C100i Adaptive Motion Trainer

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.

Acrobat Reader Users:
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

Right, Left, Front, and Back Conventions

In this manual, right, left, front, and back are from the perspective of a user standing on the C100i facing the display enclosure.

General System Information

- The generator performs three functions in the C100i. First, by controlling the amount of electrical current applied from the generator to a load circuit, the user's pedalling resistance is controlled. Second, the generator is used to charge the C100i's internal battery. Lastly, one of the generators three phase output windings is monitored to determine when the unit is in use and when it is idle. This system also determines the step rate by determining the operating speed (output frequency) of the monitored generator winding. There is also a magnetic brake that applies resistance to horizontal motion and a sensor that measures horizontal motion (stride length).

Warning and Caution Statements and General Safety Guidelines

Warning statements indicate a particularly dangerous activity. Warning statements you will find in this manual include:

- Because this is a self powered unit, it will either be necessary to either equip the unit with the optional external power supply or have an assistant pedal on the unit while voltage measurements are being taken. Because of the danger of working on the unit while it is in motion using the optional external power supply is strongly recommended.

- When the unit is used, stairarms are in motion, the generator will operate and produce potentially hazardous voltages even when the battery is disconnected.

- To remove power from the C100i, the optional external power supply (when equipped) must be disconnected from the wall outlet and the red (positive) wire must be disconnected from the battery. Always ensure that the C100i external power supply is unplugged from the wall outlet and the red (positive) wire is removed from the battery when you inspect or adjust the C100i, or when you isolate, remove, or replace an C100i component.

- Removing the covers exposes high voltage components and potentially dangerous machinery. Exercise extreme caution when you perform maintenance procedures with the cover(s) removed.

- During service operations you will be very close to moving machinery and voltage bearing components. When you perform maintenance procedures with the covers removed, remove jewelry (especially from ears and neck), tie up long hair, remove neck ties, and do not wear loose clothing.

- Exercise caution when touching any wire or electrical component during C100i operation.

- A pinching hazard exists when the unit is operated. It is possible to seriously pinch a finger. The C100i can be mechanically “locked” by inserting a screwdriver through the primary sheave and frame. See the illustration below. Locking the AMX100i will prevent accidental pinching.

- Caution statements are intended to prevent damage to the C100i as a result of the current activity. Caution statements included in this manual are listed below:

- When it is necessary to lift or move the C100i, ensure that the C100i has adequate support and that you use proper lifting techniques. When the rear platform is removed, the C100i may be lifted from the rear and moved like a “wheelbarrow”.

Safety guidelines you should know and follow include:

- Read the owner’s manual and follow all operating instructions.

- Operate the C100i on a solid, level surface with the unit properly leveled. The C100i is properly leveled when all five “feet” are in contact with the floor. Visually check the C100i before beginning service or maintenance operations. If it is not completely assembled or is damaged in any way, exercise extreme caution while operating and checking the C100i.

- When operating the C100i, do not wear loose clothing. Do not wear shoes with heels or leather soles. Check the soles of your shoes and remove any embedded stones. Tie long hair back.

- Do not rock the unit. Do not stand or climb on the handlebars, display enclosure, or cover.

- Do not set anything on the handlebars, display enclosure, or cover. Never place liquids on any part of the C100i, while performing service.

- To prevent electrical shock, keep all electrical components away from water and other liquids.
- Do not use accessory attachments that are not recommended by the manufacturer-such attachments might cause injuries.
- C100i's equipped with Cardio Theater PVS units will have external power supply and coaxial cable routed through the bottom of the unit to the top of the display console. Cord management must be maintained.

General Information

For the latest exploded view, part number and part pricing information, visit the Precor dealer website at "www.precor.com/connection".

Tools Required

Multimeter
Anti-static kit
4" - 6" gear puller
Precor part number 20030-108 belt gauge
US and metric end wrench set
US and metric socket wrench set
Torque wrench, 200 in./lbs.
Torque wrench, 200 ft./lbs
Allen wrench set
Screwdriver set

Section Two - Preventive Maintenance

Preventive maintenance measures are either scheduled or unscheduled. Scheduled preventive maintenance activities are included here so that you are aware of preventive measures performed on a regular basis.

Regular Preventive Maintenance (Owner)

Cleanliness of the C100i and its operating environment will keep maintenance problems and service calls to a minimum. Precor recommends that you perform the following preventive maintenance schedule.

After Each Use

- Wipe down the covers, handlebars and stairarms with a damp cloth.

Daily Maintenance

Clean the C100i's frame, covers, stairarms and foot pedals using water or a 30:1 solution of Simple Green® and water. Wipe the surface of the electronic console with a damp sponge or soft cloth. Dry with a clean towel. A 30:1 solution of Simple Green® and water or Contec Athletix® wipes are the only cleaning products that have been tested and approved for use on the C100i. The use of an acid (citric) based cleaner is not authorized by Precor.

Weekly Maintenance

- Vacuum underneath the C100i, following these steps:

    1. Unplug the optional external power supply (when equipped) from the AC outlet
    2. Remove the platform at the rear of the C100i.
    3. Carefully lift the rear of the C100i and move it to a temporary location.
    4. Vacuum the rug or damp mop the floor.
    5. Make sure that the floor is dry before returning the C100i to its original position and replacing the platform.

- Re-level the C1100i to ensure that all five "feet" are in contact with the floor.
- Thoroughly test all C100i per Section Four, including heart rate.
- Cardio Theater cord management must be observed.

Quarterly Maintenance

1. Remove the side covers per Procedure 7.12.
2. Check the belt alignment and tension as in Procedure 5.2.
3. Clean the inside of the C100i.
4. Inspect fasteners for proper tightness and torque.
5. Check for excessive noise during vertical and horizontal operation.
6. Replace the side covers.
7. Re-level the C100i to ensure that all five “feet” are in contact with the floor.

On-Site Preventive Maintenance (Service Technician)

When you are called to service a C100i, perform these preventive maintenance activities:

- Perform the software diagnostics. Check LED and keypad function. Record the odometer reading.
- Check stride rate and stride length sensor function (is the stride rate and stride length displayed when the unit is in operation?).
- Visually inspect the drive belts for cracks, fraying or excessive wear.
- When furnished, inspect the optional power supply cords. If a power supply cord(s) is damaged, install a new power supply.
- Visually examine all wires and check connectors and wire connections. Secure connections and replace wiring as necessary.
- Cardio Theater cord management must be observed.

Procedure 3.1 - Software Access Codes

The C100i uses the standard access codes to provide access to the various software features. Use the **RESET** key and the numeric keypad to enter the access code. The access code must be entered when the Precor banner is scrolling on the display. The standard access codes use all sequential key presses. The allowable delay between key presses is short. If too much time is taken between key presses the access procedure will be aborted and the display will return to the idle state with the Precor banner displayed. If the access is aborted, it will be necessary to start over from the beginning. Refer to Diagram 3.1.

Standard Access Codes

Diagnostics	Keys **RESET**,**5,1,7,6,5,7,6,1**
Odometer	Keys **RESET,6,5**
Club Settings	Keys **RESET,5,6,5,1,5,6,5**

Diagram 3.1 - C100i Display

Procedure 3.2 - Accessing the Diagnostic Software

The treadmill's diagnostic software consists of the following modes:

- Display Test
- Keyboard Test
- Heart Rate Test
- Brake Test
- RPM Test
- Battery Test
- Stride Position Test

Procedure

1. Start pedaling the C100i using a vertical motion.

2. Using the **RESET** key and the numeric keypad, press keys **RESET,5,1,7,6,5,7,6,1**, sequentially.

3. **Hardware Validation** will scroll across the display followed by **DISPLAY TEST**.

4. Press the **OK** key, the upper most group of LED's will illuminate on the display. Check the display to ensure that all LED segments are illuminated.

5. Press the **OK** key six more times to display the remaining LED groups. Check each display group to ensure that all LED segments are illuminated.

6. Press the **CLEAR** key then the ▼ key, **KEYBOARD TEST** will scroll across the display.

7. Press the **OK** key, a representation of all of the keys on the console will be displayed. Pressing a key on the console will cause the representation of that key to go off. Press all of the keys on the console to ensure that all of the keys are functioning.

8. Press and hold the **CLEAR** key then the ▼ key, **HEART RATE** will be displayed.

9. Grasp both of the heart rate grips on the handlebar, after a couple of seconds the heart rate will be displayed in the heart rate display. The unfiltered an filtered heart rate will be displayed in the lower display window.

10. Use chest strap transmitter or a test transmitter to test the wireless heart rate function, after a couple of seconds the heart rate will be displayed in the heart rate display. The unfiltered an filtered heart rate will be displayed in the lower display window.

11. Press the **CLEAR** key then the ▼ key, **BRAKE TEST** will scroll across the display.

12. Press the **OK** key, **BRAKE** will be displayed.

13. Press the **OK** key, **PWRB** will be displayed with the current power bit reading. Pressing the resistance ▲,▼ will change the power bit setting.

14. Press the **CLEAR** key then the ▼ key, **RPM TEST** will scroll across the display.

15. Press the **OK** key, **RPM** will be displayed.

16. Press the **OK** key, **PULSE** will be displayed with the current speed pulse count.

17. Press the **CLEAR** key then the ▼ key, **BATTERY TEST** will scroll across the display.

18. Press the **OK** key, the current battery voltage will be displayed.

19. Press the **CLEAR** key then the ▼ key, **STRIDE POSITION TEST** will scroll across the display.

20. Press the **OK** key, the low, high and actual stride positions will be displayed. The low display shows the lowest position reading achieved during the test. The high display shows the highest position reading achieved during the test. The actual display changes with the current stride position. Stride on the AMT to the maximum horizontal movement in both directions. At maximum stride length the low stride display should read 0 and the high stride display should read 40.

21. Press the **OK** key, the low and stride positions will be displayed.

22. Press the **RESET** key to exit the hardware validation test.

Procedure 3.3 - Information Display

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

Procedure

The information display will access the following data;

- Odometer
- Hour Meter
- U-Boot Software
- U-Base Software
- Lower Base Software
- Metrics Board Software
- Stride Dial Software
- Serial Number
- Usage log
- Error Log

Procedure

1. Start pedaling the C100i using a vertical motion.

2. With the **PRECOR** banner scrolling, press the keys **RESET,6,5,** sequentially.

3. **DIAGS-INFORMATION DISPLAY** will scroll across the display.

4. Use the ▲,▼ keys to move to the desired display shown in the list above.

5. **ODOMETER** display. Press the **OK** key.

6. The horizontal distance will be displayed in miles or kilometers and the vertical distance will be displayed in steps.

Note: The odometer data is stored in non-volatile memory on the upper PCA. If the upper PCA is replaced the odometer data will be lost.

7. Press the **CLEAR** key to exit the odometer display.

8. **HOUR METER** display. Press the **OK** key.

9. The operating time of the unit will be displayed as **12345 HOURS**. The operating time is defined as total amount of time that the unit has operated in program modes. The hour meter is also used to provide the “time stamp” for the error code log.

10. Press the **CLEAR** key to exit the hour meter display.

11. **U-BOOT SW** display. This display the installed version of upper boot software. The boot software is used to upload new software into the upper display PCA.

12. Press the **OK** key. The software part number will be displayed as **XXXXX-XXX.**

13. Press the **CLEAR** key to exit the U-Boot SW display.

14. **U-BASE SW** display. This display the installed version of upper PCA software.

15. Press the **OK** key. The software part number will be displayed as **XXXXX-XXX.**

16. Press the **CLEAR** key to exit the U-Base SW display.

17. **LOWER BASE SW** display. This display the installed version of lower PCA software.

18. Press the **OK** key. The software part number will be displayed as **XXXXX-XXX.**

19. Press the **CLEAR** key to exit the lower SW display.

20. **METRICS BOARD SW** display. This display the installed version of lower PCA software.

21. Press the **OK** key. The software part number will be displayed as **XXXXX-XXX.**

22. Press the **CLEAR** key to exit the lower SW display.

23. **STRIDE DIAL SW** display. This display the installed version of lower PCA software.

24. Press the **OK** key. The software part number will be displayed as **XXXXX-XXX.**

25. Press the **CLEAR** key to exit the lower SW display.

26. **SER. NUMBER** display. Press the **OK** key.

27. The C100i's serial number will be displayed. The serial number may be incorrect or not displayed if the upper PCA has been replaced.

28. Press the **CLEAR** key to exit the serial number display.

29. **USAGE LOG** display. Press the **OK** key.

30. Use the ▲,▼ keys to move through the list of programs. A message will scroll describing the program, the number of times and the number of minutes the program was used.

31. Press the **CLEAR** key to exit the usage log display.

32. **ERROR LOG** display. Press the **OK** key, the quantity of errors in the log will be displayed.

33. Press the **OK** key, the most recent error will be displayed first.

34. Use the ▲,▼ keys to move through the list of errors. The error messages will list the error name, the odometer reading when the error occurred, the hour meter when the error occurred and the drive motor current reading when the error occurred.

35. If you wish to clear the error log, press and hold the **QUICK START** key. The message **HOLD TO CLEAR ERRORS** will be displayed. The error log will be cleared when the message **NO ERRORS** is displayed.

36. Press the **RESET** key to exit the information display.

37. Please note that the **ERROR LOG** may also be accessed at any time by pressing and holding the **RESET** key for four seconds. If the error log does not contain any errors, the message **STUCK KEY** will be displayed.

Procedure 3.4 - Selecting Club Settings

Procedure

This procedure allows you to change the following club settings:

- Select Language
- Select Units
- Set Max Workout Time
- Set Max Pause Time
- Set Cool Down Time

Procedure

1. Start pedaling the C100i using a vertical motion.
2. With the banner scrolling, press keys **RESET,5,6,5,1,5,6,5**, sequentially.
3. Use the ▲,▼ keys to move to the desired display shown in the list above.
4. **DIAGS-SET CLUB PARAMETERS** will scroll across the display.
5. When **SELECT LANGUAGE** is displayed. Press the **OK** key.
6. Use the ▲,▼ keys to toggle between the available languages.
7. Press the **BACK** key to exit the select language display.
8. **SELECT UNITS** display. Press the **OK** key.
9. Use the ▲,▼ keys to toggle between **U.S** and **METRIC** measurements.
10. Press the **BACK** key to exit the set units display.
11. **SET MAX WORKOUT TIME** display. Press the **OK** key.
12. Use the ▲,▼ keys to select the maximum time a user can remain in a program.
13. Press the **BACK** key to exit the set max. workout time display.
14. **SET MAX PAUSE TIME** display. Press the **OK** key.
15. Use the ▲,▼ keys to select the maximum time a program will remain in the pause mode.
16. Press the **BACK** key to exit the set max. pause time display.

17. **SET COOL DOWN TIME** display. Press the **OK** key.
18. Use the ▲,▼ keys to select the cool down time from 0 to 5 minutes.
19. Press the **BACK** key to exit the set cool down time display.
20. Press the **RESET** key to exit the club settings program.

Procedure 3.5 - Documenting Software Problems

When a problem is found with either the upper software or lower PCA's, record the information listed below. Refer to Procedure 3.6 to install new upper software. Please note, installing new upper software is only appropriate if a later software version containing a correction for the problem experienced is available. If an appropriate software version is not available the information below must be forwarded to Precor customer support. This information will be used to correct and create new software, whenever it is appropriate.

When a problem occurs, record the following information:

- Model and serial number
- Software part numbers, Procedures 3.3.11 to 3.3.25.
- User and 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.

