Please read and save these instructions. Read through this owner's manual carefully before using product. Protect yourself and others by observing all safety information, warnings, and cautions. Failure to comply with instructions could result in personal injury and/or damage to product or property. Please retain instructions for future reference.

AUTO CIRCUIT TESTER

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For safety purposes and the prevention of damage to expensive electronic components it is advised that the user have an understanding of basic electrical theory and a working knowledge of automotive electrical systems.

AUTO CIRCUIT TESTER

INTRODUCTION

This circut tester is used to test automotive electrical systems from 12 to 24 volts. In order to save hours of testing the automotive electrical system, it is designed to test the system without re-connection between the vehicles battery and the testing components. It contains the following functions:

- Determine the polarity and circuit condition (short/open).
- Activating the components with positive or negative current without a jumper wire
- Testing the voltage and continuity of the circuit.
- Backlit digital display.
- Locate misfiring cylinders.
- Measuring frequency of the high-tension ignition pulses can also be used to calculate the rotational speed of engine according to the measured frequency.
- Peak detection.
- Testing the voltage of a circuit and displaying the voltage reading on the LCD display within 1/10 of a volt.

For testing and safety purposes, this unit contains short-circuit protection, which can also check the ground connection voltage drop tests. The short-circuit protection system contains the auto reset circuit breaker so that the technician will not waste fuses during the testing. The extension cable with this unit is long enough for a technician to test the whole system of the vehicle. The technician does not have to continually search for a good ground connection.

ILLUMINATION

For testing in poorly lit or dark areas, the unit provides illumination for your convenience. The illumination will automatically be turned on as the technician connects it to vehicle battery.

IMPORTANT

Please read the complete manual before you start to use this instrument.

Warning: RISK OF DEATH

When current is provided to the unit a spark may occur when the tip contacts the ground or certain circuits. Therefore please do not operate it around flammable fluids or gases. Please do not operate it with 110/220 volt house voltage as it is only for 12 – 24 DC volt systems.

LIMITED 90 DAY WARRANTY

If within 90 days from date of purchase, this product fails due to a defect in materials or workmanship, return the product with proof of purchase, prepaid, to OEM Warranty Dept., 3580 E. Raines Rd. #3, Memphis, TN 38118, for repair or replacement with an item of equal or greater value. This warranty excludes incidental/consequential damages and failures due to misuse, abuse or normal wear and tear. This warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state. OEM will not be responsible for any consequential or incidental damages arising from the breach of this or any other warranty, whether expressed, implied or statutory. Some states do not allow the exclusion or limitation of consequential or incidental damages, so the above exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

ALWAYS WEAR SAFETY GOGGLES.

AUTO CIRCUIT TESTER

GETTING TO KNOW YOUR AUTO CIRCUIT TESTER

If you use the “polarity switch” to test, please add the extended-probe tip to its probe. As shown in the figure 1. For example:

1. Activating components with automotive electrical system disconnected
2. Activating components with positive voltage only
3. Activating components with negative voltage only
4. Trailer light test

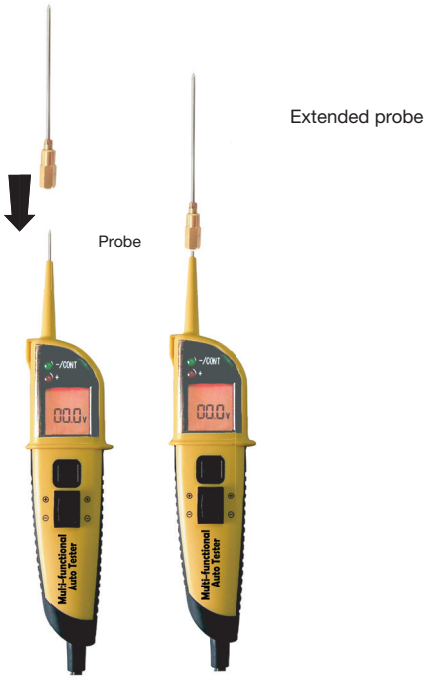
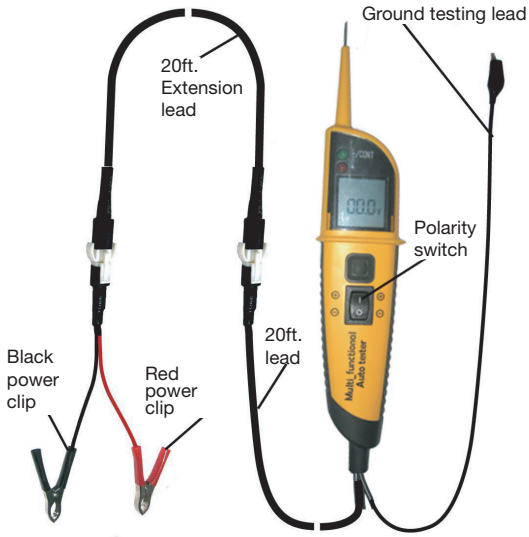


