

## 905e, 9.1, 9.10 Treadmill

**Warning:** This service manual is for use by Precor trained service providers only. If you are not a Precor Trained Servicer, you must not attempt to service any Precor Product; Call your dealer for service.

This document contains information required to perform the majority of troubleshooting, and replacement procedures required to repair and maintain this product.

This document contains general product information, software diagnostic procedures (when available), preventative maintenance procedures, inspection and adjustment procedures, troubleshooting procedures, replacement procedures and electrical block and wiring diagrams.

To move directly to a procedure, click the appropriate procedure in the bookmark section to the left of this page. You may “drag” the separator bar between this page and the bookmark section to change the size of the page being viewed.

# Section One - Things you Should Know

## About This Appendix

**Section One, Things You Should Know.** This section includes technical specifications and a procedure matrix. Read this section, as well as the appropriate treadmill owner's manual, before you perform the maintenance procedures in this manual.

**Section Two, Software Features.** Precor's 905e, 9.1 and 9.10 Treadmills are programmed with several diagnostic and setup features. This section contains the procedures you need to access the diagnostic features on this treadmill.

**Section Three, Checking Treadmill Operation.** This section provides you with a quick way of checking treadmill operation. Check treadmill operation at the end of a maintenance procedure and when it is necessary to ensure that the treadmill is operating properly.

**Section Four, Inspection and Adjustment Procedures.** Perform inspection procedures when a trouble symptom points to a particular problem and after removing and replacing major components. Many maintenance problems can be fixed by adjusting various treadmill components. This section also provides you with the step-by-step procedures required to make these adjustments.

**Section Five, Troubleshooting Procedures.** The diagnostic and troubleshooting procedures contained in this section should be performed when it is necessary to isolate a problem to a particular component.

**Section Six, Replacement Procedures.** When a treadmill component must be replaced, go to this section and follow the step-by-step procedures required to remove and replace the component.

**Section Seven, Technical Diagrams and Parts Lists.** This section includes wiring diagrams, exploded view diagrams and parts lists for the 905e, 9.1 and 9.10 Treadmills.

**Section Eight, Troubleshooting Flow Charts.** This section allows you to troubleshoot malfunctions and find problems by analyzing and diagnosing treadmill operation and trouble symptoms.

**Section Nine, Service Bulletins and Engineering Change Notices.** If you receive Service Bulletins or Engineering Change Notices about 905e, 9.1 and 9.10 Treadmills, place them in this section.

## General Information

For the latest exploded view, part number and part pricing information, visit the Precor dealer website at "[www.precor.com/Dealer](http://www.precor.com/Dealer)".

**Technical Specifications**

|                  |  |
|------------------|--|
| Length:          | 67.5 inches  |
| Width:           | 26.75 inches   |
| Height:          | 43.5 inches  |
| Running surface: | 51 inches by 17 inches   |
| Motor:           | 1.5 hp continuous duty DC  |
| Speed:           | <b>905e Treadmills (Software Version 1.4 or Less)</b><br>0.3 to 6 mph in 2 mph increments      |
|                  | <b>905e Treadmills (Software Version Greater Than 1.4)</b><br>0.5 to 8 mph in 2 mph increments |
|                  | <b>9.1 Treadmills</b><br>0.5 to 8 mph in 10 mph increments                                     |
|                  | <b>9.10 Treadmills</b><br>0.5 to 9 mph in 10 mph increments                                    |
| Incline:         | 0% to 10%  |
| Power:           | 50/60Hz 120v AC  |
| Weight:          | 195 lbs  |
| Shipping weight: | 280 lbs  |

## Procedure 2.1 - 905e, 9.1 and 9.10 Calibration Mode

Placing the 905e, 9.1 and 9.10 Treadmills in Calibration Mode causes the software to perform the following operations:

1. Display the PROM version number;
2. Check the LED's mounted on the upper PCA; and

Display the potentiometer increment number.

Place the treadmill in Calibration Mode before calibrating the lift assembly. (The steps in this procedure are included in Procedure 4.1 of this appendix, Calibrating the Lift Assembly).

When the treadmill is in calibration mode and the **SPEED ▲** key is selected, the treadmill speed will increase twice as fast as it does when the treadmill is in a normal operating mode.

### Procedure

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.

#### Note:

Diagram 9.1-1 displays the 905e Treadmill electronic console. The 9.1 Treadmill electronic console is shown in Diagram 9.1-2. The 9.10 Treadmill electronic console is shown in Diagram 9.1-3.

2. With the Enter Your Weight banner scrolling, press and hold the **SPEED ▲** key, **SPEED ▼** key, **STOP**, and **SCAN/ENTER** keys simultaneously.
3. The electronic console displays the version number of the PROM mounted on the upper PCA. Record the PROM version number.
4. Following the version number, a horizontal line sweeps from top to bottom and then a vertical line sweeps from right to left. The lines check the LED's mounted on the upper PCA.
5. After the horizontal and vertical LED test lines, the electronic console displays the potentiometer increment number.

#### Note:

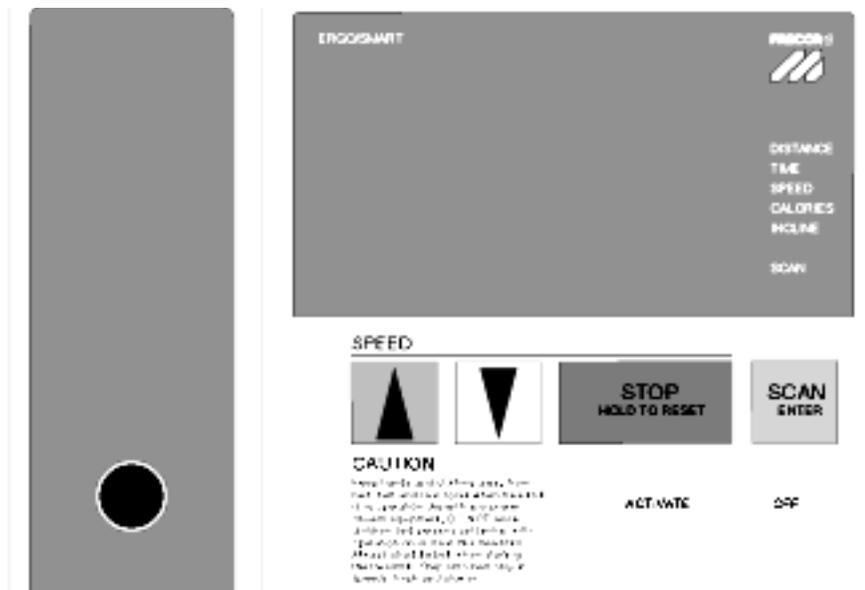
If the PROM version number displayed earlier in this procedure is equal to or greater than 4.0, the potentiometer increment number should be 18 @ 0% incline. If the PROM version number is less than 4.0, the potentiometer number should be between 10 and 12 @ 0% incline. If the electronic console does not display these increment numbers, the lift assembly is not calibrated correctly. Go to Procedure 4.1 of this appendix.

6. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

### 9.1 Electronic Console



### 9.10 Electronic Console



## Procedure 2.2 - Displaying the Odometer

This procedure allows you to display the number of miles logged on the treadmill. Total miles logged on the treadmill is different from workout time. Workout time is displayed as described in the owners manuals provided with the 905e, 9.1 and 9.10 Treadmills.

### Procedure

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. With the Enter Your Weight banner scrolling, press the **STOP** key, the **SPEED ▼** key, and then the **SPEED ▲** key sequentially.

### Note:

After you perform Step 2, the electronic console displays the number of miles logged on the treadmill.

3. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

## Procedure 2.3 - Selecting United States Standard or Metric Units

Selecting United States standard units causes information to be displayed in feet and pounds. Information is displayed in meters and kilograms if metric units are selected. After you have selected a measurement standard, the software compiles and records workout information in the units of the measurement standard selected. Changing to the alternate measurement standard after your workout has started will cause invalid data to be displayed. For this reason, change the measurement standard only after turning ON the treadmill.

### Procedure

The measurement standard must be changed within five seconds of turning on the treadmill.

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. With the Enter Your Weight banner scrolling, press and hold the **SPEED ▲** and **SCAN/ENTER** keys simultaneously until the **Press ▲ for MPH & miles or ▼ for KPH & kilometers** message scrolls across the screen.
3. Use the **SPEED ▲** or **SPEED ▼** key to select the measurement standard.

### Note:

When the treadmill is turned off or unplugged it will remember the last measurement standard selected.

## Procedure 2.4 - Determining Software Version Numbers

Software version numbers are invaluable for tracking and identifying problems and staying aware of changes to the operation and features of the product.

### Procedure

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. With the Enter Your Weight banner scrolling, press and hold the **SPEED ▲** key, **SPEED ▼** key, **STOP** and **SCAN/ENTER** keys simultaneously.
3. Note the software version number displayed on the electronic console.