Procedure 3.6 - Software Uploading Procedure

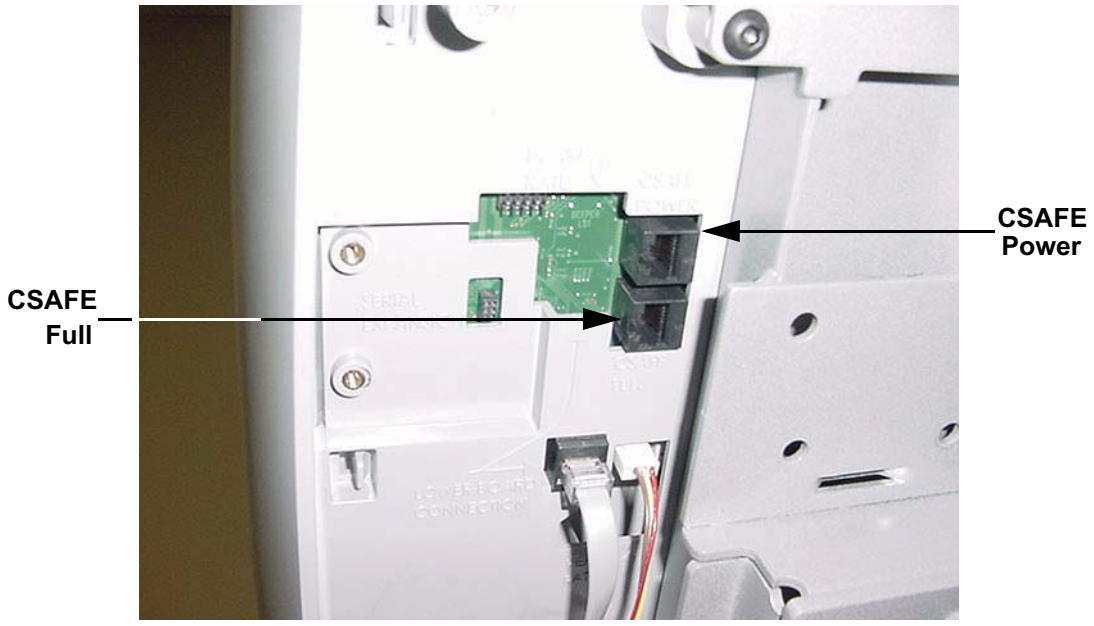
This unit utilizes an upper PCA software system that is capable of on site upper PCA software uploading (re-programming). The software upload may be accomplished with the use of a pocket PC or a laptop computer. Contact Precor Technical Support for details.

Upload Procedure

1. The C100i must be “powered down” before the upload procedure can be initiated. Ensure that the C100i has not be used for a sufficient time to allow the lower PCA to completely discharge. The light emitting diode on the lower PCA will go out when the power supply is discharged, approximately 45 seconds.

2. If the CSAFE Full port is in use, temporarily disconnect the RJ-45 cable from the CSAFE Full port. If the CSAFE Full port is not in use, temporarily remove the plastic plug from the CSAFE Full port.

Console, Rear View, with Rear Cover Removed,



3. Connect the computer interface cable to the CSAFE Full port.

4. Select the software file to be uploaded on the computer.

5. Start pedaling the C100i or power up using the external power supply. When the C100i “powers up” the upload will commence. Upload status is displayed on the PC, when 100% is reached the upload is complete. You must continue to pedal until the upload is complete, approximately 2 minutes.

6. Stop pedaling or disconnect the external power supply when the upload is complete, and allow the lower PCA to completely discharge. The light emitting diode on the lower PCA will go out when the power supply is discharged.

7. Start pedaling the C100i, after it has been allowed to power down, the C100i will now be operating on the newly uploaded software.

8. Verify software version per Procedure 3.3.

9. Thoroughly, check the C100i's function per Section Four.

Section Four - Checking C100i Operation

This section provides you with a quick method of checking C100i operation. Check the operation of the C100i at the end of most maintenance procedures.

Procedure

1. Start striding on the C100i or plug the optional external power supply (when available) into the C100i and the AC outlet.

2. When the **PRECOR** banner displayed, press **QUICK START**.

3. Select Resistance Level 1 and press **ENTER**.

4. Operate the C100i for 4–5 minutes. As you operate the C100i, concentrate on the operating sounds made by the unit. Be on the alert for unusual rubbing, hitting, grinding, or squeaking noises.

5. Ensure that the C100i is properly leveled, that all five “feet” are in contact with the floor and there is no side to side rocking.

6. If the C100i makes unusual noises or the electronic display does not change appropriately, troubleshoot per Section 6.

7. Press the **RESISTANCE ▲** key until you reach Resistance Level 10. Operate the C100i for another 2–3 minutes.

8. If the C100i resistance does not change or the operation of the C100i feels inconsistent compared with Resistance Level 1, troubleshoot per Section 6.

9. Press the **RESISTANCE ▲** key until you reach Resistance Level 20. Operate the C100i for another 2–3 minutes.

10. If the resistance of the C100i does not change or the C100i operation feels inconsistent with Resistance Levels 1 and 10, troubleshoot per Procedure 6.4.

11. Check the LED’s mounted on the upper PCA and the function keys displayed on the electronic console by performing Procedure 3.2.

12. Check stride indicator for proper operation.

13. Check wireless and hand held heart rate functions.

Procedure 5.1 - Measuring the Resistance of a Generator

Caution
If a external power supply is connected to the C100i, disconnect the external power supply from the C100i before continuing with this procedure.

Procedure

1. Remove the right side cover per Procedure 7.12.

2. Remove the red battery wire from the lower PCA. See Diagram 5.1.

WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

3. Set the ohmmeter to a range that will conveniently read up to 50 Ω.

4. Remove the two wires from the **LOAD** terminals of the lower PCA.

5. With an ohmmeter, read between the wires removed in step 5. The reading should be approximately 10Ω. Replace the two wires removed in step 5.

6. Remove the three wires from the **3 PHASE GEN IN** terminals of the lower PCA.

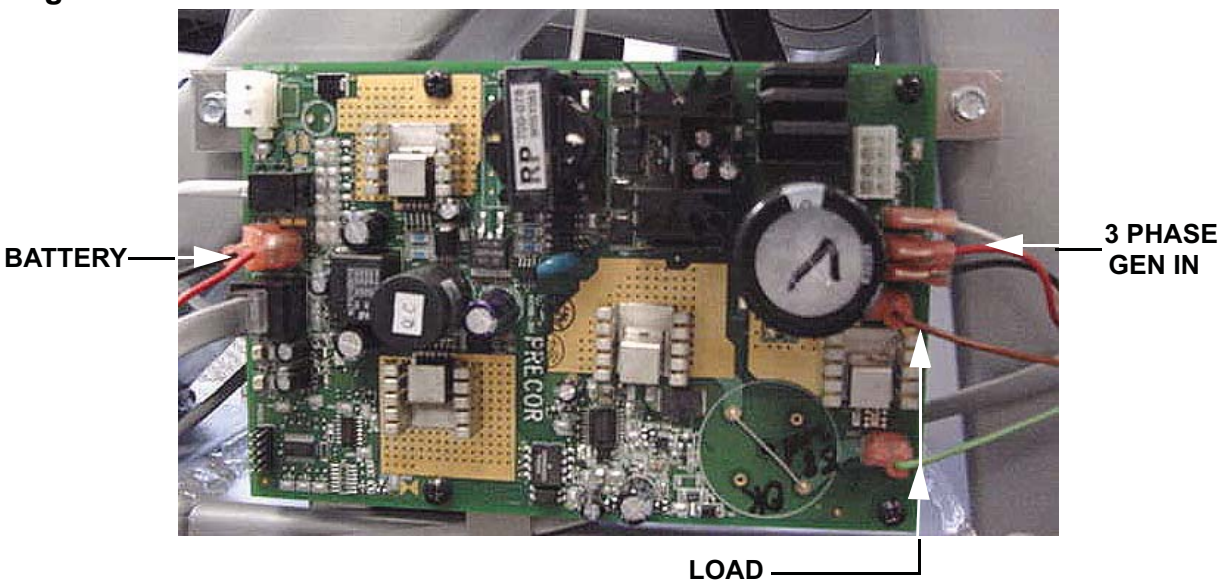
7. With an ohmmeter, read between the red & white, red & black and white & black wires. Each reading should be approximately 25Ω. Reconnect the wires removed in step 7.

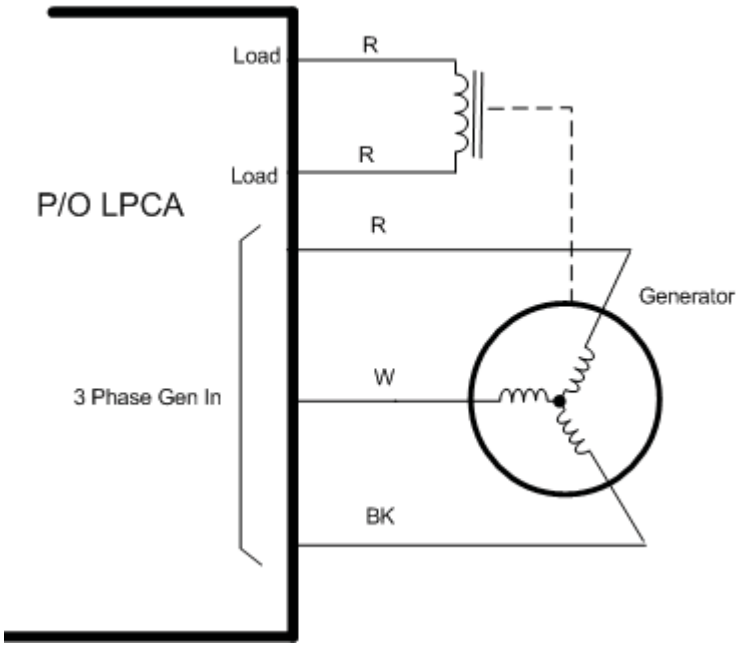
8. If any of the readings are significantly high or significantly low, remove the intermediate cable from the generator and perform the same measurements as in step 4 on the generator connector. If the reading are now correct check and or replace the intermediate cable.refer to Diagram 5.1. If the readings are still incorrect, remove the three phase generator.

9. Reconnect the red battery wire removed in step 3.

10. Replace the right side cover.

Diagram 5.1 - Lower PCA





Procedure 5.2 - Inspecting and Adjusting Belt Tension

WARNING

Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

Procedure

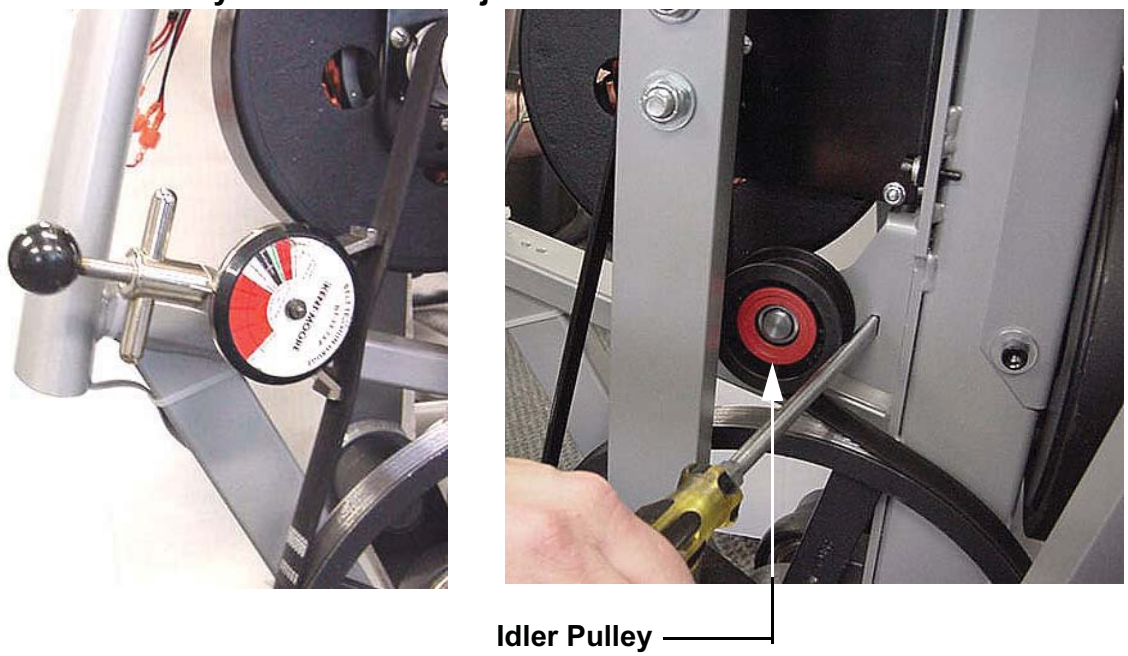
Primary Belt Adjustment

.

1. Remove the front, rear, left and right side covers per Procedure 7.12.

2. Place a belt gauge to the primary belt as shown in Diagram 5.2.

Diagram 5.2 - Primary Belt Tension Adjustment



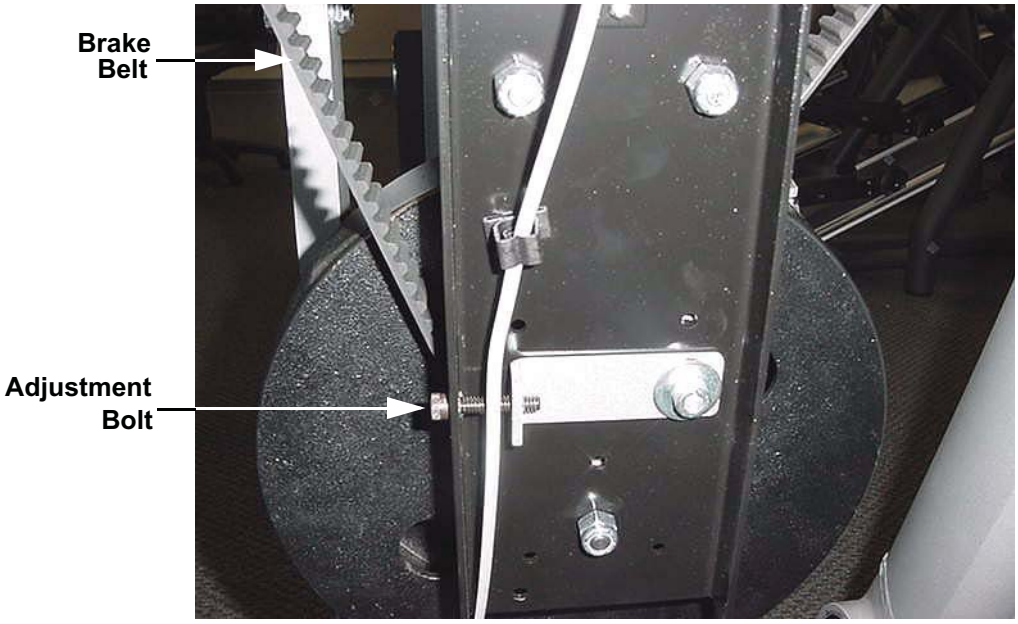
3. The belt gauge should read approximately 70 lbs. If the belt tension is significantly high or low the belt tension may be adjusted by loosening the idler pulley mounting bolt and carefully prying against the idler pulley to obtain the correct belt tension. When belt the tension is correct, torque the idler pulley mounting bolt to 17 - 21 foot pounds (200 - 250 inch pounds).

Brake Belt Adjustment

4. Check the tension of the brake belt using the belt gauge, shown in Diagram 5.2. Belt tension should be 110 lbs ± 10 lbs.

5. If the belt tension is incorrect, adjust the belt tension using the adjustment bolt shown in Diagram 5.3.

Diagram 5.3 - Brake Belt Idler Pulley Mounting Bolt



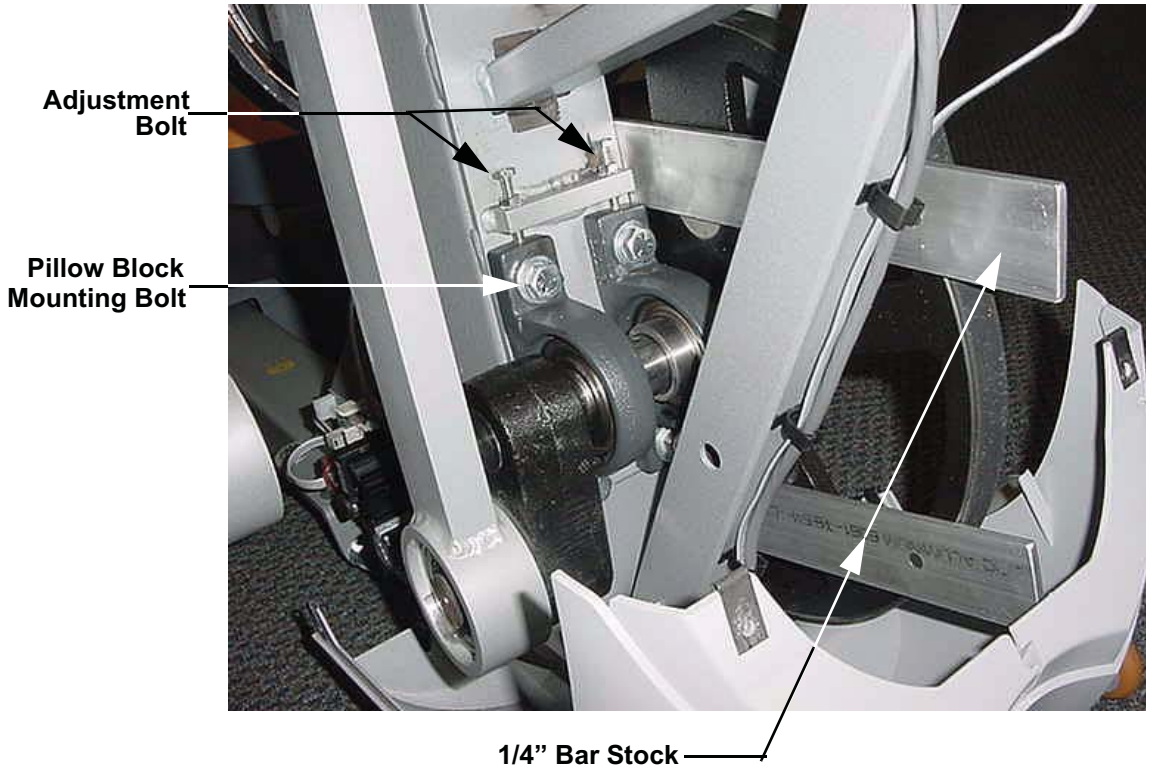
Procedure 5.3 - Drive Belt Alignment

The alignment of the drive belt between the generator pulley and the primary pulley is important. Incorrect alignment will cause premature belt wear and/or belt noise.