Figure 1



IMPORTANT:
If the circuit breaker of the short circuit protection has been tripped, do not touch the probe immediately. The probe will be very hot after the circuit breaker has tripped. **WAIT FOR PROBE TO COOL.**

OEM® AUTO CIRCUIT TESTER

MODE INSTRUCTION

The unit has four modes, the four modes can be selected by depressing the mode select button and cycling through each one.

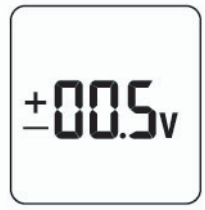
MODE Display
Voltage Meter
Measuring range
0v~60v DC

Locate missing cylinders

Measuring frequency of the ignition pulses

The sign"Hc" denotes "Hz"

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.

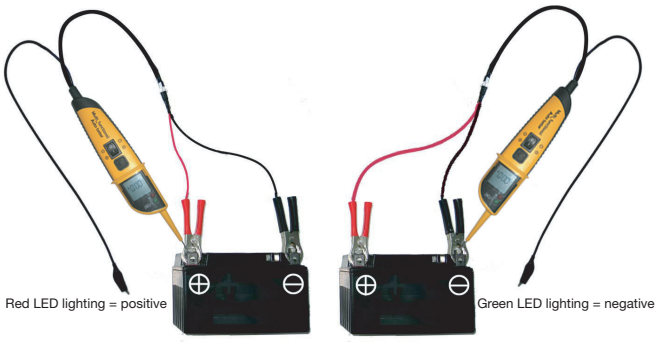
SELF-TEST

If the unit is working correctly, the conditions should be as follows:

- The red LED should be on when the technician pushes the polarity switch forward (toward the positive side).
- The green LED should be on when the technician pushes the polarity switch backward. (toward the negative side).

Polarity Test

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



AUTO CIRCUIT TESTER

CONDUCTIVITY TEST

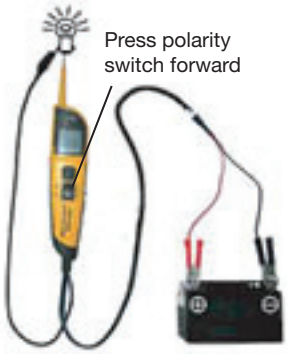
The technician can test the conductivity between wires or components which have been disconnected from the vehicle's electrical system. If the current is conductible between wires or components, the green LED should be on.

ACTIVATING COMPONENTS WITH THE AUTOMOTIVE ELECTRICAL SYSTEM DISCONNECTED

The technician can activate and test components which have been disconnected from the automotive electrical system. This function can be used to test lamps, cooling fans, fuel pumps, etc. To do this, please follow the procedure:

1. Connect the ground test lead to the negative pole of the components.
2. Contact its tip to the positive pole of the component. If the green LED is on, it means the testing component is conductible.
3. As the green LED goes on, press the polarity switch forward and then release it quickly. If the LED goes from green to red, you may proceed with 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 be due to the following reasons:
    - The component is short circuited or it has been connected to the ground/ negative pole directly.
    - The component is a high current component.

If the circuit breaker of the tection has been tripped, it seconds.



ACTIVATE COMPONENTS WITH POSITIVE VOLTAGE ONLY

The technician can use this unit to provide positive voltage to test the components. To do this, follow this procedure:

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

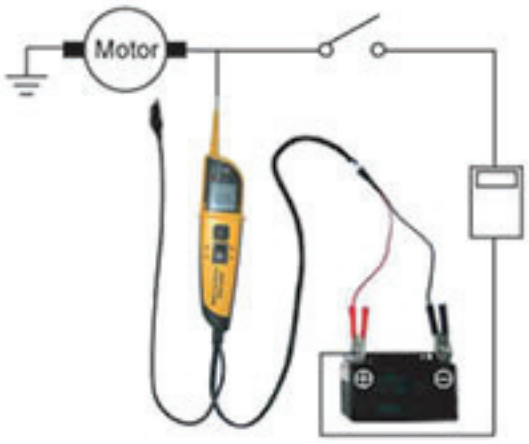
If the circuit breaker of the short circuit protection has tripped, it will reset within 60 seconds.

IMPORTANT

Please operate this function using a schematic and correct testing procedures because applying voltage arbitrarily may cause damage to components.

