

WRIST STRAP AUDITOR FIXTURE

PWA-805

User Manual



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PROSTAT® PWA-805 WRSIT STRAP AUDITOR FIXTURE

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I. Introduction

The Prostat PWA-805 Wrist Strap Auditor is designed to determine the condition of a wrist strap assembly. Used with the PRS-801 or PRS-812 Resistance Meters, a resistance measurement can be made of the full assembly cuff and cord, the cuff only, or the cord only. This measurement will define the operable condition of any standard wrist strap.

- A. The PWA-805 unit approximates the basic electrical measurement requirements of the ANSI/ESD S1.1 wrist strap standard.
- B. The intent of the PWA-805 is to provide the ESD auditor with a convenient fixture to measure the exact resistance characteristics of a wrist strap, rather than generally estimate its approximate resistance range with an indicating checker.
- C. The PWA-805 will provide the four following resistance measurements:
 - 1. Resistance of a wrist strap from the inner, middle position of the cuff to the end of the grounding cord.
 - 2. The resistance between two points on the inner surface of the cuff
 - 3. The resistance between two points on the outer surface of the cuff
 - 4. The resistance between the cord cuff snap and ground connection

II. Cautions & Warnings

- A. As with any electrical device, use proper electrical precautions to avoid personnel shock.
 - 1. The PWA-805 Wrist Strap Auditor fixture operates with power input from the Resistance Meter at 10 to 100 volts, and is capable of delivering an annoying shock to any person touching it.
 - 2. Although the current capability is limited, a distinct HAZARD EXISTS in the person's reaction to the shock.
 - 3. To avoid personnel shock, do not touch the can electrodes when power is applied to the fixture

CAUTION

To avoid electrical shock, do not touch the fixture's
can electrodes when power is being applied.

- B. The PWA-805 is designed to be used in audit environments at test voltages of 100 volts or less. Exceeding 100 volts greatly enhances the risk of personnel shock hazards and may damage the fixture.

WARNING

Operational test voltages should not exceed
100 volts in the audit environment.

- C. DO NOT USE THE PWA-805 AUDITOR if it fails to pass its functional test.

CAUTION

Should the Functional continuity check indicate improper operation of the fixture, OR the fixture becomes damaged, do not use the PWA-805. Contact Prostat Customer Service Department for further instructions.

- D. DO NOT USE THE PWA-805 AUDITOR if it becomes damaged in any way.
- E. Only qualified instrument repair personnel should open terminal connections or repair the PWA-805 AUDITOR.
- F. Do not store or use in damp environments
- G. Always store the PWA-805 in its protective case.

III. Equipment Inspection & Initial Preparation for Use

A. Basic Description

The PWA-805 Wrist Strap Auditor Fixture consists of two metal cylinder electrodes mounted on a plastic base and wired to a switch, cord connection points and meter input receptacles.

1. The metal cylinder (can) electrodes are used to mount wrist strap cuffs for continuity and resistance measurements.
2. A YELLOW cord receptacle allows the wrist strap grounding cord to be plugged into the fixture's test circuit.
3. Two meter input receptacles (RED and BLACK) are provided to connect the Resistance Meter to the fixture's test circuit. The Resistance Meter provides all resistance measurements for the PWA-805 Auditor.
4. Two male snap posts, one 7 mm and one 4 mm, are provided for mounting the cuff snap end of the grounding cord to the fixture circuit during Cord Only measurements.
5. A three position rocker switch (BLACK) allows resistance measurements of the following wrist strap components:
 - a. The Cuff and Grounding Cord
 - b. The Cuff Only
 - c. The Grounding Cord Only