1. Remove front, rear, left and right side covers per Procedure 7.12.

2. Loosen but do not remove the four pillow block mounting bolts. See Diagram 5.4.

Diagram 5.4 - Drive Belt Alignment



3. Slide two pieces of 1/4” inch thick bar stock between the upper and lower portions primary pulley and the frame as shown Diagram 5.4.

4. Use the two adjustment bolts, shown in Diagram 5.4, to align the primary pulley square to frame and a 1/4” from the frame.

5. Torque the four pillow block mounting bolts to 60 - 65 foot pounds (720 - 780 inch pounds).

6. Test the alignment of the drive belt by pedaling the unit in both the forward and reverse directions. The drive belt must remain squarely on the pulley face, not riding off the edge of the pulley, with no belt noise being generated.

7. Replace the covers removed in step 1.

Procedure 6.1 - Troubleshooting Interconnect Cable

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

Troubleshooting the Upper Interconnect Cable

1. Remove the display's rear cover.
2. Remove the right side cover.
3. Disconnect the interconnect cable from the upper PCA and the lower PCA.
4. External of the upper column, connect a replacement interconnect cable to the lower PCA and the upper PCA.
5. Check operation as described in Section 4. If the unit works properly, replace the interconnect cable as described in Procedure 7.3.
6. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.

Procedure 6.2 - Troubleshooting the Keypad and Upper PCA

If the function keys on the electronic console are unresponsive, the problem may be either the upper PCA or keypad.

WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One.

1. Attach the anti-static wrist strap to your arm, then connect the ground wire of the wrist strap to the units frame.

2. If the C100i powers up and functions normally until a particular key(s) is pressed, skip to step 10.

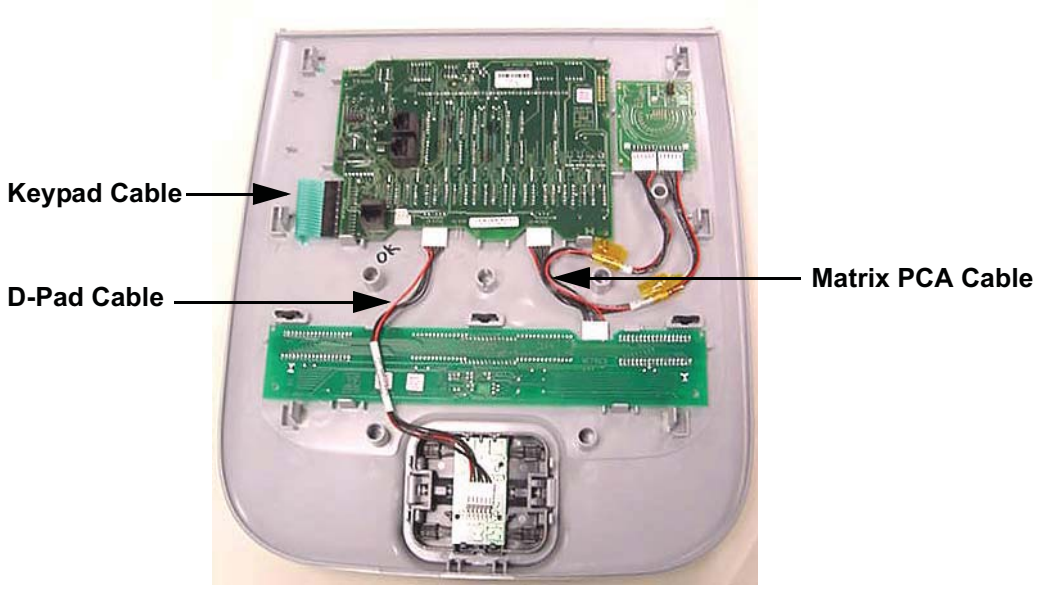
3. If a “stuck key” message is immediately displayed when the C100i is powered up, continue with the next step.

4. This condition may be caused by either the keypad or upper PCA.

5. Remove the four screws that attach the display’s rear cover.

6. Unsnap display housing front panel from the display housing. Remove the keypad cable from the upper PCA. Refer to Diagram 6.1.

Diagram 6.1 - Upper PCA & Keypad



7. If a “stuck key” message is immediately displayed when the C100i is powered up, replace the upper PCA.

8. If a “stuck key” message is not displayed when the C100i is powered up, replace the display housing front panel. The display housing front panel is equipped with the keypad.

9. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer service.

10. Access the diagnostics program per procedure 3.2. If the key(s) necessary to access the diagnostic program is not functioning, skip to step 14.

11. Test the keypad per Procedure 3.2.

12. If all of the keys test good, the problem may be user error or a key function that is normally disabled during a particular user program.

13. If one or more keys do not function correctly, either the keypad (display housing) or upper PCA could be defective. Replace the display and repeat step 12. If the display housing did not correct the problem, re-install the original display housing and replace the upper PCA.

14. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer service.

Procedure 6.3 - Upper Display does not Illuminate

1. Because this is self powered unit, the display will not illuminate until it is used or the optional external power supply is equipped. If the optional external power supply is equipped, the display should be constantly illuminated.

2. If the optional external power supply is not equipped, skip to step 5.

3. Disconnect the optional external power supply from the C100i and measure between the inner and outer sleeves of the power supply's output jack with a DC voltmeter. You should measure approximately 18 VDC.

4. If the voltage measured in step 3 was significantly low, replace the optional external power supply. If the voltage measured in step 3 was 0 Vdc, disconnect external power supply from its AC outlet and measure the voltage at the AC outlet. If the AC outlet voltage is normal replace the optional external power supply. If the AC outlet voltage is significantly low or 0 Vdc, the AC system must be inspected by an electrician.

5. Troubleshoot the generator per Procedure 6.4.

6. If the generator was found to be good, the problem will be in either the lower PCA, upper PCA or the upper to lower PCA interconnect cable.

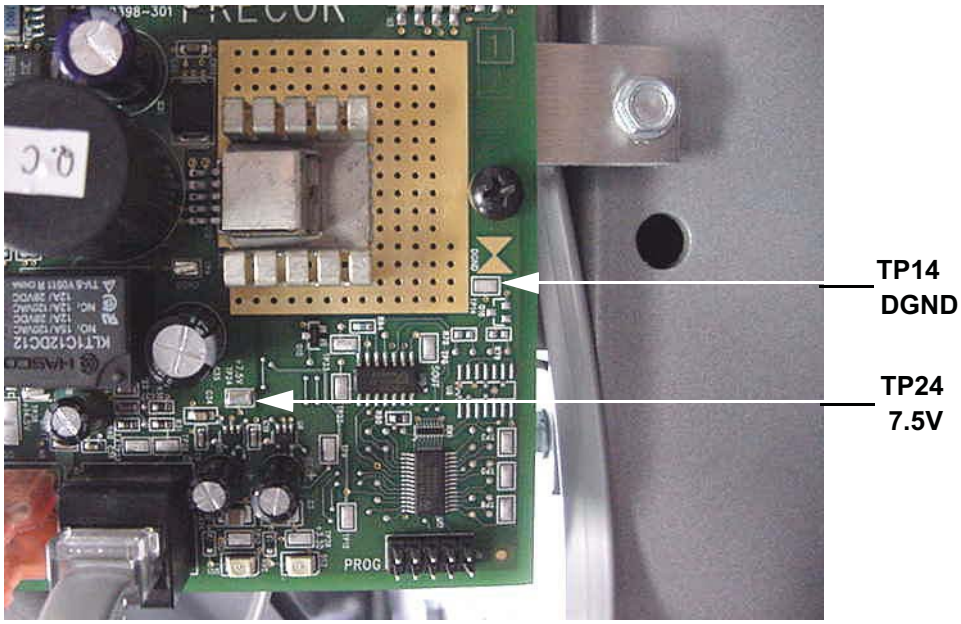
Warning
Because this is a self powered unit, it will either be necessary to either equip the unit with the optional external power supply or have an assistant pedal on the unit while voltage measurements are being taken. Because of the danger of working on the unit while it is in motion using the optional external power supply is strongly recommended.

7. Remove the right side cover and disconnect the interconnect cable from the lower PCA.

8. The following voltage reading must be taken while the unit is in motion. Extreme care must be taken to keep meter wires, hands, etc. clear of all moving parts. Using a DC voltmeter, measure the voltage between TP24 (7.5V) and TP14 (DGND). Refer to Diagram 6.2. The voltage measured should be approximately 7.5 Vdc. If the voltage is significantly low, replace the lower PCA. Additionally, the DS1 and DS2 LED's should illuminate.

9. Reconnect the interconnect cable to the lower PCA and repeat the voltage measurement in step 8. The voltage measured should be approximately 7.5 Vdc. If the voltage is significantly low, the problem is in the upper PCA or the upper to lower PCA interconnect cables.

Diagram 6.2 - Partial View of Lower PCA



10. Troubleshoot the upper to lower PCA interconnect cables per Procedure 6.1.

11. If the upper to lower interconnect cable is found to be good, replace the upper PCA.

12. If you have performed all of the above tests and are unable to resolve the problem, contact Precor customer support.

Procedure 6.4 - Troubleshooting the Generator

The generator performs three functions in the C100i. First, by controlling the amount of electrical load applied to the generator, the user's pedalling resistance is controlled. Second, the generator is used to charge the C100i's internal battery. Lastly, one of the generators six phase output windings is monitored to determine when the unit is in use and when it is idle. This system also determines the stride rate by determining the operating speed (output frequency) of the monitored generator winding.

Warning
Because this is a self powered unit, it will either be necessary to either equip the unit with the optional external power supply or have an assistant pedal on the unit while voltage measurements are being taken. Because of the danger of working on the unit while it is in motion using the optional external power supply is strongly recommended.

1. Perform the generator resistance test per Procedure 5.1. If any of the resistance measurements are significantly high or significantly low, replace the generator.

2. The following voltage reading must be taken while the unit is in motion. Extreme care must be taken to keep meter wires, hands, etc. clear of all moving parts. Using an AC voltmeter, measure the voltage between red and black, red and white and black and white wires at **3 Phase Gen In** of the lower PCA. AC voltage readings will vary depending on the unit's stride rate at the time the measurement is taken. At a stride rate of 50 strides per minute, all three voltage readings will be approximately 40 VAC - 45 VAC.

3. If any of the readings in step 2 are significantly low, replace the generator.

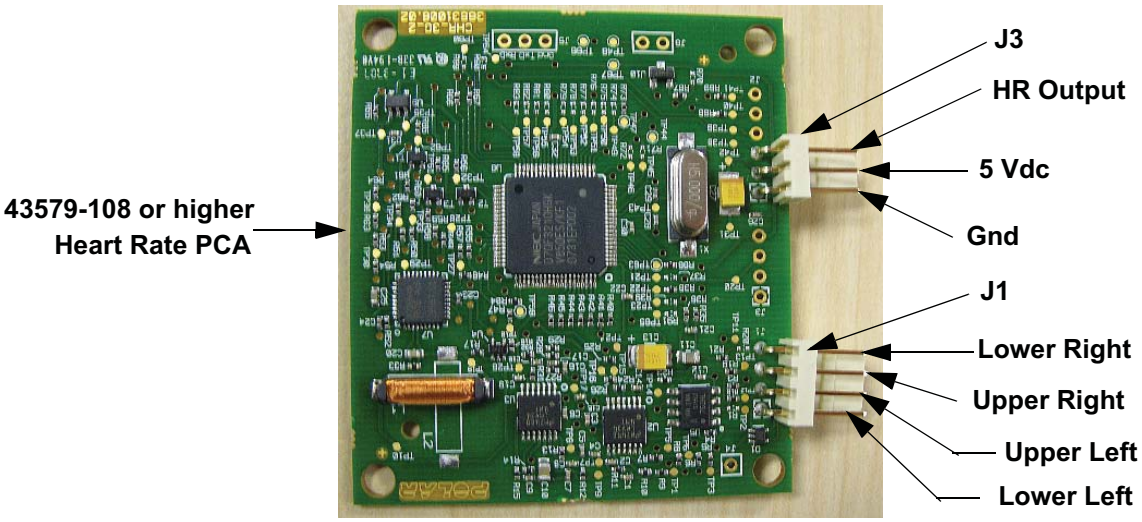
4. If you have performed all of the above tests and are unable to resolve the problem, contact Precor customer support.

Procedure 6.5 - Troubleshooting Hand Held Heart Rate

Circuit Description
The hand held heart rate system is actually a dual system, that is, it can accept a heart rate signal from either the hand held heart rate contacts on the unit's handlebar or from a Polar heart rate chest strap transmitter. The PCA is configured for hand held priority. That is, if both a chest strap and hand heart rate signal are being received, the system will accept the hand held signal and ignore the chest strap signal. If a hand held signal is not being received, the system will accept the chest strap signal.

Note:
There are four typical failure modes for the hand held/chest strap heart rate system. They are: hand held is normal - no chest strap reading; no hand held reading - chest strap normal; no hand held or chest strap reading or constant or intermittent readings when neither hand held or chest strap are in use.

Diagram 6.3 - Hand held/chest strap heart rate PCA



Normal hand held reading - No chest strap reading

1. Access the diagnostic program (Procedure 3.2). Advance to the heart rate display portion of the diagnostic program. Verify that a chest strap signal is not being accepted with either a Polar heart rate test transmitter or a known good chest strap transmitter. If this reading is good, skip to step 3.

2. Using a known good Polar heart rate chest strap, verify that the heart rate operates with the known good chest strap. If the known good Polar chest strap does corrects the problem, replace the original chest strap transmitter.

3. If the above procedures did not correct the problem, replace the heart rate PCA.

No hand held reading - Normal chest strap reading

4. Access the diagnostic program (Procedure 3.2). Advance to the heart rate display portion of the diagnostic program. Verify that a hand held signal is not being accepted by firmly grasping both the right and left hand held contacts on the handlebars. Cover as much of the contact surface area with your hands as possible (without moving your hands), you should receive a heart rate reading within ten seconds.

5. If the hand held signal is now being accepted, something in the near vicinity is radiating RF (radio frequency) energy that is being received by the chest strap portion of the heart rate PCA.

6. If a hand held signal still not being accepted, skip to step 8.

7. Replace the heart rate PCA with a 43579-108 (or higher) heart rate PCA. 43579-108 and higher versions of heart rate PCA are less susceptible to radiated RF energy.

8. Access the diagnostic program (Procedure 3.2). Advance to the heart rate display portion of the diagnostic program. Verify that a hand held signal is not being accepted by firmly grasping both the right and left hand held contacts with the opposite hands, right hand on the left handlebar contacts and left hand on the right handlebar contacts. Cover as much of the contact surface area with your hands as possible, you should receive a heart rate reading within ten seconds. If a hand held signal is still not being accepted, skip to step 10.

9. If a hand held signal was accepted in step 11, the hand held contact wiring is reversed. The end of the wire harness that connects to the hand held contacts in the handlebar is segregated into two groups. One group has blue shrink wrap around it and the other group has black shrink wrap around it. The “blue” group must go to the right hand contacts and the “black” group must go to the left hand contacts. In both groups the black wire must go to the lower contact and the red wire must go to the upper contact. If necessary, rewire the hand held contacts as described above and test as described in step 4.