Important:

When applying current to the components, please push the switch before contacting the tip with the components. In this case, any arcing will take place between the tip and the component instead of inside the switch, increasing the life of the switch.



AUTO CIRCUIT TESTER

ACTIVATE THE COMPONENTS WITH NEGATIVE VOLTAGE ONLY

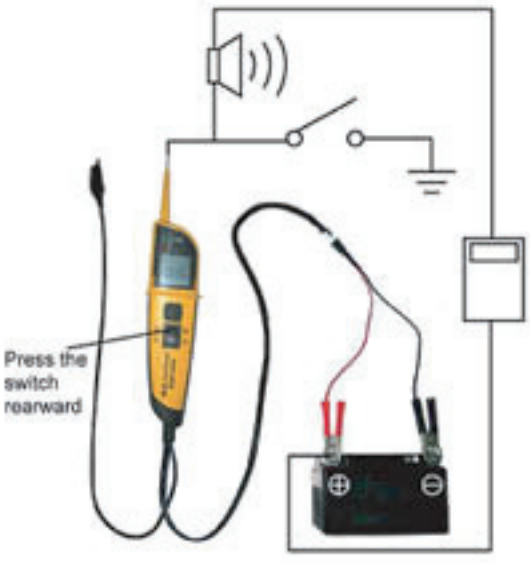
Apart from applying positive voltage, the technicians can also use this unit to provide ground to the components. These procedures are as follows:

1. Contact the tip to the negative pole of the component; at this stage, the red LED should be on if the component is working correctly.
2. Push the polarity switch backward and release it quickly. If the LED goes from red to green, you may proceed with further testing. If the green LED goes off or the circuit breaker of the short circuit protection is tripped, it means it has overloaded. This may be caused by the following reasons:
    - The component is short circuited 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 reset within 60 seconds.

IMPORTANT

Please operate this function using a schematic and correct testing procedures because applying voltage arbitrarily may cause damage to components.



TRAILER LIGHT TEST

To test trailer light wiring, you need to follow this procedure:

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

VOLTAGE TEST

The technician can also use this unit to assist with ground test lead to test the voltage of the circuit. However, during the voltage test, do not push the polarity switch.

1 If probe tip is floating (not contacting a circuit), the red and green LED turn off.

2 If you probe the 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.

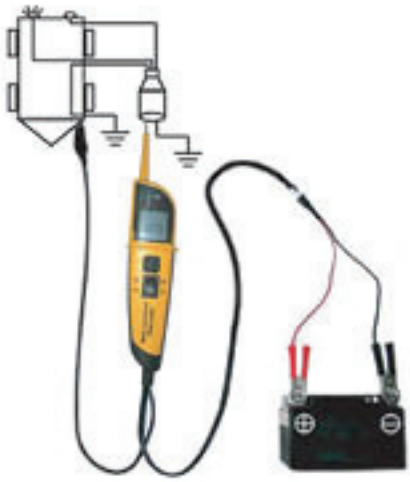
3 If you contact the probe tip to a negative circuit, the green negative sign"-" LED will light.

LOCATE MISFIRING CYLINDERS

By placing its probe tip next to a spark plug wire or coil (DON'T pierce it directly), through capacitive coupling, it can sense the high-tension ignition pulses and at the same time display a voltage reading.

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

Properly test each plug wire or coil to help locate cylinder misfires.



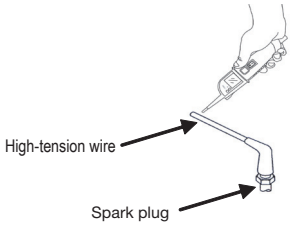
AUTO CIRCUIT TESTER

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 spark plug wire (DO NOT pierce it directly), through capacitive coupling, it can see the high-tension ignition pulses and at the same time display a frequency reading.

1. MEASURING METHOD

.1-cylinder gasoline engine



2. Distributor type multi-cylinder gasoline engine

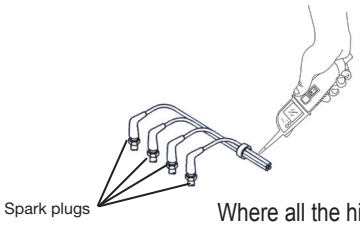


Figure A

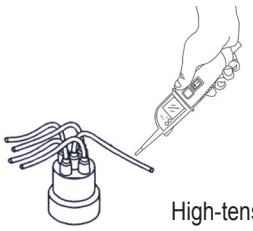


Figure B

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

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

To 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 the 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
1/21	1 cylinder	
1	2 cylinder	1 cylinder
3/23	3 cylinder	
2	4 cylinder	2 cylinder
5/25	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 is greater than the threshold, you can hear the audio alarm.
The peak threshold voltage settings 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.

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