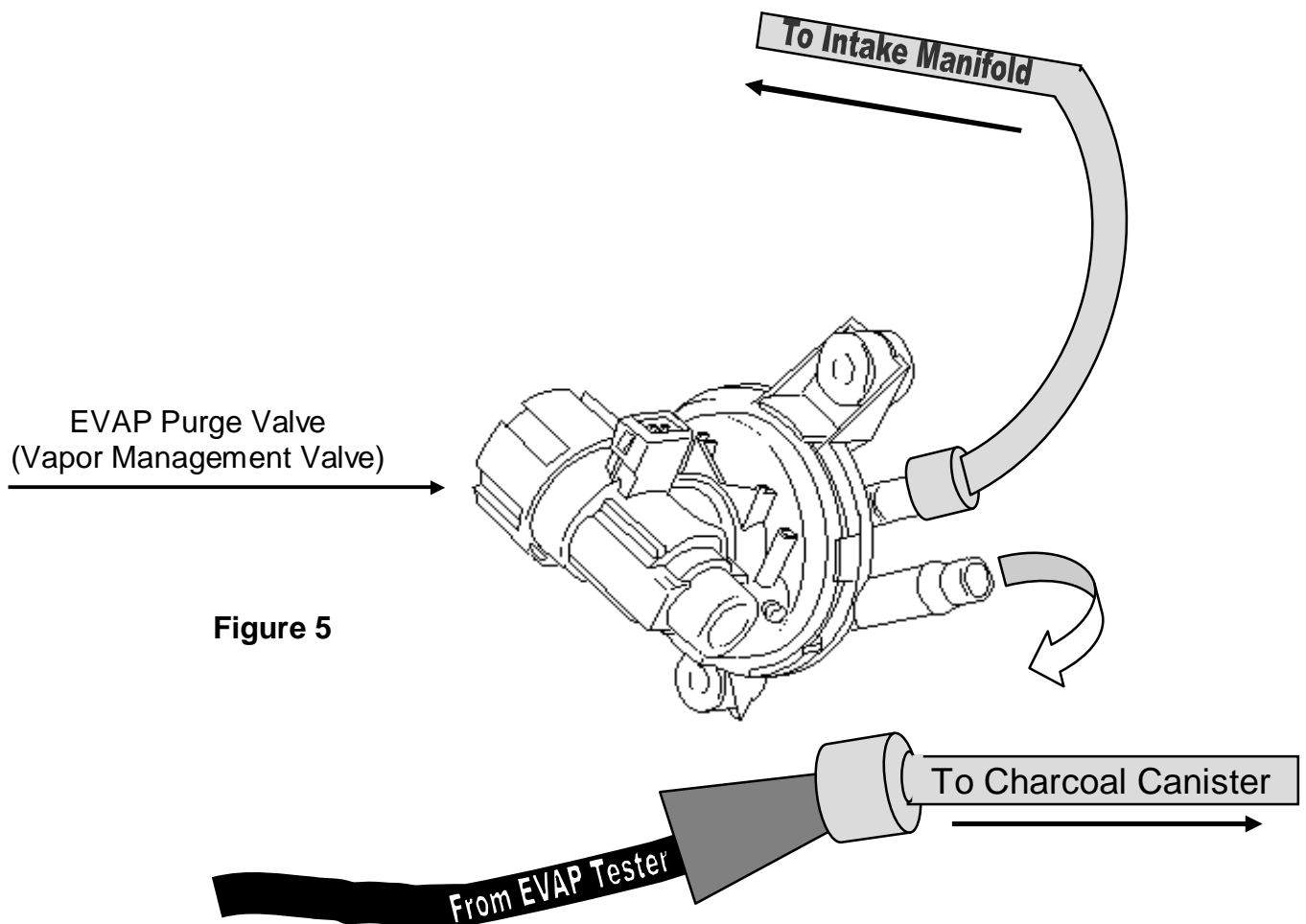


Figure 4

Note: When testing a vehicle without an EVAP Service Port; you will need to access the EVAP system by disconnecting the EVAP line from the EVAP Purge Valve leading to the charcoal canister. (See Figure 5)

- A. Locate the EVAP Purge Valve.
- B. Disconnect the line, at the EVAP Purge Valve, that leads back to the charcoal canister..
- C. Insert the smoke supply line into the line that you just removed from the EVAP Purge Valve as shown below.

Note: Be sure you have a leak-tight secure fit, otherwise a leak at that connection may fool you into thinking you have a leak in the system you are testing.



