CPS®

MOTORVAC®

Cool Smoke® MP
Multi-Pressure Leak Diagnostics System
Part No. 500-0175

LEAK DETECTION SERVICE

USER MANUAL

CPSPRODUCTS.COM

INTRODUCTION

Congratulations! You are in possession of the most advanced and powerful (yet simple to operate) multi-pressure diagnostic leak test machine available. Our patented MotorVac® Cool Smoke® "no heat" technology creates a high volume, smoke-like vapor eliminating the need for high temperature glow plugs or resistance coils. The Cool Smoke® MP was specifically developed to OEM specifications for diagnosing leaks in high pressure air systems such as turbo chargers and charge air coolers. The Cool Smoke® MP can be used to not only determine if there is a leak in a system and pinpoint its location, it can also determine the actual size of the leak allowing the technician to decide whether a repair is necessary.

The MotorVac® Cool Smoke® MP uses advanced dynamically controlled pneumatics and microprocessor technology to determine the actual leak size throughout the entire operational pressure range. The Cool Smoke® fluid will deposit ultraviolet (UV) dye at the location of small leaks where it would be difficult to see smoke.

The MotorVac® Cool Smoke® MP comes with both a powerful UV light to easily locate the UV dye deposits at leak points, as well as a powerful white light to locate the smoke at visible leak points.

The MotorVac® Cool Smoke® Fluid is a unique solution that allows for highly visible vapor (smoke) to carry UV dye to leak points. The UV dye will be deposited at small leak locations where the smoke is forced out during a test. Your MotorVac Cool Smoke MP can perform smoke or leak tests between 3-60 psi (0.2-4.1 bar) while in MP mode and 0.5 psi (0.03 bar) while in EVAP mode. The MotorVac® Cool Smoke MP comes prefilled with a charge of Cool Smoke® Fluid and is refillable by the end- user when the smoke-producing solution is depleted. The smoke it produces, as well as the UV dye, is non-toxic, solvent free and noncorrosive. The MotorVac® Cool Smoke® MP needs no assembly and requires no maintenance.

Your MotorVac® Cool Smoke® automatically sets the critical pressure that must be maintained during EVAP testing. You don't need to set flow rates and you don't need to be concerned with ambient temperatures or barometric pressures. The MotorVac Cool Smoke® is refillable by the end-user when the smoke-producing fluid is depleted.

Please review this User Guide to become familiar with the Cool Smoke® MP and all its features. Thank you for choosing the MotorVac® Cool Smoke® MP.

CPS Products Inc.

CONTENTS

SAFETY INFORMATION & PRECAUTIONS

To prevent personal injury and / or damage to vehicle or equipment:

- Many automotive manufacturers require the use of nitrogen to be used while testing the EVAP system. This is because a high heat source or spark could ignite fuel vapors mixed with air. The Cool Smoke® does not use potentially hazardous high temperature glow plugs or resistance coils to create smoke. However, nitrogen should be used to reduce the ignition risk if other potential ignition sources are nearby. The Cool Smoke can perform its functions using clean and dry conventional shop air.
- Use this equipment in the manner specified by the manufacturer.
- Understand operating procedures and all safety precautions.
- Correctly connect power supply to battery and chassis ground.
- Use only Cool Smoke® Fluid in the Cool Smoke® MP. Altering the fluid, hoses, cables, or any other replacement parts will void the warranty; may cause machine malfunction; may cause damage to the vehicle, to property or may cause personal injury.
- To view the dye deposit, use the included UV Light and UV enhancing safety goggles.
- Do not use when vehicle engine is running.
- The 12V DC battery source you use to power the machine must be in good condition and fully charged.
- Machine input pressure must be 90–150 psi (6.2–10.3 bar). Operate the machine in an upright position.

TIP: Whenever possible allow the system to vent as far away from where the smoke is being introduced. This will purge the air and quickly fill the system with smoke. Once the system is filled with smoke, close the vent, and allow the system to be pressurized.

TIP: 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

WARNING: Do not overfill unit.

CAUTION: Gloves and safety goggles must be worn at all times by users and bystanders when performing this service.

SYSTEM FEATURES & FUNCTIONS

1. **COOL SMOKE FLUID DIPSTICK**: To check the fluid level insert dipstick until threads touch then remove and read.

CAUTION: DO NOT OVERFILL THE UNIT.

Maximum

Minimum

2. **COLOR SCREEN**: The advanced color LCD display is used to navigate through all modes and gives feedback on pressure in the system.

3. **SCREEN NAVIGATION BUTTONS**: Four buttons located on the front of the unit are used to navigate through onscreen menus and select service modes.

