

## 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 or 0.8 to 20 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:

- 03 - EEPROM Error:** EEPROM checksum test error, when this error is consistently displayed, the upper PCA is usually the cause. If displayed intermittently, the cause is typically external, A.C. power spikes, for example.
- 26 - Speed Error:** This error indicates that the speed control circuit is not receiving correct motor speed pulses. This could be the result of incorrect speed, speed sensor failure, or drive motor failure.
- 40 - Lift Error:** This error indicates that the lift control system is not receiving correct analog position information from the lift motor. This could be the result of lift motor connection failure, lift motor potentiometer failure, lift motor failure or lower PCA failure.

**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. Set the on/off switch in the "on" position and remove the safety key from the console. Allow the internal power supply to discharge, approximately 10 seconds, and then replace the safety key on the console. Within 2 seconds of replacing the safety key, press the **STOP**, **INCLINE ▲**, **SPEED ▼** keys, sequentially.
2. The odometer in miles or kilometers will be displayed in the **DISTANCE** window of the display. See Diagram 2.1, below.
3. The hour meter will be displayed in the **TIME** window. See Diagram 2.1, below.
4. The upper PCA software version will be displayed in the main window.
5. Press the **STOP** key to exit this program.

Diagram 2.1 - 9.27 Display



## Procedure 2.3 - Accessing the Service Mode Program

**Calibration** - Incline calibration and treadmill calibration

**Console Sel** - Sets the console for 9.23 or 9.27 operation

**Display Test** - Tests the display

**Key Test** - Tests the keypad

1. Set the on/off switch in the “on” position and remove the safety key from the console. Allow the internal power supply to discharge, approximately 10 seconds.
2. While pressing the **QUICK START** and **SPEED ▲** keys, simultaneously, replace the safety key on the console. Continue to press the **QUICK START** and **SPEED ▲** keys until the display scrolls “**SERVICE MODE**”. The main screen will display the upper software version number.
3. Press the **ENTER** key, the display will read **CALIBRATION**. Use the **▲**, **▼** to scroll between the four test modes, **Calibration**, **Key Test**, **Display Test** and **Console Sel**. Press the **ENTER** key to select the appropriate test. You may press and hold the **STOP** key at any time to exit the **SERVICE MODE** program.

### Calibration

4. **Inc Limit** will be displayed at the bottom of the display and the incline A/D number will be displayed in the **HEART RATE** window. As the incline is raised or lowered the A/D number should track the incline’s movement.
5. The A/D number will be used to calibrate the incline, Procedure 4.1. **Warning**, Do not change the A/D number at this point, if the incline requires calibration, go to Procedure 4.1.
6. Press the **ENTER** key to enter the treadmill calibration mode.

### 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.

7. 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.
8. When the running belt stops the display show the test results **Pass** or **FAIL** and will then return to the normal user mode and the calibration process is complete.

### Key Test

9. One at a time press all of the keys on the console, the key name should be displayed at the bottom of the display. Pressing the **STOP** key a second time will exit the key test.

### **Display Test**

10. The display test will light every segment in the display. You must watch the display throughout the test to ensure that every display segment is functioning. This test will run continuously until you press the **STOP** key to halt the display test.

### **Console Sel**

11. The display will indicate whether the console is set as a 9.23 or 9.27 treadmill/ The ▲ will toggle the setting. Press the **ENTER** key to save the setting that agrees with the treadmill's model number.

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

1. Set the on/off switch in the “on” position and remove the safety key from the console. Allow the internal power supply to discharge, approximately 10 seconds, and then replace the safety key on the console. Within 2 seconds of replacing the safety key, press the **STOP**, **INCLINE ▼**, **SPEED ▲** keys, sequentially.
2. Press the **ENTER** key to toggle the selection between **U.S. Standard** and **METRIC**.
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. 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, the on/off switch should illuminate. 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 QUICK START 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.

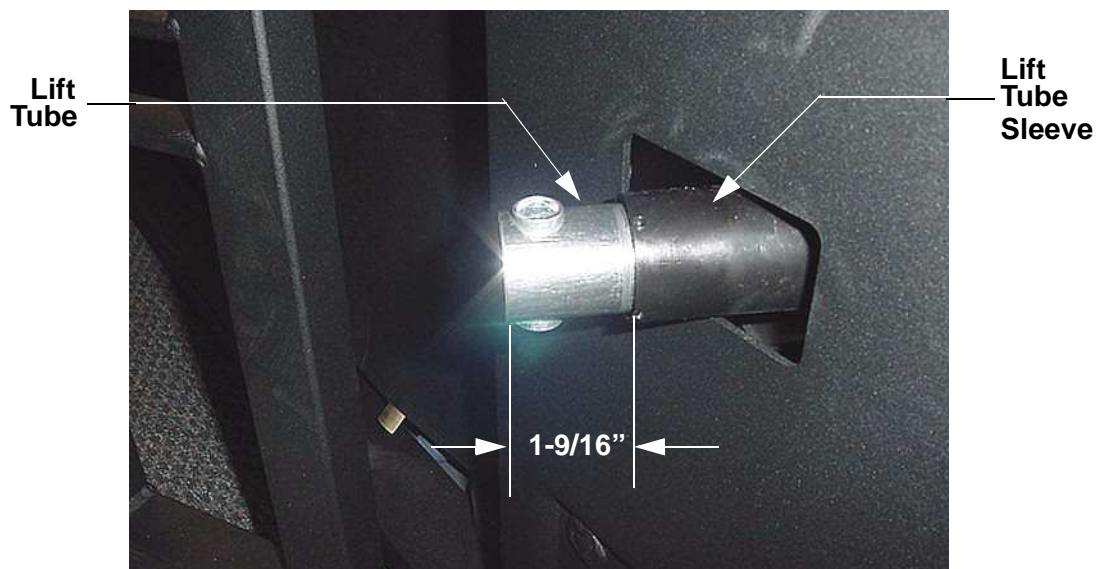
1. Set the on/off switch in the “off” position and unplug the AC power cord from the AC outlet.
2. Place the treadmill on it's left side. Remove the bolt that fastens the lift tube to the lift platform and swing the lift platform away from the lift motor's lift tube.
3. Plug the treadmill's AC power 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 incline motor stops remove the safety key. Enter the incline calibration mode per procedure 2.3. Set the incline A/D number between 44 and 48.
5. Press the **ENTER** key to save the A/D number. The treadmill will then go into the calibration mode.

### Warning

During this procedure the running belt will be accelerated to the treadmill's maximum (12.0 mph) speed.

6. 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**

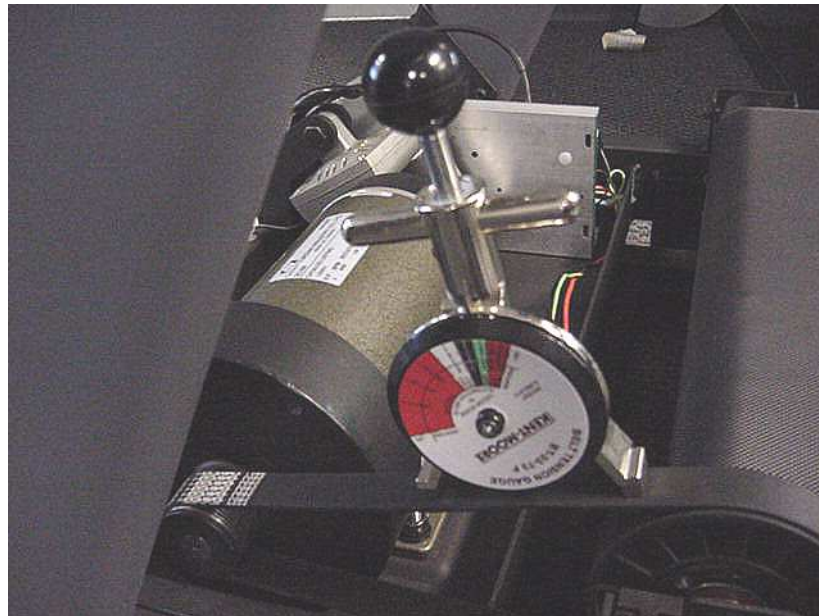


7. The lift tube must turn freely during step 5, if you turn the lift drive screw while turning the lift tube, you must return to step 4 and repeat steps 4 and 5. Set the on/off switch in the “off” position.
8. Swing the lift platform into its mounting position with the lift tube and fasten it with the bolt removed in step 2.
9. 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. Using the drive belt tension adjustment bolt, 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 4.3 - Treadmill Belt Cleaning

### Procedure:

1. First, check for proper operation of the safety stop key. Stand to one side of the treadmill. Insure that the stop key tether is hanging straight down from the stop key and is not wrapped around the handle bars. Push the "Quick Start" button and wait for the display to count down and for the running belt to begin moving. Once the running belt is moving pull the safety stop key tether. **See the illustration below.**

**CAUTION:** If the running belt does not stop, turn off the power using the ON/OFF switch at the front of the treadmill and unplug the power cord. The treadmill must remain out of service until the stop switch is repaired.  
If the running belt stops, continue with the cleaning procedure.

2. A clean, dry towel approximately 36 inches or 1 meter in length is required. Fold the towel in half lengthwise, lift the running belt up and insert the towel beneath the belt so that an end of towel extends on to each deck trim. **See the illustration below.**

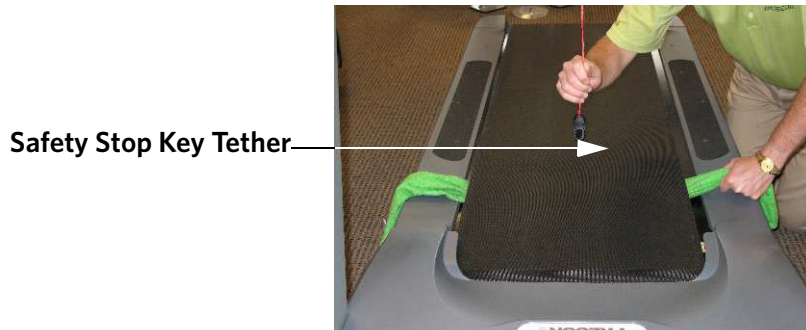


3. Stand to one side of the treadmill, push the "Quick Start" button, grasp the towel as illustrated in the illustration above. **Note:** You will have 3 seconds to firmly grasp your hands on the towel before the treadmill running belt begins to move. Allow the treadmill to run for about one minute while holding the towel firmly in place.

