



#9004A

SMART MUTT® (7 Spade Pin) Mobile Universal Trailer Tester

OPERATOR'S MANUAL



Portable Unit for
Light-Duty Trailer Lights and Electric Brakes



LETTER FROM THE PRESIDENT OF IPA®

My name is Ian Vinci and I would like to thank you for your interest in our products. In today's world, we have all experienced the lack of service and consideration demonstrated by many companies after you buy their products. They say whatever they can to make the sale, and then it's like pulling teeth to get any service response out of them. I know this myself firsthand and because of this, I want to be sure that your experience with IPA® meets your expectations and that IPA® never disappoints you with our service or customer response.

To prove my commitment to you, if for any reason, you are not happy with one of our products, or more importantly, with the response from our customer service department, or any member of the IPA® team. Your satisfaction is more important to me than the sale itself. We will not be in business for long if we don't make you completely happy with our products and service. I want IPA® to be different and be known for its quality and service.

With that said, please take a look at our product line. You will see innovative first time products that were created to help you do your job faster and better than before.

I would also like to invite you to critique our products. If you can think of a better way to make them or changes that will make them work better, please contact me directly and I will be sure to look into it. If you have an innovation and would like some feedback, give me a call.

From all of us at IPA®, we thank you for taking the time to review our product line and wish you and your family the very best of everything.

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PART 1: IMPORTANT SAFETY INSTRUCTIONS

IT IS IMPORTANT TO READ, UNDERSTAND AND FOLLOW ALL SAFETY MESSAGES AND INSTRUCTIONS PRINTED IN THIS MANUAL AND ON THE EQUIPMENT BEFORE OPERATING. IF SAFETY INFORMATION IS NOT HEEDDED, SERIOUS INJURY OR DEATH TO THE OPERATOR OR BYSTANDERS MAY OCCUR.

DANGER

Indicates a hazardous situation, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

WARNING

Indicates a hazardous situation, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

CAUTION

Indicates a hazardous situation, if not avoided, may result in minor or major injury. The possible hazards are shown in the adjoining symbols or explained in the text.

THE FOLLOWING SAFETY ALERT SYMBOLS ARE USED IN THIS MANUAL.



SYMBOL 1: Potential burn hazard. Sparks from electrical shorts can ignite flammable liquids such as fuel or oil. Heat from electrical overloads can cause fire hazards.

SYMBOL 2: Potential electrical hazard. Batteries have enough electrical energy potential to ignite flammable liquids such as fuel or oil. Wire overloads can cause electrical failures. Shock hazard exists.

SYMBOL 3: Potential explosive air hazard. Pneumatic pressures used with this equipment can cause explosive failures on damaged equipment.

SYMBOL 4: Potential eye hazard. Wear OSHA approved safety glasses. Battery acid and high air pressures create hazardous situations for eyes.

SYMBOL 5: Potential chemical burn hazard. Wear protective gloves. Battery acid is corrosive and can cause skin damage.

SYMBOL 6: Potential electrical hazard. Electrical energy can cause heat and burn hazards.

SYMBOL 7: Potential fire hazard. Use caution with flammable liquids such as fuel and oil. Electrical shorts can ignite flammable liquids and wiring.

SYMBOL 8: Important information is stated.

BATTERY GASES, TESTER PREPARATION AND TESTER/CHARGER LOCATION

RISK OF EXPLOSION



- Gases produced by a battery are highly explosive.
- Wear safety goggles and protective clothing, both users and bystanders.
- Use in an area having at least four air changes per hour.
- Read, understand and follow all instructions for charger, battery, vehicle and any equipment used near battery and charger.
- Do not smoke, strike a match, place metal tools on battery or cause a spark in the vicinity of the battery. When removing battery cables, remove the ground cable first.
- Clean terminals before charging battery. During cleaning, keep corrosive particles from eyes, nose and mouth. Use baking soda and water to neutralize acid and help eliminate airborne corrosion.
- Never allow clamps on charger cables to touch each other.
- Do not expose tester or charger to rain, snow or wet conditions.
- Do not allow battery gases or acid to contact MUTT® cabinet. Do not place charger directly above or below battery.
- Fill battery to level specified by battery manufacturer using distilled water.
- Do not remove cell caps while charging per manufacturer's instructions.
- Make sure tester cable clamps make tight connections.
- Battery explosion can cause injury.

