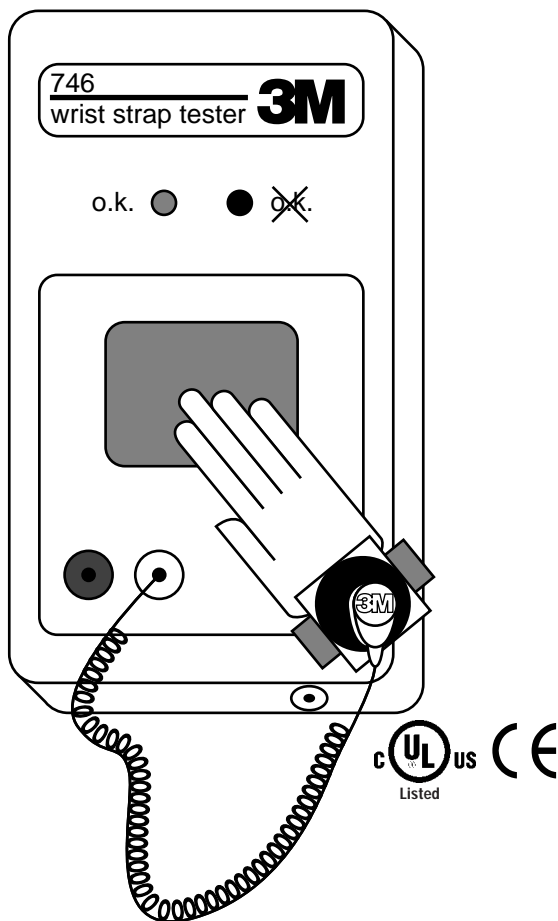


# 3M 746

## Wrist Strap Tester

### Operating Instructions








Read and Understand all Safety Information Before  
Operating this Equipment.

Safety Information

*Intended Use*

The 3M™ 746 Wrist Strap Tester was designed and tested to be used for measuring the electrical resistance of single-conductor wrist strap assemblies.

**Explanation of Symbols**

-  - Caution: read operating instructions.
-  - Warning: read operating instructions.
-  O.K. - See operating instructions for explanation of the indicator LED.
-  - See operating instructions for explanation of the indicator LED.
-  - See operating instructions for explanation of the indicator LED.

**General**

The design of the 746 allows for testing of wrist straps while being worn by a person or testing of the individual wrist strap components. The 746 can be mounted to a wall or be used as a portable piece of test equipment. It operates from a 120 Vac source through an AC adapter, or a standard 9 volt battery. An internally set resistance range extends from 750 KΩ to 10 MΩ. If the wrist strap resistance when tested is within this range, a green LED will illuminate. If outside this range, a red LED will illuminate.

Wrist straps are the primary method used to minimize charge generation on the human body. They must be able to drain this charge as rapidly as it is generated. For this reason, it is important to test wrist straps on a regular basis to ensure they are functioning properly. The test results should be recorded. The form on page 9 of these instructions can be used as a logbook.

### CAUTION

#### Battery Replacement:

The use of a NEDA 1604, 9 volt alkaline type battery is recommended for the 3M 746 Wrist Strap Tester. For longer service life, use an ULTRALIFE®, U9VL-J battery. The original battery supplied with the 746 is an ULTRALIFE brand battery. This battery is available through Radio Shack® retail electronic stores, Catalog Number 23-665. For more information about this battery or other retail outlets, contact ULTRALIFE BATTERIES INC. at 1-800-332-5000.

Battery Disposal: Dispose of batteries in accordance with state and local requirements.

### WARNING

- Battery may explode if misused. Do not recharge or disassemble.
- Do not dispose of in fire.
- When replacing with lithium battery, use only ULTRALIFE, U9VL-J. Use of another type lithium battery may present a risk of fire or explosion.

### **Battery Environmental**

The ULTRALIFE®, U9VL-J battery contains no mercury, cadmium or lead.

### CAUTION

If the AC/DC adapter is plugged into the 746 Wrist Strap Tester, it must also be plugged into the wall outlet to allow the unit to function. If the 746 tester is to be powered with battery only, the AC/DC adapter **MUST** be disconnected from the DC input jack (1B) on the tester.