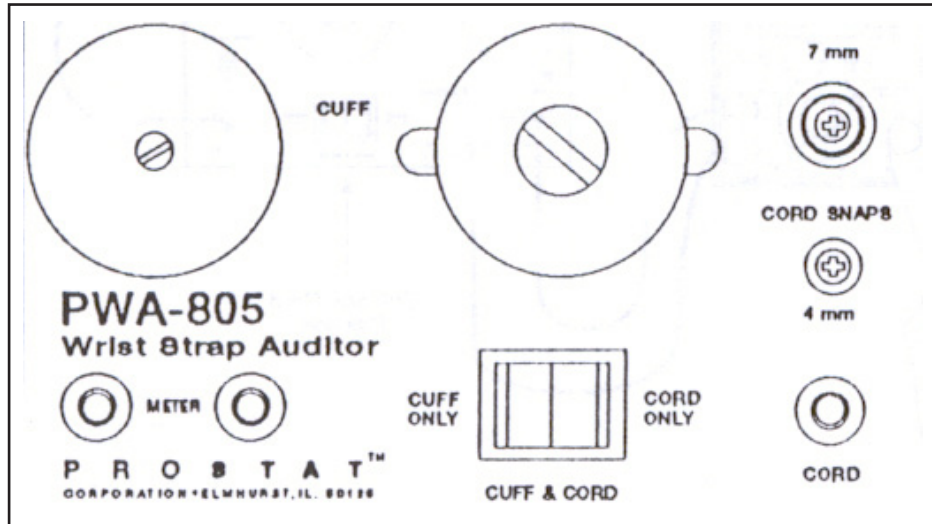


Figure 1: PWA-805 Layout

B. Functional Test of the PWA-805 Wrist Strap Auditor Fixture

1. Functional Continuity Test of the CUFF & CORD measurement function.

- a. Connect the test leads from the Resistance Meter to the PWA-805 Auditor METER receptacles. NOTE: Prior to using the Resistance Meter, read the Operations Manual.
- b. Plug an auxiliary test lead into the YELLOW CORD receptacle. Use a straight test lead equipped with banana plugs. For ease of handling install an alligator clip on one end of the test lead.
- c. Select the CONTINUITY TEST position on the Resistance Meter.
- d. Touch the free end of the installed test lead to the PWA-805 adjustable can electrode (the can on the right side of the fixture equipped with a knurled, slotted locking screw).
- e. Select the fixture rocker switch middle position, labeled CUFF & CORD.

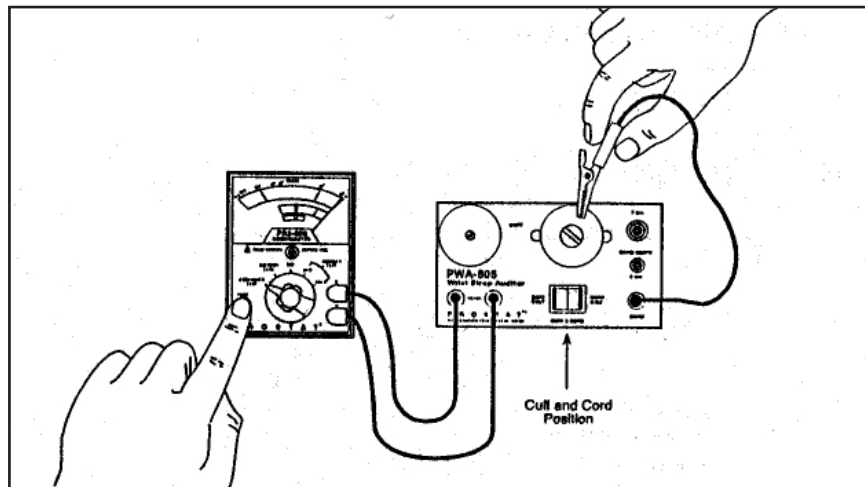


Figure 2: PWA-805 Continuity Test of Cuff & Cord Function

- f. Push the TEST button on the Resistance Meter. The Resistance Meter should indicate 0 Ohms.

CAUTION

To avoid electrical shock, do not touch the fixture, can electrodes when power is being applied.

- (1) If the Resistance Meter indicates 0 Ohms, the continuity test for the CUFF & CORD test function is acceptable. Proceed to the CORD ONLY functional test.
 - (2) If the meter indicates "infinity" or a high resistance check the rocker switch position and test lead connections and repeat the continuity test.
 - (3) If the Resistance Meter does not indicate 0 Ohms, do not use the PWA-805 Auditor. Contact Prostat Customer Service.
2. Functional Continuity Test of the CORD ONLY measurement function.
- a. Connect the test leads from the Resistance Meter to the PWA-805 Auditor METER receptacles. NOTE: Prior to using the Resistance Meter, read the Operations Manual.
 - b. Plug an auxiliary test lead into the YELLOW CORD receptacle. Use a straight test lead equipped with banana plugs. For ease of handling, install an alligator clip on one end of the test lead.
 - c. Select the CONTINUITY TEST position on the Resistance Meter.
 - d. Touch the free end of the installed test lead to the PWA-805 7 mm male CORD SNAP terminal.
 - e. Select the fixture rocker switch right position, labeled CORD ONLY.
 - f. Push the TEST button on the Resistance Meter. The Resistance Meter should indicate 0 Ohms.