GENERAL CHARGER USE

RISK OF ELECTRIC SHOCK AND FIRE

- Before connecting charger to unit, make sure controls are set to OFF.
- Do not remove or bypass the grounding pin.
- Do not operate charger with damaged cord or plug. Replace cord or plug immediately if damage occurs.
- Position power cord and charger cables away from the hood, doors and hot or moving engine parts where they could be damaged.
- Unplug power cord by grasping and pulling on the plug, rather than the cord when disconnecting charger from outlet.
- Charger power cord uses equipment-grounding conductor and a grounding plug. Plug only into a 120V AC outlet that is correctly installed and grounded in accordance with all ordinances and local codes.
- Unplug power cord from outlet before cleaning or maintaining tester and charger. Turning off controls does not reduce the risk of electric shock.
- Do not operate charger after a sharp impact, drop or any other damage. Do not disassemble charger.
- Use only recommended attachments.
- Do not charge a frozen battery.
- Do not overcharge a battery.
- Use charger only on lead-acid automotive batteries. Do not use charger for charging dry cell batteries.
- Electric shock or fire can cause injury.



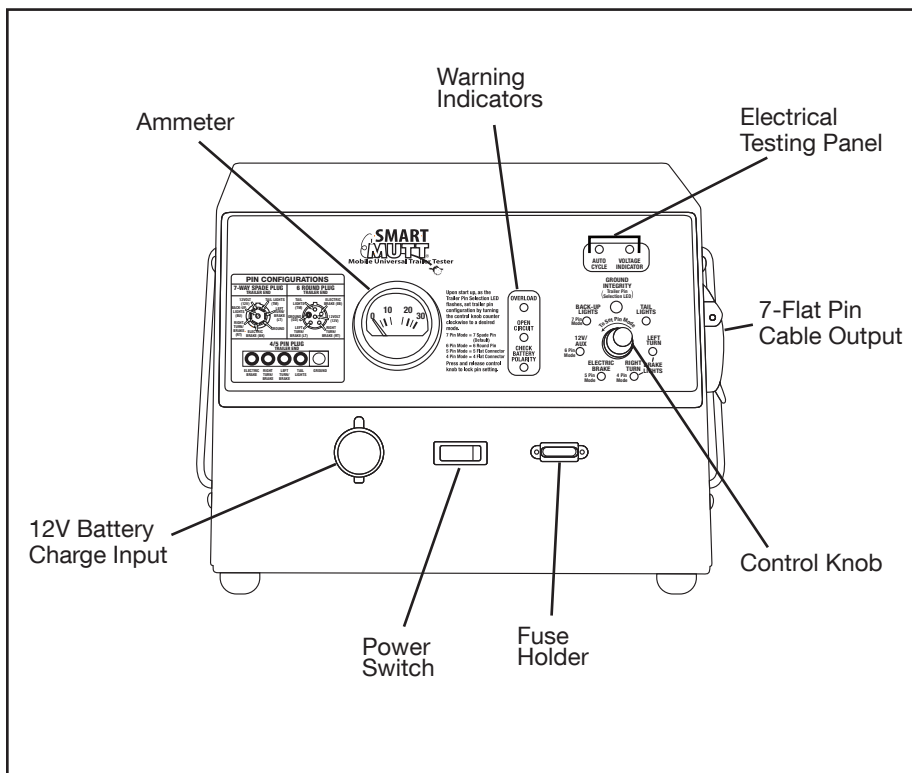
RISK OF ENTANGLEMENT

- Keep yourself, clothing and battery charger leads clear of moving parts such as fan blades, pulleys, hood and doors.
- Moving parts can cause injury.

RISK OF BURNS

- Batteries can produce short circuit current high enough to weld jewelry such as rings, bracelets and watches. You must remove them before working near batteries.
- Short circuits can cause injury.

PART 2: WHAT'S INCLUDED

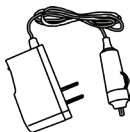


INCLUDED PARTS AND ACCESSORIES:

3-BUTTON REMOTE
CONTROL FOB (Qty. 1 Included)
#MUT-RM3-9004A



500mA BATTERY CHARGER
#CHR0001



3-WAY TRAILER ADAPTER
#8000

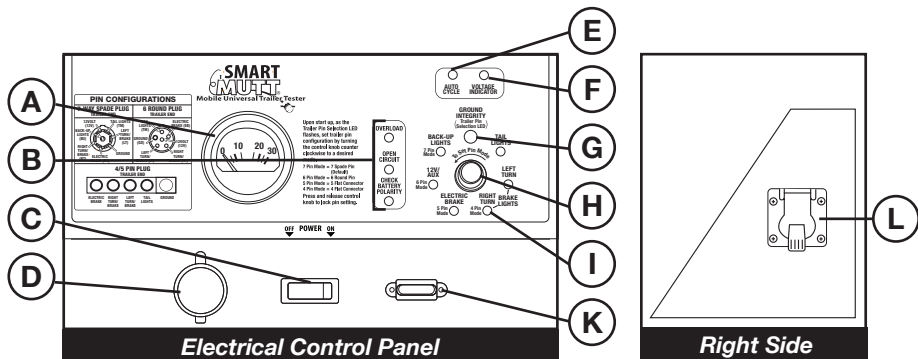


Use the Provided Reference Numbers When
Ordering Products and Parts Above

Toll Free: 888-786-7899

PART 3: CONTROLS AND PANELS

An overview of the MUTT®'s controls, inputs, outputs and their functions.



A. BACKLIT 30 AMP AMMETER

Meter shows current draw of a selected circuit up to 30 amps.

B. TROUBLE WARNING INDICATORS

Flashing red LEDs indicate problems that may exist in a selected circuit. This includes the Overload Indicator, Open Circuit Indicator, and Reversed (Battery) Polarity Indicator.

C. POWER SOURCE SWITCH

Select between Power On or Power Off.

D. 12V DC BATTERY TRICKLE CHARGER INPUT (CIGARETTE SOCKET)

For connecting the trickle charger to the MUTT®'s internal battery (battery not included).

E. AUTO CYCLE INDICATOR

Illuminates when Auto Cycle Mode is engaged.

F. VOLTAGE INDICATOR

Shows supplied battery voltage integrity. Operating Voltage Range: 12/24 volt DC.

G. GROUND INTEGRITY

A large green LED above the control knob indicates ground status. Ground integrity is automatically verified when power is turned on.

H. CONTROL KNOB

Knob activates all electrical test modes and circuits to be diagnosed.

I. CIRCUIT INDICATORS

The small green LEDs illuminate or blink in testing phases.

K. 30 AMP FUSE SOCKET

Overload protection.

L. 7 WAY FLAT/SPADE SOCKET

A receptacle used to connect your 7 Spade Pin Trailer to the MUTT® to test electrical circuits.

PART 4: SET-UP

4.1 CHOOSING A BATTERY

(Manufacturer's Suggested Replacement: YUASA #YTX14 or Group 14 Equivalent)

- Battery Voltage: 12/24V DC
- Battery Type: Lead-Acid
- Battery Compartment Dimensions: 5 7/8" L x 5 3/4" H x 3 3/8" W
- Battery Protection: In-line 30 amp Fuse for Overcharge

INSTALLING AN INTERNAL BATTERY

1. Remove the four 8/32" x 1/4" Phillips head screws in the back of the MUTT®.
2. Slide out the battery tray.
3. Place the battery onto the tray with the battery terminals facing the front of the unit. Attach the ring terminal on the red wire to the positive side of the battery and tighten securely.
4. Cover positive terminal with the red boot.
5. Attach the ring terminal of the black wire to the negative battery terminal.
6. Carefully slide the tray into the tester. Use caution – DO NOT ALLOW the positive battery terminal to contact the unit.
7. Reinstall screws to secure.

DO NOT

**Use 24 Volts on a Trailer
Wired for 12 Volts!**

PART 5: PRETESTING CHECKLIST

The pretesting checklist should always be completed prior to using the MUTT®

✓ UNIT PLACEMENT

- Place the tester on a flat, level surface.

✓ MAINTAIN CONNECTORS

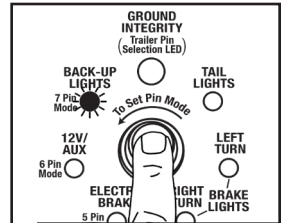
Dielectric grease should be used on all connections to avoid corrosion. If a bad connection exists at the terminal junction, you may get an erroneous reading and the MUTT® will not work properly.

- Make sure you have a solid connection in the socket.
- Be certain the 7 pins in each plug are clean and spread to the proper size.
- Always check the MUTT® connector pins at the side of the MUTT® for proper expansion. Over time, the pins may bend in slightly resulting in a poor connection between the connector and the cable ends. A flat head screwdriver can be used to expand the pins until a tight connection is made.