SYSTEM FEATURES & FUNCTIONS (CONTINUED)

4. **COMPRESSED AIR INLET**: Connect appropriate 1/4" NPT male quick coupler to supply the Cool Smoke® MP with compressed air supply.

5. **POWER CABLE**: The power harness with battery clips is intended to be connected to either a 12 VDC or 24 VDC battery. The unit will automatically adjust for the voltage that is supplied.

6. **SERIAL NUMBER LABEL**

7. **SMOKE OUTPUT HOSE**: The smoke output hose is used to connect the Cool Smoke to the system being tested in either smoke or leak mode through the use of the appropriate adapters. This hose swivels at the connection to the Cool Smoke® MP to allow for easier use.
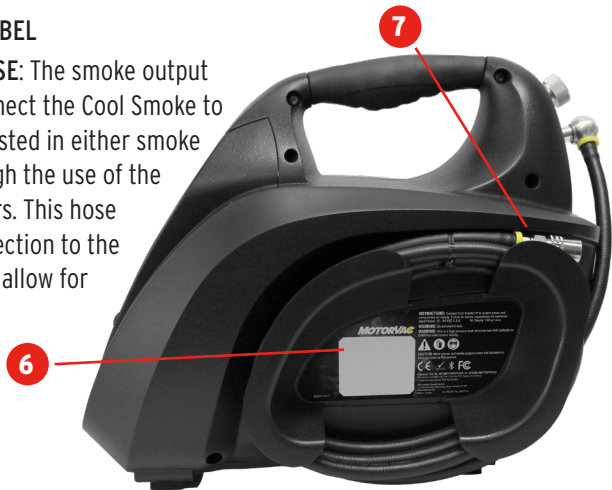
TECHNICAL SPECIFICATIONS

Dimensions (Length/Width/Height)	18" x 11" x 13" 46cm x 28cm x 33cm
Weight (Equipment)	10.7 LB (4.5 Kg)
Voltage Requirement	12–24 VDC
Power Cord Length	10' (3 m)

Current Usage	1.2A
Input Pressure Required	90–150 psi (6.2–10.3 bar)
Output Pressure	**MP**: 1–60 psi (0.1–4.1 bar)
	EVAP: 0.2–0.5 psi (0.01–0.03 bar)
Output Volume	0–42 CFH (0–20 LPM)
Output Hose Length	8' (2.4 m)

MODES OF OPERATION

The MotorVac® Cool Smoke® MP has two modes of testing:

Smoke mode: The Cool Smoke® MP will produce high density smoke-like vapor at set pressures between 3-60 psi, for MP mode, and 0.5 psi, for EVAP mode, to quickly pinpoint the location of a leak using both visible vapor and UV dye deposits.

Leak mode: The Cool Smoke® MP utilizes two methods to determine if the system under test is leaking beyond OEM specifications. The machine can use either a Pressure Decay or Leak Size/ Flow Rate Test that can determine the actual leak size

Smokeless mode: The Cool Smoke MP has this mode, where only air goes into the system, no smoke and/or UV dye. This mode can be used as a smoke purging / air only test.

FIRST TIME OPERATION

The Cool Smoke® MP comes factory filled with Cool Smoke® Fluid and is ready to use right out of the box. The air inlet is supplied with a female 1/4" NPT port. Connect an appropriate coupler that mates with your compressed air supply hose.

Your Cool Smoke® MP is now ready for its first use!

Install 1/4" NPT coupler for compressed air supply

INCLUDED ACCESSORIES

Part Number	Description	
060-0005	SERVICE PORT ADAPTER (standard size): connects to factory service port on most OBD-II vehicles	
060-0008	SCHRADER REMOVAL / INSTALLATION TOOL: fits both sizes of Schrader valves in vehicles with factory OBD-II service port fittings	
070-MD7697	UV FLAH LIGHT: This powerful White/Uv/Laser light makes it easy to find smoke	
WVA-003	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.	
200-3110	CAP PLUG KIT: 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.	
WVA-001	EXHAUST CONES: Used to either introduce smoke into the exhaust system; 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.	
040-5813	PLUG VENT	
471112	YELLOW GLASSES	
WVA-096	BLADDER PLUG (1) W/ THROUGH-HOLE	
WVA-063	UNIVERSAL ADAPTER	
WVA-129BV	EVAP SAFETY BLOCK & SMOKE HOSE	

HP TEST SETUP

Intial Setup

1. ALL tests with the Cool Smoke® MP are performed with the engine off.

2. Connect the Cool Smoke® MP red (**+**) battery clip to vehicle's positive battery terminal; connect the black (**–**) battery clip to a solid ground point as far from the battery as possible.

