

INSTRUCTION MANUAL

# POWER PROBE III S

THE ULTIMATE IN CIRCUIT TESTING



**POWER PROBE**



Power Probe Tek

**PP3S**

# INTRODUCTION

Thank you for purchasing the NEW Power Probe IIIS (PP3S). The PP3S is our most revolutionary circuit tester to date. The PP3S literally speeds you through the diagnosing of 12 to 24 volt automotive electrical systems. After connecting the PP3S's clips to the vehicle's battery, the automotive technician can determine at a glance, the voltage level and the polarity of a circuit without running for a voltmeter or reconnecting hook-up clips from one battery pole to the other. The power switch allows the automotive technician to conduct a positive or negative battery current to the tip for activating and testing the function of electrical components without wasting time with jumper leads. And yes, the PP3S is short circuit protected. It tests for bad ground contacts instantly without performing voltage drop tests. It allows you to follow and locate short circuits without wasting precious fuses. The Power Probe can also test for continuity with the assistance of its auxiliary ground lead. With a flip of the power switch, you will know at a glance that your PP3S is functioning without running to the battery as you would otherwise have to do with simple test lights. The PP3S's 20ft (extendable) cable allows you to test along the entire length of the vehicle without constantly searching for ground hook-ups. [The Power Probe IIIS Conforms to UL STD. 61010-1, 61010-2-030 and 61010-031; Certified to CSA STD. C22.2 NO. 61010-1, 61010-2-030 and 61010-031. Do not use the equipment for measurements on CAT II, CAT III & CAT IV.](#) An absolute must for every automotive technician looking for a fast and accurate solution to electrical systems diagnostics.

Before using the Power Probe IIIS please read the instruction booklet carefully.

[If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.](#)

**Warning!** When the PP3S rocker switch is depressed battery current/voltage is conducted directly to the tip which may cause sparks when contacting ground or certain circuits. Therefore the Power Probe should NOT be used around flammables such as gasoline or its vapors. The spark of an energized Power Probe could ignite these vapors. Use the same caution as you would when using an arc welder. [Product is not water resistant, please avoid water contact during operation.](#) [If the test leads need to be replaced, you must use a new one which should meet EN 61010-031 standard.](#)

**The Power Probe IIIS and the ECT 3000 are NOT to be used with 110/220-volt HOME electrical, it is only for use with 12-24-volt systems.**

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**IMPORTANT TIP:** When powering-up components, you can increase the life of your Power Probe switch if you first press the switch, then contact the tip to the component. The arcing will take place at the tip instead of the contacts of the switch.

## Hook-Up

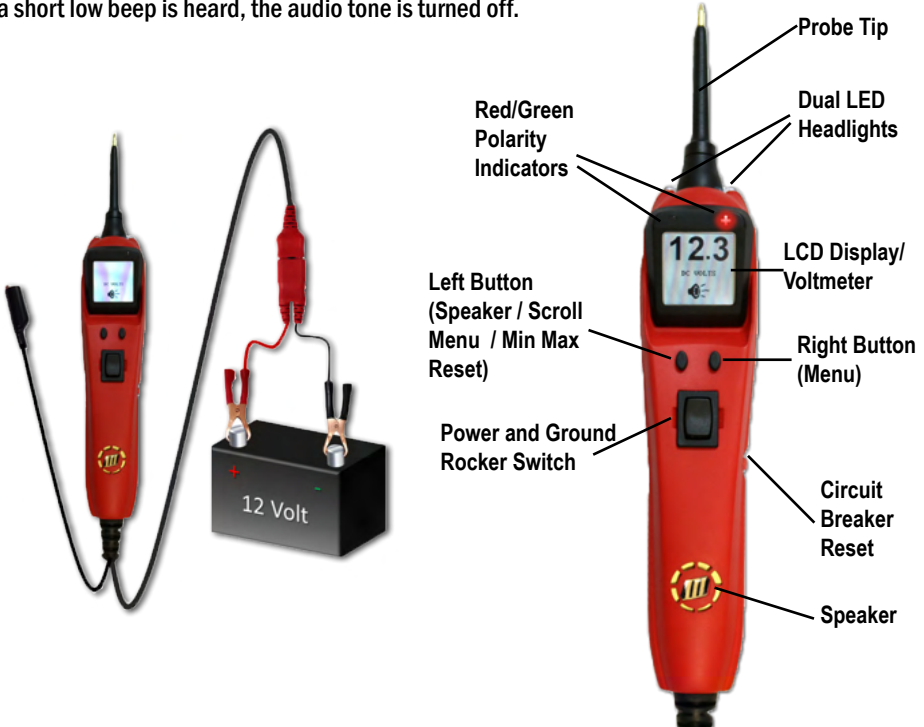
Unroll the Power Probe cable. Connect the **RED** battery hook-up clip to the **POSITIVE** terminal of the vehicle's battery. Connect the **BLACK** battery hook-up clip to the **NEGATIVE** terminal of the vehicle's battery. When the PP3S is first connected to a battery (power source), it will sound a quick start up tone and then go into Voltmeter Mode (See Mode #1 on page 10) and the 2 bright white LEDs (dual headlights) will be on to illuminate the test area of the probe tip.

