Mastercool

Mastercool Digital Dual Smoke Machine

# Mastercool Digital Dual Smoke Machine User Manual



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## Mastercool Digital Dual Smoke Machine

**Specifications**

- Power Supply: Electric
- Screen: 3.5″ LCD Color Screen
- Features: PAGE UP, ENTER button, EXIT, PAGE DOWN, Oil Fill Port, Smoke Outlet
- Recommended Oil: No. 26 Food Grade Mineral Oil

## Product Usage Instructions

**Setup**

1. **Connect the Smoke Hose:** Attach the smoke hose to the fitting on the operation panel.
2. **Fill the Unit with Oil:** Use No. 26 food grade mineral oil (max 0.5 oz at a time). Check oil level without screwing in the dip stick.
3. **Connect the Power Cord:** Match red wire with red socket, black wire with black socket. Connect red clamp to the positive battery terminal and black clamp to chassis ground.

**How to Use**

**High Pressure (HP) Smoke Test Procedure**

1. Select Smoke Test by pressing the Test icon highlighted in red.
2. Understand function introduction.
3. In Professional mode, find commonly used systems and recommended pressure settings.
4. In Custom mode, manually set pressure value (refer to manufacturer’s recommendations).
5. Select the system to be tested.
6. Set the test pressure using scroll buttons; it should be equal to or less than the operating pressure of the system.
7. Adjust the test time using scroll buttons.
8. Follow the on-screen instructions and press the button to start pressurizing the system.
9. Follow key operation instructions.

**Frequently Asked Questions (FAQ)**

**Q: What type of oil should I use with the smoke machine?**
A: It is recommended to use No. 26 Food Grade Mineral Oil. Add 0.5 oz at a time and monitor the oil level using the dipstick.

## DIGITAL DUAL SMOKE MACHINE USER MANUAL

### SAFETY

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 12 VDC 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.
- Do not put shop air into the smoke hose or the smoke hose connection. DAMAGE WILL OCCUR.

## SPECIFICATIONS

- Voltage: 12 VDC

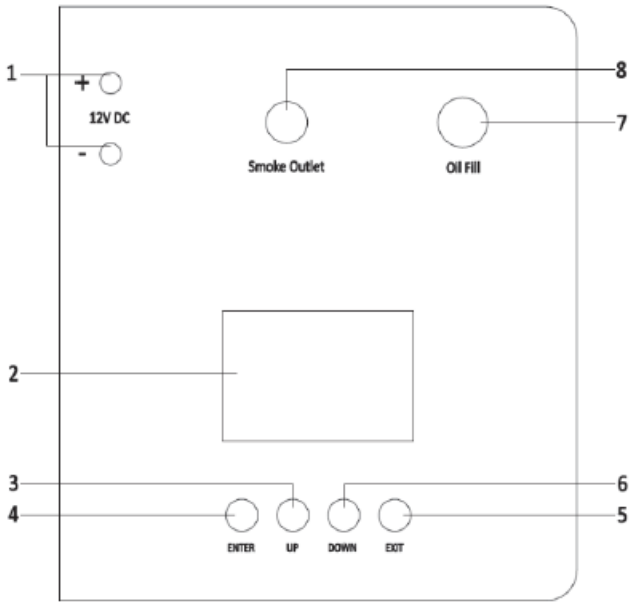
### Output Pressure

- EVAP: 0.44-0.5 psi (30 – 35 mBar)
- HP internal pump Max 20 psi (138 kPa)
- Power: Max 6.5 Amps
- Smoke Output: 6 – 8 L/min
- Operating Temperature: 0°F to 140°F (-17°C to 60°C )
- Operating Humidity: No Restrictions
- Operating Altitude: No RestrictionsVapor Output Hose: 10 feet
- Power Cable: 10 feet
- Pressure Supply: Built-In Air Pump
- Smoke Test Time can be adjusted by the user

### MACHINE INDICATION

1. Power Supply
2. 3.5” LCD Color Screen
3. PAGE UP
4. ENTER button
5. EXIT

6. PAGE DOWN
7. Oil Fill Port
8. Smoke Outlet




**INCLUDED ACCESSORIES**

1. Full set of block off caps (Seals a variety of openings in order to pressurize system for testing)
2. Exhaust cone  (To introduce smoke into exhaust and induction systems)
3. EVAP schrader valve remover/installer
4. EVAP service port adapter hose
5. 2 oz smoke-producing fluid
6. Air intake bladder for intake testing (Inflatable block off bladder with a smoke pass-through)
7. Smoke hose (Introduces the smoke from the connection deviceto the object system)
8. Power cord
9. Bladder cap
10. Smoke hose cone gasket
11. Smoke hose gasket

**APPLICATION GUIDE**

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

**SETUP**

1. CONNECT THE SMOKE HOSE: Connect the smoke hose to the smoke hose fitting on the operation panel.
2. FILL THE UNIT WITH OIL: Recommend to fill with No. 26 food grade mineral oil (max 0.5 oz at a time). To check oil level, put the dip stick in the oil fill hole. DO NOT SCREW THE DIP STICK IN. Remove the dip stick and check the level. Replace the dip stick and tighten the cap.
3. CONNECT THE POWER CORD: Connect the power cord to the unit. Connect the red wire with the red socket and the black wire with the black socket. Connect the red clamp (+) to the positive battery terminal and connect the black clamp (-) to the chassis ground.

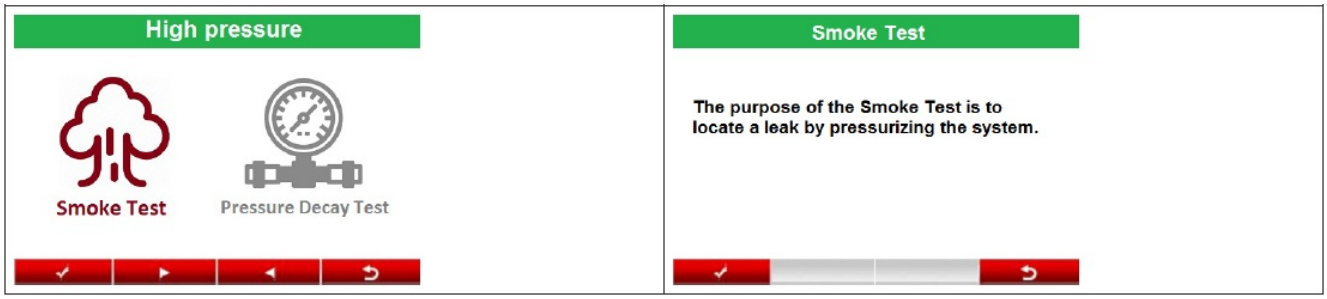
SELECT “High Pressure (HP)” OR “Low Pressure (EVAP)”:

NOTE: Do not pressurize the vehicles EVAP system when in “High Pressure (HP)” mode. Damage to the fuel tank and fuel system will occur.