### Note:

If you cannot determine the software version number in this manner, look at the PROM (U3) mounted on the upper PCA. A label on U3 indicates the software version number and the treadmill model number of the PROM.

## Procedure 2.5 - Checking the LED's Mounted on the Upper PCA

### Procedure

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. With the Enter Your Weight banner scrolling, press and hold the **SPEED ▲** key, **SPEED ▼** key, **STOP**, and **SCAN/ENTER** keys simultaneously.
3. After the software version number is displayed on the electronic console, watch the illuminated lines sweep from top to bottom and then right to left.

### Note:

The lines check the LED's mounted on the upper PCA. If the lines are broken when they sweep across the electronic console, one or more of the LED chips (DS1, DS2, DS3, DS4, or DS5) is defective. Replace the defective LED chip as described in Procedure 6.2 of this appendix.

## Procedure 2.6 - Placing the 905e, 9.1 and 9.10 Treadmills in Power Bit Mode

### Procedure

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. With the Enter Your Weight banner scrolling, press and hold the **SPEED ▲** key, **SPEED ▼** key, **STOP** and **SCAN/ENTER** keys simultaneously.
3. Watch the electronic console. When the potentiometer increment number is displayed on the electronic console, enter power bit mode by pressing the **SPEED ▼** key.

### Note:

*When you remove your finger from the **SPEED ▼** key, the number of power bits will be displayed. Power bits are directly related to the drive motor input signal. The power bit number represents a combination of requested speed and actual load.*

## Procedure 2.7 - Documenting Software Problems

When a problem is found with either the PROM or upper or lower PCA's, record the information listed below. If you isolated the problem to either the PROM, upper PCA, or lower PCA, include the information with the malfunctioning PROM or PCA when you ship it to Precor Customer Service.

When a problem occurs, record the following information:

- Model and serial number
- Software version number

**Note:**

Determine the version number of the PROM mounted on the upper PCA as described in Procedure 2.4 of this appendix.

- User and program number running when the problem occurred
- A description of:

What happened or failed to happen

The action taken by the user just before the problem occurred

Problem-related information (such as how far into the program the problem occurred, the work level being used when the problem occurred, etc.)

- The frequency of occurrence

## Section Three - Checking Treadmill Operation

This section provides you with a quick method of checking treadmill operation. Check treadmill operation at the end of a maintenance procedure and when it is necessary to ensure that the treadmill is operating properly.

### Procedure

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. Adjust the speed of the running belt to 2–3 m.p.h.
3. Operate the treadmill for at least 5 minutes.
  - Concentrate on the feel of the running belt and the sound of the drive motor and rollers. Be on the alert for unusual noises, smells or vibrations.
  - Measure and log the AC input current under loaded and unloaded conditions.
  - Press the **SCAN** key while observing the LED's on the electronic console. Make sure that each LED lights as the information corresponding to that LED is displayed on the electronic console.
4. Press the **STOP** key. When the treadmill comes to a stop, press the **SCAN** key and view the electronic console as the treadmill scans time, speed, distance and percent.
5. Turn the crank handle in the positive direction while viewing the electronic console. Confirm that the running bed inclines and the incline display increments to ten percent as the crank handle is turned.
6. Turn the crank handle in the negative direction while viewing the electronic console. Confirm that the running bed returns to a level position and the incline display decrements to zero percent as the crank handle is turned.
7. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

## Procedure 4.1 - Calibrating the Lift Assembly

### Procedure

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. Turn the crank handle in the negative direction until the crank handle will no longer move without using excessive force.

#### Note:

Do not overtighten the crank handle.

3. Press the **SCAN** key, then view the electronic console as the treadmill scans time, speed, distance, and percent.
4. If the electronic console displays zero percent . . .

#### THEN . . .

Continue with the next step.

#### OTHERWISE . . .

Skip to Step 8.

5. Turn the crank handle in the positive direction until the crank handle will no longer move without using excessive force.
6. Press the **SCAN** key, then view the electronic console as the treadmill scans time, speed, distance, and percent.
7. If the electronic console displays ten percent . . .

#### THEN . . .

The lift mechanism is calibrated correctly; place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

#### OTHERWISE . . .

Continue with the next step.

#### Note:

When you perform the next step, the electronic console will display the PROM version number, check the LED's that make up the electronic console display, and display the potentiometer increment number.

8. With the Enter Your Weight banner scrolling and the incline at minimum (zero percent), press and hold the **SPEED ▲**, **SPEED ▼**, **STOP**, and **SCAN/ENTER** keys simultaneously.
9. Record the PROM version number and potentiometer increment number.

10. Loosen the screw that secures the crank handle to the electronic console. Remove the crank handle and set it aside.
11. Remove the bolts and washers that secure the electronic console to the upper handrail clamp.
12. Carefully move the electronic console, with the ribbon cable still attached, until it can rest on the right handrail. The lift jack shaft and potentiometer are exposed.
13. Position the crank handle on the lift jack shaft and tighten the crank handle screw.
14. See Diagram 9.1-4. Watching the pin wheel, slowly rotate the crank handle until the drive wheel is disengaged from the pinwheel.
15. If the PROM version number recorded in Step 9 is equal to or greater than 4.0 . . .

**THEN . . .**

Rotate the pin wheel until the electronic console displays 18.

**OTHERWISE . . .**

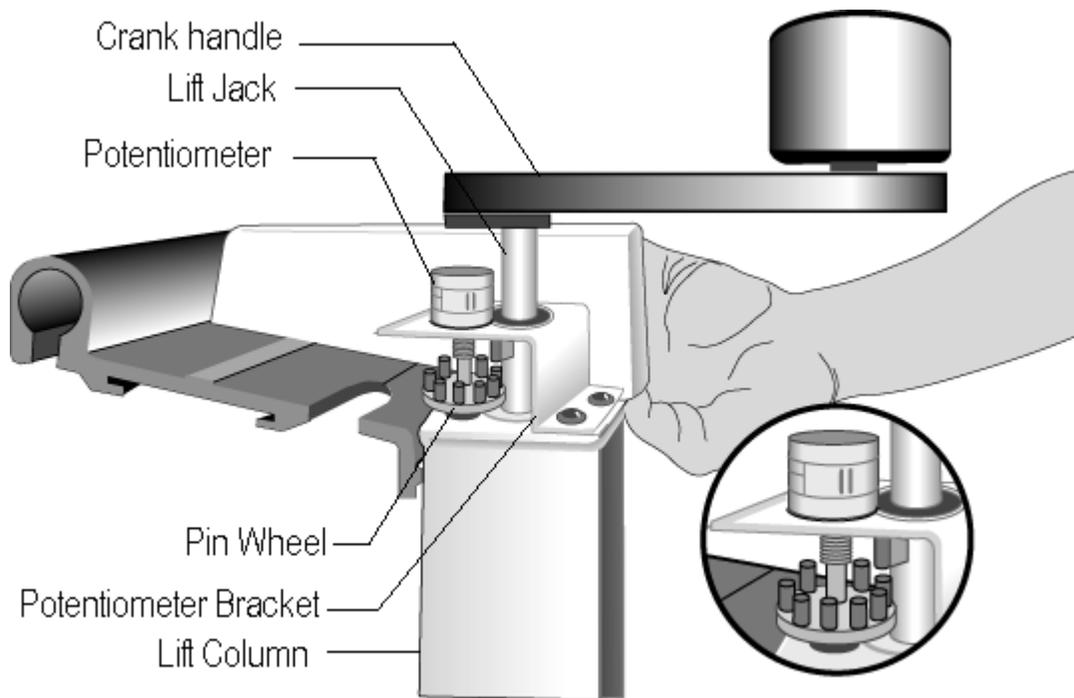
Rotate the pin wheel until the electronic console displays 10 - 12.

16. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.
17. Loosen the crank handle screw and remove the crank handle from the electronic console.
18. Place the electronic console over the lift jack shaft and potentiometer.
19. Replace the two bolts and washers that secure the electronic console to the upper handrail clamp.
20. Position the crank handle at its mounting position. Tighten the screw that secures the crank handle to the electronic console.

**Note:**

On units that have set screws securing the crank handle, one of the set screws on the crank handle must face the flat area on the lift jack shaft.

**Diagram 4.2 - Upper Lift Column Assembly**



## Procedure 5.1 - Troubleshooting the Keypad and Upper PCA

1. Set the circuit breaker in the “off” position.

### WARNING

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

2. Remove the screws that secure the upper display assembly to the upper handrail. Carefully, pull some excess interconnect cable out from the targa upright. Rotate the display housing, so that the rear of the upper PCA is facing upward, and set the display housing on the upper handrail.
3. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the treadmill frame.
4. Set the voltmeter to a range that will conveniently read +6 Vdc.
5. Set the circuit breaker in the “on” position.
6. Use a DVM, set for DC volts, and read between pin 3 of J1 and the each of the pins in Table 5.1 (no keys pressed) and Table 5.2 (with the appropriate key pressed)...

