

# EVAP DIAGNOSTIC SMOKE MACHINE INSTRUCTIONS

## SAFETY:

This user manual should not be used in place of common sense. Use this equipment in a manner that is specified with the vehicle manufacturer. Understand all the test procedures before attempting to use this equipment. Follow all safety precautions.

- All diagnostic work should be performed with the engine off.
- Do not leave the vehicle unattended when the equipment is connected or operating.
- This equipment must be connected only to a fully charged 12VDC vehicle battery.

## WARNING:



- Do not use any other type of power source to run this equipment.
- Do not use this equipment near a source of spark or ignition.
- Always use this equipment in a well-ventilated area.
- Always wear eye protection and gloves when using this equipment.

## SPECIFICATIONS:

- Voltage: 12 VDC
- Input Pressure: Max 100 psi (8.2 bar)
- Output Pressure: 12 – 14 inH<sub>2</sub>O (30 – 35 mBar)
- Safety Pressure Relief: 120 (±5) psi
- Auto Shut-off: 5 minutes
- Oil Fill Line Indicator: 3.4 oz (100 ml (±10 ml))
- Flow Meter: 0 - 0.040 in. (0 - 1.0 mm)
- Weight: 11.9 lbs (5.4 Kg)
- Power Consumption: Max 6.5 Amps
- Operating Temperature: 0 °F to 140°F (-17°C to 60°C)
- Operating Humidity: No Restrictions
- Operating Altitude: No Restrictions
- Vapor Output Hose: 10 feet
- Power Cable: 10 feet
- Pressure Supply: Air/Inert gas/Pump
- Dimensions: 11.8 x 8.1 x 11 in (300 x 205 x 280 mm)



## INCLUDED ACCESSORIES:








1. Full set of block off caps
2. Exhaust cone
3. Evap schrader valve remover/installer
4. Evap service port adapter hose (green cap)
5. High intensity smoke illuminating battery powered flashlight
6. 8 oz smoke producing fluid

## MACHINE COMPONENTS:



1. Smoke vapor switch
2. Internal pump switch
3. Smoke indicator light
4. Power source light
5. Internal pump indicator light
6. Compound pressure gauge
7. Flow meter with control knob
8. Oil fill
9. Smoke hose fitting & smoke hose cap fitting
10. Shop air/inert gas inlet
11. Maximum oil level
12. 12 VDC power cord connection

## APPLICATION GUIDE:

					
Leaks					
Evap	●	●	⊘	⊘	●
Vacuum	●	●	■	⊘	●
Oil	●	●	■	■	●
Exhaust/Sensors	●	●	■	●	●
Intake/Sensors	●	●	■	●	●
Windows/Sunroof/Cabin	●	●	●	●	●
Manifolds	●	●	■	●	●
Turbochargers	●	●	■	●	■
Seals & Hoses	●	●	■	●	●
	● excellent	■ suitable	⊘ not supported		

## SETUP:

Connect the smoke hose:

1. Remove the smoke hose fitting cap.
2. Connect the smoke hose to the smoke hose fitting.

## FILL THE UNIT WITH OIL:

1. Remove the oil fill cap.
2. Open the cap from the oil bottle from the accessory box.
3. Remove the foil on top of the oil bottle.
4. Put the cap with the nozzle and red cap on the oil bottle.
5. Remove the red cap and fill the unit with oil up to the maximum oil level.

**NOTE:** Do not over fill.

**NOTE:** The smoke hose needs to be attached in order to vent the unit to allow the oil to flow into the machine.

6. Replace the oil fill cap.
7. Store the remaining oil in the accessory box.

## CONNECT THE POWER CORD:

1. Connect the power cord to the unit. Connect the red wire with the red socket and the black wire with the black socket.
2. Connect the red clamp (+) to the positive battery terminal and connect the black clamp (-) to the chassis ground.

## HOW TO USE:

### Internal Pump:

1. Open the flow meter by turning the flow control knob counter-clockwise.
2. Press the PUMP button.
3. The unit will pump air into the system being tested.
4. Once the system is pressurized, the flow meter will show the size of the leak if one is present. If no leaks are present, then the ball in the flow meter will drop to the bottom of the flow meter.