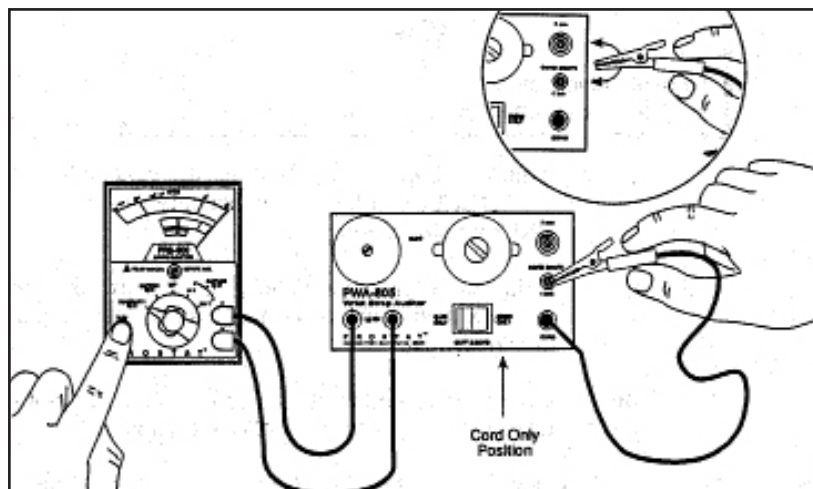


Figure 3: PWA-805 Continuity Test of Cord Only Function

CAUTION

To avoid electrical shock, do not touch the fixture can electrodes when power is being applied.

- (1) If the Resistance Meter indicates 0 Ohms, the continuity test for the 7 mm CORD ONLY test function is acceptable. Proceed to the 4 mm CORD ONLY functional test.
 - (2) If the meter indicates “infinity” or a high resistance check the rocker switch position and test lead connections and repeat the continuity test.
 - (3) If the Resistance Meter does not indicate 0 Ohms, do not use the PWA-805 Auditor. Contact Prostat Customer Service.
- g. Touch the free end of the installed test lead to the PWA-805 4 mm male CORD SNAP terminal.
- h. Select the fixture rocker switch right position, labeled CORD ONLY.
- i. Push the TEST button on the Resistance Meter. The Resistance Meter should indicate 0 Ohms.

CAUTION

To avoid electrical shock, do not touch the fixture can electrodes when power is being applied.

- (1) If the Resistance Meter indicates 0 Ohms, the continuity test for the 4 mm CORD ONLY test function is acceptable. Proceed to the CUFF ONLY functional test.
 - (2) If the meter indicates “infinity” or a high resistance check the rocker switch position and test lead connections and repeat the continuity test.
 - (3) If the Resistance Meter does not indicate 0 Ohms, do not use the PWA-805 Auditor. Contact Prostat Customer Service.
3. Functional Continuity Test of the CUFF ONLY measurement function.
- a. Connect the test leads from the Resistance Meter to the PWA-805 Auditor METER receptacles. **NOTE:** Prior to using the Resistance Meter, read the Operations Manual.
 - b. Attach an auxiliary test lead to the adjustable can electrode (right side of the fixture). Use a straight test lead equipped with banana plugs and two alligator clip.
 - c. Select the CONTINUITY TEST position on the Resistance Meter.
 - d. Touch the free end of the installed test lead to the PWA-805 fixed can electrode (the can on the left side of the fixture).
 - e. Select the fixture rocker switch left position, labeled CUFF ONLY.
 - f. Push the TEST button on the Resistance Meter. The Resistance Meter should indicate 0 Ohms.