3. Connect shop air to the MotorVac Cool Smoke MP inlet located on the side of the machine. Be sure supply pressure to the machine is between 90–150 psi.

4. Connect supplied adapters to the vehicle's turbo induction system. To test the turbo charger and intercooler (or charge air cooler) attach the adapters to the inlet of the turbo and the outlet of the cooler.

5. Ensure you are connecting to pressurized parts of the system only. Do not connect to the air filter box that is not intended for pressure.

6. Use leak test to determine if there is a leak in the system. See page XX for description.

7. If there is a leak, use smoke test to pinpoint the leak location.

COOLER OUTLET
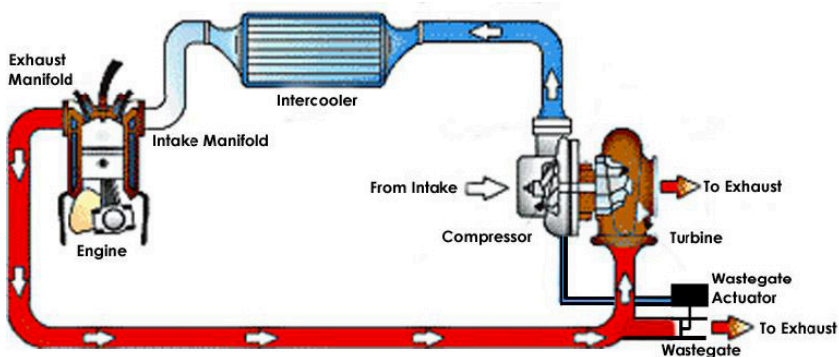
EVAP TEST SETUP

CAUTION – Many automakers require the use of a non-combustible gas such as nitrogen to be used while testing an EVAP system. This is because a heat source or spark could ignite fuel vapors when mixed with air. The MotorVac Cool Smoke does not introduce a dangerous heat source. However, other sources of spark or heat could be present in the surrounding area. The Cool Smoke can perform its functions using conventional shop air.

Test Setup

ALL tests with the MotorVac® Cool Smoke® MP are performed with the engine off.

1. For OBD-II EVAP systems when the vehicle's engine is turned off the vent valve is normally open. Use a scan tool to close the EVAP System to perform any leak tests.

2. Connect the Cool Smoke® MP's red (+) battery clip to vehicle's positive battery terminal; connect the black (-) battery clip to a solid ground point as far from the battery as possible.

3. Connect shop air to the MotorVac® Cool Smoke® MP's inlet located at the back of the machine. Be sure supply pressure to the machine is between 90–50 psi (6.2–10.3 bar).

4. Verify the vehicle's fuel level is below the base of the fuel tank neck.

5. Locate the EVAP service port indicated by its green cap. Remove the Schrader valve from the EVAP service port using the removal tool (060-0008)
    Note: The Schrader valve is a left-hand thread, turn clockwise to remove.

6. Connect the service port adapter (060-0005) to the EVAP service port. Connect the Cool Smoke's smoke hose to the service port adapter.

Leak Verification

TIP: A common reason for EVAP codes is a faulty or improperly installed fuel cap. To rule out this possibility do not disturb the gas cap before performing a leak verification test. If the vehicle fails the leak size test ensure that the fuel cap is properly installed and redo the test. If you disturb the fuel cap before doing this test and the system does not show a leak you will not be able to determine if there is an intermittent leak or if the fuel cap was the problem.

*   Select the LEAK TEST by pressing "select" (▬▬✓▬▬) button.

EVAP TEST SETUP (CONTINUED)

Finding the Leak

TIP: 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.

1. Ensure all steps outlined in test setup were followed. For best performance fully unwind the outlet hose.

2. Remove the fuel cap to allow the air out and the unit to fully fill the system with smoke.

3. Select the SMOKE TEST by pressing "select" (✔) button to begin creating smoke. The tester has a built in 5-minute timer and will stop making smoke when the timer expires. To stop making smoke earlier press the "exit" (↺) button.

4. After a solid stream of smoke is observed exiting the fuel fill neck, reinstall the fuel cap.

5. Using the supplied light search the EVAP system for smoke exiting a leak.

6. UV light can be used to pinpoint leak locations. This is useful for hard to see locations such as the top of the fuel tank or behind panels.

7. TIP: The longer smoke is allowed to exit a leak more UV dye is deposited at the leak location.

8. Repair the leaks and perform the leak test again to verify repair and that there are not more leaks present in the system.