**Table 5.1. Voltage Tests (Function Keys Not Pressed)**

| <b>Place the positive lead of the voltmeter on:</b> | <b>The voltmeter should read:</b> |
|---|-----------------------------------|
| Pin 1 of J1   | 5 Vdc $\pm$ 500 mVdc              |
| Pin 4 of J1   | 5 Vdc $\pm$ 500 mVdc              |
| Pin 5 of J1   | 5 Vdc $\pm$ 500 mVdc              |
| Pin 2 of J1   | 5 Vdc $\pm$ 500 mVdc              |

**Table 5.2. Voltage Tests (Function Keys Pressed)**

| <b>Place the positive lead of the voltmeter on:</b> | <b>Press key:</b> | <b>The voltmeter should read:</b> |
|---|-------------------|-----------------------------------|
| Pin 1 of J1   | STOP              | 0 Vdc and 500 mVdc                |
| Pin 4 of J1   | SPEED ▼           | 0 Vdc and 500 mVdc                |
| Pin 5 of J1   | SPEED ▲           | 0 Vdc and 500 mVdc                |
| Pin 2 of J1   | SCAN ▲            | 0 Vdc and 500 mVdc                |

7. If the voltage readings match those listed in Tables 5.1 and 5.2 and one or more keys do not function, replace the upper PCA.
8. If the voltage readings in Table 5.1 are incorrect, disconnect the keypad cable from the keypad connector and repeat the voltage measurements in 5.1. If the voltage readings are now correct, replace the display housing (keypad). If the voltage readings are still incorrect, replace the upper PCA.
9. If the voltage readings in Table 5.1 are correct and one or more voltage readings in Table 5.2 are incorrect, replace the display housing (keypad).
10. Set the circuit breaker in the "off" position.
11. If necessary, carefully re-connect the keypad cable to the keypad connector.
12. Remove the ground lead of the wrist strap from the treadmill frame, then remove the wrist strap from your arm.
13. Position the display enclosure on the display plate. Install the screws that secure the display enclosure to the display plate.
14. Check the operation of the treadmill as described in Section Three of this appendix.

## Procedure 5.2 - Troubleshooting the External A.C. Power Source

It is extremely important that any Precor treadmill be connected to and operated on a dedicated 20 amp A.C. circuit. A 20 amp dedicated circuit is defined as: a circuit fed by a 20 amp circuit breaker that feeds a single load. A treadmill operating from a non-dedicated circuit or a circuit breaker of less than 20 amps capacity will not have the necessary power available to operate normally under higher load conditions. The lack of available power can cause any number of symptoms ranging from numerous intermittent (seemingly inexplicable) error conditions, poor speed control, or tripping the house circuit breaker.

If any of the above symptoms exist the external A.C. circuit must be checked and confirmed to be a 20 amp dedicated circuit **before** troubleshooting the treadmill.

In addition the A.C. voltage must be checked. Nominal A.C. operating voltage on 120 Vac circuits is 105 Vac to 120 Vac. Nominal A.C. operating voltage on 240 Vac circuits is 208 Vac to 240 Vac.

For operator safety considerations and to minimize electrostatic discharge conditions the A.C. frame ground continuity must also be verified to be a low resistance connection to the A.C. distribution ground bar.

### Important

If the A.C. circuit feeding a treadmill is found to be a non-dedicated circuit or a circuit equipped with a circuit breaker with a capacity of less than 20 amps, the A.C. circuit must be corrected to be a 20 amp dedicated circuit **before** any reliable troubleshooting can be performed on the treadmill. More importantly, a non-dedicated circuit may constitute a safety hazard to the treadmill operator.

### 120 Vac Systems

120 Vac distribution systems utilize a single pole circuit breaker (hot lead) and a neutral lead connected to a common neutral (ground) bar. The A.C. safety ground (green wire) is connected to a separate ground bar in the distribution system.

The most common problems found are (1) the circuit is fed by a circuit breaker of less than 20 amp capacity, (2) the circuit breaker correctly feeds a single A.C. outlet but the neutral is common between several A.C. outlets and (3) both the hot and neutral leads feed several A.C. outlets. The appropriate correction action or actions (see below) must be followed if any of the above conditions exist. **Corrective actions should only be undertaken by a licensed electrician.**

#### 1. The circuit breaker feeding the treadmill is not a 20 amp circuit breaker.

If the circuit breaker is greater than 20 amps, the circuit breaker should be replaced with a 20 amp circuit breaker. If the circuit breaker is less than 20 amps the circuit breaker must be replaced with a 20 amp circuit breaker and the wiring from the A.C. distribution must be capable of safely handling 20 amps. If the A.C. wiring is under sized, it must be replaced with wire capable of safely handling 20 amps. Please, refer to local electrical codes when determining the appropriate wire size for a 20 amp circuit.

**2. The circuit breaker correctly feeds a single A.C. outlet but the neutral is common between several A.C. outlets.**

The common neutral lead must be removed from treadmill's A.C. outlet and a new neutral lead from the treadmill's A.C. outlet to the A.C. neutral distribution bar must be added.

**3. Both the hot and neutral leads feed several A.C. outlets.**

Both the common neutral and hot leads must be removed from treadmill's A.C. outlet and a new neutral lead and hot lead from the treadmill's A.C. outlet to the A.C. neutral distribution bar and circuit breaker must be added.

## **240 Vac Systems**

240 Vac distribution systems utilize a double pole circuit breaker (two hot leads) The A.C. safety ground (green wire) is connected to a ground bar in the distribution system.

The most common problems found are (1) the circuit is fed by a circuit breaker of less than 20 amp capacity and (2) both the hot leads feed several A.C. outlets. The appropriate correction action or actions (see below) must be followed if any of the above conditions exist. **Corrective actions should only be undertaken by a licensed electrician.**

**1. The circuit breaker feeding the treadmill is not a 20 amp circuit breaker.**

If the circuit breaker is greater than 20 amps, the circuit breaker should be replaced with a 20 amp circuit breaker. If the circuit breaker is less than 20 amps the circuit breaker must be replaced with a 20 amp circuit breaker and the wiring from the A.C. distribution must be capable of safely handling 20 amps. If the A.C. wiring is under sized, it must be replaced with wire capable of safely handling 20 amps. Please, refer to local electrical codes when determining the appropriate wire size for a 20 amp circuit.

**2. Both the hot leads feed several A.C. outlets.**

Both hot leads must be removed from treadmill's A.C. outlet and two new hot leads from the treadmill's A.C. outlet to the circuit breaker must be added.

A licensed electrician may use the followings hints to determine if an A.C. service is dedicated.

1. If, on a 120 Vac system, the A.C. distribution panel contains more circuit breakers than neutral leads, the system has shared neutral leads and is not dedicated.
2. If an A.C. outlet (120 or 240 Vac) has multiple hot and/or neutral leads, it is not a dedicated.

If either of the above conditions exist, the system is not dedicated. However, absence of the above conditions does not necessarily mean that the system is dedicated. If any doubt exists about A.C. systems dedication, point to point tracing of the A.C. wiring may be the only way to prove system dedication.

## Procedure 6.1 - Replacing the Electronic Console and Crank Handle, Upper PCA or Keypad

Wear an anti-static device (such as a wrist strap) when you perform this procedure. Anti-static kits can be ordered from Precor Customer Service (Precor part number 20024-101).

### Removing the Electronic Console

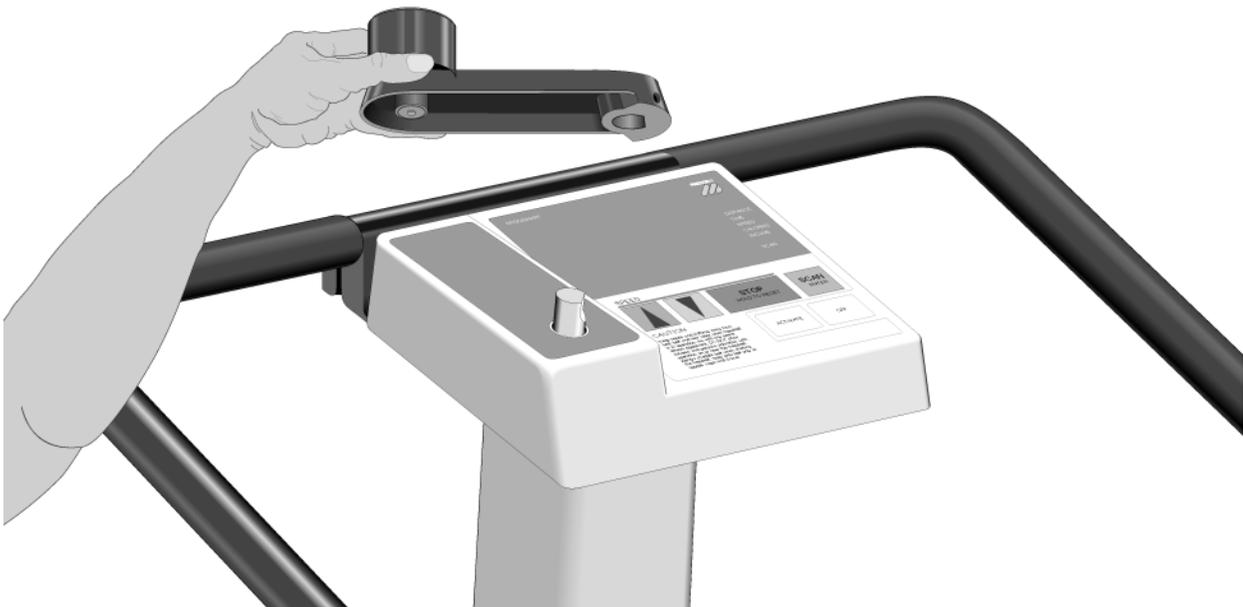
1. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

#### **WARNING**

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

2. Remove the crank handle and set it aside (see Diagram 6.1).
3. Remove the bolts and washers that secure the electronic console to the upper handrail clamp.