Testing Procedure (continued):

6. Press and release the ON / OFF button to activate the EELD601. The tester's red Smoke light will turn ON, indicating smoke production. Notice that at the beginning of the test procedure, the flowmeter's indicator-ball will go to the top of the flow meter scale. This indicates two things; (a) the EVAP System is being filled and (b) there is no restriction in the EVAP system at this time.
> If the ball initially never goes to the top of the flow meter, this indicates a restriction in the EVAP system. (Did you remember to remove the Schrader valve from the EVAP service port?)
7. Now close the vehicle's EVAP System Vent Solenoid. Usually in less than 60 seconds of activating / closing the vent solenoid -- depending on capacity and fuel system level -- the flow meter's indicator-ball will fall within the meter's visible scale
8. **Continue to fill the system until the ball stops descending.** This could take an additional two minutes.
> The timer will automatically turn OFF in five minutes. To turn the tester OFF before the 5-minutes are up, simply press the ON / OFF button again.
9. Once the meter's indicator-ball stops descending, align flow meter's red flag to the indicator-ball (Figure 6). If the ball descends to the bottom of the meter, this indicates the system has NO leak. However, if the red flag indicates a leak greater than the allowable standard, continue to introduce smoke into the system and look for the smoke or dye exiting the leak.

- **A measurement ABOVE the .020" or .040" indicator means an unacceptable leak in the EVAP System for that particular leak standard (FAIL). (See Figure 6)**
- **A measurement BELOW the .020" or .040" indicator means an acceptable leak (or no leak) in the EVAP System (PASS).**

For intermittent leaks, watch the ball in the flow meter while doing a wiggle test on the EVAP system components (hoses connections, etc.) If the ball in the flow meter goes up only when you wiggle a component, this indicates an intermittent leak. Continue to introduce smoke into the system and look for the leak. Repair the leak and retest.

Helpful Tip: You will find that a common leak in the vehicle's EVAP System is due to an unsecured or faulty fuel cap. For this reason, we recommend you do not disturb the vehicle's fuel cap before you test the system for leaks. This way if an unacceptable leak has been determined, you can reposition or test the fuel cap, then perform the EVAP test again. If you discover the leak was due to a faulty fuel cap, you will have been able to identify with the symptom. Otherwise if you disturb the fuel cap prior to performing your test, and the vehicle passes the test, you will never know for sure if the leak was due to the fuel cap or if you are dealing with an intermittent condition.

> If it has been determined that the vehicle you are testing has FAILED the leak test, then use the halogen light provided and look for smoke exiting a leak, or shine a UV light (not provided) to see the dye deposited at the leak point(s).

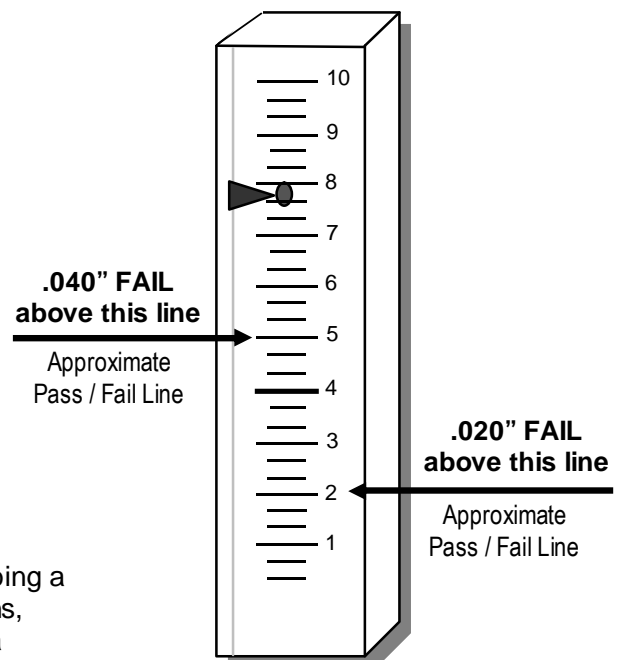
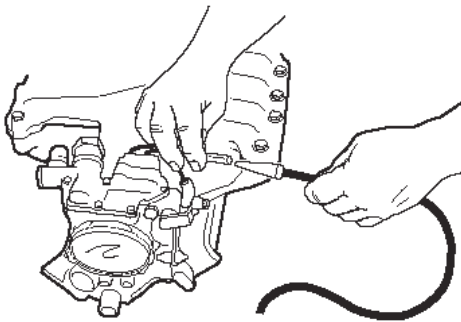


Figure 6

Other Leak Detection Applications:

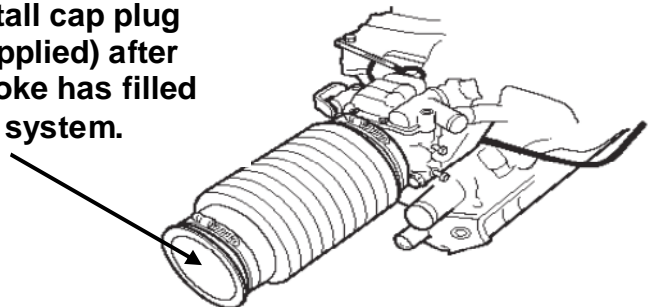
- Vacuum and induction leaks.
- Exhaust leaks.
- EGR valve leaks.
- Oil seals and gasket leaks.
- Idle motors and solenoid leaks.
- Brake booster leaks.
- Component testing (radiators, water pumps and valves).
- Under dash leaks.
- Intercooler and turbo charger leaks.
- Wind and water leaks (windows & sunroofs).

1. **Vacuum and Induction Leaks:** Select the correct size cap plug (supplied) to seal the system – but do not seal the system yet. (You should first purge all the non-smoke air out of the system being tester before you seal the system with the cap plug).
> It is best to seal the engine's intake as close to the air inlet origin as possible to inspect the entire system. This is especially important on engines equipped with mass airflow sensors and related ducting connecting it to the intake system. If the system you are testing cannot be sealed with the kit we have provided, it will become necessary to seal the intake by other means. For example; wrap the vehicle's air filter with cellophane and reinstall into the air filter housing and secure. The cellophane will prevent most of the smoke from exiting the intake system, allowing you to create a satisfactory seal in the system you are testing for leaks. Or you may choose to use a latex rubber glove and a strong rubber band to accomplish this task. Simply stretch the wrist of the glove around the air passage and secure with the rubber band. You may choose to plug the tail pipe of the vehicle with the exhaust cone that is provided -- be sure the exhaust cone's hose is also plugged. (It is possible that smoke pressure can be lost out the exhaust if both an intake and exhaust valve are open in the same cylinder at the same time).
2. Select a vacuum line on the engine that is easily accessible and insert the tapered brass nozzle into this line.
> The supply line to the brake booster is a good choice when introducing smoke into the intake manifold. It is important to make sure that you enter this line at a point where the check valve will not interfere with the smoke flow.
3. Press the ON / OFF button once to turn the tester ON. Let the tester run until the system is filled with smoke. (30 seconds to 1 minute is usually sufficient time to fill the induction system).
4. Seal the system once smoke is observed exiting a leak.
5. Turn the tester ON and OFF in 30-second intervals until you pinpoint the leak – or at an interval that will allow the smoke pressure to decrease in order to see the smoke even more easily.
6. Use the halogen light supplied to identify the origin of the smoke or use a UV light (not supplied) to look for residual traces of the fluorescent dye that was left behind by the smoke.

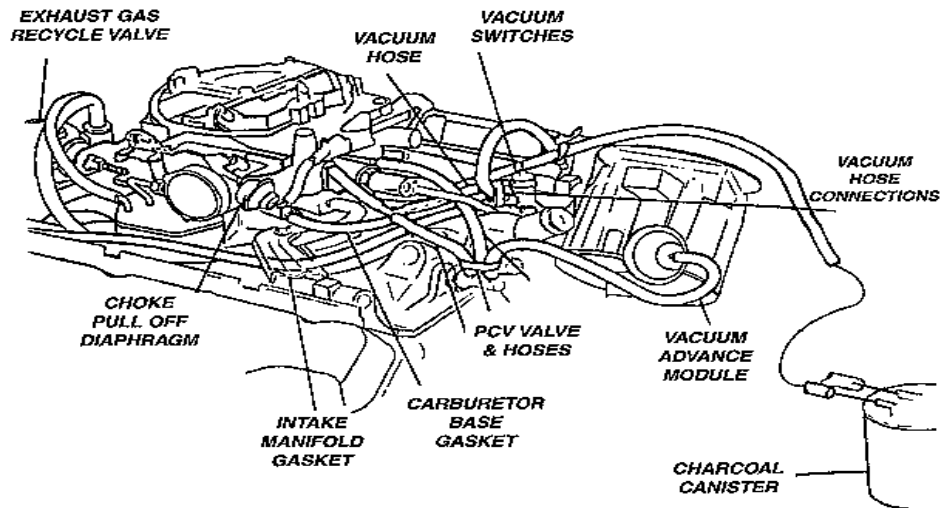


Introduce smoke through an easily accessible vacuum line.