✓ TRAILER CONFIGURATION SET-UP

The 9004A Smart MUTT® is a microprocessor controlled diagnostic trailer tester specifically designed for testing lights and electric brakes on trailers with 4, 5, 6 round pin and 7 spade pin type connections. Every time you power up the tester, the internal computer wants to know which type of trailer connection you are testing. Note, this phase

is known as Trailer Configuration Set-Up and is indicated by a high speed flickering of the LEDs surrounding the control knob. If left untouched after 15 seconds, the tester will always default to a 7 spade pin configuration. However, if the user is testing a 4, 5 or 6 round pin type trailer connection, this setting can be adjusted by rotating the control knob counterclockwise to select the desired number of circuits (as noted on the face panel). Trailer Configuration Set-Up is repeated each time the unit is powered up.



Testing 4, 5 and 6 Round Pin Type Trailer Connections

The 9004A is hard wired to a 7 spade pin connector, located on the side of the tester. Each unit is supplied with a plug-in adapter, which will adapt the 9004A to 4, 5 and 6 round pin type connections. To test trailers with these types of connections, the adapter must be plugged in line between the tester and the trailer. The instructions above for Trailer Configuration Set-Up should be used for more efficient and accurate testing.

Call 888-786-7899 with any technical questions.

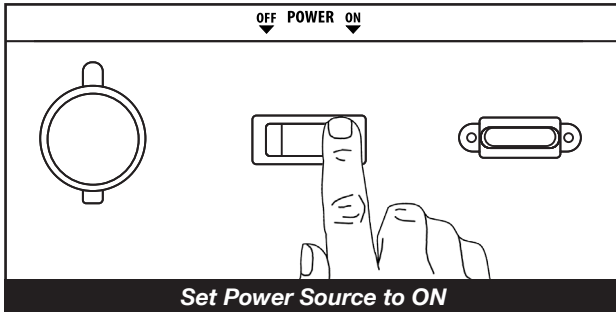
PART 6: GENERAL CONTROLS AND OPERATIONS

6.1 INITIAL STARTUP AND SHUTDOWN

All functions of the MUTT® require the Power Source Switch to be in the ON position.

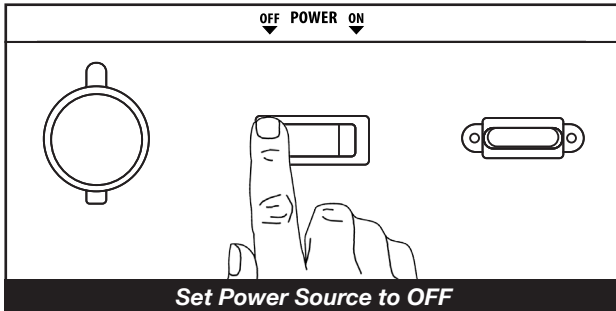
POWERING UP

1. Push the Power Source Switch to ON.



POWERING DOWN

1. Push the Power Source Switch to the OFF position.



6.2 AUTO SHUTDOWN FEATURE

If left inactive for a period of 20 minutes, the MUTT® enters a Sleep Mode and powers down.

- A sound is emitted every 20 seconds during Sleep Mode.
- Activation of the control knob will cancel Sleep Mode.

6.3 USING THE 3-BUTTON REMOTE CONTROL

The included remote control(s) is preprogrammed to your MUTT® and should never lose its programming. In the event that you suspect your remote has lost its programming, contact technical support at 888-786-7899 or email tech247@ipatools.com.

HOW TO PROGRAM THE 3-BUTTON REMOTE

1. Press and hold the On/Off Button while turning on the MUTT®.
2. Continue to hold for two seconds.
3. Your remote control is now programmed.

HOW TO USE THE WIRELESS REMOTE

1. UP ARROW

Press and release to select the next circuit in clockwise rotation. Press and hold for five seconds to activate All Circuits On Mode.

2. DOWN ARROW

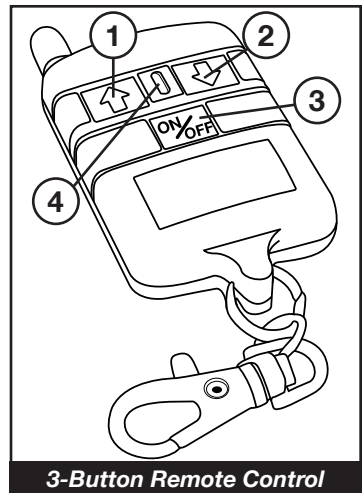
Press and release to select the next circuit in a counterclockwise rotation. Press and hold for five seconds to turn on hazard lights.

3. ON/OFF

Press and release to engage/disengage electric brakes.