**NOTE:** Some vehicles can not be completely sealed.

### Air/Inert Gas:

1. Open the flow meter by turning the flow control knob counter-clockwise.
2. Connect shop air or Inert gas to the quick disconnect on the back of the unit.
3. The gas will pass through the machine and into the system being tested.
4. Once the system is pressurized, the flow meter will show the size of the leak if one is present. If no leaks are present, then the ball in the flow meter will drop to the bottom of the flow meter.

**NOTE:** Some vehicles can not be completely sealed.

### Smoke:

1. To pressurize a system with smoke. Use one of the two air sources, Internal Pump or Air/Inert Gas.
2. Press the SMOKE button and the unit will produce smoke for 5 minutes and then the smoke will automatically shut off. If additional smoke is needed, press the SMOKE button again for another 5 minutes of smoke production.

### Finding Leaks:

1. Once the system is pressurized with smoke, use the flashlight from the kit to search for leaks. If a leak is present the smoke will illuminate when the light passes through the smoke.

### Leak Decay Testing:

1. Pressurize the system until the gauge reaches 0.5 PSI EVAP CHECK.
2. Cap the pressure in the system by turning the flow meter control knob clockwise until the flow meter is closed.
3. Observe the pressure reading on the pressure gauge. If the gauge does not lose pressure then there are no leaks present. If the gauge does lose pressure then a leak exists. The flow meter will indicate the size of the leak.

4. Use the SMOKE to find the leak.
5. Repair and re-test until no more leaks are found.

## **DIAGNOSIS:**

### **EVAP Leaks:**

1. Verify that a leak is present using the Leak Decay Test with the Internal Pump or Air/Inert Gas.
2. If the vehicle has an EVAP service port (Green Cap) then remove the schrader valve with the removal/installer tool that is supplied with the kit. (NOTE: The schrader valve has left-hand threads. Turn the valve clockwise to remove) Attach the service port adapter that is supplied with the kit to the EVAP service port. Attach the EVAP service port adapter hose to the smoke hose cone.  
If the vehicle does not have an EVAP service port, then one of the EVAP vacuum hose will have to be disconnected. One hose will have to be capped with the plugs that is supplied with the kit. Attach the other hose to the smoke hose cone.
3. Use a scan tool to close the EVAP canister vent solenoid.
4. Pressurize the system until the gauge reaches 0.5 PSI EVAP CHECK.
5. Cap the pressure in the system by turning the flow meter control knob clockwise until the flow meter is closed.
6. Observe the pressure reading on the pressure gauge. If the gauge does not lose pressure then there are no leaks present. If the gauge does lose pressure then a leak exists. The flow meter will indicate the size of the leak.
7. To find the leak, press the SMOKE button to start the 5 minute smoke cycle and open the flow meter control knob counter-clockwise.
8. Remove the fuel cap. When smoke is present exiting the fuel tank, re-install the fuel cap.
9. While the smoke is still being pumped into the vehicle, use the flashlight to locate the leak(s).
10. Repair and re-test until no more leaks are found.

### **Intake Leaks:**

1. Disconnect the intake air duct from the air filter box.
2. Insert the cone adapter that is supplied with the kit into the intake duct.
3. Attach the cone adapter to the smoke hose cone.
4. Pressurize the system by pressing the PUMP button or use external Air/Inert Gas.
5. Press the SMOKE button.
6. Use the flashlight to locate any leaks.  
**NOTE:** Some vacuum hoses may need to be capped to find small or to isolate leaks.  
**NOTE:** Some intakes may not be 100 percent sealed by design.
7. Repair and re-test until no more leaks are found.