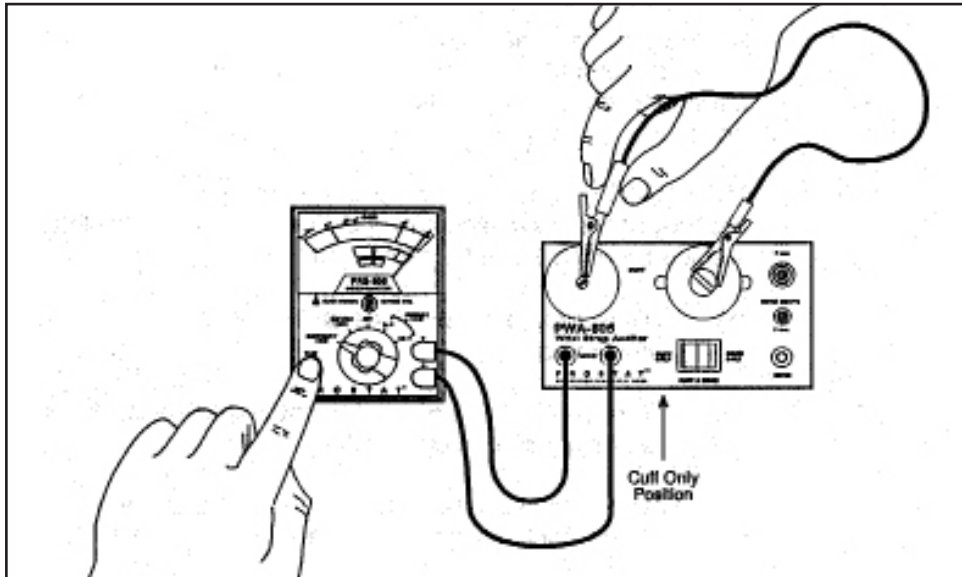


Figure 4: PWA-805 Continuity Test of Cuff Only Function

CAUTION

To avoid electrical shock, do not touch the fixture can electrodes when power is being applied.

- (1) If the Resistance Meter indicates 0 Ohms, the continuity test for the CUFF ONLY test function is acceptable, and all functional tests are completed.
- (2) If the meter indicates “infinity” or a high resistance check the rocker switch position and test lead connections and repeat the continuity test.
- (3) If the Resistance Meter does not indicate 0 Ohms, do not use the PWA-805 Auditor. Contact Prostat Customer Service.

IV. PWA-805 Wrist Strap Auditor Resistance Measurement Operation

A. General

1. This operation will provide the four following resistance measurements:
 - a. Resistance of a wrist strap from the inner surface, middle position of the cuff to the end of the grounding cord. This measurement indicates the maximum resistance between the user and an ESD common ground point.
 - b. The resistance between two points on the inner surface of the cuff. Properly used, this measurement defines the continuity of the inner cuff’s surface between 2 points, 180° apart.
 - (1) Thus, proper connections of the cuff to the wrist buckle may be confirmed.
 - (2) The continuity around the entire perimeter of the inner cuff surface may be confirmed.

- c. The resistance between two points on the outer surface of the cuff. This measurement confirms the insulative characteristics of the cuffs outer surface.
 - d. The resistance between the ground cord's cuff snap and its connection to ground. This measurement performs two functions.
 - (1) It allows the operator to check the ground cord for "opens"
 - (2) It measures the total resistance of the ground cord conductor resistor and connection points.
2. The following procedures require the use of the Resistance Meter. Be sure to read its Operations Manual and perform its Functional Test prior to using.
- B. Resistance Measurement of a wrist strap assembly CUFF & CORD.
1. Connect the test leads from the Resistance Meter to the PWA-805 Auditor RED and BLACK METER receptacles.
 2. Place the rocker switch in the middle CUFF & CORD position

IMPORTANT OPERATIONAL NOTE

The LEFT can electrode in the CUFF & CORD measurement Mode is used to hold the cuff mechanically; it is not in the measurement circuit. The RIGHT can electrode is in the measurement circuit. Consequently, the inner cuff surface must contact the RIGHT can electrode to obtain an accurate measurement.

