

## 9.23, 9.27 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. Read this section, as well as the 9.23, 9.27 Treadmill Owner's Manual, before you perform the maintenance procedures in this manual.

**Section Two, Software Features.** Precor 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, and block diagrams for the 9.23, 9.27 Treadmill.

### General Information

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

## Technical Specifications

Length:	76.5 inches (194.3 cm.)
Width:	30.5 inches (77.5 cm.)
Height:	55 inches (140 cm.)
Running surface:	20 inches by 59 inches (51 cm. by 149.9 cm.)
Motor:	2.75 hp. continuous duty DC
Speed:	0.5 to 12 mph (0.8 to 19.3 kph) 10 mph is equivalent to a 6 minute mile
Incline:	0% to +15% grade
Power:	120 Vac 50/60 Hz @ 15 amp

## Procedure 2.1 - Error Codes and Lower PCA Indicators

**Error Codes:** The error codes used by the 9.23 and 9.27 treadmills do not conform to Precor standardized error codes and are unique to these models. The 9.23, 9.27 error codes are listed and defined below.

**LS** - This error is displayed in the display's **TIME** window when the drive motor speed signal is not received from the speed sensor for eight consecutive seconds. When the **LS** error occurs, all drive motor and lift motor motion is halted and the display is blanked except for the error display.

**Err** - This error is displayed in the display's **TIME** window when the EEPROM is damaged or unable to retrieve or store data. When the **Err** error occurs, all drive motor and lift motor motion is halted and the display is blanked except for the error display.

**E2** - This error is displayed in the display's **TIME** window indicating an incline problem. This error will occur if the incline is unable to move or if the incline position potentiometer is not functioning. When the **E2** error occurs, all drive motor and lift motor motion is halted and the display is blanked except for the error display.

**E4** - This error is displayed in the display's **TIME** window indicating an incomplete upper PCA to lower PCA initialization has occurred. See Procedure 2.3. When the **E4** error occurs, all drive motor and lift motor motion is halted and the display is blanked except for the error display.

**Lower PCA Indicators:** The lower PCA is furnished with seven LED indicators. Their names and functions are listed below.

**Power** - The **POWER** LED should illuminate when the treadmill is powered "on". The **POWER** LED is in the 12 Vdc power supply and indicates the input to the power supply is receiving voltage.

**UP** - The **UP** LED should illuminate when the incline is operating in the upward direction. The **UP** LED indicates that operating voltage has been applied to the incline up relay.

**DOWN** - The **DOWN** LED should illuminate when the incline is operating in the downward direction. The **DOWN** LED indicates that operating voltage has been applied to the incline down relay.

**PWM** - The **PWM** LED should illuminate whenever the drive motor is in motion. The **PWM** LED indicates that the PWM drive signal is being applied to the drive motor power controller circuit.

**LIMIT** - The **LIMIT** LED indicator will illuminate when too much current is being demanded from the drive motor power controller circuit. If the drive motor's instantaneous current exceeds 28 amps, the current limit circuit is activated. When current limit is activated the drive motor current and speed can not be increased.

**MOT DRV** - Indicates a defective drive motor circuit. Typically caused by a component failure on the lower PCA.

**SHUTDOWN** - If the drive motor current exceeds 28 amps for 3-5 seconds, the motor drive signal is removed and the motor drive circuit is shutdown.

## Procedure 2.2 - Accessing the Odometer and Hour Meter

1. Within two seconds of “power up”, press the **STOP**, **INCLINE ▼**, **SPEED ▲** keys, sequentially.
2. **MILE** will appear in the main display window and the treadmill’s accumulated mileage will be displayed in the time window in the format **XXXXXX.X**. Press the **ENTER** key to toggle the display to the hour meter.
3. **HOUR** will appear in the main window and the treadmill’s hours of use will be displayed in the time window in the format **XXXXX:XX**. Pressing the **ENTER** key will continue to toggle the display between the odometer and the hour meter.
4. Press the **QUICKSTART** to toggle the display to the model number display. The model will be displayed in the time window in the format **23.XX** or **27.XX**.
5. Press the **STOP** key to exit this program.

### Diagram 2.1 - 9.23 Display



Safety Key

## Procedure 2.3 - Accessing the Upper PCA to Lower PCA Initialization Program

### Warning

During this procedure the running belt will be accelerated to the treadmill's maximum (12.0 mph) speed. **Do not** stand on the treadmill's running belt during this procedure.

1. This procedure **must** be performed after the upper PCA, the upper PCA software or the lower PCA has been replaced and before the treadmill is placed into normal operation.
2. If the on/off switch is in the "on" position, set the on/off switch in the "off" position for a minimum of 10 seconds to allow the internal power supply to discharge
3. Remove the safety key from the console and set the on/off switch in the "on" position.
4. While pressing the **INCLINE ▲** and **SPEED ▼** keys, replace the safety switch on the console. Continue to press the **INCLINE ▲** and **SPEED ▼** keys until the display goes blank. The word **init** will appear in the display's time window. The EEPROM has now been cleared and reset. After 1-1/4 seconds, 1.25 will be displayed in the display's distance/calories window, the maximum incline (15.0) will be displayed in the display's incline window and maximum speed (12.0) will flash in the display's speed/pace window.
5. Press the **QUICKSTART** key to start the speed calibration process. Power bits will be displayed in the display's incline window, the target speed will be displayed in the display's time window and the actual speed will be displayed in the display's speed/pace window. Initially the target speed will be 0.5. The running belt will then start. When the actual speed reaches 0.5, the target speed will change to 12.0 and the running belt will continue to accelerate until it reaches 12.0 mph and then stop.
6. When the running belt stops the display will return to the normal user mode and the initialization process is complete.

## Procedure 2.4 - U.S Standard/Metric Selection

**Note:** Only upper software version 2.2 and greater contain the option of selecting U.S. Standard or metric measurements.

1. Within 2 seconds of “power up” press the **STOP, INCLINE ▲** and **SPEED ▼** keys sequentially.
2. Press one of the arrow keys to toggle the selection between **MILE** and **KM**.
3. Press the **ENTER** key to save the selection.



## Procedure 2.5 - Documenting Software Problems

When a problem is found with the software in the upper or lower PCA, record the information listed below.

### **When a problem occurs, record the following information:**

- Model and serial number. Provide the model number as accessed in Procedure 2.2.
- Program number running when the problem occurred
- A description of:
  - a. What happened or failed to happen.
  - b. The action taken by the user just before the problem occurred.
  - c. 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

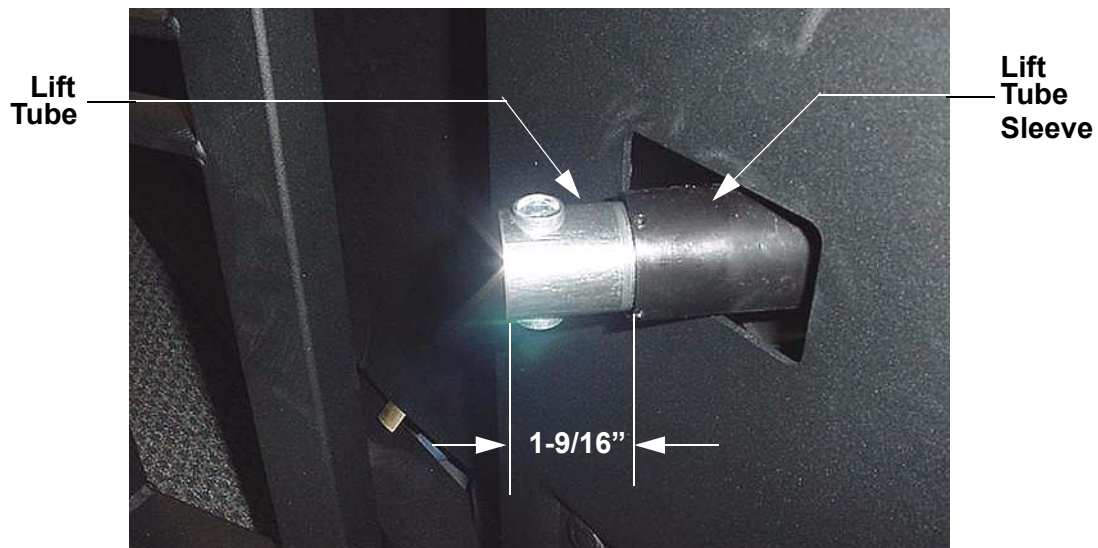
1. Plug the power cord into the AC outlet, the on/off switch should illuminate. Set the safety switch in on its operating position on the console, refer to Diagram 2.1. Set the on/off switch in the “on” position. All of the LED’s on the display should illuminate for a couple of seconds and the scroll the message **PRESS QUICKSTART OR PROGRAM**. The **POWER LED** should illuminate on the lower PCA.
2. Place the treadmill in Manual Mode. Adjust the speed of the running belt to 2–3 m.p.h. Remove the safety switch from the console. The display should go blank and the treadmill belt stop. Replace the safety switch on the console, all of the LED’s on the display should illuminate for a couple of seconds and the scroll the message **PRESS QUICKSTART OR PROGRAM**.
3. Place the treadmill in Manual Mode. Adjust the speed of the running belt to 2–3 m.p.h. Operate the treadmill for at least 5 minutes.
  - a. 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.
  - b. Log the AC input current under loaded and unloaded conditions.
  - c. Observe 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, view the electronic console as the treadmill the message **PAUSED - PRESS SPEED UP TO CONTINUE** scrolls on the display. Adjust the speed of the running belt to 2–3 m.p.h.
5. Press the **INCLINE ▲** key while viewing the electronic console. Confirm that the running bed inclines and the incline display increments to 15% as the **INCLINE ▲** key is pressed.
6. Press the **INCLINE ▼** key while viewing the electronic console. Confirm that the running bed returns to a level position and the incline display decrements to 0% as the **INCLINE ▼** key is pressed.
7. Set the on/off switch in the “off” position, then unplug the treadmill from the AC outlet.

## Procedure 4.1 - Calibrating the Lift Motor

**Note:** This calibration procedure must be performed whenever the lift motor has been replaced or the lift calibration has been disturbed.

1. Set the on/off switch in the “off” position and unplug the AC power cord from the AC outlet.
2. Place the treadmill on it’s left side. Remove the bolt that fastens the lift tube to the lift platform and swing the lift platform away from the lift motor’s lift tube.
3. Plug the treadmill’s AC power cord into a 120 VAC outlet. Set the on/off switch in the “on” position. When the treadmill is initially placed in a program and the running belt starts in motion, the incline will always return to the 0% incline position (unless it is already in the 0% incline position).
4. Press the **QUICKSTART** key when the running belt starts the incline will move to its 0% incline position (unless it is already in the 0% incline position). When the inline motor stops turning, press the **STOP** key. Set the on/off switch in the “off” position and unplug the AC power cord from the AC outlet.
5. Rotate the lift tube until the distance from the end of the lift tube to the lift tube sleeve is 1-9/16 inch. Refer to Diagram 4.1.

**Diagram 4.1 - Lift Motor Calibration**



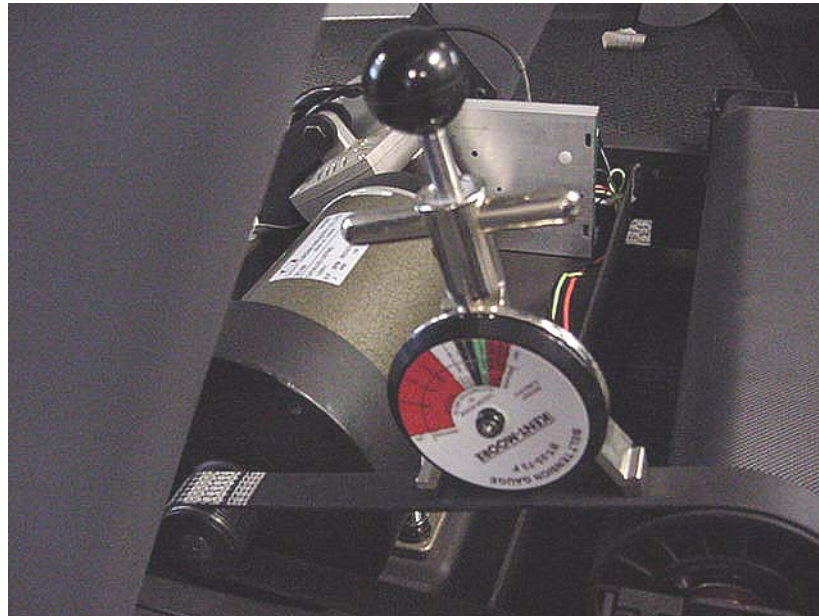
6. The lift tube must turn freely during step 5, if you turn the lift drive screw while turning the lift tube, you must return to step 4 and repeat steps 4 and 5. Set the on/off switch in the “off” position.
7. Swing the lift platform into its mounting position with the lift tube and fasten it with the bolt removed in step 2.

8. Set the treadmill in its normal upright position. Set the on/off switch in the “on” position. Place the treadmill in the manual program and operate the incline several times between its minimum and maximum incline positions to ensure that the incline is operating normally throughout its entire range.

## Procedure 4.2 - Adjusting Drive Belt Tension

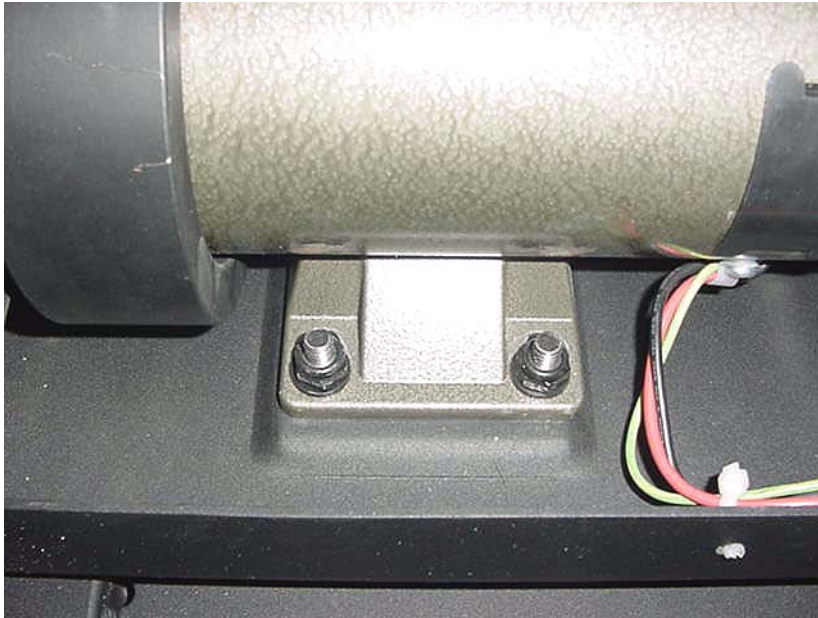
1. Set the treadmill on/off switch in the “off” position and unplug the AC power cord from the AC outlet.
2. Remove the hood.
3. Place the drive belt tension gauge on the drive belt as shown in Diagram 4.2.

### Diagram 4.2 - Drive Belt Tension Gauge



4. The gauge should read approximately 80 pounds. The drive belt tension is acceptable if it is in the range of 70 to 90 pounds.
5. If the drive belt tension is less than 70 or greater than 90 pounds, slightly loosen the four drive motor mounting nuts. The drive motor mounts on slotted holes allowing the drive motor to be move forward or rearward. Move the drive motor forward or rearwards, as required, until the belt gauge reads approximately 80 pounds and tighten the four drive motor mounting nuts. See Diagram 4.3. Momentarily remove the drive belt tension gauge from the drive belt. Replace the drive belt tension gauge on the drive belt and re-adjust the drive belt tension, if necessary. Torque the four drive motor mounting nuts to 180 inch pounds.

### Diagram 4.3 - Drive Motor Mounting



6. Plug the AC power cord into the AC outlet and set the treadmill circuit breaker in the “on” position.
7. Check treadmill operation per Section 3.

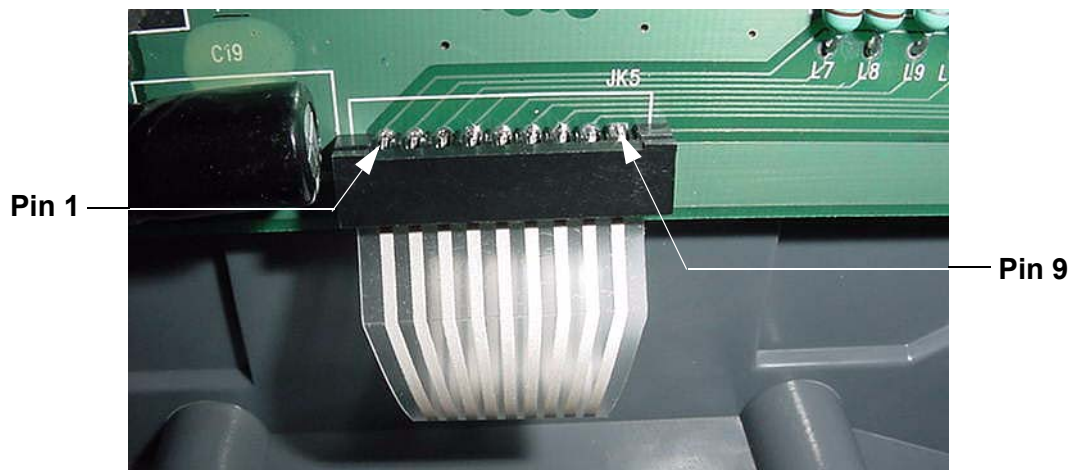
## Procedure 5.1 - Troubleshooting the Keypad

**Note:** All resistance measurements must be performed with power removed from the treadmill. Performing resistance measurements with voltage applied may damage your ohmmeter.

### Procedure

1. There are two possible fault modes for the keypad. The key may not function or it may be stuck permanently operated. The key pad may be tested using an ohmmeter.
2. Set the on/off switch in the "off" position and remove the AC power cord from the AC outlet.
3. Remove the four screws that fastens the backplate to the rear of the console and remove the backplate. Refer to Diagram 6.9. The rear of the upper PCA and the keypad connector (JK5) on the upper PCA is now accessible. See Diagram 5.1.

### Diagram 5.1 - Upper PCA Keypad Connector



4. When a key is functioning normally, reading across the key with an ohmmeter will give you an open ( $\infty$ ) reading when the key is not operated and approximately  $20\Omega$  to  $30\Omega$  when the key is operated. All of the keys on the keypad may be tested in this manner utilizing the table below.

Measure JK5 between Pins	Key Name	Not Operated	Operated
1-2	ENTER	Open ( $\infty$ )	$\approx 20-30\Omega$
1-3	SPEED ▲	Open ( $\infty$ )	$\approx 20-30\Omega$
1-4	SPEED ▼	Open ( $\infty$ )	$\approx 20-30\Omega$
1-5	QUICKSTART	Open ( $\infty$ )	$\approx 20-30\Omega$
1-6	STOP	Open ( $\infty$ )	$\approx 20-30\Omega$
1-7	INCLINE ▼	Open ( $\infty$ )	$\approx 20-30\Omega$
1-8	INCLINE ▲	Open ( $\infty$ )	$\approx 20-30\Omega$
1-9	SELECT	Open ( $\infty$ )	$\approx 20-30\Omega$

5. If one or more of the measurements above are significantly incorrect, replace the console per Procedure 6.10.
6. If all of the above measurements are good but a keypad key is still not functioning, replace the upper PCA per Procedure 6.11.
7. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.



## Procedure 5.2 - Troubleshooting the Lift System

### Lift System Description:

The lift system on these units consists of an AC line voltage driven lift motor (120 Vac), and an internal 10 K $\Omega$  potentiometer for lift position identification. The lift motor contains two motor windings, one to operate the motor in an “upward” direction and the other to operate the motor in a “downward” direction. As the lift motor is operated, the motor also rotates the potentiometer via an internal gear system. Therefore, the position of the lift system can be determined by monitoring the value of the internal potentiometer. The lift motor is initially set at a known starting position (calibration, See Procedure 4.1), subsequent motor movement is tracked via the potentiometer resistance reading.

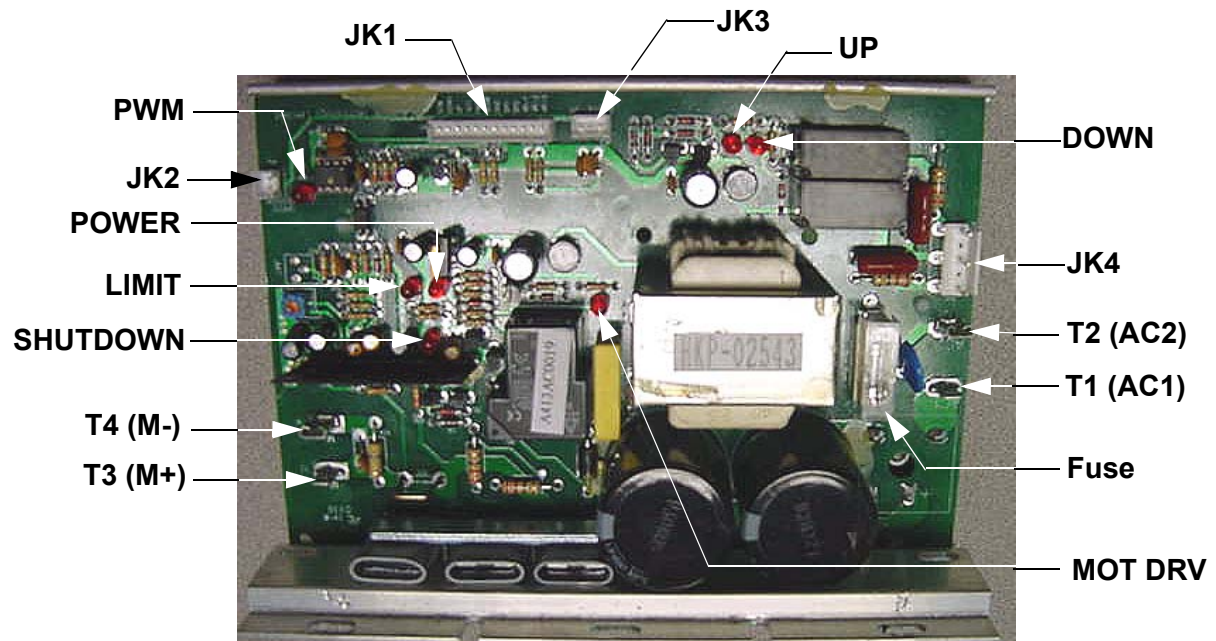
### Note:

All resistance measurements must be performed with power removed from the treadmill. Performing resistance measurements with voltage applied may damage your ohmmeter.

### Procedure

1. If the lift motor operates briefly and creates a lift error (E2) go to step 13. If the lift motor will not move continue with step 2.
2. Set the treadmill’s on/off switch in the “off” position and remove the AC power cord from the AC outlet.
3. Remove the hood from the treadmill.

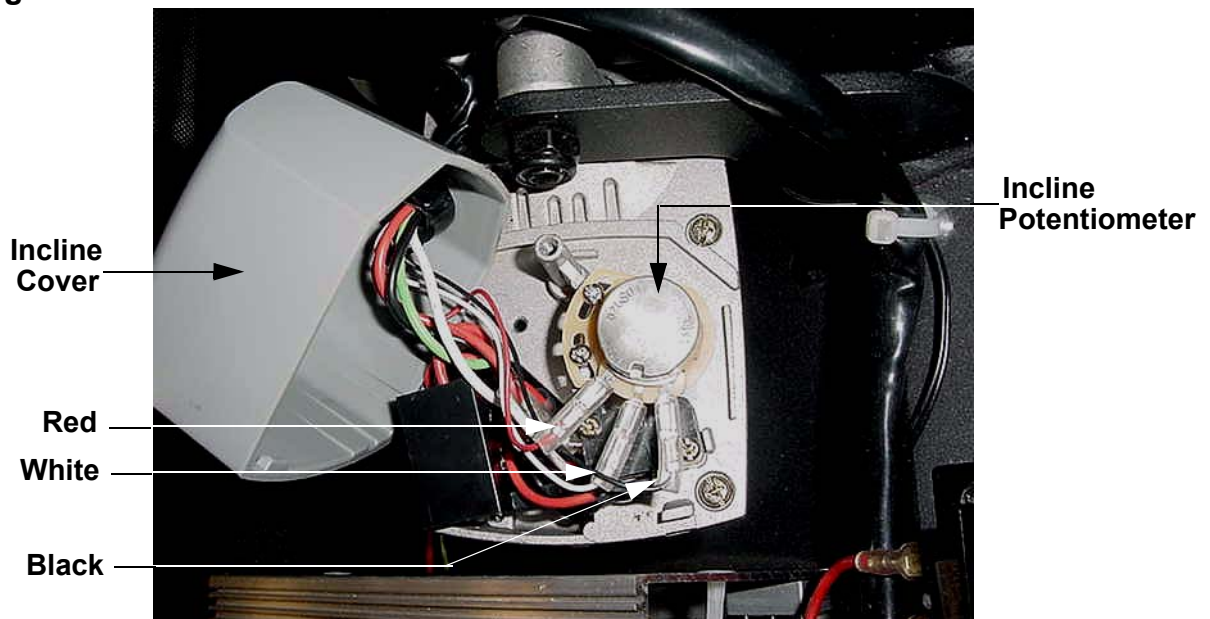
### Diagram 5.2 - Lower PCA



4. Insert the AC power cord in the AC outlet and set the on/off switch in the “on” position. Set the treadmill to operate in the manual program. Connect an AC voltmeter between terminal of 1 (red wire) and terminal 2 (white wire) of the JK4 connector on the lower PCA. Press the **INCLINE ▲** key. The **UP** LED should illuminate and the AC voltmeter should read AC line voltage (105 to 120 VAC). If the incline operated normally in the upward direction skip to step 8.
5. If the display indicated that the incline should be moving upwards and the **UP** LED did not illuminate the problem is probably in the interconnect cable between the upper and lower PCA. Replace the interconnect cable per Procedure 6.12.
6. If the **UP** LED illuminated and the AC voltage reading in step 4 was absent or significantly low, the problem is probably in the lower PCA. Replace the lower PCA per Procedure 6.3.
7. If the voltage reading in step 4 was correct and incline motor did not move, the problem is probably the incline motor. To verify the lift motor’s condition, remove power from the treadmill and measure between terminals 1 and 2 of JK4 with an ohmmeter. The motor winding should measure approximately 27Ω. If the measurement is significantly high, replace the incline motor per Procedure 6.1.
8. Connect an AC voltmeter between terminal 2 (white wire) and terminal 3 (black wire) of the JK4 connector on the lower PCA. Press the **INCLINE ▼** key. The **DOWN** LED should illuminate and the AC voltmeter should read AC line voltage (105 to 120 VAC)
9. If the display indicated that the incline should be moving downwards and the **DOWN** LED did not illuminate the problem is probably in the interconnect cable between the upper and lower PCA. Replace the interconnect cable per Procedure 6.12.
10. If the **DOWN** LED illuminated and the AC voltage reading in step 8 was absent or significantly low, the problem is probably in the lower PCA. Replace the lower PCA per Procedure 6.3.
11. If the voltage reading in step 8 was correct and incline motor did not move, the problem is probably the incline motor. To verify the lift motor’s condition, remove power from the treadmill and measure between terminals 2 and 3 of JK4 with an ohmmeter. The motor winding should measure approximately 27Ω. If the measurement is significantly high, replace the incline motor per Procedure 6.1.
12. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.
13. Remove Jk3 connector from the lower PCA, refer to Diagram 5.2. With an ohmmeter, measure between pins 1 and 3 of JK3 (red and black wires). You should measure approximately 10 KΩ (10,000Ω).

14. With an ohmmeter, measure between pins 1 and 2 of JK3 (red and white wires) and measure between pins 2 and 3 of JK3 (white and black wires). These two measurements should total 10K $\Omega$  when added together. If these three measurements in steps 13 and 14 are correct the incline should be functioning normally, replace JK3 and retest incline operation. If any of the three measurements were significantly incorrect continue with step 15.
15. Remove the screw that fasten the cover on the top of the incline motor and carefully lift the cover off of the incline motor. Check the wire connections on the incline potentiometer to ensure they are securely connected to the incline potentiometer. Refer to Diagram 5.3.

**Diagram 5.3 - Incline Potentiometer**



16. Repeat the three ohmmeter measurements in steps 13 and 14 directly on the three terminals of the incline potentiometer. If the three measurements are now correct the problem is in the cable from the incline potentiometer to the lower PCA. The cable may be repairable. If the cable can not be repaired, replace the incline motor per Procedure 6.1.
17. If the measurements in step 16 are still significantly incorrect, replace the incline motor per Procedure 6.1.
18. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.

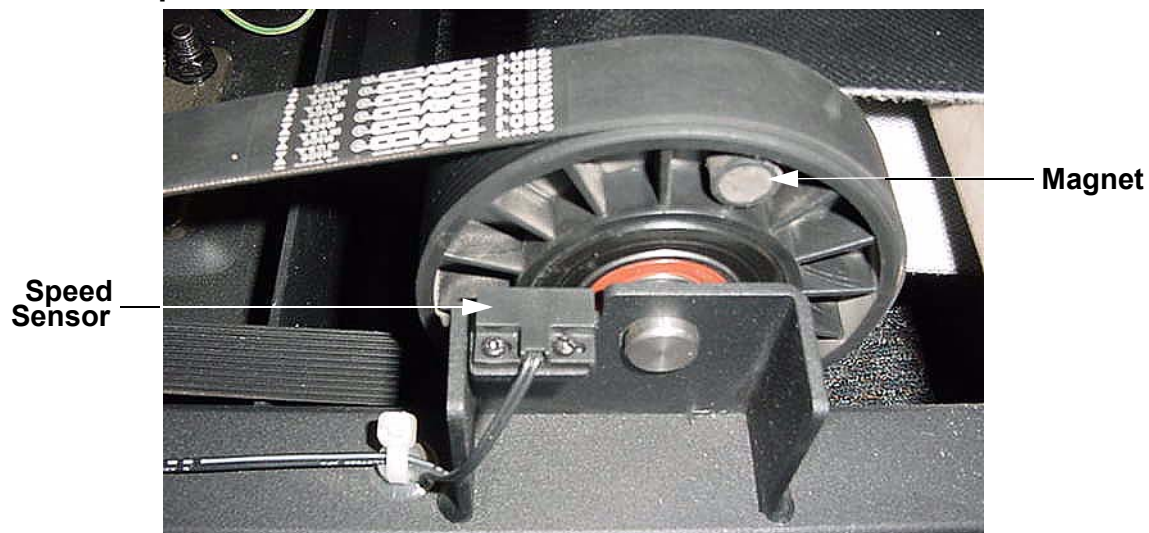
## Procedure 5.3 - Troubleshooting the Speed Sensor

**Note:** The speed sensor is a reed switch mounted beside the drive roller pulley. There is a magnet in the drive roller pulley that activates the reed switch (speed sensor) once each revolution. The speed sensor's signal is sent to the speed controller circuit via the lower PCA and is used to determine the treadmill's actual running speed.

Typically, when the speed sensor is not functioning, the drive motor will operate briefly when started and then shutdown and display a **LS** error.

1. Set the on/off switch in the "off" position and remove the AC power cord from the AC outlet.

**Diagram 5.4 - Speed Sensor**

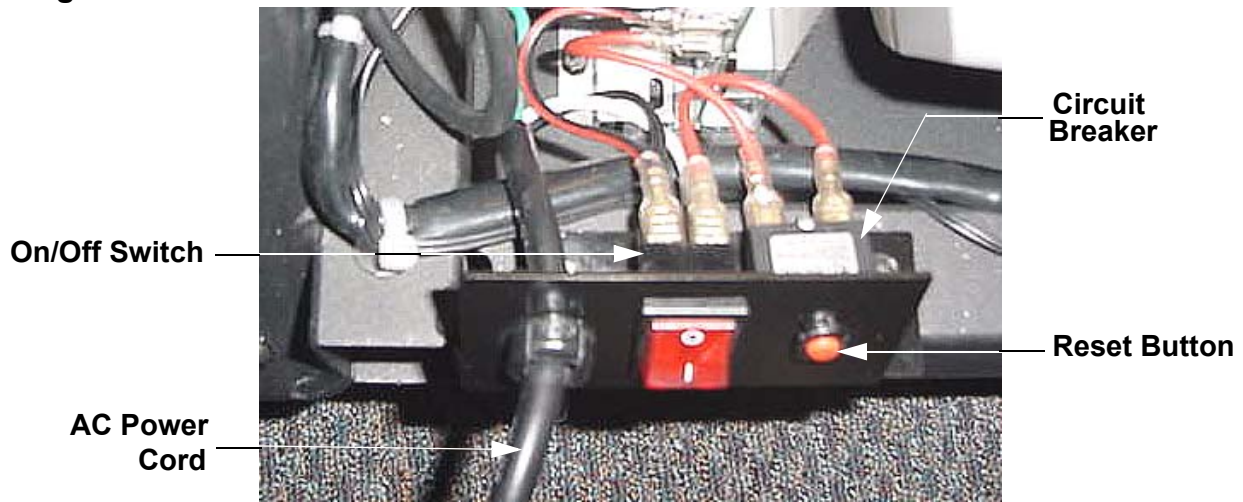


2. Remove the treadmill's hood.
3. Remove the JK2 connector from the lower PCA. Refer to Diagram 5.2.
4. With an ohmmeter measure between the two pins on the JK2 connector and slowly push the running belt to rotate the drive roller. When the magnet is not opposite the speed sensor the meter reading will be open ( $\infty$ ). When the magnet in the drive roller is opposite the speed sensor, the meter reading should be approximately  $0\Omega$ .
5. If the measurements in step 4 are not correct, repeat those measurements using a strong hand held magnet to operate the speed sensor.
6. If the measurements in step 5 are now correct, replace the drive roller. If the measurements are still incorrect, replace the speed sensor per Procedure 6.4.
7. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.

## Procedure 5.4 - The Display does not Illuminate

1. Set the on/off switch in the “off” position and insert the AC power cord into a 120 Vac outlet. The on/off switch should illuminate. If the on/off switch illuminates skip to step 5. If the on/off switch does not illuminate continue with step 2.
2. Remove the AC power cord from the AC outlet, and check the AC outlet with an AC voltmeter. The meter should read between 105 and 120 Vac. If the reading is not correct, the problem is in the AC service.
3. If the reading in step 2 was correct, reinsert the AC power cord in the AC outlet and measure between the two lower terminals of the on/off switch (black and white wires). The meter should read between 105 and 120 Vac. If the reading is not correct, the problem is in the AC power cord. Replace the AC power cord.
4. If the reading in step 3 was correct, replace the on/off switch per Procedure 6.7.
5. Ensure that the safety key magnet is operating the reed switch in the console. If the reed switch is not activated the display will not illuminate. See Procedure 5.5.
6. Remove the treadmill’s hood. Set the on/off switch in the “on” position. Set the safety key in its mounting position on the console. If the safety switch is not in its proper operating position or if the safety switch is not functioning, the display will not illuminate.
7. Referring to Diagram 5.2, check that the **POWER** LED on the lower PCA is illuminated. If it is illuminated, skip to step 12. If it is not illuminated continue with step 7.
8. With an AC voltmeter, measure between the two upper terminals of the on/off switch (red and red-black wires). The meter should read between 105 and 120 Vac. If the reading is not correct, the problem is in the on/off switch. Replace the on/off switch per Procedure 6.7.
9. With an AC voltmeter, measure between the red-black wire on the on/off switch to each of the red wires on the circuit breaker. Refer to Diagram 5.5. Both readings should read between 105 and 120 Vac.

**Diagram 5.5 - Circuit Breaker and On/Off Switch**



10. If the readings in step 8 are not correct, press the circuit breaker's reset button and repeat the measurements in step 8. If the readings are still not correct, replace the circuit breaker per Procedure 6.6.
11. Test the safety key circuit per Procedure 5.5. If the safety key circuit is functioning correctly, continue with step 11.
12. Set the on/off switch in the "off" position and remove the AC power from the AC outlet. Referring to Diagram 5.2, remove the fuse from the lower PCA. With an ohmmeter, measure across the fuse, it should read approximately, 0.2Ω. If the reading is significantly high, replace the fuse with an appropriate 3 amp slow blow fuse.
13. The problem has now been narrowed down to either the lower PCA, the interconnect cable between the lower and upper PCA and the upper PCA.

**Diagram 5.6 - JK1 Connector, Lower PCA**



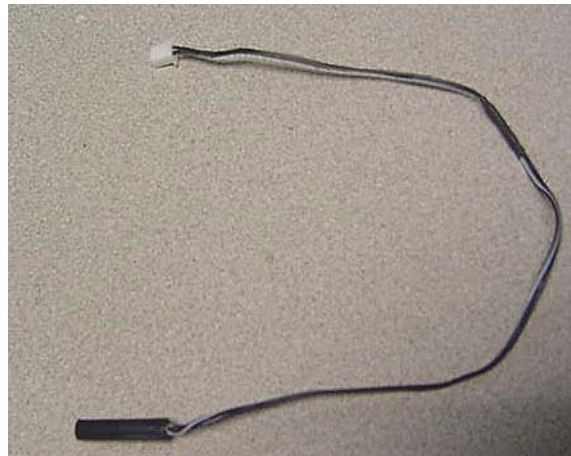
14. With a DC voltmeter, measure between **VCC** (orange wire) and **GND** (green wire) on the JK1 connector on the lower PCA. The reading should be approximately 16 Vdc. If the reading is 0 Vdc or significantly low, set the on/off switch in the "off" position, remove the four screws that fasten the backplate to the console and remove the Jk1 connector from the upper PCA. Refer to Diagram 6.9.
15. Set the on/off switch in the "on" position. Repeat the measurement in step 13. If the reading is still 0 Vdc or significantly low, replace the lower PCA. If the reading is now correct, the problem is either the interconnect cable or the upper PCA.
16. Repeat the measurement in step 13 between the orange and green wires on the upper PCA JK1 connector. If the reading is still 0 Vdc or significantly low, replace the interconnect cable. If the reading is now correct, replace the upper PCA.
17. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.

## Procedure 5.5 - Troubleshooting the Safety Key Circuit

**Note:** The safety key switch is a reed switch that is operated by a magnet on the safety key. If the safety key circuit is not functioning correctly the display will not illuminate and the treadmill can not be operated.

1. Set the on/off switch in the “off” position and remove the backplate from the console. Refer to Diagram 6.9.
2. Remove the JK5 connector from the upper PCA.
3. With an ohmmeter, measure between the two pins of the JK5 connector with the safety key installed on the console in its operating position and with the safety key removed from the console. The readings should be approximately  $0\Omega$  and open ( $\infty$ ) with the safety key removed.
4. If the readings in step 3 are incorrect, unsnap the reed switch from its mounting in the console and repeat the measurements in step 3 using a strong hand held magnet. If the readings are still incorrect, replace the safety key switch per Procedure 6.13. See Diagram 5.7. If the readings are now correct replace safety key.

### Diagram 5.7 - Safety Key Switch





## Procedure 5.6 - Troubleshooting the Drive Motor System

**Note:** The drive motor controller is a PWM (pulse width modulated) system. The system incorporates current limit (set at 28 amps of drive motor current). The lower PCA has several LED indicators to depict lower PCA status. Refer to Procedure 2.1.

1. If the **MOT DRV** LED is illuminated, replace the lower PCA per Procedure 6.3. The **MOT DRV** LED typically indicates a component failure on the lower PCA.
1. If the drive motor starts briefly then stops and an **LS** error is displayed, troubleshoot the speed sensor per Procedure 5.3. If the drive motor does not start and an **LS** error is displayed, continue with step 2.
2. Remove the treadmill hood.

**Warning:** The treadmill will be operated with the hood removed in this procedure. The service provider will be exposed to both electrical shock hazards and mechanical hazards. Extreme caution must be exercised to avoid contact with exposed electrical connections and moving parts.

3. Insert the AC power cord in an 120 VAC outlet and set the on/off switch in the “on” position.
4. Set the treadmill to operate in the manual program (at 1 mph).
5. With a DC voltmeter, measure between the T3 (M+) terminal and the T4 (M-) terminal on the lower PCA. The reading should be approximately 12 Vdc. If the voltage is absent or significantly low and/or the **PWM** LED does not illuminate, skip to step 10.
6. If the **PWM** LED does illuminate and the reading in step 2 is approximately 95 VDC the drive motor is open ( $\infty$ ). The most probable reason for the motor to be open is a badly worn motor brush.
7. Set the on/off switch in the “off” position. Remove the drive motor wires from the lower PCA (red, T3-M+ and black, T4-M-). With an ohmmeter, measure between the two wires, the reading should be approximately 4.6 $\Omega$ . If the reading is open ( $\infty$ ) or significantly high, check both motor brushes for adequate length, for solid contact with the motor commutator and for a good electrical connection at the brush holder.
8. If necessary replace the brushes per Procedure 6.8.
9. If the brushes and brush contact is good and the reading in step 7 is still open ( $\infty$ ) or significantly high, replace the drive motor per Procedure 6.3.
10. If either the **MOT DRV** or **SHUTDOWN** LED is illuminated on the lower PCA, replace the lower PCA per Procedure 6.3.

11. If the display does not indicate that the speed should be increasing when the **SPEED ▲** key is pressed, the problem is in either the keypad or the upper PCA. Troubleshoot the keypad per Procedure 5.1. If the keypad is defective, replace the console per Procedure 6.10.
12. If the keypad is good and the display still does not indicate that the speed should be increasing when the **SPEED ▲** key is pressed, replace the upper PCA per Procedure 6.11.
13. If the display does not indicate that the speed should be increasing when the **SPEED ▲** key is pressed, bypass the interconnect cable with a known good interconnect cable. It is not necessary to install the bypass cable, just connect it between the upper PCA and lower PCA. If the drive motor functions normally with the bypass cable installed, replace the interconnect cable per Procedure 6.12.
14. If the drive motor does not function normally with the bypass cable installed, replace the lower PCA per Procedure 6.5.
15. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.

## Procedure 5.7 - Troubleshooting the External A.C. Power Source

It is extremely important that any Precor treadmill be connected to and operated on a dedicated 15 amp A.C. circuit. A 15 amp dedicated circuit is defined as: a circuit fed by a 15 amp circuit breaker that feeds a single load. A treadmill operating from a non-dedicated circuit or a circuit breaker of less than 15 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 15 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 15 amps, the A.C. circuit must be corrected to be a 15 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 15 amp circuit breaker.

If the circuit breaker is greater than 15 amps, the circuit breaker should be replaced with a 15 amp circuit breaker. If the circuit breaker is less than 15 amps the circuit breaker must be replaced with a 15 amp circuit breaker and the wiring from the A.C. distribution must be capable of safely handling 15 amps. If the A.C. wiring is under sized, it must be replaced with wire capable of safely handling 15 amps. Please, refer to local electrical codes when determining the appropriate wire size for a 15 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 15 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 15 amp circuit breaker.**

If the circuit breaker is greater than 15 amps, the circuit breaker should be replaced with a 15 amp circuit breaker. If the circuit breaker is less than 15 amps the circuit breaker must be replaced with a 15 amp circuit breaker and the wiring from the A.C. distribution must be capable of safely handling 15 amps. If the A.C. wiring is under sized, it must be replaced with wire capable of safely handling 15 amps. Please, refer to local electrical codes when determining the appropriate wire size for a 15 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.
3. 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.

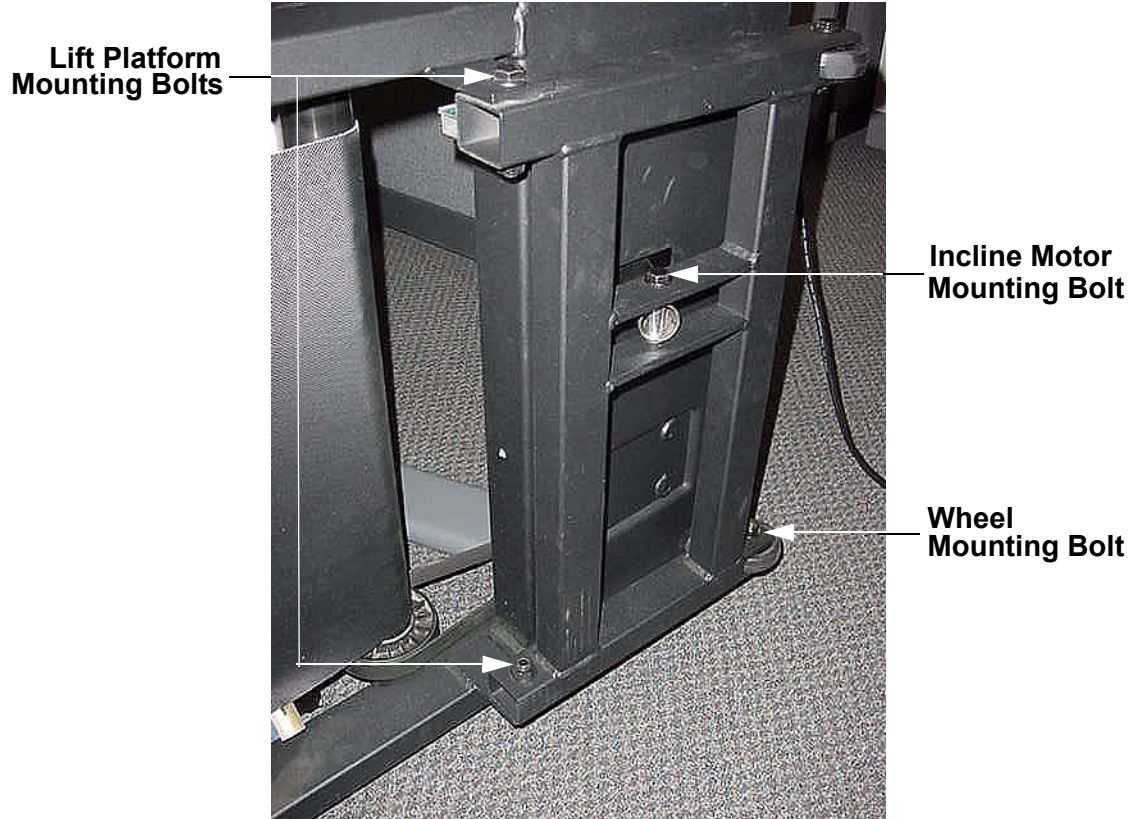
## Procedure 6.1 - Replacing the Incline Motor

1. Set the on/off switch in the “off” position and remove the AC power cord from the AC outlet.
2. Remove the treadmill’s hood.
3. Disconnect the JK3 and JK4 cables from the lower PCA. Disconnect the incline motor’s frame ground (green wire) from the frame. Cut and remove the cable ties retaining the incline motor cables.
4. Lay the treadmill on its side (preferably its left side).
5. Remove the bolt that fastens the inline motor’s lift tube to the lift platform.
6. Remove the bolt that fastens the top of the incline motor to its upper mounting bracket.
7. Remove the incline motor from the treadmill.
8. Set the replacement incline motor at its mounting position and fasten it to its upper mounting bracket with the hardware removed in step 6.
9. Connect the incline motor’s frame ground, the drive motor frame ground and the AC power cord frame ground to the frame ground with the screw removed in step 3.
10. Connect the incline motor’s JK3 and JK4 connectors to the lower PCA.
11. Dress the incline motor’s cables and frame ground wire in place and fasten the to the cable holders with cable ties.
12. Insert the AC power cord in the AC outlet and set the on/off switch in the “on” position.
13. Calibrate the incline motor and complete this replacement procedure per Procedure 4.1, steps 3-8.

## Procedure 6.2 - Replacing the Incline Platform

1. Set the treadmill's on/off switch in the "off" position. Remove the AC power cord from the AC outlet.
2. Carefully, lay the treadmill on either it's left or right side.
3. Remove the bolt that fastens the incline motor to the lift platform. Care must be taken throughout this procedure to not allow the incline motor's lift tube to rotate. The incline motor may require calibration if the incline motor's lift tube has rotated.
4. Remove the two bolts that fasten the lift platform to the frame and remove the lift platform from the treadmill. Refer to Diagram 6.1.

**Diagram 6.1 - Lift Platform**



5. Remove the bolts that fasten the wheels to the lift platform and remove both wheels from the lift platform.
6. Remove the nuts that fasten the rubber bumpers to the lift platform and remove both of the rubber bumpers from the lift platform.

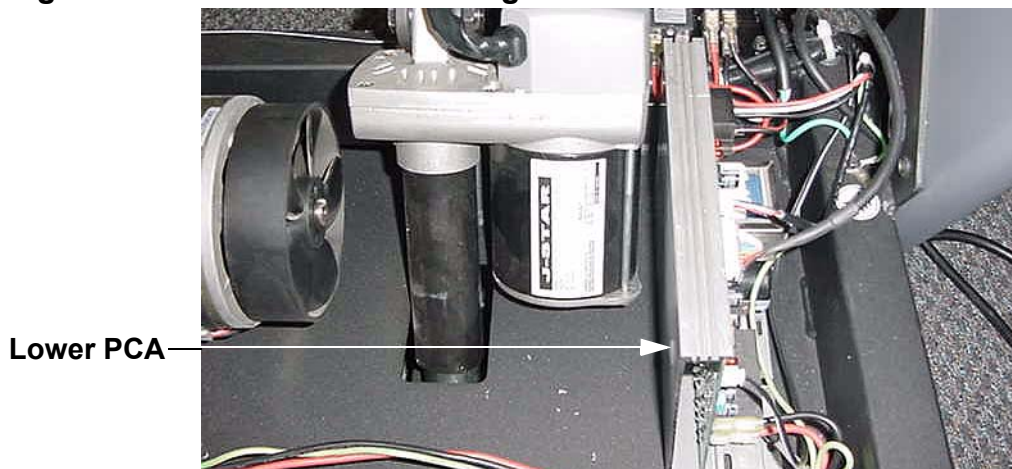
7. Install the rubber bumpers on the replacement lift platform with the hardware removed in step 6.
8. Install both wheels on the replacement lift platform with the hardware removed in step 5.
9. Set the replacement lift platform in its mounting position and fasten it with the hardware removed in step 4.
10. Fasten the incline motor's lift tube to the lift platform with the hardware removed in step 3.
11. Ensure that the wheel, lift platform and incline motor bolts are securely tightened.
12. Set the treadmill in its normal upright position and test it per Procedure 3.

## Procedure 6.3 - Replacing the Lower PCA

**Note:** If the lower PCA is replaced, the upper PCA to lower PCA initialization procedure (Procedure 2.3) **must** be performed to ensure proper operation.

1. Set the treadmill's on/off switch in the "off" position and remove the AC power cord from the AC outlet.
2. A grounded anti-static wrist strap must be worn whenever the lower PCA is being handled.
3. Remove the treadmill's hood.
4. Remove the JK1, JK2, JK3 and JK4 connectors from the lower PCA. Remove the wires from the T1 (AC1), T2 (AC2), T3 (M-) and T4 (M+) terminals on the lower PCA.
5. Remove the two screws that fasten the lower PCA to the frame and remove the lower PCA from the treadmill.
6. Set the replacement lower PCA at its mounting position and fasten it with the hardware removed in step 4.
7. Connect the JK1, JK2, JK3 and JK4 connectors to the replacement lower PCA. Refer to Diagram 5.2 for the correct positioning of these connectors.
8. Connect the red wire (from the circuit breaker) to terminal T1 (AC1) of the lower PCA, red-black wire to T2 (AC2) of the lower PCA, the red wire (from the drive motor) to T3 (M+) of the lower PCA and black wire to T4 (M-) of the lower PCA.
9. Replace the treadmill's hood. Insert the AC power cord into the AC outlet and set the on/off switch in the "on" position.
10. Perform Procedure 2.3, upper PCA to lower PCA initialization.

### Diagram 6.2 - Lower PCA Mounting

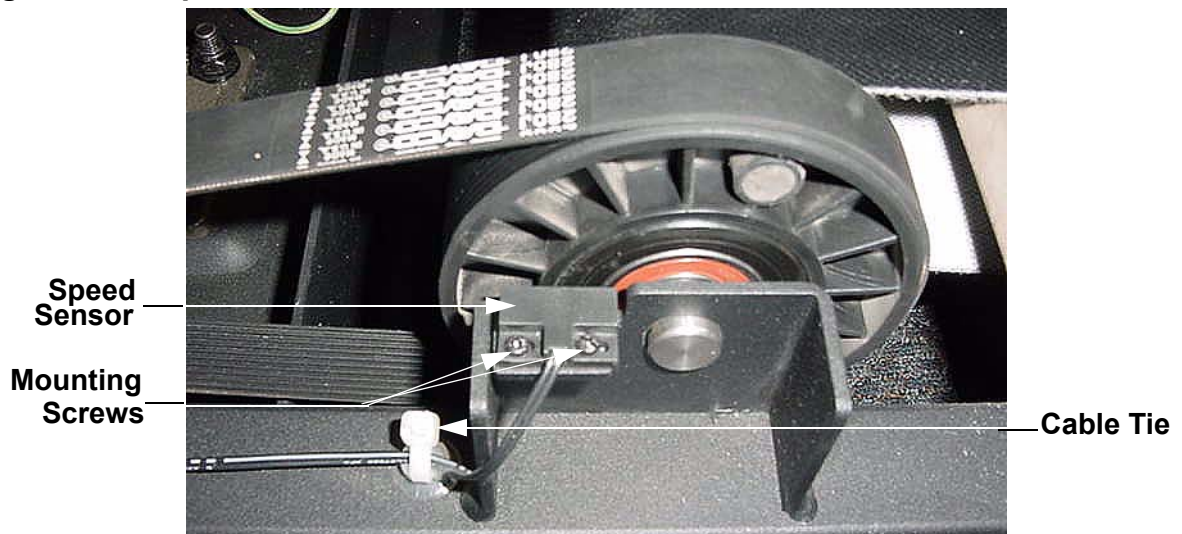




## Procedure 6.4 - Replacing the Speed Sensor

1. Set the treadmill's on/off switch in the "off" position. Remove the AC power cord from the AC outlet.
2. Disconnect the JK2 connector from the lower PCA, refer to Diagram 5.2.
3. Cut and remove the cable ties retaining the speed sensor wires.
4. Remove the speed sensor mounting screws and remove the speed sensor from the treadmill.

**Diagram 6.3 - Speed Sensor**

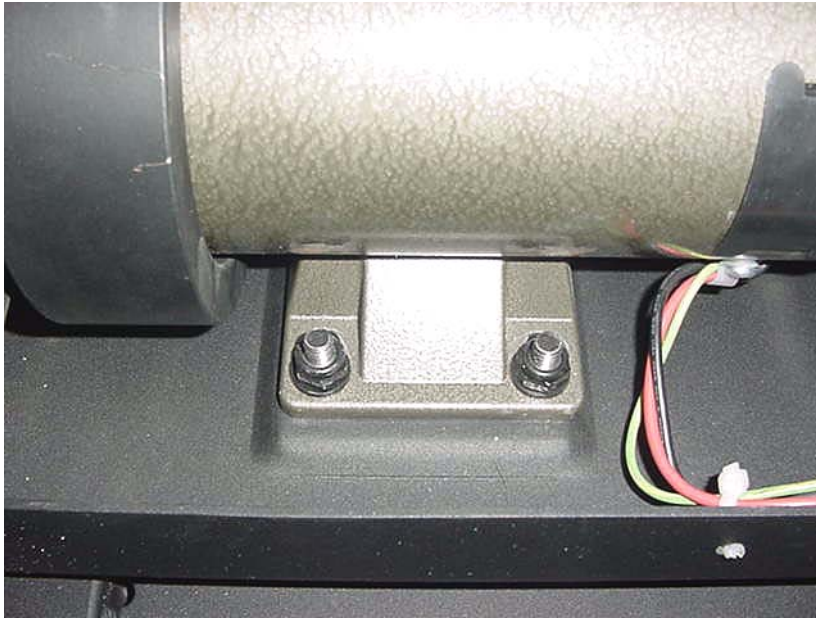


5. Set the replacement speed sensor at its mounting position and fasten it with the hardware removed in step 4.
6. Dress the speed sensor wires in place and fasten the wires with cable ties. It is important that all of the cable ties are replaced to ensure that the speed sensor wires do not get caught by any of the moving parts.
7. Insert the speed sensor cable into the JK2 connector on the lower PCA.
8. Test the treadmill per Procedure 3.

## Procedure 6.5 - Replacing Drive Motor

1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. Remove the hood.
3. The drive motor and flywheel are balanced as a matched pair. Since the flywheel is balanced to a specific motor, flywheels should not be removed from one motor and installed on a different motor. If the drive motor is replaced, the drive motor and flywheel should be replaced as a unit.
4. Disconnect the red and black drive motor wires from the lower PCA and green-yellow wire from its frame ground.

### Diagram 6.4 - Drive Motor Mounting



5. Loosen the four drive motor mounting nuts. See Diagram 6.4. Remove the drive belt from the drive motor pulley.
6. Remove the four nuts that fasten the drive motor to its mounting base. Remove the drive motor from the treadmill.
7. Set the drive motor in its mounting position. Replace and hand tighten the drive motor mounting nuts removed in step 4. Set the drive belt in place on the drive motor pulley.
8. Tension the drive belt and mount the drive motor per Procedure 4.2, steps 3-6.

9. Connect the black wire removed in step 3 to the T4 (M-) terminal of the lower PCA, the red wire removed in step 3 to the T3 (M+) terminal of the lower PCA and the green -yellow lead to its frame ground termination.
10. Dress the drive motor wires and fasten them in place with cable ties.
11. Check treadmill operation per Procedure 3.

## Procedure 6.6 - Replacing the Circuit Breaker

1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. Disconnect both red leads from the circuit breaker. Refer to diagram 5.5.
3. Push the circuit breaker toward its mounting plate to compress the spring on the circuit breaker and then downward to remove the circuit breaker from the mounting plate. refer to Diagram 6.5.

**Diagram 6.5 - Circuit Breaker**

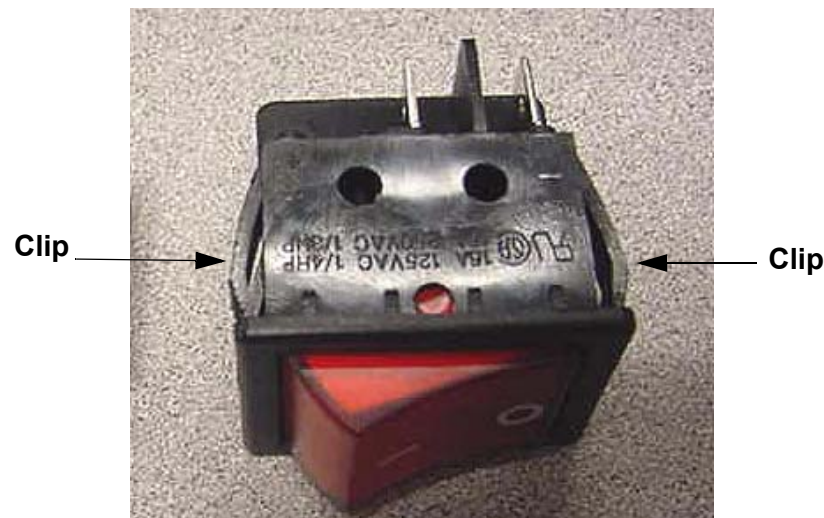


4. Press the replacement circuit breaker into its mounting hole until it snaps into place.
5. Connect the red wire from the on/off switch to the left hand terminal of the circuit breaker and the red wire from the lower PCA to the right hand terminal of the circuit breaker.
6. replace the treadmill's hood.
7. Insert the AC power cord into the AC outlet and set the on/off switch in the "on" position.
8. Test the treadmill per Procedure 3.

## Procedure 6.7 - Replacing the On/Off Switch

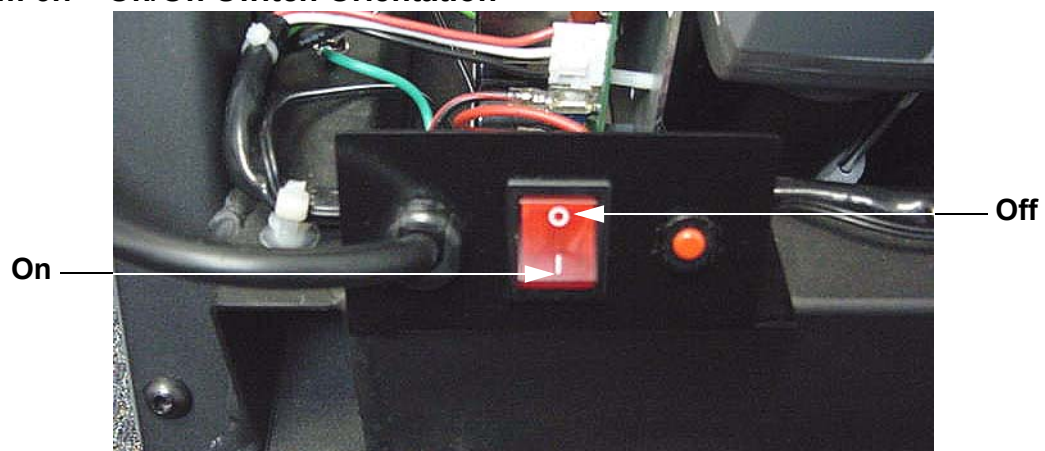
1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. Remove the treadmill's hood.
3. Remove the red, re-black, white and black wires from the on/off switch.
4. Depress the four clips on the on/off switch (two on the top and two on the bottom) and push the on/off switch out of the front of its mounting plate. Refer to Diagram 6.6.

**Diagram 6.6 - On/Off Switch**



5. Orient the on/off switch so that the "off" position is on top, refer to Diagram 6.7. Insert the replacement on/off switch into its mounting hole from the front of the mounting plate and press it into the mounting plate until it snaps into place.

**Diagram 6.7 - On/Off Switch Orientation**

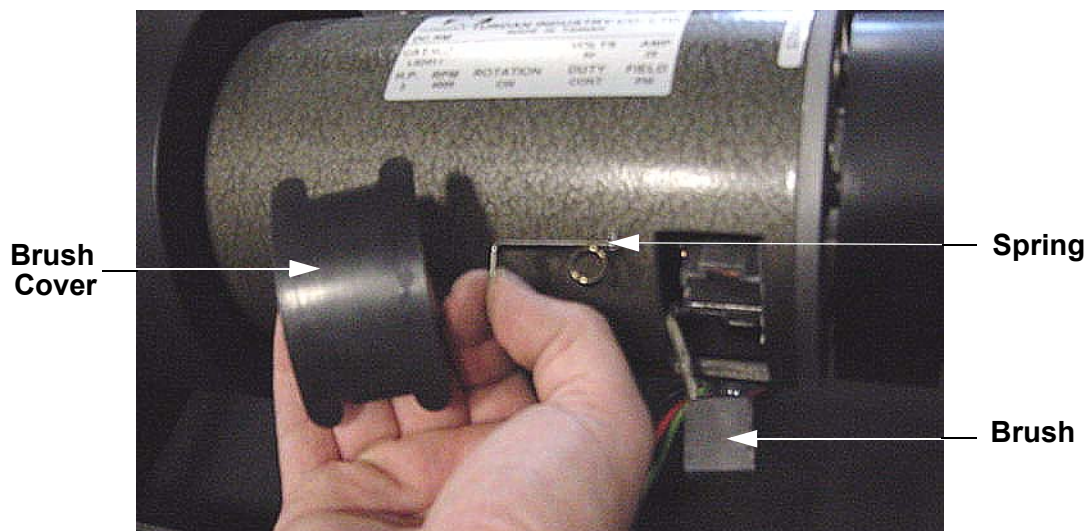


6. Connect the white wire from the AC power cord to the lower left hand terminal of the on/off switch, the black wire from the AC power cord to the lower right hand terminal of the on/off switch, the red wire from the circuit breaker to the upper left hand terminal of the on./off switch and the red-black wire from the lower PCA to the upper right hand terminal of on/off switch.
7. Replace the treadmill's hood.
8. Check treadmill operation per Section 3.

## Procedure 6.8 - Replacing the Drive Motor Brushes

1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. Remove the treadmill's hood.
3. Unsnap both brush covers (front and rear of the drive motor) from the drive motor. Refer to Diagram 6.8.

**Diagram 6.8 - Drive Motor Brush**



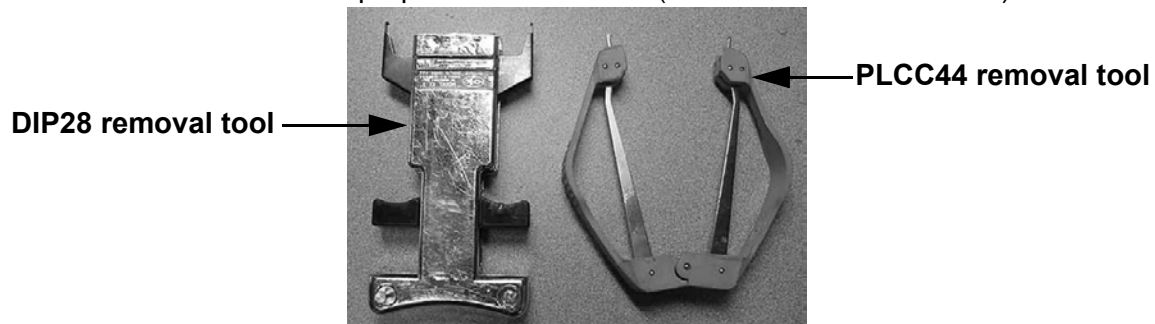
4. Press inwards on the end of the one of brush springs and upwards to allow the brush spring to disengage from the brush holder and slide out of the brush holder.
5. Disconnect the brush connector and remove the brush from the brush holder.
6. Slide the replacement brush into the brush holder and connect it to the brush connector on the brush holder.
7. Slide the brush spring into the brush holder and then downwards and allow the brush spring to slide into place and hook itself on the brush holder.
8. Repeat steps 4 to 7 on the remaining drive motor brush.
9. Snap the motor brush covers, removed in step 3, into place on the drive motor.
10. Replace the treadmill's hood.
11. Check treadmill operation per Section 3.

## Procedure 6.9 - Replacing the PROM

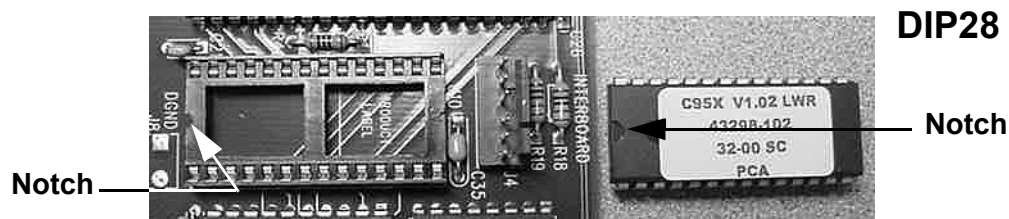
**Note:** If the lower PCA is replaced, the upper PCA to lower PCA initialization procedure (Procedure 2.3) **must** be performed to ensure proper operation.

Anti-static kits (part number 20024-101) can be ordered from Precor.

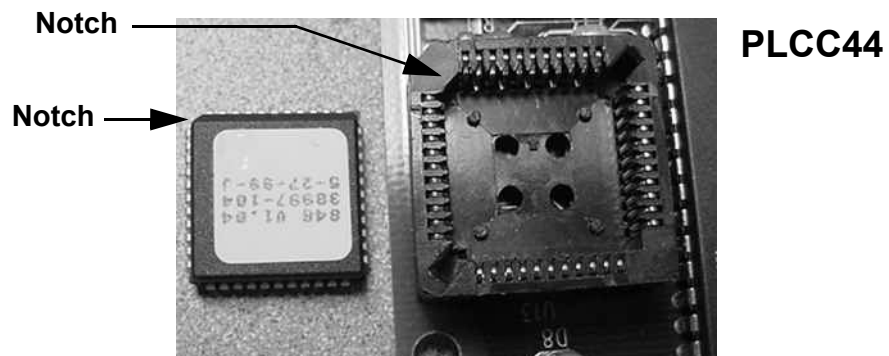
1. The PROM and the associated printed circuit assembly (PCA) are static sensitive. Anti-static devices must be used and all anti-static precautions must be followed during this procedure.
2. Remove the printed circuit assembly per its associated procedure.
3. Currently we are using two styles of IC software packages. they are a 28 pin dual in line package (DIP28) and a forty-four pin square package (PLCC44). Each of these packages should be removed with a proper IC removal tool (see the illustrations below)



4. The IC's may be inserted into their socket by hand by carefully aligning the notch on the IC with the notch on the IC socket and carefully pressing the IC into its socket. See the illustrations below for the alignment notches. Care must be taken that the IC legs on a DIP28 are all aligned in the socket to prevent the legs from bending when inserted. The PLCC44 IC must be carefully aligned squarely in its socket or it will not insert. Do not force the IC into its socket. If it does not insert easily, remove it and re-align it in its socket.







5. Perform Procedure 2.3, upper PCA to lower PCA initialization.

## Procedure 6.10 - Replacing the Console with Keypad

**Note:** The keypad is furnished as part of the console, the console must be replaced when a replacement keypad is required.

1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. A grounded anti-static wrist strap must be worn whenever the upper PCA is being handled.
3. Remove the four screws that fasten the backplate to the rear of the console and remove the backplate. Refer to Diagram 6.9.

**Diagram 6.9 - Console, Rear View**



4. Disconnect the interconnect cable from the JK1 connector on the lower PCA. Cut and remove the cable ties that retain the interconnect cable.
5. Remove four screws that fasten the console to the targa uprights. Remove the console from the targa uprights and place it on a work surface.
6. Remove the six screws that fasten the safety switch cover to the console and remove the safety switch cover. Disconnect the safety switch connector (SW1) from the upper PCA. Unsnap the safety switch from its mounting in the console.
7. Disconnect the keypad connector from the upper PCA. When furnished, disconnect the heart rate receiver connector (JK2) from the upper PCA.
8. When furnished, remove the heart rate receiver from the console.

9. Remove the five screws that fasten the upper PCA to the console and remove the upper PCA from the console.
10. Set the upper PCA in its mounting position in the replacement console and fasten it with the hardware removed in step 9. Connect the keypad connector to the JK5 connector of the upper PCA.
11. When furnished mount the heart rate receiver removed in step 8 with the hardware removed in step 8. Connect the heart rate receiver connector to the JK2 connector on the upper PCA.
12. Snap the safety switch, removed in step 6, into its mounting on the console. Connect the safety switch connector to the SW1 connector on the upper PCA.
13. Set the safety switch cover in its mounting position and fasten it with the hardware removed in step 6.
14. Set the console in its mounting position on the targa uprights and fasten it with the hardware removed in step 5.
15. Connect the interconnect cable to the JK1 connector on the upper PCA. dress the interconnect cable into place and fasten it with cable ties.
16. Set the backplate in its mounting position and fasten it with the hardware removed in step 3.
17. Check treadmill operation per Section 3.

## Procedure 6.11 - Replacing the Upper PCA

**Note:** If the lower PCA is replaced, the upper PCA to lower PCA initialization procedure (Procedure 2.3) **must** be performed to ensure proper operation.

1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. A grounded anti-static wrist strap must be worn whenever the upper PCA is being handled.
3. Remove the four screws that fasten the backplate to the rear of the console and remove the backplate. Refer to Diagram 6.9.
4. Disconnect the interconnect cable from the JK1 connector on the lower PCA.
5. Disconnect the keypad connector from the JK5 connector on the upper PCA.
6. When furnished, disconnect the heart rate connector from the JK2 connector on the upper PCA.
7. Remove the five screws that fasten the upper PCA to the console and remove the upper PCA from the console.
8. Set the replacement upper PCA in its mounting position in the console and fasten it with the hardware removed in step 7. Connect the keypad connector to the JK5 connector of the upper PCA.
9. When furnished, connect the heart rate connector to the JK2 connector on the upper PCA.
10. Connect the safety switch connector to the SW1 connector of the upper PCA.
11. Set the backplate in its mounting position and fasten it with the hardware removed in step 3.
12. Perform Procedure 2.3, upper PCA to lower PCA initialization.
13. Check treadmill operation per Section 3.

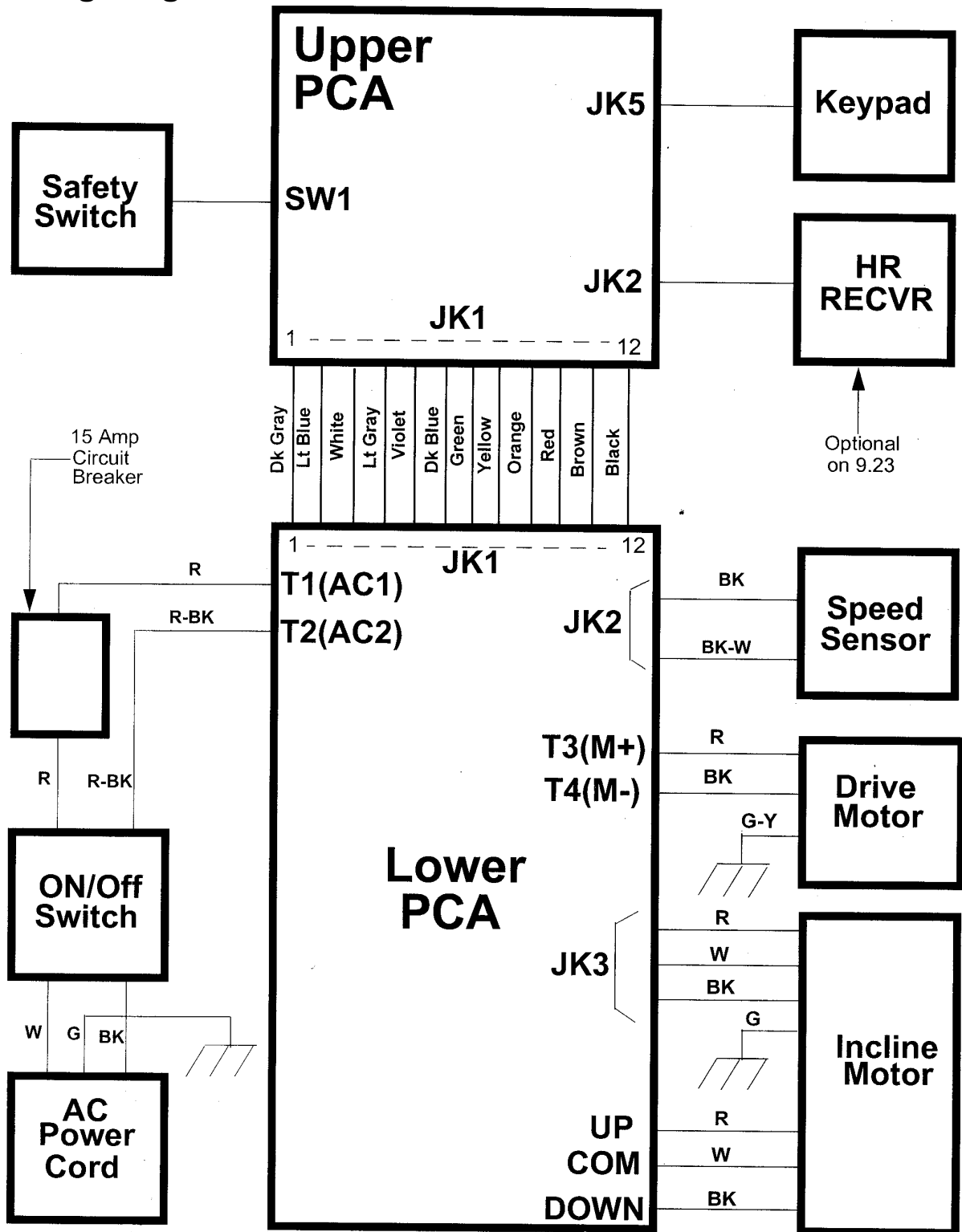
## Procedure 6.12 - Replacing the Interconnect Cable

1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. Remove the treadmill's hood.
3. Remove the four screws that fasten the backplate to the rear of the console and remove the backplate. Refer to Diagram 6.9.
4. Cut and remove the cable ties that fasten the interconnect cable to the console. Cut and remove the cable ties that fasten the interconnect cable to the treadmill frame (in the motor compartment).
5. Disconnect the interconnect cable from the JK1 connector on the lower PCA.
6. Tie a seven to eight foot long piece of string onto the lower end of the interconnect cable.
7. Draw the interconnect cable out of the upper end of the targa upright. Stop when the string is projecting out of the upper and lower ends of the targa upright. Remove the interconnect cable from the string and discard the interconnect cable.
8. Tie the lower end of the string onto the replacement interconnect cable. Carefully draw the string out of the top of the targa upright while feeding the interconnect cable into the lower end of the targa upright. Stop when the interconnect cable is projecting out of the upper and lower ends of the targa upright. Untie the string from the interconnect cable.
9. Connect the interconnect cable to the JK1 connector of the upper PCA and the JK1 connector of the lower PCA.
10. Dress the cable into place and fasten it to the console and the treadmill frame with cable ties.
11. Set the backplate in its mounting position and fasten it with the hardware removed in step 3.
12. Replace the treadmill's hood.
13. Check treadmill operation per Section 3.

## Procedure 6.13 - Replacing the Safety Key Switch

1. Set the treadmill's on/off switch in the "off" position and remove the treadmill's power cord from the AC outlet.
2. Remove the six screws that fasten the safety switch cover to the console and remove the safety switch cover. Refer to Diagram 6.9.
3. Remove the four screws that fasten the backplate to the console and remove the backplate. Refer to Diagram 6.9.
4. Disconnect the safety switch connector (SW1) from the upper PCA. Unsnap the safety switch from its mounting in the console.
5. Snap the replacement safety switch into its mount in the console.
6. Connect the safety switch connector to the SW1 connector on the upper PCA.
7. Set the backplate at its mounting position and fasten it with hardware removed in step 3.
8. Set the safety switch cover in its mounting position and fasten it with the hardware removed in step 2.
9. Check treadmill operation per Section 3

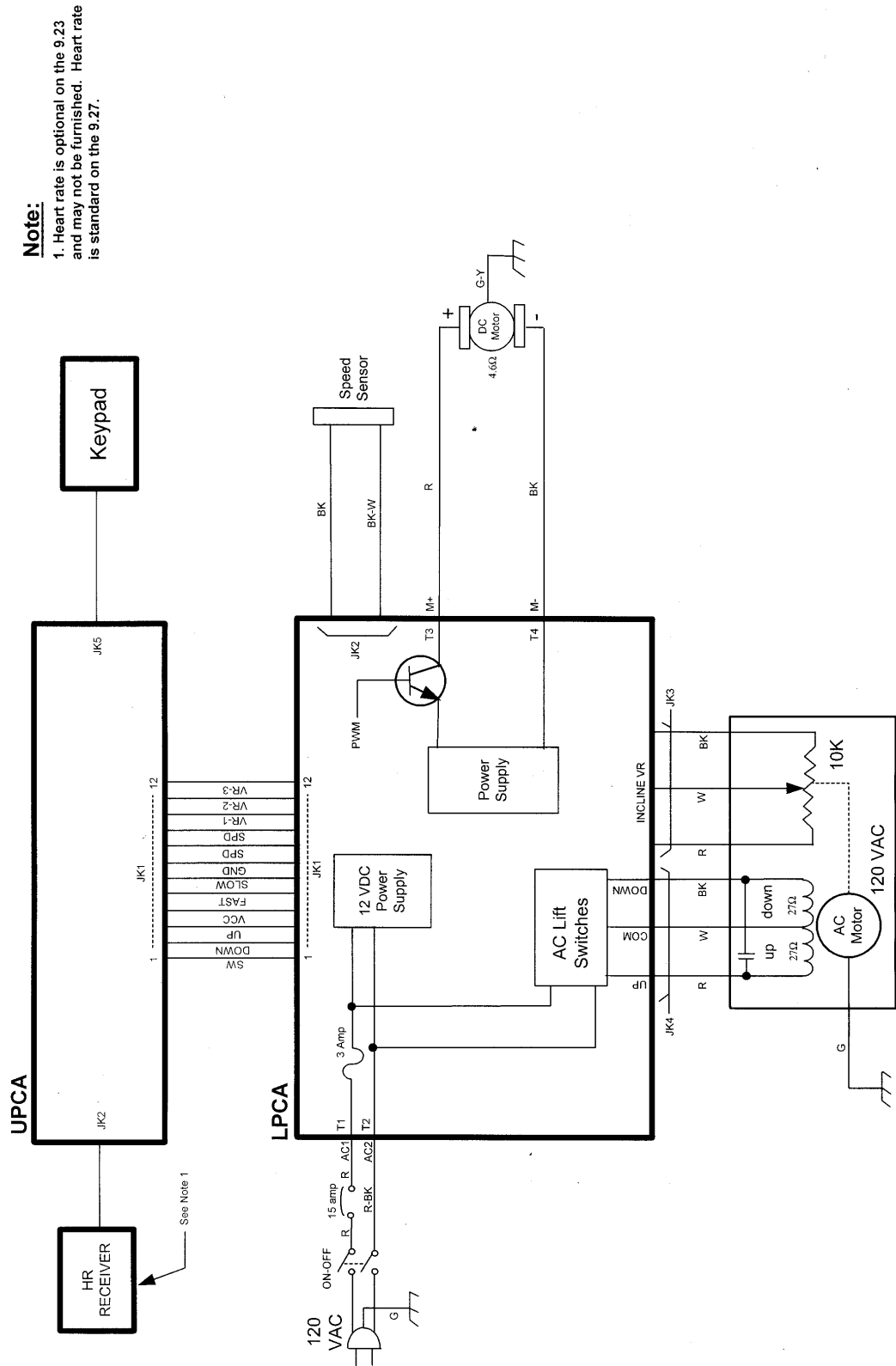
### Wiring Diagram 7.1 - 9.23, 9.27 Treadmills



# Block Diagram 7.2 - 9.23, 9.27 Treadmills



9.23, 9.27 Treadmill



**Note:**

1. Heart rate is optional on the 9.23 and may not be furnished. Heart rate is standard on the 9.27.