

ONE TOOL

Automotive Innovative Tool Experts

Instruction Manual for the

Multi-functional auto tester



Main function

- Voltage Test/Polarity Testing /Continuity Testing
- Locate Missing cylinders
- Measuring frequency of the ignition pulses
- Peak Detection

Accessories Model NO	Extension lead	Ground lead	Cigarette lighter adaptor	Hook-up clip	Extended probe
SS-6511	6M(2sets)	0.8M	Rubber adaptor	Rubber adaptor	1PCS
SS-6511EL	6M(2sets)	0.8M	EL adaptor	EL adaptor	1PCS
SS-6511A	2M(1set)	0.8M	NA	Without adaptor	1PCS

Introduction

This is an equipment used to test the automotive electrical system within 12 – 24 volts. In order to save the testing hours for the automotive electrical system, it is designed to testing the system without re-connection between the vehicle battery and the testing components, and it contains the following functions:

- Determine the polarity and circuit circumstance (short/ open).
- Activating the components with positive or negative current without jumper wire
- Testing the voltage and continuity of the circuit.
- Illumination.
- Locate missing cylinders.
- Measuring frequency of the high-tension ignition pulses and we could calculate the rotational speed of engine according to the measured frequency.
- Peak detection.
- Testing the voltage of the circuit and the voltage reading will be indicated on the LCD display within $1/10^{\text{th}}$ of a volt.

Eventually, for the testing and safety purpose, this unit contains short-circuit protection, which can also check the ground connection without voltage drop tests. The short-circuit protection system contains the recoverable fuse, and so the technician will not waste the fuses during the testing. The extension cable with this unit is long enough for a technician to test the whole system for the vehicle, therefore, the technician do not have to search for ground connection constantly.

Illumination

Since some of the testing circuit will be shadowed during the testing, it provides the illumination for you convenience. The illumination will automatically turned on as the technician hook up it with vehicle battery.

Important

Please read the instruction before you start to use this instrument.

Warning

When current is provided to the unit, spark may be occurred when the tip contacts with ground or certain circuits. Therefore please do not operate it around flammable. And please do not operating it with 110/220 volt house voltage as it is only for 12 – 24 volt systems.

(3).Multi-cylinder gasoline engine without distributor

Bring the detection head close to the place where the high-tension wire of each cylinder is bundled together.

The measurement is impossible if all the high-tension wires are not bundled together since the distance between the detection head and each high-tension wire differs.

2. Specifications

Applicable engine type: gasoline engine

2-cycle (1,2,3,4-cylinders)

4-cycle(1,2,3,4,5,6,8,12-cylinders)

Detection method: ignition spark noise detection

Detection object: High-tension wire or ignition cord

3. Calculating the rotational speed of engine

We could calculate the rotational speed of engine according to the measured frequency .

The calculation format is as follows:

$$n=60 \times f \times 1/PR .$$

The “n”denotes the rotational speed of engine .

The “f”denotes the frequency of high-tension ignition pulses.

The “PR”denotes the ratio coefficient between the “f”and the “n”.

The number of “PR”,types of engines are as follows:

PR	4-cycle	2-cycle
1/2	1 cylinder	
1	2 cylinder	1 cylinder
3/2	3 cylinder	
2	4 cylinder	2 cylinder
5/2	5 cylinder	
3	6 cylinder	3 cylinder
4	8 cylinder	4 cylinder
6	12 cylinder	

Warning: DO NOT CONTACT PROBE TIP DIRECTLY TO THE SECONDARY IGNITION CIRCUIT.

Peak Detection

The operator can pre-select the peak threshold levels,and then contact a circuit if the voltage greater than the threshold, you can hear the alarm audio.

The peak threshold voltage setting loop incrementally from 0.5, to 1.0, to 2.0, to 5.0 , to 10.0 ,to 48.0 and return back to 0.5 again.