OTHER LEAK DETECTION APPLICATIONS

Exhaust Leaks

Escaping exhaust gases can be very dangerous to the occupants of a vehicle yet these repairs are neglected – but so easy to find with the MotorVac Cool Smoke.

1. Put the vehicle on a lift to expose the underside. With the engine turned off, simply insert the exhaust adapter cone into the tail pipe of the vehicle being tested. Insert the smoke supply line nozzle into the exhaust cone's hose opening. On dual exhaust systems ensure that each tail pipe is plugged.

2. Look for the smoke exiting wherever there is a leak.

3. Even though exhaust leaks are very easy to find with MotorVac Cool Smoke, here are three helpful tips to make finding exhaust leaks even easier:
    *   It is best to test a cold exhaust system rather than a hot one because the catalytic converter may consume some of the smoke, but more importantly, many small exhaust leaks are only visible on a cold exhaust system due to 'thermal expansion'.
    *   Seal off the vehicle's intake system to achieve proper system pressure in the event both an intake and exhaust valve are open in the same cylinder at the same time.

SETTINGS

The Cool Smoke® MP Settings page allows you to change the default setting for the following functions: Language, Units of Measurement, Default Settings, Smoke Test and Smokeless Test.
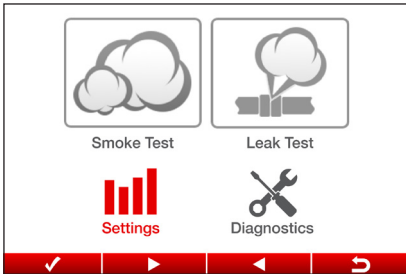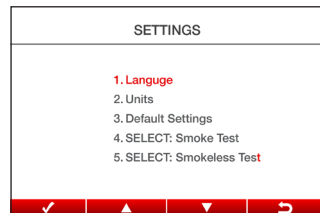

1. From the Home screen, use the Next/Back buttons (▶ ◀) to navigate to "Settings."

2. Press the "Select" button (✔) to display the Settings page.

Once in the Settings page, use the scroll buttons (▲ ▼) to select the desired function.

LANGUAGE

Cool Smoke® MP uses English as the default language. To change default language:

1. Using the scroll button (▲ ▼), select the desired default language.

2. Select the mode by pressing "select" button (✔).

SETTINGS

1. Languge
2. Units
3. Default Settings
4. SELECT: Smoke Test
5. SELECT: Smokeless Test

LANGUAGE

1. English   4. German
2. Spanish   5. Dutch
3. French

UNITS

Cool Smoke® MP uses Imperial units as the default unit of measure. To change Imperial units to Metric units:

1. Using the scroll button (▲ ▼), select the desired units of measure.

2. Select the mode by pressing "select" button (✔).

SETTINGS

1. Languge
2. Units
3. Default Settings
4. SELECT: Smoke Test
5. SELECT: Smokeless Test

UNITS

1. Imperial
2. Metric
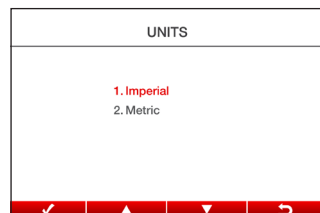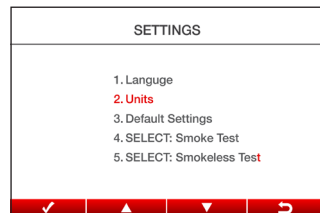
SETTINGS (CONTINUED)

DEFAULT SETTINGS

Default Pressure
You can select the default pressure for the Leak test. Default values and range are as follows:

HP Mode	EVAP Mode
Default: 10.0psi	Default: 0.5psi
Range: 1 to 60psi	Range: 0.2 to 0.5 psi

To change the default pressure, use the scroll buttons (▲ ▼) to select the desired pressure.
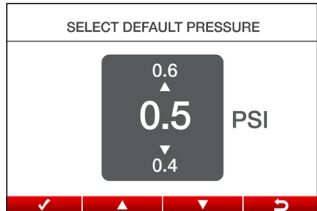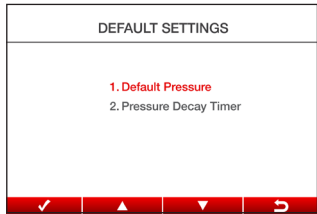
Pressure Decay Timer
You can select the default Pressure Decay Timer for the Leak test. Default values and range are as follows:

HP Mode	EVAP Mode
Default: 15Sec	Default: 15Sec
Range: 3–30Sec	Range: 3–30Sec

To change the default pressure, use the scroll buttons (▲ ▼) to select the desired pressure.
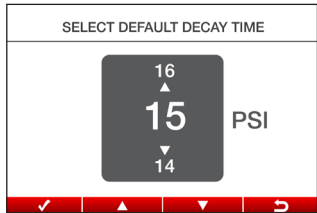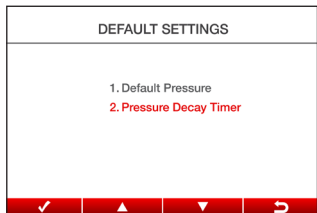
SMOKE / SMOKELESS MODE

Cool Smoke® MP is set in Smoke Mode as the default setting.