## HOW TO USE

### HIGH PRESSURE (HP) SMOKE TEST PROCEDURE

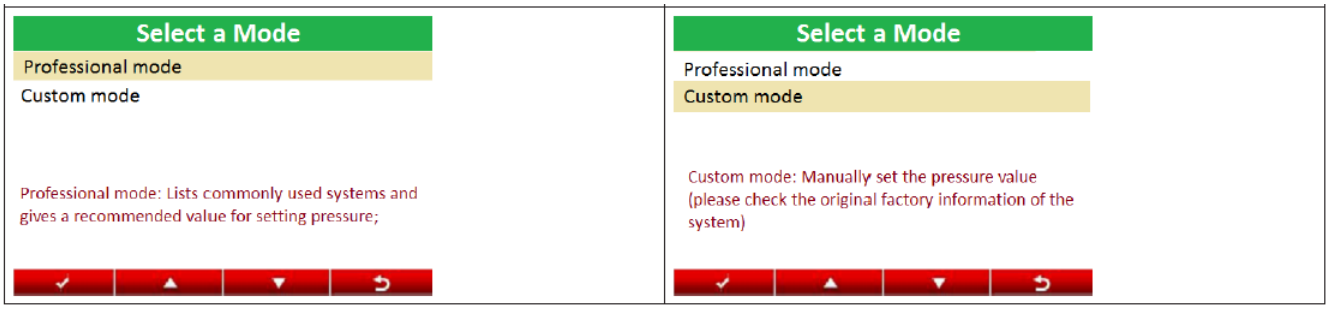
1. Select Smoke Test by pressing“select” ( ) button while Smoke Test icon is highlighted in red.
2. Function introduction.




3. Professional mode: Lists commonly used systems and gives a] recommended value for setting the pressure.
4. Custom mode: Manually set the pressure value

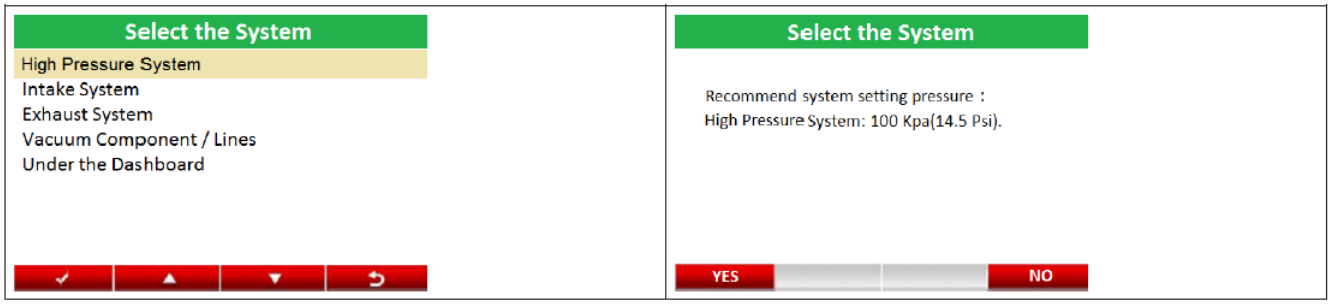
   NOTE: Check the manufacturers recommended pressure value.

   NOTE: When selecting “custom mode,” go to step 7

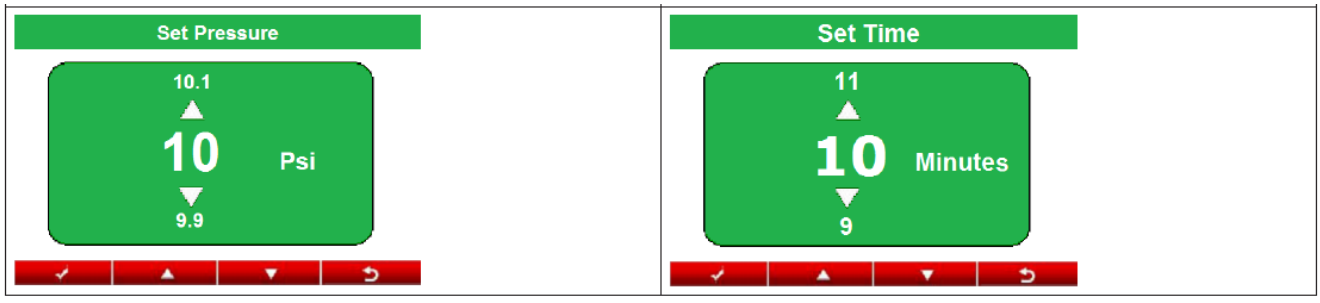



5. Select the System.
6. Pressure setting recommendations.

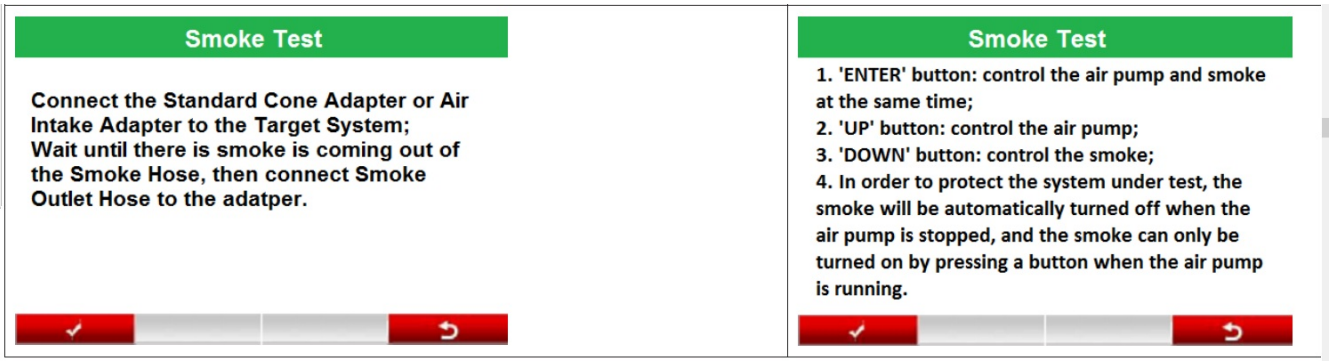
   NOTE: When selecting “professional mode,” go to step 8.