**CAUTION:** If the towel becomes loose it may be pulled into the treadmill's rollers. Pull the safety key tether to stop the treadmill and retrieve the towel, no damage should occur. Start the procedure over again.  
**See the illustration below.**

4. Keep one hand firmly grasped on the towel, use your other hand to pull on the safety stop key tether to stop the treadmill running belt. **See the illustration below.**

5. Turn the power off. Place your hands on the towel and push it up and down the length of the running deck several times to clean the deck.
6. Remove the towel.



It is recommended that this procedure be performed frequently to extend the life of the running belt and running deck.



## Procedure 5.1 - Troubleshooting the Keypad

### Procedure

1. If the malfunctioning key is not required for access to the service mode program, Procedure 2.3, access the **KEY TEST** portion of Procedure 2.3. If the key is stuck in the operated condition, the key name will be constantly displayed. If the key is not functioning, the key's name will not be displayed when the key is pressed.
1. Set the on/off switch in the "off" position.
2. Remove the four screws that fastens the backplate to the rear of the console and remove console from the backplate. Refer to Diagram 6.9. Disconnect the heart rate cable and data cable from the rear of the console. Remove the six screws from the rear of the console, remove the display face from the console rear cover. See Diagram 5.1. The keypad connector (JK6) on the upper PCA is now accessible.

**Diagram 5.1 - Rear View of Console**



3. If the key is stuck in the operated condition, disconnect the keypad cable from the JK6 connector on the PCA. Replace the console rear cover, reconnect the data cable to the console. Set the on/off switch in the "on" position. If the stuck key is still displayed, replace the display face. If the stuck is no longer displayed, replace the upper PCA.
4. 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.

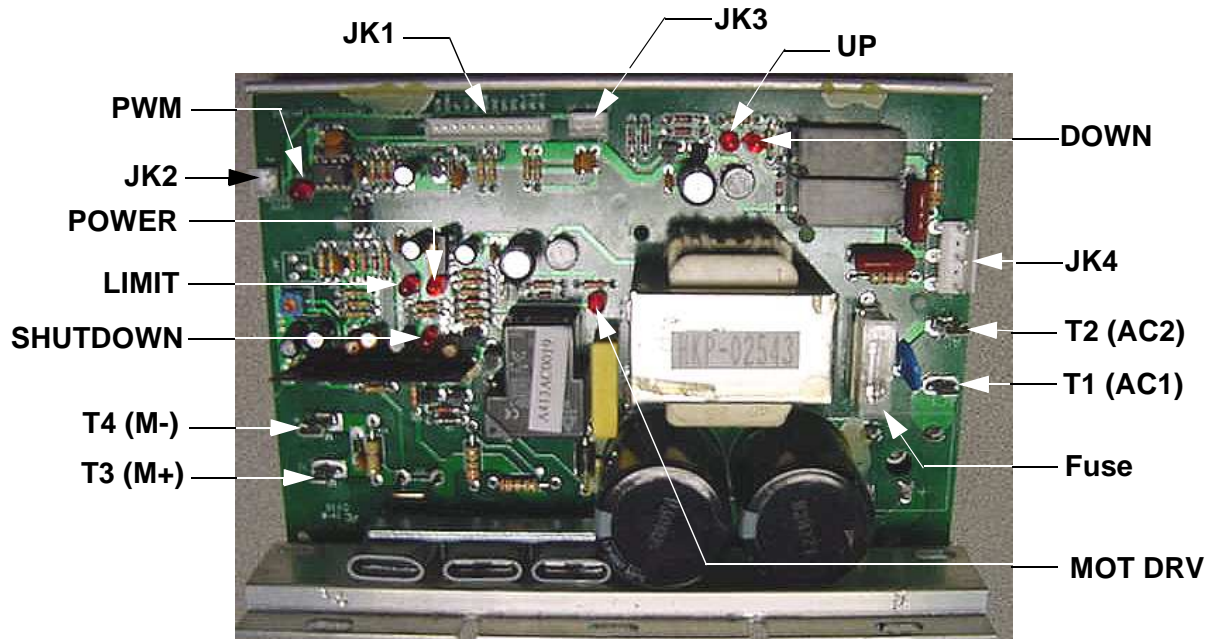
### Note:

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 (error 40) 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 data cable between the upper and lower PCA. Replace the data cable per Procedure 6.11.
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 27 $\Omega$ . 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 data cable between the upper and lower PCA. Replace the data cable per Procedure 6.11.
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 27 $\Omega$ . 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 K $\Omega$  (10,000 $\Omega$ ).

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 are two magnets 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 error. 26

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**

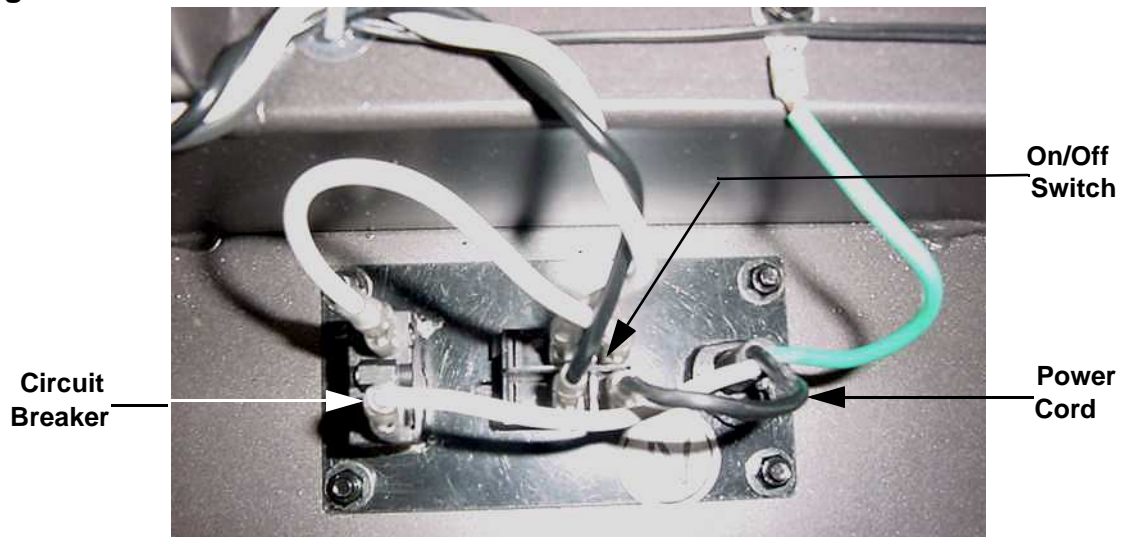


2. Remove the treadmill's hood.
3. Remove the JK2 connector from the lower PCA. Refer to Diagram 5.2.
4. With an ohmmeter measure between the two pins on the JK2 connector and slowly push the running belt to rotate the drive roller. When the magnet is not opposite the speed sensor the meter reading will 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 8.
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 12.
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,  $0.2\Omega$ . 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 data cable between the lower and upper PCA and the upper PCA.

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

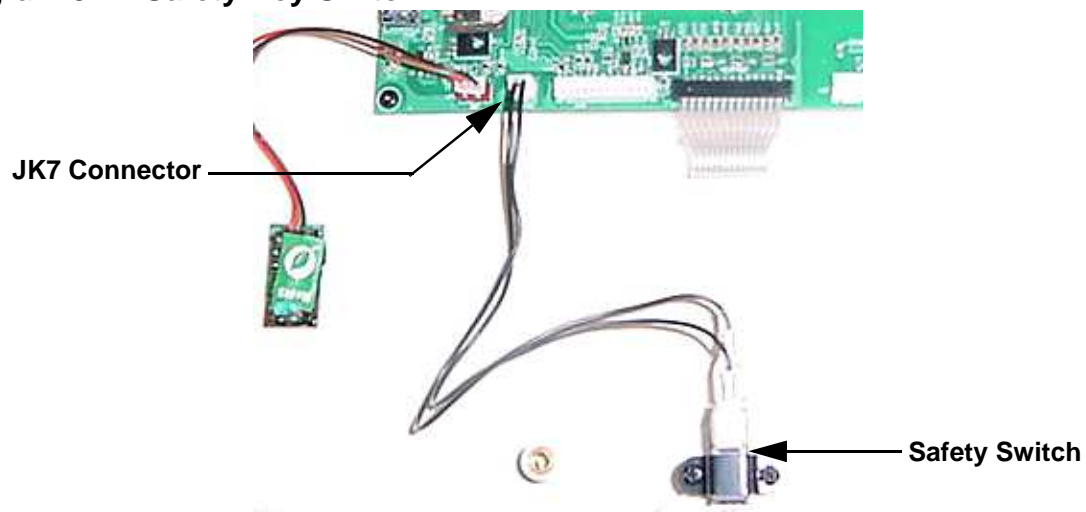
14. With a DC voltmeter, measure between **VCC** (orange wire) and **GND** (green wire) on the JK1 connector on the lower PCA. The reading should be approximately 16 Vdc. If the reading is 0 Vdc or significantly low, set the on/off switch in the “off” position, remove the four screws that fasten the backplate to the console and remove the Jk1 connector from the upper PCA. Refer to Diagram 5.2.
15. Set the on/off switch in the “on” position. Repeat the measurement in step 14. 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 data cable or the upper PCA.
16. Repeat the measurement in step 14 between the orange and green wires on the upper PCA JK1 connector. If the reading is still 0 Vdc or significantly low, replace the data 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

1. Set the on/off switch in the “off” position and remove the console from the backplate from the console. Refer to Diagram 5.2.
2. Remove the JK7 connector from the upper PCA.
3. With an ohmmeter, measure between the two pins of the JK7 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  $0\Omega$  with the safety key installed and open ( $\infty$ ) with the safety key removed.
4. If the readings in step 3 are incorrect, replace the JK7 connector on the upper PCA and remove the push on connectors from the safety switch. Measuring between the terminals on the safety switch with an ohmmeter, repeat the measurements in step 3

**Diagram 5.7 - Safety Key Switch**



5. If the measurements are still incorrect replace the safety switch. If the measurements are now correct, replace the safety switch to upper PCA cable.

## 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 error 26 is displayed, troubleshoot the speed sensor per Procedure 5.3. If the drive motor does not start and an error 26 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 and remove the A.C. power cord from the A.C. outlet. **Warning:** If the A.C power cord is not removed from the A.C. outlet, a shock hazard exists. 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. **Note:** New motor brushes are about 3/4 inches long.
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 6.5.
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 6.9.
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 6.10.
13. If the display does not indicate that the speed should be increasing when the **SPEED ▲** key is pressed, bypass the data cable with a known good data 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 data cable per Procedure 6.11.
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.