## Quick Self-Test

While the PP3S is in Voltmeter Mode, press the power switch forward to activate the tip with a **positive** (+) voltage. The **positive** sign (+) LED should light red and the LCD display will read the battery (supply) voltage. If the tone feature is turned on, a high pitched tone will sound. Press the power switch rearward to activate the tip with a **negative** (-) voltage. The **negative** sign (-) LED should light green and the LCD display will read "00.0" (ground). If the tone feature is turned on, a low pitched tone will sound. The Power Probe is now ready to use. If the indicator did not light, depress the reset button of the circuit breaker on the right side of the housing and try the self test again.

## Turning The Audio Tone On/Off

While the PP3S is in Voltmeter Mode, just do a quick press left button to toggle the tone on or off. When pressing the left (speaker) button, if a short high beep is heard, this means the audio tone is turned on. If a short low beep is heard, the audio tone is turned off.



## Circuit Breaker

In Voltmeter Mode (Mode #1) with the circuit breaker tripped, the display will show “Circuit Breaker Tripped”(see page 11-12 for detail) All other functions of the PP3S are still active. This means that you can still probe a circuit and observe the voltage reading. When the circuit breaker is tripped, the PP3S will NOT be able to conduct battery current to the tip even when the power switch is pressed. Intentionally tripping the breaker and using the PP3S to probe can be considered an added precaution against accidental pressing of the power switch.



## Voltage & Polarity Testing

While the PP3S is in Voltmeter Mode, contact the probe tip to a **POSITIVE** circuit. The red **positive** sign “+” LED will light and the voltmeter displays the voltage with a resolution of 1/10th of a volt (0.1v).

If the audio feature is turned on, a high pitched tone will sound. (See **RED/GREEN POLARITY INDICATOR & AUDIO TONE** on page 10) While the PP3S is in Voltmeter Mode, contact the probe tip to a **NEGATIVE** circuit. The **green negative** sign “-” LED will light and the voltmeter displays the voltage. If the audio feature is turned on, a low pitched tone will sound. Contacting the Power Probe tip to an **OPEN** circuit will be indicated by neither of the LED indicators lighting.



While the PP3S is in Power Probe Mode. Contact the probe tip to a **NEGATIVE** circuit. The **green negative** sign “-” LED will light. If the audio feature is turned on, a low pitched tone will sound.



While the PP3S is in Power Probe Mode. Contact the probe tip to a **POSITIVE** circuit. The **red positive** sign “+” LED will light and the voltage reading of the circuit will be indicated on the LCD display. If the audio feature is turned on, a high pitched tone will sound.

# Continuity Testing

While the PP3S is in Voltmeter Mode, and by using the Power Probe tip in connection with chassis ground or the auxiliary ground lead, continuity can be tested on wires and components attached or disconnected from the vehicle's electrical system.

The PP3S indicates continuity using 2 resistance levels. When the Power Probe tip has a resistance to ground less than 20K Ohms but greater than approx. 650 Ohms the LCD will indicate "00.0" volts but no Green "-" LED. But when the resistance to ground less than approx. 650 Ohms the LCD will indicate "00.0" volts and also the Green "-" LED. The higher resistance continuity function is useful for checking Spark Plug Wires, (disconnected from ignition) Solenoids and magnetic pickup coils, and the lower resistance continuity for testing relay coils and wiring. However the best way to prove continuity of connections to either Ground or Battery is to power up the connection using the Power Switch. If the Circuit Breaker trips you know that you have a good solid low resistance connection.