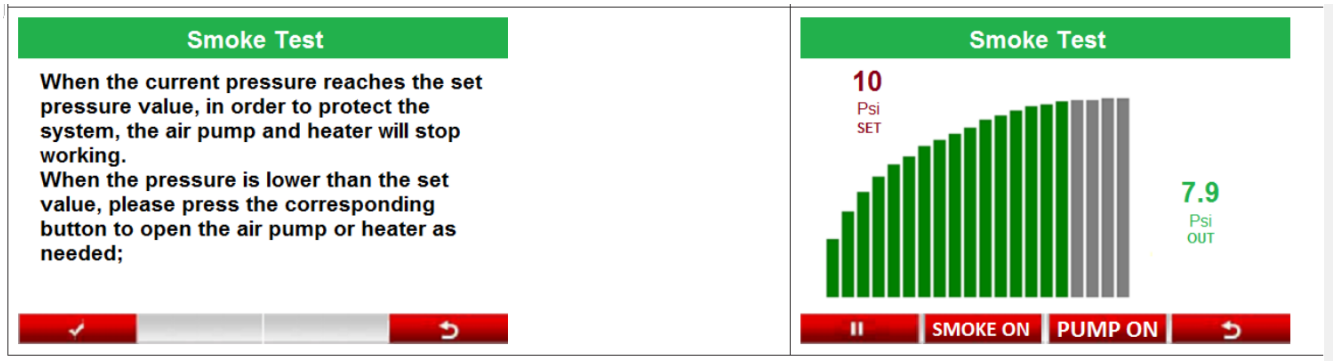

7. Set the test pressure by using the scroll buttons ( ) to set pressure. The test pressure should be the same or less than the operating pressure of the system being tested.
8. Set the test time by using the scroll buttons ( ) to set the time.



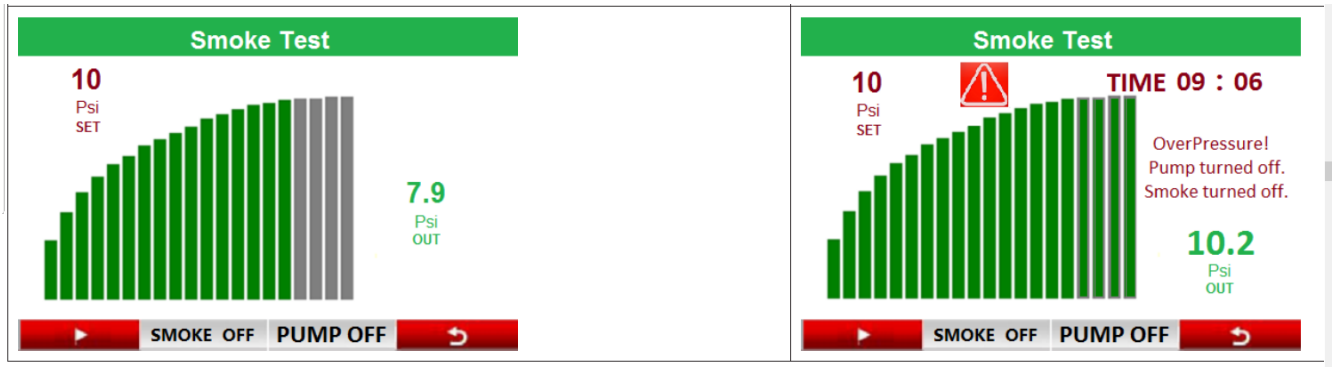
9. Follow on screen instructions and press the ( ) button to start pressuring the system.
10. Instructions for key operation.




11. Running instructions.
12. The buttons are Pause, Smoke, Air Pump, Exit; When the corresponding display position of the smoke and air pump is shown in the figure, it is turned on.

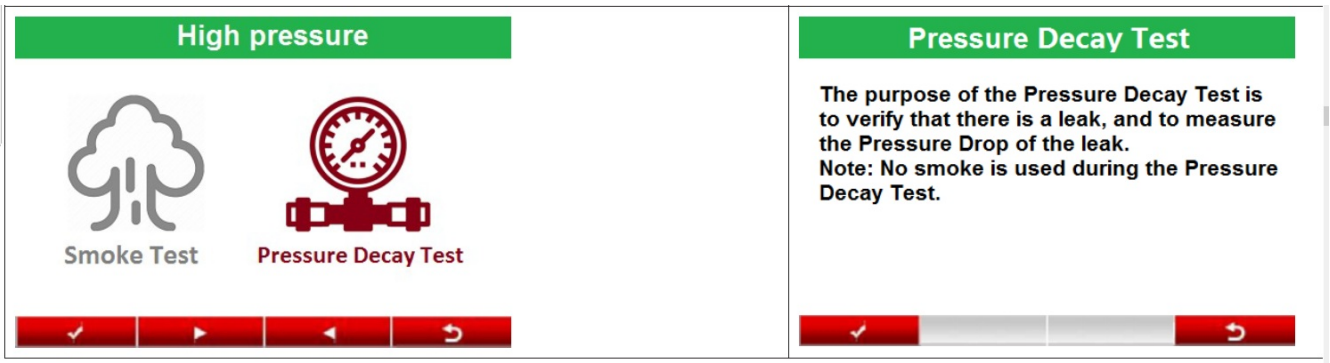



13. The buttons are Start, Smoke, Air Pump, Exit; When the corresponding display position of the smoke and air pump is shown in the figure, it is turned off.
14. Overpressure protection, with prompt interface, air pump with smoke off.




**HIGH-PRESSURE DECAY TEST PROCEDURE**

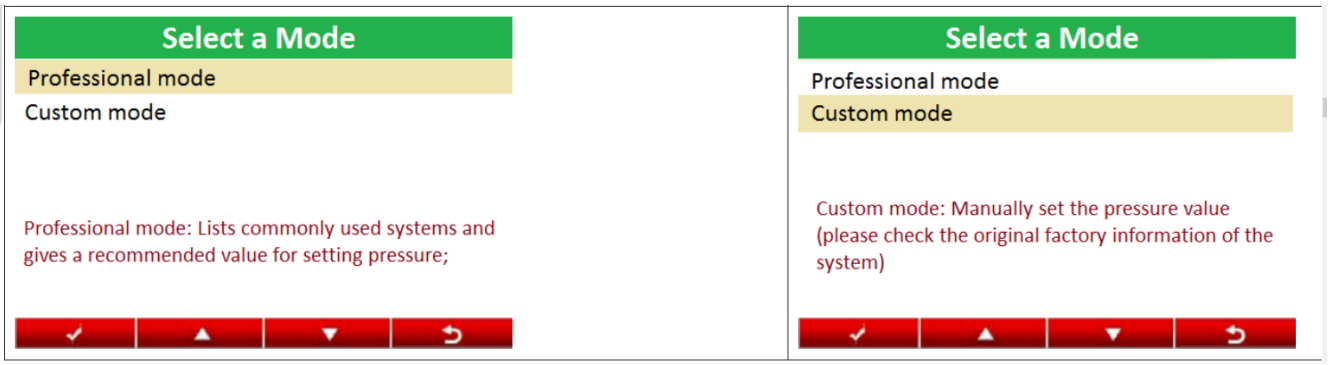
1. Select Pressure Decay Test by pressing“select”( ) button while Pressure Decay Test icon is highlighted in red.
2. Function introduction.