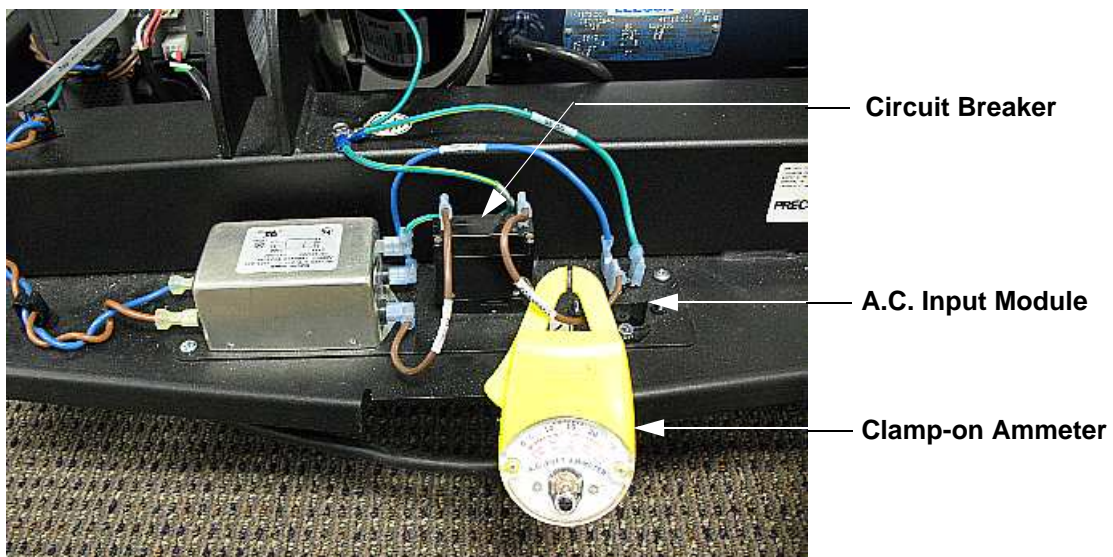
1. If, on a 120 Vac system, the A.C. distribution panel contains more circuit breakers than neutral leads, the system has shared neutral leads and is not dedicated.
2. If an A.C. outlet (120 or 240 Vac) has multiple hot and/or neutral leads, it is not a dedicated.
3. If either of the above conditions 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 5.8 - Running Belt & Deck Troubleshooting

This procedure is to be used to determine the condition of the running belt and running deck combination. A clamp-on ammeter will be used to measure the treadmill's A.C. input current under load. The A.C. input current is a direct indication of the load being placed on the treadmill. Treadmill loading consists of several factors, the user's weight, treadmill speed, treadmill incline setting and the condition of the running belt and running deck condition. By making all of the other factors consistent we will be able to determine the relative condition of the running belt and deck combination. The A.C. input current measurements will be performed at 3 m.p.h. (4.8 k.p.h.) and 0% incline. Because the loading varies with the user's weight, you should perform the A.C. input current measurement test on a new running belt and deck combination. That will provide you with a benchmark reading to account for your individual weight.

Because the A.C. input current reading will pulse between a high value (during foot plant) and a low reading (between foot plants) we suggest the use of an analog clamp-on ammeter. An analog ammeter makes it very easy to see the A.C. current pulses. The refresh rate on digital ammeters may make it difficult to see the current peaks.

1. Remove the treadmill's motor cover and place the A.C. clamp-on ammeter on the brown wire from the A.C. input module (or A.C. power cord) to the circuit breaker (on/off switch). See the illustration below.



2. Set the treadmill's speed at 3 m.p.h. (4.8 k.p.h.) and the incline at 0%. Walk on the treadmill and observe the peak A.C. current reading. Typical peak A.C. current readings on a new running belt and deck are between 3 and 6 amperes.
3. If the peak current reading approach 20 amperes, the running belt should be replaced. The running deck should be flipped or replaced if the running deck has been previously flipped. See Procedure X for running belt and running deck replacement.

4. If the peak A.C. current readings are greater than on a new running belt and deck combination but not approaching 20 amperes, the reading will give you an indication of the running belt and deck combination's general condition.



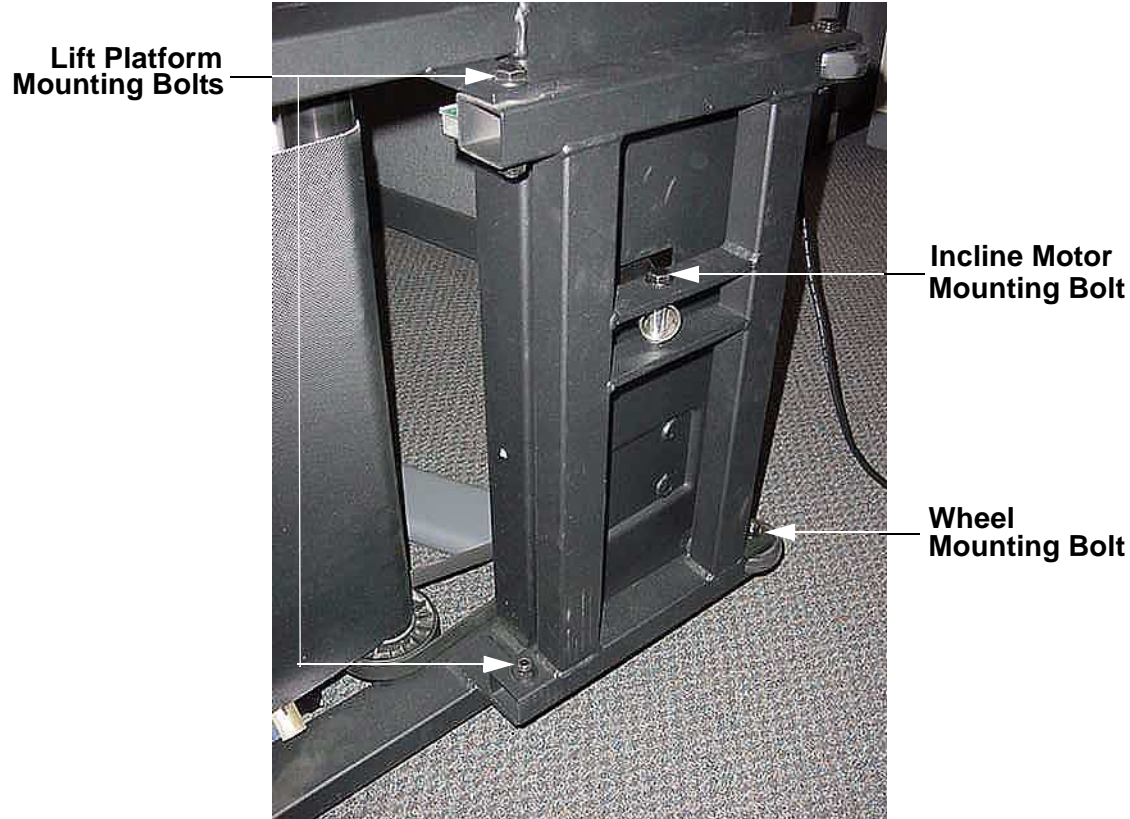
## Procedure 6.1 - Replacing the Incline Motor

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.
14. Test the treadmill per Procedure 3.

## 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 its 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. Unthread the rubber bumpers from the top front end of the lift platform.

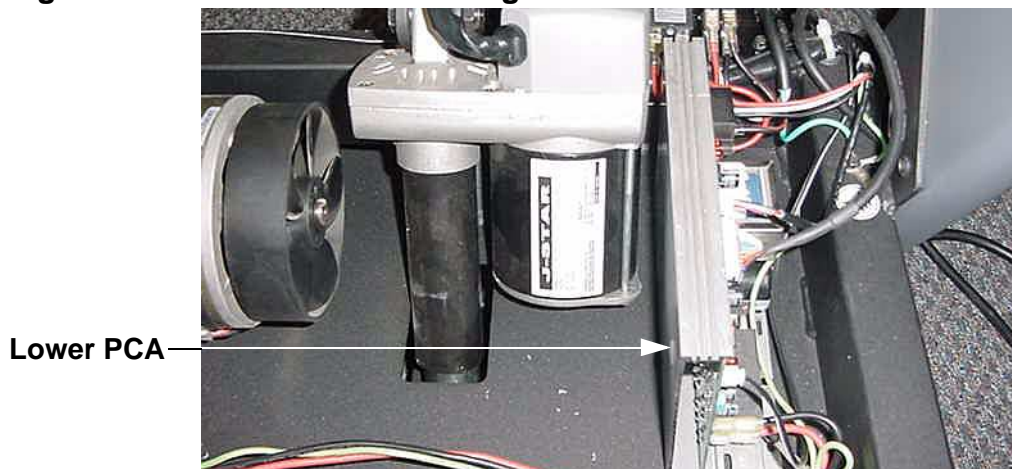
7. Thread the rubber bumpers, removed in step 6, into the replacement lift platform.
8. Install both wheels on the replacement lift platform with the hardware removed in step 5.
9. Set the replacement lift platform in its mounting position and fasten it with the hardware removed in step 4.
10. Fasten 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 treadmill calibration 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 5.
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, treadmill calibration. Test the treadmill per Procedure 3.