### **Accessories:**

- Instruction booklet
- Wall mounting kit (3M™ Dual Lock™ Wall Mounting System and template)
- Battery
- Cover for wrist strap plug-in jack
- AC/DC adapter

## Specifications

Base unit:	158 x 95 x 33 mm (6.25 x 3.75 x 1.25 in.)
Weight:	200g (7 oz.) without battery
Battery provided:	9 Vdc Lithium/Manganese Dioxide NEDA 1604LC
AC/DC Adapter:	9 Vdc regulated 75 mA
Accuracy:	+/- 10% (10 M $\Omega$ limit) + 20%-0% (750 K $\Omega$ limit)
Measurement voltage:	19 Vdc +/- 1 Vdc (open circuit)

## Environmental Operating Conditions:

Temperature:	
Maximum	104° F / 40° C
Minimum	32° F / 0° C
Humidity:	
Maximum	80% R.H.

## Installation

THE PARAGRAPH NUMBERS BELOW ARE  
REFERENCED ON THE DIAGRAM ON PAGE 7.

### Power Sources

#### 1A. 9 volt backup battery

Due to the slightly larger size of the long-life lithium battery, it is necessary to properly locate the battery snap connector and wires in the battery compartment. To correctly install the battery, follow these instructions:

Attach the battery snap connector to the battery. Place the battery into the compartment, locating the snap connector at the opposite end of the compartment from where the battery wires come through the housing, keeping the wires along the top edge of the compartment. Run the battery wires along the side of the battery and tuck them down between the housing and the battery so that the wires clear the cover. Use a small, straight blade screwdriver to gently push the battery wires down below the lip of the compartment. Slide and lock the cover into place. When changing the battery, the battery cover must be removed carefully. To remove the battery cover, slide back the cover slightly. Insert a small, straight blade screwdriver into the opening immediately over the tab area beneath the word "OPEN." Press down with the screwdriver while sliding the cover off. You must use a screwdriver to remove the battery cover.

**1B. AC/DC Adapter**

Connect the AC/DC adapter to the jack at the base of the unit.  
Plug the adapter into a 120 Vac outlet.

**⚠ CAUTION**

If the AC/DC adapter is plugged into the 746 Wrist Strap Tester, it must also be plugged into the wall outlet to allow the unit to function. If the 746 tester is powered with the battery only, the AC/DC adapter **MUST** be disconnected from the DC input jack (1B) on the tester.

**2. Battery Indicator**

**⚠ CAUTION**

When operating on battery power only, replace the battery immediately when the “Battery” indicator LED illuminates.

**Jack Cover**

3. Insert the plastic cover into the yellow wrist strap plug-in jack that is not being used. The jack on the right fits standard banana plugs used in North America. The 746 Wrist Strap Tester is now ready for use.

**Wall Mounting**

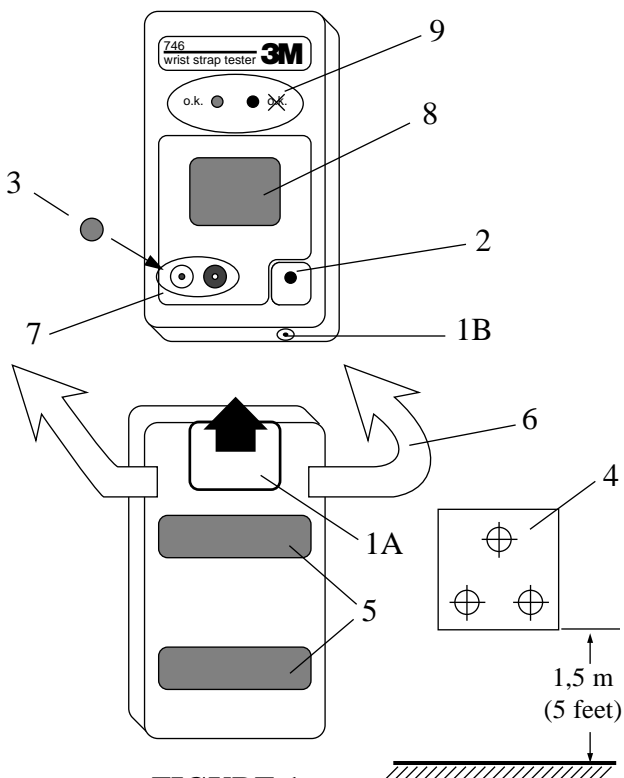
4. The enclosed 3M™ Dual Lock™ Wall Mounting System adhesion discs must be screwed onto the wall, using the attached template, approximately 1,5 m (5 ft.) off the floor. Drill three holes of 5 mm (0.2 in.) diameter at marked locations.
5. The enclosed Dual Lock adhesion strip must be cut in two halves and adhered to the rear of the 746 Tester, parallel to the bottom edge and below the battery compartment. Make sure the area on the 746 Tester where the adhesion strips are to be placed is free of dust and dirt. Press the back of the case firmly against the discs to secure the tester to the wall.
6. For removal, lift the 746 Wrist Strap Tester at the two top corners with both hands.