### **Vacuum Lines and Vacuum Component Leaks:**

1. Disconnect the vacuum line for the component or vacuum circuit that is to be tested.
2. Insert the smoke hose cone to the vacuum line.
3. Pressurize the component or circuit by pressing the PUMP button or use external Air/Inert Gas.
4. Press the SMOKE button.
5. Use the flashlight to locate any leaks.  
**Note:** The air filter box may need to be sealed so that the circuit being tested does not back flow into the air filter box.  
**Note:** Some vacuum hoses may need to be capped to find small or to isolate leaks.  
**Note:** Some vacuum components may be not be 100 percent sealed by design.
6. Repair and re-test until no more leaks are found.

### **Exhaust Leaks:**

1. Insert the cone adapter that is supplied with the kit into the tail pipe of the exhaust.  
**NOTE:** If the vehicle has dual exhaust, use the cap plugs to seal the other tail pipe.
2. Pressurize the exhaust system by pressing the PUMP button or use external Air/Inert Gas.
3. Press the SMOKE button.  
**NOTE:** Some smoke may be consumed by a hot catalytic converter.
4. Use the flashlight to locate any leaks.  
**NOTE:** Exhaust leaks are easier to find when the exhaust system is at ambient temperature.
5. Repair and re-test until no more leaks are found.

### **Under the Dashboard Leaks:**

1. Disconnect the vacuum line for the component or vacuum circuit that is to be tested.
2. Insert the smoke hose cone into the vacuum line.
3. Pressurize the circuit by pressing the PUMP button or use external Air/Inert Gas.
4. Press the SMOKE button.
5. Check the pressure gauge and the flow meter while cycling through the climate controls.
6. Changes in the pressure gauge or the flow meter readings will indicate which system is leaking.
7. Set the climate control to the system that is leaking.
8. Use the flashlight to locate any leaks.
9. Repair and re-test until no more leaks are found.  
**NOTE:** The central locking can be checked in the same manner. Activate the control solenoids while smoke is being pumped into the system.

## **MAINTENANCE:**

### **Cleaning the Flow Meter:**

1. Disconnect the unit from the power supply.
2. Disconnect the unit from external Air/Inert Gas source.
3. Remove the screw from the bottom of the flow meter bracket.

4. Swing the flow meter out of the cabinet and unhook the bracket from the cabinet.
5. Disconnect the flow meter from the unit by disconnecting the two hoses that are attached to the back of the flow meter.
6. Remove the bracket from the back of the flow meter.
7. Remove the cap from the top of the flow meter.
8. Turn the flow meter upside down to remove the ball.
9. Clean the inside of the flow meter with Isopropyl alcohol and dry thoroughly.
10. Clean the ball with a dry cloth.

**NOTE:** Do not use alcohol, cleanser or any detergent on the ball.

11. Assemble the flow meter in the reverse order.
12. Reinstall the flow meter into the machine in the reverse order.

**NOTE:** The blue hose is attached to the top of the flow meter. The red hose is attached to the bottom of the flow meter.

#### **Draining the Smoke Hose:**

1. Disconnect the unit from the power supply.
2. Disconnect the unit from external Air/Inert Gas source.
3. Disconnect the smoke hose from the back of the machine.
4. Hang the hose in a vertical position and place a container under the smoke hose.
5. Allow the excess oil to drain out of the smoke hose.
6. Reinstall the smoke hose.

#### **TROUBLESHOOTING:**

Problem	Solution
No Power Light	Ensure that the power is properly Connected
No Air Flow	<ul style="list-style-type: none"> <li>• Open the flow control valve</li> <li>• Check the air pump</li> <li>• Check that the hoses are not kinked or pushed into machine</li> </ul>
Not Enough Smoke	<ul style="list-style-type: none"> <li>• Check the fluid level</li> <li>• Open the flow control valve clockwise</li> <li>• Check that the hoses are not kinked or pushed into machine</li> <li>• Check the smoke light, if light is off press the smoke button. If using the internal pump, ensure that the pump is turned on</li> <li>• Turn the unit off. Wait 10 -20 minutes then start again.</li> </ul>
Poor Smoke Density or Volume	<ul style="list-style-type: none"> <li>• Insufficient smoke producing fluid: Refill</li> <li>• Flow control valve is partially closed</li> <li>• Smoke output hose is kinked</li> </ul>

 **WARNING:** Cancer and Reproductive Harm

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