3. Mount the wrist strap cuff to the PWA-805 fixture as follows:
 - a. Loosen the adjustable RIGHT can electrode and slide it toward the LEFT can electrode.
 - b. Position the inner surface of the cuff buckle against the LEFT can electrode and hold it firmly in position with your left hand.
 - c. With your right hand, stretch the cuff over and onto the adjustable RIGHT can electrode.
 - d. Slide the adjustable RIGHT can electrode toward the right side of the fixture until there are 1 to 2 pounds of tension on the wrist strap cuff.
 - e. Tighten the RIGHT can electrodes locking screw.
4. Plug the wrist strap's ground cord banana plug into the YELLOW CORD receptacle.
5. The wrist strap is now mounted on the PWA-80S fixture. Be sure:
 - a. The cuff is positioned smoothly on the sides of the two can electrodes
 - b. The ground cord is properly attached to the cuff buckle
 - c. The ground cord banana plug is fully inserted into the YELLOW CORD receptacle.
6. Select the 10 volt position on the Resistance Meter and push the TEST button to obtain a resistance measurement.

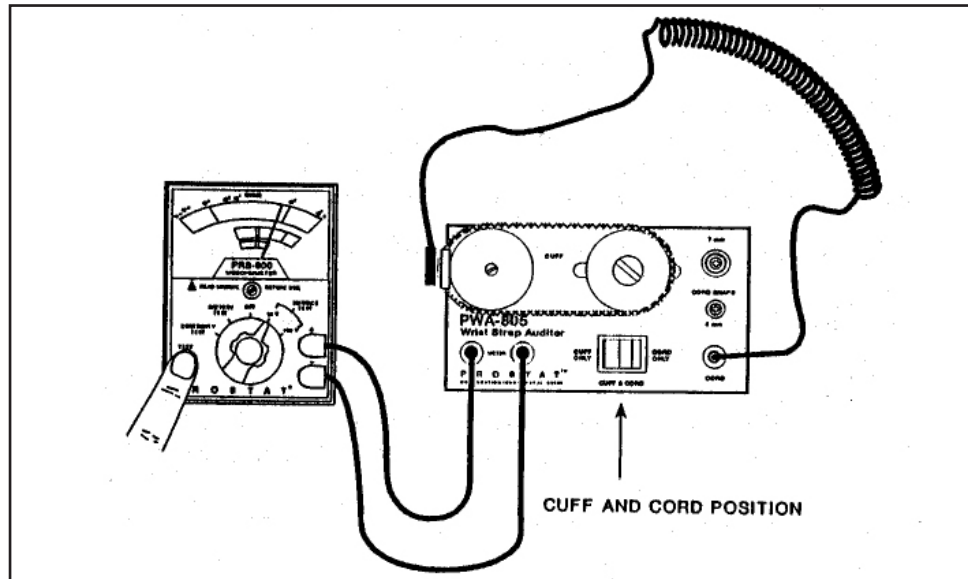


Figure 5: PWA-805 Resistance Measurement of a wrist strap assembly Cuff & Cord

CAUTION

To avoid electrical shock, do not touch the fixture can electrodes when power is being applied.

OPERATIONAL HINT

During the measurement, one might wish to check for “opens” in the ground cord or poor connections by stretching various parts of the cord and observing the meter indication. Wiggling the snap connections may indicate a loose fitting snap.

- a. Most US wrist straps are designed to measure approximately 1.0×10^6 Ohms, ± 20 percent, i.e., 8.0×10^5 to 1.2×10^6 Ohms.
 - b. Specially designed wrist straps used in munitions are lower in resistance, while others are designed for higher resistance levels, as in some international markets.
 - c. Defective wrist straps will measure well above 1.0×10^7 Ohms. CHECK YOUR ESD OPERATIONS STANDARDS TO DEFINE THE PROPER RESISTANCE RANGE FOR OPERATIONAL WRIST STRAP ASSEMBLIES.
 - d. If the wrist strap indicates defective, or you wish to further define the wrist strap’s characteristics, proceed with the following measurements.
- C. Resistance Measurement of the wrist strap CUFF ONLY, Inner Surface.
1. Connect the test leads from the Resistance Meter to the PWA-805 Auditor RED and BLACK

METER receptacles.

2. Place the rocker switch in the CUFF ONLY (left) position

IMPORTANT OPERATIONAL NOTE
In this Measurement Mode both the LEFT and the RIGHT can electrodes are in the measurement circuit.