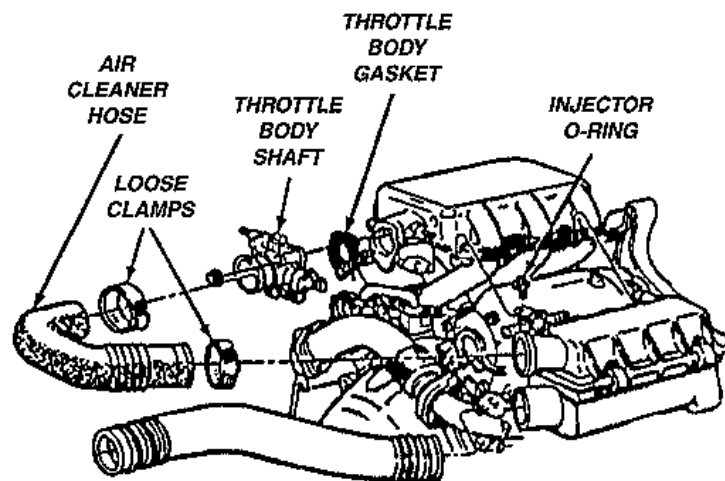
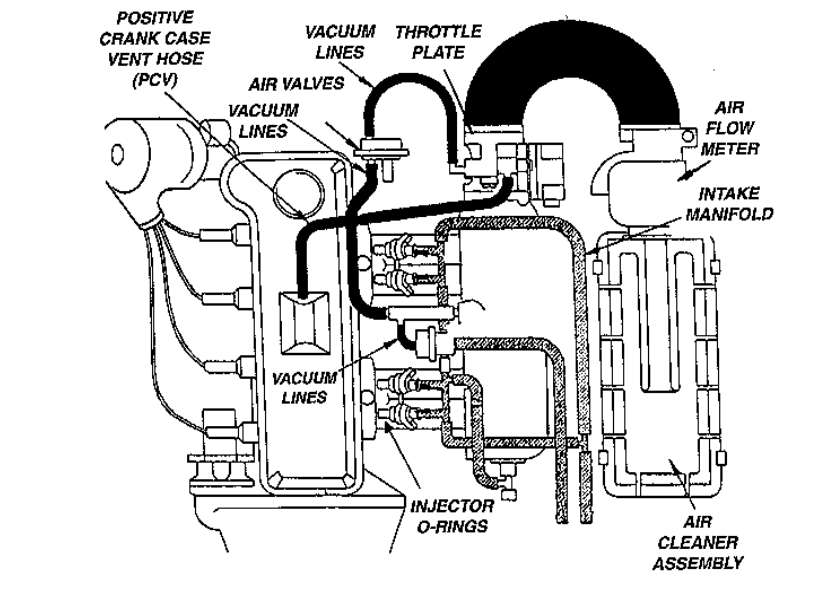
Install cap plug (supplied) after smoke has filled the system.



Carbureted Engines and Typical Leak Sources



Fuel Injected Engines and Typical Leak Source



Exhaust Leaks: Escaping exhaust gases can be very toxic to the occupants of a vehicle yet these repairs are neglected — but so easy to find with the EELD601.

1. Put the vehicle on a lift to expose the underside. With the engine off, simply insert the exhaust adapter cone into the tail pipe of the vehicle being tested (Figure 7). Insert the smoke supply line nozzle into the exhaust cone's hose opening and press the ON / OFF button.
 - > On dual exhaust systems, install a cone in each tail pipe. Be sure one cone is plugged.
 - > Most exhaust systems will fill in less than two minutes.
2. Look for the smoke exiting wherever there is a leak.
3. Even though exhaust leaks are very easy to find with EELD601, here are two helpful tips to make finding exhaust leaks even easier:
 - (a) It is best to test a cold exhaust system rather than a hot one. A very hot catalytic converter may consume some of the smoke. But most importantly, many small exhaust leaks are only visible on a cold exhaust system due to 'thermal expansion'.
 - (b) Seal off the vehicle's intake system in order to achieve proper system pressure in the event both an intake and exhaust valve are open in the same cylinder at the same time.