10. If the wiring is correct, refer to Diagram 6.3 for the following measurements. With an ohmmeter measure between the “lower right contact” pin on the J1 connector and the lower right hand held heart rate contact on the handlebar. The reading should be 1 Ω or less. Measure between the “upper right contact” pin on the J1 connector and the upper right hand held heart rate contact on the handlebar. The reading should be 1 Ω or less. Measure between the “upper left contact” pin on the J1 connector and the upper left hand held heart rate contact on the handlebar. The reading should be 1 Ω or less. Measure between the “lower left contact” pin on the J1 connector and the lower left hand held heart rate contact on the handlebar. The reading should be 1 Ω or less. If any of the above readings are greater than 1 Ω, replace the heart rate PCA to handlebar wire harness.

No hand held reading - No chest strap reading

11. Access the diagnostic program (Procedure 3.2). Advance to the heart rate display portion of the diagnostic program. Verify that neither a chest strap signal or a hand held signal is being accepted with either a heart rate test transmitter or a chest strap transmitter.

12. Check the plug/connector connections on both the heart rate PCA (J4), and upper PCA (J1).

13. If neither a chest strap signal or a hand held signal is being accepted, measure between the “ground” and “5 Vdc” pins on J4 for 5 Vdc. If 5 Vdc is present, replace the heart rate PCA.

14. If 5 Vdc is not present, remove the connector from J4 of the heart rate PCA. Measure between the “ground” and “5 Vdc” pins of the connector (just removed from the heart rate PCA) for 5 Vdc. If 5 Vdc is present, replace the heart rate PCA. If the 5 Vdc is not present, measure between the corresponding pins of J1 on the upper PCA (red and black wires). If 5 Vdc is not present replace the upper PCA. If 5 Vdc is present, replace the upper PCA to heart rate PCA cable.

Constant or intermittent readings when neither the hand held or chest strap is in use

15. Verify that a ferrite core is clamped around the heart rate PCA to upper PCA cable.

16. Constant or intermittent heart rate readings when neither heart rate system is in use is caused by something in the near vicinity radiating RF energy that is being received by the chest strap portion of the heart rate PCA.

17. Replace the heart rate PCA with a 43579-108 (or higher) heart rate PCA. 43579-108 and higher versions of heart rate PCA are less susceptible to radiated RF energy

Procedure 7.1 - Replacing the Display Enclosure or Upper PCA

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

The keyboard is part of the display housing front panel. If the keyboard is not functioning properly, replace the display housing front panel.

Removing the Display Housing Front Panel

1. Remove the right side cover and disconnect the red battery wire from the lower PCA.

WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

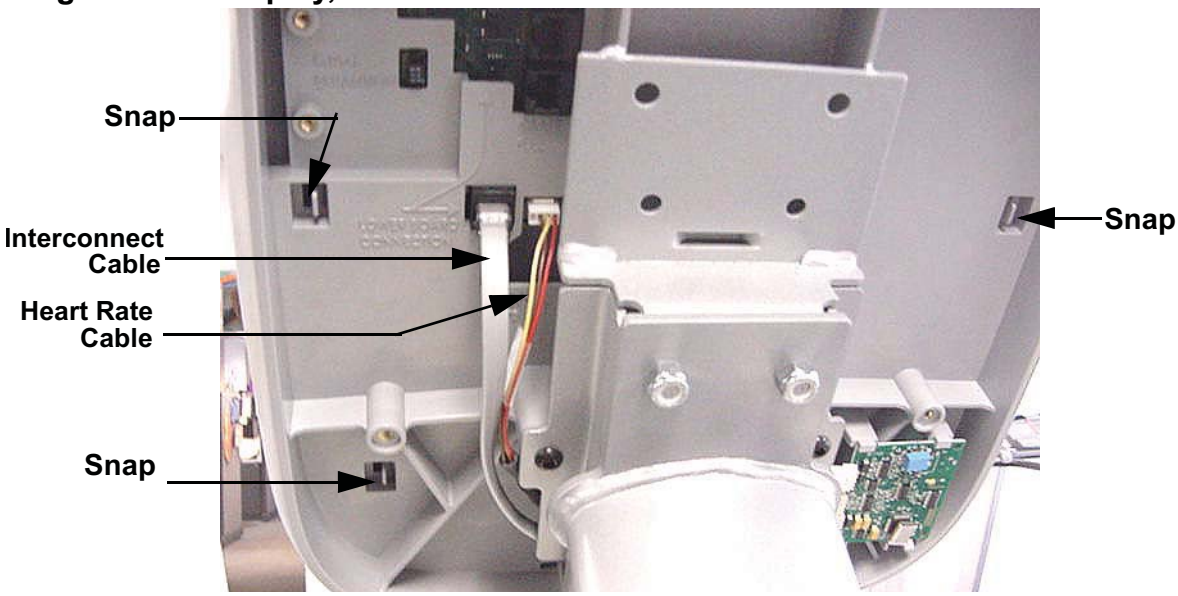
2. Attach the anti-static wrist strap to your arm, then connect the ground wire of the wrist strap to the units frame.

3. Remove the four screws that secure the display's rear cover.

4. Attach the wrist strap to your arm, then connect the ground wire of the wrist strap to the C100i frame.

5. Disconnect the interconnect cable and heart rate cable from the upper PCA.

Diagram 7.1 - Display, with Rear Cover Removed



6. Starting from the top and working downward, unsnap the display front panel from the display. There are six snaps retaining the display front panel. See Diagram 7.1.

Removing and Replacing the Upper PCA

7. Carefully disconnect the keyboard cable from the upper PCA. See Diagram 6.1.

8. Disconnect the cables from the matrix PCA and the and the D-pad PCA. See Diagram 7.1.

9. Unsnap the upper PCA from the display housing front panel.

Note:
Package the upper PCA in an anti-static bag and document the problem as described in Procedure 3.6, Documenting Software Problems.

10. Position the upper PCA at its mounting location on the display housing front panel and snap it into place (refer to Diagram 6.1).

11. Reconnect the keyboard cable, D-pad cable and matrix PCA cable to the upper PCA. See Diagram 6.1

12. Starting from the bottom and working upward, snap the display front panel onto the display housing.

13. Reconnect the interconnect and heart rate cables to the upper PCA.

14. Remove the ground wire of the wrist strap from the C100i frame, then remove the wrist strap from your arm.

15. Position the display's rear cover on the display housing. Replace and tighten the display mounting screws.

16. Replace the red battery wire removed in step 1 and check unit operation as described in Section Four.

Procedure 7.2 - Replacing the Lower PCA

1. Remove the right side cover.

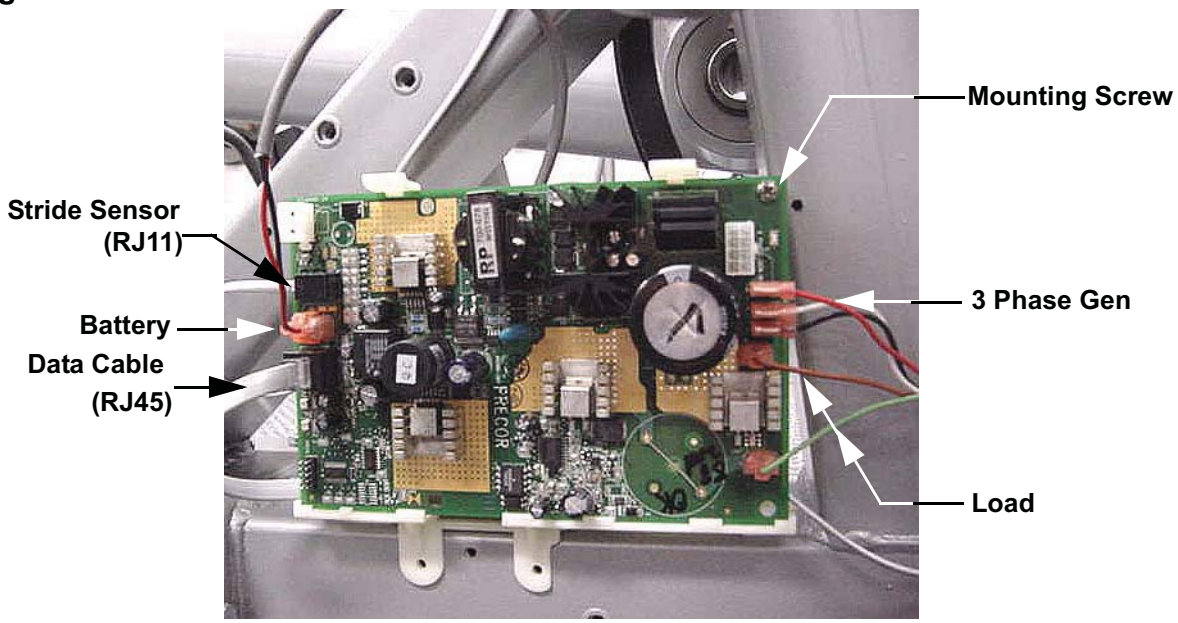
WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

2. Attach the wrist strap to your arm, then connect the ground wire of the wrist strap to the C100i frame.

3. Disconnect the battery, 3 Phase Gen and load wires from the lower PCA.

4. Remove the screw from the upper right corner the lower PCA, see Diagram 7.2.

Diagram 7.2 - Lower PCA



5. Unsnap the lower PCA from its mounting bracket.

6. Position the replacement lower PCA at its mounting position and snap it into its mounting bracket. Fasten it with the screw removed in step 4.

7. Reconnect the lower PCA wires as follows. The battery wires are polarized to prevent them from being connected incorrectly. Connect the black wire to the battery terminal nearest to the edge of the lower PCA and the red wire to the remaining battery terminal of the lower PCA. Reconnect the 3 Phase Gen wires to the terminals shown in Diagram 7.2, the wires may be connected in any order. Reconnect the load wires to the terminals shown in Diagram 7.2, the wires may be connected in any order.

8. Remove the ground wire of the wrist strap from the C100i frame, then remove the wrist strap from your arm.

9. Re-install the right side cover, then check the operation of the C100i as described in Section Four.

Procedure 7.3 - Replacing the Interconnect Cable

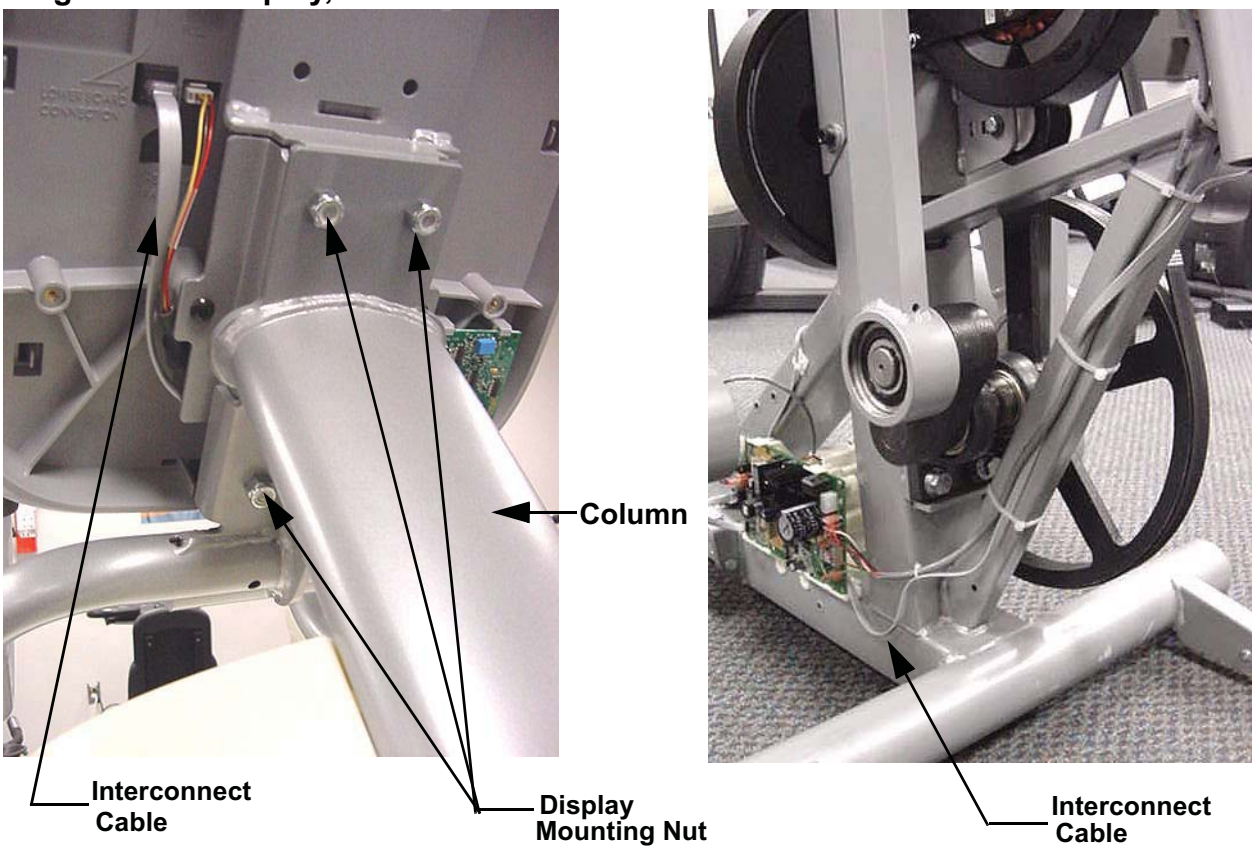
Before you install a new interconnect cable, ensure that the interconnect cable is defective as described in Procedure 6.1.

WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

1. Remove the four screws from the display rear cover and remove the display rear cover.

2. Disconnect the interconnect cable from the upper PCA. See Diagram 7.3.

Diagram 7.3 - Display, Rear View



3. Remove the four nuts that fastens the display to the column. Remove the display and set it aside. See Diagram 7.3.

4. Remove the right side cover.

5. Carefully, cut and remove the tie wraps that fasten the interconnect cable to the frame.

6. Disconnect the interconnect cable from the lower PCA.

7. Remove the interconnect cable from the column.

8. Slide the replacement interconnect cable down the column so that approximately 6 inches of remains at the top of the column.

9. Set the display at its mounting position and fasten it with the four nuts removed in step 3.

10. Connect the interconnect cable to the upper PCA and to the lower PCA as shown in Diagram 7.3.

11. Dress the interconnect cable along the frame as shown in Diagram 7.3 and secure it with four tie wraps.

12. Replace the display rear cover and the right side cover.

13. Check the operation of the C100i as described in Section Four

Procedure 7.4 - Replacing Primary Belt

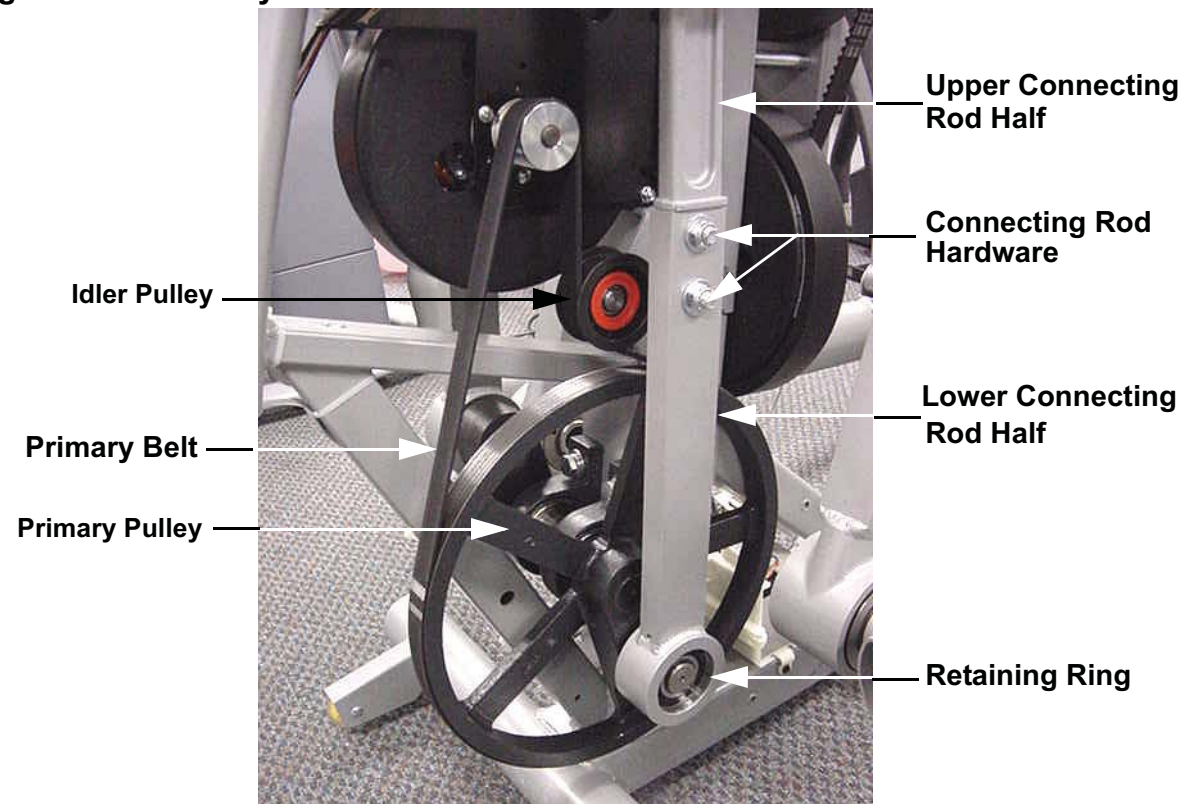
WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

1. Remove the left side cover.

2. Remove the bolt that fastens the left side upper arm weldment. Remove the handlebar from its mount and lower the assembly to the floor. See Diagram 7.7.