3. Mount the wrist strap cuff to the PWA-805 fixture as follows:
 - a. Loosen the adjustable RIGHT can electrode and slide it toward the LEFT can electrode.
 - b. Position the inner surface of the cuff buckle against the LEFT can electrode and hold it firmly in position with your left hand.
 - c. With your right hand, stretch the cuff over and onto the adjustable RIGHT can electrode.
 - d. Slide the adjustable RIGHT can electrode toward the right side of the fixture until there are 1 to 2 pounds of tension on the wrist strap cuff.
 - e. Tighten the RIGHT can electrodes locking screw.
4. Disconnect the wrist strap's ground cord from the cuff buckle.
5. The wrist strap cuff is now mounted on the PWA-805 fixture. Be sure the cuff is positioned smoothly on the sides of the two can electrodes.

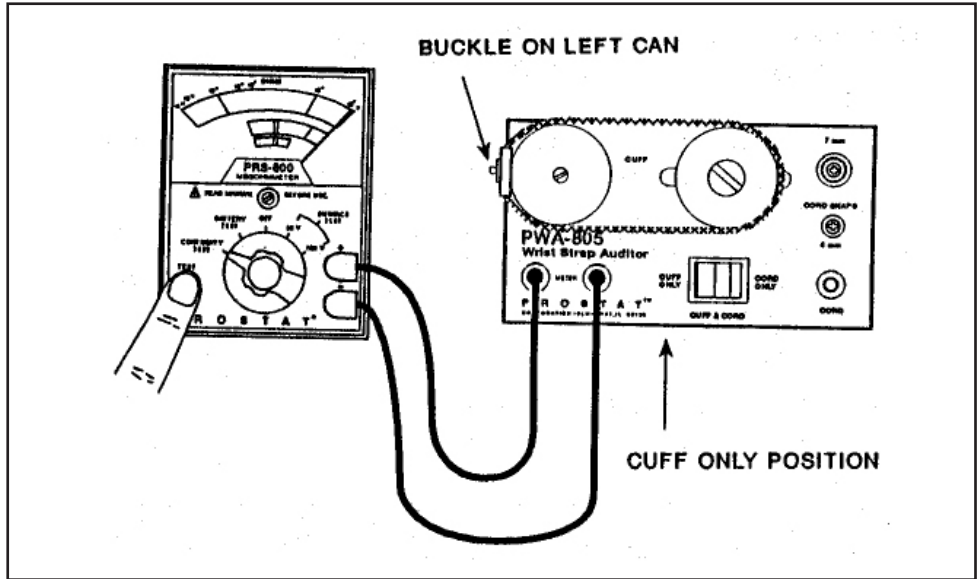


Figure 6: PWA-805 Resistance Measurement of the wrist strap Cuff Only, Inner Surface

6. Select the 10 volt position on the Resistance Meter and push the TEST button to obtain a resistance measurement.

CAUTION

To avoid electrical shock, do not touch the fixture can electrodes when power is being applied.

- a. Most US wrist strap cuffs are designed to indicate very conductive, well below 1.0×10^5 Ohms.
 - b. Defective wrist strap cuffs will measure well above 1.0×10^6 Ohms. CHECK YOUR ESD OPERATIONS STANDARDS TO DEFINE THE PROPER RESISTANCE RANGE FOR OPERATIONAL WRIST STRAP ASSEMBLIES.
 - c. Reposition the cuff by sliding it 90 degrees around the can electrodes. Repeat the cuff measurement with buckle between cans.
- D. Resistance Measurement of the wrist strap CUFF ONLY, Outer Surface.
1. Connect the test leads from the Resistance Meter to the PWA-805 Auditor RED and BLACK METER receptacles.
 2. Place the rocker switch in the CUFF ONLY (left) position

IMPORTANT OPERATIONAL NOTE

In this Measurement Mode both the LEFT and the RIGHT can electrodes are in the measurement circuit.

3. Mount the wrist strap cuff to the PWA-805 fixture as follows. Note: Be sure the ground cord is disconnected.
 - a. Loosen the adjustable RIGHT can electrode and slide it toward the LEFT can electrode.
 - b. Position the outer surface of the cuff against the LEFT can electrode and hold it firmly in position with your left hand. Position the buckle between the 2 cans.
 - c. With your right hand, stretch the cuff over and onto the adjustable RIGHT can electrode.