# Testing Procedure

## Wrist Band/Cord Test

7. Put the wrist band on with the ground cord attached and insert the ground cord banana plug into the yellow wrist strap plug-in jack.
8. Depress the metal contact plate and hold.
9. One of the LED indicators will illuminate. An illuminated green LED indicates that the wrist strap assembly performs within the resistance range of 750 K $\Omega$  to 10 M $\Omega$ . If a red LED is illuminated, the resistance of the wrist strap assembly may be outside the range of 750 K $\Omega$  to 10 M $\Omega$ . To check the resistance of the ground cord, leave the banana plug end attached to the tester. Unsnap the cord from the wrist band. Place the metal side of the ground cord snap end against the metal contact plate. Depress the plate and check to see which LED illuminates. If the red LED illuminates, the ground cord is outside of the resistance range. If the green LED illuminates, the ground cord is "OK" but the wrist band may need to be replaced.

NOTE: In some cases, a high contact resistance between the person's skin and the wrist band will cause the tester to indicate a red LED (greater than 10 M $\Omega$ ). This higher resistance may be caused by dry skin or hair on the wearer's wrist. A loose fitting wrist band can also cause intermittency or high resistance. If these conditions do not exist, a new wrist band should be obtained and tested on the person.



**FIGURE 1**

## Verification Procedure

The 746 Wrist Strap Tester cannot be adjusted by the user, but the following steps can be used to verify that the 746 is operating within its specification. (The 746 may also be returned to 3M to obtain certification. Please call 800-328-1368 for more information.)

### Equipment needed

1. Resistance substitution box, 700 K $\Omega$  - 11 M $\Omega$ , accuracy < 2%.
2. Two lead wires to connect the resistance box to the 746 Tester.

### Checking wrist strap test circuit

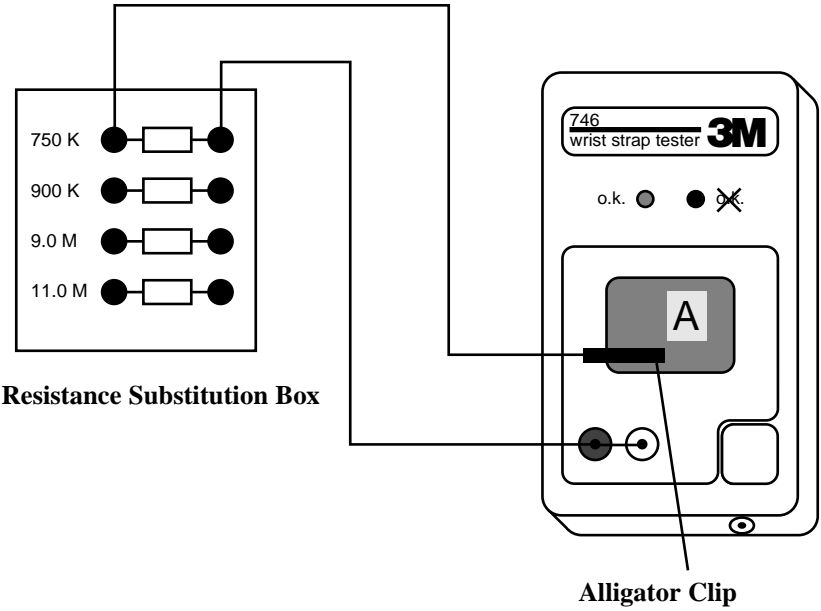
Connect the resistance substitution box to the tester as shown in Figure 2.

Adjust the resistance substitution box to each value of resistance indicated in the test table below and press contact plate A.

The LEDs will indicate, as shown below, if the unit is functioning within specifications.

Resistance substitution box setting	Resistance range of the tester	LED indication
750 K $\Omega$ *	750 K $\Omega$	red
900 K $\Omega$		green
9.0 M $\Omega$	10 M $\Omega$	green
11.0 M $\Omega$		red

\*This example is used in Figure 2



**FIGURE 2**



[illegible]

Serial-No: -----

**Important Notice**

Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use.

**Warranty; Limited Remedy; Limited Liability.**

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