3. Loosen, but do remove the bolt that fastens the idler pulley and remove tension from the primary belt. See Diagram 7.4.

Diagram 7.4 - Primary Belt



4. Remove the hardware that fasten the upper and lower connecting rod halves together. Separate the lower connecting rod half from the upper connecting rod half. See Diagram 7.4.

5. Remove and discard the primary belt.

6. Set the replacement primary belt in its mounting position with it routed around the front of the idler pulley.

7. Tension the primary belt per Procedure 5.2.

8. Slide the upper connecting rod half into the lower connecting rod half and fasten them with the hardware removed in step 4. Torque the connecting rod bolts to 17 - 21 foot pounds (200 - 250 inch pounds).

9. Raise and insert the left side handlebar on its mount and fasten it with the hardware removed in step 2.

10. Replace the left side cover.

Procedure 7.5 - Replacing Brake Belt

WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

1. Remove the rear covers, and the left and right side covers.

2. Remove the hardware that fastens the connecting rods to the brake sheave and remove the connecting rods from the brake assembly.

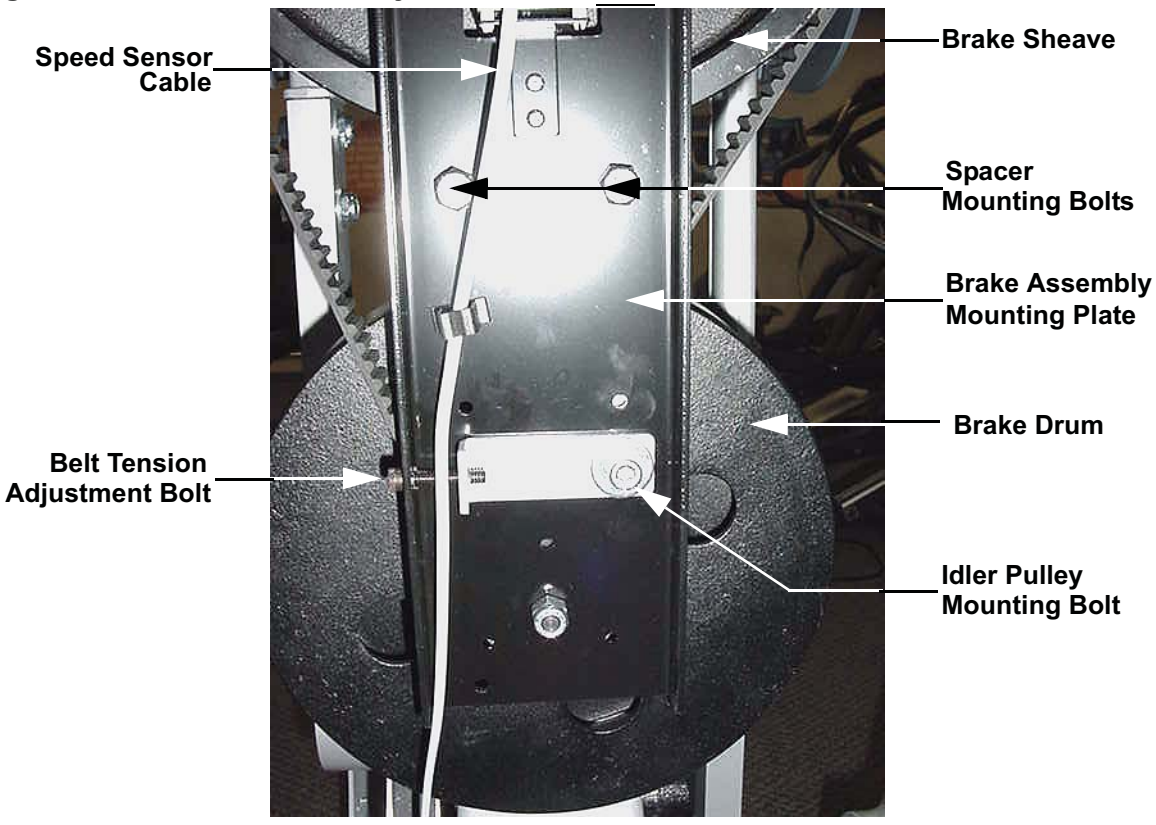
3. Disconnect the speed sensor cable from the speed sensor PCA.

4. Loosen but do not remove the two bottom brake assembly mounting bolts. Remove the two upper brake assembly mounting bolts. Carefully remove the brake assembly and place it on a flat solid work surface.

5. Loosen, the belt tension adjustment bolt. Remove the idler pulley mounting bolt and the idler pulley. See Diagram 7.5.

6. Remove the hardware that fasten the two spacers in the center of the brake assembly, remove the spacers.

Diagram 7.5 - Brake Assembly



7. Remove the four screws from the belt bracket and remove the belt bracket. Remove the brake belt by lifting it over the top and bottom edges of the brake assembly mounting bracket.

8. Set the replacement belt on the brake assembly, with the four holes in the belt aligned with the four holes in the brake sheave, by lifting the belt over the bottom and top edges of the brake assembly mounting plate. Replace the belt attachment bracket and fasten it with the four screws removed in step 7.

9. Replace the two spacers and fasten them with the hardware removed in step 6.

10. Replace the idler pulley, with the belt on the left side of the idler pulley and fasten it with the hardware removed in step 5.

11. Carefully set brake assembly its two lower mounting bolts, left in the frame in step 4, and hand start the upper brake assembly mounting bolts. Torque the four brake assembly mounting to 17 - 21 foot pounds (200 - 250 inch pounds).

12. Reconnect the speed sensor cable to the speed sensor PCA. Dress the speed sensor cable into its cable clip.

13. Rotate the brake sheave into position, with the brake attachment bracket on top. Insert the connecting rods into brake sheave and fasten them with the hardware removed in step 2. Torque the connecting rod bolts to 50 - 55 foot pounds (600 - 660 inch pounds).

14. Tension the brake belt per Procedure 5.2.

15. Replace the left and right side covers, then replace the rear covers.

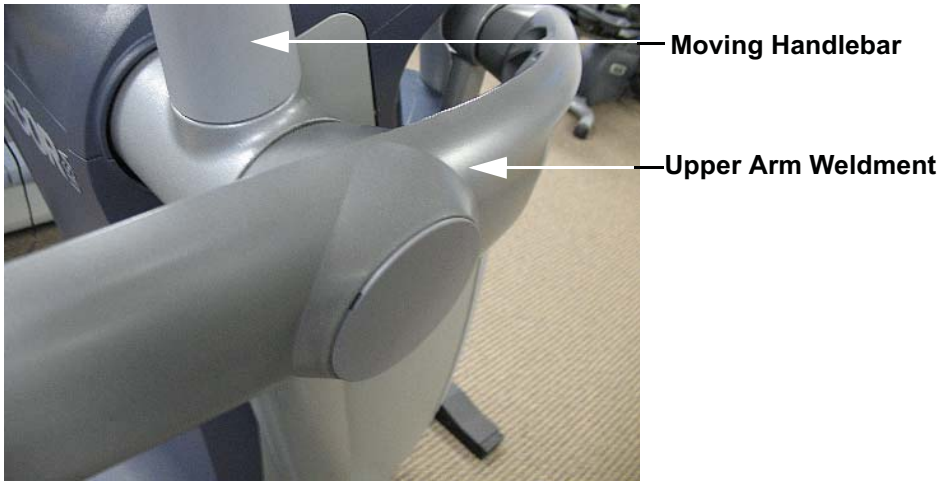
Procedure 7.6 - Replacing the Primary Pulley Assembly

WARNING
Before continuing with this procedure, review the Warning and Caution statements listed in Section One, Things You Should Know.

1. Remove the left and right side covers and the front cover.

2. This step removes most of the weight from the primary pulley connecting rods and makes the subsequent steps in this procedure easier and safer. Remove the bolt that fasten one of the upper arm weldments. Remove the upper arm weldment from its mounting and lower the assembly to the floor. Repeat this procedure with the remaining upper arm weldment. See Diagram 7.7.

Diagram 7.7 - Stairarm Rear Link Assemblies



3. Loosen, but do not remove the idler pulley mounting bolt. See Diagram 7.4.

4. Remove the retaining clip from the lower end of the of the lower connecting rod half. See Diagram 7.4

5. Remove the hardware that fasten the upper connecting rod half to the lower connecting rod half.

6. Separate the upper and lower connecting rod halves and remove the lower connecting rod half from the primary pulley.

7. Repeat steps 4 to 6 on the remaining connecting rod.

8. Remove the primary belt.

9. Remove the four bolts that fasten the primary pulley assembly to the frame. Remove the primary pulley assembly.

10. Set the replacement primary pulley assembly in its mounting position and fasten it with the hardware removed in step 9.

11. Set the primary belt in its mounting location with the belt routed in front of the idler pulley.

12. Tension the primary belt per Procedure 5.2.

13. Slide one of the tie lower connecting rod halves onto the primary pulley and fasten it with the retaining clip removed in step 4.

14. Slide the upper connecting rod half into the lower connecting rod half and fasten it with the hardware removed in step 5.

15. Repeat steps 13 and 14 with the remaining connecting rod halves.

16. Raise one of the upper arm weldments and attach it to the upper arm casting and fasten it with the bolt removed in step 2. Repeat this procedure with the remaining upper arm weldment.

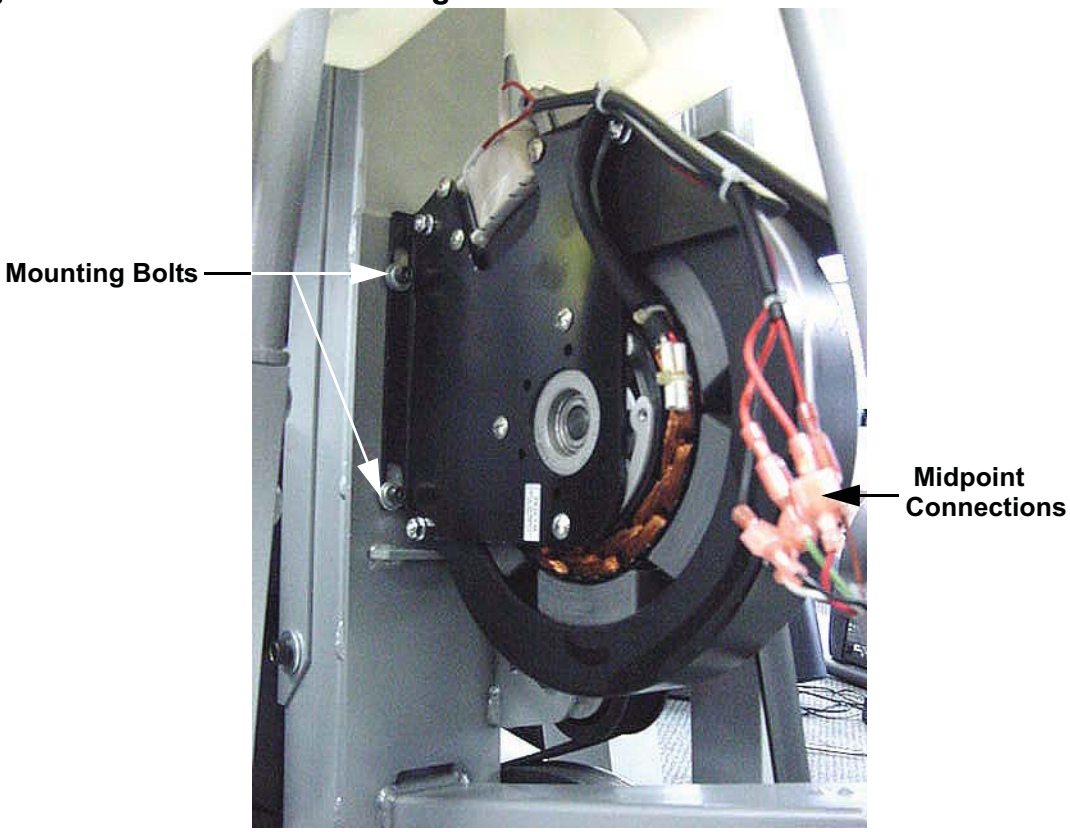
17. Replace the front cover. Replace the left and right side covers.

Procedure 7.7 - Replacing a Generator

WARNING
When the unit is used, stairarms are in motion or the generator is rotated by any means, the generator will produce potentially hazardous voltages even when the battery is disconnected.

1. Remove the left and right side covers. Remove the front cover.
2. Loosen but do not remove the primary belt idler pulley mounting bolt. See Diagram 7.4.
3. Remove the primary belt from the generators pulley.
4. Disconnect the generator wires at the midpoint connection. See Diagram 7.8.

Diagram 7.8 - Generator Mounting



5. Remove the four generator mounting bolts and remove the generator.
6. Set the replacement generator in its mounting position and fasten it with the hardware removed in step 5. Torque the generator mounting bolts to 100-110 inch pounds.
7. Place the primary belt on the generators pulley and tension the belt per Procedure 5.2.

8. Reconnect the generator midpoint connections as follows. Connect the two red wires from the generators eddy current magnet to the green and brown wires in the midpoint cable, the order does not matter. Connect the red, white and black wires from the generator to the red, white and black wires in the midpoint cable.

9. Replace the front cover. Replace the left and right side covers.

Procedure 7.8 - Replacing a Battery

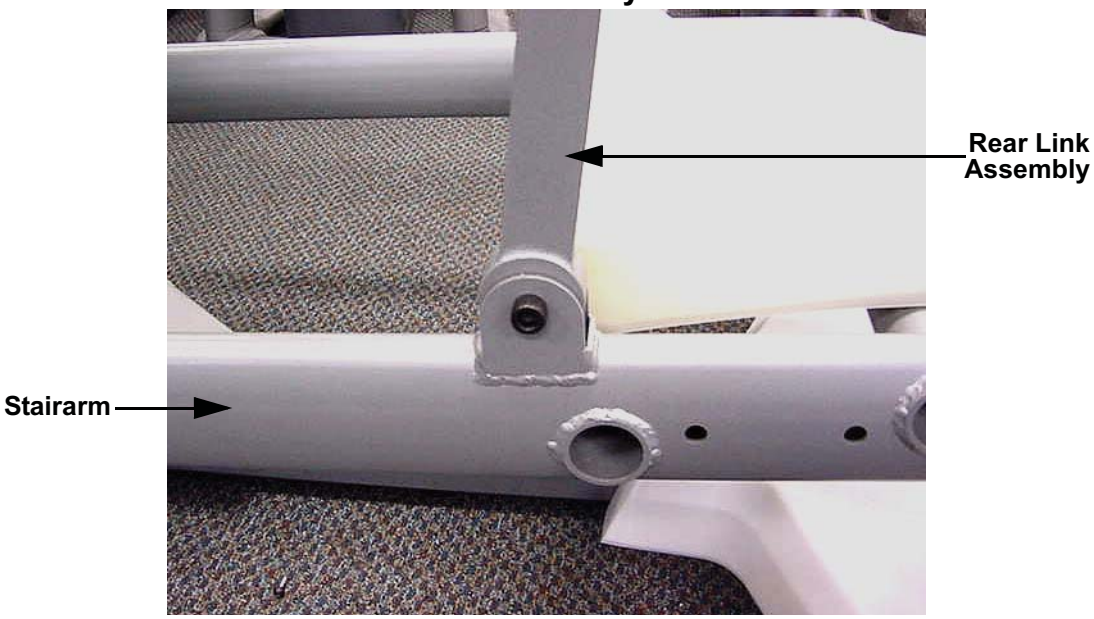
1. Remove the left side cover.
2. Disconnect the red and black wires from the battery.
3. Gently expand the plastic battery bracket and slide the battery out of the bracket.
4. Slide the replacement battery into the plastic battery bracket so that the positive terminal (red dot) is on the right side and the negative terminal is on the left side.
5. Connect the red wire removed in step 2 to the positive terminal (red dot) of the battery and the black wire removed in step 2 to the negative terminal of the battery.
6. Replace the left side cover.
7. Test the C100i per Procedure 4.