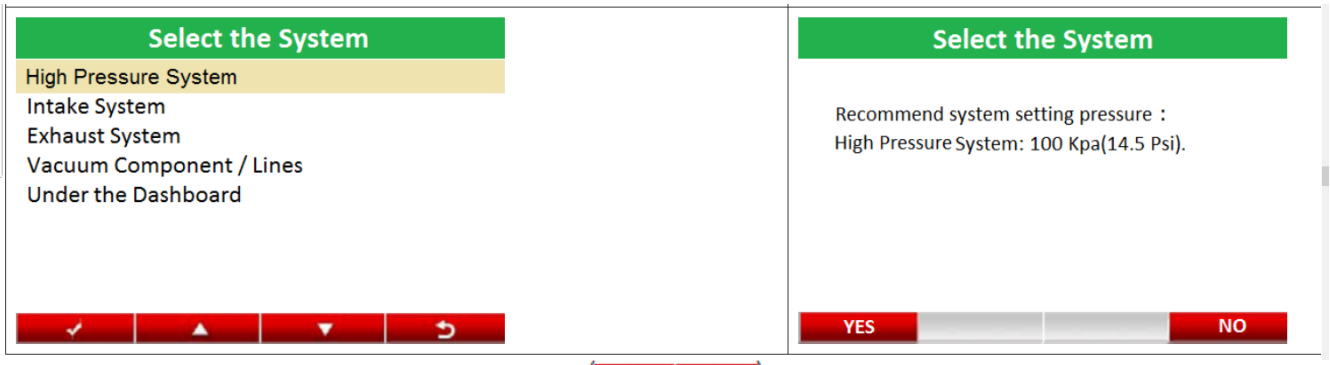

3. Professional mode: Lists commonly used systems and gives a recommended value for setting pressure.
4. Custom mode: Manually set the pressure value

   NOTE: Check the manufacturer's recommended value

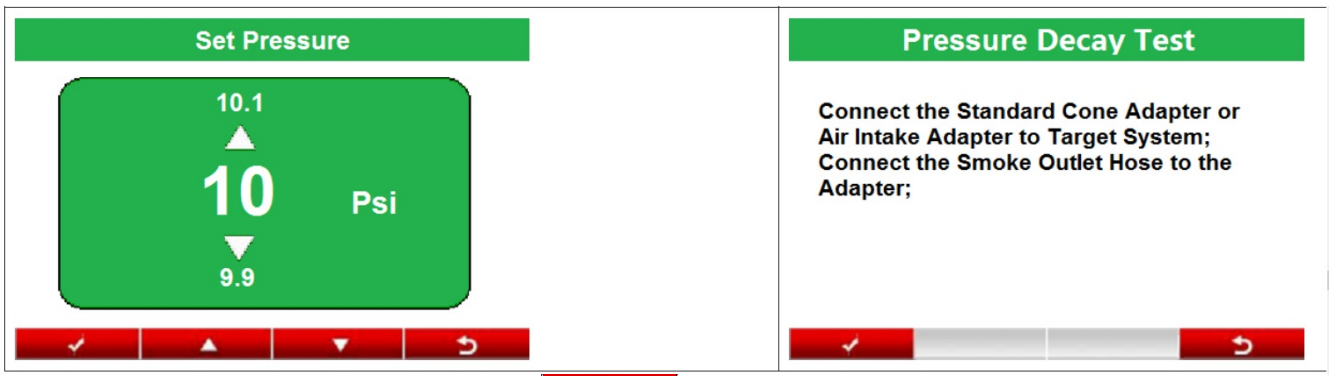
   NOTE: When selecting "custom mode," go to step 7.