No Continuity



Continuity (less than 20k  $\Omega$  but greater than approx. 650  $\Omega$ )



Continuity (less than approx. 650  $\Omega$ )



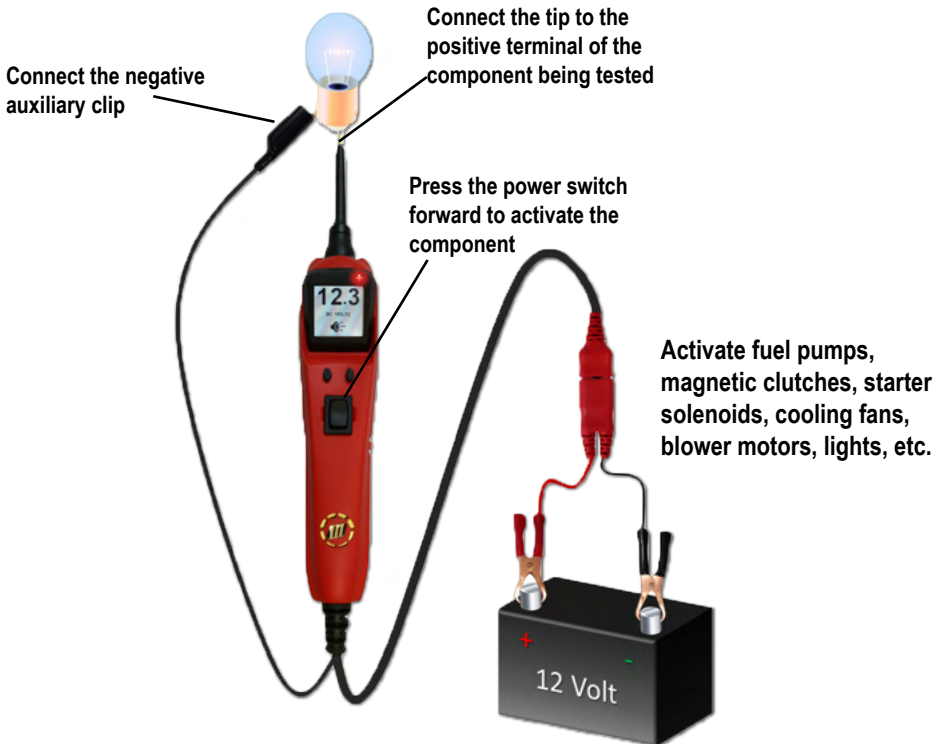
# Activating Components In Your Hand

While the PP3S is in Voltmeter Mode and by using the Power Probe tip in connection with the auxiliary ground lead, components can be activated right in your hand, thereby testing their function. Connect the negative auxiliary clip to the negative terminal or ground side of the component being tested. Contact the probe to the positive terminal of the component, the **green negative** sign “-“ LED indicator should light **GREEN** indicating continuity through the component.

While keeping an eye on the green LED negative sign, quickly depress and release the power switch forward (+). If the green negative sign “-“ LED went out and the red positive sign “+” came on, you may proceed with further activation. If the **green negative** sign “-“ LED went off at that instant or if the circuit breaker tripped, the Power Probe has been overloaded. This could happen for the following reasons:

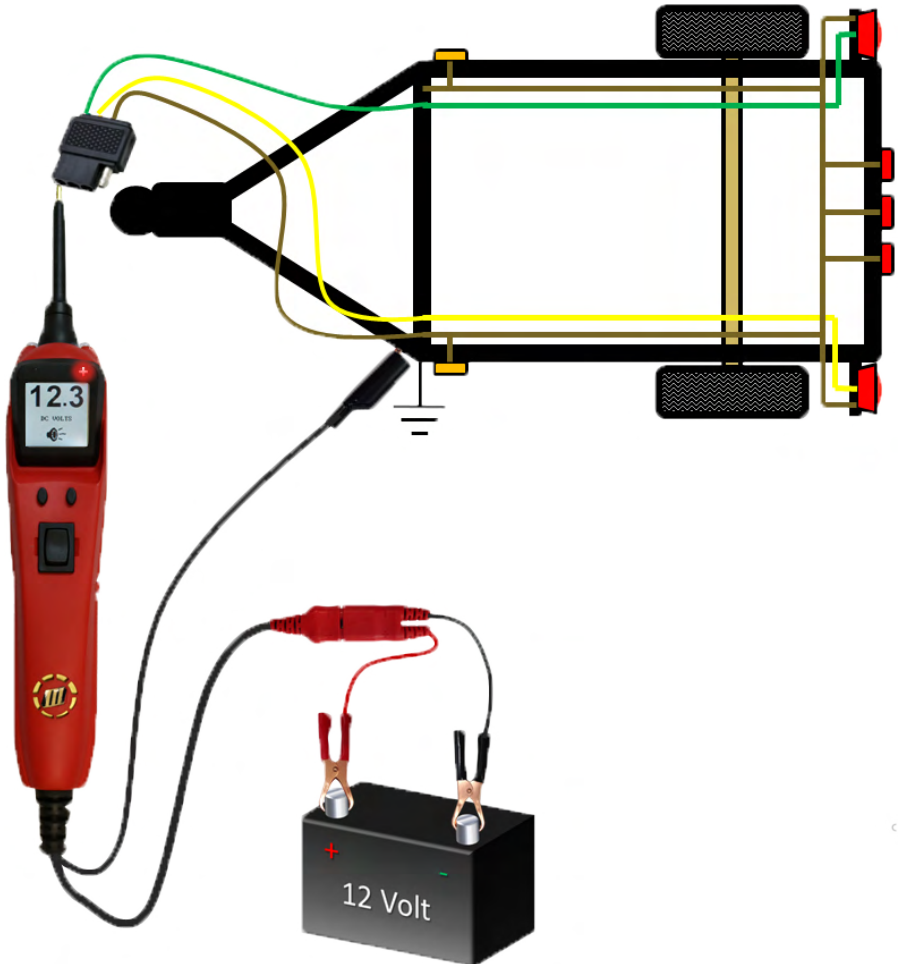
- The contact you are probing is a direct ground or negative voltage.
- The component you are testing is short-circuited.
- The component is a very high current component (i.e., starter motor).

If the circuit breaker is tripped, reset it by waiting for it to cool down (15 sec.) and then depressing the reset button.



# Testing Trailer Lights & Connections

1. Connect the PP3S to a good battery.
2. Clip the auxiliary ground clip to the trailer ground.
3. Probe the contacts at the jack and then apply voltage to them. This lets you check the function and orientation of the connector and trailer lights. If the circuit breaker tripped, that contact is likely a ground. Reset the circuit breaker by letting it cool down (15 sec.) and depressing the reset button until it clicks into place.





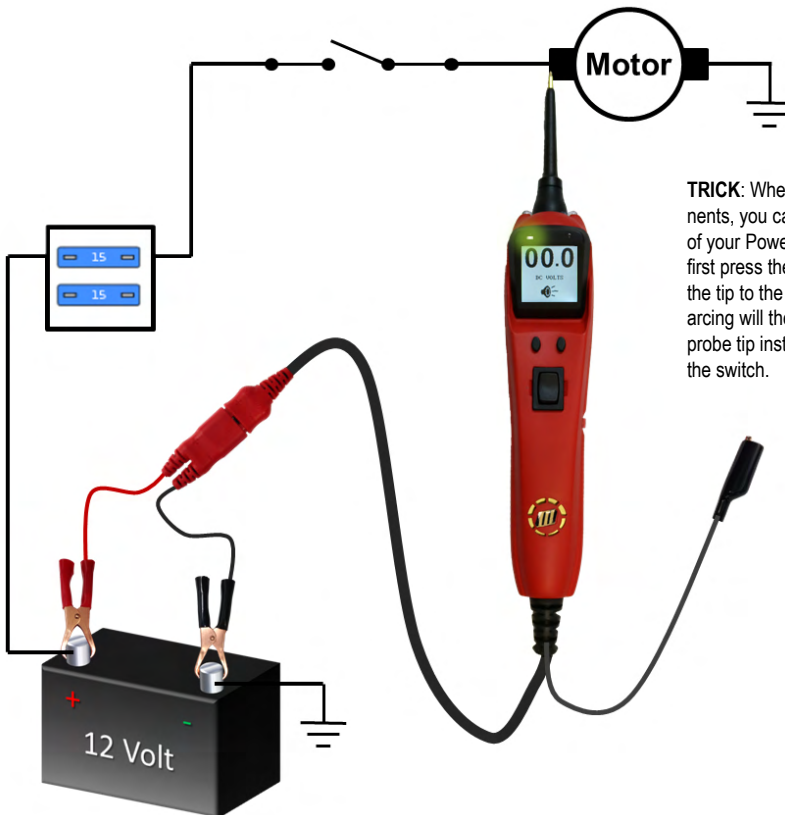
# Activating Components On Vehicle

To activate components with **positive (+)** voltage: Contact the probe tip to the positive terminal of the component, the **green negative** sign “-” LED should light. Indicating continuity to ground. While observing the **green indicator**, quickly depress and release the power switch forward (+). If the **green indicator** went out and the **red positive** sign (+) LED came on, you may proceed with further activation. If the **green indicator** went off at that instant or if the circuit breaker tripped, the Power Probe has been overloaded. This could happen for the following reasons:

- The contact is a direct ground.
- The component is short-circuited.
- The component is a high current component (i.e., starter motor).

If the circuit breaker tripped, reset it by allowing it to cool down (15 sec.) and then depress the reset button.

**Warning:** Haphazardly applying voltage to certain circuits can cause damage to a vehicle's electronic components. Therefore, it is strongly advised to use the vehicle manufacturer's schematic and diagnosing procedure while testing.



**TRICK:** When powering up components, you can increase the life of your Power Probe switch if you first press the switch, then contact the tip to the component. Any arcing will then take place at the probe tip instead of the contacts of the switch.

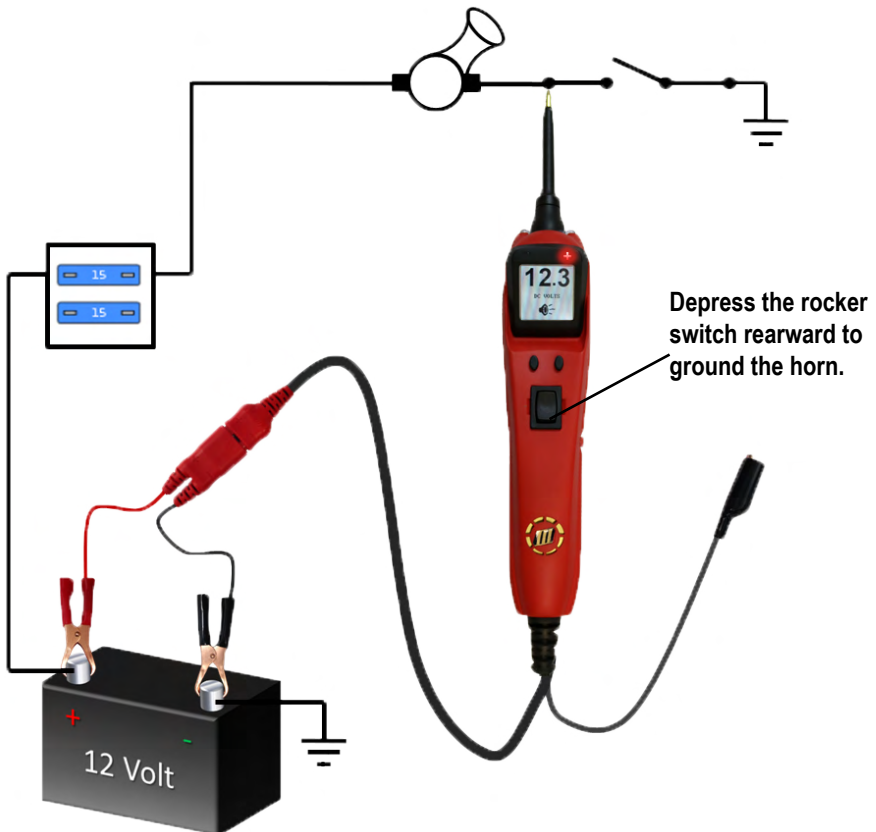
## Activating Components w/Ground

Contact the probe tip to the negative terminal of the component, the LED indicator should light **RED**. While observing **red positive** sign “+” LED, quickly depress and release the power switch rearward (-). If the red indicator went out and the **green negative** sign (-) came on you may proceed with further activation. If the **green indicator** went off at that instant or if the circuit breaker tripped, the Power Probe has been overloaded. This could have happened for the following reasons:

- The contact is a direct positive voltage.
- The component is short-circuited.
- The component is a very high current component (i.e., starter motor).

If the circuit breaker tripped, reset it by allowing it to cool down (15 sec.) and then depress the reset button.

**WARNING:** With this function, if you are contacting a protected circuit, a vehicle's fuse can be blown or tripped if you apply ground to it.