Procedure 7.9 - Replacing a Stairarm

1. Use a flat bladed screwdriver to depress the tab in the lower cover and slide the lower cover up on the rear link. See Diagram 7.25.

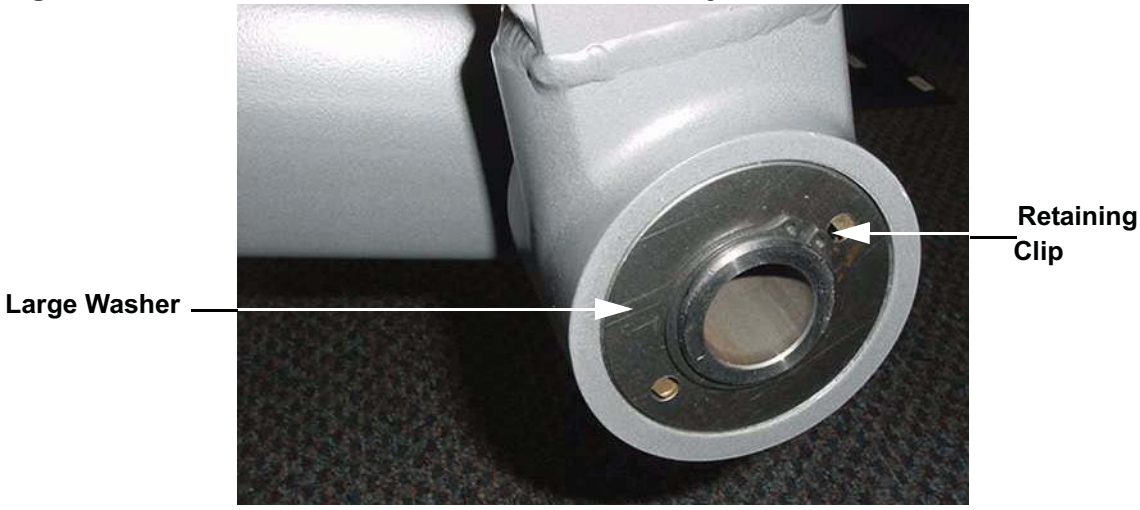
2. Remove the two bolts that fasten the stairarm to the rear link assembly. Lower the stairarm to the floor. See Diagram 7.9.

Diagram 7.9 - Stairarm and Rear Link Assembly



3. Remove the retaining clip and large washer that fastens the front of the stairarm to the front arm assembly. See Diagram 7.10.

Diagram 7.10 - Stairarm and Front Arm Assembly

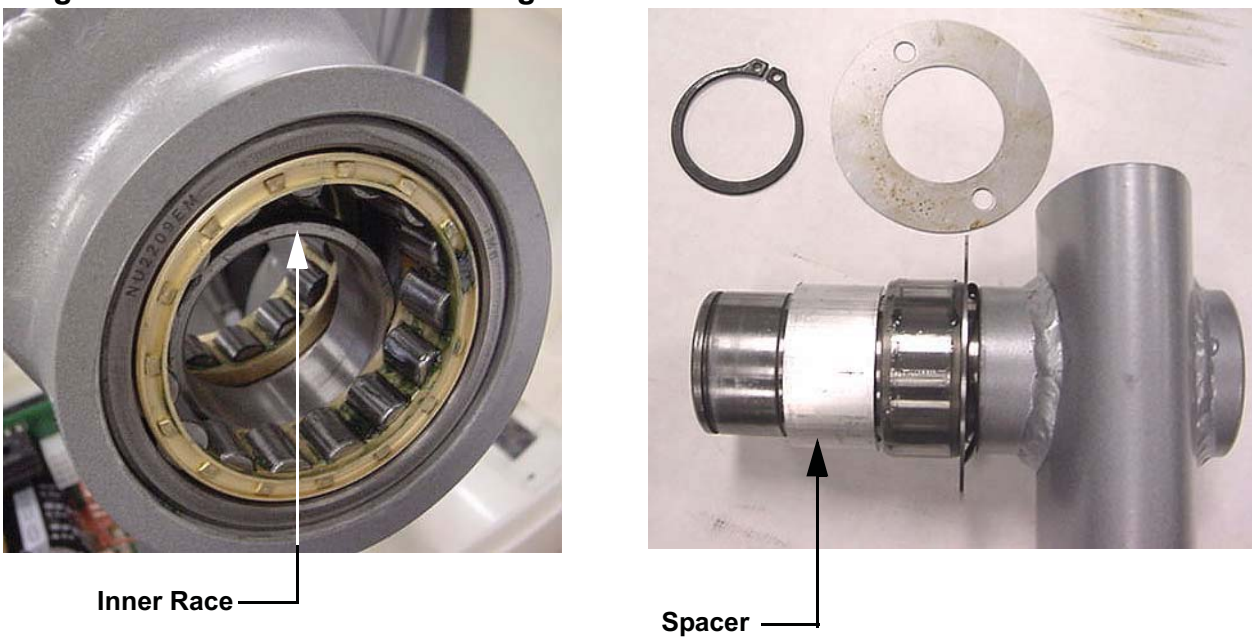


4. Remove the stairarm from the front arm assembly.

5. Remove the two screws that fasten the foot pedal to the stairarm and remove the foot pedal.

6. There are two bearings in the front arm assembly. The inner race of the bearings is not attached to the bearings and will come loose when the stairarm is removed. See Diagram 7.11.

Diagram 7.11 - Front Brace Bearings



7. Left hand view of Diagram 7.11 shows that the inner race of the far bearing has fallen into the space between the bearings. This race must be slid back into the far bearing. The right hand view of Diagram 7.11 shows that the inner race of the near bearing has stayed on the stairarm. This arrangement is typically what happens when the stairarm is removed.

8. Remove the spacer, the inner race, two large washers and a wave washer from the stairarm. The clearance between the stairarm shaft and the inner race is very small. It is very easy to jam the inner race on the stairarm shaft.

9. Slide the wave washer and two large washers on to the stairarm shaft. Carefully, slide the inner race all of the way onto the shaft and against the large washers. Slide the spacer onto the shaft of the stairarm. The arrangement should be as shown in Diagram 7.11, above.

10. Slide the inner race that is in the front arm assembly into the far bearing.

11. Carefully, slide the stairarm into the front arm assembly. The inner race of the far bearing will probably slide part way out of the bearing. Using a small blunt tool, gently tap the race back into the bearing.

12. Set the foot pedal in its mounting position and fasten it with the hardware removed in step 4.

13. Lift the stairarm and fasten it to the rear link assembly with the hardware removed in step 1. Torque the rear links assembly hardware to 100 - 110 inch pounds.

Procedure 7.10 - Replacing a Upper Arm Casting

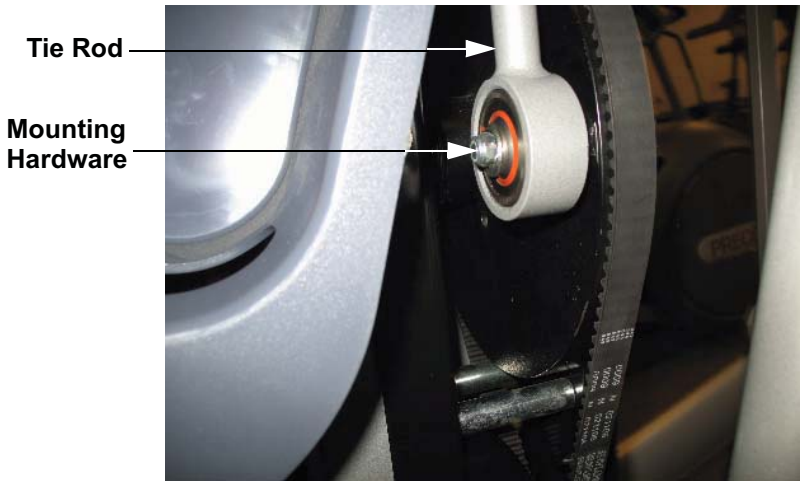
Note: This procedure was for use on older AMT's that have a two piece upper. See Procedure 7.14 for replacing a two piece upper arm with a one piece upper arm.

Procedure 7.11 - H-Brake Removal and Replacement

1. Remove the lower rear cover, the left and right lower rear side covers, upper rear cover, left side cover and right side cover per Procedure 7.12.

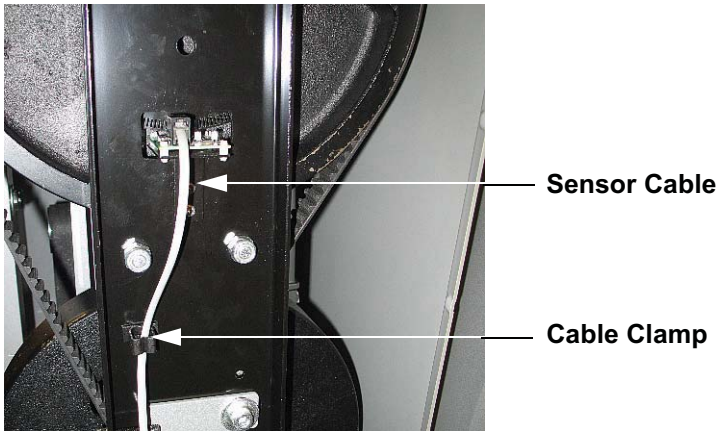
2. Remove the nuts and bolts that retain both tie rods to the H-brake assembly. See Diagram 7.12

Diagram 7.12 - H-Brake Tie Rod Mounting



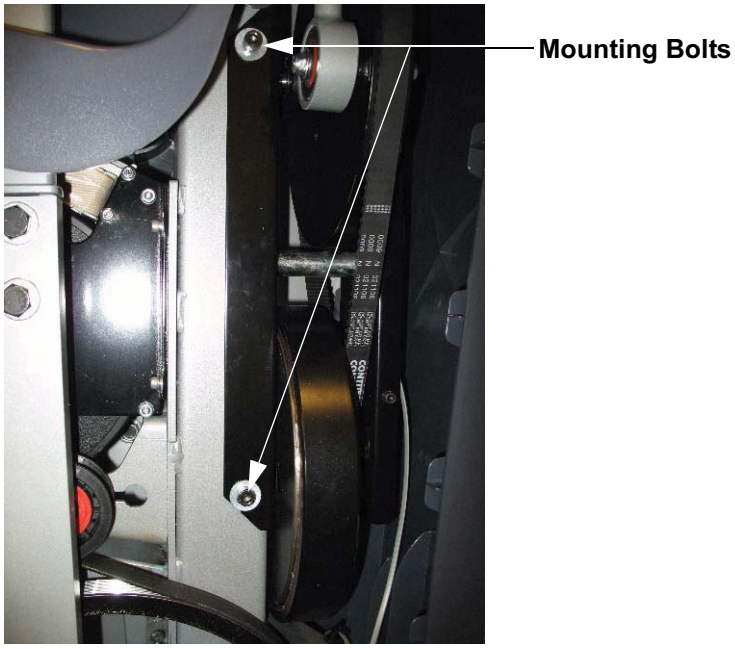
3. Disconnect the sensor cable from the H-brake assembly. Remove the cable from the cable clamp on the H-brake assembly. See Diagram 7.13.

Diagram 7.13 - H-Brake Sensor Cable



4. While supporting the H-brake assembly, it is heavy and you may wish to have an assistant support it, remove the four H-brake mounting bolts and remove the H- brake assembly from the AMT. See Diagram 7.14.

Diagram 7.14 - H-Brake Mounting Bolts



5. Set the replacement H-brake in its mounting position, If possible have an assistant support the H-brake, and replace the four H-brake mounting bolts removed in step 4. Torque the H-brake mounting bolts to 200-250 inch pounds (17 - 21 foot pounds).

6. Reconnect the sensor cable, disconnected in step 3 and route it through its cable clamp.

7. Fasten the tie rods to the H-brake assembly with the hardware removed in step 2. Torque the tie rod hardware to 100 - 110 inch pounds (8 - 9 foot pounds).

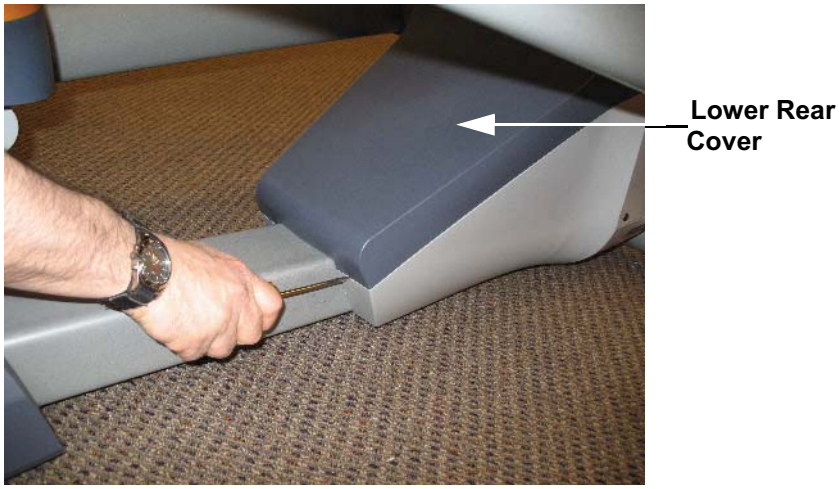
8. Replace the lower rear cover, the left and right lower rear side covers, upper rear cover, left side cover and right side cover per Procedure 7.12.

Procedure 7.12 - Replacing a Cover

Cover Removal

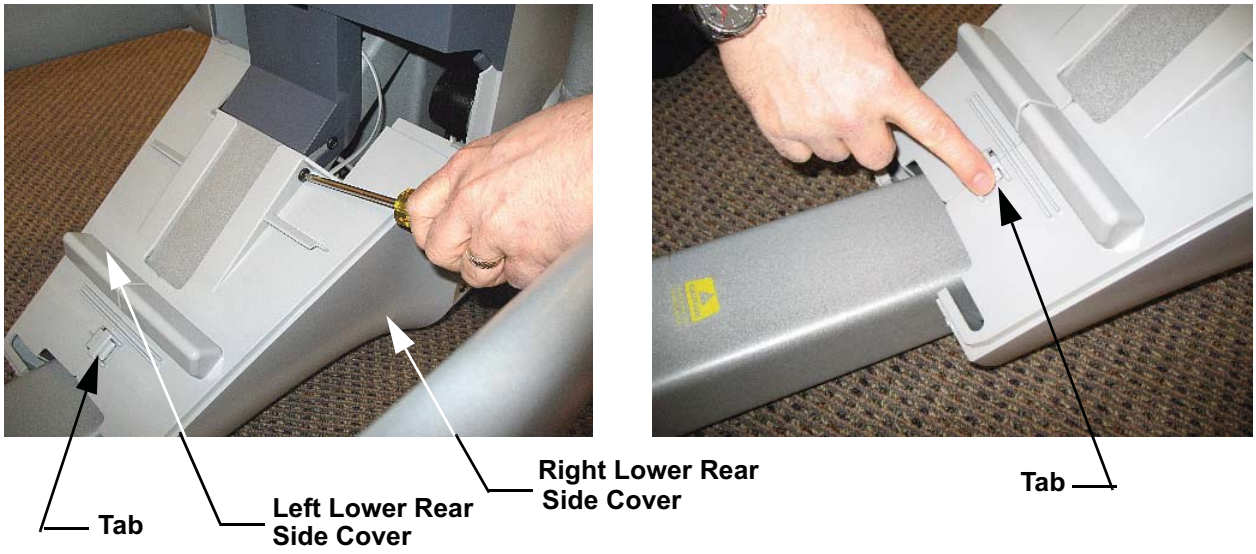
1. Using a flat bladed screwdriver, carefully pry both sides of the lower rear cover loose from its mounting. See Diagram 7.16. Remove the lower rear cover.