4. REMOTE CONFIRMATION INDICATOR

Press any of the buttons (1, 2, 3) and the blue light (4) will illuminate to confirm the battery power of the remote.



NOTE: Inclement weather, nearby power transformers and closely parked trailers may reduce the remote signal.

The supplied key fob battery for the remote control is 12V, Alkaline Energizer Type A23. A Gold Peak Type 23A or Duracell MN21 battery can also be used.

PART 7: ELECTRICAL/LIGHTING TESTING

Complete the pretesting checklist prior to all testing procedures.

The MUTT® is microprocessor controlled and features a special diagnostic firmware, designed to seamlessly integrate with your preferred methods of testing. The MUTT® will power the selected electrical circuits and instantly alert you to any signs of a faulty condition. **To properly utilize the diagnostic features, a complete scan of the trailer's electrical system should be performed at the front of the trailer using the MUTT® prior to a walk-around inspection.** If any wiring faults are present, the MUTT® will blink or sound, alerting you to the issue. Only a one-time, walk-around/visual inspection is needed to confirm that each individual light bulb is properly illuminating.

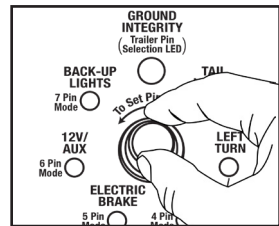
NOTE: Some advanced functions may not be listed on the face panel, so it's important to read the manual in its entirety to ensure that you are getting the full use of this diagnostic system.

7.1 SELECTING A CIRCUIT

Circuits can be selected for testing manually, via remote control or by initiating Auto Cycle Mode.

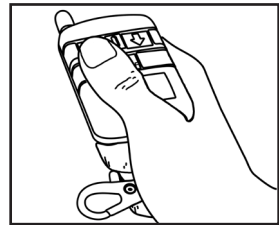
OPERATING WITH MANUAL CONTROL

1. Turn the control knob to select a circuit. The control knob is automatically set to Ground Integrity when power is turned on.



OPERATING WITH THE REMOTE CONTROL

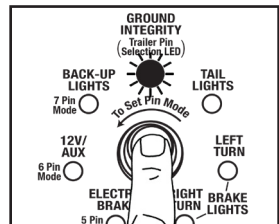
1. Press and release the UP ARROW to select the next circuit in a clockwise rotation.
2. Press and release the DOWN ARROW to select the next circuit in a counterclockwise rotation.



AUTO CYCLE MODE

Auto Cycle Mode automatically tests one circuit at a time in a clockwise rotation.

1. Press and release the control knob. The Auto Cycle Indicator should illuminate.
2. A five second delay commences before power is automatically applied to the first circuit.
3. Circuits are automatically tested one at a time in a clockwise rotation, starting from the Ground Integrity Indicator.
4. To cancel Auto Cycle Mode, momentarily press and release or turn the control knob.



NOTE: Auto Cycle Mode does not work when Brake Light Circuits are selected.

7.2 GROUND INTEGRITY TEST

Each time the MUTT® is powered on, it automatically runs a Ground Integrity Test. A good ground connection must be established for the MUTT® to operate a trailer's electrical system.

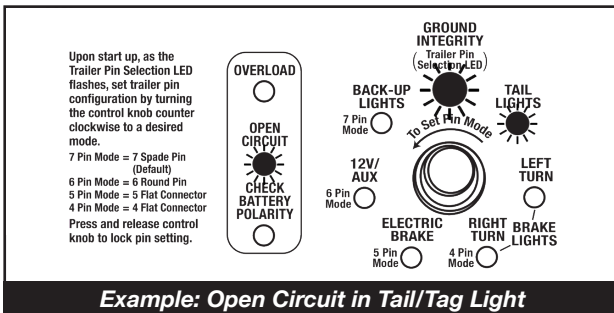
1. Immediately after power up, the green lights around the control knob will illuminate.
2. A solid/healthy ground connection is indicated by a steadily illuminated Ground Integrity Indicator.
3. Bad/poor ground or bad cable condition is indicated by all of the LED's blinking simultaneously.
4. When one or more green circuit LEDs blink while the Ground Integrity Indicator is steadily illuminated a solid ground has been established, but an open circuit has been detected. Refer to OPEN CIRCUIT below.

7.3 FAULT INDICATION

OPEN CIRCUIT

The MUTT® senses no load which is often the symptom of a disconnected wire, cut wire, poor pin connection or bad return ground. The MUTT® can detect open circuits in two ways.