## Checking For Bad Grounds

Probe the suspected ground wire or contact with the probe tip. Observe the green negative sign “-” LED. Depress the power switch forward then release. If the green negative sign “-” LED went out and the red positive sign “+” came on, this is not a true ground.

If the circuit breaker tripped, this circuit is more than likely a good ground. Keep in mind that high current components such as starter motors will also trip the circuit breaker.

## Following & Locating Short Circuits

In most cases a short circuit will appear by a fuse or a fusible link blowing or an electrical protection device tripping (i.e., a circuit breaker). This is the best place to begin the search. Remove the blown fuse from the fuse box. Use the Power Probe tip to activate and energize each of the fuse contacts. The contact which trips the PP3S circuit breaker is the shorted circuit. Take note of this wire’s identification code or color. Follow the wire as far as you can along the wiring harness, for instance if you are following a short in the brake light circuit you may know that the wire must pass through the wiring harness at the door sill. Locate the color-coded wire in the harness and expose it. Probe through the insulation with the Power Probe tip and depress the power switch forward to activate and energize the wire. If the Power Probe circuit breaker tripped you have verified the shorted wire. Cut the wire and energize each end with the Power Probe tip. The wire end which trips the Power Probe circuit breaker again is the shorted circuit and will lead you to the shorted area. Follow the wire in the shorted direction and repeat this process until the short is located. The Power Probe ECT3000 uses a wireless non-contact technique that guides you to the short/open location.

## Red/Green Polarity Indicator & Tones

The “RED/GREEN Polarity Indicator” lights-up when the probe tip voltage matches the battery voltage within  $\pm 0.5$  volts. This means that if you contact a circuit that is not a good ground or a good hot, you will see this instantly by the “RED/GREEN Polarity Indicator” NOT lighting. The Audio Tone runs parallel to the “RED/GREEN Polarity Indicator and will also NOT react when contacting a circuit that does not match the battery voltage within  $\pm 0.5$  volts. This is a very useful function that automatically alerts you of any excessive voltage drop in the circuit.

## Flip Screen Function

The PP3S has the additional ability to change the orientation of the display screen. Press the right menu button to bring up the menu, then use the left button to scroll to “FLIP SCREEN” then press the right button again. The display screen will now be inverted 180 degrees allowing the user to select either display mode depending on the testing situation. Selecting the “FLIP SCREEN” function again to restore the display to its original orientation.

# Modes

The Power Probe IIIS has been designed to work the same as the previous Power Probe circuit testers. Using the advanced features and modes is optional. However, understanding them will expand your diagnosing capabilities. The LCD display indicates voltage levels of the circuit along with an identifying symbol showing you what mode it is in. The additional features contain 5 new modes which give you specific information about how the circuit is reacting.

The 5 Modes menu can be accessed by depressing the right Menu button. Then press the left button to select the needed test mode. Once the desired test mode is highlighted on the menu screen, press the right Mode button to enter that test mode.

**Mode #1 Voltmeter Mode:** While the PP3S is in “Voltmeter Mode” and the probe tip is floating (not contacting a circuit), the display will show “DC VOLTS.” If the audio tone is turned on you will see a speaker symbol in the lower part of the display. Once you contact the probe tip to a circuit the LCD display will indicate the average voltage level of the circuit. The red/green polarity indicator (See section Red/Green Polarity Indicator and Audio Tone) will respond also, showing whether the circuit is positive or negative. A secondary feature in this mode is the peak to peak threshold detection and signal monitoring. When contacting a signal generating circuit such as a speaker wire with audio signals on it, the PP3S detects the peak to peak signals and displays the peak to peak voltage on the display, the sound of the signals will be monitored and heard through the PP3S speaker. The peak to peak threshold levels are pre-selected by the operator in “Mode 5”. See Mode #5 for more information on setting threshold levels. Placing the PP3S probe tip next to a sparkplug wire (NOT probing it directly), allows you to monitor the sound of the ignition pulses at the same time display a peak to peak reading. The PP3S senses the pulses in ignition wires through capacitive coupling (**DO NOT CONTACT PROBE TIP DIRECTLY TO THE SECONDARY IGNITION CIRCUIT**). By monitoring each plug wire in this way you can locate missing cylinders.