To change the default mode, use the scroll buttons (▲ ▼) to select the Smoke Mode or Smokeless mode.

Once selected, Smoke or Smokeless Test is displayed on the home page.

DEFAULT SETTINGS

1. Default Pressure
2. Pressure Decay Timer

SELECT DEFAULT PRESSURE

0.6
▲
0.5 PSI
▼
0.4

DEFAULT SETTINGS

1. Default Pressure
2. Pressure Decay Timer

SELECT DEFAULT DECAY TIME

16
▲
15 PSI
▼
14

Smoke Test | Leak Test
Settings | Diagnostics

Smokeless Test | Leak Test
Settings | Diagnostics
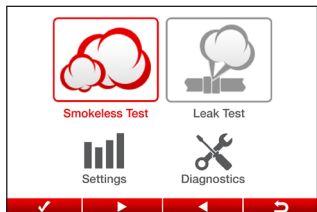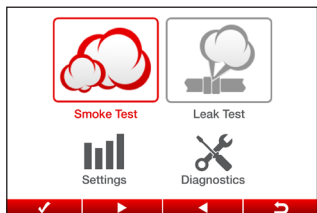
SELECT MODE OF OPERATION

EVAP or HP Mode
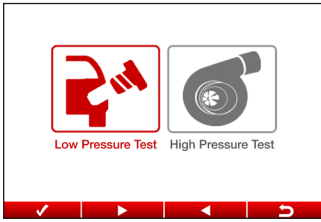
1. Select the EVAP or MP mode by using the Next/Back buttons (▶ ◀).

2. Select the mode by pressing "select" button (✔).
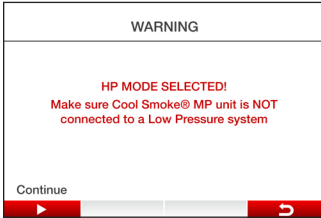
- A WARNING screen is displayed when MP is selected reminding the user NOT to connect to an EVAP system. Continue by pressing "continue" button (▶).

- If EVAP mode is selected, the Home page will be displayed.

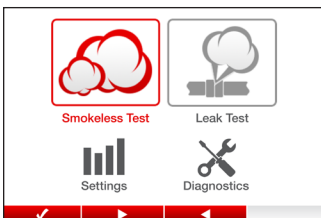- From Home Page, press "return" button (↩) to go back to EVAP/MP selection page.

Smokeless Mode
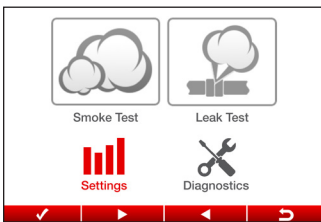
1. From Home screen, use the scroll buttons (▲ ▼) to navigate to "Settings".

2. Press "select" button (✔) to enter Settings.
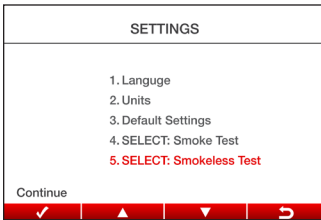
1. Scroll down the list to "**5. SELECT: Smokeless Test**".

2. Press "select" button (✔) to select Smokeless mode.

Smokeless Test is displayed on the Home page.
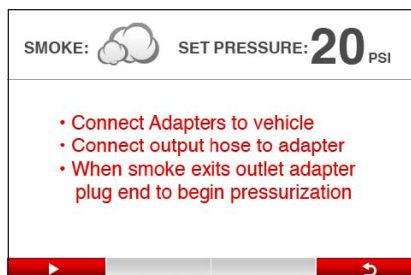
TEST PROCEDURE