1. During Ground Integrity Test: An individual circuit will blink and no audible alerts will be present.
2. During circuit selection: The selected circuit's LED will blink, while simultaneously, the Open Circuit Indicator will flash. The MUTT® will also provide an audible alert (beep).



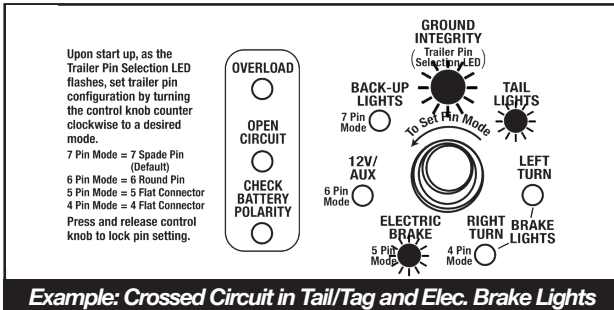
Example: The MUTT® detects an open circuit in the Tail/Tag Circuit. The Tail/Tag LED will blink, the Open Circuit Indicator will flash and the MUTT® will beep.

NOTE: Open Circuit Indicator will only illuminate during circuit selection.

CROSSED CIRCUITS

The MUTT® indicates that two or more circuits are back feeding or crossed. This can be a symptom of two wires in the same harness wearing through their insulated coating and connecting.

1. When a crossed circuit is identified, the selected circuit LED will illuminate steadily and the circuit it is crossed with will flash. The MUTT® will also provide an audible alert (beep).



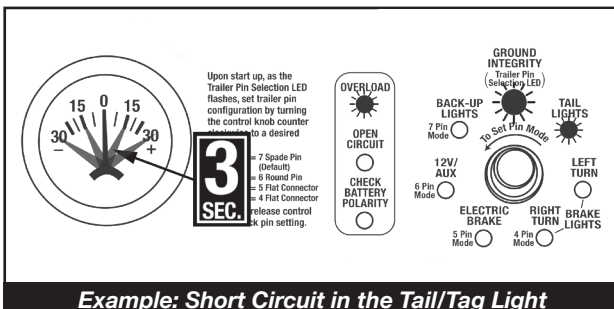
Example: The MUTT® detects that the Tail/Tag and Electric Brake are crossed while the Tail/Tag Circuit is selected. The Tail/Tag LED will illuminate, the Electric Brake LED will flash and the MUTT® will beep.

NOTE: In some cases, a crossed circuit may be a normal function of advanced diagnostic testing, such as with certain ABS systems.

SHORT/OVERLOADED CIRCUIT

Short circuits or overloads can occur when a positive, hot wire touches ground. They can also occur due to faulty lights or connectors.

1. If a short or overloaded circuit is suspected, the MUTT® will instantly stop powering the circuit.
2. The Overload Warning Indicator will then flash, along with the selected circuit's LED. The ammeter needle will also max out and return to 0.
3. The MUTT® will now automatically enter Pulsar Mode®. During Pulsar Mode®, the MUTT® will attempt to reapply power to the faulty circuit every three seconds for an indefinite period of time. After power is applied, if a short is still present, steps 1-3 will automatically repeat.



Example: The MUTT® detects a short in the Tail/Tag Light Circuit. The Tail/Tag LED and Overload Warning Indicator will flash and a warning beep will sound. The MUTT® will now enter Pulsar Mode®.

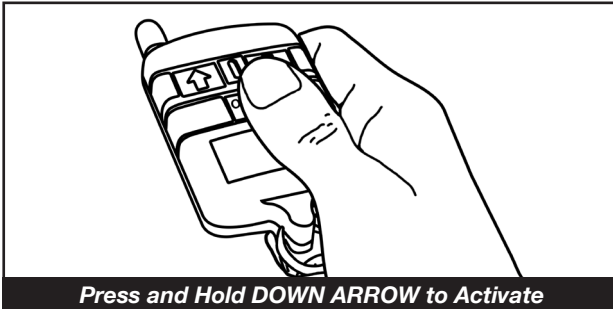
NOTE: Pulsar Mode® can be a useful troubleshooting tool for finding dead and intermittent shorts.

7.4 ACTIVATING HAZARD LIGHTS

The four-way flashers on the trailer can be activated with the 3-Button Remote Control.