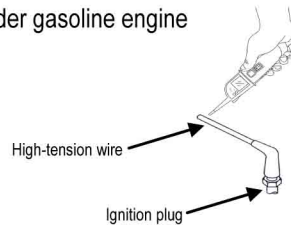


Measuring the frequency of the high-tension ignition pulses

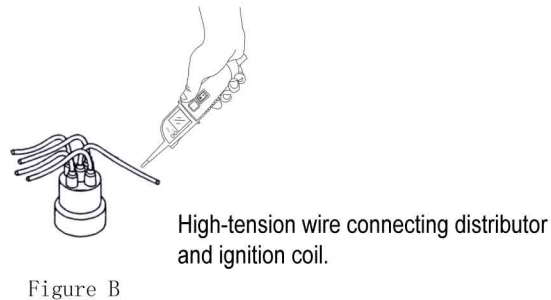
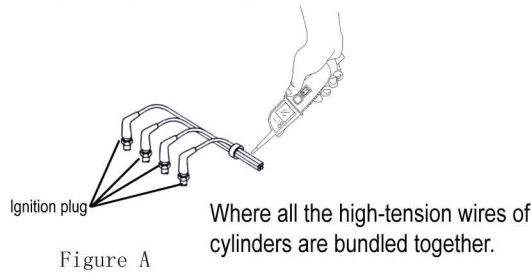
This unit can measure the frequency of the high-tension ignition pulses. Placing its probe tip next to a sparking wire (DO NOT probing it directly), through capacitive coupling, it can see the high-tension ignition pulses at the same time display a frequency reading.

1. MEASURING METHOD

(1). 1-cylinder gasoline engine



(2). Distributor type multi-cylinder gasoline engine



As shown in the figure A,B, bring the detection head close to the high-tension wire that connect the distributor and the ignition coil, or to the place where all the high-tension wires of the cylinders are bundled together.

Getting to know your the Auto Circuit Tester

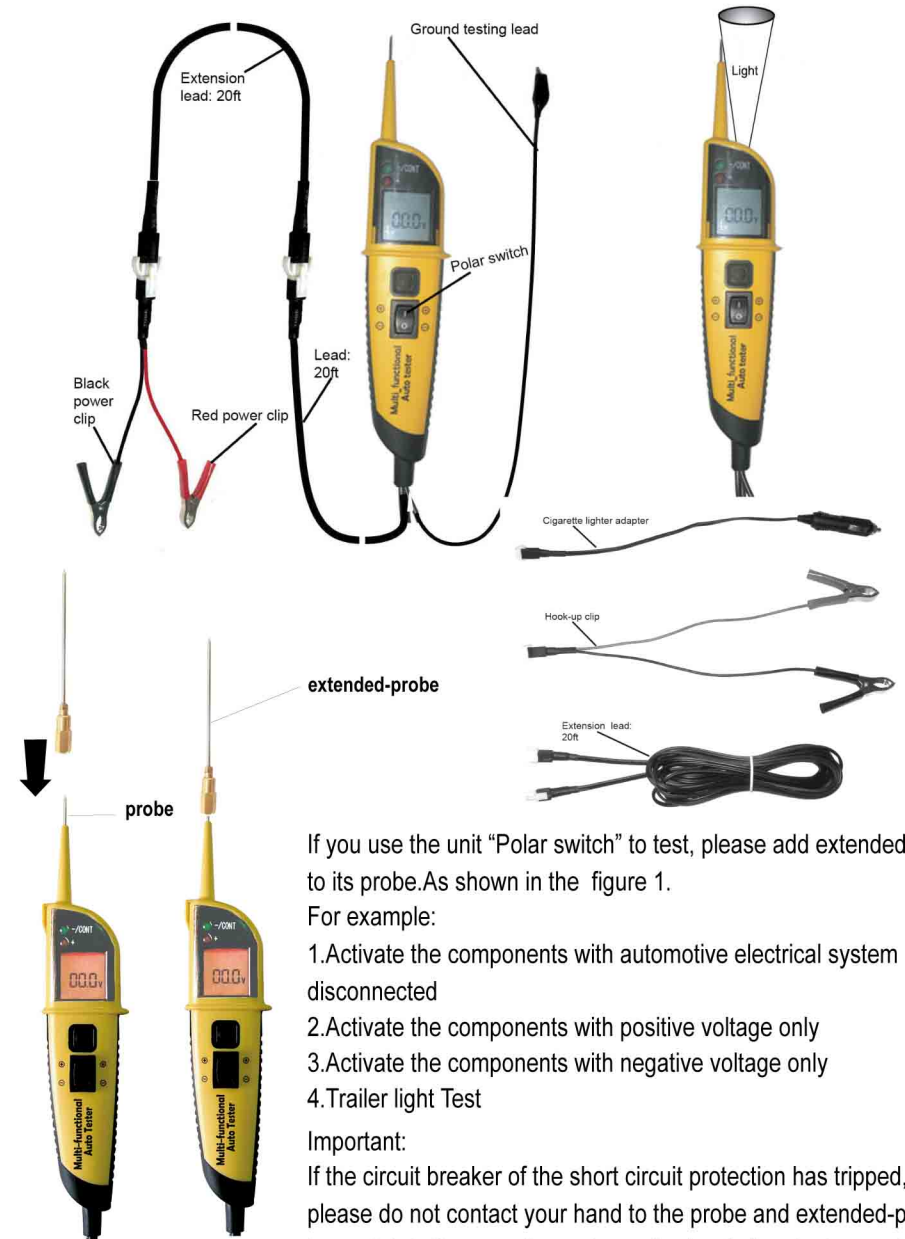


Figure 1

If you use the unit "Polar switch" to test, please add extended-probe to its probe. As shown in the figure 1.