IMPORTANT OPERATIONAL NOTE

Position the cuff buckle between the can electrodes to prevent the buckle from affecting the outer cuff resistance measurement.

- d. Slide the adjustable RIGHT can electrode toward the right side of the fixture until there are 1 to 2 pounds of tension on the wrist strap cuff.
- e. Tighten the RIGHT can electrodes locking screw.

4. The wrist strap cuff is now mounted on the PWA-805 fixture. Be sure the cuff is positioned smoothly on the sides of the two can electrodes and the buckle is between the cans.

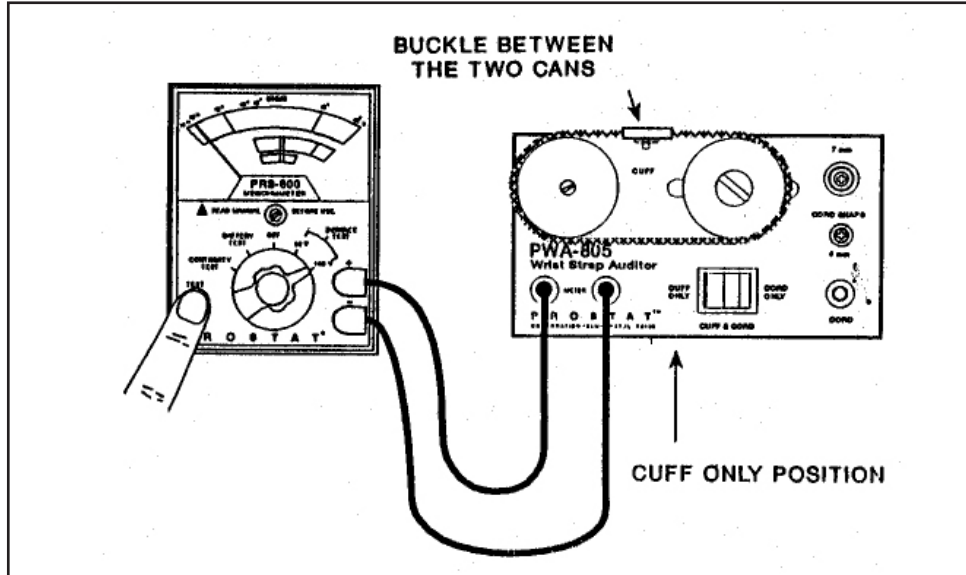


Figure 7: Resistance Measurement of a wrist strap Cuff only, Outer Surface

5. Select the 10 volt position on the Resistance Meter and push the TEST button to obtain a resistance measurement.

CAUTION

To avoid electrical shock, do not touch the fixture can electrodes when power is being applied.

- a. Most US wrist strap cuff outer surfaces are designed to indicate high resistance (insulative) and measure well above 1.0×10^9 Ohms.
 - b. Defective wrist strap cuffs will measure well below 1.0×10^9 Ohms. CHECK YOUR ESD OPERATIONS STANDARDS TO DEFINE THE PROPER RESISTANCE RANGE FOR OPERATIONAL WRIST STRAP ASSEMBLIES.
6. Repeat the outer cuff surface measurements at 100 volts.
- E. Resistance Measurement of a wrist strap ground cord, i.e., CORD ONLY
1. Connect the test leads from the Resistance Meter to the PWA-805 Auditor RED and BLACK METER receptacles.
 2. Place the rocker switch in the right CORD ONLY position

IMPORTANT OPERATIONAL NOTE

In this measurement mode, both the 7 mm and the 4 mm CORD SNAPS, as well as the YELLOW CORD receptacle are in the measurement circuit.

3. Do Not Mount the wrist strap cuff to the PWA-805 fixture for this test. If it is mounted, it is not part of the measurement circuit and may remain in position.
4. Plug the wrist strap's ground cord banana plug into the YELLOW CORD receptacle.
5. Attach the buckle connection snap assembly to either the 7 mm or 4 mm snap post.
6. The wrist strap ground cord is now mounted on the PWA-805 fixture. Be sure: The ground cord banana plug is fully inserted into the YELLOW CORD receptacle.