3-Button Remote Control

1. To activate, press and hold the DOWN ARROW button for five seconds.



7.5 ALL CIRCUITS ON (OVERRIDE) MODE

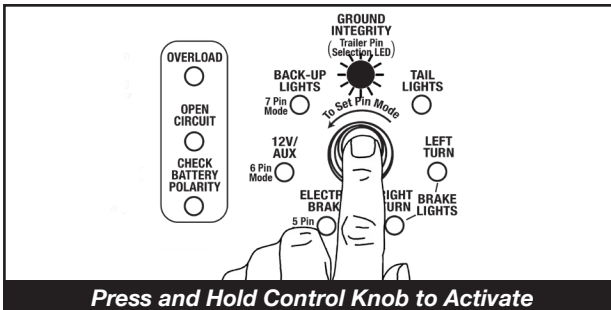
All Circuits On Mode will engage all electrical circuits at the same time. While short circuit sensing is operational in this mode, if a short circuit is found, the MUTT® will not be able to identify which circuit is the cause of the short. Open and crossed circuits sensing is not operational in this mode.

On trailers using incandescent bulbs, All Circuits On Mode will typically result in an overload because the amperage draw will exceed the maximum of 20 amps.

All Circuits On Mode can be accessed manually or by remote control.

MANUALLY

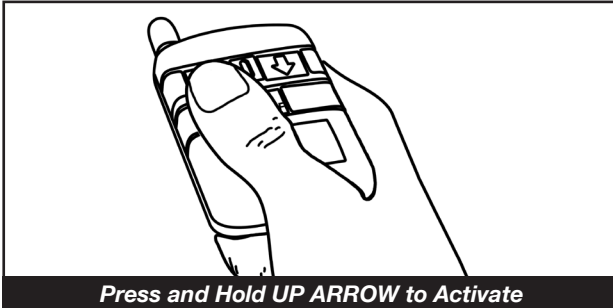
1. To activate, press and hold control knob for ten seconds. Listen for beep, then release.
2. To cancel, press or turn the control knob.



NOTE: Does not work when ABS or Brake Light Circuits are selected.

REMOTE CONTROL

1. To activate All Circuits On Mode press and hold UP ARROW for five seconds and then release.
2. To cancel, press and release either arrow.



7.6 ELECTRIC BRAKE TESTING

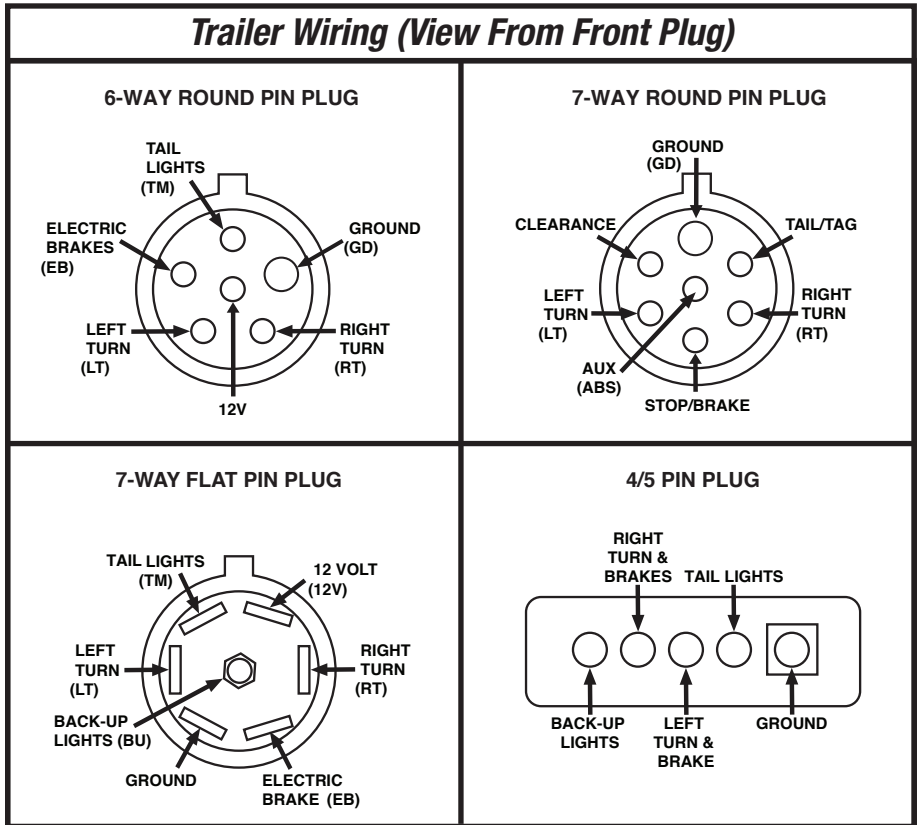
1. To inspect electric brakes, first set the trailer on a flat, level surface. Place chocks in front and behind the wheels on one side of the trailer. Proceed to jack up the unchocked side of the trailer until the tires are off the ground. Follow standard safety protocols such as using jack stands and not placing yourself in harm's way.
2. Ensure that the break away cable is not disconnected. Try to turn the trailer tires that are off the ground by hand. They should turn with little effort.
3. Turn the MUTT® control knob to the circuit labeled "Electric Brake." or press "On/Off" button on the remote. Then return to the same tires and try to turn them by hand again. You should not be able to move them. If you are able to move the tires while the Electric Brake Circuit is selected, this indicates that something is wrong or your trailer brakes are out of adjustment. Disconnect the MUTT® and inspect the braking system further to identify the source of failure.
4. To test the brakes on the other side of the trailer, let the trailer down from the jack stands and repeat the set-up procedure described in Step 1.