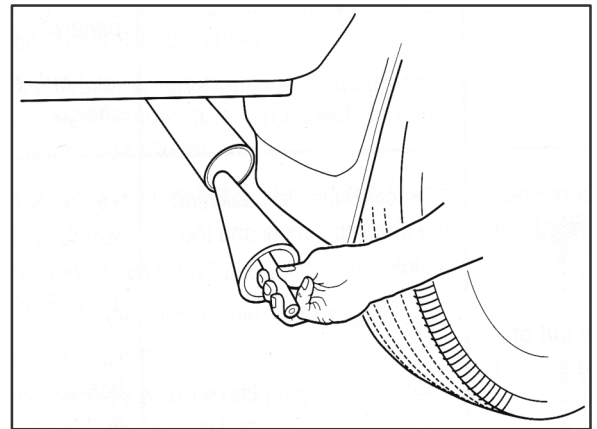
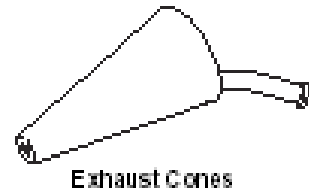


Figure 7

EGR Valve Leaks: The exhaust gas re-circulating (EGR) valve is at the heart of the emission control system. Since the EGR valve operates in such a hostile environment it is always susceptible to leakage. During a normal test for vacuum leaks, the EGR valve will be exposed to smoke and may show leaks at the seat, diaphragm, or even the base gasket.

If smoke is seen exiting the EGR valve, disconnect the vacuum supply line and introduce smoke directly into the valve. This will verify if the diaphragm is leaking, or if the valve is leaking at the seat.

Smoke may also be used to check the EGR ports for restriction. Open or remove the valve and introduce smoke through the tail pipe to verify that these ports are open.

Tech Tip - Testing the EGR Pintle Shaft: This will help you diagnose a good or bad EGR valve and other "metered" leaks.

1. Do not cap off any part of the engine – leave it in normal operating state (but NOT running). Insert the EELD601 supply hose into a direct vacuum manifold source, such as a brake booster hose or PCV. Turn the tester ON. Watch for smoke to escape from the EGR valve. If you see a lot of smoke, move on to the next step.
2. Cap off the intake using one of the cap plugs supplied with the EELD601. Insert the exhaust cone into the tailpipe. (The hose on the exhaust cone should be plugged with the cap plug provided.) Now that the system is sealed, press the remote button and watch for smoke. A small amount of smoke indicates an acceptable EGR valve.

Oil Seals and Gasket Leaks: Many oil leaks can be located with the EELD601. It is important to understand that the EELD601 will only find leaks that will allow air to flow through them. Example: A cam seal may allow air to pass through whereas a drain plug or pressure sensor will not. To locate oil leaks it is necessary to pressurize the crankcase with smoke.

1. Remove the dipstick and slip a hose over the dipstick tube, and insert the smoke supply nozzle into the hose.
2. Plug the PCV, air breather, and intake. Remove the oil filler cap.
3. Introduce smoke into the crankcase until smoke is seen exiting the oil filler port.
4. Install the oil filler cap and continue filling the system.
5. Use the spotlight to check for leaks, which could appear as seeping smoke, bubbling oil with little or no smoke, or dripping oil with no smoke at all.

Brake Booster Leaks: A leaking vacuum brake booster not only effects engine performance like other types of vacuum leaks, but more importantly, it can seriously affect the stopping power of the vehicle. The brake booster is a simple component to check for leaks.

1. Disconnect the vacuum supply line and the check valve from the brake booster.
2. Insert the smoke supply nozzle into the brake booster and begin introducing smoke.
3. Under the hood, look for smoke exiting around the crimped area of the booster canister. Also look inside the vehicle under the dash.

NOTE: Do not depress the brake pedal while performing this test.

Component Leak Testing (radiators, water pumps, valves, etc.): When installing new or rebuilt parts nothing is more frustrating than to discover on completion of the job that the component is faulty, or has a leak. It is far easier to inspect a radiator or water pump before it is installed than to find out after the job is completed and the antifreeze/coolant is installed, that there is a leak. Component leak testing has endless possibilities; anything from hoses to diaphragms can be tested. Supplied with every EELD601 is an exhaust cone adapter that can be used to access any opening from 1" to 3-½". Simply introduce smoke into the system being tested, allow to fill with smoke, then seal any inter-connecting ports or passages and look for the smoke or dye at exit points.

Under Dash Leaks: Under dashboard leaks can be very difficult to locate without a smoke machine. The EELD601 can confirm or eliminate the possibility of an under dash leak in minutes. Most vehicles have a common vacuum supply line that originates at the engine intake. This vacuum source comes through the firewall to supply the climate control functions as well as other systems in the vehicle. Vacuum systems under the dashboard are intended to be closed systems; any flow through these systems would indicate that there is a leak present.