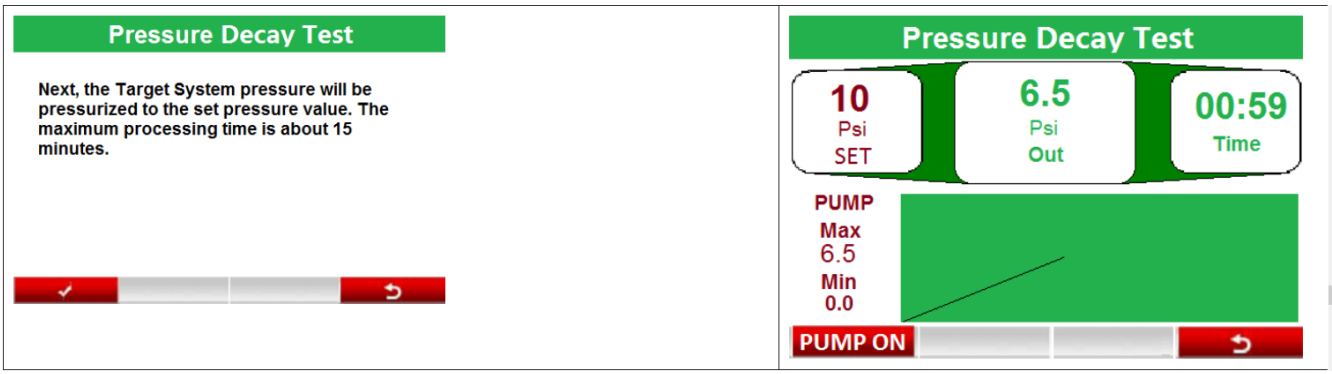

5. Select the System.
6. Pressure setting recommendations. NOTE: Select this to jump to Step 8.



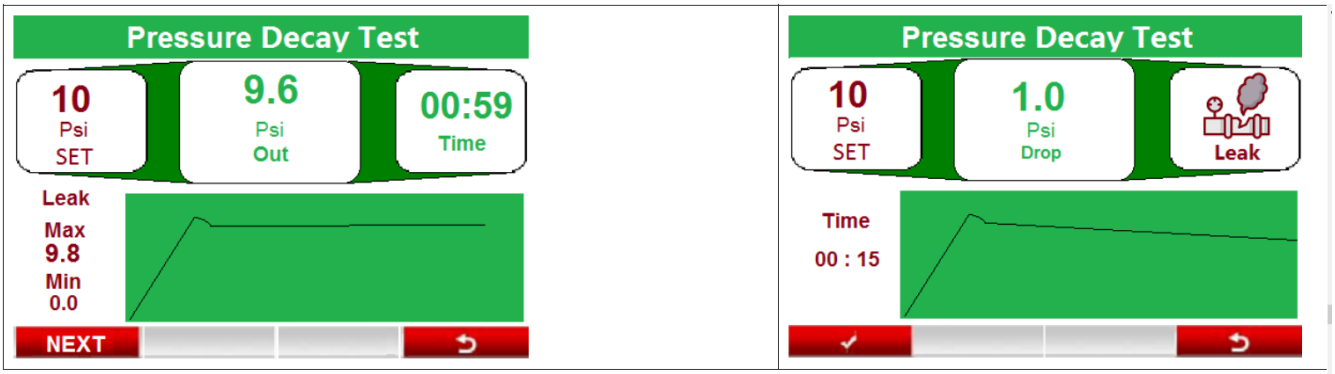

7. Set the test pressure by using the scroll buttons () to set pressure. The test pressure should be the same or less than the operating pressure of the system being tested.
8. Follow the on screen instructions and press the ( ) button to continue.




9. Follow on screen instructions and press the ( ) button to start pressuring the system.
10. The machine will fill the system with pressurized smoke until the set pressure is reached. Press the 'ENTER' (**pump on)** button to control the pump.



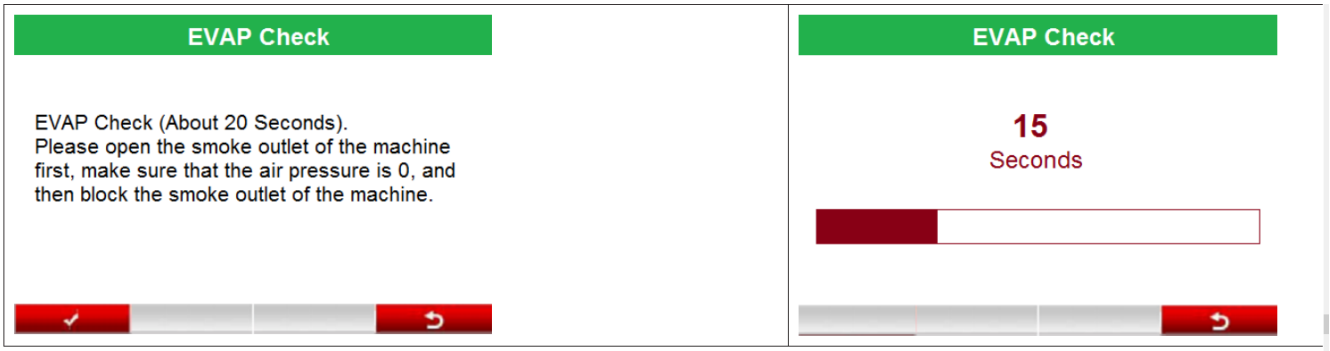

11. Leak the process. Press the 'ENTER' (**next**) button to go to the results screen.
12. Results: When the pressure decay test is complete the results will be displayed. These results can be compared with the manufacturer's specifications.



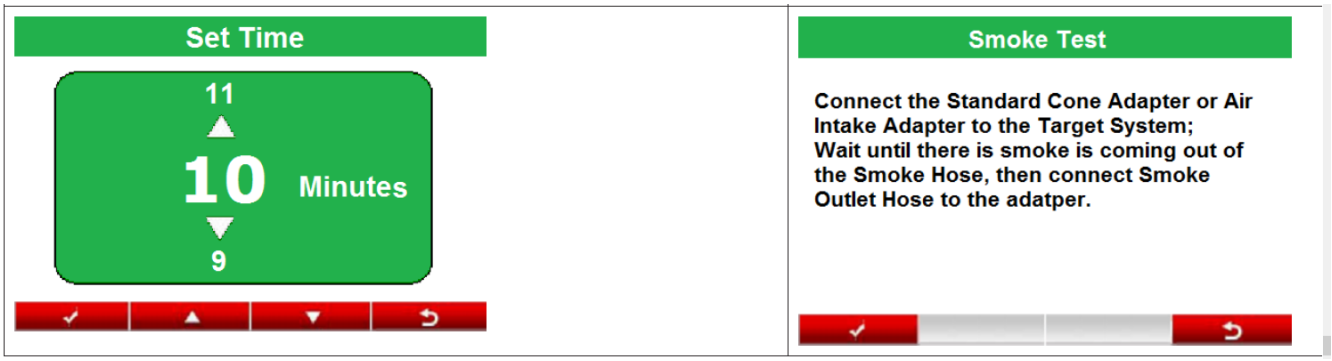

**LOW PRESSURE (EVAP) SMOKE TEST PROCEDURE:**

1. Select Smoke Test by pressing"select" ( ) button while Leak Size Test icon is highlighted in red.
2. The purpose of the Smoke Test is to locate a leak by pressurizing the system.

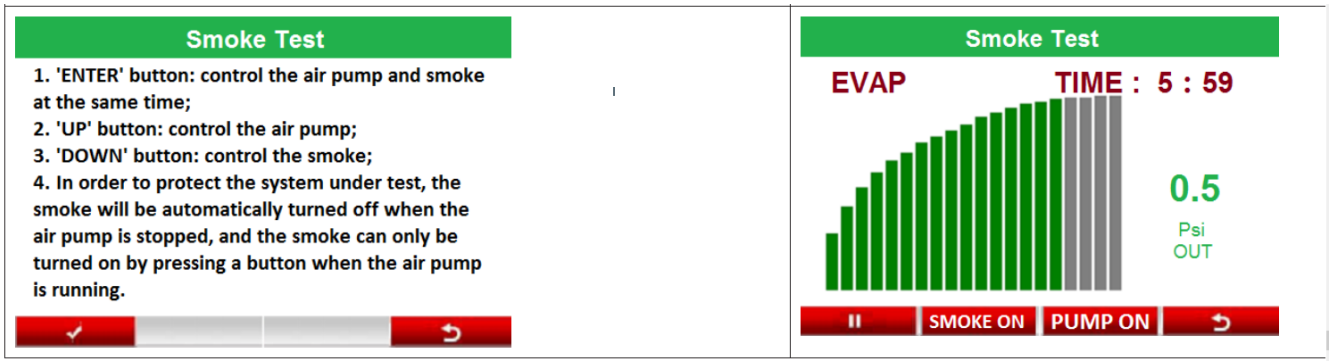
3. This step ensures that the EVAP air pressure output by the device does not exceed a safe value.
4. EVAP Check process.