**Mode #2 Peak to Peak Mode:** The Peak to Peak Mode measures the difference between the positive and negative peak voltage levels over a 1 second period. With this feature you can measure and monitor for example, the diode rectifier ripple voltage in a charging system while the engine is running. The peak to peak readings will give the technician the data necessary to determine if a diode rectifier is defective or not. A normal peak to peak reading while testing a charging circuit is usually under a volt. If a defective rectifier is present the peak to peak reading will be over 1 volt and possibly over 3 volts. Probing in “Peak to Peak Mode” is the optimum mode to display the activity of circuits such as fuel injectors, distributor pick-ups, cam and crank sensors, oxygen sensors, wheel speed sensors, hall effect sensors, or any other pulsed DC signal. It also measures fly back voltage of injectors to quickly find a problem.

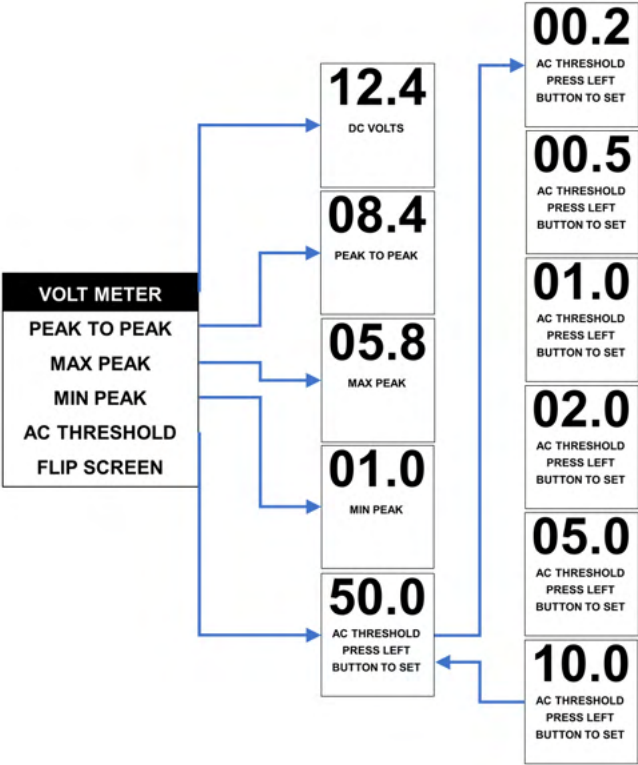
**Mode #3 Max Peak Mode:** The Max Peak Mode monitors the probed circuit and captures the highest detected voltage. Place the PP3S into Max Peak Mode by selecting MAX PEAK from the menu. Probe the circuit and the PP3 instantly displays and holds the highest voltage reading. This means you can remove the probe away from the circuit and the voltage reading remains displayed for your reference. You can reset the Max reading on the LCD display by doing a quick tap of the left button.

An APPLICATION for the use of the Max Peak Mode: Let’s say you have a circuit that is supposed to be off and is suspected of turning on inappropriately or getting a signal for some reason. Probing the circuit and monitoring it in the Max Peak Mode will instantly indicate as the circuit increases in voltage. You can monitor the circuit while wiggling wires and pulling on connectors to see if the voltage increases. Since the maximum voltage reading is captured and held on the display, you can inspect the reading at a later time.

**Mode #4 Min Peak Mode:** The Min Peak Mode monitors a positive circuit and displays the lowest voltage that it has dropped to. To do this: Place the PP3S into Min Peak Mode by selecting MIN PEAK from the menu. The display will show 00.0 volts if the probe tip is not connected to any voltage. Probe the positive circuit you want to test and press the left button to reset the voltage reading. The LCD display will show the lowest detected voltage of the circuit. If the circuit drops in voltage anytime, a new lowest reading will be captured and displayed. You can continue to reset the voltage display by pressing the left button as often as necessary.

An APPLICATION for the use of the Min Peak Mode: Lets say you have a circuit that is suspect of losing a connection and the voltage drops, causing something to turn off or malfunction. Probing the circuit and monitoring it in Min Peak Mode will instantly indicate as the circuit drops in voltage. You can monitor the circuit while wiggling wires and pulling on connectors to see if the voltage drops. Since the minimum voltage reading is captured and held on the display, you can inspect it at a later time. You could also perform a battery load test by monitoring the vehicle's lowest battery voltage while cranking the starter.