1. Connect the supply nozzle to the main vacuum line (beyond the check valve) leading to the dashboard.
2. Introduce smoke into the system and watch the flow meter's indicator ball. If the ball drops to zero the system is leak-free.
3. Continue to introduce smoke into the system while testing each setting on the climate control. Watch the flow meter, as you change the climate control settings, for any indication of flow confirming a leak.
4. Continue to introduce smoke into the position determined to have a leak. Use the spotlight to look for the smoke exiting the leak, or use a UV lamp to look for the dye deposited.

Intercooler and Turbo Charger Leaks: Engine compartments with turbochargers tend to run hotter than normally aspirated engines causing hoses and seals to dry out and leak. For turbocharged systems to operate efficiently there can be no leaks in the intercooler, ducting, exhaust or the turbo itself. Intercoolers and turbochargers are tested with the engine off, as with all tests performed with the EELD601.

1. Connect the smoke supply line to the intake system.
2. Introduce smoke into the “cold” side of the turbocharger.
3. While the intake is under smoke pressure, inspect the intercooler, the ducting, the waste gate, and the cold side of the turbo for leaks.
4. To inspect the “hot” side or exhaust side of the turbo for leaks, install the exhaust cone into the exhaust pipe. Introduce smoke and inspect the exhaust, the exhaust manifold, and the hot side of the turbocharger.

Wind and Water Leaks from sunroofs, windows and windshields: One of the toughest leaks to find on an automobile is wind / water leaks around the doors, windows, and sunroofs or into the trunk compartment. It isn't safe or practical to search for these leaks while driving at 65 M.P.H. although that is when they are most noticeable. Old fashioned ways of locating where the wind and water is entering the vehicle may identify the leak, but this does not locate the *origin* of the leak, as you can with EELD601.

1. Park the vehicle in an area that is shielded from the wind (preferably inside a closed facility).
2. Turn the vehicle's ignition to the ACCESSORIES position.
3. Turn the heater/AC blower to FRESH AIR and HIGH. (Verify the blower is NOT set to the recirculation mode.)
4. Close the vehicle's doors and windows. The cabin of the vehicle is now under a slight positive pressure.
5. Attach the Diffuser (available as an optional accessory) to the end of the tester's hose. (See Figure 8)
6. Turn the tester ON with the selector switch set to SMOKE.
7. From outside the vehicle, position the tip of the diffuser about 2 – 3 inches away from the vehicle, and follow a path along the areas you wish to test. The smoke will linger on the path you are following until a leak is present. The air exiting the vehicle will cause the smoke to be disrupted, identifying the source of the leak.

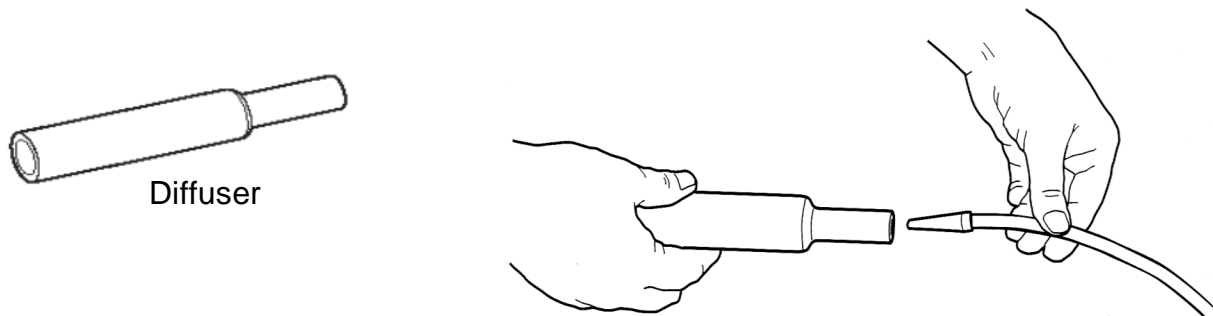


Figure 8

Calibrating System-Pressure:

Calibration Gauge
Part No. 060-30IW
(not supplied)



Figure 10



Figure 11

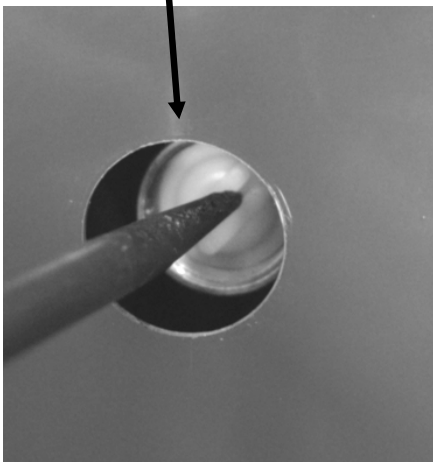


Figure 12

The EELD601 has been calibrated at the factory and **adjusting the tester's supply pressure is NOT recommended as part of any scheduled maintenance.**

However, most OEMs require that an EVAP-approved tester have a calibrating option, so the ability to calibrate the tester in the field has been provided for you.