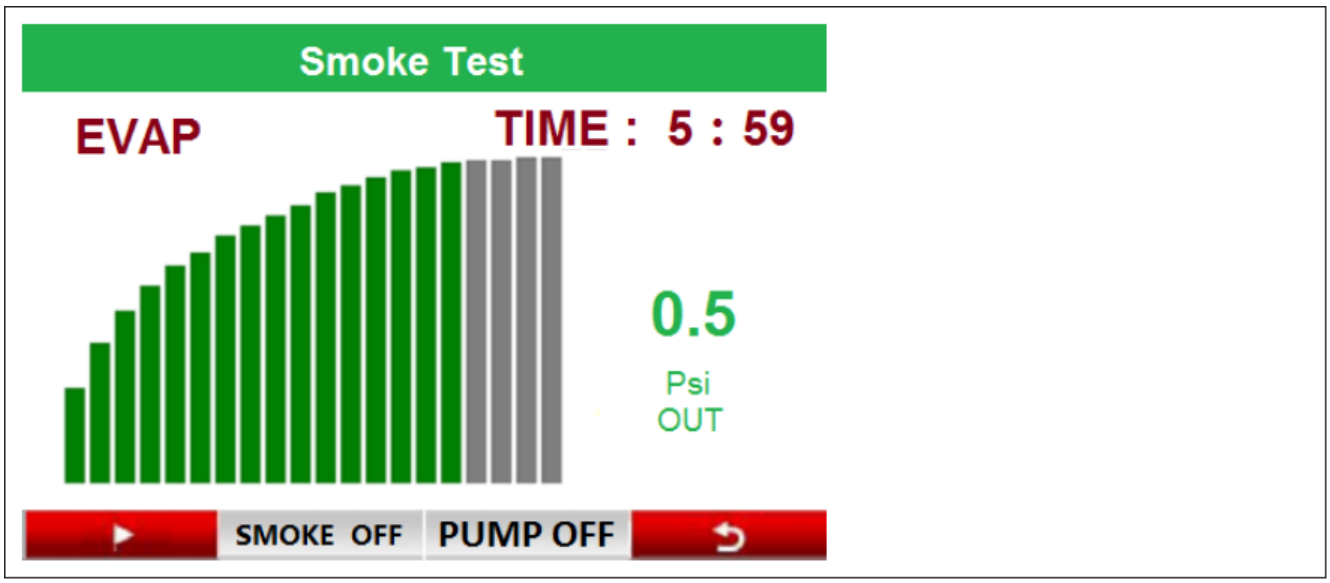

5. Set the test pressure by using the scroll buttons ( ) to set times.
6. Follow the on-screen instructions and press the ( ) button to start pressuring the system.




7. Instructions for key operation.
8. The buttons are Pause, Smoke, Air Pump, Exit; When the corresponding display position of the smoke and air pump is shown in the figure, it is turned on.



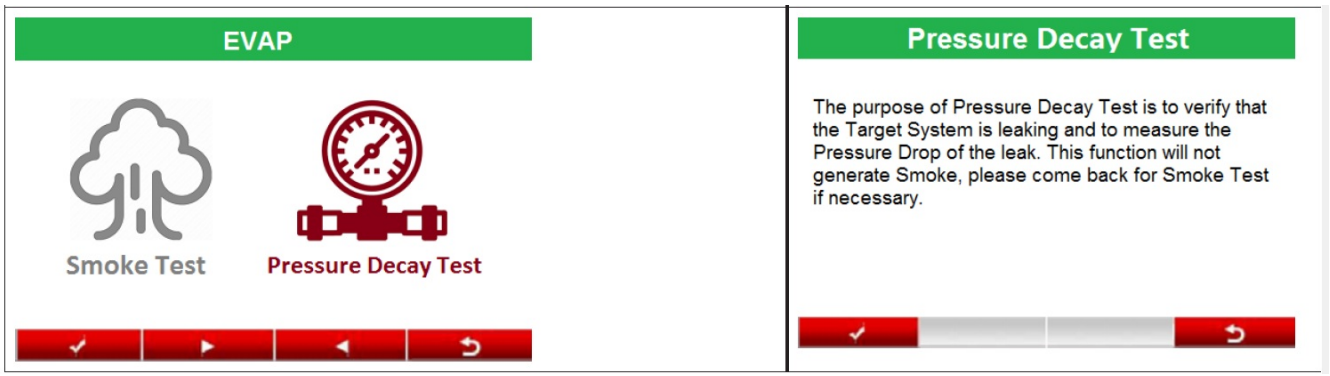

9. The buttons are Start, Smoke, Air Pump, Exit; When the corresponding display position of the smoke and air pump is shown in the figure, it is turned off.



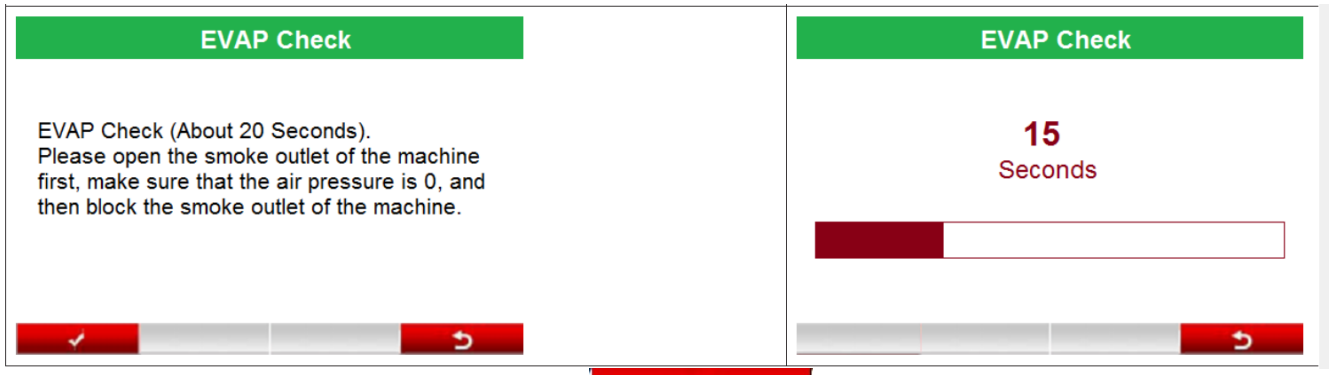

**LOW PRESSURE (EVAP) PRESSURE DECAY TEST PROCEDURE**

NOTE: No smoke is used during the pressure decay test.