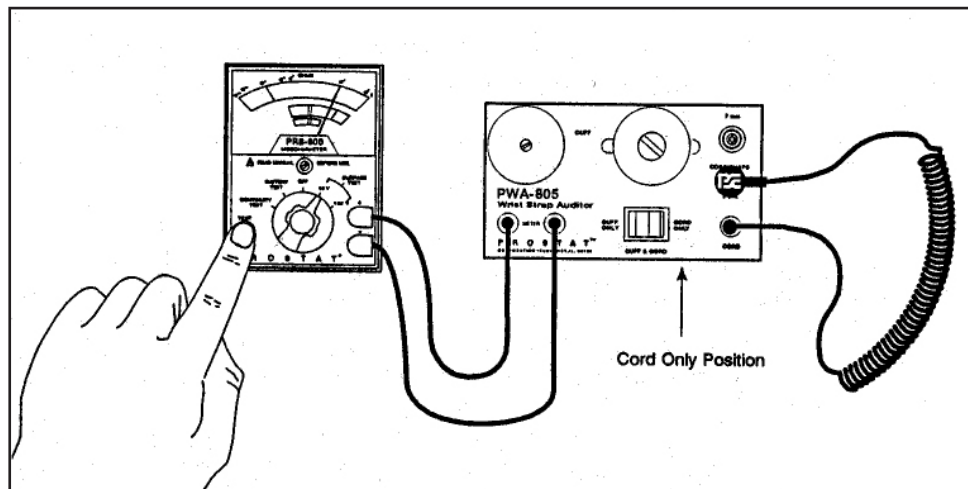


Figure 8: Resistance Measurement of a wrist strap Cord only

7. Select the 10 volt position on the Resistance Meter and push the TEST button to obtain a resistance measurement.

CAUTION

To avoid electrical shock, do not touch the fixture can electrodes when power is being applied.

OPERATIONAL HINT

During the measurement, one might wish to check for "opens" in the ground cord or poor connections by stretching various parts of the cord and observing the meter indication. Wiggling the snap connections may indicate a loose fitting snap.

- a. Most US wrist strap cord assemblies are designed to measure approximately 1.0×10^6 Ohms, ± 20 percent, i.e., 8.0×10^5 to 1.2×10^6 Ohms.
- b. Specially designed wrist straps used in munitions are lower in resistance, while others are designed for higher resistance levels, as in some international markets.
- c. Defective wrist straps will measure well above 1.0×10^7 Ohms. CHECK YOUR ESD OPERATIONS STANDARDS TO DEFINE THE PROPER RESISTANCE RANGE FOR OPERATIONAL WRIST STRAP ASSEMBLIES.

V. Maintenance

The user serviceable parts in the PWA-80S Wrist Strap Auditor are basically terminal connections.

- A. Care should be take to keep all connections free from dirt and dust.
- B. Occasionally a snap post may loosen. Tighten with a an appropriate screw driver. The fixture case may require opening to lock terminal connections.
- C. If in doubt, contact Prostat Customer Service for assistance or return of the unit.

PWA-805 Wrist Strap Auditor Fixture Specifications

Fixture Case:	4.6" L x 2.75" W x 0.95" H inches
Wrist Strap Cylinders:	Two (2) top mounted metal cylinders: 1 fixed, 1 adjustable for cuff size Cylinder Diameter: 1.25. x 1.0. H Adjustable cylinder equipped with knurled locking screw for positioning
Comtrols:	Three position rocker switch: (1) Cuff Only [Resistance between Cylinders] (2) Cuff & Cord Assembly [Resistance from cord ground point to cuff cylinder]; (3) Cord Only [Resistance from cord ground point to cuff snap connections]
Connections:	Resistance Meter: 2 banana receptacles for meter leads Cord Groundable Point: 1 banana receptacle 2 Cord Cuff Snaps: 1 each 7mm diameter, 1 each 4mm diameter
Power:	Not Applicable. The fixture is used in conjunction with the Resistance Meter and test leads.
Weight:	4.5 oz.
Warranty:	One year limited warranty

NOTES

NOTES

Specifications are subject to change without notice.
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