Confirming if the tester needs adjustment

1. For calibration purposes, you will need a water column pressure gauge reading in inches of **water** (H₂O) (such as Vacutec part # 060-30IW), **not** inches of mercury (Hg).
2. Connect tester to air pressure.
3. Connect tester to 12-volt power.
4. Connect tester's supply hose to the water column gauge.
5. Press tester's ON/OFF button to turn tester ON.
6. Read water column gauge. Be sure it is between 13"-14".
7. Proceed to step 8 if the tester's pressure is not between 13"-14" (H₂O).

Adjusting System Pressure

8. Remove the plastic cap covering the tester's adjuster. (See figure 11)
9. Be sure you have performed steps 1-6 above and that you are now on step 6 with the tester ON.
10. Use a flat-blade screwdriver to adjust the system pressure between 13"-14" H₂O (See figure 12).



CAUTION: Carefully adjust the system pressure regulator by turning the adjuster in only 1/8 turns at a time. Turning the regulator plunger too far clockwise will cause the plunger to lock up; turning the regulator plunger too far counterclockwise will cause the plunger and spring to fall out of the regulator.

11. Disconnect the tester's supply hose from the calibration gauge and reconnect it again. Verify that system pressure is between 13"-14" H₂O; if not, repeat steps 9 and 10, as necessary.
12. Turn tester OFF.
13. Replace the plastic cap as shown on Figure 11.

Troubleshooting:

The EELD601 is controlled by a sophisticated microprocessor controller. Below is a chart describing some of the diagnostic light functions.

Diagnostic Lights

Green	Red	Interval	Probable Cause
✓		Constant ON	Sufficient battery power
✓		Blinks every one (1) second	Insufficient battery power
✓	✓	Blink simultaneously every one (1) second	Power connection at battery is loose or there is short in heating circuit (could also be bad ground or power connection at smoke canister)
✓	✓	Blink simultaneously @ 4 blinks per second	Open heating circuit (could also be bad ground connection at smoke canister)
✓	✓	Blink alternately @ 1 blink per second	Circuit board failure *
* If this occurs; first try disconnecting power to the tester for 10 seconds; then reconnect power. If this failure code occurs a second time during operation, disconnect tester and contact manufacturer.			

Troubleshooting Guide

Symptom	Likely Cause	Solution
The green power indicator lamp on the tester does not come ON.	1. The power cables are reversed. 2. Poor power-supply cable connection. 3. Battery providing power is too weak.	1. <i>Correctly position the power cables.</i> 2. <i>Secure the connection at the positive terminal and chassis ground.</i> 3. <i>Verify the battery is in good condition and fully charged.</i>
I turn the tester ON but there is no air or smoke coming out of the supply hose.	1. Tester is not connected to inert gas or shop air. 2. Poor power-supply cable connection. 3. Battery providing power is too weak.	1. <i>Connect tester to gas or shop air.</i> 2. <i>Secure the connection at the positive terminal and chassis ground.</i> 3. <i>Verify the battery is in good condition and fully charged.</i>
Smoke does NOT come out of the vehicle's fuel neck area when filling the EVAP system.	1. Fuel tank level is too high and is blocking the fuel neck passage.	1. <i>Reduce the fuel level in the tank so it is below the base of the fuel tank neck.</i>

Contact Info:

See your tool dealer to order smoke solution or accessories.

To speak to Technical Support:

1-888-822-8832 (Option 2)

In the unlikely event this product has a problem,
we would like you to contact the manufacturer directly.
This will insure a faster handling of your service needs.

Manufacturer:

Worldwide Vapor, Inc.

Tel - 1.888.822-8832 (Option 2) **or 714.438.1387**

Fax - 714.433.2840

info@vacutec.com

Frequently Asked Questions for models EELD601 & EVAPro 2000E:

Why do I need a special smoke machine like this Vacutec®?

The Vacutec® smoke machine contains smoke technology approved by the OEMs for EVAP and other testing. Extensive tests were conducted to make sure the smoke vapor (and the dye marker in the vapor) did not harm any vehicle components – especially the EVAP's activated charcoal. OEMs have determined that this patented technology is safe to use in their vehicles and will not void their vehicle factory warranties. This technology was also designed so that the smoke vapor could be produced with Nitrogen, in order to meet the OEMs' and industry safety requirements for EVAP testing. Additional safety features are built in.