Smoke Test

The purpose of a smoke test is to fill a system with pressurized smoke until the set pressure is reached. Use the high intensity a white light to detect the smoke exiting any leak points. The white light has a focusing feature to zoom in on the leak points and improve visibility.
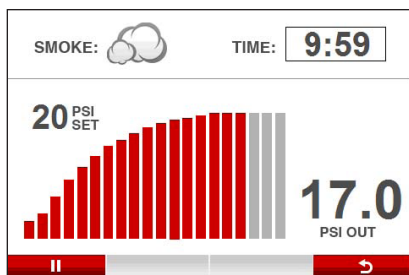
HP MODE
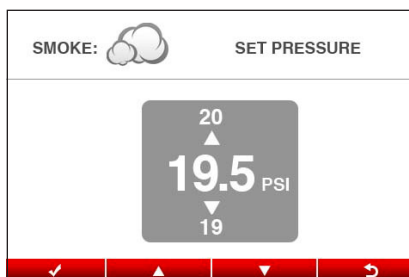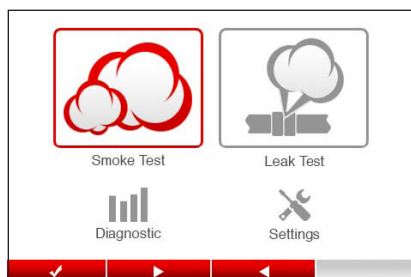
1. Select smoke test by pressing "select" button (✓) while smoke test icon is highlighted in red.

2. Set the test pressure by using the scroll buttons (▲ | ▼) to adjust pressure. The test pressure should be the same or less than the operating pressure of the system being tested.
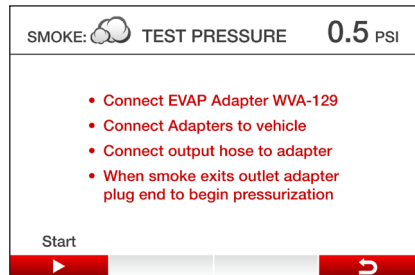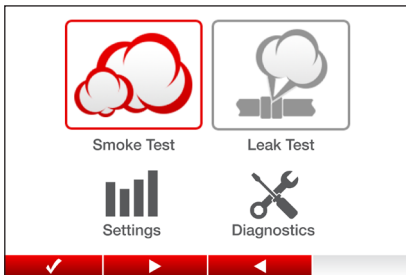

3. Follow on screen instructions and press the (▶) button to start pressurizing the system.

4. The screen displays the set pressure as well as the current output pressure. The test will automatically stop after 10 minutes.

TEST PROCEDURE (CONTINUED)

EVAP MODE

1. Select smoke test by pressing "select" button (✔) while smoke test icon is highlighted in red.

2. Follow on screen instructions and press the "Start" button (▶) to begin pressurizing the system.

3. The screen displays the set pressure as well as the current output pressure. The test will automatically stop after 5 minutes.

TEST PROCEDURE (CONTINUED)

LEAK TEST

The purpose of a leak test is to verify if a system is leaking and after repairing the vehicle, confirm that the leak has been fixed. The Cool Smoke® MP has two different leak tests: Leak Size and Pressure Decay.

1. Leak Size Test (**HP**)

The Cool Smoke® MP has advanced electronics that are capable of determining the size of a leak that is greater than 0.015″ (0.4mm).

1. Select smoke test by pressing "select" (✔) button while smoke test icon is highlighted in red.

2. Set the test pressure by using the scroll buttons (▲ ▼) to adjust pressure. The test pressure should be the same or less than the operating pressure of the system being tested.

3. Follow on screen instructions and press the (▶) button to start pressurizing the system.

4. The screen displays the set pressure as well as the current output pressure. The test will automatically stop after 10 minutes.
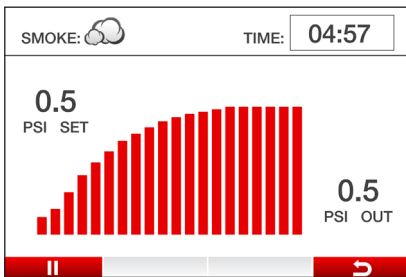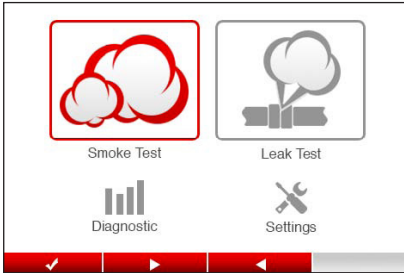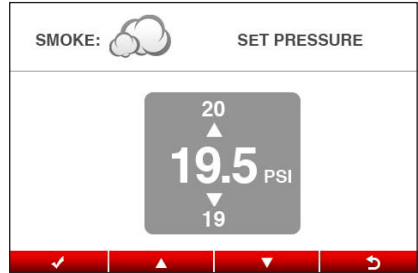
TEST PROCEDURE (CONTINUED)

LEAK TEST: **LEAK SIZE TEST RESULTS**

| **20** PSI SET | **0.01"** LEAK SIZE | **1.2** CFH |

5. Results − When the output pressure stabilizes at the set pressure, the leak size results page will display the leak size and resulting flow rate from the test.

2. Leak Size Test (EVAP)

The Cool Smoke® MP has advanced electronics that are capable of determining the size of a leak that is greater than 0.015" (0.4mm).
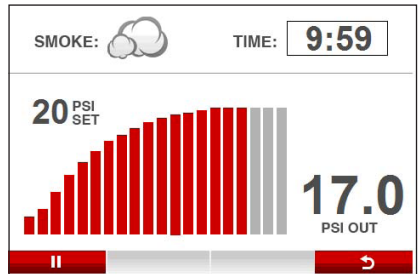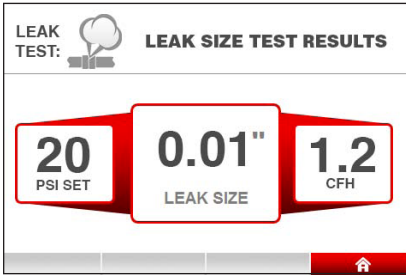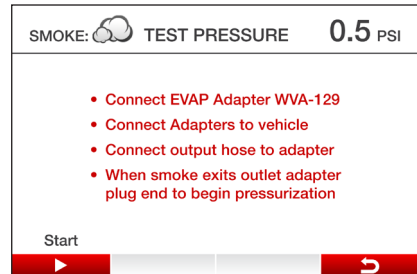
Smoke Test   Leak Test

Settings   Diagnostics

SMOKE: TEST PRESSURE   **0.5** PSI

• Connect EVAP Adapter WVA-129
• Connect Adapters to vehicle
• Connect output hose to adapter
• When smoke exits outlet adapter plug end to begin pressurization

Start

1. Select smoke test by pressing "select" button (✓) while smoke test icon is highlighted in red.

2. Follow on screen instructions and press the (▶) button to start pressurizing the system.

LEAK TEST: FLOW 0.0 CFH   LEAK SIZE ---

0.5 PSI SET

0.5 PSI OUT

DECAY TEST

LEAK TEST: **LEAK SIZE TEST RESULTS**

| **20** PSI SET | **0.01"** LEAK SIZE | **1.2** CFH |

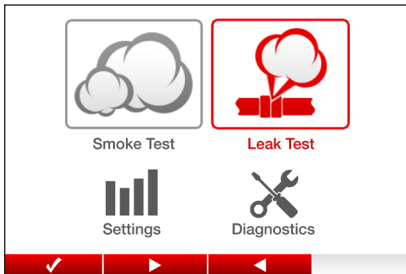**3. The machine will fill the system with pressurized smoke until the set pressure is reached.**

4. Results − When the output pressure stabilizes at the set pressure, the leak size results page will display the leak size and resulting flow rate from the test.
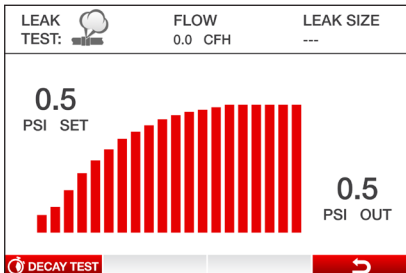
3. HP & EVAP Pressure Decay Test

A pressure decay test can be used for any size leak. This specification is used by many OEM vehicle manufacturers to determine if the amount of leakage in the turbo system is acceptable or requires repair. This test can also be applied to EVAP systems. The correct pressure will display (0.5 psi).
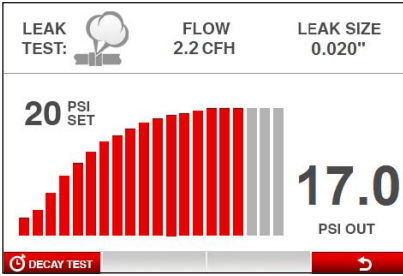
1. To perform a pressure decay test, begin a leak test. When the pressure has reached the set pressure, press the "Decay Test" button (DECAY TEST).

2. Follow The decay test will start the decay timer and show a live update on the screen of the output pressure. The time for the decay test can be changed in the options me.

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

COOL SMOKE® HP TURBO ADAPTER KIT

The optional add-on accessory Cool Smoke MP Turbo Adapter Kit Part# 200-0150 includes plugs, hoses, clamps, lights and glasses.