For example:





1. Activate the components with automotive electrical system disconnected
2. Activate the components with positive voltage only
3. Activate the components with negative voltage only
4. Trailer light Test

Important:

If the circuit breaker of the short circuit protection has tripped, please do not contact your hand to the probe and extended-probe immediately. Because the probe and extended-probe is very hot after the circuit breaker has tripped.

Mode instruction

It have four modes, the four modes can be selected by depressing the mode select button and cycling through each one.

MODE	display
Voltage meter Measuring range: 0v~60v	
Locate missing Cylinders	
Measuring frequency of the ignition pulses	 <p data-bbox="667 827 848 899">The sign "Hz" denotes "Hz"</p>
Peak Detection	

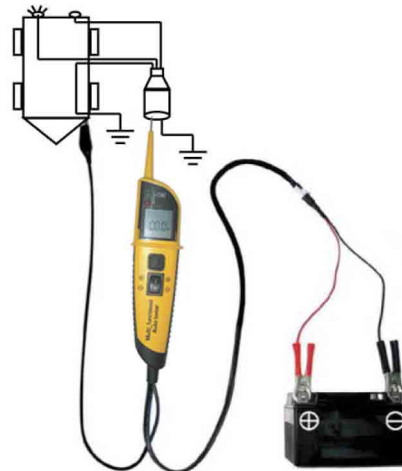
Power Connection

1. Hook up the black power clip to the negative of the vehicle battery.
2. Hook up the red power clip to the positive of the vehicle battery.

Trailer Light Test

To test the trailer light, you need to follow the procedure:

1. Connect the ground test lead to trailer ground.
2. Probe the tip to the outlet of the trailer; push the polar switch forward, then technician can diagnose the function of the trailer light.



Voltage Test

Technician can also use this unit assisting with ground test lead to test the voltage of the circuit. However, during the voltage test, please do not push the polar switch.

1. If probe tip is floating (not contacting a circuit), the red and green LED turn off.
2. If it contact the probe tip to a positive circuit. The red positive sign "+" LED will light and the voltmeter displays the voltage reading within 1/10th of a volt.
3. If it contact the probe tip to a negative circuit. The green negative sign "-" LED will light.

Locate missing cylinders

Placing its probe tip next to a sparking wire (DON'T probing it directly), through capacitive coupling, it can see the high-tension ignition pulses at the same time display a voltage reading. By monitoring each plug wire in this way you can locate missing cylinders.

Warning: DO NOT CONTACT PROBE TIP DIRECTLY TO THE SECONDARY IGNITION CIRCUIT.

Activate the components with negative voltage only

Apart from applying the positive voltage, technician can also use this unit to provide negative voltage to the components. The procedures are as follow:

1. Contact its tip to the negative pole of the component; at this stage, the red LED should be on if the component working correctly.
2. Push the polar switch backward and release it quickly. If the LED goes from red to green, you may proceed further test. If the green LED goes off or the circuit breaker of the short circuit protection tripped, it means it has overloaded. This may cause by the following reasons:

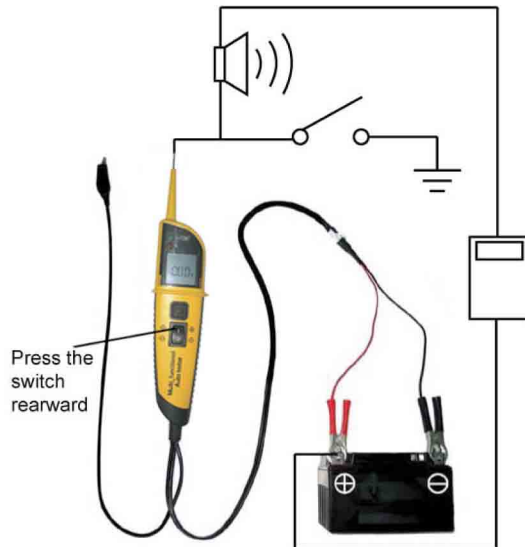
- The component is short circuit or it has been connected to the ground/ negative pole directly.
- The component is a high current component.

If the circuit breaker of the short circuit protection has tripped, it will auto-rest within no more than 60 seconds.

Important

Please operate this function with schematic and correct testing procedure because applying voltage arbitrarily may cause damage to components.