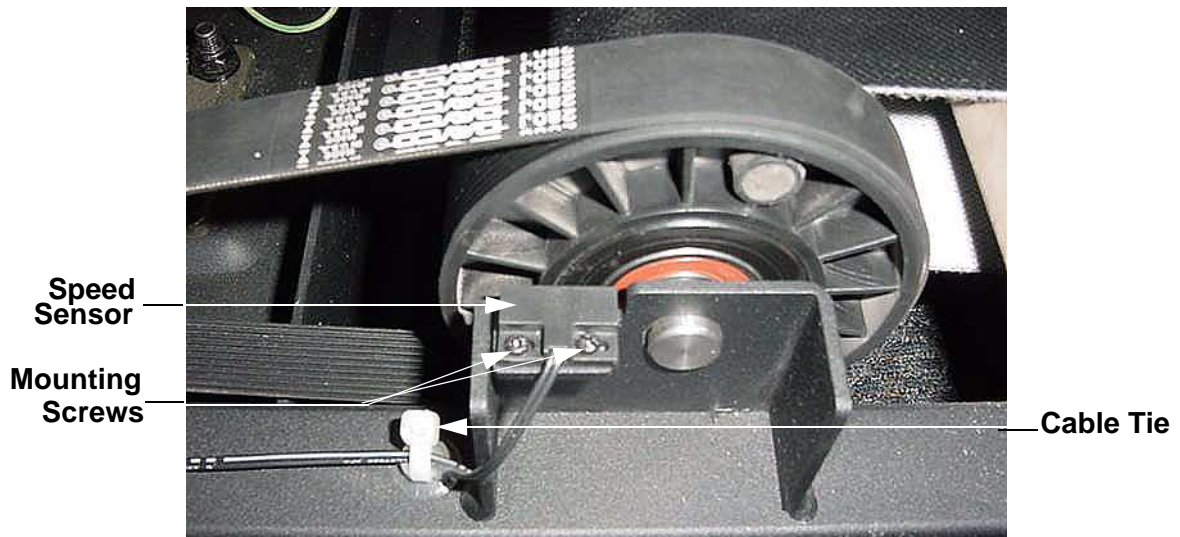
### Diagram 6.2 - Lower PCA Mounting



## 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. Remove the treadmill's hood.
3. Disconnect the JK2 connector from the lower PCA, refer to Diagram 5.2.
4. Cut and remove the cable ties retaining the speed sensor wires.
5. Remove the speed sensor mounting screws and remove the speed sensor from the treadmill.

**Diagram 6.3 - Speed Sensor**

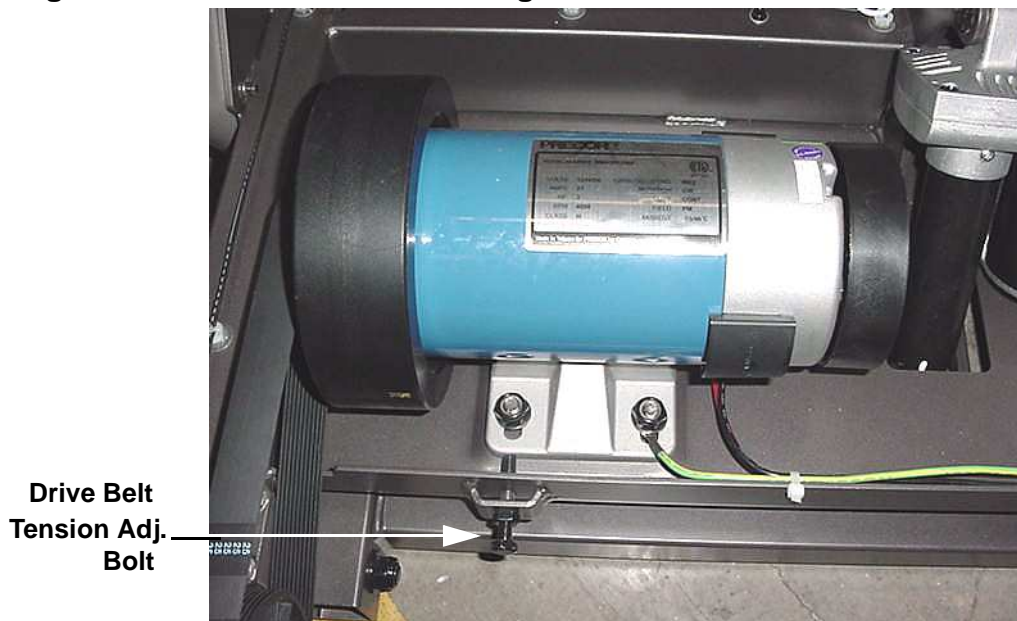


6. Set the replacement speed sensor at its mounting position and fasten it with the hardware removed in step 5.
7. Dress the speed sensor wires in place and fasten the wires with cable ties. It is important that all of the cable ties are replaced to ensure that the speed sensor wires do not get caught by any of the moving parts.
8. Insert the speed sensor cable into the JK2 connector on the lower PCA.
9. Replace the treadmill's hood
10. 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 treadmill's 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. Loosen the drive belt tension adjustment bolt to remove tension from the drive belt. 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 replacement drive motor in its mounting position. Replace and hand tighten the drive motor mounting nuts removed in step 6. 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.

9. Connect the black wire removed in step 4 to the T4 (M-) terminal of the lower PCA, the red wire removed in step 4 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. Remove the treadmill's hood.
3. Make note of the location of the wiring and disconnect both red leads from the circuit breaker. Refer to diagram 5.5.
4. Push the circuit breaker toward its mounting plate to compress the spring on the circuit breaker and then sidewise to remove the circuit breaker from the mounting plate. refer to Diagram 6.5.

**Diagram 6.5 - Circuit Breaker**



5. Press the replacement circuit breaker into its mounting hole until it snaps into place.
6. 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.
7. Replace the treadmill's hood.
8. Insert the AC power cord into the AC outlet and set the on/off switch in the "on" position.
9. 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. Make note of the location of the switch's wiring and remove the white and black wires from the on/off switch.
4. Depress the four clips on the on/off switch (two on each side) and push the on/off switch out the bottom of the treadmill. Refer to Diagram 6.6.

**Diagram 6.6 - On/Off Switch**



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

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

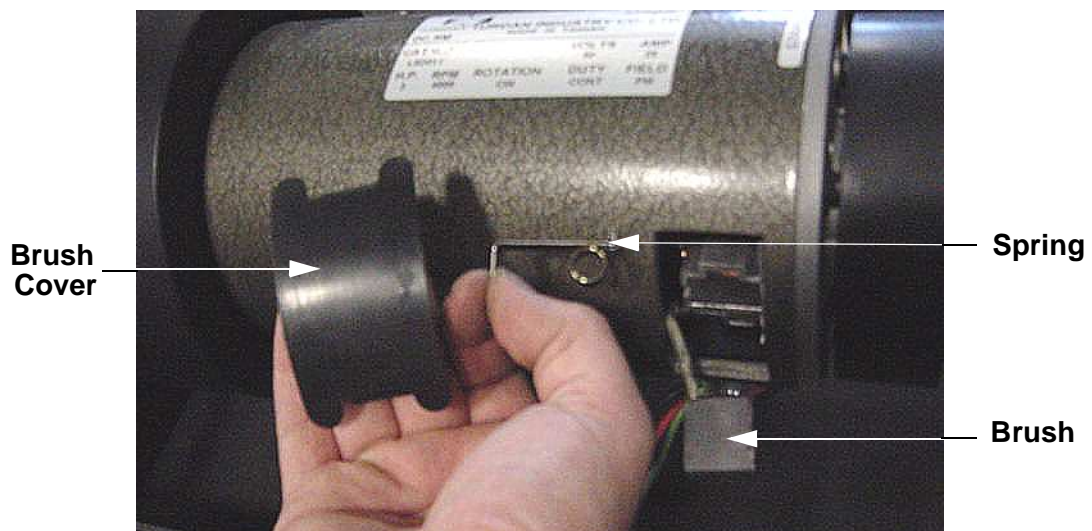


6. Connect the white wire from the AC power cord to the lower left hand terminal of the on/off switch, the black wire from the AC power cord to the lower right hand terminal of the on/off switch, the red wire from the circuit breaker to the upper left hand terminal of the on./off switch and the red-black 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 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. 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. Refer to Diagram 6.9.
4. Disconnect the data cable from the JK8 connector and the heart rate cable from the JK5 connector on the console. See Diagram 5.1.
5. Remove the six screws that fasten the console rear cover to the display face, remove the console rear cover.
6. Disconnect the safety switch connector JK7 from the upper PCA. Remove the two screws that fasten the safety switch to the display face. Remove the safety switch cable from the safety switch.
7. Set the replacement safety switch in its mounting position on the display face and fasten it with the hardware removed in step 6.
8. Connect the safety switch cable to the safety switch and to the JK7 connector on the upper PCA.
9. Set the console rear cover in its mounting position on the display face and fasten it with the hardware removed in step 5.
10. Connect the data cable to the JK8 connector on the console and the JK1 connector of the lower PCA. See Diagram 5.1.
11. Set the console in its mounting position on the backplate and fasten it with the hardware removed in step 3. Check treadmill operation per Section 3

## Procedure 6.10 - Replacing the Display Face with Keypad

**Note:** The keypad is furnished as part of the display face, the display face 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 console from the backplate. Refer to Diagram 6.9.

**Diagram 6.9 - Console, Rear View**



4. Disconnect the data cable and heart rate cable (9.27 only) from the console
5. Remove the six screws that fasten the display face to the console rear cover. See Diagram 5.1.
6. Disconnect the JK6 keypad connector, the JK7 safety switch connector and the JK10 user 1/2 keypad connector from the upper PCA.
7. Remove the two screws that fasten the safety switch to the display face and remove the safety switch.
8. Remove the four screws that fasten the upper PCA to the display face and remove the upper PCA from the display face.

9. Set the safety switch in its mounting position on the replacement display face and fasten it with the screws removed in step 7.
10. Set the upper PCA in its mounting position in the replacement display face and fasten it with the hardware removed in step 8. Connect the keypad cable to the JK6 connector, safety switch cable to the JK7 connector and the user 1/2 keypad cable to the JK10 connector of the upper PCA.
11. Set the console rear cover in its mounting position on the display face and fasten it six screws removed in step 5.
12. Connect the data cable to the JK8 connector on the console and the heart rate cable (9.27 only) to the JK5 connector on the console. See Diagram 5.1.
13. Set the console in its mounting position on the backplate and fasten it with the screws removed in step 3.
14. Check treadmill operation per Section 3.

## Procedure 6.11 - Replacing the Upper PCA

**Note:** If the upper PCA is replaced, the treadmill calibration 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. Refer to Diagram 6.9.
4. Disconnect the data cable from the JK8 connector and the heart rate cable from the JK5 connector on the console. See Diagram 5.1.
5. Remove the six screws that fasten the console rear cover to the display face, remove the console rear cover.
6. Disconnect the keypad cable from the JK6, the safety key cable from the JK7 connector and the user 1/2 keypad cable from the JK10 connector on the upper PCA.
7. Remove the four screws that fasten the upper PCA to the display face and remove the upper PCA from the display face.
8. Set the replacement upper PCA in its mounting position in the display face and fasten it with the hardware removed in step 7. Connect the keypad cable to the JK6 connector, the safety switch cable to the JK7 connector and the user 1/2 keypad cable to the JK10 connector of the upper PCA.
9. Set the console rear cover in its mounting position on the display face and fasten it with the hardware removed in step 5.
10. Connect the data cable to the JK8 connector and the heart rate cable (9.27 only) to the JK5 connector on the console. See Diagrams 5.1.
11. Fasten the console to the backplate with the hardware removed in step 3.
12. Perform Procedure 2.3, treadmill calibration.
13. Check treadmill operation per Section 3.