### Diagram 6.1 - Removing the Crank Handle



4. Disconnect the ribbon cable from the upper PCA (see Diagram 6.2).
5. If you are going to re-install the electronic console (without replacing either the upper PCA or display label and keypad) . . .

**THEN . . .**

Set aside the electronic console until maintenance operations are complete (see Diagram 6.3); then skip to Step 24.

**OTHERWISE . . .**

Continue with the next step.

6. If you are replacing the upper PCA . . .

**THEN . . .**

Continue with the next step.

**OTHERWISE . . .**

Skip to Step 16.

## Removing the Upper PCA

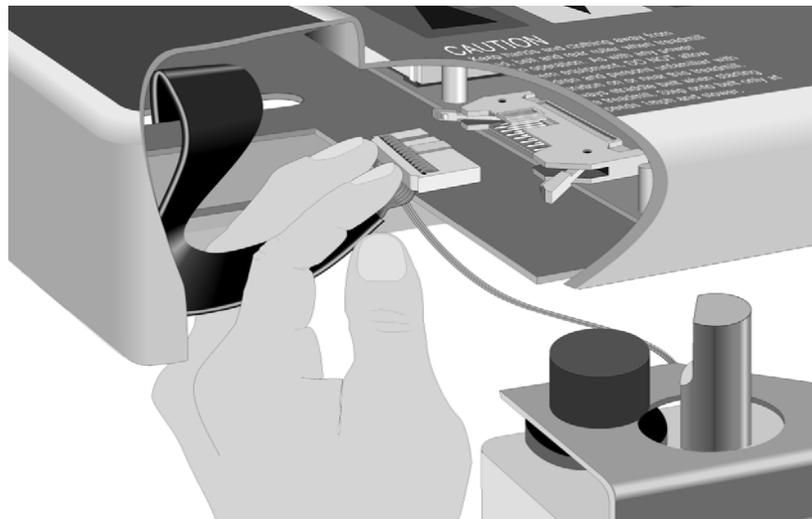
The PROM (U3) is mounted on the upper PCA. If the PROM is malfunctioning, you do not need to install the entire upper PCA. Before you install a new PCA, remove and replace the PROM (U3) as described in Procedure 6.2 of this appendix.

7. Remove the screws that secure the electronic chassis to the electronics housing assembly.

**Note:**

The electronics housing assembly is the 'frame' that holds together the electronic console components. The electronics housing assembly consists of the electronics housing, magnet keeper, ACTIVATE label, OFF label, control panel spacer, and crank housing label. These components are shipped from Precor as a single unit

### Diagram 6.2 - Disconnecting the Ribbon Cable



8. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the treadmill frame.
9. Carefully disconnect the keypad from the upper PCA.
10. Remove the screws that secure the upper PCA to the electronics housing assembly.

**Note:**

Notice the position of the ribbon cable connector on the upper PCA. When you replace the upper PCA, mount it in the same manner.

11. Set aside the defective upper PCA for eventual shipment to Precor Customer Service.

**Note**

When you package the upper PCA, document the problem as described in Procedure 2.7 of this appendix.

**Diagram 6.3 Removing the Electronic Console****Replacing the Upper PCA**

12. Position the new upper PCA at its mounting location. Install the screws that secure the PCA to the electronics housing assembly.
13. Reconnect the keypad to the upper PCA.
14. Remove the ground lead of the wrist strap from the treadmill frame, then remove the wrist strap from your arm.
15. Replace the screws that secure the upper electronic chassis to the electronics housing assembly.
16. If you are replacing the display label and keypad . . .

**THEN . . .**

Continue with the next step.

**OTHERWISE . . .**

Carefully connect the keypad (f) to the upper PCA; then skip to Step 24.

**Removing the Display Label and Keypad**

The keypad and display label are attached to the electronics housing assembly with adhesive. If the display label is removed, a new display label and keypad must be pressed to the electronics housing assembly. If the electronics housing assembly must be replaced, press a new keypad and display label onto the new electronics housing assembly.

17. Remove the window spacer, display label and keypad from the electronics housing assembly.
18. Remove as much of the old adhesive as possible. Ensure that any remaining adhesive is firmly bonded to the mounting location.
19. Clean the electronics housing assembly with a mild detergent. Remove the detergent with a damp cloth.

**Replacing the Display Label and Keypad**

20. Remove the adhesive cover from the back of the new keypad, then carefully position the keypad on the electronics housing assembly. Press the keypad firmly.
21. Remove the adhesive cover from the back of the new display label. Carefully position the display label on the electronics housing assembly, then press the label firmly.

**Note:**

The window spacer separates the upper PCA from the adhesive side of the display label.

22. Turn over the electronics housing assembly, then position the window spacer on the open area of the electronics housing assembly.
23. Carefully connect the keypad to the upper PCA.

**Replacing the Electronic Console**

24. Connect the ribbon cable to the upper PCA.
25. Position the electronic console at its mounting position.
26. Replace the bolts and washers that secure the electronic console to the upper handrail clamp.
27. Position the crank handle at its mounting position. Use the 1/8" allen wrench to tighten the set screws that secure the crank handle to the top of the lift jack.
28. Check the operation of the treadmill as described in Section Three of this appendix.

## Procedure 6.2 - Replacing the PROM

This procedure gives you the instructions for removing and replacing the PROM (U3) mounted on the upper PCA.

Wear an anti-static device (such as a wrist strap) when you perform this procedure. Anti-static kits can be ordered from Precor Customer Service (Precor part number 20024-101).

### Dismounting the Upper PCA

1. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

#### **WARNING**

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

2. Loosen the set screws that secure the crank handle to the top of the lift jack. Remove the crank handle and set it aside.
3. Remove the bolts and washers that secure the electronic console to the upper handrail clamp.
4. Remove the screws that secure the upper electronic chassis to the electronics housing assembly.
5. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the treadmill frame.
6. Carefully disconnect the keypad from the upper PCA.
7. Remove the screws that secure the upper PCA to the electronics housing assembly. Keep the ribbon cable connected to the upper PCA.

### Removing and Replacing the PROM (U3)

Keep the new PROM in its protective packaging until you are ready to insert it into the chip socket.

#### **Caution**

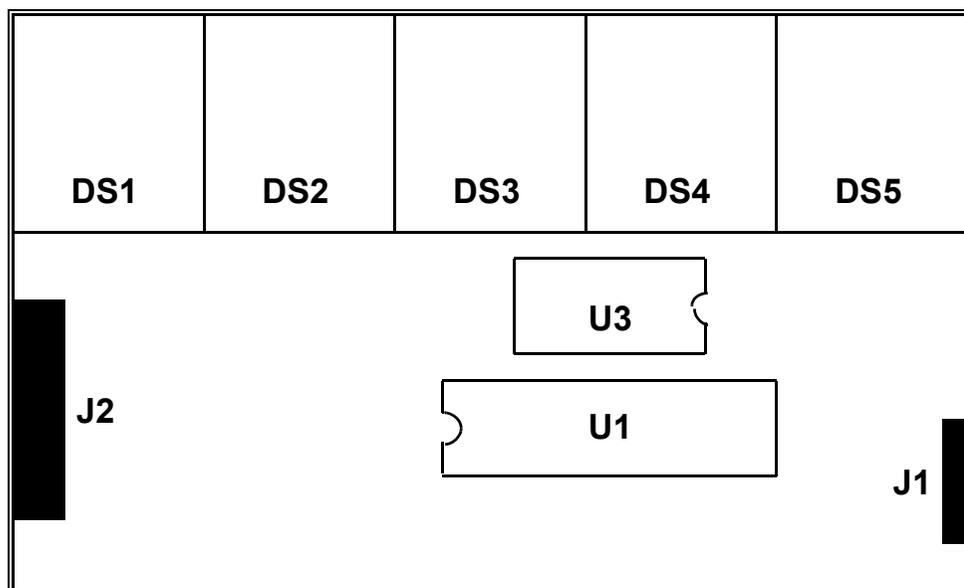
Notice the orientation notch on the PROM (U3). The new PROM must be positioned with the same notch orientation. Replacing the PROM backwards will destroy the PROM.