**Mode #5 AC Threshold Level Setting for the Peak to Peak Detection in Voltmeter Mode” (Mode #1)** This mode is only used to adjust the threshold voltage in “Voltmeter Mode” for Peak to Peak Detection and Signal Monitoring. To set the threshold level for the peak to peak detection in “Voltmeter Mode”, press right menu button to bring up the menu selections, then use the left button to highlight “AC THRESHOLD”, then press the right button again to display the AC Threshold voltage setting. The peak to peak threshold voltage settings loop incrementally from 50.0 to 0.2, to 0.5, to 1.0, to 2.0, to 5.0, to 10.0, and return back to 50.0 again. An audio installer would find the 0.2v setting convenient. Once you select the desired threshold voltage, press and hold the right menu button again to return to Voltmeter Mode (Mode #1). This AC Threshold setting determines the amount of AC voltage required to automatically switch to Peak to Peak Mode and activate the speaker to allow audible monitoring of the AC signal.



# Power Probe III S Specifications

Storage temperature/humidity: -20 to 70 °C ,  
70% RH max

Operating temperature/humidity: -10 to 50 °C ,  
70% RH max

Pollution degree: 2

DC Voltage ..... 0 to +70 Volts +1 digit

P-P Voltage ..... 0 to +70 Volts

Frequency Response ..... 10Hz to 10kHz  
(for tone pass through)

P-P display ..... 15Hz Square Wave  
35Hz Sine Wave

DC Voltmeter Mode - Continuity to ground

- First Level - display is enabled less than 20K  $\Omega$

- Second Level - green LED is enabled less than  
approx. 650  $\Omega$

- & + Peak Detector Response

- Single event capture less than 200mS pulse width

- Repetitive events less than 1mS pulse width

Peak to Peak Mode ..... 0 to +70 Volts + 1 digit

- 4Hz to over 500kHz Square Wave input



## Over Volt Warning

If the probe tip connects to a voltage greater than +70 Volts the display will show an "Over Volt" warning.

Remove the probe tip immediately to prevent internal damage to the tool.

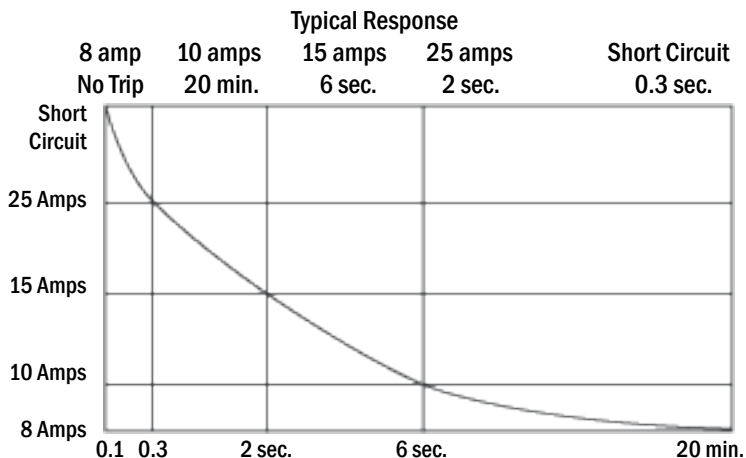


## Over Load Warning

If the probe is connected to a battery with voltage greater than 34VDC the display will show an "Over Load" warning.

## Circuit Breaker

8 amp thermal response - Manual reset



# Replacement Parts

The Power Probe 3S is engineered for years of reliable service. Some components can wear out over time with heavy use. Replacement parts can be obtained from your tool dealer or by contacting Power Probe Tek's Technical Support department at 1-800-655-3585 or email to support@pp-tek.com



Replacement Probe Tip - (#PN3015-BLK)

The Rocker Switch (#PN005) can be easily replaced in the field as the switch contacts can wear over time. Remove the Rocker Switch by using a flat pry tool such as a screwdriver and carefully pry the switch up from the probe face. Place the new Rocker Switch straight into the switch opening and press down firmly until the new switch is flush with the probe face.

Replacement Battery Clip Set (#PN3046)





## Power Probe Warranty

Power Probe products undergo a strict quality control inspection for workmanship, function, and safety before leaving the factory. From the date of purchase, we will warranty/repair Power Probe products for one (1) year against defects in parts and workmanship. All repairs due to misuse will be charged a fee not to exceed the cost of the tool. All warranty units must be accompanied by a copy of the original sale receipt. In the event of a malfunction or a defective unit, please call or write Power Probe Technical Support or your Power Probe dealer.

**[WWW.POWERPROBETEK.COM](http://WWW.POWERPROBETEK.COM)**



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