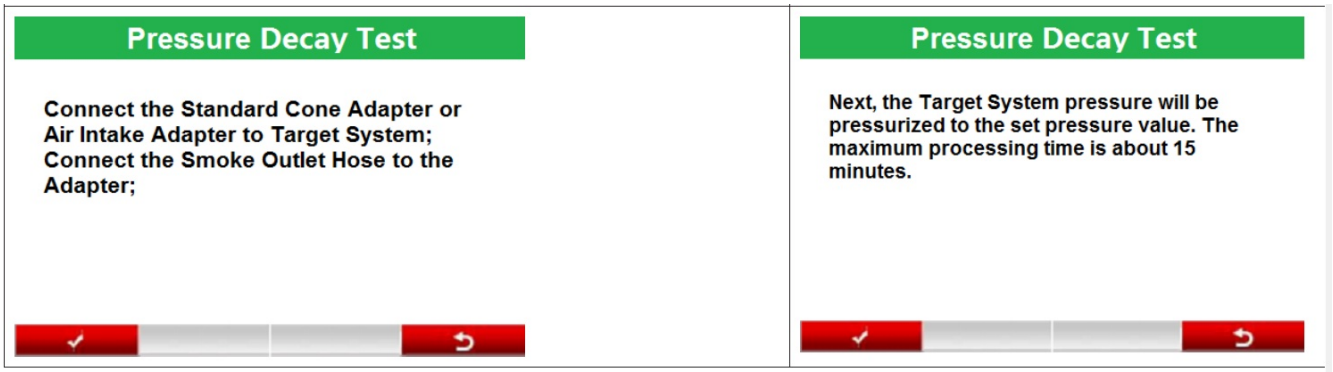
1. Select Pressure Decay Test by pressing the “select” ( ) button while the Pressure Decay Test icon is highlighted in red.
2. Function instruction.



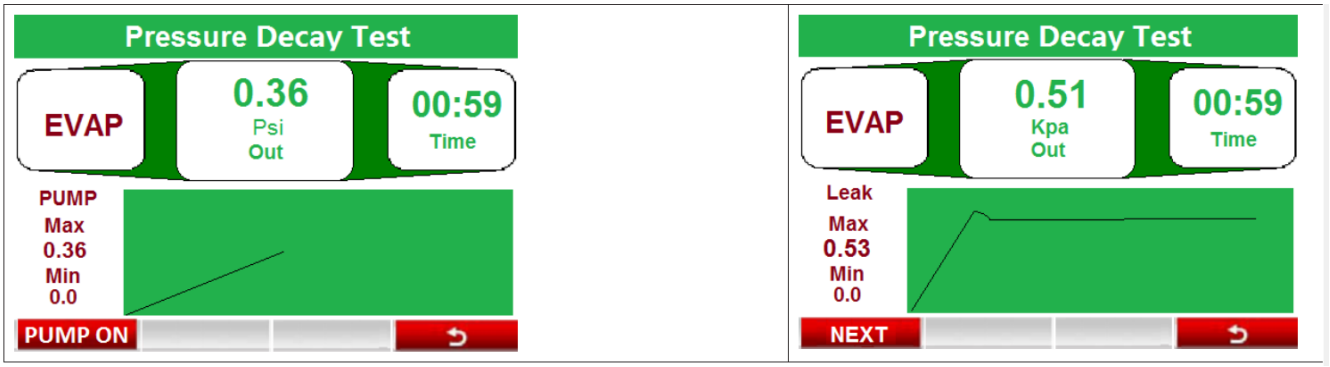

3. This step ensures that the EVAP air pressure output by the device does not exceed a safe value.
4. EVAP Check process.



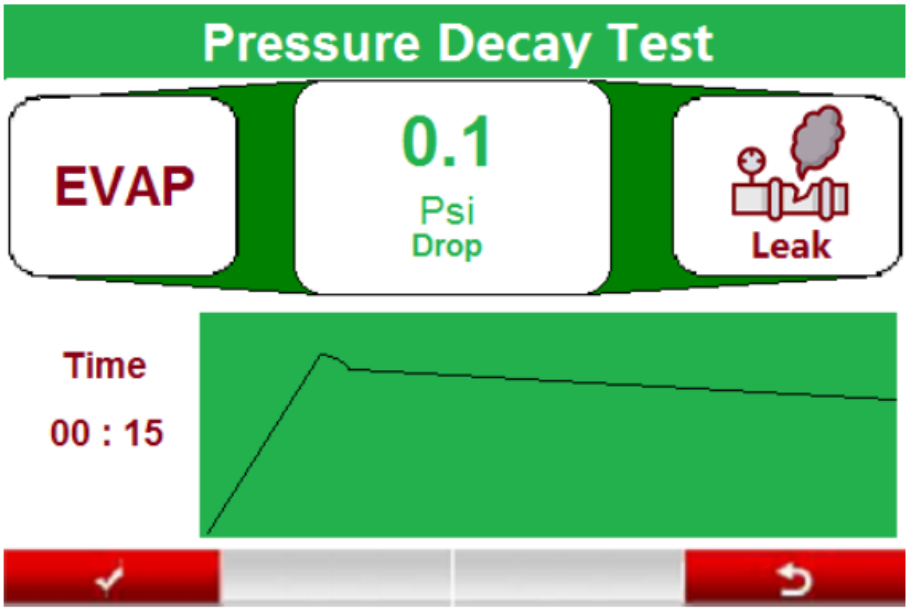

5. Follow the on-screen instructions and press the ( ) button to continue.
6. Follow the on screen instructions and press the ( ) button to start pressuring the system.




7. The machine will fill the system with pressurized smoke until the set pressure is reached. Press the button to control the pump.
8. Leak the process. Press the (**next**) button to go to the results screen.