8. Using the chip puller, remove the PROM (U3) from the upper PCA (see Diagram 6.4).
9. Carefully insert the new PROM with the correct software version number in the chip socket. Take care not to bend the legs of the PROM.

**Note:**

The software version number is labeled on the PROM (U3).

10. Position the upper PCA at its mounting location, then replace the screws that secure the upper PCA to the electronics housing assembly.
11. Carefully connect the keypad to the upper PCA.
12. Turn the electronics housing assembly so that the display label is facing up. Carefully move the electronics housing assembly until it can rest on the right handrail.

**Diagram 6.4 Partial Layout of the Upper PCA**

13. Remove the ground lead of the wrist strap from the treadmill frame, then remove the wrist strap from your arm.
14. Check the operation of the treadmill as described in Section Three of this appendix.
15. Stop the treadmill by placing the magnetic safety key in the **OFF** position, then unplug the power cord from the wall outlet.
16. If the treadmill operates correctly . . .

**THEN . . .**

Skip to Step 31.

**OTHERWISE . . .**

Continue with the next step.

17. If the electronic console displays incorrect data or if all of the display area is blank . . .

**THEN . . .**

Replace the upper PCA as described in Procedure 6.1 of this appendix.

**OTHERWISE . . .**

Continue with the next step.

**Re-Installing the Upper PCA**

18. Replace the screws that secure the upper electronic chassis to the electronics housing assembly.
19. Position the electronic console at its mounting position.
20. Replace the bolts and washers that secure the electronic console to the upper handrail clamp.
21. Position the crank handle at its mounting position. Use the 1/8" allen wrench to tighten the set screws that secure the crank handle to the top of the lift jack.
22. Check the operation of the treadmill as described in Section Three of this appendix.

## Procedure 6.3 - Replacing the Ribbon Cable on 905e, 9.1 Treadmills Made Before September 14, 1994

Removing and replacing the ribbon cable is a procedure that takes a significant amount of time to accomplish. Before performing this procedure, ensure that the ribbon cable is defective by connecting a spare ribbon cable to the upper PCA and lower PCA as described in Procedure 4.1 of the Residential Treadmill Service Manual.

### Removing the Ribbon Cable

1. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

#### **WARNING**

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

2. Remove the electronic console as described in Procedure 6.1 of this appendix.
3. Remove the lift potentiometer from the potentiometer mounting bracket as described in Procedure 6.7 of this appendix.
4. Position the crank handle on the lift jack shaft and tighten the screw.
5. Rotate the crank handle in the negative direction until the pressure washer breaks.

#### **Note:**

You will hear a loud popping sound when the pressure washer breaks.

6. Loosen the crank handle screw and remove the crank handle from the electronic console.
7. Remove the broken pressure washer and the spacer washer from the lift jack shaft.
8. Remove the screws that secure the potentiometer mounting bracket to the lift column.
9. Slide the drive wheel from the lift jack shaft. Set the drive wheel aside until maintenance operations are complete.
10. Set the treadmill on its right side.
11. Disconnect the ribbon cable from the lower PCA.
12. Strike the lift jack shaft with the rubber mallet until the lift jack shaft is loosened from its mounting position.

#### **Note:**

Even with the lift jack shaft loosened, the collar may remain lodged in the top of the lift column. If

this occurs, use the flat-head screwdriver and rubber mallet to force the collar from its mounting position.

13. Pull the lift jack from the lift column and set it aside.

**Note:**

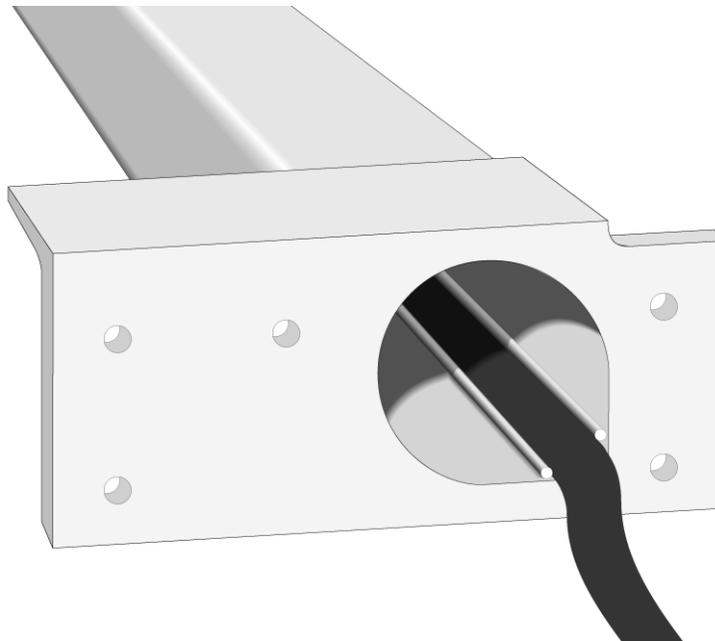
If necessary, hammer the lift jack shaft to loosen the lift jack from its mounting position.

14. Remove the old ribbon cable from the ribbon cable channel in the lift column. Pull the ribbon cable out of the lift column.

### Replacing the Ribbon Cable

15. With the treadmill still on its right side, feed the new ribbon cable into the top of the lift column until only 6–8 inches of cable are hanging out of the top of the lift column. Fold the top of the ribbon cable over the top edge of the lift column and use the tape to secure the cable to the side of the lift column that faces the floor.
16. Place the ribbon cable into the cable channel at the top of the lift column (see Diagram 6.5).
17. Pull the lower end of the ribbon cable until the cable is taut and place the ribbon cable into the cable channel at the bottom of the lift column.

### Diagram 6.5 - Ribbon Cable in the Cable Channel



18. Using a broom handle or other long, narrow object, press the ribbon cable into the cable channel that runs the length of the lift column.

**Note:**

If the ribbon cable does not lay in the cable channel along the entire length of the lift column, the cable may be caught and nicked or crimped by the floating bearings on the lift jack.

19. With the treadmill on its right side, insert the lift jack into the lift column.

**Note:**

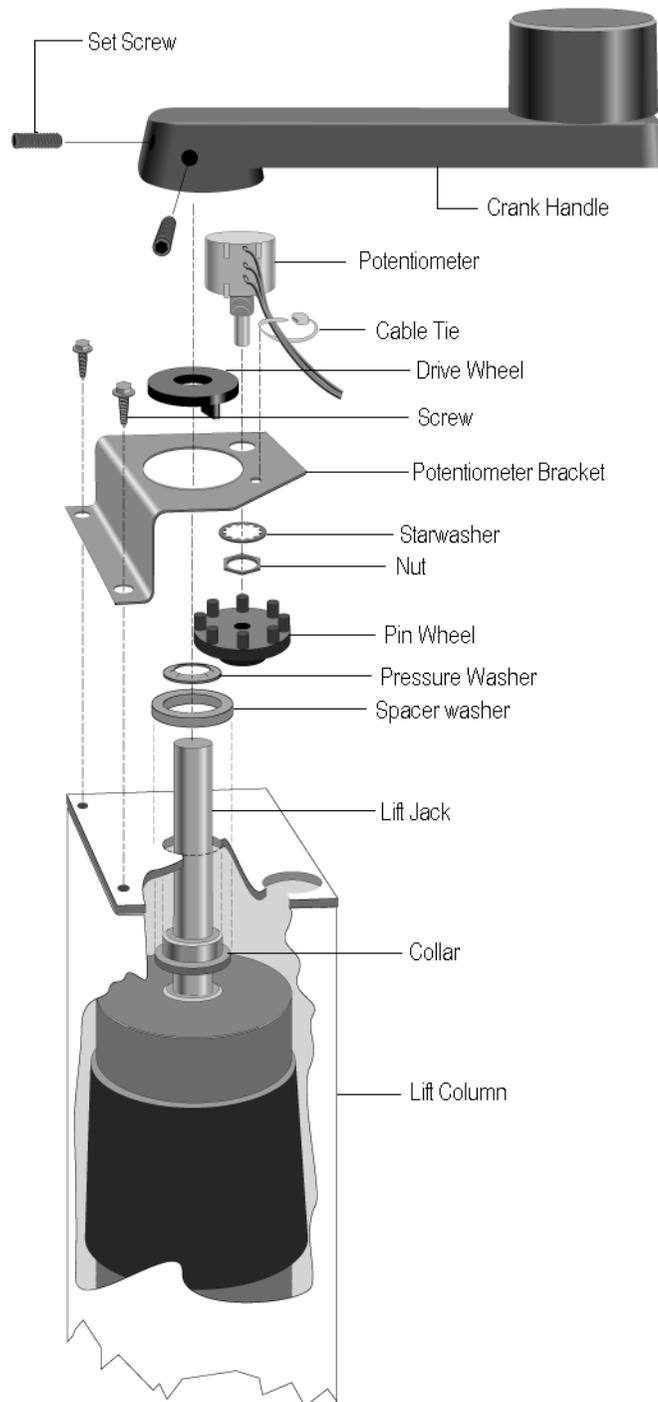
If necessary, use the rubber mallet to force the lift jack cross tube into its mounting position.

20. Connect the ribbon cable to the lower PCA.
21. Return the treadmill to an upright position.

**Replacing the Lift Assembly Hardware**

Diagram 6.6 shows an exploded view of the lift assembly.

22. Place the collar on the lift jack shaft so that the base of the collar is at the lower end of the shaft.
23. Place the spacer washer and then a new pressure washer on the collar.
24. Position an empty tube or pipe on the pressure washer and use the hammer to force the pressure washer, spacer washer and collar further down on the lift jack shaft.
25. Place the drive wheel on the lift jack shaft.
26. Replace the screws that secure the potentiometer mounting bracket to the lift column.
27. Position the drive wheel so that the top of the drive wheel is flush with the lift jack shaft opening in the potentiometer mounting bracket.
28. Replace the lift potentiometer onto the potentiometer mounting bracket as described in Procedure 6.7 of this appendix.
29. Using the cable tie, connect the ribbon cable to the small hole in the potentiometer mounting bracket.
30. Remove the tape from the upper part of the ribbon cable and connect the upper ribbon cable connector to the upper PCA.
31. Replace the electronic console as described in Procedure 6.1 of this appendix.

**Diagram 6.6 Exploded view of Lift Assembly**

32. Calibrate the lift assembly as described in Procedure 4.1 of this appendix.
33. Check the operation of the treadmill as described in Section Three of this appendix.

## **Procedure 6.4 - Replacing the Ribbon Cable on 9.1, 9.10 Treadmills Made After September 14, 1994**

Before you perform this procedure, ensure that the ribbon cable is defective by connecting a spare ribbon cable to the upper PCA and lower PCA as described in Procedure 4.1 in the Residential Treadmill Service Manual.

### **Removing the Ribbon Cable**

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. Incline the treadmill to its maximum elevation.
3. Stop the treadmill by placing the magnetic safety key in the **OFF** position, then unplug the power cord from the wall outlet.

### **WARNING**

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

4. Lift the hood as described in Procedure 5.1 of the Residential Treadmill Service Manual.
5. Disconnect the ribbon cable from the lower PCA.
6. Remove the set screws that secure the crank handle to the top of the lift jack. Remove the crank handle and set it aside.
7. Remove the bolts and washers that secure the electronic console to the upper handrail clamp.
8. Disconnect the ribbon cable from the upper PCA. Set aside the electronic console until you are ready to replace the ribbon cable.
9. Grasp the top and lower ends of the lift column trim. Firmly pull the trim away from the lift column.
10. Cut the cable ties that secure the ribbon cable to the cable tie mounts on the lift column.

### **Replacing the Ribbon Cable**

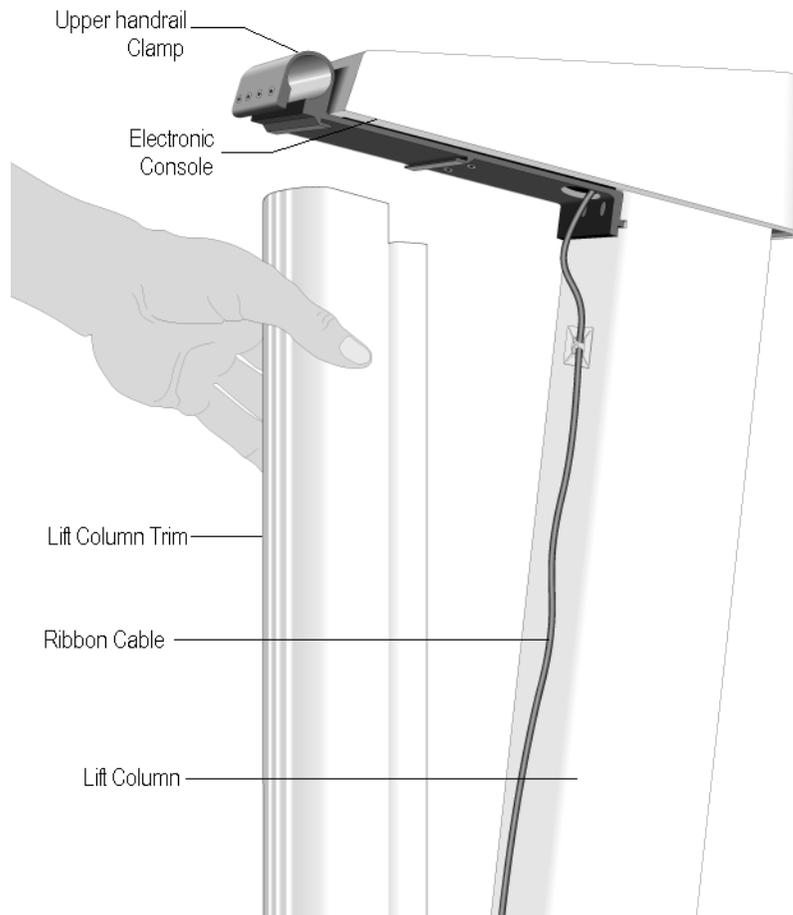
11. Remove the old cable ties, then push new ties through the cable tie mounts on the lift column.
12. Connect the ribbon cable the lower PCA.

13. Slide the connector and ribbon cable through the slot on the upper handrail clamp. Hold the potentiometer cable away from the slot as you slide the ribbon cable into place.
14. Hold the electronic console over the lift column. Connect the ribbon cable to the upper PCA.
15. Position the electronic console on the upper handrail clamp. Replace the bolts and washers that secure the electronic console to the upper handrail clamp.
16. Position the crank handle at its mounting position and use the 1/8" allen wrench to tighten the set screws that secure the crank handle to the top of the lift jack.
17. Using the cable ties, secure the ribbon cable to the cable tie mounts on the lift column.

**Note:**

Refer to Diagram 6.7 when you perform the next step.

**Diagram 6.7 - Attaching the Lift Column Trim to the Lift Column**



18. Attach the lift column trim by following the steps listed below:
  - a Position the trim so that the notched end points up.
  - b Insert the base of the trim through the opening in the hood.
  - c Raise the trim until the notched end of the trim touches the underside of the upper handrail clamp. Be careful to maintain the vertical alignment of the trim with the lift column.

**CAUTION**

Make sure that the ribbon cable is situated in the trim's center slot before you perform the following step.

- d While maintaining alignment, attach the trim by pressing firmly against the lift column until the hook and loop pads fasten securely to each other.
19. Replace the hood as described in Procedure 5.1 of the Residential Treadmill Service Manual.
20. Check the operation of the treadmill as described in Section Three of the Residential Treadmill Service Manual.

## Procedure 6.5 - Replacing the Lower PCA

### Removing the Lower PCA

1. Place the magnetic safety key in the **ACTIVATE** position, then turn on the treadmill with the circuit breaker.
2. Incline the treadmill to its maximum elevation.
3. Stop the treadmill by placing the magnetic safety key in the **OFF** position, then unplug the power cord from the wall outlet.

### WARNING

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

4. Lift the hood as described in Procedure 5.1 of the Residential Treadmill Service Manual.
5. Attach the anti-static wrist strap to your arm, then connect the ground lead of the wrist strap to the treadmill frame.
6. Disconnect the ribbon cable from the lower PCA.
7. Disconnect the wires listed in Table 6.1 from the lower PCA connectors.

**Table 6.1. Wires Connected to the Lower PCA**

| Wire Color   | Lower PCA Connector |
|--------------|---------------------|
| Red          | M+                  |
| Black        | M-                  |
| Brown        | AC-L                |
| Blue (White) | AC-N                |

8. Remove the bolts and nuts that secure the lower PCA to the motor mounting chassis.
9. Remove the lower PCA from the motor chassis groove. Set aside the lower PCA for eventual shipment to Precor.

### Note:

When you package the lower PCA, provide the information listed in Procedure 2.7.

### Replacing the Lower PCA

10. Position the lower PCA in the motor chassis groove.
11. Thread the nuts onto the lower PCA mounting bolts.

12. Inspect and adjust the target gap as described in Procedure 3.4 of the Residential Treadmill Service Manual.
13. Tighten the bolts and nuts that secure the lower PCA to the motor chassis.
14. Attach the ribbon cable to the lower PCA.
15. Connect the wires listed in Table 9.1-3 to the lower PCA.
16. Remove the ground lead of the wrist strap from the treadmill frame, then remove the wrist strap from your arm.
17. Replace the hood as described in Procedure 5.1 of the Residential Treadmill Service Manual.
18. Check the operation of the treadmill as described in Section Three of this appendix.

## Procedure 6.6 - Replacing the Lift Jack and Lift Column

Many steps include letters in parentheses after component references. These letters correlate to the call outs in Diagram 9.1-13. Diagram 9.1-13 is an exploded view of the 9.1 Treadmill lift assembly hardware.