Use tip to apply negative voltage, which can be helpful to diagnose the components



Self-Test

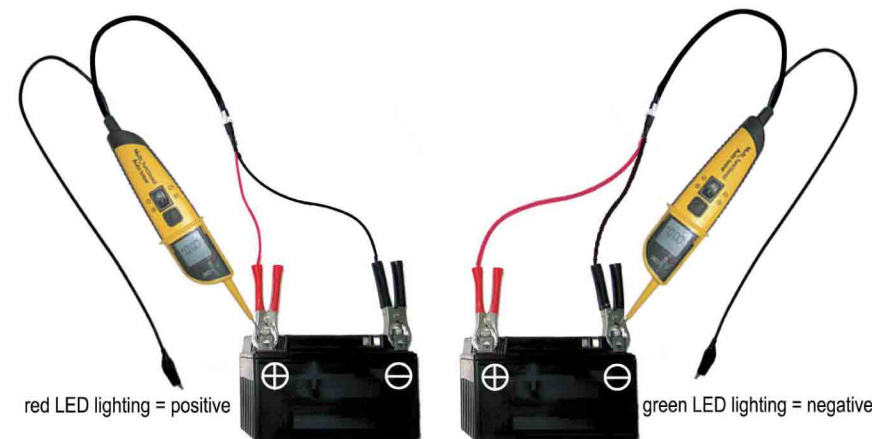
If it is working correctly, the condition should be followed:

- Red LED should be on when the technician push the polar switch forward (toward the positive side).
- Green LED should be on when the technician push the polar switch backward. (toward the negative side).



Polarity Test

- If its tip is contacting with positive pole, the red LED will be on.
- If its tip is contacting with negative pole, the green LED will be on.
- If its tip is contacting with open circuit, neither LED will be on.



Conductivity Test

By using its tip assisting with ground test lead, technician can test the conductivity between wires or components which has been disconnected from the vehicle electrical system. If the current is conductible between wires or components, the green LED should be on.



Activate the components with automotive electrical system disconnected

By assisting its tip with the ground test lead, technician can activate the testing components with automotive electrical system been disconnected. This function can be used to test light, cooling fans, and fuel pumps etc. To do this, please follow the procedure:

1. Connect the ground test lead with the negative pole of the components
2. Contact its tip with the positive pole of the components. If the green LED is on, it means the testing component is conductible.
3. As the green LED goes on, please press the polar switch forward and then release it quickly. If the LED goes from green to red, you may proceed further testing. If the green LED turns off and red LED doesn't turns on, or if the circuit breaker of the short circuit protection tripped, it means its has overloaded. This may due to the following reasons:
 - The component is short circuit or it has been connected to the ground/ negative pole directly.
 - The component is a high current component.

If the circuit breaker of the short circuit protection has tripped, it will auto-rest within no more than 60 seconds.



Activate components with positive voltage only

When technician tests the components, technician can use this unit to provide positive voltage to the testing components. To do this, pleas follow the procedure:

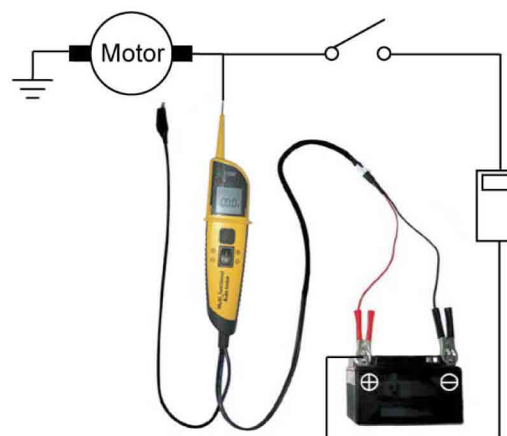
1. Contact its tip with the positive pole of the components. If the green LED is on, it means the testing component is conductible.
2. As the green LED goes on, please press the polar switch forward and then release it quickly. If the LED goes from green to red, you may proceed further testing. If the green LED turns off and red LED doesn't turns on, or if the circuit breaker of the short circuit protection tripped, it means it has overloaded. This may due to the following reasons:
 - The component is short circuit or it has been connected to the ground/ negative pole directly.
 - The component is a high current component.

If the circuit breaker of the short circuit protection has tripped, it will auto-rest within no more than 60 seconds.

Important

Please operate this function with schematic and correct testing procedure because applying voltage arbitrarily may cause damage to components.

Use tip to apply positive voltage, which can be helpful to diagnose the components.



Important:

When applying current to the components, please push the switch before contact the tip with the components. In this case, the arcing will take place between the tip and the component instead of the switch. And so it can increase the life time of the switch.