## Procedure 6.12 - Replacing the Data 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 console to the backplate. Refer to Diagram 6.9.
4. Disconnect the data cable from the JK8 connector on the console. See Diagram 5.1.
5. Tie a seven to eight foot long piece of string onto the lower end of the data cable.
6. Draw the data 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 data cable from the string and discard the data cable.
7. Tie the lower end of the string onto the replacement data cable. Carefully draw the string out of the top of the targa upright while feeding the data cable into the lower end of the targa upright. Stop when the data cable is projecting out of the upper and lower ends of the targa upright. Untie the string from the data cable.
8. Connect the data cable to the JK8 connector on the console and the JK1 connector on the lower PCA. See Diagrams 5.1. and 5.2
9. Set the console in its mounting position on the backplate and fasten it with the hardware removed in step 3.
10. Replace the treadmill's hood.
11. Check treadmill operation per Section 3.

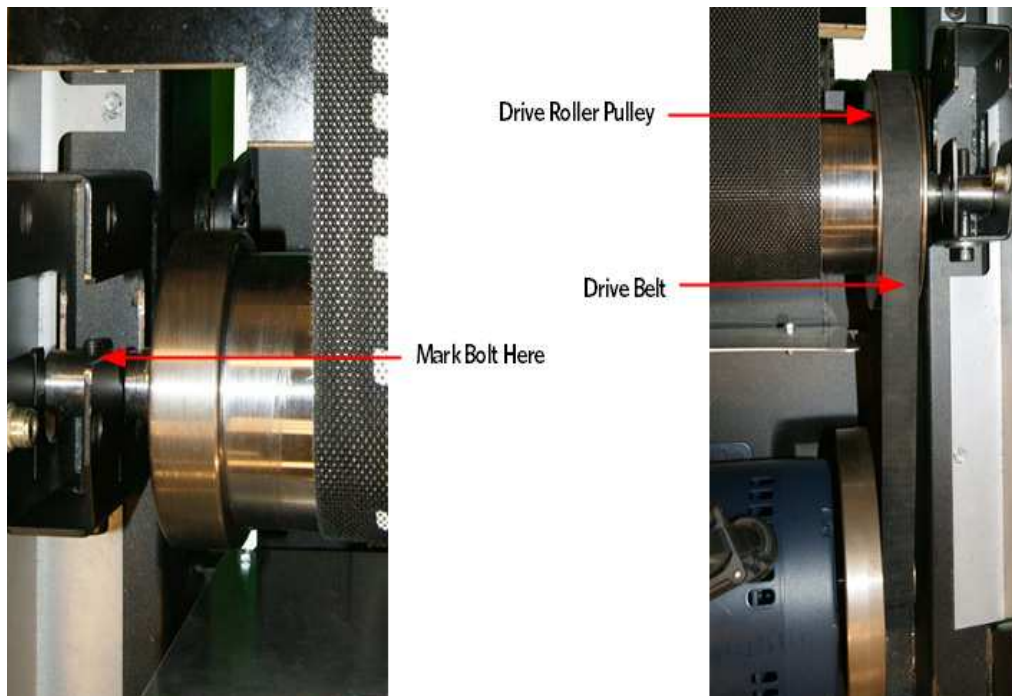


## Procedure 6.13 - Drive Roller Replacement

**Note: Two running belt gauges, Precor part number 20007-101, are required. It is important that this procedure be followed to maintain correct drive belt and running belt tension. Over tensioning the belt will lead to premature running belt wear, premature driver roller bearing failure and premature take up roller bearing failure.**

### Drive Roller Removal

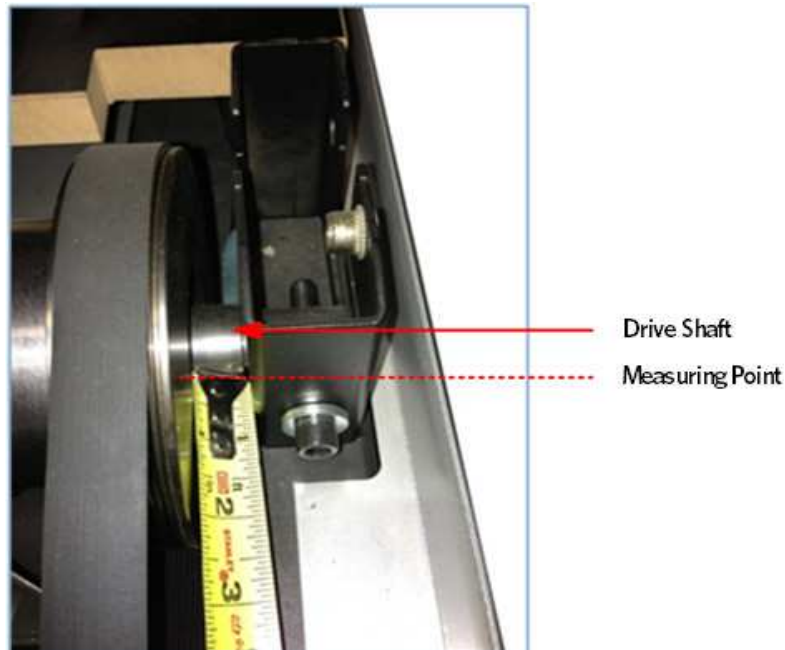
1. Remove the end caps from the rear of treadmill to expose the take up roller mounting bolts. Remove the treadmill's motor cover.
2. Remove the deck trim from both sides.
3. Loosen, but do not remove the take up roller mounting bolts. The bolts are being loosened to remove tension from the running belt.
4. Slowly rotate the drive motor flywheel while pressing the drive belt off of the drive roller pulley.

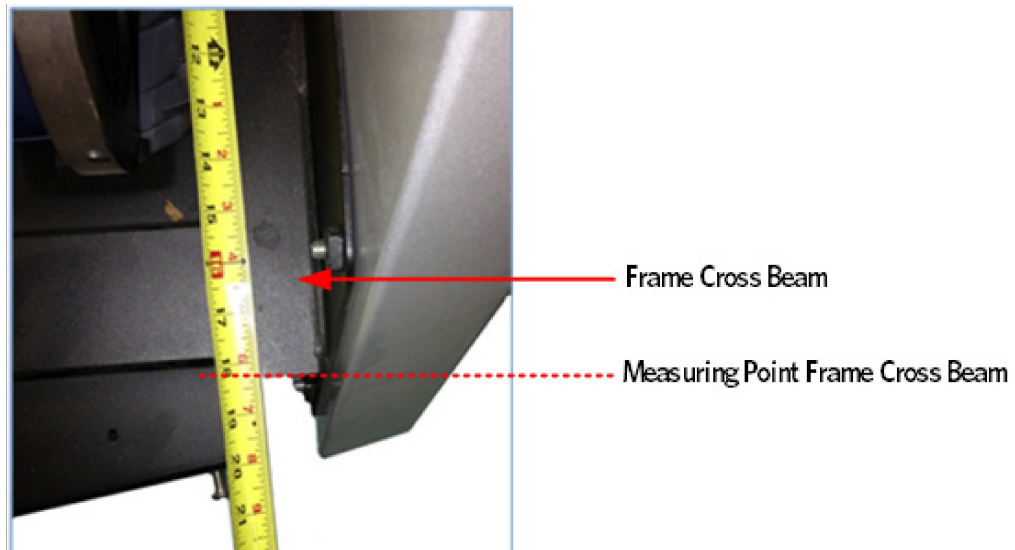


5. Remove both drive roller mounting bolts releasing the tension evenly on both sides. Remove the drive roller from the treadmill using the drive belt as a handle.

### Installing the Drive Roller

6. Place the drive belt on the new drive roller and use as a handle to slide the drive roller through the running belt and into place. Hand tighten both drive roller mounting bolts.
7. Make sure the running belt is in the center of the deck, the spacing should be the same on each side of the running belt to the edge of the running deck.
8. Start tightening the left and right side drive roller mounting bolts. Move back and forth between the left and right side mounting bolts so the bolts will tension evenly which will reduce the stress on the threads of the bolts. The left side drive roller shaft will tighten flush to the front frame bracket. Using a measuring tape, measure the distance from the front of the left side drive roller shaft to the front of the frame cross beam and make note of that measurement. Tighten the right side drive roller bolt until it measures the same distance as the left side drive roller, shaft to frame. This will ensure that the drive roller is parallel and square to the front of the frame.





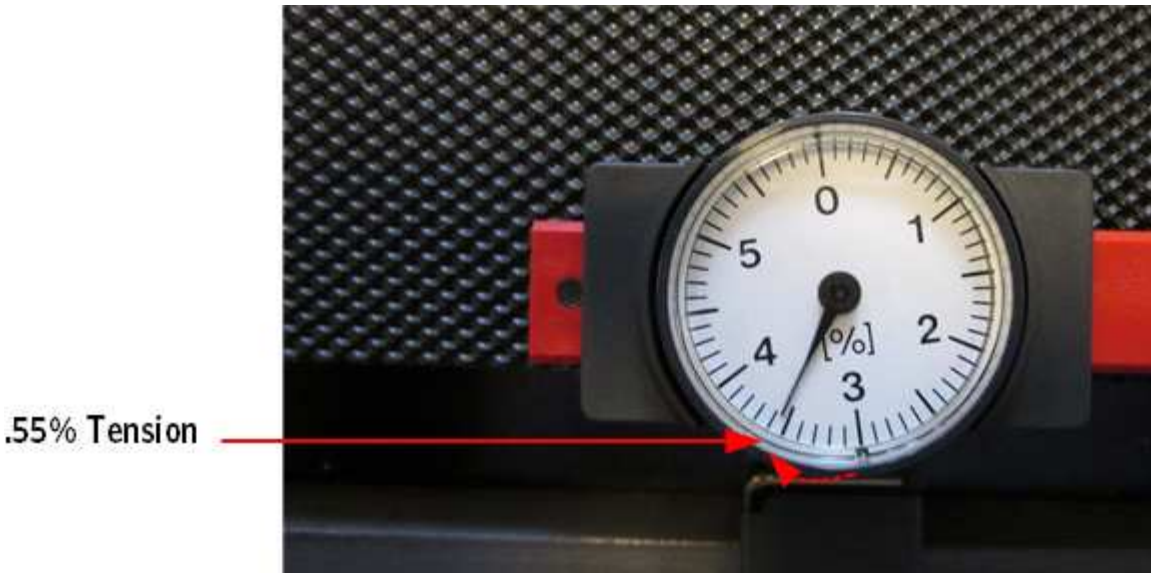
9. Walk the drive belt onto the drive roller pulley by rotating the drive motor flywheel. Be sure the belt is fully seated in the grooves of both pulleys and correctly aligned. A drive belt tension gauge should read 100-120 pounds. The drive belt de-tension after use. A range of 80-90 pounds after the belt has been installed for a while is acceptable.