Why should I use Nitrogen when testing an EVAP system?

Adding air containing 21% oxygen to a vehicle's vapor space can render it flammable. Only a volume of 11% oxygen is required to sustain combustion. See SAE document <http://www.sae.org/technical/papers/2007-01-1235>

I've heard some people say that the "OEM-Approved" smoke solution (oil) is the same as generic mineral oil, such as "baby oil", is that true?

No, that is not true. Doing a very simple comparative analysis of two oils to merely determine what the basic 'source' of the oil is can be very misleading. Most non-synthetic oils are of a "petroleum" base and many can be categorized as being a "mineral oil", but the end product can be significantly different. Upon closer analysis the truth is revealed. The oil that has been approved by all automakers using smoke technology is not "baby oil". In fact, even baby oil manufacturers say that baby oil is not intended for industrial use. The OEM-Approved oil is a highly refined mineral oil-based solution; blended in a special formula to be able to withstand the high temperatures during the oil's vaporization process; has been designed not to harm components; is patented and approved by all automakers using smoke technology. There are two approved solutions; the standard solution and the more popular UltraTraceUV® which contains dye.

Why didn't you incorporate a pressure gauge into the machine for testing pressure-decay?

Pressure decay has serious limitations and cannot indicate a 0.040" / 0.020" leak. With pressure decay you could be wasting your time looking for a leak that **didn't** cause that MIL lamp problem you are trying to fix. It's best to use the machine's flow meter and calibrate for an exact leak size.

Why doesn't this smoke machine offer a way to adjust the smoke delivery pressure?

One major safety feature requirement was to design the machine so that its delivery pressure was not adjustable. That avoids mistakes of setting the pressure to dangerous levels when testing EVAP systems.

Why doesn't this smoke machine offer a way to adjust the smoke volume?

Adjusting the smoke volume (or flow) merely reduces the amount of smoke the machine can flow and does little to assist in finding leaks. Leaks are easier to see by reducing the pressure of the smoke in the system being tested, not by reducing the volume of the smoke while maintaining the same pressure. A simple way to reduce the pressure in the system being tested is to toggle the smoke machine OFF for a few seconds after filling. That reduces the pressure in the system, making smoke exiting a small leak even easier to see.

In operating the tester, how can I be sure I am not connected to a plugged or restricted line and think I am introducing smoke into the system being tested but really I am not?

Simply by looking at the flow meter. If the flow meter's ball is at zero, that indicates there is no flow.

How long will the tester continue generating smoke?

One 16-oz. container should last about 500 tests. However, you should top off the solution level regularly.

Does the EELD601 require any assembly?

NO! The tester arrives ready for work, fully assembled and with a full charge of smoke-producing solution. Simply connect it to shop air or nitrogen and 12-volt DC power.

Wouldn't a smoke machine that generates a higher smoke pressure detect leaks better?

First of all, the pressure this tester delivers has been determined by the automotive industry as the required pressure when testing their EVAP systems and must not be exceeded. In addition, trying to detect a leak with vapor/smoke pressure much higher than this tester is actually less effective. The lower the smoke pressure, the more visible the smoke becomes.

Warranty:

LIMITED TWO (2) YEAR WARRANTY

Manufacturer Model Numbers: Vacutec® EVAPro 2000E & EELD601

Worldwide Vapor, Inc. warrants the Vacutec® to the Original Purchaser that under normal use, care and service, the Equipment (except as otherwise provided herein) shall be free from defects in material and workmanship for TWO YEARS from the date of original invoice.

This Warranty does not cover (and separate charges for parts, labor and related expenses shall apply to) any damage to, malfunctioning, inoperability or improper operation of the Equipment caused by, resulting from or attributable to (A) abuse, misuse or tampering; (B) alteration, modification or adjustment (other than calibration) of the Equipment; (C) installation, repair or maintenance (other than specified operator maintenance) of the Equipment or related equipment, attachments, peripherals or optional features by other than Seller's authorized representatives; (D) improper or negligent use, application, operation, care, cleaning, storage or handling; (E) fire, water, wind, lightning or other natural causes; (F) adverse environmental conditions, including, without limitation, excessive heat, moisture, corrosive elements, or dust or other air contaminants; radio frequency interference; electric power failure; power line voltages beyond those specified for the Equipment; unusual physical, electrical or electro-magnetic stress; and/or any other condition outside of Seller's environmental specifications; (G) use of the Equipment in combination or connection with other equipment, attachments, supplies or consumables not manufactured or supplied by Seller.

NO OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY, AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY EXCLUDED.

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.

This product contains licensed technology:



