



User's Manual

Automotive Diagnostic Smoke Leak Detector

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Preface

1. Thanks for purchase this product, this user manual shall be carefully read before first time use of the product.
2. Always keep this manual handy since it contains important information about using the product.

Note: Due to the fact that the ANCEL Diagnostic Smoke Leak Detector product line consists of a series of product models, which vary from one model to another, not all of the descriptions in this manual are applicable to all product models. Please refer to the specific product configuration for the applicability of the introduction.

Warning

	Operator shall have basic knowledge about structure of vehicle and the engine. Vehicle service book is required.
	To ensure better test result, it's required there's no wind in the operating area.
	Do NOT use the product on smoke sensitive component. Eg. Smoke residual might reduce sharpness of head lights if apply to head light housing.
	ONLY low density mineral oil based fluid is allowed to use as smoke oil. Johnson&Johnson's baby oil(pink label) is compatible. Use funnel to avoid spread the oil to other parts of the unit.head light housing.
	Check oil level before use, if oil level is lower than the middle of the gauge, the unit would need a refill, but do not overfill the unit beyond the gauge.
	The product is only allowed to use while ignition's off.
	Be sure to use 12V vehicle battery, and the battery shall be full charged and voltage not lower than 12V.
	Use bright light torch/ halogen light to help find the leaks.
	Wear goggles if available.

Scope of use

The smoke leak detector, with its WYSIWYG efficiency, is widely applicable to the leak test of various pipeline systems and quick pinpoint leak position. This product can effectively find the leakage position by simulating most suitable operating pressure condition of the vehicle pipeline, and introducing the smoke into the vehicle pipeline system through appropriate adapters. It can be used to test air intake system, exhaust system, inter-cooling system, oil circuit, water lines and other pipeline systems that users can image.

Accessories

The following list is designed to familiarize you with the function and the usage scenarios of the standard configured and optional accessories of the product.

Note: Please refer to the specific product configuration for the applicability of the introduction.

Picture	Article	Description	Remarks
	Power Cord	For connecting power supply to the unit. Fitting size 5.5x2.5mm	Configured for all models
	Delivery Hose	Air/smoke delivery hose to introduce air/smoke from main unit to the system directly or via adapters.	Configured for all models
	Hook	For hanging up the main unit.	Configured for all models
	Funnel	Refilling assistant tool to prevent the smoke oil from flowing into the casing during filling, which would cause unexpected failure.	Configured for all models
	Intake Bladder	Applicable for 25~140mm opening, especially when the opening is not round shaped. <i>Note: avoid contact to oil and high temperature.</i>	Configured for certain models
	Service Replacement	Replacement rubber and clamps for intake bladder.	Configured for certain models
	Adapter Cone	Applicable for 30~80mm round shaped opening. Eg.intake.	Configured for certain models

	Adapter Cone Set	Applicable for 25~55mm round shaped opening, eg.fuel tank, cooling system, engine oil filler port, exhaust etc.	Configured for certain models
	EVAP Adapter	For fitting to the evap service port, mostly available on vehicle made in North America.	Configured for certain models
	EVAP Removal Tool	EVAP service port valve removal tool, note the thread is anti-clockwise.	Configured for certain models
	Air Adapt (U.S. Standard)	For introducing shop air.	Configured for certain models
	Block-cap set	Mostly used when work on leak test on vehicle engine while it's unmounted from the vehicle.	Configured for certain models

		S100	S100 Pro	S110	S110 Pro	S160
Function	Output Pressure	0.5psi	0.5psi	0.5psi	0.5psi	0.8-1.2bar
	Air Source	External shop air needed	inbuild air compressor	External shop air needed	inbuild air compressor	inbuild air compressor
	Smart PCA Inbuild					
	Flow Meter			√	√	
	Mechanical Pressure Gauge					
	Digital Pressure Gauge					
Configuration	Power Cord	√	√	√	√	√
	Hook	√	√	√	√	√
	Smoke Hose	√	√	√	√	√
	Funnel	√	√	√	√	√
	1" Intake Bladder					√
	1" Intake Bladder Replacement Rubber					√
	1.5" Intake Bladder					
	1.5" Intake Bladder Replacement Rubber					
	Adapter Cone Ø25-85cm					
	Adapter Cone Set Ø17-55mm					√
	23pcs Blockoff Cap Set					
	EVAP Test Kit	√	√	√	√	
	Smoke Diffuser					

		\$1000	\$200	\$2000	\$300	\$300 Lite
Function	Output Pressure	0.8-1.2bar	0.8-1.2bar	0.8-1.2bar	0.8-1.2bar	0.8-1.2bar
	Air Source	inbuild air compressor	inbuild air compressor	inbuild air compressor	inbuild air compressor	inbuild air compressor
	Smart PCA Inbuilt	√		√		
	Flow Meter				√	√
	Mechanical Pressure Gauge		√	√	√	√
	Digital Pressure Gauge					
Configuration	Power Cord	√	√	√	√	√
	Hook	√	√	√	√	√
	Smoke Hose	√	√	√	√	√
	Funnel	√	√	√	√	√
	1" Intake Bladder		√		√	√
	1" Intake Bladder Replacement Rubber		√		√	√
	1.5" Intake Bladder	√		√		
	1.5" Intake Bladder Replacement Rubber	√		√		
	Adapter Cone Ø25-85cm	√		√	√	√
	Adapter Cone Set Ø17-55mm		√			
	23pcs Blockoff Cap Set				√	
	EVAP Test Kit					
	Smoke Diffuser					

		\$3000	\$3000+	L100	L100 Pro	L300	L3000
Function	Output Pressure	0.8-1.2bar	0.8-1.2bar	0.5psi	0.5psi	0.8-1.2bar	0.8-1.2bar
	Air Source	inbuild air compressor	inbuild air compressor	External shop air needed	inbuild air compressor	inbuild air compressor	inbuild air compressor
	Smart PCA Inbuilt	√	√				√
	Flow Meter	√	√			√	√
	Mechanical Pressure Gauge	√	√				
	Digital Pressure Gauge			√	√	√	√
Configuration	Power Cord	√	√	√	√	√	√
	Hook	√	√	√	√	√	√
	Smoke Hose	√	√	√	√	√	√
	Funnel	√	√	√	√	√	√
	1" Intake Bladder			√	√	√	
	1" Intake Bladder Replacement Rubber			√	√	√	
	1.5" Intake Bladder	√	√				√
	1.5" Intake Bladder Replacement Rubber	√	√				√

Configuration	Adapter Cone Ø25-85cm	√	√			√	√
	Adapter Cone Set Ø17-55mm					√	√
	23pcs Blockoff Cap Set		√	√	√		
	EVAP Test Kit			√	√		
	Smoke Diffuser			√	√	√	√

Specification

Power Supply	12V(Automotive Battery)/5Amp
Output Pressure	0.5psi or 0.8-1.2bar(Please refer to the specific product configuration)
Flow Rate	<6LPM or <8LPM(Please refer to the specific product configuration)
Length of Power Cord	2.5Meters
Length of Smoke Hose	2.5Meters

Product Structure

The following list is designed to familiarize you with the function of the operational components of the machine.

Note: Please refer to the specific product configuration for the applicability of the introduction.

Article	Description	Remarks
Oil Refill Port	For oil refill while its needed. The funnel is a nice helper to prevent oil from poured to the surface of the unit.	Configured for all models
Velcro Strap	For collection of the smoke delivery hose, and power cord before storage.	Configured for all models

Smoke Outlet Port	While set up the unit, the Smoke Delivery Hose need to be mounted onto the Smoke Outlet .	Configured for all models
Power Socket	While set up the unit, the power cords need to plug into the power socket.	Configured for all models
Oil Level Gauge	While set up the unit, smoke oil need to be filled into the unit, do not exceed the MAX line. Check and confirm proper oil level periodically. If the oil level is lower than the MIN line,the unit would need a refill.	Configured for all models
System Pressure Gauge	The Pressure Gauge displays the output pressure of the machine if block the smoke outlet port, otherwise it shows the real time pressure of the system been testing. Pressure Decay Test: This gauge can also be used to determine if a leak exists by switching off the <Air Control> while the system is under pressure. If the gauge holds the displayed pressure, there is no leakage. If the displayed pressure starts drops, there is leakage in the system.	Configured for certain models
Digital Pressure Gauge	Short press the switch button to set the displayed pressure unit according to the reading preference, there are 4 kinds of pressure unit available, psi, bar, kpa, kg/m2. Long press the switch button for 3 seconds to make the displayed pressure value zero.	Configured for certain models
Flow Meter	The purpose of the flow meter is to provide a quick visual indication of the amount of air/smoke passing through the system being tested. If the smoke nozzle is in a closed system, and there are no leaks Configured for certain modelsin that system, the flow meter will read zero (ball at bottom of scale). As the system is filled with air or smoke, the ball in the flow meter will slowly fall to the bottom of the scale as the pressure in the system equalizes to the output pressure of the unit. As the flow decreases, the output pressure will increase. If the flow meter ball never falls to the bottom of the scale, there is leakage or air passing through the system. It is not necessary to use smoke when using the flow meter to determine if a leak exists.	Configured for certain models

Flow Dial	In many cases excessive smoke exiting a leak may make it difficult to determine the exact location of the leak. The purpose of the Flow Control Valve is to decrease the amount of smoke exiting a leak so that its position may be pinpointed without the masking effect of excessive smoke. Turn clockwise to decrease flow, counterclockwise to increase flow. This valve is also used to lock out the system under test and observe any pressure decay on the pressure gauge.	Configured for certain models
State Indication and Air Control	The <Left - LED Indication> LED has two states. RED: Power ON. GREEN: Pressurized air production. While power up the unit, the LED would turn RED. Press <Air Control switch>, the <Left - LED Indication> would turn GREEN, and the unit start to generate pressurized air. Press <Air Control switch> again anytime, the <Left - LED Indication> would turn RED, and the unit stops generating pressurized air.	Configured for certain models
State Indication and Smoke Control	The <Right - LED Indication> LED has three states. OFF: Smoke generation not started. GREEN: Smoke generation. RED: Overheat. While not smoke the unit, the LED would be OFF. Press <Smoke Control switch>, the <Right - LED Indication> would turn GREEN, and the unit start to generate smoke. Press <Smoke Control switch> again anytime, the <Right - LED Indication> would turn OFF, and the unit stops generating smoke. While the smoke generating chamber is overheat, for protection, the smoke generation would be halted and the <Right - LED Indication> would turn RED and restart generating smoke while the smoke generating chamber cooled down, or you can switch it OFF by pressing <Smoke Control switch> .	Configured for certain models

Leak Status Indication

		
No Leak	Small Leak	Massive Leak
Flow Meter drop to '0' and pressure reading raise to Max.	Flow Meter stay between 0.1 to 0.5LPM.	Flow Meter raise and pressure reading drop to '0'.

Generic Operation

1. Mount the hook on to the unit.
2. Mount the shop air adapter to the unit (For the model without built-in air pump inside).
3. Plug the power cord into the socket.
4. Screw on the smoke hose to the unit.
5. Fill (mineral Oil based) smoke oil into the unit from the refill port on the top.
Note: The oil level shall not exceed the level gauge.
6. Connect shop air supply (For the model without built-in air pump inside).
7. Connect 12V vehicle power.
8. Introduce shop air to the unit (For the model without built-in air pump inside).
9. Turn the Flow Dial (if equipped) anti-clockwise to open the air flow.
10. Switch on the power or the mode selector button, then the unit will start to work.
11. Introduce smoke into the system.
12. The system will be ready for leak check in 2 minutes. Use a bright light torch or working lamp to assist.
13. After test, switch off the power or the mode selector button, then the unit will start to work.
14. Collect the Smoke Hose and the Power Cord with the Velcro Straps for storage.
15. Hang the unit or make it stand in UPRIGHT position only. Do NOT lay it down.

Knowledge for Fuel Vapor Recovery System (EVAP)

1. According to the Environmental Protection Agency, the EVAP system is the most neglected of all the emission systems in an automobile. A leak as small as 0.020" diameter can allow over 30 times the allowable hydrocarbons into the atmosphere then is currently acceptable through the exhaust. Additionally, EVAP system leaks can be a major cause of check engine lights occurring. In the past, EVAP related problems have been difficult to locate and repair. These can now be quickly diagnosed and repaired, becoming a profitable ticket for service facilities.
2. There are several acceptable methods of inspecting the EVAP system. Basically we need to close any vent solenoids, fill the system with smoke, and look for the smoke escaping at the leak. Since these systems vary in different vehicles and have evolved over the years, we will attempt to describe operating guidelines that should be helpful in inspecting these EVAP systems.
3. Beginning with the 1996 model year, U.S. Vehicles have been produced with an EVAP Service Port to access this system. The port is usually located under the hood, but may be located elsewhere on the

vehicle. To access this port for testing, remove the cap, then remove the Schrader Valve from inside the Service Port, using the supplied Schrader Valve Removal Tool. Important Note: The Schrader Valve has left-hand threads, turn clockwise to remove! Connect the supplied Service Port Adaptor to the Service Port.

4. The Onboard Diagnostics on vehicles 1996 and beyond will determine if a leak exists, the following trouble codes may be indicated to report the leak:

P0442 for a .040 leak standard

P0456 for a .020 leak standard.

5. Using a scan tool, close the vent solenoids so that the EVAP system is closed to the atmosphere.

6. Set up the machine

7. Remove the fuel cap and begin to fill the system through the Service Port Adaptor until dense smoke is seen exiting the fuel neck. This procedure ensures that the system is full of smoke. Replace the fuel cap and continue pumping smoke into the system.

8. Inspect under the hood for leaks using a bright halogen lamp. Raise the vehicle on a hoist and inspect the underside of the vehicle, tracing the route of the EVAP system. Note: It may be necessary to hang the Smoke Machine under the car so that it is visible to the operator .

9. As the system fills with smoke, and the pressure in the system equalizes, keep an eye on the Flow meter and the Pressure Gauge. If there is no leakage in the system the Pressure Gauge will go to its maximum pressure and the Flow meter will drop to zero.

10. For trouble code P0456, the meter should stabilize at 0.1 LPM or less with the Smoke Machine.

11. For trouble code P0442, the meter should stabilize at 0.5 LPM or less with the Smoke Machine.

Note: These readings are approximate and are for reference only.

12. Once the leak has been located and repaired, it is a good idea to repeat the above procedure using air only. It is not necessary to turn on the smoke to test for leakage using the flow meter.

13. Replace Schrader Valve and cover. (Note: Valve is Left-hand thread.)

14. Following are some generic OBD EVAP related codes:

P0443 Purge Control Valve Circuit

P0444 Purge Control Valve Circuit Open

P0445 Purge Control Valve Circuit Shorted

P0446 Vent Control Circuit

P0447 Vent Control Circuit Open

P0448 Vent Control Circuit Shorted

P0449 Vent Valve/Solenoid Circuit

P0450 Pressure Sensor

P0451 Pressure Sensor Range/Performance

P0452 Pressure Sensor Low Input

P0453 Pressure Sensor High Input

P0454 Pressure Sensor Intermittent

P0455 System Leak Detected (gross leak)

P0456 System Leak Detected (very small leak)

P0457 System Leak Detected (fuel cap loose/off)

P0465 EVAP Purge Flow Sensor Circuit

P0466 EVAP Purge Flow Sensor Circuit Range/Performance

P0467 EVAP Purge Flow Sensor Circuit Low Input

P0468 EVAP Purge Flow Sensor Circuit High Input

P0469 EVAP Purge Flow Sensor Circuit Intermittent

Troubleshooting

Error	Possible Reason	Solution
LED not ON	Mistaken possitive to negative	Connect to power source correctly.
	Poor contact of power line	Check with meter if the power line is broken , confirm and replace the power lines.
Pump's on but no air output	Flow Dial not open	Open the Flow Dial anti-clockwise.
	Pump failure	Replace a new pump
No smoke output	No air output	Make reference to #3
	Smoke oil out or overfilled	Check oil level; turn unit upside down while the oil filler port is open, and refill to the correct level.
	Voltage Low	Check battery voltage if its over 12V.
	Heater damaged	Heater damaged if current consumption less than 3Amp, replace the heater.
Weak smoke, obvious oil drops from the output	Smoke oil not compatible	Change proper smoke oil.
	Voltage Low	Check battery voltage if its
Slow oil drops from the output	Normal smoke condensation	Periodically take off the smoke hose and blow it with air gun.
Sudden stop of smoke output	Overheat protection activated	Cool down the unit before use again.

Warranty

- 1.The main unit entitled free warranty since the date of purchasing up to 12 months.
- 2.The accessories are consumables and no warranty would apply.
- 3.Any damage to the machine caused by misuse, or improper operation, is not covered by warranty.