### Tensioning the Running Belt

10. Move the running belt so that the seam is underneath the treadmill. Place a running belt tension gauge on each side of the running belt parallel from each other. The gauges have a fixed side and a movable side. Place the movable side to the middle of its travel and adjust the dial pointer to the number 3.



11. Carefully move the running belt so that you can see the dials easily while tightening the take up roller mounting bolts. Tighten the take up roller mounting bolts alternately in order to evenly tighten the running belt. Tighten bolts until the gauges read .55%, which is five and 1/2 lines past the number 3.



12. Remove both gauges from the running belt.

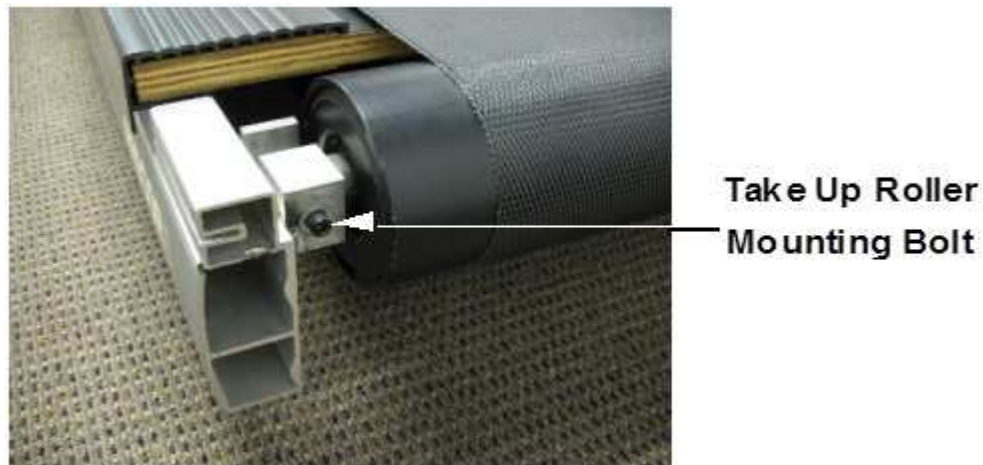
### Running Belt Tracking Adjustment

13. Place a reference point on the deck right next to one edge of the running belt so that any side to side movement can be observed, a white grease marker works well. Start the treadmill and set the speed to 1 mph. Observe the running belt, if the belt starts to drift toward the right, slowly turn the right side take up roller mounting bolt clockwise until the drifting stops. If the belt starts to drift toward the left, slowly turn the right side take up roller mounting bolt counterclockwise until the drifting stops. The adjustments should only be done in 1/4 turn increments. NOTE: ONLY use the right side take up roller mounting bolt to adjust tracking.
14. Increase the speed to 3 mph for a minute, then 6 mph, 9 mph and finally 12 mph, making any small adjustments as needed.
15. Set the treadmill speed to 3 mph and walk on the treadmill for a couple of minutes. Verify that the belt has not moved. Adjust the right side take up roller mounting bolt if needed to make final adjustments.
16. Replace the end caps or rear guard and motor cover.

## Procedure 6.14 - Take Up Roller Replacement

**Note: Two running belt gauges, Precor part number 20007-101, are required. It is important that this procedure be followed to maintain correct drive belt and running belt tension. Over tensioning the belt will lead to premature running belt wear, premature driver roller bearing failure and premature take up roller bearing failure.**

1. Remove the end caps or rear guard from the rear of the treadmill to expose the take up roller mounting bolts. Remove the treadmill motor cover.
2. Remove the deck trim from both sides.
3. Walk the drive belt off the drive roller and motor pulleys.
4. Loosen, but do not remove the drive roller mounting bolts. Release the tension evenly on both sides. These bolts are being loosened to remove the tension on the running belt.
5. If applicable, remove the rear roller guards located in the front of the take up roller.
6. Remove the take up roller mounting bolts by releasing the tension evenly on both sides. Then lift and slide the take up roller out.



7. Slide the new take up roller through the running belt and into place. Hand tighten both take up roller mounting bolts a few turns only.
8. Make sure the running belt is in the center of the deck, the spacing should be the same on each side of the running belt to the edge of the running deck.
9. Start tightening the left and right side drive roller mounting bolts. Move back and forth between the left and right side mounting bolts so the bolts will tension evenly which will reduce the stress on the threads of the bolts. The left side drive roller shaft will tighten flush to the front frame



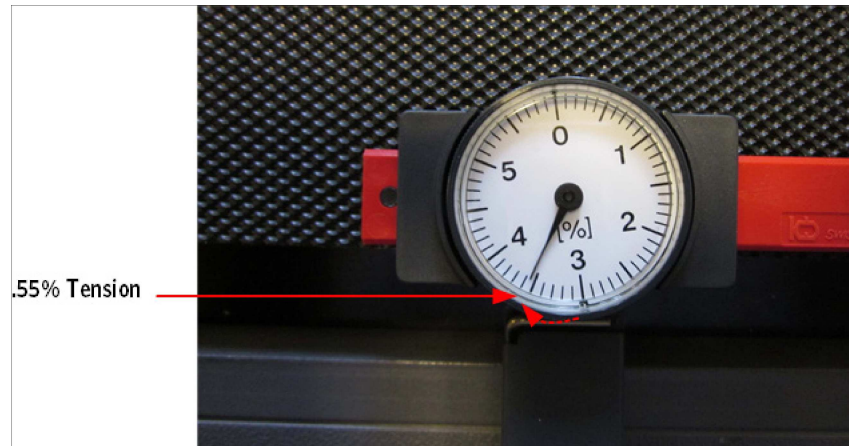
bracket. Using a measuring tape, measure the distance from the front of the left side drive roller shaft to the front of the frame cross beam and make note of that measurement. Tighten the right side drive roller bolt until it measures the same distance as the left side drive roller, shaft to frame. This will ensure that the drive roller is parallel and square to the front of the frame.

10. Walk the drive belt onto the drive roller pulley by rotating the drive motor flywheel. Be sure the belt is fully seated in the grooves of both pulleys and correctly aligned. A drive belt tension gauge should read 100-120 pounds. The drive belt de-tension after use. A range of 80-90 pounds after the belt has been installed for a while is acceptable.
11. Move the running belt so that the seam is underneath the treadmill. Place a running belt tension gauge on each side of the running belt parallel from each other. The gauges have a fixed side and a movable side. Place the movable side to the middle of its travel and adjust the dial pointer to the number 3.

NOTE: Using the number 3 as a reference point and centering the movable side of the gauge allows increment or decrement movement without impeding the travel of the gauge.



12. Carefully move the running belt so that you can see the dials easily while tightening the take up roller mounting bolts. Tighten the take up roller mounting bolts alternately in order to evenly tighten the running belt. Tighten bolts until the gauges read .55%, which is five and 1/2 lines past the number 3.



13. Remove both gauges from the running belt.

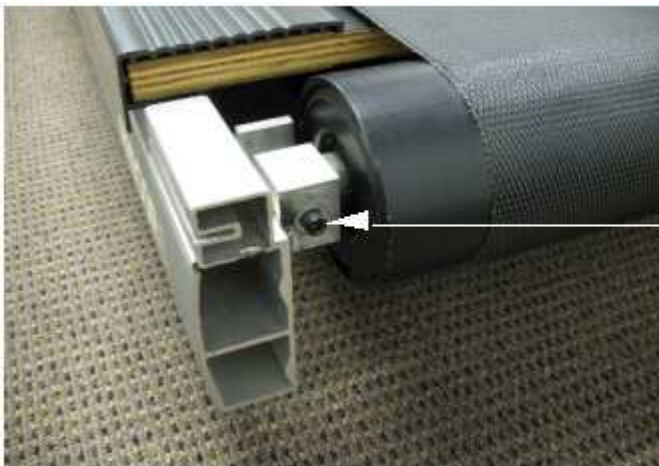
### Running Belt Tracking Adjustment

14. Place a reference point on the deck right next to one edge of the running belt so that any side to side movement can be observed, a white grease marker works well. Start the treadmill and set the speed to 1 mph. Observe the running belt, if the belt starts to drift toward the right, slowly turn the right side take up roller mounting bolt clockwise until the drifting stops. If the belt starts to drift toward the left, slowly turn the right side take up roller mounting bolt counterclockwise until the drifting stops. The adjustments should only be done in 1/4 turn increments. NOTE: ONLY use the right side take up roller mounting bolt to adjust tracking.
15. Increase the speed to 3 mph for a minute, then 6 mph, 9 mph and finally 12 mph, making any small adjustments as needed.
16. Set the treadmill speed to 3 mph and walk on the treadmill for a couple of minutes. Verify that the belt has not moved. Adjust the right side take up roller mounting bolt if needed to make final adjustments.
17. Replace the end caps or rear guard and motor cover.

## Procedure 6.15 - Running Belt and/or Deck Replacement

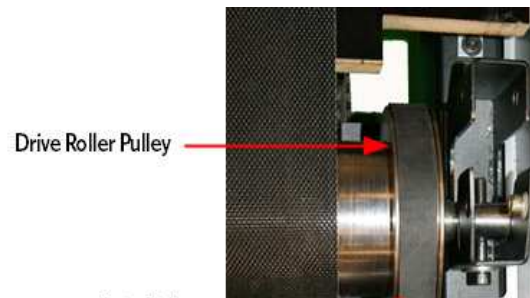
**Note:** Two running belt gauges, Precor part number 20007-101, are required. It is important that this procedure be followed to maintain correct drive belt and running belt tension. Over tensioning the belt will lead to premature running belt wear, premature driver roller bearing failure and premature take up roller bearing failure.

1. Remove the end caps from the rear of treadmill to expose the take up roller mounting bolts. Remove the treadmill's motor cover.
2. If applicable, remove the finger guard from in front of the take up roller.
3. Remove both running deck trim strips and both take up roller mounting bolts. Remove the take up roller from the treadmill.