Diagram 7.16 - Lower Rear Cover



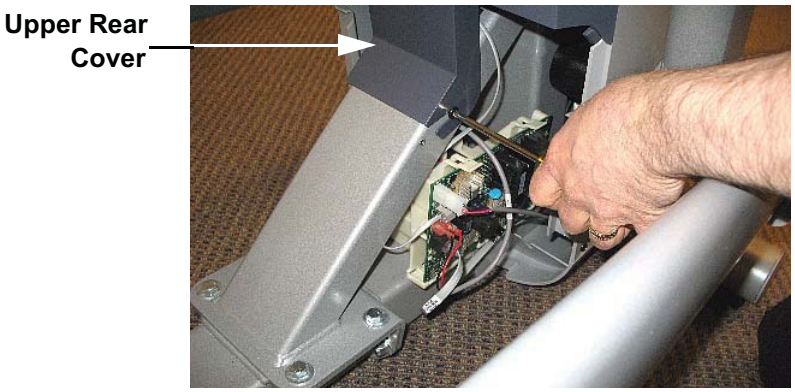
2. Remove two screws, one each side, from left and right lower rear side covers. See Diagram 7.17. Depress the tab at the rear of the covers and remove the left and right rear side covers.

Diagram 7.17 - Lower Rear Side Covers



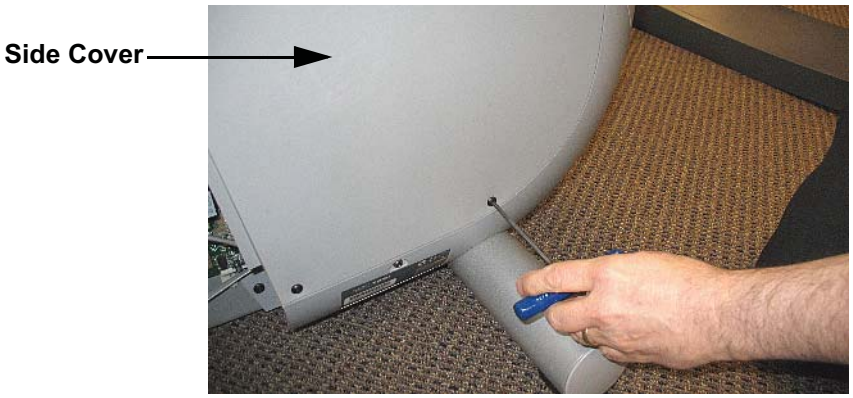
3. Support the upper rear cover and remove both screws from the bottom of the cover. See Diagram 7.18. Remove the upper rear cover.

Diagram 7.18 - Upper Rear Cover



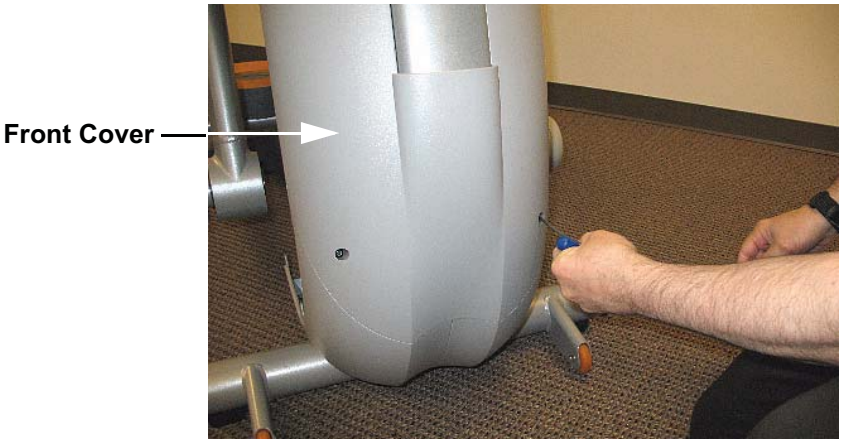
4. Remove two screws from the bottom edge of both side covers and remove both covers. See Diagram 7.19.

Diagram 7.19 - Side Covers



5. Remove two screws from the lower portion of the front cover. Grasp the lower portion of the front cover and remove the front cover. See Diagram 7.20.

Diagram 7.20 - Front Cover



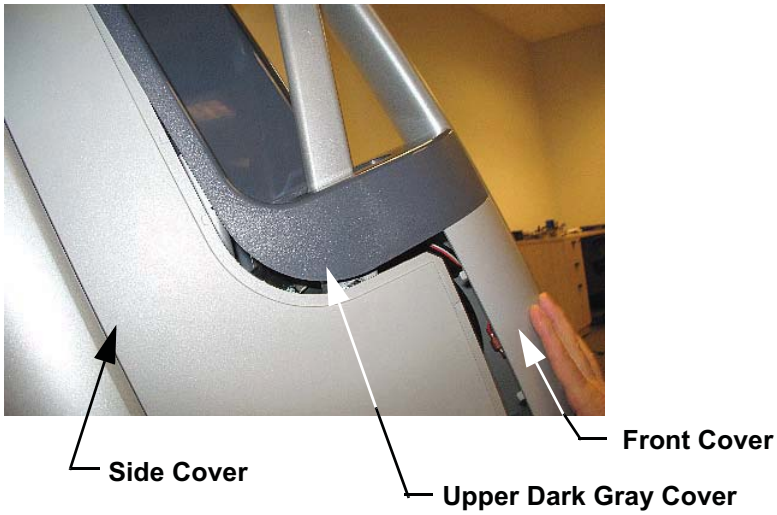
Cover Installation

6. Slide the front cover into its mounting position and fasten it with the two screws removed in step 5.

7. Slide the right side cover into its mounting position with the lip on the cover behind the upper dark gray cover, behind the front cover and the tab at the bottom of the side cover into the clip in the lower cover. See Diagram 7.21. Fasten the cover with the screws removed in step 4.

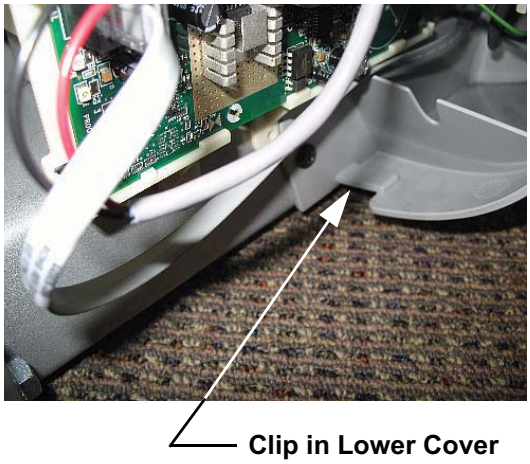
8. Replace the left side cover using the procedure described in step 7.

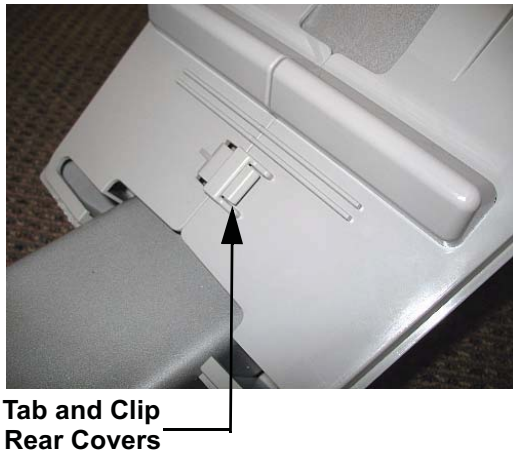
Diagram 7.21 - Side Covers



9. Set the right rear side cover in its mounting position and engage the tab at the front of the cover in the clip in the lower cover. Set the left rear side cover in its mounting position and engage the tab at the front of the cover in the clip in the lower cover. Engage the tab and clip at the rear of the left and right rear side covers. See Diagram 7.22. Fasten the left and right rear side covers with the screws removed in step 2.

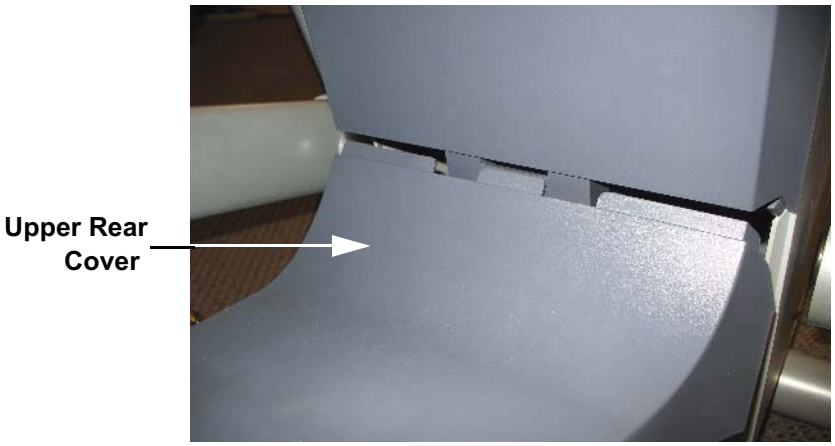
Diagram 7.22 - Lower Rear Side Covers





10. Set the upper rear cover in its mounting position. First, slide the upper portion of the cover into place. See Diagram 7.23. Press downward on the rear portion of the cover and snap it into place.

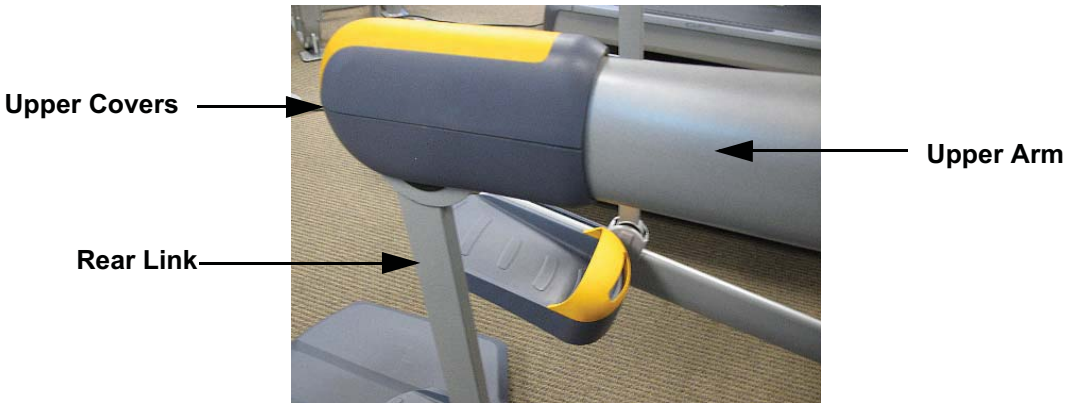
Diagram 7.23 - Upper Rear Cover



Procedure 7.13 - Replacing a Rear Link

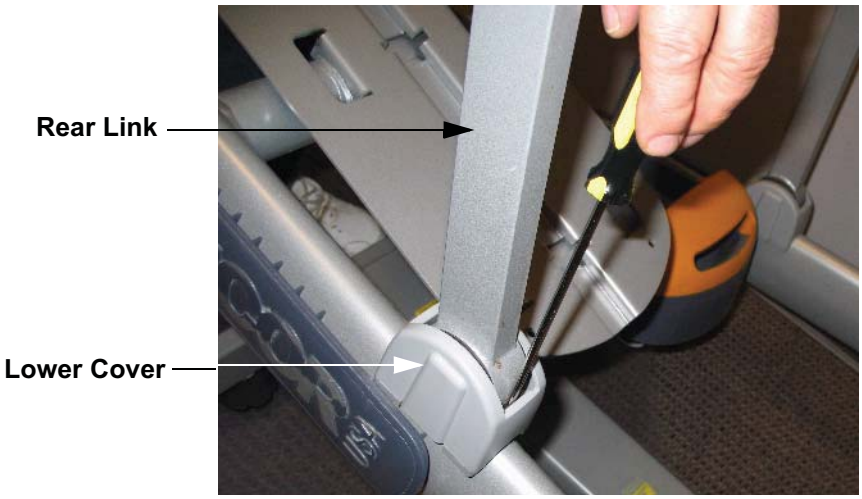
1. Remove the screws from the lower half of the upper cover. Remove the upper half of the upper cover. The lower half of the upper cover will be removed later. See Diagram 7.24.

Diagram 7.24 - Upper Arm



2. Use a flat bladed screwdriver to depress the tab in the lower cover and slide the lower cover up on the rear link. See Diagram 7.25.

Diagram 7.25 - Releasing the Lower Cover



3. Place a 9/16” end wrench on each of the hex head bolts that fasten the upper arm to the rear link. These bolts thread into a free floating shaft, remove one of the two bolts.

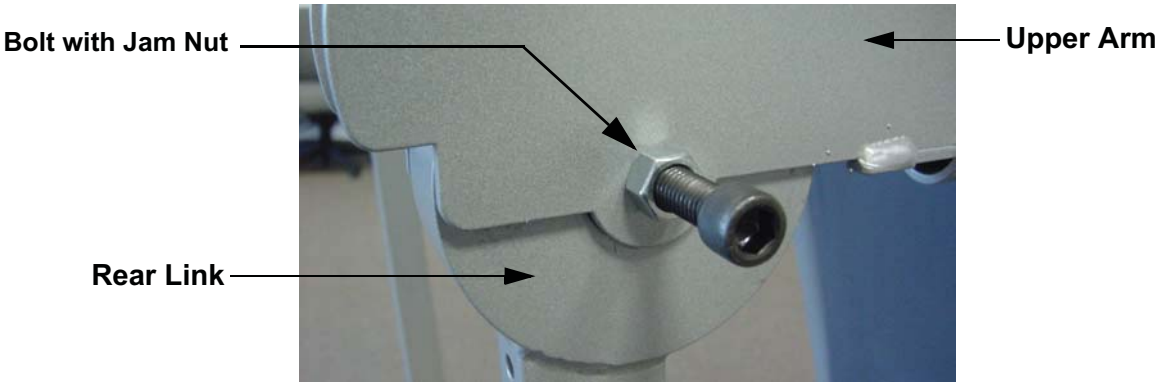
4. Visually, inspect the shaft where the bolt was removed in step 3. If a 1/4” hex slot is visible, hold the shaft with a 1/4” allen wrench and remove the remaining bolt, skip step 5. If the 1/4” hex slot is not visible, continue with step 5.

5. Place a 9/16” end wrench on each of the hex head bolts that fasten the upper arm to

the rear link. These bolts thread into a free floating shaft, remove one of the two.

6. Thread a 3/8 X 16 bolt that is approximately 2 inches long with jam nut, not provided, into the hole that the bolt was just removed from and tighten the jam nut. The bolt and jam nut will hold the shaft in place and allow removal of the remaining mounting bolt. Remove the remaining mounting bolt. Loosen the jam and remove the bolt with jam nut. See Diagram 7.26.

Diagram 7.26 - Using a Bolt and Jam Nut



7. Separate the upper arm from the rear link. Slide the lower half of the upper cover and the lower cover off of the rear link.

8. Remove the lower end of the rear link from the stairarm using a similar procedure as in steps 3 to 6.

9. If you are reusing the rear link mounting hardware, apply blue loctite to the bolts and allow sufficient time for the loctite to cure. New replacement hardware does not need to have loctite applied because it utilizes a loctite patch.

10. Set the replacement rear link in its mounting position on the stairarm. Use a quarter inch allen wrench to hold the free floating shaft, thread one of the mounting bolts into the other side of the free floating shaft and torque it to 100 to 110 inch pounds. Thread another mounting bolt into the free floating shaft and torque it to 100 to 110 inch pounds.

11. Slide the lower cover onto the rear link and snap it into place. Slide the lower half of the plastic cover onto the rear link.

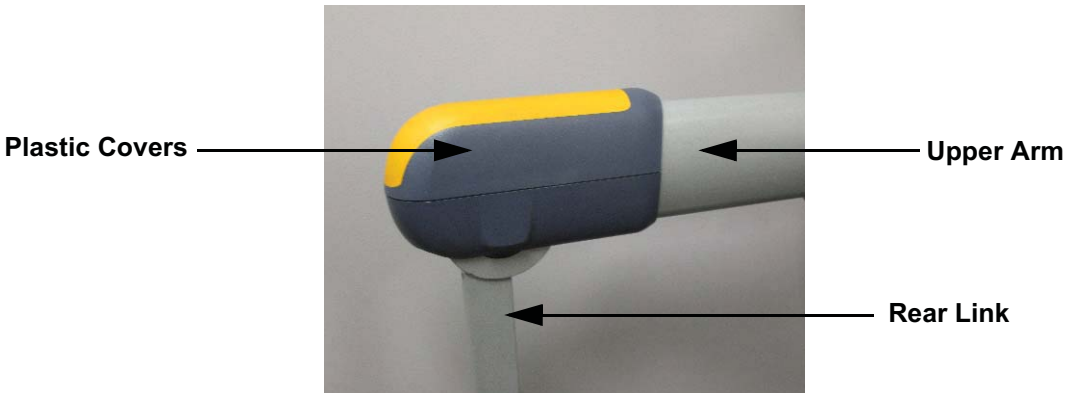
12. Fasten the rear link to the upper arm using the procedure in step 10.