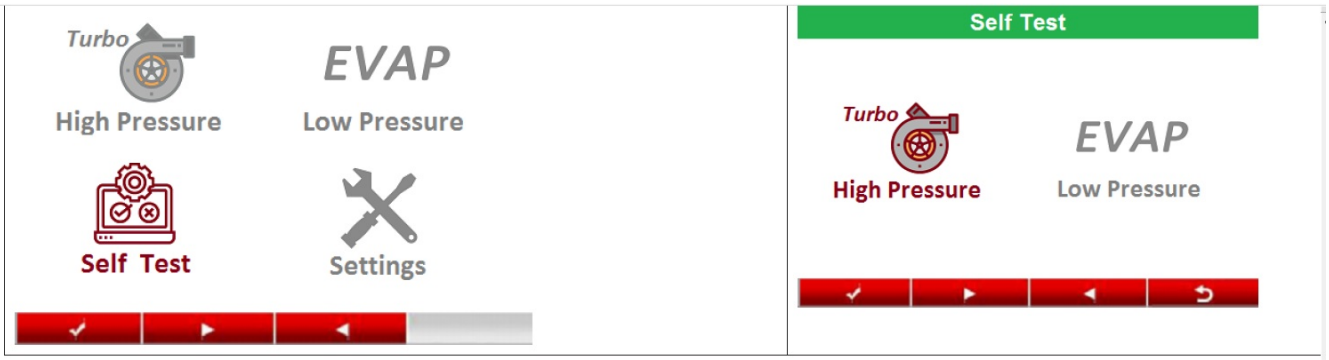

9. Results: When the pressure decay test is complete the results will be displayed. These results can be compared with the manufacturer's specifications.




**SELF TEST:**

The purpose of Self Test is to detect whether there is a leak in the machine itself. Please block the smoke outlet of the machine.

1. Select Self Test by pressing the “select” ( ) button while the Self Test icon is highlighted in red.
2. The process is the same as the High Pressure (HP) Pressure Decay Test Procedure




3. The process is the same as the Low Pressure (EVAP) Pressure Decay Test Procedure

**SETTINGS**

- LANGUAGE: Set the system language (English/French/Spanish/German/ Italian/Finnish/Turkish/Polish/Portuguese)
- PRESSURE VALUE UNIT: Set the pressure unit (psi/kPa)
- BEEP: Set the buzzer switch (on/off)
- ABOUT ME: View the machine information

**INTAKE BLADDER “HP” MODE:**
NOTE: Inspect the inside of the duct that will be tested and ensure that it is clean and free of sharp edges and burrs that could damage or puncture the bladder.

Proper Installation

Improper Installation

- A. Pressure Relief Valve
- B. Hand Pump
- C. Intake Bladder
- D. Smoke Hose Connection

1. Completely insert the bladder into the duct that is being tested so that both collars are inside of the duct.
2. Close the pressure relief valve by turning the knob clockwise until it is tight.
3. Compress and release the hand pump repeatedly until the bladder is secured inside the duct.

4. Ensure that the bladder is secured by gently pulling on both hoses.
5. To remove the bladder, release the pressure by turning the pressure relief knob counter-clockwise.
6. Allow the air to purge from the bladder.
7. Remove the bladder from the duct.

**DIAGNOSIS**
NOTE: Refer to the vehicle manufacturer's recommendation for the maximum pressure of each Target System that will be tested.

**FINDING LEAKS "HIGH PRESSURE (HP)" OR "LOW PRESSURE (EVAP)" MODE**

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

**LEAK DECAY TESTING "HIGH PRESSURE (HP)" MODE:**

1. Perform High Pressure (HP) Pressure decay test Procedure.
2. Use the SMOKE to find the leak.
3. Repair and re-test until no more leaks are found.

**LEAK DECAY TESTING "LOW PRESSURE (EVAP)" MODE:**

1. Perform Low Pressure (EVAP) Pressure decay test Procedure.
2. Use the SMOKE to find the leak.
3. Repair and re-test until no more leaks are found.

**INTAKE LEAKS "HIGH PRESSURE (HP)" MODE:**

1. Disconnect the intake air duct from the air filter box.
2. Insert the intake bladder or the cone adapter that is supplied with the kit into the intake duct.
3. Attach the intake bladder or the cone adapter to the smoke hose cone.
4. Perform High Pressure (HP) Smoke Test Procedure.
5. Use a 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.
6. Repair and re-test until no more leaks are found.

**VACUUM LINES AND VACUUM COMPONENT LEAKS "HIGH PRESSURE (HP)" MODE:**

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. Perform High Pressure (HP) Smoke Test Procedure.
4. Use a 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 isolated leaks.
- NOTE: Some vacuum components may not be 100 percent sealed by design.

5. Repair and re-test until no more leaks are found.

**EXHAUST LEAKS “HIGH PRESSURE (HP)” MODE:**

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. Perform High Pressure (HP) Smoke Test Procedure.
   NOTE: Some smoke may be consumed by a hot catalytic converter.
3. Use a flashlight to locate any leaks.
   NOTE: Exhaust leaks are easier to find when the exhaust system is at ambient temperature.
4. Repair and re-test until no more leaks are found.

**UNDER THE DASHBOARD LEAKS “HIGH PRESSURE (HP)” MODE:**

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. Perform High Pressure (HP) Smoke Test Procedure.
4. Use a flashlight to locate any leaks.
5. 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.

**EVAP LEAKS “LOW PRESSURE (EVAP)” MODE:**

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 hoses 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. Perform Low Pressure (EVAP) Smoke Test Procedure.
5. Remove the fuel cap. When smoke is present exiting the fuel tank, re-install the fuel cap.
6. While the smoke is still being pumped into the vehicle, use a flashlight to locate the leak(s).
7. Repair and re-test until no more leaks are found.

## MAINTENANCE

**DRAINING THE SMOKE HOSE**

1. Disconnect the unit from the power supply.
2. Disconnect the smoke hose from the box.
3. Hang the hose in a vertical position and place a container under the smoke hose.
4. Allow the excess oil to drain out of the smoke hose.
5. Reinstall the smoke hose.

## TROUBLESHOOTING

| Problem | Solution |
|---|---|
| **No Display** | Ensure that the power is properly connected |
| **No Air Flow** | • Check the air pump<br>• Check that the hoses are not kinked or pushed into machine |
| **Not Enough Smoke** | • Check the fluid level to make sure there is enough oil (unscrew the oil cap to see if the fluid level reaches the black mark of the dip stick)<br>• Check that the hoses are not kinked or pushed into the machine<br>• Ensure that the pump is turned on and working.<br>• Turn the unit off. Wait 10 – 15 minutes, then start again. (Overheating temperature control might be working) |
| **Poor Smoke Density or Volume** | • Insufficient smoke-producing fluid: refill<br>• Smoke output hose is kinked |

**WARNING:** Cancer and Reproductive Harm – **www.P65Warnings.ca.gov**

FOR PARTS OR SERVICE CONTACT THE SERVICE DEPARTMENT: 1- **888-825-6989**

## Documents / Resources

| | |
|---|---|
| | **Mastercool Digital Dual Smoke Machine** [pdf] User Manual<br>Digital Dual Smoke Machine, Dual Smoke Machine, Smoke Machine, Machine |

## References

- **P65Warnings.ca.gov**
- **User Manual**

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