Take Up Roller  
Mounting Bolt

4. Slowly rotate the drive motor flywheel while pressing the drive belt off of the drive roller pulley. Continue until the drive belt walks completely off of the drive roller pulley.

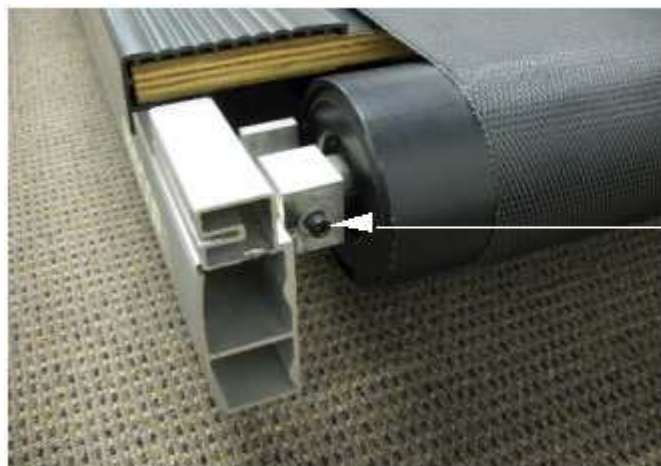




## Procedure 6.18 - Running Belt and/or Deck Replacement

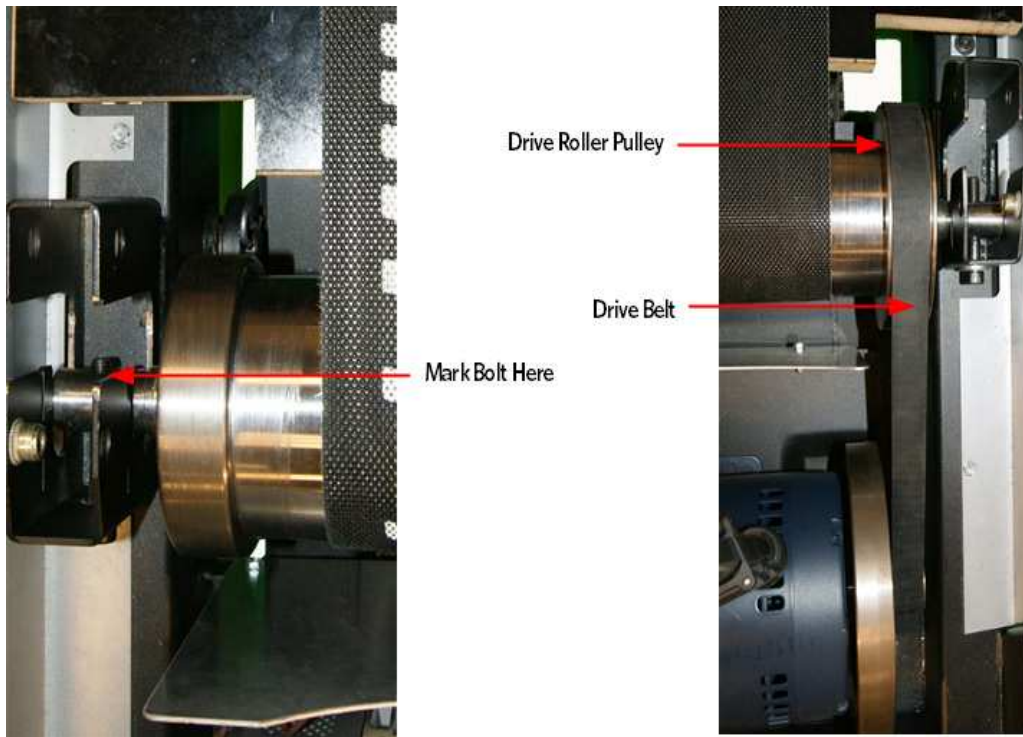
**Note:** Two running belt gauges, Precor part number 20007-101, are required. It is important that this procedure be followed to maintain correct drive belt and running belt tension. Over tensioning the belt will lead to premature running belt wear, premature driver roller bearing failure and premature take up roller bearing failure.

1. Remove the end caps from the rear of treadmill to expose the take up roller mounting bolts. Remove the treadmill's motor cover.
2. If applicable, remove the finger guard from in front of the take up roller.
3. Remove both running deck trim strips and both take up roller mounting bolts. Remove the take up roller from the treadmill.



**Take Up Roller  
Mounting Bolt**

4. Slowly rotate the drive motor flywheel while pressing the drive belt off of the drive roller pulley. Continue until the drive belt walks completely off of the drive roller pulley.



5. Remove the four bolts and the retaining plates that hold the deck to the frame. Lift the deck and running belt up and away from the treadmill.



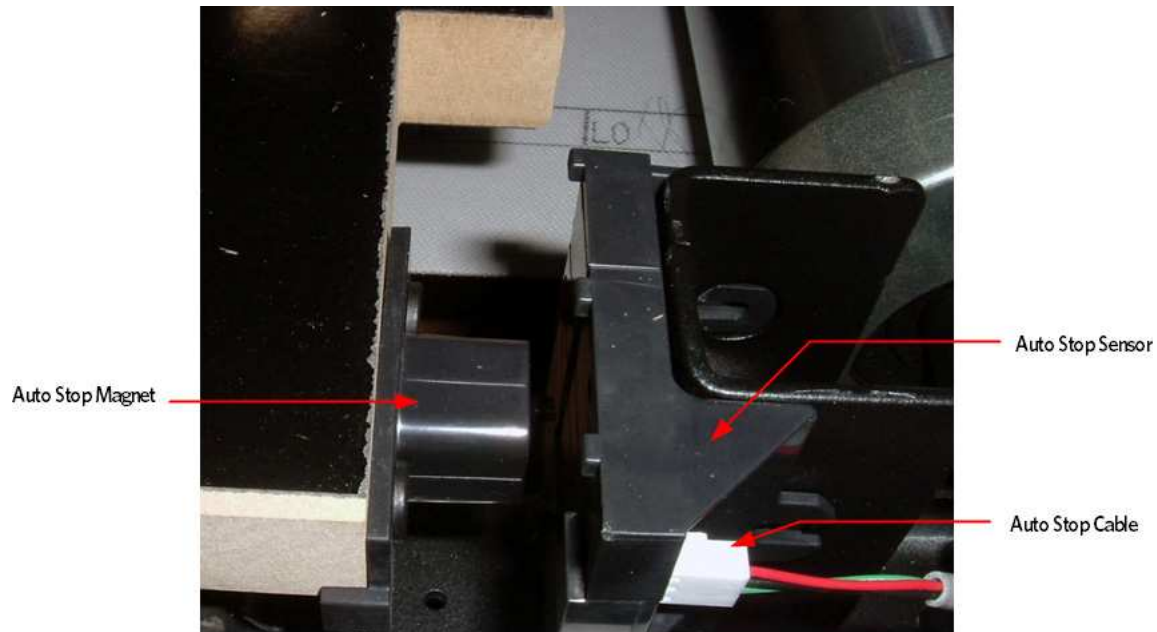
6. Remove both drive roller mounting bolts releasing the tension evenly on both sides. Remove the drive roller from the treadmill using the drive belt as a handle.
7. Remove the Auto Stop magnet from the deck, if applicable. Slip the running belt off the deck and discard. Remove the inserts from the deck and flip it over. re-insert them into the new deck surface.

If the deck has already been flipped replace it with a new deck. Make sure that the new deck surface is clear of debris. Ensure the new deck is installed with the inserts on the bottom of the deck.

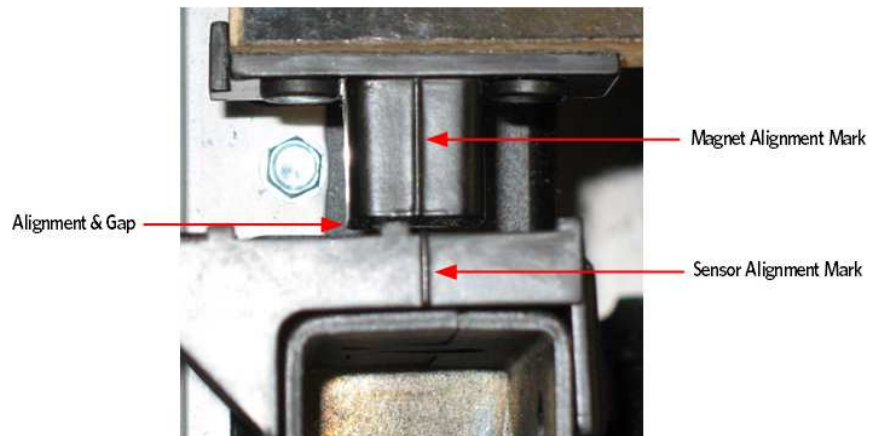
8. The new running belt will have an arrow pointing in one direction on the underside. The arrow indicates the correct direction of travel for the belt. Premature belt failure will occur if the belt is installed incorrectly. Slip the new running belt onto the deck and carefully place them back onto the treadmill.