13. Place the upper half of the upper cover in its mounting position, slide the lower half of the upper cover up to its mounting position and fasten it with the hardware removed in step 1.

Procedure 7.14 - Upper Arm Replacement

1. Remove the two screws that fasten the plastic covers on the end of the upper arm. Remove the top cover and slide the bottom cover down the rear link to the stairarm.

Diagram 7.27 - Upper Arm Cover

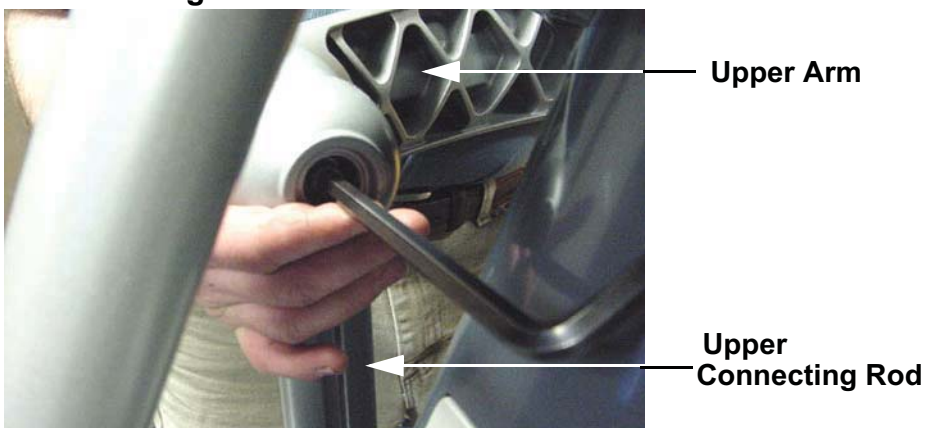


2. Place a 9/16” end wrench on each of the hex head bolts that fasten the upper arm to the rear link. These bolts thread into a free floating shaft, remove one of the two bolts.

3. Visually, inspect the shaft where the bolt was removed in step 2. There is a 1/4” hex slot in the shaft, hold the shaft with a 1/4” allen wrench and remove the remaining bolt.

4. Separate the upper arm from the rear link.

Diagram 7.29 - Upper Connecting Rod Removal

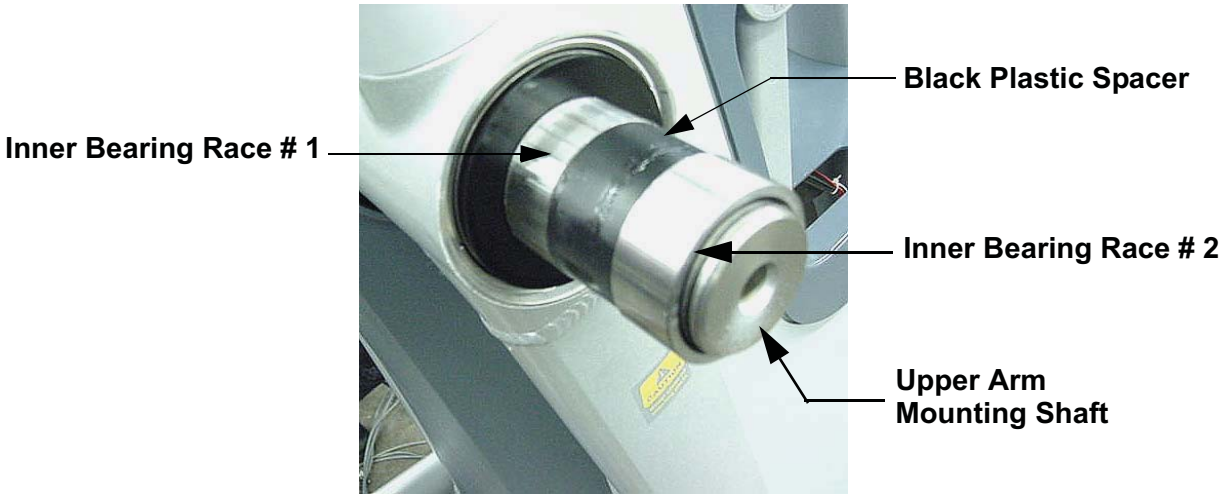


5. Remove the large end cap from the center of the upper.

6. Remove, and retain for later use, the large snap ring from the center of the upper arm and remove and save the large black plastic washer. Remove the upper arm from AMT and discard.

7. Slide both of the inner bearing races and black plastic spacer off of the upper arm mounting shaft and discard. See Diagram 7.30. Retain the black plastic spacer for later use.

Diagram 7.30 - Bearing Removal.

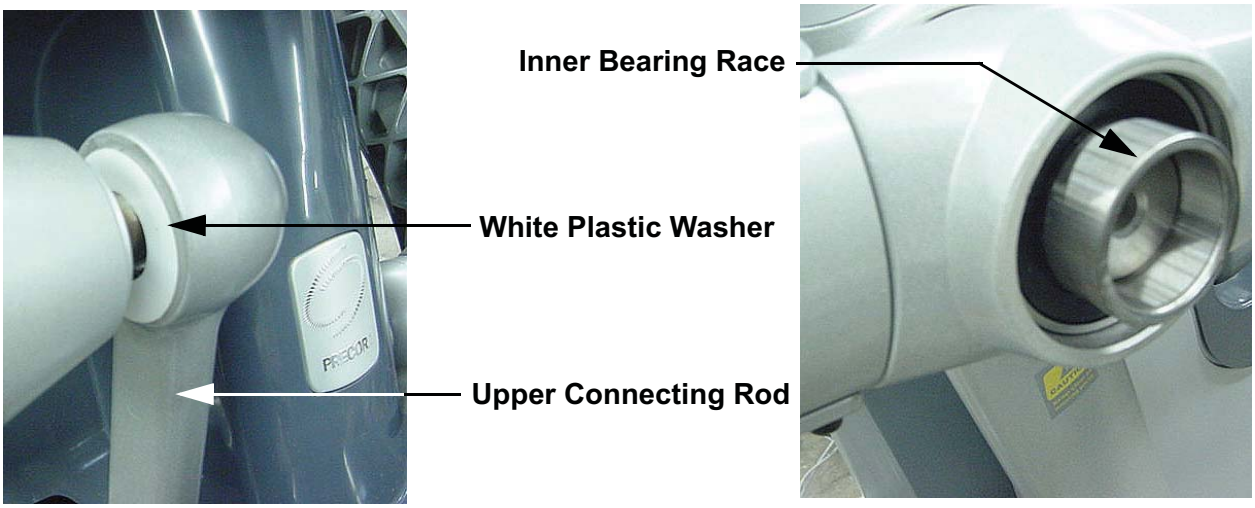


8. Slide inner bearing race #1 onto the upper arm mounting shaft.

9. Ensure that the white plastic washer is on the upper arm, see Diagram 7.31, slide the replacement upper arm onto inner bearing race #1 and into the upper connecting rod.

10. Slide the black plastic spacer and inner bearing race # 2 into the upper arm. If necessary, carefully tap it into place with a rubber mallet. See Diagram 7.31.

Diagram 7.31 - Bearing Replacement



11. Slide the large black washer, removed in step 8, onto the upper arm mounting shaft and fasten the upper arm with the snap ring removed in step 8. replace the large end cap removed in step 6. It may be necessary to replace the large end cap if it no longer fits securely in the upper arm.

12. Fasten the upper arm to the upper connecting rod with the bolt removed in step 5. Torque the bolt to 17 - 21 foot pounds (200 - 250 inch pounds).

13. If you are reusing the rear link mounting hardware, apply loctite accelerator and blue loctite to the bolts. New replacement hardware does not need to have loctite applied because it utilizes a loctite patch.

14. Set the replacement rear link in its mounting position on the upper arm. Use a quarter inch allen wrench to hold the free floating shaft or the bolt and jam nut as described in step 4, thread one of the mounting bolts into the other side of the free floating shaft and torque it to 100 to 110 inch pounds. Thread another mounting bolt into the free floating shaft and torque it to 100 to 110 inch pounds.

15. Set the upper arm’s top cover in place and slide the bottom cover up the rear link. Fasten the covers with the screws removed in step 1.

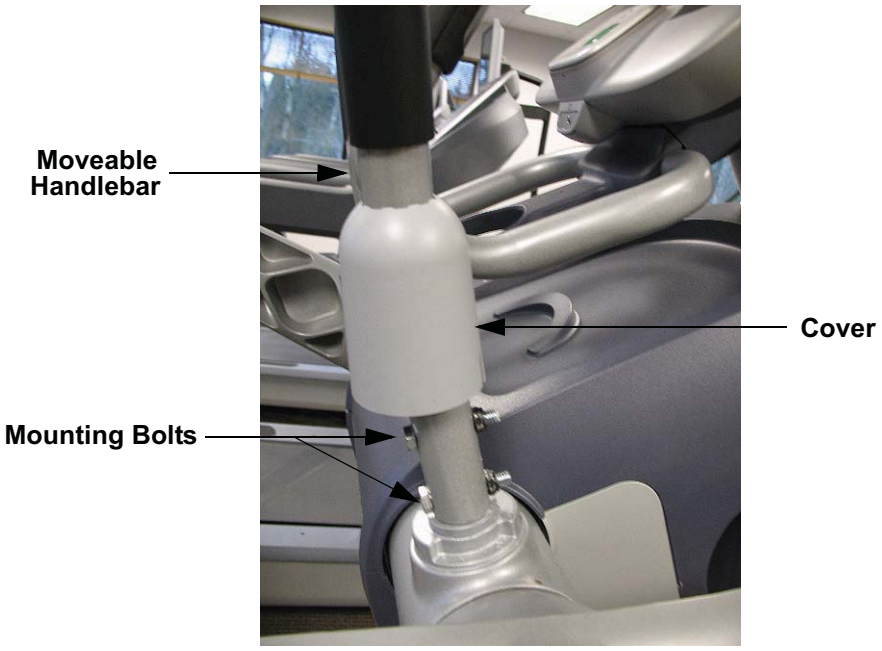
16. Repeat steps 1 through 16 with the remaining upper arm.

17. Thoroughly test all AMT functions.

Procedure 7.15 - Front Arm Replacement

1. Slide the cover up on the moveable handlebar, remove the two bolts that fasten the moveable handlebar to front arm. Remove the moveable handlebar from the front arm. See Diagram 7.32.

Diagram 7.32 - Moveable Handlebar



2. Follow Procedure 7.9, steps 1-4. Remove the stairarm from the front arm.

3. There are four bearings in the front arm assembly. The inner races of the bearings are not attached to the bearings and may come loose when the stairarm is removed. See Diagram 7.11.

4. Remove the upper arm per Procedure 7.14, steps 1 to 9.

5. Slide the inner bearing race and black plastic spacer off of the upper arm mounting shaft and retain for later use. See Diagram 7.30.

6. Slide the front arm off of the upper arm mounting shaft.

7. Clean the upper arm mounting shaft to remove any dried grease, dirt or debris.

8. Slide the replacement front arm into place on the upper arm mounting shaft.

9. Replace the upper arm per Procedure 7.14, steps 10-19.

10. Remove the spacer, the inner race, two large washers and a wave washer from the stairarm. The clearance between the stairarm shaft and the inner race is very small. It is very easy to jam the inner race on the stairarm shaft.

11. Carefully, clean the stairarm shaft to remove any dried grease, dirt or debris.

12. Slide the wave washer and two large washers on to the stairarm shaft. Carefully, slide the inner race all of the way onto the shaft and against the large washers. Slide the spacer onto the stairarm shaft. The arrangement should be as shown in Diagram 7.36, above.

13. Carefully, slide the stairarm onto the inner race on the front arm assembly.

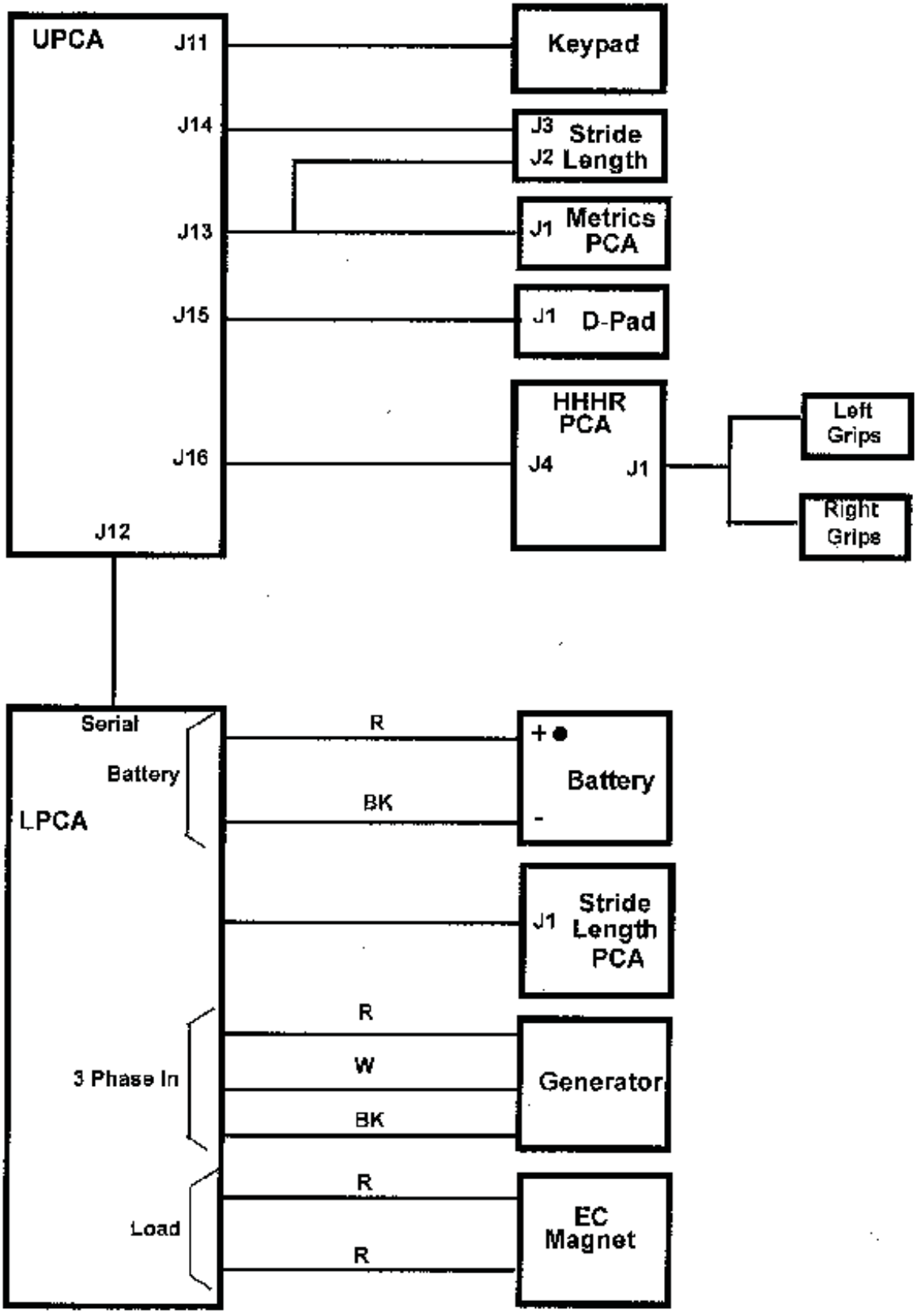
14. Slide the remaining inner race that is in the arm into the far bearing and secure with the snap ring.

15. Lift the stairarm and fasten it to the rear link assembly with the hardware removed in step 1. Torque the rear links assembly hardware to 100 - 110 inch pounds.

16. Set the moveable handlebar in its mounting position on the front arm and fasten it with the hardware removed in step 1. Slide its cover down into place.

17. Thoroughly test all AMT functions.

Wiring Diagram 8.1 - C100i Self Powered



Block Diagram 8.2 - C100i Self Powered