### Removing the Lift Assembly Hardware

1. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

#### **WARNING**

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

2. Remove the electronic console and crank handle as described in Procedure 6.1 of this appendix.
3. Slide the pin wheel from the potentiometer shaft. If necessary, deflect the potentiometer bracket to allow the pin wheel to clear the end of the potentiometer shaft. Set aside the pin wheel.
4. Remove the jam nut and star washer securing the potentiometer to the potentiometer bracket.
5. Position the crank handle on the lift jack shaft and use the 1/8" allen wrench to tighten one set screw.
6. Rotate the crank handle in the negative direction until the pressure washer breaks.

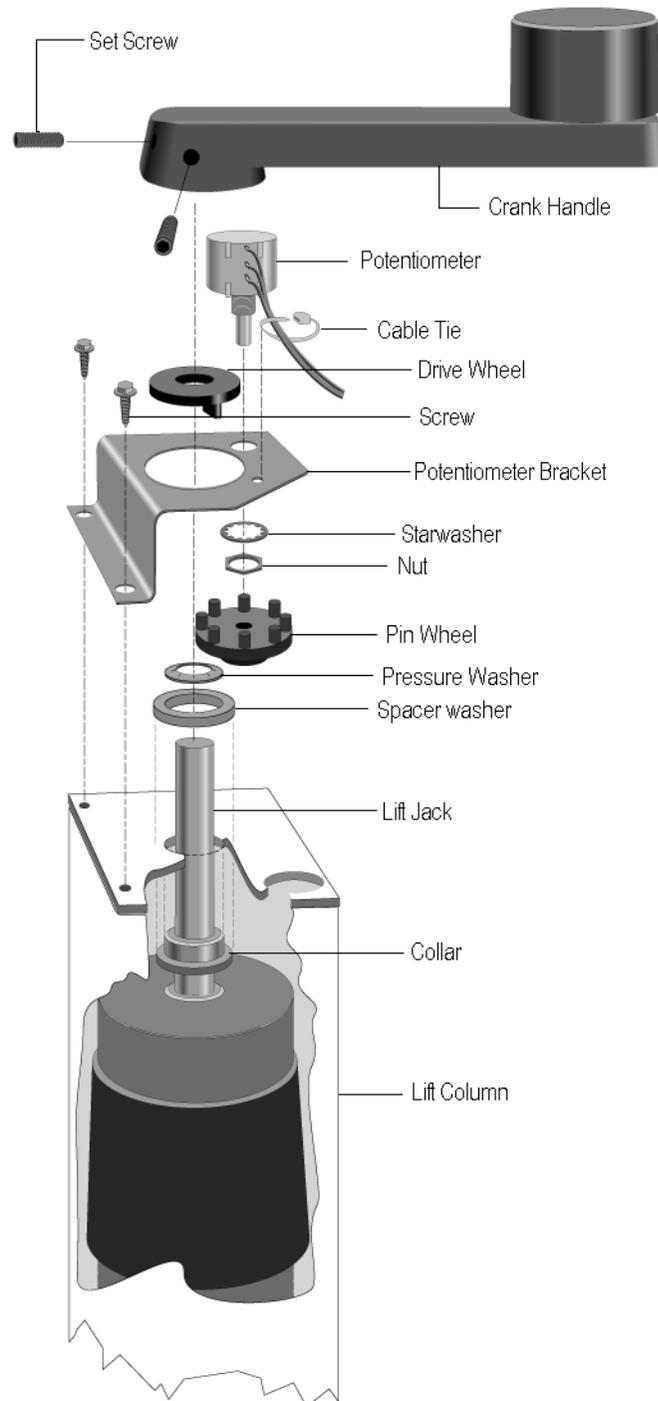
#### **Note:**

You will hear a loud popping sound when the pressure washer breaks.

7. Loosen the crank handle set screw and remove the crank handle from the lift jack.
8. Remove the broken pressure washer and spacer washer from the lift jack shaft.
9. Remove the screws that secure the potentiometer bracket to the lift column.
10. Slide the drive wheel from the lift jack shaft. Set the drive wheel aside until maintenance operations are complete.
11. Place the treadmill on its right side.

**Note**

Place a drop cloth under the treadmill to protect the flooring and to ensure that the treadmill handrail is not scratched or damaged.

**Diagram 6.8 - Exploded View of the Lift Assembly**

12. Pull the lift jack from the lift column and set it aside (see Diagram 6.9).
13. If you are removing the lift jack only . . .

**THEN . . .**  
Skip to Step 21.

**OTHERWISE . . .**  
Continue with next step.

### Removing and Replacing the Lift Column

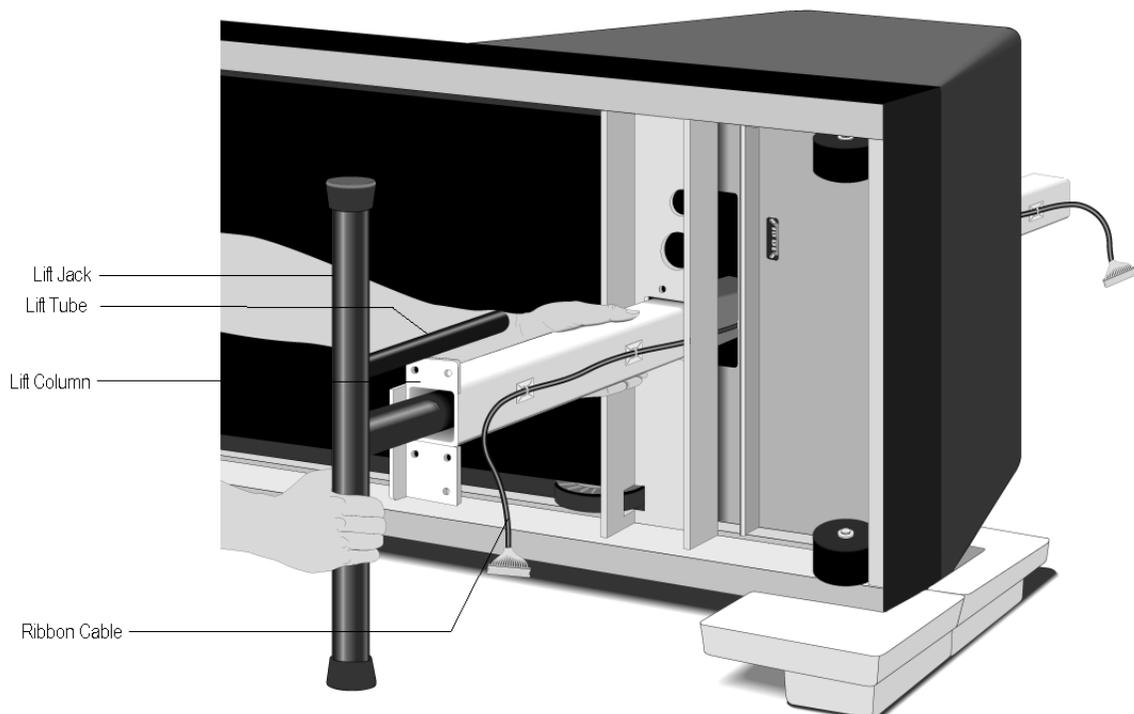
14. Remove the ribbon cable using the appropriate procedure listed in Table 6.2.

#### Table 6.2 - Replacing the Ribbon Cable Procedures

|               |  |
|---------------|--|
| Procedure 6.3 | 905e Treadmills and 9.1 Treadmills Made Before<br>September 14, 1994 |
| Procedure 6.4 | 9.10 Treadmills and 9.1 Treadmills Made After<br>September 14, 1994  |

15. Remove the fasteners that secure the upper handrail clamp to the lift column.
16. Remove the bolts and washers that secure the lift column to the treadmill frame.

#### Diagram 6.9 - Removing the Lift Jack from the Lift Column



17. Slide the lift column through the base of the treadmill frame.
18. Position the new lift column at its mounting location.
19. Replace the bolts and washers that secure the lift column to the treadmill frame.

**Note**

If necessary, use the rubber mallet to loosen the lift jack shaft from its mounting position.

20. Replace the screws and washers that secure the upper handrail clamp to the lift column.
21. Remove the ribbon cable using the appropriate procedure listed in Table 6.2.

**Replacing the Lift Jack and Lift Assembly Hardware**

22. With the treadmill on its right side, insert the lift jack into the lift column.

**Note:**

If necessary, use the rubber mallet to force the lift jack cross tube into its mounting position.

23. Return the treadmill to an upright position.
24. Place the collar on the lift jack shaft so that the base of the collar is at the lower end of the shaft.
25. Place the spacer washer and then a new pressure washer on the collar.
26. Position an empty tube or pipe on the pressure washer and use the rubber mallet to force the pressure washer, spacer washer, and collar further down on the lift jack shaft.
27. Place the drive wheel on the lift jack shaft.
28. Using the phillips screwdriver, replace the two screws that secure the potentiometer bracket to the lift column.
29. Position the drive wheel so that the top of the drive wheel is flush with the lift jack shaft opening in the potentiometer bracket.
30. Position the potentiometer at its mounting location.
31. Thread the star washer and jam nut onto the potentiometer shaft. Tighten the star washer and the jam nut with your fingers.
32. Slide the pin wheel onto the potentiometer shaft.
33. Calibrate the lift assembly as described in Procedure 4.1 of this appendix.
34. Replace the electronic console and crank handle as described in Procedure 6.1 of this appendix.