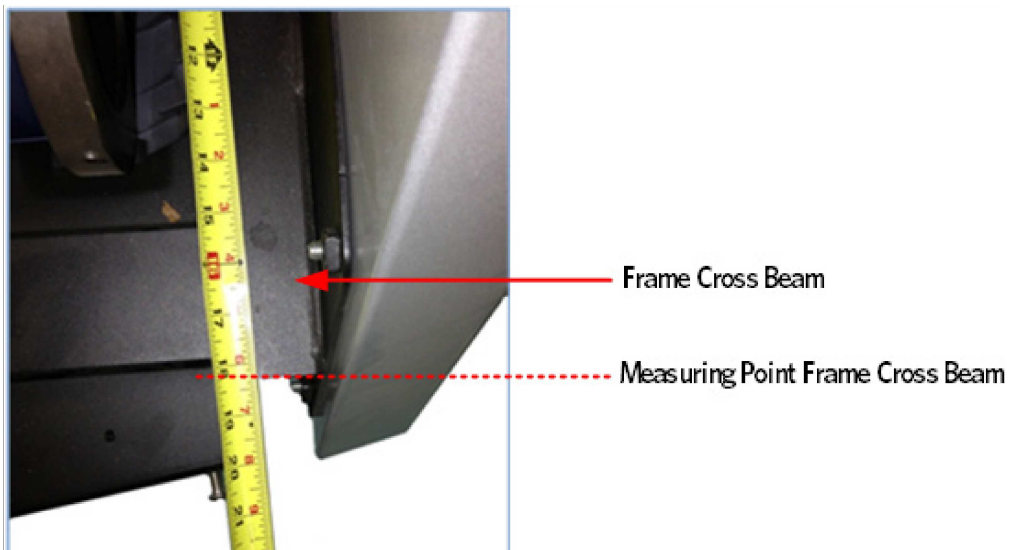
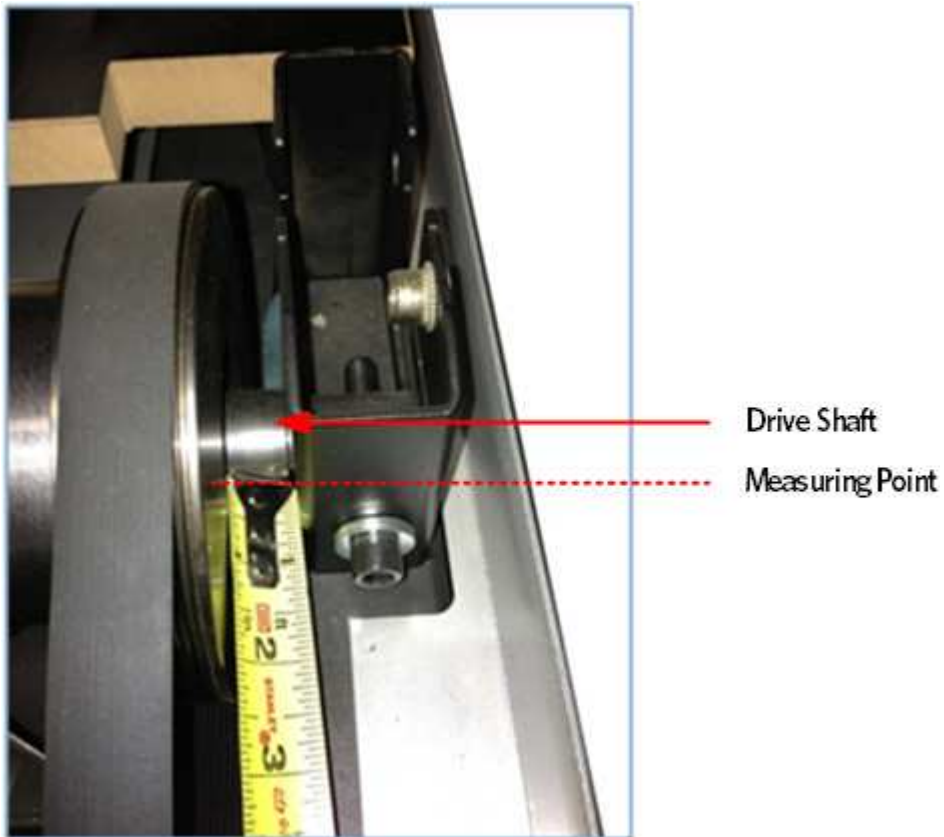
9. Reinstall the Auto Stop magnet on the right front corner of the deck, if applicable.



10. Slide the running deck back into position over the running deck pivot bracket. Align the bottom plate and pivot bracket holes with the running deck bolt holes. Replace the plates and the running deck mounting bolts removed in step 7. Only hand tighten the bolts at this time.
11. Hand tighten the bolts and washers back onto the deck securing it to the frame ensuring the bottom retaining plates are between the deck and the pivots. Verify the spacing on all four corners that they are the same..
12. Check the alignment of the magnet and the auto stop assembly. The magnet and the auto stop assembly each have an alignment mark on the top of their housings. The magnet mark and the auto stop mark should align and the gap should be approximately 3/16 of an inch between the housings. A 3/16 allen wrench can be used as a feeler gauge to set the correct gap. If the gap or alignment are off adjust the running deck until the magnet and auto housing are properly aligned.



13. Tighten the bolts so the deck is secure. Torque the bolts to 150 inch pounds.
14. Make sure the running belt is in the center of the deck, the spacing should be the same on each side of the running belt to the edge of the running deck.
15. Start tightening the left and right side drive roller mounting bolts. Move back and forth between the left and right side mounting bolts so the bolts will tension evenly which will reduce the stress on the threads of the bolts. The left side drive roller shaft will tighten flush to the front frame bracket. Using a measuring tape, measure the distance from the front of the left side drive roller shaft to the front of the frame cross beam and make note of that measurement. Tighten the right side drive roller bolt until it measures the same distance as the left side drive roller, shaft to frame. This will ensure that the drive roller is parallel and square to the front of the frame.



16. Walk the drive belt onto the drive roller pulley by rotating the drive motor flywheel. Be sure the belt is fully seated in the grooves of both pulleys and correctly aligned. A drive belt tension gauge should read 100-120 pounds. The drive belt de-tension after use. A range of 80-90 pounds after the belt has been installed for a while is acceptable.



17. Move the running belt so that the seam is underneath the treadmill. Place a running belt tension gauge on each side of the running belt parallel from each other. The gauges have a fixed side and a movable side. Place the movable side to the middle of its travel and adjust the dial pointer to the number 3.

NOTE: Using the number 3 as a reference point and centering the movable side of the gauge allows increment or decrement movement without impeding the travel of the gauge.



18. Carefully move the running belt so that you can see the dials easily while tightening the take up roller mounting bolts. Tighten the take up roller mounting bolts alternately in order to evenly tighten the running belt. Tighten bolts until the gauges read .55%, which is five and 1/2 lines past the number 3.
19. Remove both gauges from the running belt.

### Running Belt Tracking Adjustment



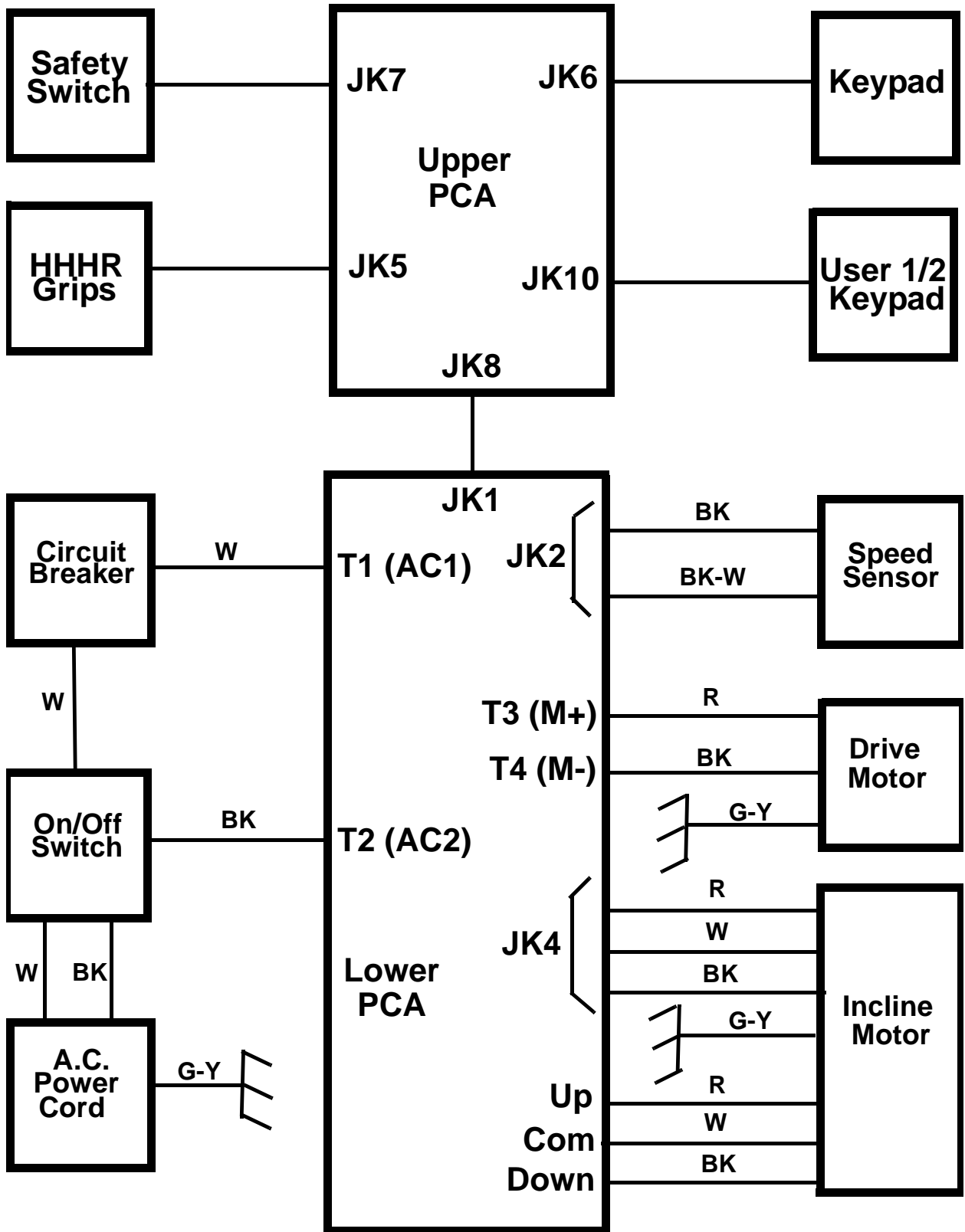
20. Place a reference point on the deck right next to one edge of the running belt so that any side to side movement can be observed, a white grease marker works well. Start the treadmill and set the speed to 1 mph. Observe the running belt, if the belt starts to drift toward the right, slowly turn the right side take up roller mounting bolt clockwise until the drifting stops. If the belt starts to drift toward the left, slowly turn the right side take up roller mounting bolt counterclockwise until the

drifting stops. The adjustments should only be done in 1/4 turn increments. NOTE: ONLY use the right side take up roller mounting bolt to adjust tracking.

21. Increase the speed to 3 mph for a minute, then 6 mph, 9 mph and finally 12 mph, making any small adjustments as needed.
22. Set the treadmill speed to 3 mph and walk on the treadmill for a couple of minutes. Verify that the belt has not moved. Adjust the right side take up roller mounting bolt if needed to make final adjustments.
23. If applicable, replace the finger guard.
24. Replace both running deck trim strips and the end caps and motor cover.



Diagram 7.1 - Wiring Diagram



# Diagram 7.2 Block Diagram

9.23, 9.27 Treadmill