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	98821846	Phazer White 5 W Light AAA	1
2	98006475	Black UV LED Light AAA S/A	1
3	068-0100	Turbo Adapter Plug 2.25" to 2.5" Assembly	2
4	068-0120	Turbo Adapter Plug 2.75" to 3" Assembly	2
5	068-0140	Turbo Adapter Plug 1.75" to 2" Assembly	2
6	068-0250	Turbo Adapter Plug Assembly	1
7	98821847	Hose Silicone 1.75" I.D. X 3.7"	2
8	98821849	Hose Silicone 2.25" I.D. X 3.7"	2
9	98821852	Hose Silicone 2.75" I.D. X 3.7"	2
10	98821854	Hose Clamp Turn Key 64-89mm	2
11	98820992	Hose Clamp Turn Key 46-70 mm	2
12	471112	UV Enhancing Safety Glasses	1
13	98821848	Hose Silicone 2" I.D. X 3.7"	2
14	98821851	Hose Silicone 2.5" I.D. X 3.7"	2
15	98821853	Hose Silicone 3" I.D. X 3.7"	2
16	98027050	Battery AAA	12

APPENDIX A: TROUBLESHOOTING & ADDITIONAL HELP

Refer to the list below in the unlikely event that you have any operating issues with your Cool Smoke® MP Diagnostic System.

Issue	Solution
Excess fluid exits output hose	The unit may have been overfilled with Cool Smoke fluid. Check fluid level with dipstick. If overfilled, remove the dipstick and allow fluid to pour out of the dipstick port into an appropriate container. Remove the smoke output hose and use compressed air to expel any fluid that is in the hose. Refill the tank. Use the dipstick to ensure proper fluid level. (From empty the tank capacity is 180ml)
Screen does not power on	Check connection with battery and check voltage (12-24 VDC)
No smoke output	Check fluid level with dipstick. Check compressed air supply.
Ouput pressure does not reach set pressure	If there is a large leak the unit may not be able to reach the set output pressure. Repair leak and retest.
Machine Error	If the machine declares an internal error, call our technical support team.

For additional help you can contact our Technical support team at 1-877-776-8486 or email info@cpsproducts.com.

APPENDIX B: REPLACEMENT PARTS

Please refer to the part number below when ordering replacement parts for the Cool Smoke® MP. For Turbo Adapter Kit accessories see page 21.
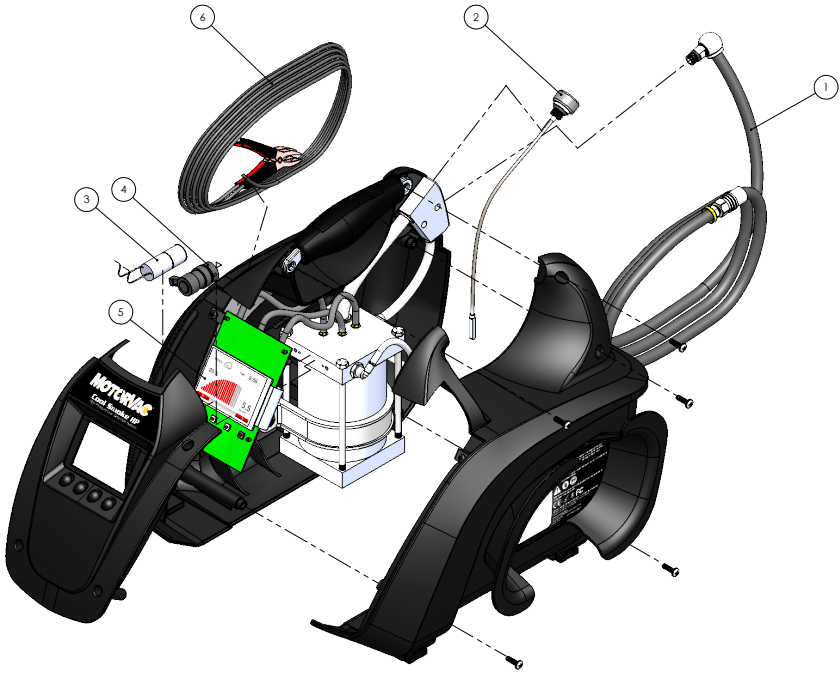
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	200-1801	Smoke Output Hose Cool Smoke® MP	1
2	200-1802	Dipstick Cool Smoke MP	1
3	200-1803	Smoke Solenoid Cool Smoke MP	1
4	200-1804	Pressure Solenoid Cool Smoke® MP	1
5	200-1805	PCB Cool Smoke® MP	1
6	200-1836	ower Harness Cool Smoke® MP	1
N/A	200-0175	MotorVac® Cool Smoke® MP Light Kit	1

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