## Procedure 6.7 - Replacing the Lift Potentiometer

### Removing the Lift Potentiometer

1. Place the magnetic safety key in the OFF position, then unplug the treadmill from the wall outlet.

#### **WARNING**

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual

2. Remove the electronic console and crank handle as described in Procedure 6.1 of this appendix.
3. Cut the cable tie that binds the potentiometer wires to the potentiometer bracket.
4. Using the tape, uniquely mark the three wires soldered to the potentiometer (i). Make a note of which wire goes to each of the terminals.
5. Cut the three wires from the potentiometer terminals.
6. Slide the pin wheel from the potentiometer shaft. If necessary, deflect the potentiometer bracket to allow the pin wheel to clear the end of the potentiometer shaft. Set aside the pin wheel.
7. Remove the jam nut and star washer securing the potentiometer to the potentiometer bracket (see Diagram 6.8). Discard the potentiometer.

### Replacing the Lift Potentiometer

8. Position the new potentiometer at its mounting location.
9. Thread the star washer and jam nut onto the potentiometer shaft. Tighten the washer and the nut with your fingers.
10. Slide the pin wheel onto the potentiometer shaft.
11. Strip 1/4" of insulation from each of the three wires cut from the old potentiometer.

#### **Caution**

Using the marking code you established above, make sure each wire is connected to the correct terminal when you perform the following step.

12. Place a 1/2" piece of heat shrinkable tubing onto each wire before wrapping the bare end of each wire around the terminals on the new potentiometer.

13. Using the soldering iron, melt a small piece of solder onto the junction formed by each wire and potentiometer terminal. Slide a piece of shrinkable tubing over the soldered connection.
14. Using a new cable tie, secure the three potentiometer wires to the potentiometer bracket.
15. Calibrate the lift assembly as described in Procedure 4.1 of this appendix.
16. Replace the electronic console and crank handle as described in Procedure 6.1 of this appendix.
17. Check the operation of the treadmill as described in Section Three of this appendix.

## Procedure 6.8 - Replacing the Handrails

### Removing the Handrails

1. Place the magnetic safety key in the **OFF** position, then unplug the treadmill from the wall outlet.

#### **WARNING**

Before continuing with this procedure, review the Warning and Caution statements listed in Section One of the Residential Treadmill Service Manual.

2. Loosen the screws that secure the handrail to the upper handrail clamp.
3. Remove the screws that secure the right lower handrail clamp to the treadmill frame and remove the right handrail from its mounting position.
4. Repeat Step 3 for the left handrail.
5. If you are removing the upper handrail clamp as well as the handrails . . .

#### **THEN . . .**

Continue with next step.

#### **OTHERWISE . . .**

Skip to Step 10.

### Removing the Upper Handrail Assembly

6. Remove the electronic console as described in Procedure 6.1 of this appendix.
7. Remove the screws and washers that secure the upper handrail clamp to the lift column.

### Replacing the Upper Handrail Assembly

8. Position the upper handrail assembly at its mounting location. Secure the screws and washers that mount the upper handrail clamp to the lift column.
9. Replace the electronic console as described in Procedure 6.1 of this appendix.

#### **Note:**

Do not tighten the screws that secure the electronic enclosure to the upper handrail assembly.

### Replacing the Handrails

10. Place the end of the right handrail tube against the plastic cradle.

#### **Note**

Sit the end of the handrail tube on the projecting ledge of the cradle.

11. Insert the right handrail into the upper handrail clamp until the foam just touches the clamp.

**Note:**

When you position the lower handrail clamp, make sure that the clamp is lined up with the mounting holes on the treadmill frame.

12. Position the right lower handrail clamp at its mounting location. Replace the screws that secure the clamp to the treadmill frame.
13. Repeat Steps 11 through 13 for the left handrail clamp.
14. Tighten the screws that secure the handrail to the upper handrail clamp.
15. Plug the power cord into the wall outlet.

Use the item numbers listed in Table 9.1-5 and the exploded view diagram shown in Diagram 9.1-16 to locate and identify 905e Treadmill components.

**Diagram 7.1 - Wiring Diagram, 905e, 9.1, 9.10**

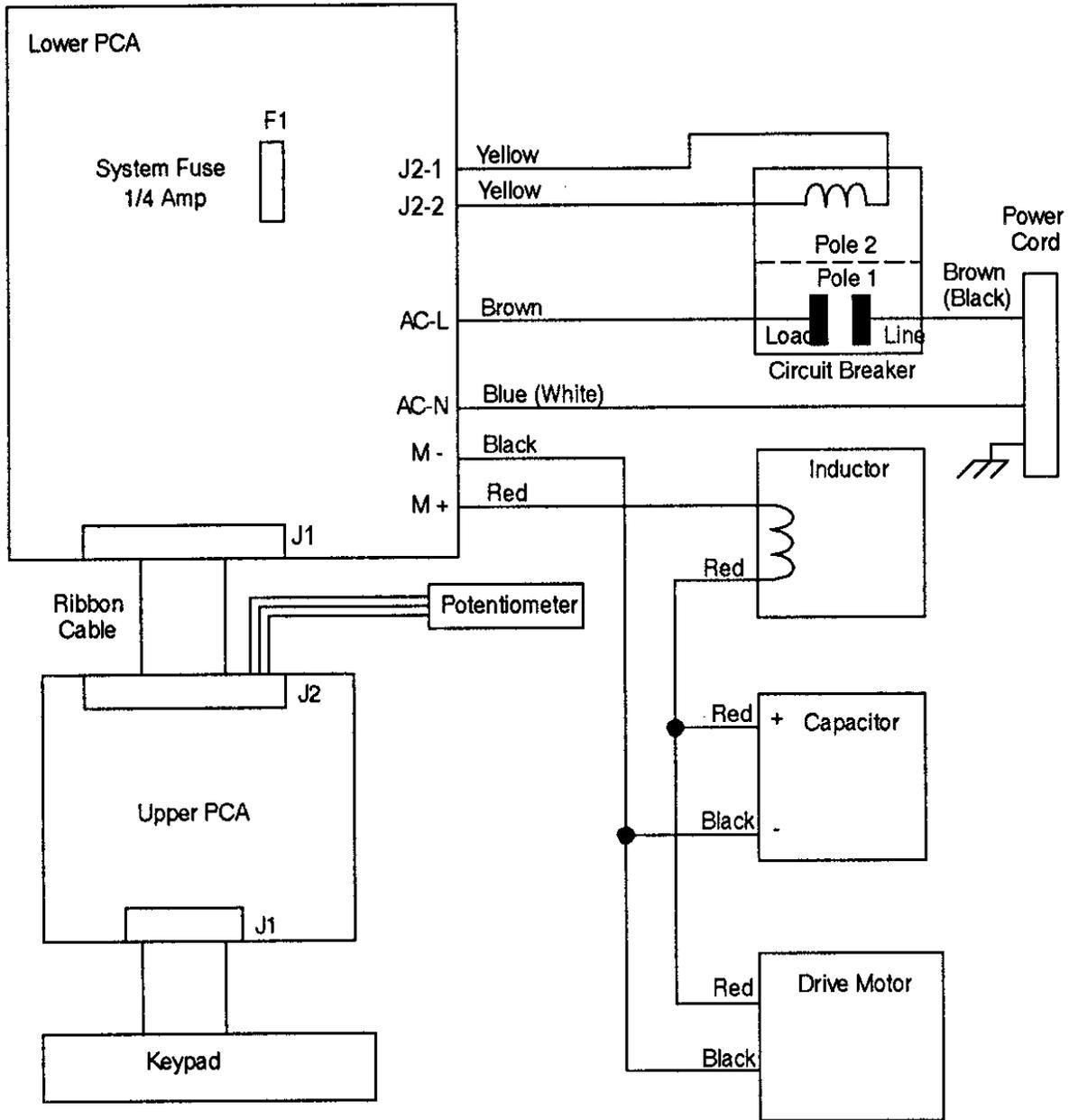


Diagram 7.2 - Block Diagram 905e, 9.1, 9.10 Treadmills



905E, 9.1, 9.10 Treadmills

Ribbon Cable Connections

| Pin | Description          |
|-----|----------------------|
| 1   | Circuit breaker trip |
| 2   | +5 VDC               |
| 3   | +5 VDC               |
| 4   | +5 VDC               |
| 5   | Ground               |
| 6   | Photoeye             |
| 7   | Ground               |
| 8   | Zero Cross detect    |
| 9   | Ground               |
| 10  | SCR control          |