NOTE: The trailer electric brakes are applied when they receive 12 volts from the towing vehicle. During this test, the MUTT® will simulate the tow vehicle by providing the full amount of power the trailer brakes can draw. As a general rule, each wheel or electric brake will draw approximately 1.5 - 3 amps. A trailer with four wheels equipped with electric brakes should draw a total load of six or more amps on the electric brake circuit. While testing, the use of an amp meter may be helpful when troubleshooting exact causes of electric brake failure.

WARNING: BE SURE TO CHOCK ALL TRAILER WHEELS BEFORE USING THIS TOOL AND ESPECIALLY BEFORE JACKING UP ONE SIDE OF THE TRAILER. FOLLOW ALL STANDARD PROTOCOL AND COMMON SENSE PRACTICES INVOLVED INCLUDING WORKING WITH A TRAILER ON A FLAT, SOLID SURFACE AND USING PROPERLY RATED JACK STANDS. KEEP HANDS AND FEET FREE FROM TRAILER AT ALL TIMES.

PART 8: TYPICAL TRAILER WIRING

NOTE: Not all trailers/vehicles are wired to this standard. The use of an electrical circuit tester is necessary to ensure proper match of vehicle's wiring to trailer's wiring. On some trailers with 6-way round plugs, the 12V wire and electric brake wire may be reversed (particularly horse trailers).



PART 9: MAINTENANCE AND STORAGE

- Switch power to OFF, remove all power cables and disconnect battery before storing and cleaning.
- Wipe surfaces down with a well-wrung, soft, damp cloth.
- Diluted dishwashing liquid or similar substance can be used in the dampened cloth if necessary.
- Dielectric grease can be used in 7-way flat socket and cable, as well as battery clamps, to prevent corrosion.
- Disconnect and remove battery when placing the MUTT® into long-term storage.
- Store in a cool, dry area.

PART 10: OPTIONAL ACCESSORIES AND RELATED PRODUCTS

#9008-DL SUPER MUTT® PRO EDITION: (1) 12-Button Remote, (2) 3-Button Remotes, Face Shield, 7-Way Cable, 8-ft. Glad Hands, Battery Charger, Rain Cover

#9005A SUPER MUTT® SERVICE TRUCK EDITION: (1) 12-Button Remote, (2) 3-Button Remotes, Face Shield, 5' 7-Way Cable, 8-ft. Glad Hands, Battery Charger, External Battery Connector,

#9007A SMART MUTT® (7 ROUND PIN): (1) 3-Button Remote, 500mA Battery Charger, 5' 7-Way Cable



9007A



9005A



9008-DL

#8026 4/5 PIN TOWING MAINTENANCE KIT



#7866 4/5 PIN TRAILER HARNESS CHECKER



#8027 6 ROUND PIN TOWING MAINTENANCE KIT



#7897 6 ROUND PIN TRACTOR TRAILER CIRCUIT TESTER



#8028 7 FLAT (SPADE) PIN TOWING MAINTENANCE KIT



#7893 7 FLAT (SPADE) PIN TRAILER CIRCUIT TESTER



#8029 7 ROUND PIN TOWING MAINTENANCE KIT



#7865L 7 ROUND PIN TRACTOR TRAILER CIRCUIT TESTER



#9107 ELECTRIC BRAKE FORCE METER W/ DYNAMIC LOAD SIMULATION AND CIRCUIT TESTING



Learn more about diagnostic and testing tools we have.